# 2014 – 3<sup>rd</sup> Quarter Report Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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**Prepared for:** 

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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 May 2016, the network is comprised of 94 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC 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, FOR604, and SHE604.

Some or all of the additional monitored variables, NOy, CO, and SO<sub>2</sub> have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, ROM206, and BEL116. Those variables were audited at the ROM206, PND165, HWF187, and BVL130 stations during third quarter 2014. All of the SO<sub>2</sub> and NOy results for those audits were found to be within acceptance criteria. The preliminary reports of those results were delivered following the audits and are not included in this report.

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	$\leq \pm 10.0\%$ of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ 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)	$\leq \pm 0.5^{\circ} \mathrm{C}$
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	$\leq \pm 5^{\circ}$ 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	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ 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	$\leq \pm 5.0\%$ of designated rate

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter         Audit Challenge         Acceptance Criteri			
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$	
Ozone	Intercept	point test gas concentration as $-5.0 \text{ ppb} \le b \le 5.0 \text{ ppb}$		
Ozone	Correlation Coefficient	transfer standard	$0.9950 \le r$	
DAS	Accuracy	Comparison with certified standard	$\leq \pm 0.003 \text{ VDC}$	

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

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

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

### **1.3 CASTNET Sites Visited Third Quarter 2014**

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the third quarter (July through September) of 2014. The locations and dates of the audits are presented in Table 2.

<u>Side ID</u>	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name	
ANA115	Without met	EPA	8/19/2014	Ann Arbor	
ARE128	Without met	EPA	9/25/2014	Arendtsville	
CAT175	Without met	EPA	9/26/2014	Claryville	
CTH110	Without met	EPA	9/5/2014	Connecticut Hill	
DIN431	Without met	NPS	7/15/2014	Dinosaur NM	
EGB181	Without met	EPA	8/28/2014	Egbert, Ontario	
FOR605	With met	EPA / BLM	7/21/2014	Fortification Creek	
HOX148	Without met	EPA	8/25/2014	Hoxeyville	
HWF187	Without met	EPA	9/30/2014	Huntington Wildlife Forest	
KEF112	Without met	EPA	9/23/2014	Kane Experimental Forest	
MKG113	Without met	EPA	9/20/2014	M.K. Goddard State Park	
PSU106	Without met	EPA	9/23/2014	Penn State University	
RED004	Flow only	EPA	9/4/2014	Red Lake Nation	
SAL133	Without met	EPA	7/19/2014	Salamonie Reservoir	
UVL124	Without met	EPA	8/26/2014	Unionville	

 Table 2. Site Audit Visits

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

Side ID	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name	
ALH157	Ozone PE	EPA	7/22/2014	Alhambra	
ANA115	Ozone PE	EPA	9/24/2014	Ann Arbor	
BAS601	Ozone PE	EPA / BLM	7/17/2014	Basin	
BVL130	Ozone PE	EPA	9/20/2014	Bondville	
BVL130	NO <sub>y</sub> CO SO <sub>2</sub>	EPA	9/20/2014	Bondville	
CNT169	Ozone PE	EPA	8/23/2014	Centennial	
GLR468	Ozone PE	NPS	8/23/2014	Glacier NP	
GTH161	Ozone PE	EPA	8/21/2014	Gothic	
HWF187	NOy	EPA	9/30/2014	Huntington Wildlife Forest	
LRL117	Ozone PE	EPA	9/19/2014	Laurel Hill	
NEC602	Ozone PE	EPA / BLM	7/22/2014	New Castle	
PND165	Ozone PE	EPA / BLM	7/16/2014	Pinedale	
PND165	NOy	EPA / BLM	7/16/2014	Pinedale	
PRK134	Ozone PE	EPA	9/10/2014	Perkinstown	
ROM206	Ozone PE	EPA	8/16/2014	Rocky Mountain NP	
ROM206	NO <sub>y</sub>	EPA	8/16/2014	Rocky Mountain NP	
ROM406	Ozone PE	NPS	8/16/2014	Rocky Mountain NP	
STK138	Ozone PE	EPA	7/21/2014	Stockton	
THR422	Ozone PE	NPS	8/25/2014	Theodore Roosevelt NP	
VIN140	Ozone PE	EPA	7/23/2014	Vincennes	
VOY413	Ozone PE	NPS	9/8/2014	Voyageurs NP	
WNC429	Ozone PE	NPS	7/23/2014	Wind Cave NP	
YEL408	Ozone PE	NPS	8/24/2014	Yellowstone NP	

 Table 3.
 Site TTP Pollutant Monitor PE Audit Visits

### 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 200 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 Frontier Global Sciences), and the network equipment depot (NED).

### 2.2 **Project Objectives**

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

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

### 2.3 Sites Visited Third Quarter 2014

This report covers the results from the NADP sites surveyed during the third quarter (July through September) of 2014. The station names and dates of the audits are presented in Table 4.

<u>Side ID</u>	<u>Network</u>	<u>Visit Date</u>	Station Name	
IA08	NTN	7/21/2014	Big Springs Fish Hatchery	
IL37	AMoN	7/21/2014	Stockton	
IL46	AMoN/NTN	7/22/2014	Alhambra	
IN20	NTN	7/19/2014	Roush Lake	
WY99	NTN	7/22/2014	Newcastle	
CO10	NTN	8/21/2014	Gothic	
CO15	NTN	8/25/2014	Sand Spring	
CO19	NTN	8/27/2014	Rocky Mountain NP-Beaver Meadows	
CO97	MDN/NTN	8/26/2014	Buffalo Pass - Summit Lake	
MT97	NTN	8/22/2014	Lost Trail Pass	
ON07	MDN	8/28/2014	Egbert	
SD18	MDN	8/26/2014	Eagle Butte	
SD99	NTN	8/27/2014	Huron Well Field	
CAN5	NTN	9/3/2014	Frelighsburg	
ND08	NTN	9/3/2014	Icelandic State Park	
ND11	NTN	9/2/2014	Woodworth	
NY01	NTN	9/21/2014	Alfred	
NY08	NTN	9/5/2014	Aurora Research Farm	
NY20	MDN/NTN/AMoN	9/30/2014	Huntington Wildlife	
NY67	AIRMoN	9/5/2014	Ithaca	
NY68	MDN/NTN	9/26/2014	Biscuit Brook	
NY98	NTN/AMoN	9/29/2014	Whiteface Mountain	
PA15	AIRMoN/NTN	9/24/2014	Penn State	

 Table 4. Sites Surveyed – Third Quarter 2014

<u>Side ID</u>	<u>Network</u>	<u>Visit Date</u>	Station Name		
PA18	NTN	9/22/2014	Young Woman's Creek		
PA60	NTN	9/24/2014	Valley Forge		
PA90	NTN	9/22/2014	Hills Creek State Park		
PQ17	MDN	9/1/2014	Chapais		
WI35	NTN/AMoN	9/10/2014	Perkinstown		
WI37	NTN	9/9/2014	Spooner		

### 2.4 Survey Results

Site survey results are entered into a relational database. The database in turn generates Site Spot Reports which are distributed among the interested parties as soon as all the site data has been entered. Database tables with all the data collected and reviewed are then sent to the NADP Program Office and to the U.S. EPA Project Officers.

Other items gathered during the surveys (i.e., photographs, Belfort charts, etc.) are uploaded to EEMS' server where the NADP PO and the U.S. EPA POs can access them and download them as needed by login into the server site.

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

## APPENDIX A

**CASTNET** Audit Report Forms

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
DIN	DIN431-Eric Hebert-07/15/2014								
1	7/15/2014	DAS	Environmental Sys Corp	90652	8816	2565			
2	7/15/2014	elevation	Elevation	none	none	none			
3	7/15/2014	flow rate	Mykrolis	none	FC280SAV-4S	AW902153			
4	7/15/2014	Infrastructure	Infrastructure	none	none	none			
5	7/15/2014	MFC power supply	Tylan	none	RO-32	FP9706002			
6	7/15/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490			
7	7/15/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450194			
8	7/15/2014	Shelter Temperature	ARS	none	unknown	none			
9	7/15/2014	siting criteria	Siting Criteria	none	none	None			
10	7/15/2014	Temperature	RM Young	none	41342	4273			

# **DAS Data Form**

DAS Time Max Error: 1.25

Mfg		Serial Nur	nber Site	1	<b>Technician</b>	Site Visit Date	Parameter	Use Desc.
Environment	tal Sys	2565	DIN	1431	Eric Hebert	07/15/2014	DAS	Primary
Das Date: Das Time: Das Day:	7 /15	5/2014 :28:15 196	Audit Date Audit Time Audit Day	7 /15/2014 13:27:00 196	Mfg Serial Number	Datel 15510194	Parameter Tfer Desc.	DAS Source generator (D
Low Chann	el:		High Channe	el:	Tfer ID	01320		
Avg Diff:	Ma	x Diff:	Avg Diff:	Max Diff:				
0.000	02	0.0005	0.0002	2 0.0003				
					Mfg	Fluke	Parameter	DAS
					Serial Number	86590148	Tfer Desc.	DVM
					Tfer ID	01310		
					Slone	1 0000	0 Intercent	0,00000
					Slope	1.0000	• Intercept	0.00000
					Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Inp	out D'	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	2 0	0.0000	0.0000	0.0000	V	V	0.0000	
2	2 0	0.1000	0.1000	0.1000	V	V	0.0000	
2	2 0	0.3000	0.2999	0.2999	V	V	0.0000	
2	2 0	0.5000	0.5004	0.5006	V	V	0.0002	
2	2 0	0.7000	0.7002	0.7007	V	V	0.0005	
2	2 0	).9000	0.9003	0.9008	V	V	0.0005	
2	2 1	.0000	1.0004	1.0009	V	V	0.0005	
9	0 0	0.0000	-0.0002	-0.0002	V	V	0.0000	
9	0 0	0.1000	0.0997	0.1000	V	V	0.0003	
9	0 0	0.3000	0.3001	0.3004	V	V	0.0003	
9	) (	).5000	0.5000	0.5002	V	V	0.0002	
9	) (	).7000	0.7003	0.7004	V	V	0.0001	
9	) (	).9000	0.9003	0.9005	V	V	0.0002	
9	) 1	.0000	0.9993	0.9992	V	V	-0.0001	

# **Flow Data Form**

Mfg	Serial Nun	nber Ta S	lite	Тес	chnician	Site Visit I	Date Paran	neter	<b>Owner ID</b>
Mykrolis	AW902153	3	DIN431	Eri	c Hebert	07/15/2014	flow ra	ite	none
Mfg	Tylan				Mfg	BIOS	Ι	Parameter Flo	w Rate
SN/Owner ID	FP9706002	none			Serial Number	122974	1	fer Desc. Bl	DS 220-H
Parameter	MFC power sup	oply			Tfer ID	01416			
					Slope	1.	00000 Int	ercept	0.00000
					Cert Date	1/8	3/2014 <b>Co</b>	rrCoff	1.00000
<b>DAS 1:</b>		DAS 2:		L	Cal Factor Z	ero	0.0	38	
A Avg % Diff:	A Max % Di	A Avg %I	Dif A Max	% Di	Cal Factor F	ull Scale	10.	92	
0.24%	0.28%				Rotometer R	eading:	3	3.4	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	-0.05	0.0101	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.05	0.0101	0.01	l/m	l/m	
primary	test pt 1	0.000	2.993	1.35	1.3574	3.00	l/m	l/m	0.20%
primary	test pt 2	0.000	2.991	1.35	1.3574	3.00	l/m	l/m	0.28%
primary		0.000	2.992	1.55	1.5574	5.00	1/111	1/111	0.23%
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent System N	lemo		Conditio	n		Statu	s pass	
Sensor Comp	onent Rotomete	er Condition		Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Leak Tes	it		Conditio	n		Statu	s pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Dist	tance		Conditio	n 5.5 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 1.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 360 deg		Statu	s pass	

# **Ozone Data Form**

Mfg	Seria	l Number Ta	Site		Te	chnician		Site Visi	it Date	Parame	eter	Owner l	D
ThermoElectron Inc	1211	052490	DIN4	131	E	ric Hebert		07/15/2	014	Ozone		none	
Slope: Intercept CorrCoff	0.9936 0.3393 0.9999	<ul> <li>Slope:</li> <li>Intercept</li> <li>CorrCoff</li> </ul>		0.0000	0 0	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7	Electron 70008-36	Inc Pa	rameter o er Desc. O	zone Dzone primar	y stan
DAS 1.		DAS 2:							1 0070	7		0.2	1022
A Avg % Diff: A N	Max %	DAS 2.	<b>6Dif</b>	A Max	% Di	Slope			1.0070	Inter	rcept	-0.2	032
0.9%	2	2.4%				Cert Da	ite		1/8/201	4 Corr	·Coff	1.00	000
UseDescription	:	ConcGroup:	Tfe	er Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary		1		0.32	0.	52	0.4	47	ppb				
primary		2	3	33.21	33	.18	33.	.99	ppb			2.44%	
primary		3	4	52.94	52	.77	52.	.63	ppb			-0.27%	
primary		4	3	33.46	83	.08	82.	.82	ppb			-0.31%	
primary		5	1	12.74	112	2.15	111	.70	ppb			-0.40%	
Sensor Compone	ent Ce	II B Noise			Conditi	on 0.7 pp	b			Status	pass		
Sensor Compone	ent Ce	ll B Tmp.			Conditi	on				Status	pass		
Sensor Compone	ent Ful	llscale Voltage			Conditi	on 0.999	8			Status	pass		
Sensor Compone	ent Inle	et Filter Conditio	on		Conditi	on Clean	1			Status	pass		
Sensor Compone	ent Lin	e Loss			Conditi	on Not te	sted			Status	pass		
Sensor Compone	ent Off	set			Conditi	on 0.000				Status	pass		
Sensor Compone	ent Spa	an			Conditi	on 1.024				Status	pass		
Sensor Compone	ent Ce	ll B Freq.			Conditi	on 80.0 k	Hz			Status	pass		
Sensor Compone	ent Sys	stem Memo			Conditi	on				Status	pass		
Sensor Compone	ent Sa	mple Train			Conditi	on Good				Status	pass		
Sensor Compone	ent Ce	II B Pressure			Conditi	on				Status	pass		
Sensor Compone	ent Ce	II B Flow			Conditi	on 0.69 l	pm			Status	pass		
Sensor Compone	ent Ce	ll A Tmp.			Conditi	on 34.1 (	)			Status	pass		
Sensor Compone	ent Ce	II A Pressure			Condition	on 620.9	mmHg			Status	pass		
Sensor Compone	ent Ce	II A Noise			Condition	on 0.9 pp	b			Status	pass		
Sensor Compone	ent Ce	ll A Freq.			Condition	on 81.9 k	Hz			Status	pass		
Sensor Compone	ent Ce	II A Flow			Condition	on 0.69 l	pm			Status	pass		
Sensor Compone	ent Ba	ttery Backup			Conditi	on N/A				Status	pass		
Sensor Compone	ent Zei	ro Voltage			Conditi	on 0.000	1			Status	pass		

# Temperature Data Form

Mfg		Serial Nun	nber Ta	Site		Tec	chni	ician	Site V	isit Date	Param	eter	Owner II	)
RM Young		4273		DIN431		Eric		ebert	07/18	(15/2014 Temper		rature	none	
							Mf	g	Extec	h	Pa	arameter Te	emperature	
							Ser	ial Number	H232	679	T	fer Desc. R	٢D	
							Tfe	er ID	01228	3				
DAS 1:			DAS 2:				Slo	ре		1.0049	6 Inte	rcept	-0.230	009
Abs Avg Err	Abs	Max Er	Abs Av	g Err Abs	Max Er		Cert Date		1/8/2014 Corr		rCoff	1.000	000	
0.44		0.54				]								
UseDesc.		Test type	In	outTmpRaw	InputTm	ърСо	orr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary	Temp	Low Range	e	0.06	0.2	.9	0.0000		0.7		7	С	0.37	
primary	Temp	Mid Range	;	25.37	25.4	47		0.0000		25.9		С	0.42	
primary	Temp	High Rang	e	45.32	45.3	33		0.0000		45.	9	С	0.54	
Sensor Com	ponen	t System N	/lemo		Cone	ditio	n S	See comments			Status	pass		]
Sensor Com	ponen	t Shield			Cone	ditio	n C	Clean			Status	pass		]
Sensor Com	ponen	t Blower S	tatus Swi	itch	Cone	ditio	n N	I/A			Status	pass		
Sensor Com	ponen	t Blower			Cone	ditio	n F	unctioning			Status	pass		]

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	DIN431	Eric Hebert	07/15/2014	Shelter Temperatu	renone
DAS 1:	DAS 2:	Davis Alex Maria Dav	Mfg	Extech	Parameter S	helter Temperatur
Abs Avg ErrAbs0.23	0.49	Err Abs Max Er	Serial Number	H232679	Tfer Desc. R	TD
			Tfer ID	01228		
			Slope	1.0049	6 Intercept	-0.23009
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.16	25.26	0.000	25.4	С	0.11
primary	Temp Mid Range	24.62	24.73	0.000	25.2	С	0.49
primary	Temp Mid Range	25.32	25.42	0.000	25.3	С	-0.1

#### **Infrastructure Data For**

DIN431

Site ID

Technician Eric Hebert

Site Visit Date 07/15/2014

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

# **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature	DIN431	Eric Hebert	07/15/2014	System Memo	RM Young	3992		
The temperature sensor is mounted directly above the shelter roof.								

# **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

The site operator was observed to lower the sample tower and replace the filter pack with the sample pump running and the channel marked as valid. Although gloves were used to handle the filter, they were kept in a pants pocket until needed and many items were touched between handling the filters. The operator was not completely familiar with the CASTNET procedures.

#### 2 Parameter: DasComments

All sensors, filter pack, and ozone sample inlet are on a single, crank-down tower.

#### 3 Parameter: SiteOpsProcedures

The site operator is not responsible for manual zero/span/precision checks of the ozone analyzer.

#### 4 Parameter: DocumentationCo

There is very little documentation of onsite activities. No manual entries in Dataview. The COC section of the SSRF is not being used.

#### 5 Parameter: SitingCriteriaCom

A small parking lot for park service employees is located approximately 40 meters north of the site.

#### 6 Parameter: ShelterCleanNotes

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

#### 7 Parameter: MetSensorComme

The ambient temperature sensor is mounted approximately 8 meters from the ground and above the shelter roof.

# Field Systems Data Form

# F-02058-1500-S1-rev002

Site ID DIN431	Technician Eric Hebert	Site Visit Date 07/1	5/2014
Site Sponsor (agency)	NPS	USGS Map	Dinosaur Quarry
<b>Operating Group</b>	NPS	Map Scale	
AQS #	49-047-1002	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	QAPP Latitude	40.4373
Deposition Measurement	dry	QAPP Longitude	-109.3046
Land Use	Desert	QAPP Elevation Meters	1463
Terrain	complex	QAPP Declination	10.7
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone		Audit Latitude	40.4373
Site Address 1		Audit Longitude	-109.3046
Site Address 2		Audit Elevation	1463
County	Uintah	Audit Declination	10.7
City, State	Jensen, UT	Present	
Zip Code	84035	Fire Extinguisher 🗹	No inspection date
Time Zone	Mountain	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🛛	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🗹	
Shelter Working Room $\checkmark$	Make American Portable B M	odel A0810	Shelter Size 640 cuft
Shelter Clean	Notes The shelter is in good condition	n, clean, and well organized.	
Site OK	Notes		
Driving Directions Go ea	st on route 40 from ∨ernal, UT. Turn nort	h on route 149 and follow signs	s for Dinosaur National Monument.

# **Field Systems Data Form**

DIN431

## F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 07/15/2014

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		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m	40 m	$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

A small parking lot for park service employees is located approximately 40 meters north of the site.

Fie	eld Systems Data Form		F-02058-1500-S3-rev002
Site	<b>DIN431 Technician</b> Eric Hebert		Site Visit Date 07/15/2014
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?	✓	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?		Mounted on south of tower, over shelter
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	✓	N/A
Pro	wide any additional evaluation (nhotograph or sketch if nec	essar	y) regarding conditions listed above, or any other features

natural or man-made, that may affect the monitoring parameters:

The ambient temperature sensor is mounted approximately 8 meters from the ground and above the shelter roof.

# **Field Systems Data Form**

## F-02058-1500-S4-rev002

Site	e ID	DIN431	Technician	Eric Hebert		Site Visit Date 07/	15/2014		
1	Do all th condition	e meterological senso n, and well maintaine	ors appear to be ed?	intact, in good	✓				
2	Are all t reportin	he meteorological sen g data?	nsors operationa	l online, and	✓				
3	Are the	shields for the temper	rature and RH s	sensors clean?	✓				
4	Are the	aspirated motors wor	rking?		✓				
5	Is the so scratche	lar radiation sensor's s?	s lens clean and	free of	✓	N/A			
6	Is the su	rface wetness sensor	grid clean and ι	indamaged?		N/A			
7	Are the s	sensor signal and pov n, and well maintaine	ver cables intact ed?	t, in good	✓				
8	Are the s from the	sensor signal and pov elements and well m	ver cable connectaintained?	ctions protected	✓				
Par	rameter	Μ	lanufacturer	Model		S/N	Clie	nt ID	
Ter	nperature	RI	M Young	41342		4273	none	9	

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID DIN431 Technician Eric Hebert		Site Visit Date 07/15/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	quipi	nent 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 an	d ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?		
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?		No
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry

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

Fi	eld Sy	stems Data Fo	orm					<b>F-02</b>	2058-15	00-S6-rev002
Site	e ID	DIN431	Technician	Eric Hebert		Site Visi	it Date	07/15/2014	4	
	DAS, ser	nsor translators, and p	eripheral equi	pment operation	ns ai	<u>nd maintena</u>	<u>nce</u>			
1	Do the I well mai	OAS instruments appeantained?	ar to be in good	l condition and	✓					
2	Are all t modem,	he components of the I backup, etc)	DAS operation	al? (printers,	✓					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass (	through	✓	Met sensors	only			
4	Are the well mai	signal connections pro ntained?	tected from the	e weather and	✓					
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	we a stable pov	ver source?	✓					
8	Is the in	strument shelter tempo	erature control	lled?						
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?				✓ One tower o	nly			

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

All sensors, filter pack, and ozone sample inlet are on a single, crank-down tower.

Field Sy	stems Data	For	m				<b>F-02</b>	<b>058-</b> 1	1500-S7-rev002
Site ID	DIN431		Technicia	n Eric Heber	ť	Site Visit Date	07/15/2014		
Document	tation								
Does the s	ite have the require	d ins	trument a	<u>nd equipmen</u>	<u>t manuals?</u>				
Wind speed s Wind directi Temperature Relative hum Solar radiati Surface weth Wind sensor Temperature Humidity sen Solar radiati Tipping buck Ozone analyz	Sensor on sensor e sensor nidity sensor on sensor translator e translator esor translator on translator on translator cet rain gauge zer				Data logger Data logger Strip chart Computer Modem Printer Zero air pu Filter flow p Surge prote UPS Lightning p Shelter hea	mp pump ector protection device ter	Yes ✓ □ □ □ □ □ □ □ □ □ □ □ □ □	No	N/A  V V V V V V V V V V V V V V V V V V
Filter pack fl	ow controller				Shelter air	conditioner		$\checkmark$	
Filter pack M	<b>IFC power supply</b>		$\checkmark$						
Does the	site have the requi	ed a	<u>nd most re</u>	cent QC doci	uments and	report forms?			
		Prese	ent				Currei	nt	
Station Log SSRF Site Ops Mar HASP Field Ops Ma Calibration I Ozone z/s/p O Preventive m	nual anual Reports Control Charts naintenance schedul		Not p           Not p           Not p           Not p           1/20/	present present present present 2014				11	
<ol> <li>Is the st</li> <li>Are the current'</li> </ol>	ation log properly c Site Status Report ] ?	ompl Form	leted durin is being co	ng every site v	visit?	ow & observation s	sections		
<ul><li>3 Are the sample</li><li>4 Are ozo</li></ul>	chain-of-custody fo transfer to and fron ne z/s/p control cha	rms j 1 lab: rts pr	properly u ? roperly con	sed to docum	ient	ontrol charts not us	sed		
current Provide any natural or m	additional explanat an-made, that may	ion (p affect	photograph t the moni	h or sketch if toring param	necessary) r neters:	regarding conditi	ions listed a	bove, o	r any other features,

There is very little documentation of onsite activities. No manual entries in Dataview. The COC section of the SSRF is not being used.

## **Field Systems Data Form**

## F-02058-1500-S8-rev002

Site	ID	DIN431	Technician	Eric Hebert	Site Visit Date	07/15/2014	
1	<u>Site ope</u> Has the course?	<u>eration procedures</u> site operator attender If yes, when and who	d a formal CAS instructed?	TNET training			
2	Has the training	backup operator atte g course? If yes, when	nded a formal ( and who instru	CASTNET cted?			
3	Is the sit	e visited regularly on ?	the required <b>T</b> u	iesday			
4	Are the sflollowed	standard CASTNET of d by the site operator?	operational pro	cedures being			
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	lgeable of, and a cluding docum	able to perform entation)			

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

QC Check Performed	
Multipoint Calibrations	$\checkmark$
Visual Inspections	$\checkmark$
Translator Zero/Span Tests (climatronics)	$\checkmark$
Manual Rain Gauge Test	$\checkmark$

**Confirm Reasonableness of Current Values** 

**Test Surface Wetness Response** 

Frequency	Compliant
N/A	

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

<b>QC Check Perfor</b>
------------------------

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

	Frequency	Co
✓	Semiannually	$\checkmark$
✓	Daily	✓
	Not performed	
✓	Daily	$\checkmark$
	Not performed	
	Not performed	
✓	Weekly	$\checkmark$
✓	N/A	$\checkmark$
	Not performed	
✓	Semiannually	$\checkmark$

- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

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

	Unknown	
✓	Dataview	

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

The site operator is not responsible for manual zero/span/precision checks of the ozone analyzer.

#### **Compliant**

Fi	ield Sy	vstems Data Form					F-02058-1	500-S9-rev002
Sit	te ID	DIN431 Te	chnician	Eric Hebert		Site Visit Dat	te 07/15/2014	
	<u>Site ope</u>	eration procedures						
1	Is the fi	lter pack being changed even	ry Tuesda	y as scheduled?		Filter changed afte	ernoons	
2	Are the correct	Site Status Report Forms bo ly?	eing comp	leted and filed				
3	Are dat schedul	a downloads and backups bo ed?	eing perfo	ormed as		No longer required	d	
4	Are ger	neral observations being mad	le and rec	orded? How?	✓	SSRF		
5	Are site fashion	e supplies on-hand and replex ?	nished in	a timely				
6	Are san	nple flow rates recorded? Ho	ow?		✓	SSRF		
7	Are san fashion	nples sent to the lab on a reg ?	ular schee	dule in a timely				
8	Are filt and shi	ers protected from contamin pping? How?	ation dur	ing handling				
9	Are the operation	site conditions reported reg ons manager or staff?	ularly to t	the field				
QC	C Check P	erformed	Freq	luency			Compliant	
	Multi-poi	nt MFC Calibrations	✓ Sem	iannually				
	Flow Syst	em Leak Checks	🗆 Not p	performed				
	Filter Pac	k Inspection						
	Flow Rate	e Setting Checks	✓ Wee	kly			$\checkmark$	
	Visual Ch	eck of Flow Rate Rotometer	· ✔ Wee	kly			$\checkmark$	
	In-line Fi	Iter Inspection/Replacement	✓ Sem	iannually			$\checkmark$	
	Sample L	ine Check for Dirt/Water	🗆 Not p	performed				

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

The site operator was observed to lower the sample tower and replace the filter pack with the sample pump running and the channel marked as valid. Although gloves were used to handle the filter, they were kept in a pants pocket until needed and many items were touched between handling the filters. The operator was not completely familiar with the CASTNET procedures.

Field Sy	Field Systems Data Form			F-02058-1500-S10-rev002			
Site ID	DIN431	Technician	Eric Hebert	Site Visit Date	07/15/2014		

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2565	90652
elevation	Elevation	none	none	none
flow rate	Mykrolis	FC280SAV-4S	AW902153	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9706002	none
Ozone	ThermoElectron Inc	49i A3NAA	1211052490	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450194	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	4273	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
SAL	SAL133-Sandy Grenville-07/19/2014								
1	7/19/2014	Computer	Dell	000292	D520	unknown			
2	7/19/2014	DAS	Campbell	000351	CR3000	2129			
3	7/19/2014	Elevation	Elevation	None	1	None			
4	7/19/2014	Filter pack flow pump	Thomas	00765	107CA110	0000141			
5	7/19/2014	Flow Rate	Арех	000465	AXMC105LPMDPCV	43974			
6	7/19/2014	Infrastructure	Infrastructure	none	none	none			
7	7/19/2014	Met tower	Universal Tower	03558	unknown	none			
8	7/19/2014	Modem	Raven	06594	V4221-V	0844344486			
9	7/19/2014	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316			
10	7/19/2014	Ozone Standard	ThermoElectron Inc	000372	49i A3NAA	0726124684			
11	7/19/2014	Sample Tower	Aluma Tower	none	В	AT-51065-5-G-A			
12	7/19/2014	Shelter Temperature	Campbell	none	107-L	none			
13	7/19/2014	Siting Criteria	Siting Criteria	None	1	None			
14	7/19/2014	Temperature	RM Young	06410	41342	14043			
15	7/19/2014	Zero air pump	Werther International	06935	C 70/4	000829172			

# **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial Number		e 1	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.	
Campbell	2129		L133	Sandy Grenville	07/19/2014	DAS	Primary	
Das Date:7 /19/2014AuditDas Time:17:30:33AuditDas Day:200AuditLow Channel:High CAvg Diff:Max Diff:Avg Dif0.00010.0002		Audit Date Audit Time Audit Day High Chann Avg Diff: 0.000	7 /19/2014 17:30:34 200 el: Max Diff: 1 0.0002	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D	
				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 12/28/201	<ul> <li>Parameter</li> <li>Tfer Desc.</li> <li>Intercept</li> <li>CorrCoff</li> </ul>	DAS DVM 0.00000 1.00000	
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference		
7	0.0000	0.0000	0.0000	V V	V	0.0000		
7	0.1000	0.0999	0.0999	V	V	0.0000		
7	0.3000	0.2998	0.2998	v v	V	0.0000		
7	0.5000	0.4997	0.4996	v v	V	-0.0001		
7	0.7000	0.6996	0.6995	V	V	-0.0001		
7	0.9000	0.8995	0.8993	V	V	-0.0002		
7	1.0000	0.9994	0.9992	V	V	-0.0002		

# Flow Data Form

Mfg Serial Number Ta		ber Ta	Site	Tec	hnician	Site Visit Date Para		neter	<b>Owner ID</b>	
Apex 43974			SAL133	Sa	ndy Grenville	07/19/2014 Flow F		Rate	000465	
				Mfg		BIOS		Parameter Flow Rate		
					Serial Number	103471	103471 <b>T</b>		exus	
					<b>Tfer ID</b> 01420					
					Slope	1.0	0846 <b>In</b>	tercept	0.01358	
					Cert Date 1/		2014 CorrCoff		0.99997	
					Mfg	BIOS Parameter			Flow Rate	
					Serial Number	103424 Tfer Desc		Ffer Desc.	BIOS cell	
					Tfer ID	01410	01410			
					Slope	1.00846		tercept	0.01358	
					Cert Date	1/8	1/8/2014 <b>Co</b>		0.99997	
DAS 1:		DAS 2:		_	Cal Factor Z	ero	-0.	.02		
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0	.97		
1.12%	1.35%				Rotometer R	eading:		1.4		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	Unit OutputSignall PctDiff		
primary	pump off	0.000	0.000	0.01	0.000	-0.02	l/m	l/m		
primary	leak check	0.000	0.000	0.01	0.000	-0.01	l/m	l/m		
primary	test pt 1	1.510	1.480	1.54	0.000	1.50	l/m	l/m	1.35%	
primary	test pt 2	1.506	1.480	1.54	0.000	1.50	l/m	l/m	1.35%	
primary	test pt 3	1.515	1.490	1.54	0.000	1.50	l/m	l/m	0.67%	
Sensor Component Leak Test				Conditio	n		Statu	s pass		
Sensor Component Tubing Condition				Conditio	n Good		Statu	s pass		
Sensor Component Filter Position				Conditio	n Good	Statu	s pass			
Sensor Component Rotometer Condition			Conditio	n Clean and dry		Statu	s pass			
Sensor Component Moisture Present			Conditio	n No moisture p	resent	Statu	s pass			
Sensor Component Filter Distance				Conditio	n 3.5 cm		Statu	s pass		
Sensor Component Filter Depth				Conditio	n 2.0 cm		Statu	s pass		
Sensor Component Filter Azimuth			Conditio	200 deg St			us pass			
Sensor Component System Memo			Conditio	Status pass						

# **Ozone Data Form**

Mfg	Serial Number Ta	Site	Те	Technician		Site Visit Date		Parameter		Owner ]	D
ThermoElectron Inc 1105347316		SAL133	Sandy Grenville		07/19/2014		Ozone		000741		
Slope:1.01925Slope:Intercept-0.35120Intercept		0.00000		Mfg Serial Number		ThermoElectron In 49C-73104-373		Inc Par	rameter 02 er Desc. 0	zone zone transfe	er er
CorrCoff	0.99999 CorrCoff	0.0000	0	Tfer ID		01100		]			
DAS 1:	<b>DAS 2:</b>			Slope 1.004			1.00458	3 Inter	cent	-0.1	1484
A Avg % Diff: A N	Max % Di A Avg	%Dif A Max	% Di			12/10/2013 ComCoff			1.00	0000	
1.4%	1.6%						., 10, 2010				
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDif	fference:	
primary	1	0.55	0.66		0.1	0.15 ppb					
primary	2	30.65	30.62		31.05 ppb		ppb			1.40%	
primary	3	50.33	50.21		50.99 ppb		ppb			1.55%	
primary	4	80.69	80.4	80.43 81.40 pp		ppb	pb		1.21%		
primary	5	100.53	100	.18	101	.80	ppb			1.62%	
Sensor Compone	Cell B Noise		Conditio	<b>n</b> 0.9 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	N/A				Status [	pass		
Sensor Compone	nt Inlet Filter Conditi	on	Conditio	n Clean	1			Status	pass		
Sensor Compone		Condition Not tested				Status	pass				
Sensor Component Offset			Condition 0.10				Status pass				
Sensor Component Span			Condition 1.020					Status	pass		
Sensor Compone	Cell B Freq.	Cell B Freq.			Condition 96.7 kHz			Status	pass		
Sensor Compone	stem Memo		Conditio	on				Status	pass		
Sensor Compone	nt Sample Train		Conditio	Good				Status	pass		
Sensor Compone	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Compone	Cell B Flow		Conditio	<b>n</b> 0.54 l	pm			Status	pass		
Sensor Compone	Cell A Tmp.		Conditio	<b>n</b> 33.7 (	)			Status	pass		
Sensor Compone	Cell A Pressure		Conditio	<b>n</b> 729 m	nmHg			Status [	pass		
Sensor Compone	Cell A Noise		Conditio	0.8 pp	b			Status	pass		
Sensor Compone	Cell A Freq.		Conditio	<b>n</b> 109.7	kHz			Status	pass		
Sensor Compone	Cell A Flow		Conditio	<b>n</b> 0.63 l	pm			Status	pass		
Sensor Compone	Battery Backup		Conditio	N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	N/A				Status	pass		
## Temperature Data Form

Mfg	Serial Number	la Site	Site 7		Technician		isit Date	Param	eter	<b>Owner ID</b>	
RM Young	14043	SAL133	SAL133		Sandy Grenville		9/2014	Temper	ature	06410	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	pe		1.0028	8 Inte	rcept	-0.15155	;
Abs Avg Err Ab	os Max Er Abs	Avg Err Abs	Max Er	ax Er Cert Date		1/8/2014 <b>Cor</b>		rCoff 1.00000		)	
0.10	0.18										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.04	0.19		0.000	0.2		2	С	0	
primary Tem	p Mid Range	26.02	26.10		0.000		26.0		С	-0.12	
primary Tem	p High Range	49.32	49.33	3	0.000		49.	2	С	-0.18	
Sensor Compone	ent Shield		Condi	ition C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Component Blower Status Switch			Condi	Condition N/A			Status		pass		
Sensor Compone	ent System Memo		Condi	Condition				Status	pass		

## Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	none	SAL133	Sandy Grenville	07/19/2014	Shelter Temperatu	ire none
DAS 1: Abs Avg Err Ab	DAS 2: s Max Er Abs Avg	Err Abs Max Er	Mfg	Extech	ParameterS	Shelter Temperatur
0.14	0.31		Serial Number	H232734	Tfer Desc.	RTD
			Tfer ID	01227		
			Slope	1.0028	8 Intercept	-0.15155
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.60	22.69	0.000	23.0	С	0.31
primary	Temp Mid Range	22.70	22.79	0.000	22.8	С	0.01
primary	Temp Mid Range	22.80	22.89	0.000	23.0	С	0.11

#### **Infrastructure Data For**

SAL133

Site ID

Technician Sandy Grenville

Site Visit Date 07/19/2014

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

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

There is evidence of a leak in the shelter roof, and the condition has deteriorated since the previous audit visit. Only one light is working. There are signs of ants in the shelter.

<b>Field Systems Data Form</b>	

### F-02058-1500-S1-rev002

SAL133	ite ID SAL133 Technician Sandy Grenville		9/2014			
Site Sponsor (agency)	EPA	USGS Map	Lagro			
<b>Operating Group</b>	private	Map Scale				
AQS #	18-169-9991	Map Date				
Meteorological Type	Climatronics					
Air Pollutant Analyzer	Ozone	QAPP Latitude				
<b>Deposition Measurement</b>	dry	QAPP Longitude				
Land Use	agriculture	QAPP Elevation Meters				
Terrain	flat	QAPP Declination				
Conforms to MLM	Yes	QAPP Declination Date				
Site Telephone	(260) 782-2428	Audit Latitude	40.816038			
Site Address 1	Hamilton Road	Audit Longitude	-85.661407			
Site Address 2		Audit Elevation	250			
County	Wabash	Audit Declination	-5			
City, State	Lagro, IN	Present				
Zip Code	46941	Fire Extinguisher 🗹	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 M	odel 8810	Shelter Size640 cuft			
Shelter Clean	Notes There is evidence of a leak in taudit visit. Only one light is wo	the shelter roof, and the condition of the condition of ants	on has deteriorated since the previous in the shelter.			
Site OK	Notes	• • • •				
Driving Directions From several next r	iving Directions From Huntington, IN take route 9 south a few miles to Division Road. Turn right (west) on Division and continue several miles to S 750 E, turn left (south). Turn right (west) at the first intersection (E 50 S). Turn left (south) at the next road, Hamilton or 725E. The site is about 1 mile on the right.					

### **Field Systems Data Form**

SAL133

### F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 07/19/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m	20 m	
Limited agricultural operations	200 m	20 m	
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

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

C I	eld Systems Data Form		F-02058-1500-S3-rev002
Sit	e ID SAL133 Technician		Site Visit Date 07/19/2014
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

Fi	eld Systems Data Form				<b>F-0</b> 2	2058-15	00-S6-rev002
Site	Site ID       SAL133       Technician       Sandy Grenville			Site Visit Date	07/19/2014	1	
	DAS, sensor translators, and periphe	eral equipment operation	is ar	nd maintenance			
1	Do the DAS instruments appear to b well maintained?	✓					
2	Are all the components of the DAS o modem, backup, etc)	perational? (printers,					
3	Do the analyzer and sensor signal lea lightning protection circuitry?	ads pass through	✓	Met sensors only			
4	Are the signal connections protected well maintained?	from the weather and					
5	Are the signal leads connected to the	correct DAS channel?	✓				
6	Are the DAS, sensor translators, and grounded?	l shelter properly	✓				
7	Does the instrument shelter have a st	table power source?	✓				
8	Is the instrument shelter temperatur	e controlled?	✓				
9	Is the met tower stable and grounded	1?		Stable		Grounded	
10	Is the sample tower stable and groun	nded?					
11	Tower comments?						

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

Field S	ystems Data	Foi	rm				<b>F-02</b>	058-	1500-8	87-rev00	2
Site ID	SAL133		Techi	nician	Sandy Grenville	Site Visit Date	07/19/2014				
<b>Docume</b>	entation										
Does the	e site have the requi	red ins	strume	nt and	equipment manuals?	2					
		Yes	No	<b>N/</b>	A		Yes	No	N/A		
Wind speed	d sensor			✓	Data logg	er					
Wind direc	ction sensor			✓	Data logg	er			$\checkmark$		
Temperatu	ire sensor		✓		Strip chai	rt recorder			$\checkmark$		
Relative hu	umidity sensor			$\checkmark$	Computer	r					
Solar radia	ation sensor			$\checkmark$	Modem			$\checkmark$			
Surface we	tness sensor			$\checkmark$	Printer				$\checkmark$		
Wind sense	or translator			$\checkmark$	Zero air p	oump		$\checkmark$			
Temperatu	ire translator			$\checkmark$	Filter flov	v pump		$\checkmark$			
Humidity s	sensor translator			$\checkmark$	Surge pro	otector		$\checkmark$			
Solar radia	ntion translator			$\checkmark$	UPS				$\checkmark$		
Tipping bu	icket rain gauge			$\checkmark$	Lightning	protection device		$\checkmark$			
Ozone anal	lyzer	$\checkmark$			Shelter he	eater		$\checkmark$			
Filter pack	flow controller				Shelter ai	r conditioner		$\checkmark$			
Filter pack	MFC power supply		$\checkmark$								
Does th	he site have the requ	ired a	nd mos	st rece	nt QC documents and	d report forms?					
		Pres	ent				Curre	nt			
Station Log	g	[	✓				$\checkmark$				
SSRF		[									

Station Log			
SSRF	$\checkmark$		$\checkmark$
Site Ops Manual	$\checkmark$		
HASP		November 2009	$\checkmark$
Field Ops Manual			
Calibration Reports	$\checkmark$		
Ozone z/s/p Control Charts			
Preventive maintenance schedul			
			1

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

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

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

Site	ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2014	
1	<u>Site ope</u> Has the course?	<u>ration procedures</u> site operator attended If yes, when and who	d a formal CAS instructed?	TNET training 🔽	Trained on-site by E	SE employee (JBA)	
2	Has the training	backup operator atte course? If yes, when	nded a formal ( and who instru	CASTNET			
3	Is the sit	e visited regularly on ?	the required <b>T</b> u	iesday 🗸			
4	Are the s flollowed	standard CASTNET of by the site operator?	perational pro	cedures being 🔽			
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	geable of, and a	able to perform 🗹 entation)			

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

QC Check Performed
Multipoint Calibrations

#### Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	
Visual Inspections	$\checkmark$	Weekly	
Translator Zero/Span Tests (climatronics)		N/A	
Manual Rain Gauge Test	$\checkmark$	N/A	
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	
Test Surface Wetness Response	$\checkmark$	N/A	✓

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

OC Check Performed
--------------------

**Multi-point Calibrations Automatic Zero/Span Tests Manual Zero/Span Tests Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water Zero Air Desiccant Check

Frequency	Compliant
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
Weekly	$\checkmark$

- 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?					

Unknown
SSRF, logbook, call-in

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

The ozone sample train is leak tested every two weeks.

Compliant

Fi	eld Systems Data Form			F-02058-1500-S9-rev0					
Sit	e ID SAL133 Tec	hnician Sandy Grenville		Site Visit Date	07/19/2014				
	Site operation procedures								
1	Is the filter pack being changed ever	y Tuesday as scheduled?		Filter changed morr	ings				
2	Are the Site Status Report Forms be correctly?	ing completed and filed	✓						
3	Are data downloads and backups be scheduled?	ing performed as		No longer required					
4	Are general observations being made	e and recorded? How?	✓	SSRF, logbook					
5	Are site supplies on-hand and replenished in a timely fashion?								
6	Are sample flow rates recorded? How	w?	✓	SSRF, call-in					
7	Are samples sent to the lab on a regu fashion?	lar schedule in a timely	✓						
8	Are filters protected from contamina and shipping? How?	tion during handling		Clean gloves on and off					
9	Are the site conditions reported regu operations manager or staff?	larly to the field							
QC	Check Performed	Frequency			Compliant				
I	Aulti-point MFC Calibrations	Semiannually							
I	Flow System Leak Checks	✓ Weekly							
Filter Pack Inspection									
Flow Rate Setting Checks									
Visual Check of Flow Rate Rotometer Weekly									
I	n-line Filter Inspection/Replacement	Semiannually			$\checkmark$				
5	Sample Line Check for Dirt/Water	✓ Weekly							
D	· · · · · · · · · · · · · · · · · · ·		~ ~ ~ ~	a) manager die a aan ditt	and listed above and	and other footeness			

Provide any additional 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 V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number	
FOR605-Eric Hebert-07/21/2014							
1	7/21/2014	DAS	Campbell	49922	CR1000	illegible	
2	7/21/2014	elevation	Elevation	none	none	none	
3	7/21/2014	Flow Rate	AALBORG	none	GFMS-012446	196706-5	
4	7/21/2014	Infrastructure	Infrastructure	none	none	none	
5	7/21/2014	Precipitation	Vaisala	none	444A	2998	
6	7/21/2014	Relative Humidity	Vaisala	none	HMP45AC	C2240042	
7	7/21/2014	siting criteria	Siting Criteria	none	none	None	
8	7/21/2014	Solar Radiation	Licor	none	LI-200	PY47986	
9	7/21/2014	Temperature	Vaisala	none	HMP45AC	C2240042	
10	7/21/2014	Wind Direction	Met One	illegible	Illegible	k5192	
11	7/21/2014	Wind Speed	Met One	none	014	D3117	

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
AALBORG 196706-5			FOR605	Eri	ic Hebert	07/21/2014	Flow R	late	none
					Mfg	BIOS	P	arameter Flov	v Rate
					Serial Number	131818	T	fer Desc. BIO	S 220-H
					Tfer ID	01417			
					Slope	1.0	00000 <b>Int</b>	ercept	0.00000
					Cert Date	1/8	/2014 <b>Co</b>	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero	0.3	33	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.00	19	
6.56%	6.82%				Rotometer R	eading:		0	
Desc.	Test type	Input l/m	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.36	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.36	l/m	l/m	
primary	test pt 1	3.080	3.080	0.00	0.000	3.29	l/m	l/m	6.82%
primary	test pt 2	3.079	3.080	0.00	0.000	3.29	l/m	l/m	6.66%
primary	test pt 3	3.081	3.080	0.00	0.000	3.27	l/m	l/m	6.20%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n N/A		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Status	as pass	
Sensor Component Filter Distance		Conditio	ion 3.0 cm		Status	pass			
Sensor Component Filter Depth			Conditio	<b>n</b> 3.0 cm	Statı		18 pass		
Sensor Comp	onent Filter Azi	muth		Conditio	n N/A		Status	pass	
Sensor Comp	onent System M	Nemo		Conditio	n		Status	pass	

## Wind Speed Data Form

Mfg	Serial Num	iber Ta Site	Tech	nician	Site Visit Date	Parameter	Owner II	D
Met One	D3117	D3117 FOR605		Eric Hebert		Wind Speed	none	
			N S	Ifg erial Number	RM Young CA04013	Paramet	er wind speed	otor (h
			Т	fer ID	01253			
<b>Prop or Cups S</b>	SN N/A		S	lope	1.0000	00 Intercept	0.000	000
Prop or Cups 7	Forque	0 <b>to</b>	0	ert Date	1/16/20	14 CorrCoff	1.00	000
Prop Correctio	n Fact N/A			Juit Dute				
•	DAS 1:	D	AS 2:					
	Low Range	High Range L	ow Range Hig	h Range				
Abs Avg Err	0.07	0.63%						
Abs Max Er	0.17	1.26%						
UseDescription	: Input Device	e Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.45	0.0	0.5		0.00	
primary	01253	40	1.67	0.0	1.5		-0.17	
primary	01253	80	2.75	0.0	2.7		-0.10	
primary	01253	140	4.26	0.0	4.3		-0.01	
primary	01253	210	6.07	0.0	6.1	-0.33%		
primary	01253	400	11.11	0.0	11.3	1.26%		
primary	01253	730	19.87	0.0	20.1	0.91%		
primary	01253	1800	48.44	0.0	48.5	0.02%		
Sensor Comp	onent Condition		Condition	Good		Status pass		
Sensor Comp	onent Prop or C	ups Condition	Condition	Good		Status pass		
Sensor Comp	onent Sensor H	eater	Condition	N/A		Status pass		
Sensor Comp	onent Torque		Condition		Status pass			
Sensor Comp	onent Sensor Pl	lumb	Condition	Plumb		Status pass		
Sensor Comp	onent System M	lemo	Condition			Status pass		

## Wind Direction Data Form

Mfg	Serial Number Ta	Site	1	Technician	Site Visit	Date Para	meter	<b>Owner ID</b>
Met One	k5192	FOR605		Eric Hebert	07/21/20	14 Wind	Direction	illegible
				Mfg	RM Youn	g	Parameter	wind direction
				Serial Numbe	er 🗌		Tfer Desc.	wind direction wheel
				Tfer ID	01264			
Vane SN: N/ VaneTorque	<sup>/A</sup> C. A 0 to 0	A. Align. deg	. <b>true:</b> 360					
				Mfg	Ushikata		Parameter	wind direction
				Serial Numbe	<b>r</b> 192034		Tfer Desc.	transit
				Tfer ID	01270			
				Slope		1.00000 Ir	itercept	0.00000
				Cert Date	1/	30/2014 C	orrCoff	1.00000
1		DAS	2.2.					
	Orientation Lineari	v. Orio	entation	Linearity				
Abs Avg Err	3.5							
Abs Max Er	5							
UseDescription	n TferID I	nput Raw	Linearity	Output V O	utput Deg.	Difference	Change	Error
primary	01270	0		0.000	1	1		1
primary	01270	90		0.000	86	4		4
primary	01270	180		0.000	176	4		4
primary	01270	270		0.000	265	5		5
Sensor Comp	onent Sensor Heater		Cond	ition N/A		Stat	us pass	
Sensor Comp	onent Mast		Cond	ition Good		Stat	us pass	
Sensor Comp	onent Sensor Plumb		Cond	ition Plumb		Stat	us pass	
Sensor Comp	onent Condition		Cond	ition Good		Stat	us pass	
Sensor Comp	onent Torque		Cond	ition		Stat	us pass	
Sensor Comp	onent Vane Condition		Cond	ition Good		Stat	us pass	
Sensor Comp	onent System Memo		Cond	ition		Stat	us pass	

## **Temperature Data Form**

Mfg	Serial Number Ta	Site	,	Techni	ician	Site V	visit Date	Param	eter	<b>Owner ID</b>	
Vaisala	C2240042	FOR605		Eric H	ebert	07/21	/2014	Temper	ature	none	
				Mf	<sup>°</sup> g	Eutec	hnics	Pa	arameter Te	emperature	
				Ser	rial Number	01D10	02193	Tf	er Desc. R	D translator	
				Tfer ID		01231					
DAS 1:		Slope			1.0013	3 Inte	rcept	-0.0573	31		
Abs Avg Err	Abs Max Er Abs Av	g Err Abs	Max Er	Cei	rt Date		12/27/201	3 Cor	rCoff	1.0000	00
				Mf	g	Eutec	hnics	Pa	arameter Temperature		
				Serial Number0Tfer ID0		01H0	060	Tf	er Desc. R	۲D probe	
						01230	)				
					pe		1.0013	3 Inte	rcept	-0.0573	31
				Cert Date		12/27/2013 Cor		rCoff	1.0000	)0	
0.67	1.45										
UseDesc.	Test type In	putTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary T	emp Low Range	4.41	4.46	j	0.000	-	5.9	)	С	1.45	
primary T	emp Mid Range	33.72	33.7	3	0.000		33.	5	С	-0.27	
primary T	emp High Range	43.63	43.6	3	0.000		43.	9	С	0.29	
Sensor Component Shield			Cond	Condition Clean				Status	pass		
Sensor Component Blower				ondition N/A			Status		pass		
Sensor Component Blower Status Switch				ndition N/A				Status	pass		
Sensor Component System Memo				ition				Status	us pass		

## Humidity Data Form

Mfg	Serial Nur	nber Ta Site		Technician		Site Visi	it Date	Paran	neter	<b>Owner ID</b>
Vaisala	C2240042	FOF	8605	Eric Hebert		07/21/2	014	Relativ	ve Humidity	none
				Mfg		Rotronic		I	Parameter Rel	ative Humidity
				Serial Nu	mber	75296		]	Ffer Desc. GT	L
				Tfer ID		01220				
				Slope			1.0000	0 Int	ercept	0.00000
	DAS 1:		<b>DAS 2:</b>	Cert Date	e		1/5/201	0 Co	rrCoff	1.00000
	Low Range	High Range	Low Range	High Rang	e					
Abs Avg Err	3.5	6.5								
Abs Max Er	4.7	6.5								
UseDesc.	Test type	Device	Input RH	GTL Raw	RH (	Corr.	DAS Vo	olts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32	.8	0.000	)	30.5	-2.3
primary	RH Low Range	GTL	52.9	0.0	52	.9	0.000	)	48.2	-4.7
primary	RH High Range	GTL	93.6	0.0	93	.6	0.000	)	87.1	-6.5
Sensor Com	ponent RH Filter	•	Con	dition Clean				Statu	s pass	
Sensor Com	ponent Shield		Con	dition Clean				Statu	s pass	
Sensor Com	ponent Blower		Con	dition N/A				Statu	s pass	
Sensor Component Blower Status Switch Co				Condition N/A Status pass						
Sensor Com	ponent System	Vemo	Con	dition				Statu	s pass	

## Solar Radiation Data Form

Mfg	Serial Number	Ta Site	Te	chnician		Site Visit Date	Parameter		Owner	ID
Licor	PY47986	FOR605	Er	ric Hebe	ert	07/21/2014	Solar R	adiation	none	
				Mfg		RM Young	Pa	arameter s	olar radiatio	n
				Serial	Number		T	fer Desc. S	R transfer t	ranslat
				Tfer I	D	01240				
DAS 1:	DA	S 2:		Slope		1.0267	8 Inte	rcept	-16.9	1000
% Diff of Avg %	6Diff of Max %D	Diff of Avg %Di	ff of Max	Cert I	Date	6/14/201	4 Cor	rCoff	0.9	9800
				Mfg		Licor	Pa	arameter s	olar radiatio	n
				Serial	Number		Tí	fer Desc. S	R transfer s	ensor
				Tfer I	D	01241				
				Slope		1.0267	8 Inte	rcept	-16.9	1000
				Cert Date		6/14/2014 Cor		rCoff	0.9	9800
2.3%	1.7%	0.0%	0.0%							
UseDescription	Measure Date	MeasureTime	Tfer Raw	,	Tfer Corr	DAS w/	/m2	PctDiffer	rence	
primary	7/21/2014	10:00	844		838	814			-2.9%	
primary	7/21/2014	11:00	875		868	853			-1.7%	
Sensor Compor	Sensor Component Sensor Clean			on Clea	IN	Statu		pass		
Sensor Component Sensor Level			Conditio	n Leve	el		Status	pass		
Sensor Component Properly Sited Con			Conditio	Prop	erly sited		pass			
Sensor Component System Memo			Conditio	on			pass			

## Precipitation Data Form

Mfg	Serial 1	Number Ta	Site		Те	echnician		Site	Visit Date	Paramo	eter		Owner II	)
Vaisala	2998		FOR605		Er	ic Hebert		07/2	21/2014	Precipit	ation	1	none	
						Mfg		PMF	)	Pa	iram	eter Pre	ecipitation	
DAS 1: DAS 2:						Serial Nun	ıber	EW-	06134-50	Tfer Desc. 250ml graduate			•	
A Avg % Diff: A Max % Di A Avg %Dif A Max % Di						Tfer ID		0125	50					
9.7%	10.3	3%												
						Slope			1.0000	0 Inte	rcep	t	0.000	000
						Cert Date			9/5/200	)5 Cori	rCof	f	1.000	000
U. D.		<b>T</b> 2 <b>X</b> 1		<b>D</b>			<b>D</b> 10		-	007.11			D . D : 00	
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ıp	Eq.Ht	DAS	eng	Eq.HtUnit	OSE Ur	nit T	TerUnits	s PctDifferer	nce
primary	test 2	231.5	1 2	15 sec	7 25		0 6.	50 60	mm	mm		ml	-10.3	% %
Sensor Con	ponent Gaug	ge Drain Scree	en e	Cond	itio	n Installed				Status	pass	S		
Sensor Con	ponent Funn	el Clean		Cond	ition Clean					Status	pass	S		
Sensor Com	ponent Conc	dition		Cond	itio	Good				Status	pass	S		]
Sensor Con	ponent Prop	erly Sited		Cond	itio	on 45 degree	e rule			Status	pass	S		
Sensor Com	ponent Gaug	ge Screen		Cond	litio	n Installed				Status	pass	S		]
Sensor Component Gauge Clean Cond			itio	Dirty				Status	Fail					
Sensor Component Level Co			Cond	litio	tion Level				Status	pass	S		]	
Sensor Component Sensor Heater Condit			itio	ion N/A				Status	pass	S				
Sensor Con	nponent Syste	em Memo		Cond	itio	tion Status pass								

#### **Infrastructure Data For**

Site ID F	OR605	Technician	Eric Hebert	Site Visit Date 07	7/21/2014
Shelter Mak	se S	Shelter Model	Shelte	: Size	

Sensor Component	Sample Tower Type	Condition	Pole type	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	Status	pass
Sensor Component	Shelter Floor	Condition	N/A	Status	pass
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate Additional details can be	FOR605 found in the ha	Eric Hebert rdcopy of the site a	07/21/2014 udit report.	System Memo	AALBORG	4202		
Temperature Additional details can be	FOR605 found in the ha	Eric Hebert rdcopy of the site a	07/21/2014 udit report.	System Memo	Vaisala	4198		

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

The dry deposition sample height is approximately 6 meters and not 10 meters.

#### 2 Parameter: DocumentationCo

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office.

#### 3 Parameter: SitingCriteriaCom

The site is located in a wellfield with oil and gas operations nearby.

#### 4 Parameter: ShelterCleanNotes

This is a small footprint site with instruments mounted in enclosure on tripod tower.

#### 5 Parameter: MetOpMaintCom

The temperature and relative humidity sensor is a combination sensor which cannot be submersed making it difficult to audit throughout a range of temperatures.

## Field Systems Data Form

### F-02058-1500-S1-rev002

Site ID FOR605	Technician Eric Hebert	Site Visit Date 07/2	1/2014
Site Sponsor (agency)	EPA	USGS Map	
<b>Operating Group</b>	BLM	Map Scale	
AQS #		Map Date	
Meteorological Type	Met One		
Air Pollutant Analyzer		QAPP Latitude	
Deposition Measurement	dry	QAPP Longitude	
Land Use	Range	QAPP Elevation Meters	
Terrain	Rolling	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone		Audit Latitude	44.339232
Site Address 1		Audit Longitude	-105.92023
Site Address 2		Audit Elevation	1402
County	Campbell	Audit Declination	9.5
City, State	Gillette, WY	Present	
Zip Code	82716	Fire Extinguisher	
Time Zone	Mountain	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	
Primary Op. E-mail		Climbing Belt	
<b>Backup Operator</b>		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🔽	
Shelter Working Room	Make Me	odel	Shelter Size
Shelter Clean	Notes This is a small footprint site wit	h instruments mounted in enclo	osure on tripod tower.
Site OK	Notes		
Driving Directions			

### **Field Systems Data Form**

FOR605

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 07/21/2014

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		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		$\checkmark$

Siting Distances OK

**Siting Criteria Comment** 

The site is located in a wellfield with oil and gas operations nearby.

Fi	eld Sy	stems Data F	orm			F-02058-1500-S3-rev002
Site	e ID	FOR605	Technician	Eric Hebert		Site Visit Date 07/21/2014
1	Are win being in	d speed and direction fluenced by obstructi	sensors sited so ons?	as to avoid		
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)					
3	Are the	tower and sensors plu	ımb?			
4	Are the avoid ra	temperature shields p diated heat sources s	oointed north or uch as buildings	positioned to , 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 o standing water should be avoided)					
6	Is the so	lar radiation sensor p	olumb?			
7	Is it site light?	d to avoid shading, or	• any artificial o	r reflected		
8	Is the ra	in gauge plumb?				
9	Is it site towers,	d to avoid sheltering o etc?	effects from buil	dings, trees,		45 degree rule violation
10	Is the su facing n	urface wetness sensor orth?	sited with the gr	rid surface		N/A
11	Is it inc	lined approximately 3	30 degrees?			N/A

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

### **Field Systems Data Form**

### F-02058-1500-S4-rev002

Site	ID	FOR605	Technician	Eric Hebert		Site Visit Date 07/21/2014
1	Do all the condition	e meterological sensor 1, and well maintained	rs appear to be l?	intact, in good		
2	Are all th reporting	ne meteorological sens g data?	ors operational	l online, and	✓	
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓	
4	Are the a	spirated motors work	king?			N/A
5	Is the sol scratches	ar radiation sensor's l ?	lens clean and f	ree of	✓	
6	Is the sur	face wetness sensor g	rid clean and u	ndamaged?	✓	N/A
7	Are the s condition	ensor signal and powe	er cables intact l?	, in good		
8	Are the s from the	ensor signal and powe elements and well ma	er cable connec intained?	tions protected		

Provide any additional 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 and relative humidity sensor is a combination sensor which cannot be submersed making it difficult to audit throughout a range of temperatures.

Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S5-re					
Site	e ID	FOR605	Technician	Eric Hebert		Site Visit Date 07/21/2014				
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition equ	<u>uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E				
1	Do the s unrestri	cample inlets have at le	east a 270 degre	e arc of						
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓					
3	Are the and 20 1	sample inlets > 1 mete meters from trees?	er from any maj	or obstruction,						
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	intenance				
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be l?	in good						
2	Are the reportin	analyzers and moniton ng data?	rs operational, o	on-line, and	✓					
3	Describ	e ozone sample tube.				N/A				
4	Describ	e dry dep sample tube.				3/8 teflon by 8 meters				
5	Are in-li indicate	ine filters used in the o location)	ozone sample lin	e? (if yes	✓	N/A				
6	Are sam obstruct	ple lines clean, free of tions?	kinks, moisture	e, and	✓					
7	Is the ze	ero air supply desiccan	t unsaturated?		✓	N/A				
8	Are the	re moisture traps in th	e sample lines?							
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it						

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

Fi	eld Sy	stems Data Fo	orm			<b>F-0</b> 2	2058-15	00-S6-rev002	
Site ID FOR605		FOR605	Technician	Eric Hebert		Site Visit D	ate 07/21/201	4	
	DAS, se	nsor translators, and p	eripheral equij	<u>pment operatio</u>	<u>ns ar</u>	<u>nd maintenance</u>			
1	Do the I well mai	DAS instruments appea intained?	ar to be in good	condition and	✓				
2 Are all the components of the DAS operational? (printers, modem, backup, etc)					✓				
3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?				✓					
4	4 Are the signal connections protected from the weather and well maintained?			e weather and	✓				
5	Are the	signal leads connected	to the correct l	DAS channel?	✓				
6	Are the grounde	DAS, sensor translator cd?	rs, and shelter J	properly	✓				
7	Does the	e instrument shelter ha	we a stable pow	ver source?	✓	Solar power			
8	Is the in	strument shelter temp	erature control	led?	✓	N/A			
9	Is the m	et tower stable and gro	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower c	omments?							

Provide any additional 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	a Fo	rm				<b>F-0</b> 2	2058-	1500-S7-rev002
Site ID	FOR605		Techni	cian Eric	Hebert	Site Visit Date	07/21/201	4	
<u>Docu</u>	<u>mentation</u>								
Does	the site have the requ	ired in	strumen	t and equi	pment manuals	?			
	<u> </u>	Yes	No	N/A	•		Yes	No	N/A
Wind sp	beed sensor				Data log	ger			
Wind di	rection sensor				Data log	ger			
Temper	ature sensor				Strip cha	art recorder			
Relative	humidity sensor				Compute	er			
Solar ra	diation sensor				Modem				
Surface	wetness sensor				Printer				
Wind se	ensor translator				Zero air	pump			
Temper	ature translator				Filter flo	w pump			
Humidi	ty sensor translator				Surge pr	otector			
Solar ra	diation translator				UPS				
Tipping	bucket rain gauge				Lightnin	g protection device			
Ozone a	nalyzer				Shelter h	leater			
Filter pa	ack flow controller				Shelter a	ir conditioner			
Filter pa	ack MFC power supp	ly 🗌							
Doe	s the site have the req	uired a	and most	recent Q	C documents ar	nd report forms?			
		Pre	sent			-	Curr	ent	
Station	Log							]	
SSRF	C							]	
Site Ops	s Manual							]	
HASP								]	
Field O	ps Manual							]	
Calibra	tion Reports							]	
Ozone z	/s/p Control Charts							]	
Prevent	ive maintenance schee	dul						]	
1 Is t	he station log properl	y com	pleted du	ring ever	y site visit?				
2 Are	e the Site Status Repo rent?	rt Fori	ns being	complete	d and 🔽				
3 Ar san	e the chain-of-custody nple transfer to and fi	o forms rom lai	properl	y used to o	locument 🔽				
4 Are	e ozone z/s/p control c rrent?	harts p	oroperly	completed	l and 🗸	N/A			
Provide natural	any additional explar or man-made, that m	nation ( ay affe	(photogr ct the mo	aph or sko onitoring j	etch if necessary parameters:	y) regarding condition	ons listed	above,	or any other features,

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office.

### **Field Systems Data Form**

#### Site ID FOR605 Technician Eric Hebert Site Visit Date 07/21/2014 Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? ✓ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

	Frequency	Compliant
$\checkmark$	Semiannually	$\checkmark$
$\checkmark$	Weekly	$\checkmark$
		$\checkmark$
$\checkmark$	Monthly	$\checkmark$
$\checkmark$	Weekly	$\checkmark$
$\checkmark$	N/A	$\checkmark$
	> > > > >	Frequency       ✓     Semiannually       ✓     Weekly       ✓     Monthly       ✓     Weekly       ✓     N/A

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

QC Check Performed		Frequency	Compliant					
Multi-point Calibrations		N/A	$\checkmark$					
Automatic Zero/Span Tests		N/A						
Manual Zero/Span Tests		N/A	$\checkmark$					
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 N/A								

- **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?

$\checkmark$	N/A
✓	N/A
✓	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:

### F-02058-1500-S8-rev002

Field Systems Data Form						F-02058-1500-S9-rev			
Site	ID	FOR605	Technician	Eric Hebert		Site Visit Date 07/21/2014			
	<u>Site oper</u>	ration procedures							
1	Is the fil	ter pack being changed	d every Tuesda	y as scheduled?		Filter changed mornings			
2	Are the	Site Status Report For	ms being com	pleted and filed	$\checkmark$	Flow section only			

✓

✓

 $\checkmark$ 

✓

SSRF

SSRF

No longer required

One set of gloves only

Compliant

2	Are the Site Status Report Forms being completed and filed correctly?	
3	Are data downloads and backuns being performed as	✓

- Are data downloads and backups being performed as 3 scheduled?
- Are general observations being made and recorded? How? 4
- 5 Are site supplies on-hand and replenished in a timely fashion?

Are sample flow rates recorded? How?

- Are samples sent to the lab on a regular schedule in a timely 🗹 7 fashion?
- Are filters protected from contamination during handling 8 and shipping? How?
- Are the site conditions reported regularly to the field 9 operations manager or staff?

**QC Check Performed** 

6

#### Frequency

Multi-point MFC Calibrations	✓ 5	Semiannually	$\checkmark$
Flow System Leak Checks	✓ V	Weekly	$\checkmark$
Filter Pack Inspection			
Flow Rate Setting Checks	✓ V	Weekly	$\checkmark$
Visual Check of Flow Rate Rotometer		N/A	$\checkmark$
In-line Filter Inspection/Replacement		As needed	$\checkmark$
Sample Line Check for Dirt/Water			

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

The dry deposition sample height is approximately 6 meters and not 10 meters.

Field Sys	stems Data Fo	rm		F-02058-150	0-S10-rev002	
Site ID	FOR605	Technician	Eric Hebert	Site Visit Date	07/21/2014	

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	illegible	49922
elevation	Elevation	none	none	none
Flow Rate	AALBORG	GFMS-012446	196706-5	none
Infrastructure	Infrastructure	none	none	none
Precipitation	Vaisala	444A	2998	none
Relative Humidity	Vaisala	HMP45AC	C2240042	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	LI-200	PY47986	none
Temperature	Vaisala	HMP45AC	C2240042	none
Wind Direction	Met One	Illegible	k5192	illegible
Wind Speed	Met One	014	D3117	none

# Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number		
ANA115-Eric Hebert-08/19/2014								
1	8/19/2014	Computer	Dell	000298	D520	unknown		
2	8/19/2014	DAS	Campbell	000338	CR3000	2117		
3	8/19/2014	Elevation	Elevation	None	1	None		
4	8/19/2014	Filter pack flow pump	Thomas	00209	107CA110	0000124		
5	8/19/2014	Flow Rate	Apex	000809	AXMC105LPMDPCV	illegible		
6	8/19/2014	Infrastructure	Infrastructure	none	none	none		
7	8/19/2014	Met tower	Universal Tower	03555	unknown	none		
8	8/19/2014	Modem	Raven	06588	V4221-V	0844352818		
9	8/19/2014	Ozone	ThermoElectron Inc	000746	49i A1NAA	1105347315		
10	8/19/2014	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012		
11	8/19/2014	Ozone Standard	ThermoElectron Inc	000364	49i A3NAA	0726124687		
12	8/19/2014	Sample Tower	Aluma Tower	000180	В	none		
13	8/19/2014	Shelter Temperature	Campbell	none	107-L	none		
14	8/19/2014	Shield (10 meter)	Climatronics	00768	100325	illegible		
15	8/19/2014	Siting Criteria	Siting Criteria	None	1	None		
16	8/19/2014	Temperature	Climatronics	06708	100093	missing		
17	8/19/2014	Zero air pump	Werther International	06933	C 70/4	000836202		

## **DAS Data Form**

DAS Time Max Error: 0.05

Mfg	Serial	Number S	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2117		ANA115	Eric Hebert	08/19/2014	DAS	Primary
Das Date: Das Time: Das Day:	8 /20/2014 12:47:35 232	Audit Da Audit Tii Audit Da	te 8/20/2014 me 12:47:32 y 232	Mfg Serial Number	HY 12010039329	Parameter Tfer Desc.	DAS Source generator (D
Low Channel Avg Diff: 0.0000	Max Diff:         0       0.0	High Cha Avg Diff: 000 0.0	nnel: Max Diff: 0000 0.0000	Slope Cert Date	1.0000 6/15/201	0 Intercept 4 CorrCoff	0.00000
				Mfg Serial Number	Fluke 86590148	Parameter Tfer Desc.	DAS DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	4 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.000	00.000	0 V	V	0.0000	

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Те	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>		
Apex	illegible		ANA115		ic Hebert	08/19/2014	Flow F	Rate	000809		
				Mfg BIOS		I	w Rate				
					Serial Number	131818	1	fer Desc. BIC	IS 220-H		
					Tfer ID	01417					
					Slope	1.0	00000 Int	ercept	0.00000		
					Cert Date	1/8	3/2014 <b>Co</b>	rrCoff	1.00000		
DAS 1: DAS 2:					Cal Factor Z	ero		0			
A Avg % Diff:	A Avg % Diff: A Max % Di A Avg %Dif A Max %			x % Di	Cal Factor F		0				
2.04%	2.04%				Rotometer R	eading:	1	.5			
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference		
primary	pump off	0.000	0.000	0.00	0.000	-0.01	1/m	l/m			
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m			
primary	test pt 1	1.474	1.470	1.47	0.000	1.50	l/m	l/m	2.04%		
primary	test pt 2	1.474	1.470	1.47	0.000	1.50	l/m	l/m	2.04%		
primary	test pt 3	1.473	1.470	1.47	0.000	1.50	l/m	l/m	2.04%		
Sensor Component Leak Test			Conditio	on	Statu		s pass				
Sensor Component Tubing		Condition		Conditio	Condition Good		Statu	s pass			
Sensor Compo	onent Filter Pos	sition		Conditio	n Good		Statu	s pass			
Sensor Component Rotometer Condition			Conditio	ndition Clean and dry			s pass				
Sensor Component Moisture Present			Conditio	n See comments	Statu	s pass					
Sensor Component Filter Distance			Conditio	<b>n</b> 5.5 cm	Statu	s pass					
Sensor Component Filter Depth				Conditio	2.5 cm	Statu	IS pass				
Sensor Component Filter Azimuth			Conditio	n 180 deg		Statu	Status pass				
Sensor Component System Memo			Conditio	n	Statu	Status pass					

### **Ozone Data Form**

Mfg	Se	erial Number Ta	Site	Те	echnician		Site Visit	Date Para	imeto	er	Owner I	D
ThermoElec	ermoElectron Inc 1105347315		ANA115		ric Hebert		08/19/201	4 Ozoi	Ozone		000746	
Slope: Intercept	0.8	0101 Slope: 2814 Intercept	0.00000	)	Mfg Serial N	umbor	ThermoEle	ctron Inc	Para	ameter 0	zone	/ stan
CorrCoff	CorrCoff 0.99999 CorrCoff		0.00000		Tfer ID		01112		IICI			
DAS 1: DAS 2:					Slope		1.00928 Inter		nterc	cept 0.11		780
A Avg % Diff:       A Max % Di       A Avg %         16.0%       17.9%			JDII A Max % Di		Cert Date		1/8/2014 <b>Cor</b>		orrC	<b>Coff</b> 1.0000		000
UseDes	scription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site Unit	:	PctDi	fference:	
prir	mary	1	-0.36 -(		.47 1.		91 ppb					
prir	mary	2	32.59 32		.17 28.		.06 ppb			-12.78%		
prir	mary	3	53.27 52		.66 44.		.13 ppb			-16.20%		
prir	mary	4	85.17	84.27		69.	.91 ppb			-17.04%		
prir	mary	5	110.87 1		9.73 90.		10 ppb			-17.89%		
Sensor C	omponent	Cell B Noise		Conditi	on 0.5 pp	b		Stat	us p	ass		
Sensor C	component	Cell B Tmp.		Conditi	on			Stat	us p	ass		
Sensor Component Fullscale Voltage		Condition		DN/A		Stat	Status pass					
Sensor Component Inlet Filter Conditio			n	on Clean			Stat	us p	pass			
Sensor Component Line Loss		Conditi		on Not tested		Stat	us p	pass				
Sensor C	Sensor Component Offset		Condit		<b>on</b> 0.10			Stat	us p	pass		
Sensor Component Span		Condit		on 1.016		Stat	us P	pass				
Sensor C	Sensor Component Cell B Freq.		Condit		on 90.3 kHz		Stat	us p	s pass			
Sensor C	ensor Component System Memo		Conditi		on		Stat	tatus pass				
Sensor C	Sensor Component Sample Train		Conditi		on Good			Stat	us p	s pass		
Sensor Component Cell B Pressure		Condit		ion		Stat	us p	pass				
Sensor C	Sensor Component Cell B Flow		Conditi		on 0.66 lpm		Stat	tatus pass				
Sensor Component Cell A Tmp.			Conditio		on 35.2 C		Stat	us P	pass			
Sensor Component Cell A Pressure				Condition 712.7 mmHg			Stat	us p	pass			
Sensor Component Cell A Noise				Condition		0.7 ppb		Stat	us p	pass		
Sensor Component Cell A Freq.		Condition		on 87.1 kHz		Stat	Status pass					
Sensor Component Cell A Flow				Condition 0.72 lpm			Stat	us P	pass			
Sensor Component Battery Backup			Conditi		on N/A			Status F		pass		
Sensor Component Zero Voltage		Condi		ion N/A			Stat	us p	pass			
## Temperature Data Form

Mfg	Serial Number Ta	Site	,	Techni	Fechnician S		/isit Date Parame		eter	<b>Owner ID</b>	
Climatronics	missing	ANA115		Eric Hebert		08/19	9/2014	Temper	ature	06708	
				Mfg			Extech Pa		arameter Temperature		
				Ser	rial Number	H232	H232679 T		er Desc. R	D	
				Tfer ID 0122			3				
DAS 1. DAS 2.				Slo	ope		1.0049	6 Inte	-0.23009		9
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma			Max Er	Er Cert Date		1/8/2014 <b>Cor</b>		4 Cor	rCoff 1.00000		0
0.20	0.28			<u></u>							
UseDesc.	Test type In	putTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	Low Range	-0.03	0.20	)	0.000		0.3	3	С	0.08	
primary Temp	Mid Range	25.10	25.2	1	0.000		25.	0	С	-0.24	
primary Temp	High Range	47.26	47.2	6	0.000		47.	5	С	0.28	
Sensor Compone	nt Shield		Cond	ition Clean Status pass							
Sensor Component Blower				ndition Functioning Status pass							
Sensor Component Blower Status Switch				ition 🕨	N/A			Status	pass		
Sensor Compone	nt System Memo		Cond	ition				Status	pass		

## Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	none	ANA115	Eric Hebert	08/19/2014	Shelter Temperature	enone
DAS 1:	DAS 2:		Mfg	Extech	Parameter Sh	elter Temperatur
Abs Avg ErrAbs0.12	0.22	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RT	D
			Tfer ID	01228		
			Slope	1.0049	6 Intercept	-0.23009
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.50	22.62	0.000	22.6	С	0.01
primary	Temp Mid Range	22.20	22.32	0.000	22.5	С	0.22
Sensor Component System Memo Condition Status							

#### **Infrastructure Data For**

Site ID ANA115	Technician Eric Hebert	Site Visit Date 08/19/2014
Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft
Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

## **Site Visit Comments**

Parameter	Site	Technician	ician S.V. Date Component		Mfg	Serial No.	erial No. Hazard	
Elsen Dete	A NIA 115	Eni- Habant	09/10/2014	Counterer Manue	<b>A</b>	2000		
Flow Rate	ANAIIS	Eric Hebert	08/19/2014	System Memo	Apex	3990		
There is no plastic bag for	or the installed f	filter. The operator	uses the receive	d bag for the install	ed filter to sh	ip the removed filter	to the lab.	
Flow Rate	ANA115	Eric Hebert	08/19/2014	Moisture Present	Apex	3990		

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

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

Gloves were not used to change the filter. It was observed that the dry deposition filter was replaced while the sample pump was running with the sample tower lowered. The filter was changed during a rain storm and water entered the filter and sample lines (flow and ozone). The filter can be exposed and sampling from ground level for up to 30 minutes if the ozone leak check is also performed.

#### 2 Parameter: DasComments

The air conditioner thermostat control is by-passed and the air conditioner is running continuously.

#### 3 Parameter: SitingCriteriaCom

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

#### 4 Parameter: ShelterCleanNotes

The shelter is well organized and in fair condition.

#### 5 Parameter: PollAnalyzerCom

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

## F-02058-1500-S1-rev002

Site IDANA115TechnicianEric Hebert			bert	Site Visit Date 08/19/2014				
Site Sponsor (agency)	EPA		US	GS Map		Pinckney		
Operating Group	Univers	sity of MI	Ma	p Scale				
AOS #	26-161	-9991	Ma	p Date				
Meteorological Type	Climatr	onics						
Air Pollutant Analyze	r Ozone		OA	PP Latitude				
Deposition Measurem	ent dry, we	t, Hg		PP Longitude				
Land Use	woodla	nd - mixed	QA	PP Elevation 1	Meters			
Terrain	flat			PP Declination	n			
Conforms to MLM	Margin	ally		PP Declination	n Date			
Site Telephone	(734) 4	26-0060	Au	dit Latitude		42,416636		
Site Address 1	8420 S	trawberry Lake Rd.		dit Longitude		-83 90218		
Site Address 2			Au	dit Elevation		266		
County	Washte	enaw	Au	dit Declination		-6.6		
City. State	Dexter,	MI		1	Duccont			
Zin Code	48130		Fir	r e Extinguisher		No inspection date		
Time Zone	Easterr	1	Fir	st Aid Kit				
Primary Operator				Safety Classes				
Primary Op. Phone #			Sat	etv Hard Hat	$\checkmark$			
Primary Op. E-mail			Cli	, mbing Belt				
Backup Operator			See	curity Fence				
Backup Op. Phone #			See	ure Shelter				
Backup Op. E-mail			Sta	ble Entry Step				
Shelter Working Room	m ✓ Make	Ekto	Model	8810		Shelter Size 640 cuft		
Shelter Clean	✓ Notes	The shelter is well org	anized and in	fair condition.				
Site OK	✓ Notes							
Driving Directions	From Ann Arbor take I-94 west to exit 169 to Dexter, turning right (north) to Dexter. Continue a few miles to the stop sign and turn left. Continue approximately one block to the small park in the center of town and turn right (north). Continue through Dexter, across the railroad tracks and river. Turn left (west) just across the river on Huron River Drive. Continue about 8 miles on Huron River Drive which becomes a dirt road after the intersection of North Territorial Rd. The site is on the left, just past the first sharp turn in the road (to the right) where it becomes Strawberry Lake Road.							

ANA115

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/19/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		

### Siting Distances OK

#### **Siting Criteria Comment**

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

Fie	eld Sy	stems Data	Form		F-02058-1500-S3-rev002				
Site	e ID	ANA115	Technician	Eric Hebert		Site Visit Date 08/19/2014	]		
1	Are win being in	d speed and direct fluenced by obstru	ion sensors sited so ıctions?	as to avoid	N//	<b>Α</b>			
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)					Ą			
3	Are the tower and sensors plumb?					Ą			
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)			id unnatural be natural vs, and areas of					
6	Is the so	lar radiation sense	or plumb?		N/	Ą			
7	Is it site light?	d to avoid shading	, or any artificial o	r reflected	N//	Ą			
8	Is the ra	in gauge plumb?			N/	Ą			
9	Is it site towers,	d to avoid shelterin etc?	ng effects from buil	dings, trees,	N//	Ą			
10	Is the su facing n	rface wetness sens orth?	sor sited with the gr	id surface	N/	Ą			
11	1 Is it inclined approximately 30 degrees?				N/	Ą			

## natural or man-made, that may affect the monitoring parameters:

### F-02058-1500-S4-rev002

Site	ID	ANA115	Technician	Eric Hebert		Site Visit Date 08/19/2014					
1	Do all th condition	e meterological senso 1, and well maintaine	rs appear to be d?	intact, in good	✓	N/A					
2	Are all the reporting	ne meteorological sens g data?	sors operationa	l online, and	✓	N/A					
3	Are the s	hields for the temper	ature and RH s	ensors 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 s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected	✓						

eld Systems Data Form		F-02058-1500-S5-rev002					
ANA115 Technician Eric Hebert		Site Visit Date 08/19/2014					
Siting Criteria: Are the pollutant analyzers and deposition eq	uipı	nent sited in accordance with 40 CFR 58, Appendix E					
Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓						
Are the sample inlets 3 - 15 meters above the ground?	✓						
Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?							
Pollutant analyzers and deposition equipment operations and	l ma	<u>intenance</u>					
Do the analyzers and equipment appear to be in good condition and well maintained?	✓						
Are the analyzers and monitors operational, on-line, and reporting data?	✓						
Describe ozone sample tube.		1/4 teflon by 12 meters					
Describe dry dep sample tube.		3/8 teflon by 12 meters					
Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only					
Are sample lines clean, free of kinks, moisture, and obstructions?		Moisture in tubing only					
Is the zero air supply desiccant unsaturated?	✓						
Are there moisture traps in the sample lines?	✓	Flow line only					
Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry					
	e ID     ANA115     Technician     Eric Hebert       Siting Criteria: Are the pollutant analyzers and deposition equipment control of the sample inlets have at least a 270 degree arc of unrestricted airflow?       Are the sample inlets have at least a 270 degree arc of unrestricted airflow?       Are the sample inlets 3 - 15 meters above the ground?       Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?       Pollutant analyzers and deposition equipment operations and Do the analyzers and equipment appear to be in good condition and well maintained?       Are the analyzers and monitors operational, on-line, and reporting data?       Describe ozone sample tube.       Describe dry dep sample tube.       Are in-line filters used in the ozone sample line? (if yes indicate location)       Are sample lines clean, free of kinks, moisture, and obstructions?       Is the zero air supply desiccant unsaturated?       Are there moisture traps in the sample lines?       Is there a rotometer in the dry deposition filter line, and is it clean?	e ID     ANA115     Technician     Eric Hebert       Siting Criteria: Are the pollutant analyzers and deposition equipm       Do the sample inlets have at least a 270 degree arc of     Image: Criteria analyzers and deposition equipment of the sample inlets 3 - 15 meters above the ground?       Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?     Image: Criteria analyzers and deposition equipment operations and mail 20 meters from trees?       Pollutant analyzers and equipment appear to be in good condition and well maintained?     Image: Criteria analyzers and equipment appear to be in good condition and well maintained?       Are the analyzers and monitors operational, on-line, and reporting data?     Image: Criteria analyzers and monitors operational, on-line, and and reporting data?       Describe dry dep sample tube.     Image: Criteria analyzers and monitors operational, on-line, and and analyzers and equipment appear to be in good condition and well maintained?       Are the analyzers and monitors operational, on-line, and reporting data?     Image: Criteria analyzers and monitors operational, on-line, and and and and analyzers and equipment appear to be in good and and and the color and the sample line?       Are in-line filters used in the ozone sample line? (if yes indicate location)     Image: Criteria analyzers and color and					

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

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

Fi	eld Sy	stems Data F	orm			F-02058-1500-S6-rev002					
Site	e ID	ANA115	Technician	Eric Hebert		Site Visit Da	ate 08/19/201	4			
	<u>DAS, se</u>	ensor translators, and	peripheral equi	pment operation	<u>15 ai</u>	<u>nd maintenance</u>					
1	Do the well ma	DAS instruments appe intained?	ear to be in good	l condition and							
2	2 Are all the components of the DAS operational? (printers, modem, backup, etc)										
3	<b>3</b> 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?			DAS channel?	✓						
6	Are the ground	DAS, sensor translate ed?	ors, and shelter	properly	✓						
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓						
8	Is the instrument shelter temperature controlled?			lled?		A/C running cont	inuously, then	mostat by-pa	ssed		
9	Is the n	net tower stable and gr	ounded?			Stable		Grounded			
10	Is the s	ample tower stable and	l grounded?								
11	1 Tower comments?					Sample tower not grounded					

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

The air conditioner thermostat control is by-passed and the air conditioner is running continuously.

Fie	eld Sy	stems Data	a Foi	rm			<b>F-02</b>	058-	1500-S'	7-rev002
Site	ID	ANA115		Techr	nician Eric H	Hebert Site Visit Date	08/19/2014			
D	ocument	tation								
<u>D</u>	oes the s	<u>ite have the requi</u>	ired in	strume	nt and equip	oment manuals?				
Win	d speed s	sensor	Yes	No	N/A ✓	Data logger	Yes	No ✓	N/A	
Win	d directi	on sensor			$\checkmark$	Data logger			$\checkmark$	
Tem	perature	e sensor		$\checkmark$		Strip chart recorder				
Rela	tive hun	nidity sensor			$\checkmark$	Computer				
Sola	r radiati	on sensor				Modem		$\checkmark$		
Surf	ace wetn	less sensor				Printer		✓		
Win	d sensor	translator				Zero air pump				
Tem	perature	e translator				Filter flow pump				
Hum	idity sei	nsor translator				Surge protector		✓		
Sola	r radiati	on translator				UPS				
Tipp	ing bucl	ket rain gauge				Lightning protection device	• 🗌		$\checkmark$	
Ozoi	ie analyz	zer	$\checkmark$			Shelter heater		$\checkmark$		
Filte	r pack fl	low controller		$\checkmark$		Shelter air conditioner		$\checkmark$		
Filte	r pack M	AFC power supply	у 🗌		$\checkmark$					
]	Does the	site have the requ	uired a	nd mos	st recent QC	documents and report forms?				
			Pres	ent			Currer	ıt		
Stati	on Log		-				$\checkmark$			
SSR	F		-				$\checkmark$			
Site	Ops Mai	nual	[							
HAS	P		-	<b>v</b>	Oct 2014		$\checkmark$			
Field	l Ops Ma	anual	[							
Calil	bration l	Reports	-				$\checkmark$			
Ozoi	ne z/s/p (	Control Charts	[							
Prev	entive m	naintenance sched	lul [	✓						
1	Is the st	ation log properly	y comp	leted d	uring every	site visit? 🔽				
2	Are the current	Site Status Repor ?	rt Forn	ns bein <sub>į</sub>	g completed	and 🔽				
3	Are the	chain-of-custody	forms	proper	ly used to de	ocument 🔽				

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

sample transfer to and from lab?

Control charts not used

#### ANA115 Technician Eric Hebert Site Visit Date 08/19/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?

✓

- Is the site visited regularly on the required Tuesday 3 schedule?
- Are the standard CASTNET operational procedures being 4 flollowed by the site operator?
- Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

### **QC Check Performed**

1

2

### Frequency

Multipoint Calibrations	$\checkmark$	N/A	$\checkmark$
Visual Inspections	$\checkmark$	N/A	$\checkmark$
Translator Zero/Span Tests (climatronics)	$\checkmark$	N/A	$\checkmark$
Manual Rain Gauge Test	$\checkmark$	N/A	$\checkmark$
Confirm Reasonableness of Current Values	$\checkmark$	N/A	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	<b>~</b>

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

00	Chook	Dorformod
Ųυ	Спеск	Performed

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

Frequency	Compliant
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	$\checkmark$
Weekly	$\checkmark$
Weekly	

- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

	1 1	8
3	Are the automatic and	manual z/s/p checks monitored and
	reported? If yes, how?	

	Unknown
✓	
∕	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:

**Compliant** 

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Form					F-02058-15	00-S9-rev002	
Sit	e ID	ANA115 Tec	chnici	an Eric Hebert		Site Visit Date	08/19/2014		
	<u>Site ope</u>	eration procedures							
1	Is the fi	lter pack being changed ever	y Tu	esday as scheduled?		Filter changed vario	ous times		
2	Are the correctl	Site Status Report Forms be y?	eing c	ompleted and filed					
3	Are dat schedul	a downloads and backups be ed?	eing p	erformed as		No longer required			
4	Are gen	eral observations being mad	e and	recorded? How?	✓	SSRF, logbook			
5	5 Are site supplies on-hand and replenished in a timely fashion?								
6	Are san	nple flow rates recorded? Ho	w?		✓	SSRF, logbook, call-in			
7	Are san fashion	nples sent to the lab on a regu ?	ular s	chedule in a timely					
8	Are filte and shi	ers protected from contamina pping? How?	ation	during handling					
9	Are the operation	site conditions reported reguons manager or staff?	ularly	to the field					
QC	Check P	erformed	I	Frequency			Compliant		
I	Multi-poi	nt MFC Calibrations	✓ 5	Semiannually			$\checkmark$		
Flow System Leak Checks					$\checkmark$				
Filter Pack Inspection									
Flow Rate Setting Checks						$\checkmark$			
	Visual Check of Flow Rate Rotometer						$\checkmark$		
I	In-line Fil	ter Inspection/Replacement	<b>v</b> 5	Semiannually			$\checkmark$		
5	Sample L	ine Check for Dirt/Water	✓ \	Veekly			$\checkmark$		
<b>D</b>		ditional annianation (mb at		h an alaatah if maaaa	~ ~ ~ ~ ~	.)	in a listed above on a	en oth on footeneos	

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

Gloves were not used to change the filter. It was observed that the dry deposition filter was replaced while the sample pump was running with the sample tower lowered. The filter was changed during a rain storm and water entered the filter and sample lines (flow and ozone). The filter can be exposed and sampling from ground level for up to 30 minutes if the ozone leak check is also performed.

ANA115

### F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/19/2014

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000298
DAS	Campbell	CR3000	2117	000338
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0000124	00209
Flow Rate	Apex	AXMC105LPMDPC	illegible	000809
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03555
Modem	Raven	V4221-V	0844352818	06588
Ozone	ThermoElectron Inc	49i A1NAA	1105347315	000746
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124687	000364
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200012	000436
Sample Tower	Aluma Tower	В	none	000180
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	Climatronics	100325	illegible	00768
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	missing	06708
Zero air pump	Werther International	C 70/4	000836202	06933

## Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
НОХ	HOX148-Eric Hebert-08/25/2014										
1	8/25/2014	Computer	Dell	000289	D520	unknown					
2	8/25/2014	DAS	Campbell	000426	CR3000	2533					
3	8/25/2014	Elevation	Elevation	None	1	None					
4	8/25/2014	Filter pack flow pump	Thomas	04927	107CAB18	110300021225					
5	8/25/2014	Flow Rate	Арех	000526	AXMC105LPMDPCV	48099					
6	8/25/2014	Infrastructure	Infrastructure	none	none	none					
7	8/25/2014	Met tower	Universal Tower	03560	unknown	none					
8	8/25/2014	Modem	Raven	06480	H4222-C	0808311145					
9	8/25/2014	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794					
10	8/25/2014	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008					
11	8/25/2014	Sample Tower	Aluma Tower	000131	В	none					
12	8/25/2014	Shelter Temperature	Campbell	none	107-L	none					
13	8/25/2014	Shield (10 meter)	RM Young	00794	Aspirated 43408	none					
14	8/25/2014	Siting Criteria	Siting Criteria	None	1	None					
15	8/25/2014	Temperature	RM Young	06544	41342	14805					
16	8/25/2014	Zero air pump	Werther International	06938	C 70/4	000829164					

## **DAS Data Form**

DAS Time Max Error: 0.75

Mfg	Serial Number Site		<b>Sechnician</b>	Site Visit Date	Parameter	Use Desc.		
Campbell	2533	НОХ	X148	Eric Hebert	08/25/2014	DAS	Primary	
Das Date:	8 /25/2014	Audit Date	8 /25/2014	Mfg	HY	Parameter	DAS	
Das Time: Das Day:	13:14:15 237	Audit Time Audit Day	13:15:00 237	Serial Number	12010039329	Tfer Desc.	Source generator (D	
Low Channel:		High Channel	l:	Tfer ID	01322			
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000	
0.0001	0.0001	0.0001	0.0001	Cert Date	6/15/201	4 CorrCoff	1.00000	
				Mfg	Fluke	Fluke Parameter DAS		
			Serial Number	86590148	Tfer Desc.	DVM		
				Tfer ID	01310			
				Slope	1.0000	0 Intercept	0.00000	
				Cert Date	1/22/201	4 CorrCoff	1.00000	
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference		
7	0.0000	0.0004	0.0004	V	V	0.0000		
7	0.1000	0.0999	0.0999	V	V	0.0000		
7	0.3000	0.3003	0.3004	V	V	0.0001		
7	0.5000	0.5004	0.5005	V	V	0.0001		
7	0.7000	0.7002	0.7003	V	V	0.0001		
7	0.9000	0.9005	0.9004	V	V	-0.0001		
7	1.0000	1.0000	1.0000	V	V	0.0000		

## Flow Data Form

Mfg Serial Num		nber Ta	Site	Тес	chnician	Site Visit Da	te Paran	neter	<b>Owner ID</b>
Apex 48099			HOX148		ic Hebert	08/25/2014	Flow R	late	000526
					Mfg	BIOS	P	arameter Flow	v Rate
					Serial Number	131818	Т	fer Desc. BIO	S 220-H
					Tfer ID	01417			
					Slope	1.00	)000 <b>Int</b> e	ercept	0.00000
					Cert Date	1/8/2	2014 <b>Co</b>	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>		-	Cal Factor Z	ero	0.0	05	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	1.(	06	
0.67%	0.67%				<b>Rotometer R</b>	eading:	1	.4	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E I	nputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.08	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.000	0.04	l/m	l/m	
primary	test pt 1	1.499	1.500	1.43	0.000	1.49	l/m	l/m	-0.67%
primary	test pt 2	1.495	1.500	1.43	0.000	1.49	l/m	l/m	-0.67%
primary	test pt 3	1.500	1.500	1.43	0.000	1.49	l/m	l/m	-0.67%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Component Filter Distance			Conditio	lition 5.5 cm			pass		
Sensor Comp	onent Filter Dep	oth		Conditio	n 3.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 180 deg		Status	pass	
Sensor Comp	onent System M	/lemo		Conditio	Condition See comments		Status	pass	

## **Ozone Data Form**

Mfg	Se	rial Number Ta	Site	Те	chnician		Site Visit	t Date	Parame	ter	Owner I	D
ThermoElectron Inc	2 10	009241794	HOX148	E	ric Hebert		08/25/20	14	Ozone		000614	
Slope:	0.97	7404 <b>Slope:</b>	0.0000	0	Mfg		ThermoE	lectron	Inc Pa	rameter 0	zone	
Intercept	1.20	0525 Intercept	0.0000	0	Serial N	lumber	04196069	966	Tfe	er Desc. O	zone primary	/ stan
CorrCoff	0.99	0999 CorrCoff	0.0000	0	Tfer ID		01112					
DAS 1:		<b>DAS 2:</b>			Slope			1.00928	B Inter	cept	0.11	780
A Avg % Diff: A	Max	x % Di A Avg %	<b>b</b> Dif A Max	% <b>Di</b>	Cert Da	ite	· ·	1/8/2014	4 Corr	Coff	1.00	0000
1.4%		2.2%										
UseDescription	ı:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary		1	-0.56	-0.	.67	0.7	72 J	opb		_	2.21.04	
primary		2	24.81	24	.46	25.	00 l	ppb			2.21%	
primary		3	52.58	51	.97	51.	63 <u> </u>	ppb			-0.65%	
primary		4	81.19	80	.52	/9. 110	30 I	ppo ppb			-1.27%	
prinary	-	<u> </u>	115.00			110	.40	pp	<b>~</b>		-1.3470	
Sensor Compon	ent _	Cell B Noise		Conditi	<b>on</b> 0.9 pp	ad			Status	pass		
Sensor Compon	ent	Cell B Tmp.		Conditi	on				Status	pass		
Sensor Compon	ent	Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Compon	ent	Inlet Filter Conditio	n	Conditi	on Clean	1			Status	pass		
Sensor Compon	ent	Line Loss		Conditi	on Not te	sted			Status [	pass		
Sensor Compon	ent	Offset		Conditi	on -0.50				Status	pass		
Sensor Compon	ent	Span		Conditi	on 1.022				Status	pass		
Sensor Compon	ent	Cell B Freq.		Conditi	on 95.7 k	Hz			Status	pass		
Sensor Compon	ent	System Memo		Conditi	on				Status	pass		
Sensor Compon	ent	Sample Train		Conditi	on Good				Status	pass		
Sensor Compon	ent	Cell B Pressure		Conditi	on				Status	pass		
Sensor Compon	ent	Cell B Flow		Conditi	on 0.72	pm			Status	pass		
Sensor Compon	ent	Cell A Tmp.		Conditi	on 33.8 (	2			Status	pass		
Sensor Compon	ent	Cell A Pressure		Conditi	on 711.8	mmHg			Status	pass		
Sensor Compon	ent	Cell A Noise		Conditi	on 0.9 pp	b			Status	pass		
Sensor Compon	ent	Cell A Freq.		Conditi	on 89.1 k	Hz			Status	pass		
Sensor Compon	ent	Cell A Flow		Conditi	on 0.72	pm			Status	pass		
Sensor Compon	ent	Battery Backup		Conditi	on N/A				Status	pass		
Sensor Compon	ent	Zero Voltage		Conditi	on N/A				Status	pass		

## Temperature Data Form

Mfg	Serial Number	Ta Site	,	<b>Fechn</b> i	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	14805	HOX148		Eric H	ebert	08/25	5/2014	Temper	ature	06544	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	679	Tf	er Desc. R	٢D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	pe		1.0049	6 Inte	rcept	-0.2300	9
Abs Avg Err A	Abs Max Er Abs	Avg Err Abs	Max Er	r Cert Date			1/8/2014 Corr		<b>:rCoff</b> 1.00000		0
0.11	0.18										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Te	mp Low Range	-0.06	0.17		0.000		0.1		С	-0.05	
primary Te	mp Mid Range	22.61	22.7	3	0.000		22.	6	С	-0.1	
primary Te	mp High Range	43.57	43.5	3	0.000		43.	4	С	-0.18	
Sensor Compo	nent Shield		Condi	ition N	Moderately clea	an		Status	pass		
Sensor Compo	nent Blower		Condi	ition F	Functioning			Status	pass		
Sensor Component Blower Status Switch				Condition N/A			Status		pass		
Sensor Compo	nent System Memo		Condi	Condition				Status	us pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	HOX148	Eric Hebert	08/25/2014	Shelter Temperatur	renone
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperatur
Abs Avg ErrAb0.29	0.60	Err Abs Max Er	Serial Number	H232679	Tfer Desc. R	TD
			Tfer ID	01228		
			Slope	1.0049	6 Intercept	-0.23009
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	20.94	21.07	0.000	20.8	С	-0.25	
primary	Temp Mid Range	26.36	26.46	0.000	26.4	С	-0.03	
primary	Temp Mid Range	19.35	19.48	0.000	20.1	С	0.6	
Sensor Component System Memo			Condition	Status pass				

#### **Infrastructure Data For**

Site ID	HOX148	Technician Eric He	bert Site Visit Date 08/25/2014
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem
Flow Rate	HOX148	Eric Hebert	08/25/2014	Moisture Present	Apex	3194		
Although there currently	is no moisture i	n the flow sample t	rain, there is evi	idence of previous m	noisture events.			
Shelter Temperature	HOX148	Eric Hebert	08/25/2014	System Memo	Campbell	3192		
The shelter thermostat for	or cooling has be	en bypassed and th	e air conditionir	ng system is no long	er being control	lled by the shelter t	hermostat.	

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

The ozone analyzer sample train is leak-checked every two weeks.

#### 2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

The shelter is clean, neat, well organized.

#### 4 Parameter: MetSensorComme

Met tower and 10 meter temperature operating and audited.

## F-02058-1500-S1-rev002

Site ID HOX148	Technician Eric Het	Site Visit Date 08/25	i/2014						
Site Sponsor (agency)	EPA	USGS Map	Hoxeyville						
<b>Operating Group</b>	private	Map Scale							
AQS #	26-165-9991	Map Date							
Meteorological Type	R.M. Young								
Air Pollutant Analyzer	Ozone	QAPP Latitude							
<b>Deposition Measurement</b>	dry	QAPP Longitude							
Land Use	woodlands - mixed	QAPP Elevation Meters							
Terrain	gently rolling	QAPP Declination							
Conforms to MLM	Yes	QAPP Declination Date							
Site Telephone	(231) 862-3750	Audit Latitude	44.18089						
Site Address 1	10637 South 9 Rd.	Audit Longitude	-85.73898						
Site Address 2		Audit Elevation	297						
County	Wexford	Audit Declination	-5						
City, State	Cadillac, MI	Present							
Zip Code	49601	<b>Fire Extinguisher</b>	No inspection date						
Time Zone	Eastern	<b>First Aid Kit</b>							
Primary Operator		Safety Glasses							
Primary Op. Phone #		Safety Hard Hat							
Primary Op. E-mail		Climbing Belt							
<b>Backup Operator</b>		Security Fence							
Backup Op. Phone #		Secure Shelter							
Backup Op. E-mail		Stable Entry Step 🗹							
Shelter Working Room ✓	Make Ekto	<b>Model</b> 8810	Shelter Size 640 cuft						
Shelter Clean	Notes The shelter is clean, ne	at, well organized.							
Site OK	Notes								
Driving Directions From and co approx the sit	Driving Directions From Cadillac proceed west on route 55 for approximately 12.5 miles. Turn left (south) on Hoxeyville Road (S13) and continue approximately 2 miles to the first stop sign. Turn right (west) on an unmarked road and continue approximately 2 miles to 9 road. Turn left (south) on 9 road which is not paved and continue approximately 1 mile, the site is on the left.								

HOX148

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/25/2014

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

### Siting Distances OK

### **Siting Criteria Comment**

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

Fi	eld Sy	stems Data	Form		F-02058-1500-S3-rev002				
Sit	e ID	HOX148	Technician	Eric Hebert		Site Visit Date 08/25/2014			
1	Are win being in	d speed and direc fluenced by obstr	tion sensors sited so uctions?	as to avoid	✓	N/A			
2	Are win (i.e. wind horizont tower in	d sensors mounted d sensors should h ally extended boo to the prevailing	d so as to minimize oe mounted atop the om >2x the max diar wind)	tower effects? e tower or on a neter of the		N/A			
3	Are the	tower and sensors	s plumb?		✓	N/A			
4	Are the avoid ra	temperature shiel diated heat sourc	ds pointed north or es such as buildings	positioned to , walls, etc?	✓				
5	Are tem conditio surface a standing	perature and RH ns? (i.e. ground b and not steeply slo g water should be	sensors sited to avo elow sensors should oped. Ridges, hollow avoided)	id unnatural be natural vs, and areas of					
6	Is the so	lar radiation sens	or plumb?		✓	N/A			
7	Is it site light?	d to avoid shading	g, or any artificial o	r reflected	✓	N/A			
8	Is the ra	in gauge plumb?			✓	N/A			
9	Is it site towers,	d to avoid shelteri etc?	ng effects from buil	dings, trees,	✓	N/A			
10	Is the su facing n	rface wetness sen orth?	sor sited with the gr	rid surface	✓	N/A			
11	Is it inc	lined approximate	ely 30 degrees?		✓	N/A			

natural or man-made, that may affect the monitoring parameters:

Met tower and 10 meter temperature operating and audited.

### F-02058-1500-S4-rev002

Site	e ID	HOX148	Technician	Eric Hebert		Site Visit Date	08/25/2014	
1	Do all th condition	e meterological senso n, and well maintained	rs appear to be : 1?	intact, in good	✓	Temperature only		
2	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 sol scratche	lar radiation sensor's s?	lens clean and f	ree of		N/A		
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7	Are the s	sensor signal and pow n, and well maintained	er cables intact, 1?	, in good	✓			
8	Are the s from the	sensor signal and pow elements and well ma	er cable connec aintained?	tions protected	✓			

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	HOX148	Technician E	ric Hebert		Site Visit Date 08/25/2014
	<u>Siting C</u>	riteria: Are the polluta	ant analyzers and	d deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	ample inlets have at least teacher at least teacher and the second	ast a 270 degree	arc of	✓	
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?					
	<u>Pollutar</u>	nt analyzers and deposi	tion equipment	operations and	mai	intenance
1	Do the a conditio	nalyzers and equipment on and well maintained	nt appear to be i ?	n good	✓	
2	Are the reportin	analyzers and monitor ng data?	s operational, or	ı-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 15 meters
4	Describ	e dry dep sample tube.				3/8 teflon by 15 meters
5	Are in-li indicate	ine filters used in the o location)	zone sample line	? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	kinks, moisture,	and		
7	Is the ze	ero air supply desiccan	t unsaturated?		✓	
8	Are the	re moisture traps in the	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	deposition filter	line, and is it		Clean and dry

Fie	eld Sy	stems Data Fo			F-02058-1500-S6-rev002					
Site ID HOX148 Technician Eric H		Eric Hebert		Site Visi	it Date 08	/25/2014				
	DAS, se	nsor translators, and j	pment operatio	ns and	maintena	nce				
1	Do the I well mai	DAS instruments appe intained?								
2 Are all the components of the DAS operational? (printers, modem, backup, etc)										
3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?										
4	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 grounde	DAS, sensor translato ed?	rs, and shelter	properly						
7	Does the	e instrument shelter ha	ave a stable pov	ver source?						
8	8 Is the instrument shelter temperature controlled?			lled?						
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

Field Systems Data		F-02058-1500-S7-rev00					
Site ID HOX148		Tech	nician Eric H	lebert Site Visit Date 0	8/25/201	4	
<b>Documentation</b>							
Does the site have the require	<u>ed ins</u>	trum	ent and equip	oment manuals?			
	Yes	No	N/A		Yes	No	N/A
Wind speed sensor			$\checkmark$	Data logger			
Wind direction sensor			$\checkmark$	Data logger			
Temperature sensor				Strip chart recorder			$\checkmark$
<b>Relative humidity sensor</b>			$\checkmark$	Computer		$\checkmark$	
Solar radiation sensor			$\checkmark$	Modem			
Surface wetness sensor			$\checkmark$	Printer			
Wind sensor translator			$\checkmark$	Zero air pump		$\checkmark$	
Temperature translator			$\checkmark$	Filter flow pump		$\checkmark$	
Humidity sensor translator			$\checkmark$	Surge protector			$\checkmark$
Solar radiation translator			$\checkmark$	UPS			
Tipping bucket rain gauge			$\checkmark$	Lightning protection device			$\checkmark$
Ozone analyzer		$\checkmark$		Shelter heater		$\checkmark$	
Filter pack flow controller		$\checkmark$		Shelter air conditioner	$\checkmark$		
Filter pack MFC power supply			$\checkmark$				
Does the site have the requi	red a	nd mo	ost recent QC	documents and report forms?			
	Pres	ent			Curr	ent	
Station Log					$\checkmark$		
SSRF	5				$\checkmark$		
Site Ops Manual	5		Oct 2001				
HASP	•		Nov 2001				
Field Ops Manual			June 1987				
Calibration Reports					$\checkmark$		
Ozone z/s/p Control Charts							
Preventive maintenance schedul	1				$\checkmark$		

- **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:

✓

#### HOX148 Technician Eric Hebert Site Visit Date 08/25/2014 Site ID Site operation procedures 10/20/2000 by ESE employee EOH Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QC	Check	Perf	formed
----	-------	------	--------

#### Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	$\checkmark$
Visual Inspections	$\checkmark$	Weekly	✓
Translator Zero/Span Tests (climatronics)	$\checkmark$	N/A	$\checkmark$
Manual Rain Gauge Test	$\checkmark$	N/A	$\checkmark$
Confirm Reasonableness of Current Values	$\checkmark$	N/A	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

✓  $\checkmark$ 

 $\checkmark$ 

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V

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 $\checkmark$ 

 $\checkmark$ 

 $\checkmark$ 

 $\checkmark$ 

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

<b>OC</b>	Check	Performed
VV.	CHUCK	I CHIOI IIICU

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

Frequency	Compliant
Semiannually	
Daily	
Daily	
Weekly	
Every 2 weeks	
N/A	
Weekly	
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?		

	Unknown
✓	
✓	SSRF, call-in

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

The ozone analyzer sample train is leak-checked every two weeks.

### F-02058-1500-S8-rev002

**Compliant** 

Field Systems Data Form							F-02058-1500-S9-rev002			
Sit	e ID	HOX148 T	echnic	echnician Eric Hebert		Site Visit Date	08/25/2014			
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being changed ev	ery Tu	esda	ay as scheduled?		Filter changed mornings			
2	Are the Site Status Report Forms being completed and filed correctly?									
3	Are data downloads and backups being performed as scheduled?						No longer required			
4	Are general observations being made and recorded? How?				✓	SSRF, logbook				
5	Are site supplies on-hand and replenished in a timely fashion?									
6	Are sample flow rates recorded? How?				✓	SSRF, call-in				
7	Are san fashion	nples sent to the lab on a re ?	gular s	che	dule in a timely					
8	Are filte and shi	ers protected from contami pping? How?	nation	dur	ing handling	✓	Clean gloves on and off			
9	Are the operation	site conditions reported re ons manager or staff?	gularly	to '	the field					
QC	Check P	erformed		Free	quency			Compliant		
I	Multi-poi	nt MFC Calibrations		Sem	iannually					
]	Flow Syst	em Leak Checks		Wee	kly					
]	Filter Pack Inspection									
1	Flow Rate Setting Checks Weekly									
	Visual Check of Flow Rate Rotometer Veekly									
I	n-line Fil	lter Inspection/Replacemen	t 🗹	Sem	iannually			$\checkmark$		
5	Sample L	ine Check for Dirt/Water		Wee	kly					
D		differel emleration (nhe		le es	n alaatah if maaaa	~ ~ ~ ~ ~		and listed above on	ann ath an factures	

HOX148

### F-02058-1500-S10-rev002

Technician Eric Hebert

Site Visit Date 08/25/2014

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000289
DAS	Campbell	CR3000	2533	000426
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	110300021225	04927
Flow Rate	Apex	AXMC105LPMDPC	48099	000526
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03560
Modem	Raven	H4222-C	0808311145	06480
Ozone	ThermoElectron Inc	49i A1NAA	1009241794	000614
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200008	000432
Sample Tower	Aluma Tower	В	none	000131
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	Aspirated 43408	none	00794
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14805	06544
Zero air pump	Werther International	C 70/4	000829164	06938

## Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
UVL	.124-Eric H	ebert-08/26/2014				
1	8/26/2014	Computer	Dell	000294	D520	unknown
2	8/26/2014	DAS	Campbell	000423	CR3000	2517
3	8/26/2014	Elevation	Elevation	None	1	None
4	8/26/2014	Filter pack flow pump	Thomas	02973	107CAB18	0493002467
5	8/26/2014	Flow Rate	Apex	000600	AXMC105LPMDPCV	illegible
6	8/26/2014	Infrastructure	Infrastructure	none	none	none
7	8/26/2014	Met tower	Universal Tower	02745	unknown	none
8	8/26/2014	Modem	Raven	06466	V4221-V	0808339409
9	8/26/2014	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
10	8/26/2014	Ozone Standard	ThermoElectron Inc	000365	49i A3NAA	0726124688
11	8/26/2014	Sample Tower	Aluma Tower	03557	А	none
12	8/26/2014	Shelter Temperature	Campbell	none	107-L	none
13	8/26/2014	Shield (10 meter)	RM Young	missing	Aspirated 43408	none
14	8/26/2014	Siting Criteria	Siting Criteria	None	1	None
15	8/26/2014	Temperature	RM Young	06504	41342	14624
16	8/26/2014	Zero air pump	Werther International	06936	C 70/4	000829169

## **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial Nu	mber Site	T	<b>Cechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2517	UVL	.124	Eric Hebert	08/26/2014	DAS	Primary
Das Date:	8 /26/2014	Audit Date	8 /26/2014	Mfg	HY	Parameter	DAS
Das Time:	238	Audit Time	238	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel: High Channel:				Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0003	0.0002	0.0003	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	4 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0002	0.0000	V	V	0.0002	
7	0.1000	0.0997	0.0996	V	V	-0.0001	
7	0.3000	0.2996	0.2997	V	V	0.0001	
7	0.5000	0.4994	0.4996	V	V	0.0002	
7	0.7000	0.6998	0.6999	V	V	0.0001	
7	0.9000	0.8999	0.8996	V	V	-0.0003	
7	1.0000	1.0000	0.9998	V	V	-0.0002	
## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Те	chnician	Site Visit D	ate Param	eter	<b>Owner ID</b>
Apex	illegible		UVL124	Er	ic Hebert	08/26/2014	Flow R	ate	000600
					Mfg	BIOS	P	arameter Flov	v Rate
	Serial Number 131818		Т	Tfer Desc. BIOS 220-H					
	<b>Tfer ID</b> 01417								
					Slope	1.0	00000 Inte	ercept	0.00000
					Cert Date	1/8	/2014 <b>Cor</b>	rCoff	1.00000
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	-0.0	)2	
A Avg % Diff:	A Max % Di	A Avg %l	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	9	
0.67%	0.67%				<b>Rotometer R</b>	eading:	1.	.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.488	1.490	1.50	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.485	1.490	1.50	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.494	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
Sensor Compo	onent Leak Tes	it		Conditio	n	Status		is pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Compo	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Compo	onent Rotomete	er Conditior	1	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Compo	onent Filter Dis	tance		Conditio	<b>n</b> 5.0 cm		Status	pass	
Sensor Compo	onent Filter Dep	oth		Conditio	<b>n</b> 3.0 cm		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	<b>n</b> 360 deg		Status	pass	
Sensor Compo	onent System N	/lemo		Conditio	n See comments	Status	pass		

## **Ozone Data Form**

Mfg		Serial I	Number Ta	Site		Te	echnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	ctron Inc	110534	47310	UVL	124	E	ric Hebert	:	08/26/20	)14	Ozone		000745	
CI		00102	a		0.0000	0	Mfg		ThermoF	lectron	Inc Pa	rameter	zone	
Slope:		0.99192	Slope:		0.0000	0	ang							
CorrCoff		.00000	CorrCoff		0.0000	0	Serial N	umber	0419606	966	Tf	er Desc. 🕻	Jzone primary	stan
correon			correon				Tfer ID		01112					
DAS 1:			<b>DAS 2:</b>				Slope			1.0092	8 Inter	rcept	0.11	780
A Avg % E	Diff: A M	Iax % I	Di A Avg %	6Dif	A Max	% Di				1/0/201	4	C ee	1.00	000
0.9	9%	2.2	2%				Cert Da	ite		1/6/201	4 Cori	Coff	1.00	000
UseDes	cription:	С	oncGroup:	Tfe	er Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctDi	fference:	
prin	nary		1	-	0.41	-0	.52	0.2	29	ppb				
prin	nary		2	2	26.07	25	.71	26.	.28	ppb			2.22%	
prin	nary		3	5	51.19	50	.60	51.	.06	ppb			0.91%	
prin	nary		4	7	7.54	76	.71	76.	.86	ppb			0.20%	
prin	nary		5	1	13.77	112	2.60	112	.50	ppb			-0.09%	
Sensor C	omponer	nt Cell E	B Noise			Conditi	on 0.9 pp	b			Status	pass		
Sensor C	omponei	nt Cell E	B Tmp.			Conditi	on				Status	pass		
Sensor C	omponei	nt Fulls	cale Voltage			Conditi	on N/A				Status	pass		
Sensor C	omponei	nt Inlet	Filter Conditio	n		Conditi	on Clean	1			Status	pass		7
		. Line I					Nista	- 4 - J			<b>G</b> 1 1			5
Sensor C	omponei	it Line	LOSS			Conditi	on NOT te	sted			Status	pass		
Sensor C	omponei	nt Offse	et			Conditi	<b>on</b> -0.10				Status	pass		
Sensor C	omponei	nt Span	1			Conditi	on 1.049				Status	pass		
Sensor C	omponei	nt Cell E	B Freq.			Conditi	on 90.4 k	κHz			Status	pass		]
Sensor C	omponei	nt Syste	em Memo			Conditi	on				Status	pass		
Sensor C	ompone	nt Sam	ple Train			Conditi	on Good				Status	pass		
Sensor C	omponer	nt Cell E	B Pressure			Conditi	on				Status	pass		
Sensor C	omponei	nt Cell E	B Flow			Conditi	on 0.46 l	pm			Status	pass		
Sensor C	omponei	nt Cell /	A Tmp.			Conditi	on 35.4 (	2			Status	pass		
Sensor C	omponei	nt Cell /	A Pressure			Conditi	on 726.5	mmHg			Status	pass		
Sensor C	omponei	nt Cell /	A Noise			Conditi	on 1.0 pp	b			Status	pass		
Sensor C	omponer	nt Cell /	A Freq.			Conditi	on 87.4 k	κHz			Status	pass		
Sensor C	omponer	nt Cell /	A Flow			Conditi	on 0.64 l	pm			Status	pass		
Sensor C	omponei	nt Batte	ery Backup			Conditi	on N/A				Status	pass		
Sensor C	omponei	nt Zero	Voltage			Conditi	on N/A				Status	pass		

## Temperature Data Form

Mfg	Serial Number T	'a Site	1	Techni	ician	Site V	Site Visit Date		eter	<b>Owner ID</b>	
RM Young	14624	UVL124		Eric H	ebert	08/26	6/2014	Temper	ature	06504	
				Mf	g	Extec	h	Ра	rameter Te	emperature	
				Ser	rial Number	H232	H232679 TI		fer Desc. RTD		
				Tfer ID 0		01228	3				
DAS 1:	DAS	2:		Slo	pe	1.00496 Interce		rcept -0.23009		09	
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma			Max Er	ax Er Cert Date			1/8/201	4 Cor	rCoff	1.000	00
0.08	0.11										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	-0.06	0.17	7	0.000		0.1		С	-0.06	
primary Tem	p Mid Range	25.21	25.3	1	0.000		25.	2	С	-0.08	
primary Tem	p High Range	46.38	46.3	8	0.000		46.	3	С	-0.11	
Sensor Compone	ent Shield		Cond	ition N	Moderately clea	an		Status	pass		
Sensor Component Blower				ition F	Functioning			Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass		
Sensor Compone	ent System Memo		Cond	Condition				Status	IS pass		

## Shelter Temperature Data For

Mfg	Serial Number Ta	Serial Number Ta Site Technician S		Site Visit Date	Parameter	Owner ID
Campbell	none	UVL124	Eric Hebert	08/26/2014	Shelter Temperatu	ire none
DAS 1:	DAS 2:	-	Mfg	Extech	Parameter S	Shelter Temperatur
Abs Avg ErrAt0.34	0.50 Abs Avg	g Err Abs Max Er	Serial Number	H232679	Tfer Desc.	RTD
			Tfer ID	<b>Tfer ID</b> 01228		
			Slope	1.0049	6 Intercept	-0.23009
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	24.28	24.39	0.000	24.6	С	0.16	
primary	Temp Mid Range	23.99	24.10	0.000	23.8	С	-0.35	
primary	Temp Mid Range	26.15	26.25	0.000	25.8	С	-0.5	
Sensor Component System Memo			Condition	Status pass				

#### **Infrastructure Data For**

Site ID	UVL124	Technician Eric Hel	oert Site Visit Date 08/26/2014
Shelter I	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft
and the providence			

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem		
Flow Rate	UVL124	Eric Hebert	08/26/2014	Moisture Present	Apex	3991				
Although there currently is no moisture in the flow sample train, there is evidence of previous moisture events.										

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

Ozone sample train leak-check performed every two weeks.

#### 2 Parameter: DocumentationCo

The ozone diagnostic and observation sections of the SSRF were completed during the filter removal visit and not the installation visit as indicated on the form.

#### 3 Parameter: SitingCriteriaCom

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

#### 4 Parameter: ShelterCleanNotes

The shelter is clean and in good condition.

#### 5 Parameter: MetOpMaintCom

Met tower and 10 meter temperature operating and audited.

### F-02058-1500-S1-rev002

Site ID UVL124	Technician Eric Hebert	Site Visit Date 08/26	5/2014						
Site Sponsor (agency)	EPA	USGS Map	Ellington						
<b>Operating Group</b>	private	Map Scale							
AQS #	26-157-9991	Map Date							
Meteorological Type	R.M. Young								
Air Pollutant Analyzer	Ozone	QAPP Latitude							
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude							
Land Use	agriculture	QAPP Elevation Meters							
Terrain	flat	QAPP Declination							
Conforms to MLM	Yes	QAPP Declination Date							
Site Telephone	(989) 673-5901	Audit Latitude	43.613572						
Site Address 1	1821 E. Dickerson Rd.	Audit Longitude	-83.359869						
Site Address 2		Audit Elevation	202						
County	Tuscola	Audit Declination	-7						
City, State	Unionville, MI	Present							
Zip Code	48767	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							
<b>Backup Operator</b>		Security Fence							
Backup Op. Phone #		Secure Shelter							
Backup Op. E-mail		Stable Entry Step 🔽							
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size 640 cuft						
Shelter Clean	Notes The shelter is clean and in good	od condition.							
Site OK	Notes								
Driving Directions From Saginaw MI, take route 81 east through Caro. About 2.9 miles past the junction of SR24 and 81, turn left (north) on Colwood. There is a large church at that intersection. Continue on Colwood for about 6 miles to the intersection of Dickerson road. Turn left (west) at the stop sign. The site is on the right (north) side on the road behind the first farmhouse, where Fred Matt, the landowner resides.									

UVL124

#### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/26/2014

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		$\checkmark$
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m	30 m	
Limited agricultural operations	200 m		
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

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

Fi	eld Systems Data Form	F-02058-1500-S3-rev002					
Sit	e ID UVL124 Technician Eric Hebert		Site Visit Date 08/26/2014				
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				
Pro	ovide any additional explanation (photograph or sketch if nece tural or man-made, that may affect the monitoring parameters	ssar	y) regarding conditions listed above, or any other features,				

#### F-02058-1500-S4-rev002

Site	e ID	UVL124	Technician	Eric Hebert		Site Visit Date	08/26/2014	
1	Do all th condition	e meterological senso 1, and well maintained	rs appear to be 1?	intact, in good	✓	Temperature only		
2 Are all the meteorological sensors operational online, and reporting data?						Temperature only		
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors worl	king?		✓			
5	Is the sol scratches	ar radiation sensor's	lens clean and f	ree of		N/A		
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7	Are the s condition	ensor signal and pow a, and well maintained	er cables intact, 1?	, in good				
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected				

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

Met tower and 10 meter temperature operating and audited.

Field Systems Data Form			F-02058-1500-S5-rev002			
Site	<b>UVL124 Technician</b> Eric Hebert		Site Visit Date 08/26/2014			
	Siting Criteria: Are the pollutant analyzers and deposition eq	uip	<u>ment sited in accordance with 40 CFR 58, Appendix E</u>			
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	l ma	intenance			
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓				
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓				
3	Describe ozone sample tube.		1/4 teflon by 12 meters			
4	Describe dry dep sample tube.		3/8 teflon by 12 meters			
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only			
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓				
7	Is the zero air supply desiccant unsaturated?	✓				
8	Are there moisture traps in the sample lines?	✓	Flow line only			
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry			

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

Field Systems Data Form							<b>F-02</b>	2058-15	00-S6-rev002
Site ID UVL124 Technician Eric Hebert		Eric Hebert		Site Visit Date	08/26/2014	4			
	DAS, sei	nsor translators, and p	eripheral equi	pment operatio	ns ai	nd maintenance			
1	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	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?			e weather and					
5	Are the	signal leads connected	to the correct	DAS channel?	✓				
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly	✓				
7	Does the	e instrument shelter ha	ive a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	erature control	lled?					
9	Is the m	et tower stable and gro	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower c	omments?				Towers not grounde	ed		

Provide any additional 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 S	ystems Data	For	m				<b>F-02</b>	.058-	-1500-S7	-rev002
Site ID	UVL124		Tech	nician	Eric Hebert	Site Visit Dat	te 08/26/2014	ļ		
<b>Docume</b>	<u>ntation</u>									
Does the	site have the require	ed ins	trume	ent and	equipment manuals?					
		Yes	No	<b>N/</b>	A		Yes	No	N/A	
Wind speed	sensor			$\checkmark$	Data logge	er		$\checkmark$		
Wind direct	tion sensor			✓	Data logge	er			$\checkmark$	
Temperatu	re sensor	$\checkmark$			Strip char	t recorder			$\checkmark$	
Relative hu	midity sensor			$\checkmark$	Computer			$\checkmark$		
Solar radia	tion sensor			$\checkmark$	Modem			$\checkmark$		
Surface wet	mess sensor			$\checkmark$	Printer				$\checkmark$	
Wind senso	r translator			$\checkmark$	Zero air p	ump		$\checkmark$		
Temperatu	re translator			$\checkmark$	Filter flow	y pump		$\checkmark$		
Humidity se	ensor translator			$\checkmark$	Surge pro	tector			$\checkmark$	
Solar radiat	tion translator			$\checkmark$	UPS					
Tipping buo	cket rain gauge			$\checkmark$	Lightning	protection devi	ce		$\checkmark$	
Ozone analy	yzer	$\checkmark$			Shelter he	ater		$\checkmark$		
Filter pack	flow controller	$\checkmark$			Shelter air	conditioner	$\checkmark$			
Filter pack	MFC power supply	$\checkmark$								
Does th	<u>e site have the requi</u>	i <mark>red a</mark>	nd mo	st rece	nt QC documents and	report forms?				
		Pres	ent				Curre	nt		
<b>Station Log</b>							$\checkmark$			
SSRF							$\checkmark$			
Site Ops Ma	anual			Oct 200	01					
HASP				Nov 20	01					

**Field Ops Manual Calibration Reports** 

1

2

3

4

current?

**Ozone z/s/p Control Charts** 

**Preventive maintenance schedul** 

	Oct 2001	
$\checkmark$	Nov 2001	
$\checkmark$	4/2/2014	

✓

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

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

The ozone diagnostic and observation sections of the SSRF were completed during the filter removal visit and not the installation visit as indicated on the form.

#### UVL124 Technician Eric Hebert Site Visit Date 08/26/2014 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

#### **QC Check Performed**

#### Frequency

Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	$\checkmark$
Visual Inspections	$\checkmark$	Weekly	$\checkmark$
Translator Zero/Span Tests (climatronics)	$\checkmark$	N/A	$\checkmark$
Manual Rain Gauge Test	$\checkmark$	N/A	$\checkmark$
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

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

<b>OC</b>	Check	Perf	formed	
VV.	Chick	I UII	uncu	

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

1 requerey	000
Semiannually	$\checkmark$
Daily	$\checkmark$
	$\checkmark$
Daily	$\checkmark$
	$\checkmark$
Weekly	$\checkmark$
Every 2 weeks	✓
N/A	✓
Weekly	✓
Weekly	$\checkmark$
	Semiannually Daily Daily Weekly Every 2 weeks N/A Weekly Weekly

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

	Unknown
✓	
✓	SSRF, logbook, call-in

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

Ozone sample train leak-check performed every two weeks.

#### **Compliant**

F-02058-1500-S8-rev002

#### **Compliant**

#### **Field Systems Data Form** F-02058-1500-S9-rev002 UVL124 Technician Eric Hebert Site Visit Date 08/26/2014 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed afternoons 1 Are the Site Status Report Forms being completed and filed With noted exceptions 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? ✓ SSRF Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, logbook, call-in Are sample flow rates recorded? How? 6 $\checkmark$ Are samples sent to the lab on a regular schedule in a timely 🗹 7 fashion? ✓ Clean gloves on and off Are filters protected from contamination during handling 8 and shipping? How? ✓ Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency $\checkmark$ Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks Filter Pack Inspection** $\checkmark$ ✓ Weekly **Flow Rate Setting Checks** $\checkmark$ ✓ Weekly Visual Check of Flow Rate Rotometer Semiannually $\checkmark$ **In-line Filter Inspection/Replacement** $\checkmark$ ✓ Weekly 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:

UVL124

#### F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/26/2014

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000294
DAS	Campbell	CR3000	2517	000423
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002467	02973
Flow Rate	Apex	AXMC105LPMDPC	illegible	000600
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	02745
Modem	Raven	V4221-V	0808339409	06466
Ozone	ThermoElectron Inc	49i A1NAA	1105347310	000745
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124688	000365
Sample Tower	Aluma Tower	A	none	03557
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	Aspirated 43408	none	missing
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14624	06504
Zero air pump	Werther International	C 70/4	000829169	06936

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
EGB	181-Eric H	ebert-08/28/2014				
1	8/28/2014	Computer	Dell	000263	D520	unknown
2	8/28/2014	DAS	Campbell	000408	CR3000	2538
3	8/28/2014	Elevation	Elevation	None	1	None
4	8/28/2014	Filter pack flow pump	Thomas	04285	107CAB18B	129800010108
5	8/28/2014	Flow Rate	Арех	000663	AXMC105LPMDPCV	illegible
6	8/28/2014	Infrastructure	Infrastructure	none	none	none
7	8/28/2014	Met tower	Universal Tower	04649	unknown	none
8	8/28/2014	Modem	Raven	06584	H4223-C	0844381230
9	8/28/2014	Sample Tower	Aluma Tower	01791	A	none
10	8/28/2014	Shelter Temperature	Campbell	none	107-L	none
11	8/28/2014	Shield (10 meter)	RM Young	02942	Aspirated 43408	none
12	8/28/2014	Siting Criteria	Siting Criteria	None	1	None
13	8/28/2014	Temperature	RM Young	06502	41342	14622

## **DAS Data Form**

DAS Time Max Error: 1.33

Mfg	Serial Nu	mber Site	1	<b>Sechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2538	EGI	B181	Eric Hebert	08/28/2014	DAS	Primary
Das Date:	8 /28/2014	Audit Date	8 /28/2014	Mfg	HY	Parameter	DAS
Das Time: Das Day:	13:15:20 240	Audit Time_ Audit Day	13:14:00 240	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channels	:	High Channe	d:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0004	0.0002	0.0004	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	4 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0005	-0.0001	V	V	0.0004	
7	0.1000	0.0997	0.0996	V	V	-0.0001	
7	0.3000	0.2996	0.2993	V	V	-0.0003	
7	0.5000	0.4994	0.4994	· V	V	0.0000	
7	0.7000	0.7000	0.6999	V	V	-0.0001	
7	0.9000	0.9000	0.8997	V	V	-0.0003	
7	1.0000	1.0000	0.9999	V	V	-0.0001	

## Flow Data Form

Mfg	Serial Nun	ıber Ta	Site	Тес	chnician	Site Visit D	Date Paran	neter	<b>Owner ID</b>	
Apex	illegible		EGB181	Eri	ic Hebert	08/28/2014	Flow F	late	000663	
					Mfg BIOS		Parameter Flow		w Rate	
					Serial Number	131818	1	fer Desc. BIO	S 220-H	
					Tfer ID	01417				
					Slope	1.0	00000 Int	ercept	0.00000	
					Cert Date	1/8	3/2014 <b>Co</b>	rrCoff	1.00000	
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	-0.0	15		
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.99	94		
2.40%	2.63%				Rotometer R	eading:	1	.6		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference	
primary	pump off	0.000	0.000	-0.46	0.000	-0.01	l/m	l/m		
primary	leak check	0.000	0.000	-0.26	0.000	-0.01	l/m	l/m		
primary	test pt 1	1.524	1.520	1.49	0.000	1.49	l/m	l/m	-1.97%	
primary	test pt 2	1.523	1.520	1.49	0.000	1.48	l/m	l/m	-2.63%	
primary	test pt 3	1.530	1.530	1.50	0.000	1.49	l/m	l/m	-2.61%	
Sensor Comp	onent Leak Tes	t		Conditio	n		Status	pass		
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass		
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass		
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass		
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	1s pass		
Sensor Component Filter Distance			Conditio	<b>n</b> 4.5 cm		Status	pass			
Sensor Component Filter Depth			Conditio	<b>n</b> 1.0 cm		Status pa				
Sensor Comp	onent Filter Azi	muth		Conditio	n 270 deg		Status	pass		
Sensor Comp	onent System M	/lemo		Conditio	n		Status	pass		

## Temperature Data Form

Mfg	Serial Number	Ta Site		Techni	ician	Site V	Site Visit Date		eter	<b>Owner ID</b>
RM Young	14622	EGB181		Eric H	Eric Hebert		/28/2014 Temper		ature	06502
			Mfg		Extec	h	Pa	rameter Te	emperature	
				Serial Number		H232	H232679 T		fer Desc. RTD	
			Tfer ID		01228					
DAS 1:	DAS	2:		Slo	ре		1.0049	6 Inte	rcept	-0.23009
Abs Avg Err Abs Max Er Abs Avg		Avg Err Abs	bs Max Er		Cert Date		1/8/201	1/8/2014 <b>Cor</b>		1.00000
0.06	0.08									
UseDesc.	Test type	InputTmpRaw	InputTm	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary Terr	p Low Range	0.30	0.53	3	0.000		0.5	5	С	-0.07
primary Tem	p Mid Range	25.20	25.3	0	0.000		25.	2	C	-0.08
primary Tem	p High Range	48.64	48.6	3	0.000		48.	6	С	-0.02
Sensor Compone	ent Shield		Cond	ition C	Clean			Status	pass	
Sensor Component Blower			Cond	Condition Functioning				Status	pass	
Sensor Component Blower Status Switch			Cond	Condition N/A				Status	pass	
Sensor Compone	ent System Memo		Cond	Condition				Status	pass	

## Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	EGB181	Eric Hebert	08/28/2014	Shelter Temperature	none
DAS 1:	DAS 2:	-	Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAbs0.27	0.36	Err Abs Max Er	Serial Number	H232679	Tfer Desc. RTD	)
			Tfer ID	01228		
			Slope	1.0049	6 Intercept	-0.23009
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	22.81	22.93	0.000	23.3	С	0.36	
primary	Temp Mid Range	23.28	23.39	0.000	23.6	С	0.17	
primary	Temp Mid Range	23.65	23.76	0.000	23.5	С	-0.27	
Sensor Component System Memo			Condition	Status pass				

#### **Infrastructure Data For**

Site ID	EGB181	Technician Eric He	bert Site Visit Date 08/28/2014
Shelter 1	Make	Shelter Model	Shelter Size
custom		N/A	7200 cuft

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

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

Filters are sent 4 at a time and stored in a refrigerator before and after sampling prior to shipment to the lab.

2 Parameter: DasComments

The sample tower is badly damaged at the hinge point and should be replaced.

3 Parameter: DocumentationCo

The site operator no longer uses the station logbook during routine site visits.

4 Parameter: ShelterCleanNotes

The shelter is provided by the Center for Atmospheric Research and is clean, organized, and spacious.

#### 5 Parameter: PollAnalyzerCom

Ozone concentration is not measured at EGB181 as part of CASTNET.

### F-02058-1500-S1-rev002

Site ID EGB181	Technician Eric Hebert	Site Visit Date 08/2	3/2014					
Site Sponsor (agency)	EPA/Envir Canada	USGS Map						
Operating Group	Envir Canada	Map Scale						
AQS#		Map Date						
Meteorological Type	R.M. Young							
Air Pollutant Analyzer	SO2, NOx, NOy, More	QAPP Latitude	44.2317					
<b>Deposition Measurement</b>	dry, wet, CAPMon	QAPP Longitude	-79.7840					
Land Use	Agriculture	QAPP Elevation Meters	251					
Terrain	gentley rolling	QAPP Declination	10.75					
Conforms to MLM	Yes	QAPP Declination Date	9/16/2005					
Site Telephone	(705) 458-3309	Audit Latitude	44.231071					
Site Address 1	Center for Atmospheric Research	Audit Longitude	-79.783115					
Site Address 2	6248 Eighth Line	Audit Elevation	227					
County		Audit Declination	-10.4					
City, State	Egbert, Ontario	Present						
Zip Code	CAN LOL 1N0	Fire Extinguisher 🗹	inspected July 2014					
Time Zone	Eastern	First Aid Kit						
Primary Operator		Safety Glasses						
Primary Op. Phone #		Safety Hard Hat						
Primary Op. E-mail		Climbing Belt						
<b>Backup Operator</b>		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Step 🔽						
Shelter Working Room ✓	Make custom M	odel N/A	Shelter Size   7200 cuft					
Shelter Clean	<b>Notes</b> The shelter is provided by the spacious.	Center for Atmospheric Resear	ch and is clean, organized, and					
Site OK	Notes							
Driving Directions From Cooks at the Canad	Driving Directions       From Toronto take the 403 to the 401 and then go north on the 400 toward Barrie. Go west on Hwy 89 at the Cookstown exit. Turn right (north) on Hwy 27. Continue approximately 3 miles and turn left (west) on Side Road 10 at the sign for Egbert. Continue approximately 3.2 miles and turn right (north) on the dirt road at the Environment Canada. Center for Atmospheric Research. The site is through the locked gate on the left into the complex.							

EGB181

#### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/28/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Sit	e ID EGB181 Technician Eric Hebert		Site Visit Date 08/28/2014
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
Pro	ovide any additional explanation (photograph or sketch if nece tural or man-made, that may affect the monitoring parameters	ssar s:	y) regarding conditions listed above, or any other features,

#### F-02058-1500-S4-rev002

Site	e ID	EGB181	Technician	Eric Hebert		Site Visit Date	08/28/2014	
1	1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?					Temperature only		
2	2 Are all the meteorological sensors operational online, and reporting data?					Temperature only		
3	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?			ree of		N/A		
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7	Are the s condition	ensor signal and pow 1, and well maintained	er cables intact, 1?	, in good	✓			
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec hintained?	tions protected				

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	EGB181 Technician Eric Hebert		Site Visit Date 08/28/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	ment 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	d ma	<u>intenance</u>
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 20 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?		
7	Is the zero air supply desiccant unsaturated?		N/A
8	Are there moisture traps in the sample lines?	✓	
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

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

Ozone concentration is not measured at EGB181 as part of CASTNET.

Fi	eld Sy	stems Data Fo	orm					<b>F-02</b>	2058-15	500-S6-rev002
Site	e ID	EGB181	Technician	Eric Hebert		Site Visi	it Date	08/28/2014	4	
	DAS, ser	nsor translators, and <b>j</b>	peripheral equi	pment operatio	ns a	nd maintena	nce			
1	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	4 Are the signal connections protected from the weather and well maintained?			✓						
5	5 Are the signal leads connected to the correct DAS channel?			DAS channel?	✓					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter j	properly	✓					
7	Does the	e instrument shelter ha	ave a stable pow	ver source?	✓					
8	8 Is the instrument shelter temperature controlled?			lled?						
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	0 Is the sample tower stable and grounded?							<ul><li>✓</li></ul>		
11	Tower c	omments?							•	

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

The sample tower is badly damaged at the hinge point and should be replaced.

Fiel	d Systems Data	n For	m				<b>F-02</b>	058-	1500-S7-rev002
Site II	D EGB181		Techni	ician Eric	Hebert	Site Visit Date	8/28/2014	ŀ	
Doc	cumentation								
Doe	Does the site have the required instrument and equipment manuals?								
	<u> </u>	Yes	No	N/A			Yes	No	N/A
Wind	speed sensor			$\checkmark$	Data logge	r		✓	
Wind	direction sensor			$\checkmark$	Data logge	r			$\checkmark$
Tempe	erature sensor		✓		Strip chart	recorder			$\checkmark$
Relativ	ve humidity sensor			$\checkmark$	Computer			$\checkmark$	
Solar 1	radiation sensor			$\checkmark$	Modem		$\checkmark$		
Surfac	e wetness sensor			$\checkmark$	Printer				$\checkmark$
Wind	sensor translator			$\checkmark$	Zero air pı	ımp		$\checkmark$	
Tempe	erature translator			$\checkmark$	Filter flow	pump		$\checkmark$	
Humic	dity sensor translator			$\checkmark$	Surge prot	ector			$\checkmark$
Solar 1	radiation translator			$\checkmark$	UPS				$\checkmark$
Tippin	ng bucket rain gauge			$\checkmark$	Lightning j	protection device			
Ozone	analyzer			$\checkmark$	Shelter hea	ater			
Filter	pack flow controller		$\checkmark$		Shelter air	conditioner			
Filter	- pack MFC power supply	у 🗌	$\checkmark$						
De	oes the site have the requ	uired a	nd most	recent OC	documents and	report forms?			
<u></u>	bes the site have the requ	Drog	ont		o documento una		Cum	nt	
Station	n Log	IICS						111	
SCALIO									
Site O	nc Monuol			Oct 2001					
HASD				ct 2001					
Field (	Ong Manual			ov 2009		<u></u>	V		
Calibr	Ops Manual			arch 2006 \	ersion QAPP on L	Disc	V		
Orono	auon Reports								
D	z/s/p Control Charts			/A					
Prevei	ntive maintenance sched	ui L							
1 Is the station log properly completed during every site visit?  Logbook not used									
2 Are the Site Status Report Forms being completed and current?									
3 A	3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?								
4 A	re ozone z/s/p control cl urrent?	harts p	roperly	completed	and 🗌 N	/A			
Provid natura	le any additional explan Al or man-made, that ma	ation (j 1y affec	photogr t the mo	aph or ske onitoring p	tch if necessary) parameters:	regarding conditio	ns listed a	above, o	or any other features,
				~ •					

The site operator no longer uses the station logbook during routine site visits.

#### Site ID EGB181 Technician Eric Hebert Site Visit Date 08/28/2014 Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? ✓ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

Are the automatic and manual z/s/p checks monitored and

3

reported? If yes, how?

QC Check Performed	Frequency	Compliant
Multi-point Calibrations	N/A	
Automatic Zero/Span Tests	N/A	$\checkmark$
Manual Zero/Span Tests	N/A	$\checkmark$
Automatic Precision Level Tests	N/A	$\checkmark$
Manual Precision Level Test	N/A	$\checkmark$
Analyzer Diagnostics Tests	N/A	$\checkmark$
In-line Filter Replacement (at inlet)	N/A	$\checkmark$
In-line Filter Replacement (at analyze	N/A	$\checkmark$
Sample Line Check for Dirt/Water	N/A	$\checkmark$
Zero Air Desiccant Check	N/A	$\checkmark$
1 Do multi-point calibration gases go through the sample train including all filters?	complete N/A	
2 Do automatic and manual z/s/p gasses go throug complete sample train including all filters?	gh the	

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

□ N/A

#### F-02058-1500-S8-rev002

Fi	eld Sy	vstems Data Form				<b>F-02058-1</b>	1500-S9-rev002		
Sit	e ID	EGB181 Te	chnician Eric Hebert		Site Visit Date	08/28/2014			
	<u>Site ope</u>	eration procedures							
1	Is the fi	lter pack being changed eve	ry Tuesday as scheduled	?⊻	Filter changed morr	nings			
2	Are the correctl	Site Status Report Forms b ly?	eing completed and filed	✓					
3	Are dat schedul	a downloads and backups b ed?	eing performed as		No longer required				
4	Are gen	neral observations being mad	le 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 filt and shi	ers protected from contamin pping? How?	ation during handling	✓	Clean gloves on an	d off			
9	Are the operation	site conditions reported reg ons manager or staff?	ularly to the field						
QC	Check P	erformed	Frequency			Compliant			
ľ	Multi-poi	nt MFC Calibrations	Semiannually			$\checkmark$			
I	Flow Syst	tem Leak Checks	✓ Weekly			$\checkmark$			
I	Filter Pac	k Inspection							
I	Flow Rate Setting Checks					$\checkmark$			
	Visual Check of Flow Rate Rotometer Weekly					$\checkmark$			
I	n-line Fil	lter Inspection/Replacement	Semiannually			$\checkmark$			
8	Sample L	ine Check for Dirt/Water							
Prov	vide any a	additional explanation (phot	ograph or sketch if neces	sarv	y) regarding conditi	ions listed above, or	any other features,		

natural or man-made, that may affect the monitoring parameters:

Filters are sent 4 at a time and stored in a refrigerator before and after sampling prior to shipment to the lab.

Site ID EGB18	81 Technician	Eric Hebert	Site Visit Date 08/28/201	14
Site Visit Sensors				
Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000263
DAS	Campbell	CR3000	2538	000408
Elevation	Elevation	1	None	None
Filter pack flow pump	D Thomas	107CAB18B	129800010108	04285
Flow Rate	Арех	AXMC105LPMDPC	illegible	000663
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	04649
Modem	Raven	H4223-C	0844381230	06584
Sample Tower	Aluma Tower	A	none	01791
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	Aspirated 43408	none	02942
Siting Criteria	Siting Criteria	1	None	None

41342

RM Young

14622

F-02058-1500-S10-rev002

06502

**Field Systems Data Form** 

Temperature

# Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number		
RED004-Alison Ray-09/04/2014								
1	9/4/2014	DAS	Campbell	Unknown	CR850	unknown		
2	9/4/2014	Filter pack flow pump	gast	none	16D-6150-101-1039	1039		
3	9/4/2014	Flow Rate	Арех	000599	AXMC105LPMDPCV	illegible		
4	9/4/2014	Sample Tower	Aluma Tower	000813	В	unknown		
5	9/4/2014	Temperature	RM Young	06986	41342	024087		

## Flow Data Form

Mfg	Serial Nun	ıber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>	
Apex	illegible		RED004		son Ray	09/04/2014	Flow R	late	000599	
					Mfg	BIOS	P	arameter Flow	w Rate	
					Serial Number	122974	Т	fer Desc. BIO	S 220-H	
					Tfer ID	01416				
					Slope	1.0	00000 <b>Int</b> e	ercept	0.00000	
					Cert Date	1/8	/2014 Col	rrCoff	1.00000	
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	0.0	)1		
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	1.01	14		
0.99%	0.99%				Rotometer R	eading:		3		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	0.01	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m		
primary	test pt 1	3.026	3.030	2.97	0.000	3.00	l/m	l/m	-0.99%	
primary	test pt 2	3.028	3.030	2.97	0.000	3.00	l/m	l/m	-0.99%	
primary	test pt 3	3.033	3.030	2.97	0.000	3.00	l/m	l/m	-0.99%	
Sensor Comp	onent Leak Tes	t		Conditio	n		Status	pass		
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass		
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass		
Sensor Comp	onent Rotomete	meter Condition		Conditio	lition Clean and dry		Status	Status pass		
Sensor Comp	onent Moisture	Noisture Present		Conditio	n No moisture pr	resent	nt Status pass		ass	
Sensor Component Filter Distance			Conditio	Condition 4.0 cm		Status	s pass			
Sensor Comp	onent Filter Dep	t Filter Depth			n 1.5 cm		Status	pass		
Sensor Comp	onent Filter Azi	Filter Azimuth			n 180 deg		Status	pass		
Sensor Comp	onent System M	/lemo		Conditio	n		Status	pass		
## **Field Systems Comments**

#### 1 Parameter: DocumentationCo

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

2 Parameter: ShelterCleanNotes

Small footprint site with enclosure for instruments only.

### F-02058-1500-S1-rev002

Site ID RED004	Technician Alison Ray	Site Visit Date 09/04	/2014
Site Sponsor (agency)	FΡΔ	USGS Map	
Site Sponsor (agency)		Man Scale	
Operating Group		Map Dete	
AQS #		Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		QAPP Latitude	
<b>Deposition Measurement</b>	dry	QAPP Longitude	
Land Use		QAPP Elevation Meters	
Terrain		QAPP Declination	
Conforms to MLM		QAPP Declination Date	
Site Telephone		Audit Latitude	47.86382
Site Address 1		Audit Longitude	-94.83535
Site Address 2		Audit Elevation	374
County	Beltrami	Audit Declination	
City, State	Redby, MN	Present	
Zip Code	56670	Fire Extinguisher	
Time Zone	Central	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step	
Shelter Working Room	Make Me	odel	Shelter Size
Shelter Clean	Notes Small footprint site with enclose	ure for instruments only.	
Site OK	Notes		
Driving Directions			

RED004

### F-02058-1500-S2-rev002

Site ID

Technician Alison Ray

Site Visit Date 09/04/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		$\checkmark$

Siting Distances OK

Siting Criteria Comment

Fi	eld Sy	stems Data F	orm		F-02058-1500-S3-rev002					8-rev002
Site	e ID	RED004	<b>Technician</b>	Alison Ray		Site Visit Date 09/	04/2014			
1	Are win being in	d speed and direction fluenced by obstructi	sensors sited so a ons?	as to avoid 🛛 🗸	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)						/A				
3	Are the	tower and sensors plu	ımb?	V	N	/A				
4	Are the avoid ra	temperature shields p diated heat sources s	pointed north or p uch as buildings,	positioned to 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 so	lar radiation sensor p	olumb?	$\checkmark$	N	/A				
7	Is it site light?	d to avoid shading, or	• any artificial or	reflected	N	/Α				
8	Is the ra	in gauge plumb?		V	N	/Α				
9	Is it site towers,	d to avoid sheltering o etc?	effects from build	lings, trees,	N	/Α				
10	Is the su facing n	rface wetness sensor orth?	sited with the gri	d surface	N	/Α				
11	Is it inc	lined approximately 3	30 degrees?		N	/Α				
Pro nat	ovide any ural or m	additional explanational explanation	on (photograph o ffect the monitor	r sketch if necessa ing parameters:	ry)	regarding condition	s listed abov	ve, or	any othe	r features,

#### F-02058-1500-S4-rev002

Site	ID	RED004	Technician	Alison Ray		Site Visit Date 09/04/2014
1 2	Do all th condition Are all tl	e meterological senso n, and well maintained ne meteorological sens	rs appear to be 1? sors operationa	intact, in good l online, and		Temperature only Temperature only
3	<ul><li>reporting data?</li><li>3 Are the shields for the temperature and RH sensors clean?</li></ul>					
4	Are the aspirated motors working?					N/A
5	5 Is the solar radiation sensor's lens clean and free of scratches?					N/A
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A
7	Are the s condition	ensor signal and pow a, and well maintained	er cables intact 1?	, in good	✓	
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected		

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	Technician Alison Ray		Site Visit Date 09/04/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	luipı	nent 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	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 8 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	N/A
8	Are there moisture traps in the sample lines?	✓	
9	Is there a rotometer in the dry deposition filter line, and is it clean?		

Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S6-rev002				
Site	e ID	RED004	Technician	Alison Ray		Site Visi	t Date 09/04/20	)14	
	DAS, se	nsor translators, and j	peripheral equi	pment operatio	ns an	<u>d maintena</u>	nce		
1	Do the I well mai	DAS instruments appe intained?	ar to be in good	l condition and					
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,					
3	3 Do the analyzer and sensor signal leads pass through lightning protection circuitry?								
4	Are the signal connections protected from the weather and well maintained?								
5	Are the	signal leads connected	to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translato cd?	rs, and shelter	properly					
7	Does the	e instrument shelter ha	ave a stable pov	ver source?					
8	Is the in	strument shelter temp	erature control	lled?		N/A			
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?							

Field Sy	stems Data	For	m				<b>F-02</b>	058-1	500-S7-rev002
Site ID	RED004		Technician	Alison Ray		Site Visit Date	9/04/2014	ļ	
<u>Documen</u>	tation								
Does the s	site have the require	<u>d ins</u>	strument and	equipment r	nanuals?				
Wind speed Wind directi Temperature Relative hum Solar radiati Surface weth Wind sensor Temperature Humidity sen Solar radiati Tipping buck Ozone analy Filter pack f	sensor ion sensor e sensor nidity sensor ion sensor tess sensor translator e translator nsor translator ion translator ket rain gauge zer low controller		No       N/.         Image: No and the second se	A D S C M P Z F S U L S S S	Data logger Data logger Data logger Computer Aodem Printer Zero air pur Filter flow p Surge protect JPS Lightning p Shelter heat	recorder mp pump ctor rotection device er conditioner	Yes		N/A
Filter pack M	<b>AFC power supply</b>								
Does the	site have the requi	ed a	nd most rece	nt QC docun	nents and r	eport forms?			
		Pres	ent				Curre	nt	
Station Log SSRF Site Ops Ma HASP Field Ops M Calibration I Ozone z/s/p 0 Preventive n	nual anual Reports Control Charts naintenance schedul		<ul> <li>Feb 20</li> <li>Feb 20</li> <li>Feb 20</li> <li>Feb 20</li> <li>Feb 20</li> </ul>	14 14 14					
1 Is the st	ation log properly c	omp	leted during	every site vis	sit? 🗌 No	Logbook			
2 Are the current	Site Status Report 1 ?	Form	ns being comj	pleted and					
3 Are the sample	chain-of-custody fo transfer to and fron	rms j 1 lab	properly used ?	d to documer	nt 🗌				
4 Are ozo current	ne z/s/p control cha ?	rts p	roperly comp	leted and					
Provide any natural or m	additional explanat an-made, that may	ion (j affec	photograph o t the monitor	or sketch if no ring paramet	ecessary) re ters:	egarding conditio	ns listed a	above, oi	any other features,

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

#### Site ID RED004 Technician Alison Ray Site Visit Date 09/04/2014 Site operation procedures Trained by AMEC technician during site installation Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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  N/A								

- **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?

✓	N/A
✓	N/A
✓	N/A

F-02058-1500-S8-rev002

E 02058 1500 S0 poy002
r-02038-1300-89-rev002

Site	ID	RED004	Technician	Alison Ray		Site Visit Date	09/04/2014	
	<u>Site oper</u>	ation procedures						
1	Is the fil	ter pack being change	d every Tuesda	y as scheduled?	✓			
2	Are the scorrectly	Site Status Report For ?	ms being comp	leted and filed				
3	Are data schedule	downloads and back d?	ups being perfo	rmed as		No longer required		
4	Are gene	eral observations being	g made and rec	orded? How?	✓	SSRF		
5	Are site fashion?	supplies on-hand and	replenished in	a timely	✓			
6	Are sam	ple flow rates recorded	d? How?		✓	SSRF		
7	Are sam fashion?	ples sent to the lab on	a regular schee	lule in a timely				
8	Are filte and ship	rs protected from cont ping? How?	tamination dur	ing handling				
9	Are the soperatio	site conditions reporte ns manager or staff?	d regularly to t	he field				
QC	Check Pe	rformed	Freq	uency			Compliant	
Multi-point MFC Calibrations								
Flow System Leak Checks						$\checkmark$		
F	Filter Pack Inspection							
Flow Rate Setting Checks     Weekly								
V	Visual Check of Flow Rate Rotometer <a> Weekly</a>							
I	In-line Filter Inspection/Replacement Semiannually							
S	ample Li	ne Check for Dirt/Wat	ter			]		

Field Sy	stems Data Fo	rm		F-02058-1500-S10-rev00				
Site ID	RED004	Technician Alison	Ray Site	e Visit Date	09/04/2014			

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	unknown	Unknown
Filter pack flow pump	gast	16D-6150-101-1039	1039	none
Flow Rate	Арех	AXMC105LPMDPC	illegible	000599
Sample Tower	Aluma Tower	В	unknown	000813
Temperature	RM Young	41342	024087	06986

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СТН	110-Eric H	lebert-09/05/2014				
1	9/5/2014	Computer	Dell	000479	D630	unknown
2	9/5/2014	DAS	Campbell	000420	CR3000	2520
3	9/5/2014	Elevation	Elevation	None	1	None
4	9/5/2014	Filter pack flow pump	Thomas	04987	107CA18	050400022550
5	9/5/2014	Flow Rate	Apex	000559	AXMC105LPMDPCV	illegible
6	9/5/2014	Infrastructure	Infrastructure	none	none	none
7	9/5/2014	Met tower	Universal Tower	03442	unknown	none
8	9/5/2014	Modem	Raven	06599	V4221-V	0844349892
9	9/5/2014	Ozone	ThermoElectron Inc	000742	49i A1NAA	1105347313
10	9/5/2014	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
11	9/5/2014	Sample Tower	Aluma Tower	666363	В	AT-5107-E-4-10
12	9/5/2014	Shelter Temperature	Campbell	none	107-L	none
13	9/5/2014	Shield (10 meter)	Climatronics	00917	100325	illegible
14	9/5/2014	Siting Criteria	Siting Criteria	None	1	None
15	9/5/2014	Temperature	Climatronics	06647	100093	none
16	9/5/2014	UPS	APC	06796	RS900	unknown
17	9/5/2014	Zero air pump	Werther International	06864	PC70/4	000815261

### **DAS Data Form**

DAS Time Max Error: 0.05

Mfg	Serial Number Site		1	<b>Sechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2520	CTH	1110	Eric Hebert	09/05/2014	DAS	Primary
Das Date:	9 /5 /2014	Audit Date	9 /5 /2014	Mfg	HY	Parameter	DAS
Das Time: Das Day:	248	Audit Time Audit Day	248	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channe	l:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0003	0.0007	0.0003	0.0007	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	4 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0008	-0.0001	V	V	0.0007	
7	0.1000	0.0992	0.0993	V	V	0.0001	
7	0.3000	0.2997	0.2996	V	V	-0.0001	
7	0.5000	0.4997	0.4995	V	V	-0.0002	
7	0.7000	0.6995	0.6993	V	V	-0.0002	
7	0.9000	0.8998	0.8994	V	V	-0.0004	
7	1.0000	1.0000	0.9995	V	V	-0.0005	

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit D	ate Param	neter	<b>Owner ID</b>
Apex	illegible		CTH110	Eri	c Hebert	09/05/2014	Flow R	late	000559
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	131818	Т	fer Desc. BIO	S 220-H
					Tfer ID	01417			
					Slope	1.0	0000 <b>Inte</b>	ercept	0.00000
					Cert Date	1/8/	2014 Cor	rrCoff	1.00000
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero	0.00	)7	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0.97	79	
0.22%	0.67%				Rotometer R	eading:	1.5	55	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.10	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.03	l/m	l/m	
primary	test pt 1	1.500	1.500	1.53	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.499	1.500	1.53	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.490	1.490	1.53	0.000	1.50	l/m	l/m	0.67%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	<b>n</b> 4.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 2.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 270 deg		Status	pass	
Sensor Comp	onent System M	/lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	S	erial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner I	D
ThermoElect	tron Inc	1105347313	CTH110	E	ric Hebert		09/05/20	014	Ozone		000742	
Slope:	0.9	97108 <b>Slope:</b> 71838 <b>Intercept</b>	0.0000	)	) Mfg T			ThermoElectron Inc Par			ozone	/ stan
CorrCoff	1.(	CorrCoff	0.0000	ס	Tfer ID	unioci	01112			.1 Dese. <u>-</u>		
DAS I: $A = \frac{1}{2} \frac$		DAS 2:		)/ <b>D:</b>	Slope			1.0092	8 Inter	cept	0.11	780
A Avg % D 1.5	5%	2.3%		70 DI	Cert Da	ite		1/8/201	4 Corr	Coff	1.00	000
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	e Unit:	PctD	ifference:	
prim	nary	1	0.10	-0.	.01	0.:	56	ppb				
prim	nary	2	28.84	28	.45	28	.52	ppb			0.25%	
prim	nary	3	52.06	51	.46	50	.76	ppb			-1.36%	
prim	nary	4	80.25	79	.39	77.	.75	ppb			-2.07%	
prim	nary	5	109.89	108	3.76	106	5.30	ppb			-2.26%	
Sensor Co	omponent	Cell B Noise		Conditi	on 0.9 pp	b			Status	pass		
Sensor Co	omponent	Cell B Tmp.		Conditi	on				Status	pass		
Sensor Co	omponent	Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Co	omponent	Inlet Filter Condition	n	Conditi	on Clean				Status	pass		
Sensor Co	omponent	Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Co	omponent	Offset		Conditi	on -0.50				Status	pass		
Sensor Co	omponent	Span		Conditi	on 1.001				Status	pass		
Sensor Co	omponent	Cell B Freq.		Conditi	on 100.3	kHz			Status	pass		
Sensor Co	omponent	System Memo		Conditi	on				Status	pass		
Sensor Co	omponent	Sample Train		Conditi	on Good				Status	pass		
Sensor Co	omponent	Cell B Pressure		Conditi	on				Status	pass		
Sensor Co	omponent	Cell B Flow		Conditi	on 0.70 l	pm			Status	pass		
Sensor Co	omponent	Cell A Tmp.		Conditi	on 29.2 (	)			Status	pass		
Sensor Co	omponent	Cell A Pressure		Conditi	on 694.9	mmHg			Status	pass		
Sensor Co	omponent	Cell A Noise		Conditi	on 1.0 pp	b			Status	pass		
Sensor Co	omponent	Cell A Freq.		Conditi	on 100.6	kHz			Status	pass		
Sensor Co	omponent	Cell A Flow		Conditi	on 0.67 l	om			Status	pass		
Sensor Co	omponent	Battery Backup		Conditi	on Funct	ioning			Status	pass		
Sensor Co	omponent	Zero Voltage		Conditi	on N/A				Status	pass		

## Temperature Data Form

Mfg	Serial Number T	a Site	,	Techni	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
Climatronics	limatronics none CTH110			Eric H	ebert	09/05	5/2014 Temper		ature	06647	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	679	Tí	er Desc. R	٢D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	ope		1.0049	6 Inte	rcept	-0.2300	)9
Abs Avg Err Ab	s Max Er Abs A	vg Err Abs	Max Er	Ce	rt Date		1/8/201	4 Cor	rCoff	1.0000	00
0.11	0.22			<u></u>							
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	b Low Range	0.08	0.31		0.000		0.3	3	С	-0.04	
primary Temp	o Mid Range	25.21	25.3	1	0.000		25.	1	С	-0.22	
primary Temp	o High Range	49.30	49.2	9	0.000		49.	2	С	-0.08	
Sensor Compone	nt Shield		Cond	ition N	Moderately clea	an		Status	pass		
Sensor Compone	nt Blower		Cond	ition F	Functioning			Status	pass		
Sensor Compone	nt Blower Status S	Switch	Cond	ition 🛚	N/A			Status	pass		
Sensor Compone	nt System Memo		Cond	ition				Status	pass		

# Shelter Temperature Data For

Mfg	g Serial Number Ta Site		Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	none	CTH110	Eric Hebert	09/05/2014	Shelter Temperatu	renone
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperatur
Abs Avg ErrAbs1.00	s Max Er Abs Avg 1.07	Err Abs Max Er	Serial Number	H232679	Tfer Desc.	TD
			Tfer ID	01228		
			Slope	1.0049	6 Intercept	-0.23009
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.99	23.11	0.000	24.0	С	0.93
primary	Temp Mid Range	22.74	22.86	0.000	23.9	С	1
primary	Temp Mid Range	22.28	22.40	0.000	23.5	С	1.07
Sensor Con	ponent System Memo	)	Condition		Status	pass	

#### **Infrastructure Data For**

Site ID	CTH110	Technician Eric Heb	oert Site Visit Date 09/05/2014
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-6)	640 cuft

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem		
Flow Rate	CTH110	Eric Hebert	09/05/2014	Moisture Present	Apex	3262				
Although there currently is no moisture in the flow sample train, there is evidence of previous moisture events.										

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

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

#### 2 Parameter: SitingCriteriaCom

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions.

### F-02058-1500-S1-rev002

Site ID CTH110	Technician Eric Hebert	Site Visit Date 09/0	5/2014
Site Sponsor (agency)	EPA	USGS Map	Mecklenburg
<b>Operating Group</b>	IES	Map Scale	
AQS #	36-109-9991	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, ammonia	QAPP Latitude	42.4010
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude	-76.6535
Land Use	woodland - mixed	QAPP Elevation Meters	515
Terrain	rolling	QAPP Declination	12.3
Conforms to MLM	No	QAPP Declination Date	12/28/2004
Site Telephone	(607) 564-7622	Audit Latitude	42.400875
Site Address 1	CR 136 (Connecticut Hill Road)	Audit Longitude	-76.653516
Site Address 2		Audit Elevation	511
County	Tompkins	Audit Declination	-12.0
City, State	Newfield, NY	Present	
Zip Code	14867	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	
<b>Backup Operator</b>		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🗹	
Shelter Working Room ✓	Make Ekto Me	odel 8810 (s/n 2116-6)	Shelter Size 640 cuft
Shelter Clean	Notes		
Site OK	Notes		
Driving Directions From entrai Corne onto 0 on the	Ithaca take route 13 south to hwy 327. B nees for Robert Treman St Park. Turn left ers Road. Continue on Trumbell Corners Connecticut Hill Road and continue for app e left just after the turn in the road.	ear right onto hwy 327 and go p t at the second left past the upp Rd for approximately one mile t proximately 1/4 mile where it ve	bast both the lower and upper er entrance to the park onto Trumbell to the stop sign. Turn right at the stop ers to the right. The site is up the hill

CTH110

#### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 09/05/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		
Tree line	50 m	30 m	
Obstacles to wind	10 times obstacle height		

#### Siting Distances OK

#### **Siting Criteria Comment**

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002			
Site	<b>Technician</b> Eric Hebert		Site Visit Date 09/05/2014			
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			
Pro nat	ovide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters	essar S:	y) regarding conditions listed above, or any other features,			

### F-02058-1500-S4-rev002

Site	e ID	CTH110	Technician	Eric Hebert		Site Visit Date 09/05/2014
1 2 3	Do all the condition Are all the reporting Are the s	e meterological sensor n, and well maintained ne meteorological sens g data? hields for the temper	rs appear to be 1? sors operationa ature and RH s	intact, in good l online, and ensors clean?	<b>&gt; &gt; &gt;</b>	Temperature only Temperature only
4	Are the a	spirated motors worl	king?			
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of		N/A
6	Is the sur	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A
7	Are the s conditior	ensor signal and pow 1, and well maintained	er cables intact 1?	, in good		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected		

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	CTH110 Technician Eric Hebert		Site Visit Date 09/05/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	ment 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	d ma	<u>intenance</u>
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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002				
Site	e ID	CTH110	Technician	Eric Hebert		Site Visit I	Date 0	9/05/2014	•	
DAS, sensor translators, and peripheral equipment operations and maintenance										
1	Do the E well mai	✓								
2 Are all the components of the DAS operational? (printers, modem, backup, etc)				✓						
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass (	through		Met sensors or	nly			
4	Are the swell mai	signal connections pro ntained?	tected from the	e weather and	✓					
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly	✓					
7	Does the	instrument shelter ha	we a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	erature control	lled?						
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

Field Systems Da	ta Foi	m			<b>F-02</b>	058-	1500-S7-rev002
Site ID CTH110		Techn	ician Eric	Hebert Site Visit Date	09/05/2014		
<b>Documentation</b>							
Does the site have the red	quired ins	strumer	<u>nt and equi</u>	pment manuals?			
Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator Tipping bucket rain gauge Ozone analyzer	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □			Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	No  V  V  V  V  V  V  V  V  V  V  V  V  V	N/A  V
Filter pack flow controller				Shelter air conditioner			
Filter pack MFC power sup	oply 🗆	$\checkmark$					
Does the site have the r	equired a	nd mos	st recent Q	<u>C documents and report forms?</u>			
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance sch	Pres	ent	Oct 2001 lov 2001 uly 1990		Currer	ıt	
1 Is the station log prope	erly comp	leted d	uring every	vite 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

✓

#### CTH110 Technician Eric Hebert Site Visit Date 09/05/2014 Site ID Site operation procedures Trained at ESE in 1987 Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

#### **QC Check Performed**

#### Frequency

Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	
Visual Inspections	$\checkmark$	Weekly	
Translator Zero/Span Tests (climatronics)	$\checkmark$	N/A	
Manual Rain Gauge Test	$\checkmark$	N/A	
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	
Test Surface Wetness Response	$\checkmark$	N/A	✓

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

<b>OC</b>	Check	Perf	formed	
VV.	Chick	I UII	uncu	

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

	requency	COL
	Semiannually	$\checkmark$
	Daily	✓
$\checkmark$	Daily	$\checkmark$
$\checkmark$	Weekly	$\checkmark$
$\checkmark$	Every 2 weeks	$\checkmark$
$\checkmark$	N/A	$\checkmark$
$\checkmark$	Weekly	$\checkmark$
$\checkmark$	Weekly	$\checkmark$

- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

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

	Unknown
✓	
	SSRF, call-in

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

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

### F-02058-1500-S8-rev002

#### **Compliant**

**Compliant** 

Fi	eld Sy	stems Data Form					<b>F-02058-</b> 1	1500-S9-rev002
Sit	e ID	CTH110 Te	chnician	Eric Hebert		Site Visit Date	09/05/2014	
	<u>Site ope</u>	eration procedures						
1	Is the fi	lter pack being changed even	ry Tuesc	lay as scheduled	<mark>?</mark> ✓	Filter changed after	noons	
2	Are the correct	Site Status Report Forms bo ly?	eing con	pleted and filed	✓			
3	Are dat schedul	a downloads and backups be ed?	eing per	formed as		No longer required		
4	Are gen	neral observations being mad	le and re	ecorded? How?	✓	SSRF		
5	Are site fashion	e supplies on-hand and replet ?	nished iı	n a timely				
6	Are san	nple flow rates recorded? Ho	w?		✓	SSRF, call-in		
7	Are san fashion	nples sent to the lab on a reg ?	ular sch	edule in a timely	✓			
8	Are filt and shi	ers protected from contamin pping? How?	ation du	ring handling	✓	Clean gloves on an	d off	
9	Are the operation	site conditions reported reg ons manager or staff?	ularly to	the field				
QC	Check P	erformed	Fre	equency			Compliant	
I	Multi-poi	nt MFC Calibrations	✓ Ser	miannually			$\checkmark$	
]	Flow Syst	tem Leak Checks	✔ We	ekly			$\checkmark$	
]	Filter Pac	k Inspection						
]	Flow Rate	e Setting Checks	✔ We	ekly			$\checkmark$	
	Visual Ch	neck of Flow Rate Rotometer	🖌 🖌 We	ekly			$\checkmark$	
1	n-line Fi	Iter Inspection/Replacement	✓ Ser	miannually			$\checkmark$	
5	Sample L	ine Check for Dirt/Water	✔ We	ekly			$\checkmark$	
Dura	de ener	ditional amplemention (mb at		an alaotok if moooo	~ ~ ~ ~ ~	)	and listed above on	ann ath an faatamaa

CTH110

### F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 09/05/2014

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D630	unknown	000479
DAS	Campbell	CR3000	2520	000420
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	050400022550	04987
Flow Rate	Apex	AXMC105LPMDPC	illegible	000559
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03442
Modem	Raven	V4221-V	0844349892	06599
Ozone	ThermoElectron Inc	49i A1NAA	1105347313	000742
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200023	000447
Sample Tower	Aluma Tower	В	AT-5107-E-4-10	666363
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	Climatronics	100325	illegible	00917
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	none	06647
UPS	APC	RS900	unknown	06796
Zero air pump	Werther International	PC70/4	000815261	06864

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
MKO	G113-Sandy	Grenville-09/20/2014				
1	9/20/2014	Computer	Dell	000276	D520	unknown
2	9/20/2014	DAS	Campbell	000404	CR3000	2521
3	9/20/2014	Elevation	Elevation	None	1	None
4	9/20/2014	Filter pack flow pump	Thomas	03639	107CAB18	049400004427
5	9/20/2014	Flow Rate	Арех	000637	AXMC105LPMDPCV	illegible
6	9/20/2014	Infrastructure	Infrastructure	none	none	none
7	9/20/2014	Met tower	Universal Tower	03445	unknown	none
8	9/20/2014	Modem	Raven	06593	V4221-V	0844350394
9	9/20/2014	Ozone	ThermoElectron Inc	000612	49i A1NAA	1009241779
10	9/20/2014	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
11	9/20/2014	Sample Tower	Aluma Tower	666362	В	AT-5107-E-4-11
12	9/20/2014	Shelter Temperature	Campbell	none	107-L	none
13	9/20/2014	Shield (10 meter)	Climatronics	01383	100325	illegible
14	9/20/2014	Siting Criteria	Siting Criteria	None	1	None
15	9/20/2014	Temperature	Climatronics	06706	100093	missing
16	9/20/2014	Zero air pump	Werther International	06937	C 70/4	000821896

### **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial I	Number Site	Т	<b>Technician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2521	MK	G113	Sandy Grenville	09/20/2014	DAS	Primary
Das Date: Das Time: Das Day: Low Channel	9 /20/2014 12:49:03 263	Audit Date Audit Time Audit Day High Channe	9 /20/2014 12:49:02 263	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0001				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 12/28/201	Parameter Tfer Desc.	DAS DVM 0.00000 1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.1000	0.0999	V	V	-0.0001	
7	0.3000	0.2998	0.2997	V	V	-0.0001	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8994	0.8993	V	V	-0.0001	
7	1.0000	0.9993	0.9992	V	V	-0.0001	

## Flow Data Form

Mfg	Serial Num	ıber Ta	Site	Тес	hnician	Site Visit D	ate Parai	neter	<b>Owner ID</b>
Apex	illegible		MKG113	Sa	ndy Grenville	09/20/2014	Flow I	Rate	000637
					Mfg	BIOS	]	Parameter F	low Rate
					Serial Number	103471	r	<b>Ffer Desc.</b> n	exus
					Tfer ID	01420			
					Slope	1.0	00846 <b>In</b> t	ercept	0.01358
					Cert Date	1/8	/2014 Co	rrCoff	0.99997
					Mfg	BIOS	]	Parameter F	low Rate
					Serial Number	103424		Ffer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	1.0	)0846 <b>In</b> t	ercept	0.01358
					Cert Date	1/8	/2014 <b>Co</b>	rrCoff	0.99997
<b>DAS 1:</b>		DAS 2:		L	Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale		1	
0.66%	0.66%				<b>Rotometer R</b>	eading:		1.6	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	all PctDifference
primary	pump off	0.000	0.000	-0.02	0.000	-0.02	1/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.538	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.538	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.539	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
Sensor Comp	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 3.0 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 3.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	n 15 deg		Statu	s pass	
Sensor Comp	onent System M	1emo		Conditio	n		Statu	s pass	

## **Ozone Data Form**

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner ]	D
ThermoElectron Inc	1009241779	MKG113	Sa	ndy Grer	nville	09/20/20	014	Ozone		000612	
Slope:	1.00307 <b>Slope:</b> 0.04993 <b>Intercept</b>	0.0000	0	Mfg Serial N	Jumber	ThermoE	Electron	Inc Pa	rameter o	zone	
CorrCoff (	0.99998 CorrCoff	0.0000	0	Terrin	umber	01100					
				Tfer ID		01100					
DAS 1:	DAS 2:		0/ D:	Slope			1.00458	3 Inter	cept	-0.1	1484
0.3%	0.6%		% DI	Cert Da	ite	12	2/10/2013	B Corr	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.38	0.4	9	0.4	17	ppb				
primary	2	30.96	30.	93	31.	02	ppb			0.29%	
primary	3	50.19	50.	07	50.	19	ppb			0.24%	
primary	4	82.55	82.	28	82.	10	ppb			-0.22%	
primary	5	100.20	99.	85	100	.40	ppb			0.55%	
Sensor Component	nt Cell B Noise		Conditio	<b>n</b> 1.2 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	n				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	n Clean	1			Status	pass		
Sensor Compone	nt Line Loss		Conditio	n Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditio	Condition 0.20				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 1.005				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	<b>n</b> 99.9 k	Hz			Status	pass		
Sensor Compone	nt System Memo		Conditio	n See c	omments			Status	pass		
Sensor Component	nt Sample Train		Conditio	n Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	on				Status	pass		
Sensor Compone	nt Cell B Flow		Conditio	<b>n</b> 0.70 l	pm			Status	pass		
Sensor Componer	nt Cell A Tmp.		Conditio	<b>n</b> 34.8 0	)			Status	pass		
Sensor Componer	nt Cell A Pressure		Conditio	<b>n</b> 705.3	mmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	<b>n</b> 0.9 pp	b			Status	pass		
Sensor Componen	nt Cell A Freq.		Conditio	<b>n</b> 87.5 k	ίHz			Status	pass		
Sensor Componen	t Cell A Flow		Conditio	<b>n</b> 0.0 lpi	m			Status	Fail		
Sensor Componen	nt Battery Backup		Conditio	n N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	N/A				Status	pass		

## Temperature Data Form

Mfg	Serial Number Ta	Site	1	Techni	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
Climatronics	missing	MKG113		Sandy	Grenville	09/20	)/2014	Temper	ature	06706	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	٢D	
				Tfe	er ID	01227	7				
DAS 1:	DAS 2			Slo	pe		1.0028	8 Inte	rcept	-0.15155	•
Abs Avg Err Abs	Max Er Abs Av	g Err Abs	Max Er	Ce	rt Date		1/8/201	4 Cor	rCoff	1.00000	I
0.09	0.19										
UseDesc.	Test type In	putTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	Low Range	0.69	0.84	ļ	0.000		0.7	7	C	-0.19	
primary Temp	Mid Range	24.82	24.9	0	0.000		24.	9	С	-0.01	
primary Temp	High Range	49.38	49.3	9	0.000		49.	3	С	-0.06	
Sensor Compone	nt Shield		Cond	ition N	Moderately clea	an		Status	pass		
Sensor Compone	nt Blower		Cond	ition F	Functioning			Status	pass		
Sensor Compone	nt Blower Status Sw	itch	Cond	ition 🛚	N/A			Status	pass		
Sensor Compone	nt System Memo		Cond	ition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	MKG113	Sandy Grenville	09/20/2014	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err   Abs     0.21	0.47 Abs Avg	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0028	8 Intercept	-0.15155
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.90	26.97	0.000	26.5	С	-0.47
primary	Temp Mid Range	24.60	24.68	0.000	24.6	С	-0.06
primary Temp Mid Range		21.80	21.89	0.000	21.8	С	-0.11
Sensor Component System Memo		Condition	n Status pass				
#### **Infrastructure Data For**

Site ID	MKG113	Technician Sandy G	renville Site Visit Date 09/20/2014
Shelter I	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-4)	640 cuft

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No. Hazard		Problem
Ozone	MKG113	Sandy Grenville	09/20/2014	Cell A Flow	ThermoElectron	3362		
This analyzer diagnostic of	check is outside t	he manufacturer's r	ecommended va	alue.				

## **Field Systems Comments**

#### 1 Parameter: ShelterCleanNotes

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

#### 2 Parameter: MetOpMaintCom

The temperature shield forced-air blower has a loose connection and the operation is intermittent.

## Field Systems Data Form

### F-02058-1500-S1-rev002

Site ID MKG113	Technician Sandy Grenville	Site Visit Date 09/20	0/2014	
Site Sponsor (agency)	EPA	USGS Map	Hadley	
Operating Group	PA/private	Map Scale		
AOS #	42-085-9991	Map Date		
Meteorological Type	Climatronics			
Air Pollutant Analyzer	Ozone, IMPROVE	OAPP Latitude	41.4250	
Deposition Measurement	dry	OAPP Longitude	-80.1447	
Land Use	woodland - mixed, agriculture	OAPP Elevation Meters	384	
Terrain	aently rolling	OAPP Declination	9.25	
Conforms to MLM	Marginally	OAPP Declination Date	2/22/2006	
	(724) 252 2695		41 406947	
Site Telephone	(124) 253-3685	Audit Latitude	41.420047	
Site Address 1	M. K. Goddard St. Park	Audit Longitude	-80.145247	
Site Address 2	684 Lake Wilhelm Rd.	Audit Elevation	377	
County	Mercer	Audit Declination	-9.3	
City, State	Sandy Lake, PA	Present		
Zip Code	16145	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		
<b>Backup Operator</b>		Security Fence		
Backup Op. Phone #		Secure Shelter		
Backup Op. E-mail		Stable Entry Step 🔽		
Shelter Working Room	Make Ekto Me	odel 8810 (s/n 2116-4)	Shelter Size   640 cuft	
Shelter Clean	Notes The shelter is clean and organ counter. Mold beginning on wa	ized. Leak and rot below the ail alls and floor.	r conditioner and on the floor under the	
Site OK	Notes			
Driving Directions From the sto the sit	I-79 take exit 130 (route 358). Go west a op sign, and turn right onto Lake Wilhelm e will be visible on the right at the state pa	nd bear right onto Sheakleyville Road. Continue approximately ark headquarters facility.	e Road. Continue less than a mile to v 1.5 miles, just after crossing the lake	

### **Field Systems Data Form**

MKG113

### F-02058-1500-S2-rev002

Site ID

Tec

Technician Sandy Grenville

Site Visit Date 09/20/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km	1.5 km	
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m	60 m	
Tree line	50 m	10 - 30 m	
Obstacles to wind	10 times obstacle height		$\checkmark$

Siting Distances OK

Siting Criteria Comment

Site I			
	D         MKG113         Technician         Sandy Grenville		Site Visit Date 09/20/2014
1 A b	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2 A (i) h t	Are wind sensors mounted so as to minimize tower effects? i.e. wind sensors should be mounted atop the tower or on a norizontally extended boom >2x the max diameter of the ower into the prevailing wind)		N/A
3 A	Are the tower and sensors plumb?	✓	N/A
4 A a	Are the temperature shields pointed north or positioned to void radiated heat sources such as buildings, walls, etc?		
5 A c s	Are temperature and RH sensors sited to avoid unnatural onditions? (i.e. ground below sensors should be natural urface and not steeply sloped. Ridges, hollows, and areas of tanding water should be avoided)		
6 I	s the solar radiation sensor plumb?	✓	N/A
7 I li	s it sited to avoid shading, or any artificial or reflected ight?	✓	N/A
8 I	s the rain gauge plumb?	✓	N/A
9 I t	s it sited to avoid sheltering effects from buildings, trees, owers, etc?		N/A
10 I f	s the surface wetness sensor sited with the grid surface acing north?	✓	N/A
11 I	s it inclined approximately 30 degrees?	✓	N/A

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

#### **Field Systems Data Form** F-02058-1500-S4-rev002 Site ID MKG113 Technician Sandy Grenville Site Visit Date 09/20/2014 $\checkmark$ Temperature only 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? ✓ Are the shields for the temperature and RH sensors clean? 3 ✓ 4 Are the aspirated motors working? ✓ N/A Is the solar radiation sensor's lens clean and free of 5 scratches?

- 6 Is the surface wetness sensor grid clean and undamaged?
- 7 Are the sensor signal and power cables intact, in good condition, and well maintained?
- 8 Are the sensor signal and power cable connections protected **rom** the elements and well maintained?

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

✓ N/A

✓

The temperature shield forced-air blower has a loose connection and the operation is intermittent.

Fi	Field Systems Data Form					F-02058-1500-S5-rev002
Site	e ID	MKG113	Technician	Sandy Grenville		Site Visit Date 09/20/2014
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at lo icted airflow?	east a 270 degre	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the and 20 1	sample inlets > 1 meto meters from trees?	er from any maj	or obstruction,	✓	
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	intenance
1	Do the a conditio	analyzers and equipmon and well maintained	ent appear to be 1?	e in good	✓	
2	Are the reportin	analyzers and monito ng data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 15 meters
4	Describ	e dry dep sample tube	•			3/8 teflon by 15 meters
5	Are in-l indicate	ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	f kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccar	nt unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dr	y deposition filte	er line, and is it	✓	Clean and dry

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

Fi	eld Systems Data Form		<b>F-02</b>	2058-15	00-S6-rev002	
Site	e ID MKG113 Technician Sandy Grenville	)	Site Visit Date	09/20/2014	4	
	DAS, sensor translators, and peripheral equipment operation	ons a	<u>nd maintenance</u>			
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?					
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?					

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

Field Sys	tems Data	For	m				<b>F-02</b>	.058-	1500-87-	rev0
Site ID	Site ID MKG113		Technician Sandy Grenville		Sandy Grenville	Site Visit Date 09/20/2014				
Documenta	<u>tion</u>									
Does the site	<u>e have the requir</u>	ed ins	strument	and	<u>equipment manuals'</u>	<u>?</u>				
Wind speed se Wind direction Temperature s Relative humic Solar radiation	nsor n sensor sensor dity sensor n sensor	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	No		A Data logg Data logg Strip cha Compute Modem Printer	ger ger rt recorder r	Yes □ □ □ □	<b>No</b> ✓ □ ✓ ✓ ✓ ✓ ✓ ✓	N/A □ ✓ □ □ ✓	
Wind sensor th Temperature t Humidity sens Solar radiation Tipping bucke Ozone analyze Filter pack flor Filter pack MI	ranslator cranslator or translator n translator t rain gauge r w controller FC power supply				Zero air j Filter flov Surge pro UPS Lightning Shelter ho Shelter ai	oump v pump otector g protection device eater ir conditioner		<b>Y Y U U U U U U U U U U</b>		

()2

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

	Present		Current
Station Log	$\checkmark$		$\checkmark$
SSRF	$\checkmark$		$\checkmark$
Site Ops Manual	$\checkmark$	Feb 2014	
HASP	$\checkmark$	Feb 2014	$\checkmark$
Field Ops Manual	$\checkmark$	Feb 2014	$\checkmark$
Calibration Reports	$\checkmark$		$\checkmark$
Ozone z/s/p Control Charts			$\checkmark$
Preventive maintenance schedu	Ⅰ ✓		$\checkmark$

1	Is the station log properly completed during every site visit?	✓	
2	Are the Site Status Report Forms being completed and	✓	

- 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**

Site	ID	MKG113	Technician	Sandy Grenville		Site Visit Date	09/20/2014	]
1	<u>Site ope</u> Has the course?	<u>ration procedures</u> site operator attende If yes, when and who	d a formal CAS instructed?	TNET training	✓	July 2006, refresher	training by Howell and	d Lavery
2	Has the training	backup operator atte course? If yes, when	ended a formal ( and who instru	CASTNET cted?				
3	Is the site schedule	e visited regularly on ?	the required T	uesday	✓			
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro ?	cedures being	✓			
5	Is the sit the requi	e operator(s) knowled ired site activities? (ir	lgeable of, and a cluding docum	able to perform entation)	✓			

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

### **QC Check Performed**

#### Frequency

Frequency

As needed

As needed

Every 2 weeks

Weekly

Weekly

Weekly

N/A

Daily

Daily

Semiannually

Multipoint Calibrations	$\checkmark$	Semiannually	$\checkmark$
Visual Inspections	$\checkmark$	Weekly	
Translator Zero/Span Tests (climatronics)		N/A	<b>∠</b>
Manual Rain Gauge Test	$\checkmark$	N/A	$\checkmark$
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	<ul> <li>✓</li> </ul>

✓

 $\checkmark$ 

✓

✓

 $\checkmark$ 

✓

✓

 $\checkmark$ 

 $\checkmark$ 

✓

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

#### **QC Check Performed**

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

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

	Unknown
V	
$\checkmark$	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:

#### Compliant

✓

 $\checkmark$ 

✓

✓

 $\checkmark$ 

✓

✓

 $\checkmark$ 

 $\checkmark$ 

✓

Compliant

F-02058-1500-S8-rev002

Fi	eld Systen	ns Data Fo	orm					<b>F-02058</b>	8-1500-S9-rev002
Sit	e ID MKG	113	Tech	nician	Sandy Grenville	Э	Site Visit Date	09/20/2014	
	Site operation	<u>procedures</u>							
1	Is the filter pa	ck being change	ed every	Tuesda	ay as scheduled	?⊻	Filter changed vario	ous times of day	
2	Are the Site St correctly?	atus Report Fo	rms bein	ig comj	pleted and filed	✓			
3	Are data down scheduled?	lloads and back	ups bein	g perfo	ormed as		No longer required		
4	Are general ob	servations bein	g made a	and ree	corded? How?	✓	SSRF, logbook		
5	Are site suppli fashion?	es on-hand and	replenis	hed in	a timely	✓			
6	Are sample flo	w rates recorde	ed? How	?		✓	SSRF, logbook, cal	II-in	
7	Are samples se fashion?	ent to the lab on	a regula	ar sche	dule in a timely	<ul> <li>Image: A start of the start of</li></ul>			
8	Are filters pro and shipping?	tected from con How?	taminat	ion dui	ring handling	✓	Clean gloves on an	d off	
9	Are the site co operations ma	nditions reporte nager or staff?	ed regula	arly to	the field	✓			
QC	Check Perform	ed		Free	quency			Compliant	
I	Multi-point MF(	C Calibrations		✓ Sem	niannually				
1	Flow System Lea	ak Checks	ŀ	✔ Wee	ekly				
I	Filter Pack Inspe	ection	ŀ	✔ Wee	ekly				
1	Flow Rate Settin	g Checks	Ŀ	✔ Wee	ekly				
	visual Check of	Flow Rate Roto	meter [	✔ Wee	ekly				
I	n-line Filter Ins	pection/Replace	ement	Sem	niannually			$\checkmark$	
5	Sample Line Cho	eck for Dirt/Wa	ter	✔ Wee	ekly			$\checkmark$	
D		al annian attan	(mlastar	nomb o	n alaatah if maaa			iona listad abama	an ann ath an faatamaa

Provide any additional 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**

MKG113

### F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 09/20/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000276
DAS	Campbell	CR3000	2521	000404
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	049400004427	03639
Flow Rate	Арех	AXMC105LPMDPC	illegible	000637
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03445
Modem	Raven	V4221-V	0844350394	06593
Ozone	ThermoElectron Inc	49i A1NAA	1009241779	000612
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124694	000374
Sample Tower	Aluma Tower	В	AT-5107-E-4-11	666362
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	Climatronics	100325	illegible	01383
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	missing	06706
Zero air pump	Werther International	C 70/4	000821896	06937

# Site Inventory by Site Visit

Site \	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PSU	106-Sandy	Grenville-09/23/2014				
1	9/23/2014	Computer	Dell	000268	D520	unknown
2	9/23/2014	DAS	Campbell	000407	CR3000	2512
3	9/23/2014	Elevation	Elevation	None	1	None
4	9/23/2014	Filter pack flow pump	Thomas	06023	107CAB18	060400022676
5	9/23/2014	Flow Rate	Арех	000560	AXMC105LPMDPCV	50732
6	9/23/2014	Infrastructure	Infrastructure	none	none	none
7	9/23/2014	Modem	Raven	06483	V4221-V	0808310813
8	9/23/2014	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
9	9/23/2014	Ozone Standard	ThermoElectron Inc	000219	49i A3NAA	0622717857
10	9/23/2014	Sample Tower	Aluma Tower	02747	A	none
11	9/23/2014	Shelter Temperature	Campbell	none	107-L	none
12	9/23/2014	Siting Criteria	Siting Criteria	None	1	None
13	9/23/2014	Temperature	RM Young	04316	41342VO	4013
14	9/23/2014	Zero air pump	Werther International	06914	C 70/4	000829156

### **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial	Number Site	1	<b>Technician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2512	PSI	J106	Sandy Grenville	09/23/2014	DAS	Primary
Das Date: Das Time: Das Day: Das Day: Das Day: Das Day: Das Day: Channel Avg Diff: 0.0001	9 /23/2014 17:36:17 266 : Max Diff: 0.00	Audit Date Audit Time Audit Day High Channe Avg Diff: 002 0.0001	9 /23/2014 17:36:16 266 d: Max Diff: 0.0002	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D
				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 12/28/201	Parameter Tfer Desc. Intercept CorrCoff	DAS DVM 0.00000 1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.1000	V	V	0.0001	
7	0.3000	0.2998	0.2997	V	V	-0.0001	
7	0.5000	0.4997	0.4996	V	V	-0.0001	
7	0.7000	0.6996	0.6995	V	V	-0.0001	
7	0.9000	0.8995	0.8993	V	V	-0.0002	
7	1.0000	0.9994	0.9993	V	V	-0.0001	

## Flow Data Form

Mfg	Serial Num	iber Ta	Site	Teo	hnician	Site Visit D	ate Para	neter	<b>Owner ID</b>
Apex	50732		PSU106	Sa	ndy Grenville	09/23/2014	Flow	Rate	000560
					Mfg	BIOS	]	Parameter FI	ow Rate
					Serial Number	103471	,	Ffer Desc. ne	exus
						01420			
					Tter ID	01420			
					Slope	1.(	00846 <b>In</b>	tercept	0.01358
					Cert Date	1/8	3/2014 <b>Co</b>	orrCoff	0.99997
					Mfg	BIOS	]	Parameter Fl	ow Rate
					Serial Number	103424	,	Ffer Desc. BI	OS cell
					Tfer ID	01410			
								Г	
					Slope	1.0	00846 <b>In</b>	tercept	0.01358
					Cert Date	1/8	3/2014 <b>Co</b>	orrCoff	0.99997
<b>DAS 1:</b>		<b>DAS 2:</b>			Cal Factor Z	ero	-0.	02	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0	96	
0.66%	0.66%				Rotometer R	eading:	1	45	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	ll PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.539	1.510	1.55	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.540	1.510	1.55	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.541	1.510	1.55	0.000	1.50	l/m	l/m	-0.66%
Sensor Compo	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Compo	onent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Compo	onent Rotomete	er Conditio	۱	Conditio	n Clean and dry		Statu	s pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Compo	onent Filter Dist	ance		Conditio	<b>n</b> 4.0 cm		Statu	s pass	
Sensor Compo	onent Filter Dep	oth		Conditio	n 0.5 cm		Statu	s pass	
Sensor Compo	onent Filter Azir	muth		Conditio	n Not tested		Statu	s pass	
Sensor Compo	onent System M	lemo		Conditio	n		Statu	s pass	

## **Ozone Data Form**

Mfg	Serial Number Ta	Site	Te	chnician		Site Visi	it Date	Parame	ter	Owner ]	D
ThermoElectron Inc	1030244791	PSU106	Sa	andy Grei	nville	09/23/2	014	Ozone		000678	
Slope: C Intercept -C	0.99612 Slope: 0.56230 Intercept	0.0000	0	Mfg Serial N	lumber	Thermol 49C-731	Electron 04-373	Inc Pa	rameter o	zone zone transfe	er
CorrCoff C	0.99986 CorrCoff	0.0000	0	Tfer ID		01100		7			
DAS 1:	<b>DAS 2:</b>			Slope			1.00458	3 Inter	cent	-0.1	1484
A Avg % Diff: A M	lax % Di A Avg %	6Dif A Max	% Di	Cost Da	4	10	0/10/201			1.00	0000
1.6%	2.5%			Cert Da	ite	12	2/10/201	5 Corr	Соп	1.00	5000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.05	0.	16	-0.	46	ppb				
primary	2	30.65	30.	.62	29.	85	ppb			-2.51%	
primary	3	52.82	52.	.69	51.	72	ppb			-1.84%	
primary	4	81.14	80.	.88	81.	10	ppb			0.27%	
primary	5	101.05	100	0.70	99.	00	ppb			-1.69%	
Sensor Componer	t Cell B Noise		Conditio	on 1.1 pp	b			Status	pass		
Sensor Componer	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Componer	t Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Componer	t Inlet Filter Condition	on	Conditio	on Clean				Status	pass		
Sensor Componer	t Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Componer	1t Offset		Conditio	<b>on</b> 0.60				Status	pass		
Sensor Componer	1t Span		Conditio	on 0.994				Status	pass		
Sensor Componer	t Cell B Freq.		Conditio	on 104.5	kHz			Status	pass		
Sensor Componer	t System Memo		Conditio	on				Status	pass		
Sensor Componer	t Sample Train		Conditio	on Good				Status	pass		
Sensor Componer	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Componer	t Cell B Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Componer	t Cell A Tmp.		Conditio	on 33.9 (	)			Status	pass		
Sensor Componer	t Cell A Pressure		Conditio	on 709.5	mmHg			Status	pass		
Sensor Componer	t Cell A Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Componer	t Cell A Freq.		Conditio	on 106 k	Hz			Status	pass		
Sensor Componer	t Cell A Flow		Conditio	on 0.71 l	om			Status	pass		
Sensor Componer	t Battery Backup		Conditio	n N/A				Status	pass		
Sensor Componer	t Zero Voltage		Conditio	on N/A				Status	pass		

## Temperature Data Form

Mfg	Serial Number	Fa Site	r	<b>Fechn</b> i	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	4013	PSU106		Sandy	Grenville	09/23	3/2014	Temper	ature	04316	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	ре		1.0028	8 Inte	rcept	-0.1515	5
Abs Avg Err Ab	os Max Er Abs	Avg Err Abs	Max Er	Cei	rt Date		1/8/201	4 Cor	rCoff	1.0000	0
0.17	0.35										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.05	0.20		0.000		-0.1	2	С	-0.35	
primary Tem	p Mid Range	25.50	25.58	3	0.000		25.	5	С	-0.08	
primary Tem	p High Range	48.20	48.21	L	0.000		48.	3	С	0.09	
Sensor Compone	ent Shield		Condi	tion	Clean			Status	pass		
Sensor Compone	ent Blower		Condi	tion N	I/A			Status	pass		
Sensor Compone	ent Blower Status	Switch	Condi	tion N	I/A			Status	pass		
Sensor Compone	ent System Memo		Condi	tion				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PSU106	Sandy Grenville	09/23/2014	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	lter Temperatur
Abs Avg ErrAb0.14	s Max Er Abs Avg 0.25	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTI	)
			Tfer ID	01227		
			Slope	1.0028	8 Intercept	-0.15155
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.90	22.99	0.000	23.2	С	0.25
primary	Temp Mid Range	23.86	23.94	0.000	23.9	С	-0.03
primary Temp Mid Range		23.80	23.88	0.000	24.0	С	0.14
Sensor Con	ponent System Memo	)	Condition		Status	pass	

#### **Infrastructure Data For**

Site ID	PSU106	Technician Sandy (	Grenville Site Visit Date 09/23/2014
Shelter I	Make	Shelter Model	Shelter Size
PSU		N/A	3840 cuft

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

## **Field Systems Comments**

#### 1 Parameter: DasComments

The meteorological tower has been removed.

#### 2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

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

#### 4 Parameter: MetOpMaintCom

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

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
KEF	112-Sandy	Grenville-09/23/2014				
1	9/23/2014	Computer	Dell	000256	D520	unknown
2	9/23/2014	DAS	Campbell	000414	CR3000	2537
3	9/23/2014	Elevation	Elevation	None	1	None
4	9/23/2014	Filter pack flow pump	Thomas	000965	107CA18	00000878
5	9/23/2014	Flow Rate	Apex	000671	AXMC105LPMDPCV	illegible
6	9/23/2014	Infrastructure	Infrastructure	none	none	none
7	9/23/2014	Met tower	Universal Tower	06487	unknown	none
8	9/23/2014	Modem	Raven	06455	V4221-V	0808337420
9	9/23/2014	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
10	9/23/2014	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
11	9/23/2014	Sample Tower	Aluma Tower	03443	A	none
12	9/23/2014	Shelter Temperature	Campbell	none	107-L	none
13	9/23/2014	Shield (10 meter)	RM Young	01399	Aspirated 43408	none
14	9/23/2014	Siting Criteria	Siting Criteria	None	1	None
15	9/23/2014	Temperature	RM Young	06388	41342	13992
16	9/23/2014	Zero air pump	Werther International	06922	C 70/4	000836217

### **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial	Number Site	ſ	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2537	KEI	F112	Sandy Grenville	09/23/2014	DAS	Primary
Das Date:	9 /23/2014	Audit Date	9 /23/2014	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	266	Audit Day	266	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	4:	High Channe	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.000	1 0.00	004 0.0001	1 0.0004				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/28/201	3 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	) V	V	0.0000	
7	0.1000	0.0999	0.1000	) V	V	0.0001	
7	0.3000	0.2997	0.2998	8 V	V	0.0001	
7	0.5000	0.4996	0.4997	7 V	V	0.0001	
7	0.7000	0.6996	0.6997	7 V	V	0.0001	
7	0.9000	0.8999	0.8995	5 V	V	-0.0004	
7	1.0000	0.9993	0.9994	4 V	V	0.0001	

## Flow Data Form

Mfg	Serial Num	ber Ta	Site	Тес	hnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
Apex	illegible		KEF112	Sa	ndy Grenville	09/23/2014	Flow R	late	000671
				[	Mfg	BIOS	P	arameter F	ow Rate
					Serial Number	103471	Т	fer Desc. ne	exus
					Tfer ID	01420			
					Slope	1.(	00846 <b>Int</b>	ercept	0.01358
					Cert Date	1/8	/2014 <b>Co</b>	rrCoff	0.99997
					Mfg	BIOS	P	arameter Fl	ow Rate
					Serial Number	103424	Т	fer Desc. Bl	OS cell
					Tfer ID	01410			
					Slope	1.(	00846 <b>Int</b>	ercept	0.01358
					Cert Date	1/8	/2014 <b>Co</b>	rrCoff	0.99997
DAS 1:		<b>DAS 2:</b>		L	Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0.9	98	
1.54%	1.97%				<b>Rotometer R</b>	eading:	1.5	55	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	ll PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.10	0.000	0.10	l/m	l/m	
primary	test pt 1	1.546	1.520	1.53	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.542	1.520	1.53	0.000	1.49	l/m	l/m	-1.97%
primary	test pt 3	1.542	1.520	1.53	0.000	1.50	l/m	l/m	-1.32%
Sensor Compo	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditior	1	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Status	pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 3.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 1.0 cm		Status	pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 330 deg		Status	pass	
Sensor Comp	onent System M	lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	S	erial Number Ta	Site	Te	chnician		Site Visi	t Date	Paramet	ter	Owner II	)
ThermoElec	ctron Inc	1030244793	KEF112	Sa	andy Grer	nville	09/23/20	014	Ozone		000700	
Slope:	1.0 0.1	00924 Slope: 71974 Intercept	0.0000	0	Mfg Serial N	umber	ThermoE 49C-731	Electron I 04-373	nc Par	ameter ozo r Desc. Ozo	ne one transfer	
	0.	Correon	0.0000	5	Tfer ID		01100					
DAS 1:		<b>DAS 2:</b>			Slope			1.00458	Intero	cept	-0.114	184
A Avg % D	Diff: A Ma	ax % Di A Avg %	6Dif A Max	% Di	Cert Da	ite	12	/10/2013	Corr	Coff	1.000	000
UseDee		Can a Crowni	Tfen Derry	[	C	<u> </u>	· · · · · · · · · · · · · · · · · · ·	<b>C</b> :4-	T.L.: 4.	D-(D):ff		
DseDes	narv	1	0.04	01	15	-0	29	nnh	Unit:	PCIDIIIe	erence:	
prin	narv	2	31.06	31.	03	33.	.52	ppb			8.02%	
prin	narv	3	50.00	49.	88	51.	.51	ppb			3.27%	
prin	nary	4	80.54	80.	28	81.	.30	ppb			1.27%	
prin	nary	5	99.84	99.	49	100	.80	ppb			1.32%	
Sensor Co	omponent	Cell B Noise		Conditio	on 0.6 pp	b			Status 7	pass		1
Sensor Co	omponent	Cell B Tmp.		Conditio	on				Status F	oass		1
Sensor Co	omponent	Fullscale Voltage		Conditio	n N/A				Status F	oass		]
Sensor Co	omponent	Inlet Filter Condition	on	Conditio	on Clean				Status F	pass		]
Sensor Co	omponent	Line Loss		Conditio	n Not te	sted			Status F	pass		]
Sensor Co	ensor Component Offset			Conditio	on 0.30				Status [	pass		
Sensor Co	omponent	Span		Conditio	<b>n</b> 1.023				Status [	oass		
Sensor Co	omponent	Cell B Freq.		Conditio	on 89.7 k	Hz			Status [	pass		
Sensor Co	omponent	System Memo		Conditio	on				Status [	pass		
Sensor Co	omponent	Sample Train		Conditio	Good				Status [	oass		
Sensor Co	omponent	Cell B Pressure		Conditio	on				Status [	oass		
Sensor Co	omponent	Cell B Flow		Conditio	on 0.67 l	pm			Status [	oass		]
Sensor Co	omponent	Cell A Tmp.		Conditio	on 30.0 C	)			Status [	pass		
Sensor Co	omponent	Cell A Pressure		Conditio	on 696.3	mmHg			Status [	pass		]
Sensor Co	omponent	Cell A Noise		Conditio	<b>on</b> 0.6 pp	b			Status [	pass		]
Sensor Co	omponent	Cell A Freq.		Conditio	on 94.5 k	Hz			Status [	oass		
Sensor Co	omponent	Cell A Flow		Conditio	on 0.63 l	om			Status [	oass		
Sensor Co	omponent	Battery Backup		Conditio	n N/A				Status [	oass		]
Sensor Co	omponent	Zero Voltage		Conditio	n N/A				Status [	pass		

## Temperature Data Form

Mfg	Serial Number 7	Га Site	1	Techni	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
RM Young	13992	KEF112		Sandy	Grenville	09/23	3/2014	Temper	ature	06388	
				Mf	g	Extec	h	Ра	rameter Te	mperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	D	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	pe		1.0028	8 Inte	rcept	-0.15155	•
Abs Avg Err A	bs Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		1/8/201	4 Cor	rCoff	1.00000	
0.18	0.37										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Ten	np Low Range	0.38	0.53	3	0.000		0.2	2	С	-0.37	
primary Ten	np Mid Range	25.43	25.5	1	0.000		25.	4	С	-0.13	
primary Ten	np High Range	47.74	47.7	5	0.000		47.	7	С	-0.03	
Sensor Compon	ent Shield		Cond	ition C	Clean			Status	pass		
Sensor Compon	ent Blower		Cond	ition F	Functioning			Status	pass		
Sensor Compon	ent Blower Status	Switch	Cond	ition 🛚	N/A			Status	pass		
Sensor Compon	ent System Memo		Cond	ition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	KEF112	Sandy Grenville	09/23/2014	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	elter Temperatur
Abs Avg Err Abs 0.41	s Max Er Abs Avg 1.06	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTI	D
			Tfer ID	01227		
			Slope	1.0028	8 Intercept	-0.15155
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	19.50	19.60	0.000	20.7	С	1.06	
primary	Temp Mid Range	19.52	19.61	0.000	19.7	С	0.11	
primary	Temp Mid Range	20.66	20.75	0.000	20.8	С	0.06	
Sensor Com	ponent System Memo	)	Condition	n Status pass				

#### **Infrastructure Data For**

Site ID	KEF112	Technician Sandy G	renville Site Visit Date 09/23/2014
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-14)	640 cuft

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

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

#### 2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

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

#### 4 Parameter: PollAnalyzerCom

The MFC was observed to fluctuate from 1.4 to 1.6 lpm. Trees to the east are within 20 meters of the ozone inlet.

#### 5 Parameter: MetSensorComme

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

### F-02058-1500-S1-rev002

Site ID	PSU106		Technician Sandy Grenville		Site Visit D	<b>ate</b> 09/23	3/2014		
Site Sponsor (	(agency)	EPA			USGS Map		Pine Grove Mills		
<b>Operating Group</b>		PSU		]	Map Scale				
AQS #		42-027-9	991	I	Map Date				
Meteorological Type		Climatror	nics						
Air Pollutant	Analyzer	Ozone			QAPP Latitude		40.7209		
Deposition Me	easurement	dry			QAPP Longitude		-77.9316		
Land Use		agricultur	e		QAPP Elevation N	Meters	376		
Terrain		rolling - c	omplex		QAPP Declination	ı	10.9		
Conforms to MLM		Marginal	У		QAPP Declination	n Date	9/16/2005		
Site Telephone		(814) 237	7-5778		Audit Latitude		40.720902		
Site Address 1		PSU Agr	culture Research Farm		Audit Longitude		-77.931759		
Site Address 2		Tadpole	Road		Audit Elevation		364		
County		Centre			Audit Declination		-10.7		
City, State		Rockspring, PA			Present				
Zip Code		16865		]	Fire Extinguisher		No inspection date		
Time Zone		Eastern		]	First Aid Kit	$\checkmark$			
Primary Oper	rator			5	Safety Glasses	$\checkmark$			
Primary Op.	Phone #				Safety Hard Hat				
Primary Op.	E-mail				Climbing Belt				
Backup Opera	ator				Security Fence				
Backup Op. 1	Phone #			5	Secure Shelter				
Backup Op. 1	E-mail			<u> </u>	Stable Entry Step				
Shelter Work	ing Room ☑	Make	PSU	Mod	lel N/A		Shelter Size 3840 cuft		
Shelter Clean		Notes	The shelter is owned by network.	the unive	ersity and is clean a	and orderl	y. The site is part of the Surfrad		
Site OK	$\checkmark$	Notes							
Driving Direc	tions From SR 30 on Ta	322 on the 24 will cha dpole Roa	e east side of State Colleg ange to Whitehall Road. d in Fairbrook at the chur	ge, take Continue rch. Con	SR 3024 south. Aft e on Whitehall road htinue approximately	ter the tra for appro y 0.5 mile	ffic light at the intersection of route 26, ximately 3 miles to Fairbrook. Turn left s, the site will be in the field on the right.		

### **Field Systems Data Form**

PSU106

### F-02058-1500-S2-rev002

Site ID

Techn

Technician Sandy Grenville

Site Visit Date 09/23/2014

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

### Siting Distances OK

#### **Siting Criteria Comment**

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

Site Visit Date 09/23/2014
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natural or man-made, that may affect the monitoring parameters:

#### **Field Systems Data Form** F-02058-1500-S4-rev002 Site ID PSU106 Technician Sandy Grenville Site Visit Date 09/23/2014 ✓ Temperature only Do all the meterological sensors appear to be intact, in good condition, and well maintained? ✓ Temperature only Are all the meteorological sensors operational online, and reporting data? ✓ Are the shields for the temperature and RH sensors clean?

N/A

✓ N/A

✓ 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 is now mounted in a naturally aspirated shield on the sample tower.

1

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3

4

5

6

7

8

scratches?

Are the aspirated motors working?

condition, and well maintained?

from the elements and well maintained?

Is the solar radiation sensor's lens clean and free of

Is the surface wetness sensor grid clean and undamaged?

Are the sensor signal and power cable connections protected

Are the sensor signal and power cables intact, in good

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	PSU106	Technician	Sandy Grenville		Site Visit Date 09/23/2014
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at lo icted airflow?	east a 270 degre	e arc of		
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the and 20 1	sample inlets > 1 mete meters from trees?	er from any maj	jor obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	ntenance
1	Do the a conditio	analyzers and equipmo on and well maintained	ent appear to be l?	e in good	✓	
2	Are the reportin	analyzers and monito ng data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 20 meters
4	Describ	e dry dep sample tube	•			3/8 teflon by 20 meters
5	Are in-l indicate	ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only
6	Are sam	ple lines clean, free of tions?	<sup>°</sup> kinks, moistur	e, and	✓	
7	Is the ze	ero air supply desiccar	nt unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	y deposition filte	er line, and is it		Clean and dry

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

Fi	eld Sy	stems Data Fo	orm		<b>F-0</b> 2	2058-15	00-S6-rev002		
Site	e ID	PSU106	Technician	Sandy Grenville		Site Visit Date	09/23/2014	4	
	DAS, se	nsor translators, and <b>j</b>	peripheral equip	oment operation	ns ai	nd maintenance			
1	Do the I well mai	OAS instruments appe intained?	ar to be in good	condition and					
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	hrough	✓	Met sensors only				
4	Are the well mai	signal connections pro intained?	otected from the	weather and	✓				
5	Are the	signal leads connected	l to the correct l	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato d?	rs, and shelter <b>j</b>	properly	✓				
7	Does the	e instrument shelter ha	ave a stable pow	er source?	✓				
8	Is the in	strument shelter temp	erature control	led?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?				Met tower removed			

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

The meteorological tower has been removed.

Field Sy	ystems Data	<b>F-02</b>	2058-	-1500-S7	7-rev00					
Site ID	PSU106		Tech	nician	Sandy Grenville	Site Visit Date	09/23/2014	4		
Documen	<u>itation</u>									
Does the	site have the requir	ed ins	trume	ent and e	equipment manuals?	-				
		Yes	No	N/A	L		Yes	No	N/A	
Wind speed	sensor			$\checkmark$	Data logg	er		$\checkmark$		
Wind direct	ion sensor			$\checkmark$	Data logg	er			$\checkmark$	
Temperatur	e sensor		$\checkmark$		Strip char	t recorder			$\checkmark$	
<b>Relative humidity sensor</b>				$\checkmark$	Computer	•		$\checkmark$		
Solar radiat	ion sensor			$\checkmark$	Modem			$\checkmark$		
Surface wet	ness sensor			$\checkmark$	Printer				$\checkmark$	
Wind sensor	r translator			$\checkmark$	Zero air p	ump		$\checkmark$		
Temperatur	e translator			$\checkmark$	Filter flow	v pump		$\checkmark$		
Humidity se	ensor translator			$\checkmark$	Surge pro	tector			$\checkmark$	
Solar radiat	ion translator			$\checkmark$	UPS				$\checkmark$	
Tipping buc	ket rain gauge			$\checkmark$	Lightning	protection device			$\checkmark$	
Ozone analy	zer		$\checkmark$		Shelter he	ater			$\checkmark$	
Filter pack f	flow controller	$\checkmark$			Shelter ai	r conditioner			$\checkmark$	
Filter pack	MFC power supply			$\checkmark$						
Does the	<u>e site have the requi</u>	ired a	nd mo	ost recen	t QC documents and	l report forms?				
		Pres	ent				Curre	ent		
<b>Station Log</b>							$\checkmark$			
SSRF										
Site Ops Ma	nual			Feb 2014	4					
HASP				Feb 2014	4		$\checkmark$			

2

Field Ops Manual Calibration Reports Ozone z/s/p Control Charts

**Preventive maintenance schedul** 

	$\checkmark$
	✓
Feb 2014	
Feb 2014	

✓

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

✓

✓

- 2 Are the Site Status Report Forms being completed and current?
- 3 Are the chain-of-custody forms properly used to document sample transfer to and from lab?
- 4 Are ozone z/s/p control charts properly completed and current?

Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:
Site	e ID PSU106 Technician S	andy Grenville	Site Visit Date	09/23/2014	
1	Site operation procedures Has the site operator attended a formal CAST course? If yes, when and who instructed?	NET training	Trained by previous	operator	
2	Has the backup operator attended a formal Catraining course? If yes, when and who instruct	ASTNET	No backup operator		
3	Is the site visited regularly on the required Tue schedule?	esday 🗸			
4	Are the standard CASTNET operational proce flollowed by the site operator?	edures being			
5	Is the site operator(s) knowledgeable of, and ab the required site activities? (including documer	ole to perform <b>v</b> ntation)			

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

### **QC Check Performed**

### Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	✓
Visual Inspections	$\checkmark$	Weekly	
Translator Zero/Span Tests (climatronics)		N/A	✓
Manual Rain Gauge Test	$\checkmark$	N/A	✓
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	✓
Test Surface Wetness Response	$\checkmark$	N/A	✓

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

### **QC Check Performed**

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

	Frequency	Co
✓	Semiannually	
✓	Daily	
	As needed	
✓	Daily	
	As needed	
✓	Weekly	
✓	Every 2 weeks	
$\checkmark$	N/A	
✓	Weekly	
✓	Weekly	

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

Unknown
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:

### mpliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form								F-02058-	1500-S9-rev002	
Site ID PSU106 Tech		Techn	nician Sandy Grenville		Site Visit Date	09/23/2014				
	<u>Site ope</u>	ration procedures								
1	Is the fil	lter pack being change	ed every T	uesd	ay as scheduled?		Filter changed morinings			
2 Are the Site Status Report Forms being completed and filed correctly?										
3	Are data schedule	a downloads and back ed?	ups being	perf	ormed as		No longer required			
4	Are gen	eral observations bein	g made a	nd re	corded? How?	✓	SSRF, logbook			
5	5 Are site supplies on-hand and replenished in a timely fashion?				✓					
6	Are sam	ple flow rates recorde	ed? How?			✓	SSRF, logbook, call-in			
7	Are sam fashion	pples sent to the lab on	a regulai	sche	dule in a timely	✓				
8	Are filte and ship	ers protected from con oping? How?	taminatio	n du	ring handling		gloves are not used			
9	Are the operation	site conditions reporte ons manager or staff?	ed regular	ly to	the field					
QC	Check Po	erformed		Fre	quency			Compliant		
N	Aulti-poir	nt MFC Calibrations	$\checkmark$	Sem	niannually					
I	Flow Syste	em Leak Checks		Wee	ekly					
Filter Pack Inspection										
Flow Rate Setting Checks					$\checkmark$					
Visual Check of Flow Rate Rotometer						$\checkmark$				
Ι	n-line Fil	ter Inspection/Replace	ement 🗹	Sem	niannually			$\checkmark$		
8	Sample Li	ne Check for Dirt/Wa	ter 🔽	Wee	ekly					
Provide one additional employation (photograph or shotab if reasons							) maganding aanditi	and listed above a	n ann ath an factorias	

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

PSU106

## F-02058-1500-S10-rev002

Techr

Technician Sandy Grenville

Site Visit Date 09/23/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000268
DAS	Campbell	CR3000	2512	000407
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022676	06023
Flow Rate	Apex	AXMC105LPMDPC	50732	000560
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808310813	06483
Ozone	ThermoElectron Inc	49i A1NAA	1030244791	000678
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717857	000219
Sample Tower	Aluma Tower	A	none	02747
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4013	04316
Zero air pump	Werther International	C 70/4	000829156	06914

Field Systems Data Form	
I ferd by sterns Duta I of m	

## F-02058-1500-S1-rev002

Site ID KEF112		Technician Sandy Grenville		e Site Visit Date 09/23/2014			]		
						S Man		James City	
Site Sponsor (agency)		EPA							
<b>Operating Group</b>		PAFS/pri	vate		Map	Scale			
AQS #		42-047-9	991		Map	Date			
Meteorological Typ	e	R.M. You	ing						
Air Pollutant Analy	zer	Ozone			QAI	PP Latitude		41.5981	
Deposition Measure	ement	dry, wet			QAI	PP Longitude	2	-78.7683	
Land Use		woodland	I - mixed		QAI	P Elevation	Meters	622	
Terrain		rolling			QAI	P Declinatio	n	10.5	
Conforms to MLM		Yes			QAI	P Declinatio	on Date	2/24/2006	
Site Telephone		(814) 837-8069			Aud	it Latitude		41.598119	
Site Address 1		Kane Experimental Forest Hdqts			Aud	Audit Longitude		-78.767866	
Site Address 2		Seven Mile Road			Aud	Audit Elevation		618	
County		Elk			Aud	Audit Declination		-10.3	
City, State		Kane, PA		]	Present				
Zip Code		16735			Fire	Extinguisher	<b>r</b> ✓	No inspection da	ate
Time Zone		Eastern			Firs	t Aid Kit	✓		
Primary Operator					Safe	ty Glasses	$\checkmark$		
Primary Op. Phone	e #				Safe	ty Hard Hat	$\checkmark$		
Primary Op. E-mai	I				Clin	bing Belt			
Backup Operator				Secu	rity Fence				
Backup Op. Phone	#			Secu	re Shelter	$\checkmark$			
Backup Op. E-mail					Stab	le Entry Step	<b>⊳</b> ✓		
Shelter Working Room		Make	Ekto	N	lodel	8810 (s/n 214	9-14)	Shelter Size	640 cuft
Shelter Clean	✓	Notes	The shelter is cl	ean and very	well org	anized. The f	floor and b	ottom of walls are	e beginning to
Site OK		Notes							
Driving Directions From Kane go south on route 66 for approximately 1 mile. Just past the 2nd cemetery turn left. Continue to the sign just over the railroad tracks. Turn right and continue approximately 3.2 miles through the town of Lamont. About 0.5 mile past Lamont, turn left on a gravel road which is marked with a brown Forest Service sign for the N Forest Experimental Station. Continue approximately 2 miles and bear left at the fork. The site is behind the gre Forest Service buildings on the left.					Continue to the stop own of Lamont. vice sign for the NE is behind the green				

KEF112

## F-02058-1500-S2-rev002

Site ID

Tec

Technician Sandy Grenville

Site Visit Date 09/23/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m	10 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

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

Fi	eld Systems Data Form		F-02058-1500-S3-rev002				
Site	EID KEF112 Technician Sandy Grenville		Site Visit Date 09/23/2014				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>v</b>	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)	1 🔽	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)		Femperature sensor mounted over shelter roof				
6	Is the solar radiation sensor plumb?	<b>v</b>	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>∠</b> I	N/A				
8	Is the rain gauge plumb?	<b>v</b>	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>⊻</b> 1	N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>v</b>	N/A				
11	Is it inclined approximately 30 degrees?		N/A				
Pro	ovide any additional explanation (photograph or sketch if nece	sary)	regarding conditions listed above, or any other features,				

natural or man-made, that may affect the monitoring parameters:

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

## F-02058-1500-S4-rev002

Site	e ID	KEF112	Technician	Sandy Grenville		Site Visit Date	09/23/2014	
1	Do all the condition	e meterological senso 1, and well maintained	rs appear to be 1?	intact, in good		N/A		
2	Are all th reporting	ne meteorological sens g data?	sors operationa	l online, and	✓	N/A		
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors worl	king?		✓			
5	Is the sol scratches	ar radiation sensor's	lens clean and f	ree of		N/A		
6	Is the sur	face wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7	Are the s conditior	ensor signal and pow a, and well maintained	er cables intact 1?	, in good				
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected				

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

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID KEF112 Technician Sandy Grenville	)	Site Visit Date 09/23/2014
	Siting Criteria: Are the pollutant analyzers and deposition e	<u>quip</u>	<u>ment sited in accordance with 40 CFR 58, Appendix E</u>
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 an	d ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?		
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

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

The MFC was observed to fluctuate from 1.4 to 1.6 lpm. Trees to the east are within 20 meters of the ozone inlet.

Fie	eld Sy	stems Data Fo	orm				<b>F-02</b>	2058-15	00-S6-rev002
Site	e ID	KEF112	Technician	Sandy Grenville		Site Visit Date	09/23/2014	1	
	DAS, se	nsor translators, and	peripheral equi	pment operation	ns a	nd maintenance			
1	Do the l well ma	DAS instruments appe intained?	ar to be in good	l condition and	✓				
2	Are all modem,	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightnin	analyzer and sensor sig g protection circuitry	gnal leads pass ?	through	✓	Met sensors only			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct	DAS channel?					
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly	✓				
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	perature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower o	comments?				Towers are not grou	unded		

Provide any additional 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 Sys	stems Data	Foi	<b>·</b> m			<b>F-0</b> 2	2058-	1500-S7-rev
Site ID	KEF112		Techni	cian S	Sandy Grenville Site Visit Date 0	9/23/201	4	
<b>Document</b> a	ation							
Does the si	<u>te have the requir</u>	ed ins	strumen	t and eq	quipment manuals?			
		Yes	No	N/A		Yes	No	N/A
Wind speed se	ensor			$\checkmark$	Data logger		$\checkmark$	
Wind directio	on sensor			$\checkmark$	Data logger			$\checkmark$
Temperature	sensor	✓			Strip chart recorder			$\checkmark$
<b>Relative humi</b>	idity sensor			$\checkmark$	Computer	$\checkmark$		
Solar radiatio	on sensor				Modem		$\checkmark$	
Surface wetne	ess sensor				Printer			$\checkmark$
Wind sensor t	translator			$\checkmark$	Zero air pump		$\checkmark$	
Temperature	translator			$\checkmark$	Filter flow pump		$\checkmark$	
Humidity sens	sor translator			$\checkmark$	Surge protector			
Solar radiatio	on translator				UPS	$\checkmark$		
Tipping buck	et rain gauge				Lightning protection device			$\checkmark$
Ozone analyz	er				Shelter heater		$\checkmark$	
Filter pack flo	ow controller		$\checkmark$		Shelter air conditioner	$\checkmark$		
Filter pack M	FC power supply			$\checkmark$				

002

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

	Present		Current
Station Log	$\checkmark$		$\checkmark$
SSRF			$\checkmark$
Site Ops Manual	$\checkmark$	Oct 2001	
HASP	$\checkmark$	Oct 2011	$\checkmark$
Field Ops Manual	$\checkmark$	Oct 2011	$\checkmark$
Calibration Reports	$\checkmark$		$\checkmark$
Ozone z/s/p Control Charts			$\checkmark$
Preventive maintenance schedul			$\checkmark$

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:

 $\checkmark$ 

Site	ID KEF112 Technician Sandy Grenville		Site Visit Date 09/23/2014
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?		Current operator trained by previous operator, who was trained by previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?		
3	Is the site visited regularly on the required Tuesday schedule?	✓	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	✓	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)		

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

### **QC Check Performed**

### Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	✓
Visual Inspections	$\checkmark$	Weekly	
Translator Zero/Span Tests (climatronics)		N/A	✓
Manual Rain Gauge Test	$\checkmark$	N/A	✓
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	✓
Test Surface Wetness Response	$\checkmark$	N/A	✓

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

### **QC Check Performed**

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

- Frequency ✓ ✓ Semiannually  $\checkmark$  $\checkmark$ Daily ✓ As needed ✓ ✓ Daily  $\checkmark$  $\square$ As needed ✓ ✓ Weekly ✓ ✓ Every 2 weeks  $\checkmark$  $\checkmark$ N/A  $\checkmark$  $\checkmark$ Weekly ✓ ✓ Weekly
- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

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

	Unknown
✓	
✓	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 sample train is leak tested every two weeks.

### Compliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form							F-02058-1500-S9-rev				
Site	e ID	KEF112	Techni	cian	Sandy Grenville		Site Visit Date	09/23/2014		]	
	<u>Site ope</u>	eration procedures									
1	Is the fi	lter pack being change	ed every T	uesd	ay as scheduled?		Filter changed mori	nings 90% of th	ne time		
2	Are the correctl	Site Status Report Fo y?	rms being	com	pleted and filed						
3	Are dat schedul	a downloads and back ed?	ups being	perf	formed as		No longer required				
4	Are gen	eral observations bein	g made ar	nd re	corded? How?	✓	SSRF				
5	Are site fashion	supplies on-hand and ?	replenish	ed in	a timely	✓					
6	Are san	nple flow rates recorde	ed? How?			✓	SSRF, logbook, cal	I-in			
7	Are san fashion	nples sent to the lab on ?	a regular	sche	edule in a timely						
8	Are filte and shij	ers protected from con pping? How?	taminatio	n du	ring handling	✓	Clean gloves on and off				
9	Are the operation	site conditions reported ons manager or staff?	ed regular	ly to	the field						
QC	Check P	erformed		Fre	quency			Compliant			
N	Aulti-poi	nt MFC Calibrations	$\checkmark$	Sen	niannually						
I	low Syst	em Leak Checks		Wee	ekly						
I	Filter Pac	k Inspection									
I	low Rate	e Setting Checks	$\checkmark$	Wee	ekly						
V	isual Ch	eck of Flow Rate Roto	meter 🗹	Wee	ekly			$\checkmark$			
Ι	n-line Fil	ter Inspection/Replace	ement 🔽	As r	needed						
S	ample L	ine Check for Dirt/Wa	ter 🗸	Wee	ekly						
		ditional ambanation	(nhotoma	mh o	n alaatah if maaaa		) maganding conditi	and listed also		othou foot	

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

KEF112

## F-02058-1500-S10-rev002

Site ID

Tecl

Technician Sandy Grenville

Site Visit Date 09/23/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000256
DAS	Campbell	CR3000	2537	000414
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00000878	000965
Flow Rate	Арех	AXMC105LPMDPC	illegible	000671
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	06487
Modem	Raven	V4221-V	0808337420	06455
Ozone	ThermoElectron Inc	49i A1NAA	1030244793	000700
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200014	000438
Sample Tower	Aluma Tower	A	none	03443
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	Aspirated 43408	none	01399
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	13992	06388
Zero air pump	Werther International	C 70/4	000836217	06922

# Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
ARE	128-Sandy	Grenville-09/25/2014				
1	9/25/2014	Computer	Dell	000244	D520	67FNHB1
2	9/25/2014	DAS	Campbell	000400	CR3000	2524
3	9/25/2014	Elevation	Elevation	None	1	None
4	9/25/2014	Filter pack flow pump	Thomas	02661	107CA110	000012187C
5	9/25/2014	Flow Rate	Арех	000462	AXMC105LPMDPCV	42228
6	9/25/2014	Infrastructure	Infrastructure	none	none	none
7	9/25/2014	Met tower	Universal Tower	03505	unknown	none
8	9/25/2014	Modem	Raven	06809	V4221-V	093644408
9	9/25/2014	Ozone	ThermoElectron Inc	000609	49i A1NAA	1009241782
10	9/25/2014	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
11	9/25/2014	Sample Tower	Aluma Tower	666361	В	none
12	9/25/2014	Shelter Temperature	Campbell	none	107-L	none
13	9/25/2014	Shield (10 meter)	Climatronics	01167	100325	1272
14	9/25/2014	Siting Criteria	Siting Criteria	None	1	None
15	9/25/2014	Temperature	Climatronics	06678	100093	missing
16	9/25/2014	Zero air pump	Werther International	06866	PC70/4	000815262

## **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial N	Number Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2524	ARE	E128	Sandy Grenville	09/25/2014	DAS	Primary
Das Date: Das Time: Das Day: Channel	9 /25/2014 15:28:25 268	Audit Date Audit Time Audit Day High Channe	9 /25/2014 15:28:26 268	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D
Avg Diff: 0.0000	Max Diff: 0.00	Avg Diff: 01 0.0000	0.0001				
				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 12/28/201	<ul> <li>Parameter</li> <li>Tfer Desc.</li> <li>Intercept</li> <li>CorrCoff</li> </ul>	DAS DVM 0.00000 1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8994	0.8993	V	V	-0.0001	
7	1.0000	0.9993	0.9992	V	V	-0.0001	

# Flow Data Form

Mfg	Serial Num	iber Ta	Site	Тес	hnician	Site Visit Da	ate Parar	neter	<b>Owner ID</b>
Apex	42228		ARE128	Sa	ndy Grenville	09/25/2014	Flow F	Rate	000462
					Mfg	BIOS	]	Parameter F	low Rate
					Serial Number	103471	1	Ffer Desc. n	iexus
					Tfer ID	01420			
					Slope	1.0	0846 <b>Int</b>	tercept	0.01358
					Cert Date	1/8/	/2014 <b>Co</b>	orrCoff	0.99997
					Mfg	BIOS	]	Parameter F	low Rate
					Serial Number	103424		Ffer Desc.	BIOS cell
					Tfer ID	01410			
					Slope	1.0	0846 <b>Int</b>	tercept	0.01358
					Cert Date	1/8/	/2014 <b>Co</b>	orrCoff	0.99997
<b>DAS 1:</b>		<b>DAS 2:</b>		L	Cal Factor Z	ero	0.	04	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	1.	02	
0.22%	0.67%				Rotometer R	eading:		1.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSign	all PctDifference
primary	pump off	0.000	0.000	-0.10	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.05	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.525	1.500	1.49	0.000	1.51	l/m	l/m	0.67%
primary	test pt 2	1.522	1.500	1.49	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.528	1.500	1.49	0.000	1.50	l/m	l/m	0.00%
Sensor Comp	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Condition	ו	Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 2.5 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 2.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 250 deg		Statu	s pass	
Sensor Comp	onent System M	lemo		Conditio	n		Statu	s pass	

## **Ozone Data Form**

Mfg	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	ter	Owner ]	D
ThermoElectron Inc	1009241782	ARE128	Sa	andy Grer	nville	09/25/2	014	Ozone		000609	
Slope: C	0.99159 Slope: 0.17333 Intercept	0.0000	0	Mfg Serial N	umber	ThermoE	Electron	Inc Pa	rameter of	zone	
CorrCoff C	0.99995 CorrCoff	0.0000	0	Te ID	umber	01100		<b>*</b> *			
				Tfer ID		01100					
DAS 1:	DAS 2:			Slope			1.00458	B Inter	cept	-0.1	1484
A Avg % Diff: A M 1.0%	Iax % Di         A Avg %           1.8%	6Dif A Max	% D1	Cert Da	ite	12	2/10/2013	3 Corr	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	e:	Site	Unit:	PctDit	fference:	
primary	1	0.05	0.1	16	-0.	03	ppb				
primary	2	31.26	31.	23	31.	78	ppb			1.76%	
primary	3	51.05	50.	93	50.	50	ppb			-0.84%	
primary	4	80.17	79.	91	79.	44	ppb			-0.59%	
primary	5	101.56	101	.21	100	.40	ppb			-0.80%	
Sensor Componer	Cell B Noise		Conditio	0.7 pp	b			Status	pass		
Sensor Componer	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Componer	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Componer	t Inlet Filter Condition	งท	Conditio	n Clean				Status	pass		
Sensor Componer	t Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Componer	nt Offset		Conditio	<b>0.10</b>				Status	pass		
Sensor Componer	nt Span		Conditio	on 0.999				Status	pass		
Sensor Componer	t Cell B Freq.		Conditio	<b>n</b> 106.1	kHz			Status	pass		
Sensor Componer	t System Memo		Conditio	on				Status	pass		
Sensor Componer	t Sample Train		Conditio	Good				Status	pass		
Sensor Componer	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Componer	t Cell B Flow		Conditio	<b>0.75</b> lj	om			Status	pass		
Sensor Componer	t Cell A Tmp.		Conditio	<b>n</b> 31.9 <b>(</b>	)			Status	pass		
Sensor Componer	t Cell A Pressure		Conditio	<b>n</b> 716 m	mHg			Status	pass		
Sensor Componer	t Cell A Noise		Conditio	<b>0.9</b> pp	b			Status	pass		
Sensor Componer	t Cell A Freq.		Conditio	<b>97.0</b> k	Hz			Status	pass		
Sensor Componer	t Cell A Flow		Conditio	0.70 l	om			Status	pass		
Sensor Componer	t Battery Backup		Conditio	N/A				Status	pass		
Sensor Componer	t Zero Voltage		Conditio	N/A				Status	pass		

# Temperature Data Form

Mfg	Serial Number	<b>Fa</b> Site	r	<b>Fechn</b> i	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>	
Climatronics	missing	ARE128		Sandy	Grenville	09/25	5/2014	Temper	ature	06678	_
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	٢D	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	pe		1.0028	8 Inte	rcept	-0.15155	
Abs Avg Err A	Abs Max Er Abs	Avg Err Abs	Max Er	Cei	rt Date		1/8/201	4 Cor	rCoff	1.00000	
0.19	0.24										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Te	mp Low Range	0.50	0.65		0.000		0.5	5	С	-0.14	
primary Te	mp Mid Range	25.66	25.74	1	0.000		25.	6	С	-0.18	
primary Te	mp High Range	49.67	49.68	3	0.000		49.	4	С	-0.24	
Sensor Compo	nent Shield		Condi	tion	Clean			Status	pass		
Sensor Compo	nent Blower		Condi	tion F	Functioning			Status	pass		
Sensor Compo	nent Blower Status	Switch	Condi	tion N	I/A			Status	pass		
Sensor Compo	nent System Memo		Condi	tion				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ARE128	Sandy Grenville	09/25/2014	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAbs0.51	0.65	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE	)
			Tfer ID	01227		
			Slope	1.0028	8 Intercept	-0.15155
			Cert Date	1/8/201	4 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.78	22.87	0.000	22.3	С	-0.54
primary	Temp Mid Range	22.94	23.03	0.000	22.7	С	-0.35
primary	Temp Mid Range	25.92	26.00	0.000	25.4	С	-0.65
Sensor Component System Memo		Condition	Status pass				

### **Infrastructure Data For**

Site ID	ARE128	Technician Sandy G	renville Site Visit Date 09/25/2014
Shelter N	Aake	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-7)	640 cuft

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

# **Field Systems Comments**

#### 1 Parameter: DasComments

The meteorological tower is grounded but the lightning rod has been removed. The sample tower is not grounded.

#### 2 Parameter: SitingCriteriaCom

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

### 3 Parameter: MetOpMaintCom

The 10-meter temperature sensor is being operated and maintained on the meteorological tower.

## F-02058-1500-S1-rev002

Site ID	ARE128		Technician	Sandy Grenvill	e	Site Visit I	<b>Date</b> 09/2	5/2014		
	,					S Man		Arendtsville		
Site Sponsor (	agency)	EPA				5 Map				
<b>Operating Gr</b>	oup	PSU/priv	ate		Map	Scale				
AQS #		42-001-9	991		Map	Date				
Meteorologica	al Type	Climatro	nics							
Air Pollutant	Analyzer	Ozone, I	MROVE		QAF	P Latitude		39.9231		
Deposition Mo	easurement	dry, wet,	Hg, PM		QAF	P Longitude		-77.3078		
Land Use		agricultu	re		QAF	P Elevation	Meters	269		
Terrain		complex	- rolling		QAF	P Declination	n	10.9		
Conforms to I	MLM	Marginal	ly		QAF	P Declination	n Date	2/22/2006		
Site Telephon	e	(717) 67	7-9866		Aud	it Latitude				39.923241
Site Address 1	t	PSU Fru	it Research Orch	ard	Aud	it Longitude				-77.307863
Site Address 2	2	Winding	Road		Aud	it Elevation				266
County		Adams			Aud	it Declination	L	-11		
City, State		Arendtsv	ille, PA		]	1	Present			
Zip Code		17307			Fire	Extinguisher		No inspection da	ate	
Time Zone		Eastern			First	Aid Kit				
Primary Open	rator				Safe	ty Glasses				
Primary Op.	Phone #				Safe	ty Hard Hat				
Primary Op.	E-mail				Clim	bing Belt				
Backup Opera	ator				Secu	rity Fence				
Backup Op. 1	Phone #				Secu	re Shelter				
Backup Op. I	E <b>-mail</b>				Stab	le Entry Step				
Shelter Work	ing Room⊻	Make	Ekto	N	lodel	3810 (s/n 2116	6-7)	Shelter Size	640 cuft	
Shelter Clean	$\checkmark$	Notes								
Site OK		Notes								
Driving Direc	tions Contin onto C Boyer	Gettysbur nue into th Chambers Nursery 8	g take route 34 r e town of Arendt burg Street. Cor & Orchard. The s	north to Biglerv sville. At the s atinue approxir site will be visi	rille. At stop sigi nately 0 ole at th	the intersection next to the g .4 miles and to e top of the hi	on of 34 an as station, urn right o Il in the ore	d 234 turn left (w , turn left and imn nto Winding Road chard on the righ	rest) to Aren nediately tur d. There is t.	dtsville. n right, a sign for

ARE128

## F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 09/25/2014

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		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		
Intensive agricultural ops (including aerial spraying)	500 m	20 m	
Limited agricultural operations	200 m	20 m	
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		
Obstacles to wind	10 times obstacle height		

Siting Distances OK

**Siting Criteria Comment** 

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

Technician Sandy Gren	ville Site Visit Date 09/25/2014
rection sensors sited so as to avoid structions?	✓ N/A
nted so as to minimize tower effect ld be mounted atop the tower or or boom >2x the max diameter of the ng wind)	s? ✓ N/A 1 a
ors plumb?	✓ N/A
nields pointed north or positioned a north or positioned a north section of the north section	
RH sensors sited to avoid unnatura d below sensors should be natural v sloped. Ridges, hollows, and area be avoided)	l 🗹
ensor plumb?	✓ N/A
ling, or any artificial or reflected	✓ N/A
b?	✓ N/A
tering effects from buildings, trees	, ☑ <mark>N/A</mark>
sensor sited with the grid surface	N/A
nately 30 degrees?	✓ N/A
	struction sensors shed so us to a vola structions? nted so as to minimize tower effects ld be mounted atop the tower or or boom >2x the max diameter of the ng wind) sors plumb? nields pointed north or positioned to arces such as buildings, walls, etc? RH sensors sited to avoid unnatural d below sensors should be natural / sloped. Ridges, hollows, and areas be avoided) ensor plumb? ling, or any artificial or reflected b? tering effects from buildings, trees, sensor sited with the grid surface nately 30 degrees?

natural or man-made, that may affect the monitoring parameters:

# Field Systems Data Form F-02058-1500-S4-rev002

Site	ID	ARE128	Technician	Sandy Grenville		Site Visit Date 09/25/2014	
1	1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?					Temperature only	
2	2 Are all the meteorological sensors operational online, and reporting data?					Temperature only	
3	3 Are the shields for the temperature and RH sensors clean?				✓		
4	Are the a	spirated motors wor	king?		✓		
5	5 Is the solar radiation sensor's lens clean and free of scratches?			ree of	✓	2 N/A	
6	Is the sur	face wetness sensor g	grid clean and u	ndamaged?	✓	N/A	
7	Are the s condition	ensor signal and pow , and well maintained	er cables intact, d?	in good	✓		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connect aintained?	tions protected			

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

The 10-meter temperature sensor is being operated and maintained on the meteorological tower.

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	ARE128	Technician	Sandy Grenville		Site Visit Date 09/25/2014
	Siting C	riteria: Are the pollut	t <mark>ant analyzers a</mark>	nd deposition eq	uipr	nent 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 m	eters above the	ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?					
	<b>Pollutar</b>	nt analyzers and depos	sition equipmen	t operations and	mai	intenance
1	Do the a conditio	nalyzers and equipmon and well maintained	ent appear to be 1?	in good	✓	
2	Are the reportin	analyzers and monito ng data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters
4	Describ	e dry dep sample tube				3/8 teflon by 12 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	f kinks, moistur	e, and		Moisture in tubing only
7	Is the ze	ero air supply desiccar	nt unsaturated?			
8	Are the	re moisture traps in th	ne sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dr	y deposition filte	er line, and is it		Clean and dry

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

Fi	eld Systems Data Form		F-02058-1	500-S6-rev002	
Site	ARE128 Technician Sandy Grenville	Э	Site Visit Date	09/25/2014	]
	DAS, sensor translators, and peripheral equipment operation	ons a	nd 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?				
9	Is the met tower stable and grounded?		Stable	Groundee	1
10	Is the sample tower stable and grounded?				
11	Tower comments?		Met tower grounded grounded	but lightning rod remo	oved, sample tower not

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

The meteorological tower is grounded but the lightning rod has been removed. The sample tower is not grounded.

Field Sy	stems Data	Fo	rm				<b>F-02</b>	058-	-1500-	S7-rev002
Site ID	ARE128		Tech	nician	Sandy Grenville	Site Visit Da	te 09/25/2014			
Document	ation									
Does the s	<u>ite have the requir</u>	ed in	strume	nt and	equipment manuals?	2				
		Yes	No	<b>N/</b> .	A		Yes	No	N/A	
Wind speed s	sensor			$\checkmark$	Data logg	er		✓		
Wind directi	on sensor			$\checkmark$	Data logg	er			$\checkmark$	
Temperature	e sensor	✓			Strip cha	rt recorder			$\checkmark$	
<b>Relative hum</b>	idity sensor			$\checkmark$	Computer	r				
Solar radiati	on sensor			$\checkmark$	Modem			$\checkmark$		
Surface wetn	ess sensor			$\checkmark$	Printer				$\checkmark$	
Wind sensor	translator			$\checkmark$	Zero air p	oump		$\checkmark$		
Temperature	e translator			$\checkmark$	Filter flov	v pump		$\checkmark$		
Humidity ser	nsor translator			$\checkmark$	Surge pro	otector			$\checkmark$	
Solar radiati	on translator			$\checkmark$	UPS			$\checkmark$		
Tipping buck	xet rain gauge			$\checkmark$	Lightning	protection devi	ice		$\checkmark$	
Ozone analyz	zer	$\checkmark$			Shelter he	eater		$\checkmark$		
Filter pack fl	ow controller		$\checkmark$		Shelter ai	r conditioner				
Filter pack M	IFC power supply			$\checkmark$						
Does the	site have the requ	ired a	and mo	<u>st rece</u>	nt QC documents and	d report forms?				
		Pres	sent				Curre	nt		
Station Log			✓							
SSRF			✓				$\checkmark$			

Station Log			
SSRF			1
Site Ops Manual	$\checkmark$	Oct 2010	
HASP	$\checkmark$	Oct 2010	
Field Ops Manual	$\checkmark$	Oct 2001	-
Calibration Reports	$\checkmark$		-
Ozone z/s/p Control Charts			1
Preventive maintenance schedul			

1

2

3

4

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

✓

✓

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

#### Site ID ARE128 Technician Sandy Grenville Site Visit Date 09/25/2014 Site operation procedures Refresher training by Lavery and Howell, July 2006 Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? Refresher training by Lavery and Howell, July 2006 2 Has the backup operator attended a formal CASTNET $\checkmark$ training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

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

$\checkmark$		
$\checkmark$	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:

### 

**Compliant** 

### F-02058-1500-S8-rev002

Fi	eld Sy	vstems Data Fo	rm				<b>F-02058</b>	-1500-S9-rev002
Sit	Site ID ARE128 Tech		Technician	nician Sandy Grenville		Site Visit Date	09/25/2014	
	<u>Site ope</u>	eration procedures						
1	Is the fi	lter pack being changed	d every Tuesc	lay as scheduled	<b>~</b>	Filter changed afternoons		
2	Are the correctl	Site Status Report For y?	ms being con	pleted and filed				
3	Are dat schedul	a downloads and backu ed?	ips being per	formed as		No longer required		
4	Are gen	eral observations being	g made and ro	ecorded? How?	✓	SSRF, logbook		
5	Are site supplies on-hand and replenished in a timely fashion?			✓				
6	Are san	nple flow rates recorded	1? How?		✓	SSRF, call-in		
7	Are san fashion	nples sent to the lab on a ?	a regular sch	edule in a timely	✓			
8	Are filte and shij	ers protected from cont pping? How?	amination du	ring handling		Gloves not consiste	ently used	
9	Are the operation	site conditions reported ons manager or staff?	d regularly to	the field				
QC	Check P	erformed	Fre	equency			Compliant	
I	Multi-poi	nt MFC Calibrations	Sei	miannually			$\checkmark$	
I	Flow System Leak Checks				$\checkmark$			
I	Filter Pack Inspection							
1	Flow Rate Setting Checks Veekly				$\checkmark$			
	Visual Check of Flow Rate Rotometer Veekly				$\checkmark$			
I	In-line Fil	lter Inspection/Replace	ment 🗹 Sei	miannually			$\checkmark$	
5	Sample L	ine Check for Dirt/Wat	er					
-								

\_

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

ARE128

## F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 09/25/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	67FNHB1	000244
DAS	Campbell	CR3000	2524	000400
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	000012187C	02661
Flow Rate	Арех	AXMC105LPMDPC	42228	000462
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03505
Modem	Raven	V4221-V	093644408	06809
Ozone	ThermoElectron Inc	49i A1NAA	1009241782	000609
Ozone Standard	ThermoElectron Inc	49i A3NAA	0607315737	000199
Sample Tower	Aluma Tower	В	none	666361
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	Climatronics	100325	1272	01167
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	missing	06678
Zero air pump	Werther International	PC70/4	000815262	06866

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
CAT	CAT175-Eric Hebert-09/26/2014							
1	9/26/2014	Computer	Dell	000275	D520	unknown		
2	9/26/2014	DAS	Campbell	000412	CR3000	2532		
3	9/26/2014	Elevation	Elevation	None	1	None		
4	9/26/2014	Filter pack flow pump	Brailsford	none	TD-4X2N	none		
5	9/26/2014	Flow Rate	Арех	000644	AXMC105LPMDPCV	illegible		
6	9/26/2014	Infrastructure	Infrastructure	none	none	none		
7	9/26/2014	Met tower	Universal Tower	02742	unknown	none		
8	9/26/2014	Modem	Raven	06660	V4221-V	0918425101		
9	9/26/2014	Sample Tower	Aluma Tower	666359	В	none		
10	9/26/2014	Shield (10 meter)	RM Young	none	41003	none		
11	9/26/2014	Siting Criteria	Siting Criteria	None	1	None		
12	9/26/2014	Temperature	RM Young	06409	41342VO	14042		
13	9/26/2014	UPS	ProSine	04576	1000w	unknown		

## Flow Data Form

Mfg	Serial Nun	ıber Ta	Site	Тес	chnician	Site Visit Da	ate Paran	neter	<b>Owner ID</b>
Apex	illegible		CAT175	Eri	ic Hebert	09/26/2014	Flow R	late	000644
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	131818	Т	fer Desc. BIO	S 220-H
					Tfer ID	01417			
					Slope	1.0	0000 <b>Int</b>	ercept	0.00000
					Cert Date	1/8/	2014 <b>Co</b>	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale		0	
3.21%	3.21%				Rotometer R	eading:	1.5	55	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.03	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.02	l/m	l/m	
primary	test pt 1	1.556	1.560	1.50	0.000	1.51	l/m	l/m	-3.21%
primary	test pt 2	1.560	1.560	1.50	0.000	1.51	l/m	l/m	-3.21%
primary	test pt 3	1.564	1.560	1.50	0.000	1.51	l/m	l/m	-3.21%
Sensor Comp	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Poor		Status	Fail	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Component Filter Distance			Conditio	ition 4.5 cm			IS pass		
Sensor Component Filter Depth			Conditio	ition -0.5 cm			18 Fail		
Sensor Comp	onent Filter Azi	muth		Conditio	<b>n</b> 90 deg		Status	pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Status	pass	

# Temperature Data Form

Mfg	Serial Number T	la Site	,	<b>Techn</b> i	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	ng 14042 CAT175			Eric Hebert		09/26	26/2014 Temper		ature	06409	
				Mf	g	Extec	h	Ра	rameter Te	mperature	
				Ser	rial Number	H232	679	Tf	er Desc. R	D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	pe		1.0049	6 Inte	rcept	-0.23009	9
Abs Avg Err Ab	s Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		1/8/201	4 Cor	rCoff	1.00000	0
0.06	0.06 0.11										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	-0.07	0.16	i	0.000		0.2	2	С	0.01	
primary Tem	p Mid Range	24.98	25.0	9	0.000		25.	0	С	-0.11	
primary Tem	p High Range	47.52	47.5	1	0.000		47.	5	С	-0.06	
Sensor Compone	nt Shield		Condi	ition C	Clean			Status	pass		
Sensor Compone	nt Blower		Condi	ition 🕨	I/A			Status	pass		
Sensor Compone	nt Blower Status S	Switch	Condi	ition 🕨	I/A			Status	pass		
Sensor Compone	ent System Memo		Condi	ition				Status	pass		

### **Infrastructure Data For**

Site ID	CAT175	Technician Eric Heb	oert Site Visit Date 09/26/2014
Shelter M	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 1977-1)	640 cuft

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

# **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg Serial No.		Hazard Problem	
Flow Rate	CAT175	Eric Hebert	09/26/2014	Filter Position	Apex	4212		

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

#### 1 Parameter: SiteOpsProcComm

The site operator was not available to meet with the auditor during the audit visit due to a personal family matter. Audit information was obtained from review of the site documentation.

#### 2 Parameter: DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered.

#### 3 Parameter: ShelterCleanNotes

The shelter is neat and clean. The vegetation has been allowed to grow. The shelter roof has been repaired.

### 4 Parameter: PollAnalyzerCom

Ozone monitoring is no longer being conducted at the site.

## F-02058-1500-S1-rev002

Site ID	CAT175		Technician Eric Hebert		Site Visit I	<b>Date</b> 09/2	6/2014		
					S Mon		Clanville		
Site Sponsor (	(agency)	EPA			55 Map				
<b>Operating Gr</b>	oup	private		Ma	o Scale				
AQS #				Ma	p Date				
Meteorologica	al Type	R.M. You	ing						
Air Pollutant	Analyzer	Ozone		QA	PP Latitude		41.9423		
<b>Deposition</b> M	easurement	dry		QA	PP Longitude		-74.5519		
Land Use		woodland	d - mixed	QA	PP Elevation	Meters	765		
Terrain		complex		QA	PP Declination	n	13.5		
Conforms to 3	MLM	No		QA	PP Declination	n Date	2/22/2006		
Site Telephon	ie	(845) 798	3-0947	Au	lit Latitude		41.942325		
Site Address	1	Wildcat N	/t. Road	Au	lit Longitude		-74.551999		
Site Address 2	2			Au	lit Elevation		754		
County		Ulster		Au	lit Declination	L	-13.2		
City, State		Claryville	, NY		Present				
Zip Code		12725		Fire	Extinguisher		No inspection date		
Time Zone		Eastern		Firs	t Aid Kit				
Primary Ope	rator			Saf	ety Glasses				
Primary Op.	Phone #			Saf	ety Hard Hat				
Primary Op.	E-mail			Clin	nbing Belt	$\checkmark$			
Backup Oper	ator			Sec	urity Fence				
Backup Op.	Phone #			Sec	ıre Shelter	$\checkmark$			
Backup Op. E-mail				Sta	ole Entry Step				
Shelter Work	ing Room ☑	Make	Ekto	Model	8810 (s/n 197	7-1)	Shelter Size 640 cuft		
Shelter Clean		Notes	The shelter is neat and clea	an. The v	egetation has l	been allow	red to grow. The shelter roof has been		
Site OK		Notes							
Driving Direc	tions From	Liberty, N	Y go west on route 52 towar	d Grahan	nsville. Just be	fore reach	ing Grahamsville, turn left onto County		
	Road bridge the for	19 to Clar at the far k and turr	yville. Stay on 19 through C end of town. Bear right and h left at the first house on the	laryville a I follow th e left. Th	nd turn left on e semi-paved r e site is about .	Wildcat M oad for ab 75 miles u	t Road immediately after crossing the bout 0.7 miles to the fork. Go right at up the dirt road behind the house.		

CAT175

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 09/26/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height		$\checkmark$

Siting Distances OK

**Siting Criteria Comment** 

Fi	eld Systems Data Form		F-02058-1500-S3-rev002				
Site	<b>ID</b> CAT175 <b>Technician</b> Eric Hebert		Site Visit Date 09/26/2014				
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				
Pro nat	wide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameter	essar s:	y) regarding conditions listed above, or any other features,				

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Site	e ID	CAT175	Technician	Eric Hebert		Site Visit Date 09/26/2014
1 2 3	Do all th condition Are all th reporting Are the s	e meterological senso 1, and well maintaine he meteorological sen g data? shields for the temper	rs appear to be d? sors operationa rature and RH s	intact, in good l online, and ensors clean?	<b>&gt; &gt; &gt;</b>	Temperature only Temperature only
4	Are the a	aspirated motors wor	king?		✓	Natural aspiration
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	free of		N/A
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A
7	Are the s condition	ensor signal and pow 1, and well maintaine	er cables intact d?	, in good		N/A
8	Are the s from the	ensor signal and pow elements and well m	ver cable connec aintained?	ctions protected		N/A

Fi	eld Systems Data Form		F-02058-1500-S5-rev002				
Site	ID CAT175 Technician Eric Hebert		Site Visit Date 09/26/2014				
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	ment 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 an	d ma	intenance				
1	Do the analyzers and equipment appear to be in good condition and well maintained?		Ozone not measured				
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 18 meters				
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		N/A				
6	Are sample lines clean, free of kinks, moisture, and obstructions?						
7	Is the zero air supply desiccant unsaturated?		N/A				
8	Are there moisture traps in the sample lines?						
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry				

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

Ozone monitoring is no longer being conducted at the site.

Field Systems Data Form								<b>F-02</b>	2058-15	00-S6-rev002
Site	e ID	CAT175	Technician	Eric Hebert		Site Visi	t Date 0	9/26/2014	1	
	DAS, se	nsor translators, and	peripheral equij	pment operation	<u>ıs a</u> ı	<u>nd maintenar</u>	<u>1ce</u>			
1	Do the I well mai	OAS instruments appendintained?	ear to be in good	condition and						
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,						
3	Do the a lightning	nalyzer and sensor sig g protection circuitry	gnal leads pass t ?	hrough	✓	Met sensors	only			
4	Are the well mai	signal connections pro intained?	otected from the	e weather and						
5	Are the	signal leads connected	l to the correct l	DAS channel?	✓					
6	Are the grounde	DAS, sensor translato d?	ors, and shelter <b>j</b>	properly	✓					
7	Does the	e instrument shelter h	ave a stable pow	ver source?		Solar power				
8	Is the in	strument shelter temp	oerature control	led?		Shelter not te	emperatu	re control	lled	
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	l grounded?							
11	Tower c	omments?								

Provide any additional 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 not temperature controlled. The site is solar and DC battery powered.

Field Sy	stems Data I	Foi	rm					<b>F-02</b>	2058-	1500-	S7-rev002
Site ID	CAT175		Tech	nician	Eric Hebert		Site Visit Date	09/26/2014	Ļ		
Document	ation										
Does the s	ite have the require	d ins	strum	ent and	equipment ma	nuals?					
Does the s	<u>Ite nuve the require</u>	Zes	No	<u>N/</u>	<u>equipinent ind</u>			Yes	No	N/A	
Wind speed s	sensor				Dat	ta logger					
Wind direction	on sensor			$\checkmark$	Dat	ta logger				$\checkmark$	
Temperature	sensor	✓			Str	ip chart	recorder			$\checkmark$	
<b>Relative hum</b>	hidity sensor			$\checkmark$	Co	mputer		$\checkmark$			
Solar radiati	on sensor			$\checkmark$	Мо	dem			$\checkmark$		
Surface wetn	ess sensor			$\checkmark$	Pri	nter				$\checkmark$	
Wind sensor	translator			$\checkmark$	Zer	o air pu	mp			$\checkmark$	
Temperature	translator			$\checkmark$	Filt	ter flow <b>j</b>	oump		$\checkmark$		
Humidity ser	sor translator			$\checkmark$	Sur	ge prote	ctor				
Solar radiatio	on translator			$\checkmark$	UP	S					
Tipping buck	et rain gauge			$\checkmark$	Lig	htning p	rotection device		$\checkmark$		
Ozone analyz	zer			$\checkmark$	She	elter heat	ter			$\checkmark$	
Filter pack fl	ow controller				She	elter air o	conditioner			$\checkmark$	
Filter pack M	IFC power supply			$\checkmark$							
Does the	site have the requir	ed a	nd mo	ost recei	nt QC docume	nts and 1	<u>eport forms?</u>				
	]	Pres	ent					Curre	ent		
Station Log		ŀ	✓								
SSRF		ŀ	✓								
Site Ops Mar	nual		✓	Oct 200	1						
HASP			✓	Nov 200	)1						
Field Ops Ma	anual	[									
Calibration H	Reports	[									
Ozone z/s/p (	Control Charts	[		N/A							
Preventive m	aintenance schedul	[									
1       Is the station log properly completed during every site visit?											
2 Are the current?	Site Status Report I ?	Forn	ns beir	ng comp	leted and						
3 Are the sample t	chain-of-custody for transfer to and from	rms 1 lab	prope ?	rly used	l to document						
4 Are ozor current	ne z/s/p control char ?	rts p	roper	ly comp	leted and	□ N//	Ą				
Provide any a	additional explanati	on (	photo	graph o	r sketch if nec	essary) r	egarding condit	ions listed a	above,	or any otl	ner features,

natural or man-made, that may affect the monitoring parameters:

#### Site ID CAT175 Technician Eric Hebert Site Visit Date 09/26/2014 Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET No backup operator training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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	$\checkmark$				
Manual Zero/Span Tests	N/A					
Automatic Precision Level Tests	N/A	$\checkmark$				
Manual Precision Level Test	N/A	$\checkmark$				
Analyzer Diagnostics Tests	N/A	$\checkmark$				
In-line Filter Replacement (at inlet)	N/A	$\checkmark$				
In-line Filter Replacement (at analyze	N/A	$\checkmark$				
Sample Line Check for Dirt/Water	N/A	$\checkmark$				
Zero Air Desiccant Check	N/A	$\checkmark$				
<ul> <li>1 Do multi-point calibration gases go through the complete sample train including all filters?</li> <li>2 Do automatic and manual z/s/p gasses go through the N/A</li> </ul>						
complete sample train including all filters?						

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

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

N/A

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Fi	eld Sy	vstems Data Form			F-02058-1500-S9-rev002			
Site	e ID	CAT175 <b>Tec</b>	chnician Eric Hebert		Site Visit Date 09/26/2014			
	Site ope	eration procedures						
1	Is the fi	lter pack being changed ever	y Tuesday as scheduled?		Filter changed afternoons			
2	Are the correct	Site Status Report Forms be ly?	ing completed and filed	✓				
3	Are dat schedul	a downloads and backups be ed?	ing performed as		No longer required			
4	Are gen	neral observations being mad	e and recorded? How?					
5	Are site fashion	e supplies on-hand and replen ?	ished in a timely	✓				
6	Are sample flow rates recorded? How?				SSRF, e-mail			
7	Are san fashion	nples sent to the lab on a regu ?	ılar schedule in a timely	✓				
8	Are filt and shi	ers protected from contamina pping? How?	ation during handling	✓	Clean gloves on and off			
9	Are the operation	site conditions reported reguons manager or staff?	llarly to the field					
QC	Check P	erformed	Frequency		Compliant			
N	Aulti-poi	nt MFC Calibrations	Semiannually					
F	Flow System Leak Checks							
F	Filter Pack Inspection							
F	Flow Rate Setting Checks							
V	Visual Check of Flow Rate Rotometer							
I	n-line Fi	lter Inspection/Replacement	Semiannually					
S	ample L	ine Check for Dirt/Water	✓ Weekly					
Prov	vide anv a	additional explanation (photo	ograph or sketch if neces	sary	nry) regarding conditions listed above, or any other features.			

natural or man-made, that may affect the monitoring parameters:

The site operator was not available to meet with the auditor during the audit visit due to a personal family matter. Audit information was obtained from review of the site documentation.

Field Systems Data Fo	orm
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CAT175

## F-02058-1500-S10-rev002

Site ID	
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Technician Eric Hebert

Site Visit Date 09/26/2014

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000275
DAS	Campbell	CR3000	2532	000412
Elevation	Elevation	1	None	None
Filter pack flow pump	Brailsford	TD-4X2N	none	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000644
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	02742
Modem	Raven	V4221-V	0918425101	06660
Sample Tower	Aluma Tower	В	none	666359
Shield (10 meter)	RM Young	41003	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	14042	06409
UPS	ProSine	1000w	unknown	04576

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
HWI	F187-Eric H	1ebert-09/30/2014				
1	9/30/2014	Computer	Dell	000290	D520	unknown
2	9/30/2014	DAS	Campbell	000356	CR3000	2134
3	9/30/2014	Elevation	Elevation	None	1	None
4	9/30/2014	Filter pack flow pump	Thomas	02358	illegible	illegible
5	9/30/2014	Flow Rate	Apex	000592	AXMC105LPMDPCV	illegible
6	9/30/2014	Infrastructure	Infrastructure	none	none	none
7	9/30/2014	Met tower	Universal Tower	03579	unknown	none
8	9/30/2014	Modem	Raven	06807	H4223-C	0934393748
9	9/30/2014	Ozone	ThermoElectron Inc	000681	49i A1NAA	1030244790
10	9/30/2014	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
11	9/30/2014	Sample Tower	Aluma Tower	illegible	В	AT-5107-E-4-12
12	9/30/2014	Shelter Temperature	Campbell	none	107-L	unknown
13	9/30/2014	Shield (10 meter)	RM Young	04676	Aspirated 43408	none
14	9/30/2014	Siting Criteria	Siting Criteria	None	1	None
15	9/30/2014	Temperature	RM Young	06401	41342VO	14034
16	9/30/2014	Zero air pump	Teledyne	000775	701H	611

## **DAS Data Form**

DAS Time Max Error: 0.25

Mfg	Serial Nu	mber Site	ſ	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2134	HWI	F187	Eric Hebert	09/30/2014	DAS	Primary
Das Date:	10/1 /2014	Audit Date	10/1 /2014	Mfg	HY	Parameter	DAS
Das Day:	9.00.15	Audit Time	274	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channel:		High Channel	:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0002	0.0004	0.0002	0.0004	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	4 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0004	0.0000	V	V	0.0004	
7	0.1000	0.0997	0.0997	V V	V	0.0000	
7	0.2000	0.1996	0.1995	V	V	-0.0001	
7	0.5000	0.4994	0.4995	V	V	0.0001	
7	0.7000	0.6999	0.6997	V	V	-0.0002	
7	0.9000	0.8995	0.8994	V	V	-0.0001	
7	1.0000	1.0003	1.0005	V	V	0.0002	

## Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
Apex	illegible		HWF187	Eri	ic Hebert	09/30/2014	Flow R	late	000592
					Mfg Serial Number	BIOS	P T	arameter Flow	v Rate
					Tfer ID	01417			
					Slope	1.0	00000 <b>Int</b>	ercept	0.00000
					Cert Date	1/8	/2014 <b>Co</b>	rrCoff	1.00000
<b>DAS 1:</b>		<b>DAS 2:</b>		L	Cal Factor Z	ero	0.0	01	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	99	
1.12%	1.35%				Rotometer R	eading:	1.{	55	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.483	1.480	1.52	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.485	1.480	1.51	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.492	1.490	1.52	0.000	1.50	l/m	l/m	0.67%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	Condition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomet	er Conditic	n	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Compo	Filter Dis	tance		Conditio	n 6.5 cm		Status	pass	
Sensor Compo	Filter De	pth		Conditio	n 0.5 cm		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	n 180 deg		Status	pass	
Sensor Comp	onent System	Memo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	Serial Number Tag	Site	Te	chnician		Site Visi	it Date	Paramet	ter	Owner I	D
ThermoElectron Inc	1030244790	HWF187	Er	ic Hebert		09/30/2	014	Ozone		000681	
Slope: 0 Intercept -0 CorrCoff 1	.97152 Slope: .17924 Intercept	0.0000	D D	Mfg Serial N	umber	ThermoE 0419606	Electron	Inc Par	rameter ( er Desc. (	ozone Ozone primary	/ stan
DAS 1: A Avg % Diff: A M 3.2%	DAS 2: ax % Di A Avg %	6Dif A Max	% Di	Tfer ID Slope Cert Da	ıte	01112	1.00928 1/8/2014	3 Inter 4 Corr	cept Coff	0.11	780 000
UseDescription:	ConcGroup:	Tfer Raw	Tfer	Corr.	Si	te	Site	Unit	PctD	ifference:	
primary	1	-0.20	-0.	31	-0.	50	ppb	omt.	TetD	interence.	
primary	2	26.78	26.	41	25	.55	ppb			-3.26%	
primary	3	47.59	47.	.03	45	.44	ppb			-3.38%	
primary	4	77.75	76.	.91	74	.56	ppb			-3.06%	
primary	5	107.83	106	5.72	103	.50	ppb			-3.02%	
Sensor Componer	t Cell B Noise		Conditio	<b>0.6</b> pp	b			Status	pass		
Sensor Componer	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Componer	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Componer	t Inlet Filter Condition	วท	Conditio	on Clean				Status	pass		
Sensor Componer	t Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Componer	t Offset		Conditio	<b>on</b> 0.000				Status	pass		
Sensor Componer	t Span		Conditio	<b>on</b> 1.006				Status	pass		
Sensor Componer	t Cell B Freq.		Conditio	<b>90.4</b>	Hz			Status	pass		
Sensor Componer	t System Memo		Conditio	See c	omments	;		Status	pass		
Sensor Componer	t Sample Train		Conditio	on Good				Status	pass		
Sensor Componer	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Componer	t Cell B Flow		Conditio	on 0.72 I	pm			Status	pass		
Sensor Componer	t Cell A Tmp.		Conditio	on 34.9 (	)			Status	pass		
Sensor Componer	t Cell A Pressure		Conditio	on 692.5	mmHg			Status	pass		
Sensor Componer	t Cell A Noise		Conditio	<b>0.6</b> pp	b			Status	pass		
Sensor Componer	t Cell A Freq.		Conditio	on 89.7 k	Hz			Status	pass		
Sensor Componer	t Cell A Flow		Conditio	on 0.32 l	pm			Status	Fail		
Sensor Componer	t Battery Backup		Conditio	on N/A				Status	pass		
Sensor Componer	t Zero Voltage		Conditio	n N/A				Status	pass		

# Temperature Data Form

Mfg	Serial Number T	'a Site	7	<b>Fechn</b>	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
RM Young	14034	HWF187		Eric H	ebert	09/30	0/2014	Temper	ature	06401	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Sei	rial Number	H232	679	Tf	er Desc. R	٢D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	ppe		1.0049	6 Inte	rcept	-0.2300	)9
Abs Avg Err Ab	s Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		1/8/201	4 Cor	rCoff	1.0000	00
0.14	0.29			L							
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	-0.02	0.21		0.000		0.3	3	С	0.06	
primary Tem	p Mid Range	24.57	24.68	3	0.000		24.	6	С	-0.06	
primary Tem	p High Range	47.90	47.89	)	0.000		48.	2	С	0.29	
Sensor Compone	nt Shield		Condi	ition N	Moderately clea	an		Status	pass		
Sensor Compone	nt Blower		Condi	ition F	Functioning			Status	pass		
Sensor Compone	Blower Status S	Switch	Condi	ition 🛚	N/A			Status	pass		
Sensor Compone	ent System Memo		Condi	ition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>	
Campbell	unknown	HWF187	Eric Hebert	09/30/2014	Shelter Temperatu	renone	
DAS 1: Abs Avg Err A 0.28	1:DAS 2:Avg ErrAbs Max ErAbs Avg ErrAbs Max Er0.280.36		Mfg Serial Number Tfer ID	MfgExtechParametSerial NumberH232679Tfer DesTfer ID01228			
			Slope	1.0049	6 Intercept	-0.23009	
			Cert Date	1/8/201	4 CorrCoff	1.00000	

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.40	22.52	0.000	22.9	С	0.36
primary	Temp Mid Range	22.02	22.14	0.000	22.4	С	0.21

### **Infrastructure Data For**

Site ID	HWF187	Technician Eric H	ebert Site Visit Date 09/30/2014
Shelter N	Make	Shelter Model	Shelter Size
ESF		none	1630 cuft

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

# **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate The filter sample tubing h	HWF187 has drops of mois	Eric Hebert ture in low sections	09/30/2014 outside the she	Moisture Present lter.	Apex	4026		
07070	11WE197	Erric Habort	00/20/2014		Thomas Electron	2269		
This analyzer diagnostic	check is outside t	he manufacturer's r	ecommended va	lue.	InermoElectron	3308		

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The shelter is in good condition.

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Site ID HWF187	Technician Eric Hebert	Site Visit Date 09/3	0/2014				
Site Sponsor (agency)	EPA	USGS Map	Newcomb				
<b>Operating Group</b>	SUNY/ESF	Map Scale					
AQS #	36-031-9991	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, Hg	QAPP Latitude	43.9732				
<b>Deposition Measurement</b>	dry, wet, Hg	QAPP Longitude	-74.2232				
Land Use	woodland - mixed	QAPP Elevation Meters	502				
Terrain	complex	QAPP Declination	14.5				
Conforms to MLM	No	QAPP Declination Date	6/17/2004				
Site Telephone	(518) 582-4800	Audit Latitude	43.973044				
Site Address 1	Adirondack Ecological Center	Audit Longitude	-74.223317				
Site Address 2		Audit Elevation	497				
County	Essex	Audit Declination	-14				
City, State	Newcomb, NY	Present					
Zip Code	12852	Fire Extinguisher 🗹	Inspected Oct 2014				
Time Zone	Eastern	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Step 🗹					
Shelter Working Room	Make ESF M	odel none	Shelter Size 1630 cuft				
Shelter Clean	Notes The shelter is in good condition	٦.					
Site OK	Notes						
Driving Directions From I-87 take exit 29 west to Newcomb. Continue through Newcomb (about 6 miles). Just west of town, turn right (north) at the Adirondack Ecological Center. Continue past the building on the dirt road to the site.							

HWF187

### F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 09/30/2014

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		$\checkmark$
City > 50,000 population	40 km		$\checkmark$
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m		$\checkmark$
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m	20 m	
Obstacles to wind	10 times obstacle height		$\checkmark$

Siting Distances OK

**Siting Criteria Comment** 

Fi	eld Sy	stems Data F	orm		F-02058-1500-S3-rev002			
Site	e ID	HWF187	Technician Eric Hebert		Site Visit Date 09/30/2014			
1	Are win being in	d speed and direction fluenced by obstruction	sensors sited so as to avoid ons?	✓	N/A			
2	Are win (i.e. win horizon tower in	d sensors mounted so d sensors should be m tally extended boom > nto the prevailing wind	as to minimize tower effects? nounted atop the tower or on a -2x the max diameter of the 1)		N/A			
3	Are the	tower and sensors plu	umb?	✓	N/A			
4	Are the avoid ra	temperature shields p adiated heat sources su	oointed north or positioned to 1ch as buildings, walls, etc?					
5	Are tem condition surface standing	perature and RH sen ons? (i.e. ground below and not steeply sloped g water should be avo	sors sited to avoid unnatural y sensors should be natural I. Ridges, hollows, and areas of ided)	✓				
6	Is the so	lar radiation sensor p	lumb?	✓	N/A			
7	Is it site light?	d to avoid shading, or	any artificial or reflected		N/A			
8	Is the ra	ain gauge plumb?		✓	N/A			
9	Is it site towers,	d to avoid sheltering e etc?	ffects from buildings, trees,		N/A			
10	Is the su facing n	urface wetness sensor a orth?	sited with the grid surface	✓	N/A			
11	Is it inc	lined approximately 3	80 degrees?	✓	N/A			
11 Pro	Is it inc	lined approximately 3 additional explanatio	0 degrees? n (photograph or sketch if nec	✓	N/A y) regarding conditions listed above, or any other fea			

## natural or man-made, that may affect the monitoring parameters:

### F-02058-1500-S4-rev002

Site	ID	HWF187	Technician	Eric Hebert		Site Visit Date 09/30/2014
1	Do all th condition	e meterological senso 1, and well maintaine	rs appear to be d?	intact, in good		Temperature only
2	Are all the reporting	ne meteorological sen g data?	sors operational	l online, and		Temperature only
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓	Moderately clean
4	Are the a	spirated motors wor	king?			]
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of	✓	] N/A
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	$\checkmark$	] <mark>N/A</mark>
7	Are the s condition	ensor signal and pow h, and well maintaine	ver cables intact d?	, in good		
8	Are the s from the	ensor signal and pow elements and well ma	ver cable connec aintained?	tions protected		

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002				
Site	e ID	HWF187	Technician	Eric Hebert		Site Visit Date 09/30/2014				
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	oment sited in accordance with 40 CFR 58, Appendix E				
1	Do the s unrestri	sample inlets have at le icted airflow?	ast a 270 degre	e arc of	✓					
2	Are the	sample inlets 3 - 15 me	eters above the	ground?	✓					
3	Are the and 20	sample inlets > 1 mete meters from trees?	r from any maj	or obstruction,						
	Pollutant analyzers and deposition equipment operations and maintenance									
1	Do the a condition	analyzers and equipme on and well maintained	nt appear to be ?	in good	✓					
2	Are the reportin	analyzers and monitor 1g data?	rs operational, o	on-line, and	✓					
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters				
4	Describ	e dry dep sample tube.				3/8 teflon by 12 meters				
5	Are in-l indicate	ine filters used in the o location)	zone sample lin	e? (if yes		At inlet only				
6	Are san obstruc	nple lines clean, free of tions?	kinks, moisture	e, and	✓	Moisture in tubing only				
7	Is the ze	ero air supply desiccan	t unsaturated?		✓					
8	Are the	re moisture traps in th	e sample lines?			Flow line only				
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it		Clean and dry				

Fi	Field Systems Data Form						F	-02058-1	500-S6-rev002
Site	e ID	HWF187	Technician	Eric Hebert		Site Visit I	<b>Date</b> 09/30	)/2014	
	DAS, sei	nsor translators, and j	peripheral equij	pment operation	ns ai	nd maintenance	<u>e</u>		
1	Do the I well mai	OAS instruments appe intained?	ar to be in good	condition and	✓				
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,					
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	gnal leads pass t ?	hrough	✓	Met sensors on	lly		
4	Are the well mai	signal connections pro intained?	otected from the	e weather and					
5	Are the	signal leads connected	to the correct ]	DAS channel?					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter <b>j</b>	properly					
7	Does the	e instrument shelter ha	ave a stable pow	ver source?	✓				
8	Is the in	strument shelter temp	oerature control	led?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounde	d
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?							

Fiel	d Systems Data	a Fo	rm			<b>F-02</b>	2058-	1500-S7-rev002
Site I	<b>D</b> HWF187		Tech	nician Eric I	Hebert Site Visit Date	9/30/2014	4	
<u>Do</u>	<u>cumentation</u>							
Do	es the site have the requ	ired in	<u>strume</u>	nt and equip	oment manuals?			
		Yes	No	N/A		Yes	No	N/A
Wind	speed sensor				Data logger			
Wind	direction sensor			$\checkmark$	Data logger			$\checkmark$
Temp	erature sensor				Strip chart recorder			
Relati	ive humidity sensor			$\checkmark$	Computer			
Solar	radiation sensor			$\checkmark$	Modem		$\checkmark$	
Surfa	ce wetness sensor				Printer			
Wind	sensor translator			$\checkmark$	Zero air pump			
Temp	erature translator			$\checkmark$	Filter flow pump			
Humi	dity sensor translator			$\checkmark$	Surge protector			
Solar	radiation translator			$\checkmark$	UPS		✓	
Tippiı	ng bucket rain gauge			$\checkmark$	Lightning protection device		$\checkmark$	
Ozone	e analyzer	$\checkmark$			Shelter heater			
Filter	pack flow controller	$\checkmark$			Shelter air conditioner		$\checkmark$	
Filter	pack MFC power suppl	ly 🗌						
<u>D</u>	oes the site have the req	uired a	and mo	st recent QC	C documents and report forms?			
		Pres	sent			Curre	ent	
Statio	on Log		✓			$\checkmark$		
SSRF			<ul><li>✓</li></ul>			$\checkmark$		
Site O	)ps Manual			Oct 2001				
HASP	•			Nov 2009		$\checkmark$		
Field	Ops Manual							
Calib	ration Reports		✓			$\checkmark$		
Ozone	e z/s/p Control Charts							
Preve	ntive maintenance schee	dul						
1 I	s the station log proper	ly comp	pleted d	luring every	site visit?  Minimal information			
2 A	Are the Site Status Repo current?	rt Forr	ns bein	g completed	and 🗹			

- **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

#### HWF187 Technician Eric Hebert Site Visit Date 09/30/2014 Site ID Site operation procedures Trained during site installation by ESE employee Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ 4 Are the standard CASTNET operational procedures being flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

QCO	Check	Perf	ormed
-----	-------	------	-------

#### Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	$\checkmark$
Visual Inspections	$\checkmark$	Weekly	✓
Translator Zero/Span Tests (climatronics)		N/A	$\checkmark$
Manual Rain Gauge Test	$\checkmark$	N/A	$\checkmark$
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	$\checkmark$
Test Surface Wetness Response	$\checkmark$	N/A	

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

OC	Check	Performed
VU.	CIICCA	I CITOI IIICU

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

	Frequency	Co
✓	Semiannually	
✓	Daily	
✓	Daily	
✓	Weekly	
✓	Every 2 weeks	
✓	N/A	
✓	Weekly	
✓	N/A	<ul> <li>✓</li> </ul>

- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

	······································
3	Are the automatic and manual z/s/p checks monitored and
	non orte do Tê mar le arro
	reported? If yes, now?

	Unknown	
✓		
✓	SSRF, call-in	

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

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

### mpliant

**Compliant** 

F-02058-1500-S8-rev002

Fi	Field Systems Data Form						F-02058-1500-S9-rev0				
Sit	Site ID HWF187 Tech		Technic	chnician Eric Hebert			Site Visit Date	09/30/2014			
	<u>Site ope</u>	ration procedures									
1	Is the fi	lter pack being changed	every Tu	esda	ay as scheduled	?⊻	Filter changed mori	nings			
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 san	ple flow rates recorded	? How?			✓	SSRF, call-in				
7	Are san fashion	nples sent to the lab on a ?	ı regular s	che	dule in a timely						
8	Are filte and shij	ers protected from conta pping? How?	mination	duı	ring handling	✓	Clean gloves on and off				
9	Are the operation	site conditions reported ons manager or staff?	l regularly	' to	the field						
QC	Check P	erformed	]	Fre	quency			Compliant			
I	Multi-poi	nt MFC Calibrations		Sem	niannually						
J	Flow Syst	em Leak Checks		Nee	ekly						
]	Filter Pac	k Inspection									
Flow Rate Setting Checks					$\checkmark$						
Visual Check of Flow Rate Rotometer			ekly			$\checkmark$					
]	In-line Fil	ter Inspection/Replacen	nent 🗹	Sem	niannually			$\checkmark$			
5	Sample Li	ine Check for Dirt/Wate	er 🗹	Nee	ekly			$\checkmark$			
Dana	do onvo	ditional employation (	hotomon	ha	n alrotah if naaa		) maganding conditi	and listed above a	n any other features		

HWF187

### F-02058-1500-S10-rev002

Site ID	
---------	--

Technician Eric Hebert

Site Visit Date 09/30/2014

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000290
DAS	Campbell	CR3000	2134	000356
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	illegible	illegible	02358
Flow Rate	Apex	AXMC105LPMDPC	illegible	000592
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03579
Modem	Raven	H4223-C	0934393748	06807
Ozone	ThermoElectron Inc	49i A1NAA	1030244790	000681
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200021	000445
Sample Tower	Aluma Tower	В	AT-5107-E-4-12	illegible
Shelter Temperature	Campbell	107-L	unknown	none
Shield (10 meter)	RM Young	Aspirated 43408	none	04676
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	14034	06401
Zero air pump	Teledyne	701H	611	000775

### **APPENDIX B**

**CASTNET Site Spot Report Forms** 

# **EEMS Spot Report**

**Data Compiled:** 1/23/2015 12:39:32 PM

SiteVisitDate	Site	Technician
07/22/2014	ALH157	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99162	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.55984	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.0	%	Р
5	Ozone % difference max	Р	7	10	4	3.0	%	Р

# **EEMS Spot Report**

Data Compiled:

**d:** 5/10/2016 9:43:24 AM

# SiteVisitDateSiteTechnician08/19/2014ANA115Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.20	с	Р
2	Temperature max error	Р	4	0.5	9	0.28	c	Р
3	Ozone Slope	Р	0	1.1	4	0.80101	unitless	Fail
4	Ozone Intercept	Р	0	5	4	2.22814	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	16.0	%	Fail
7	Ozone % difference max	Р	7	10	4	17.9	%	Fail
8	Flow Rate average % difference	Р	10	5	2	2.04	%	Р
9	Flow Rate max % difference	Р	10	5	2	2.04	%	Р
10	DAS Time maximum error	Р	0	5	1	0.05	min	Р
11	DAS Voltage average error	Р	7	0.003	7	0.0000	V	Р

08/19/2014 ANA115

Eric Hebert

# **Field Performance Comments**

 1
 Parameter:
 Flow Rate
 SensorComponent:
 System Memo
 CommentCode
 81

There is no plastic bag for the installed filter. The operator uses the received bag for the installed filter to ship the removed filter to the lab.

2 Parameter: Flow Rate SensorComponent: Moisture Present

CommentCode 72

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

# **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

Gloves were not used to change the filter. It was observed that the dry deposition filter was replaced while the sample pump was running with the sample tower lowered. The filter was changed during a rain storm and water entered the filter and sample lines (flow and ozone). The filter can be exposed and sampling from ground level for up to 30 minutes if the ozone leak check is also performed.

#### 2 Parameter: DasComments

The air conditioner thermostat control is by-passed and the air conditioner is running continuously.

3 Parameter: SitingCriteriaCom

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

4 **Parameter:** ShelterCleanNotes

The shelter is well organized and in fair condition.

5 Parameter: PollAnalyzerCom

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

# **EEMS Spot Report**

Data Compiled:

led: 1/23/2015 1:10:27 PM

SiteVisitDate	Site	Technician
09/24/2014	ANA115	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97366	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.48989	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.6	%	Р
5	Ozone % difference max	Р	7	10	4	2.4	%	Р

## **EEMS Spot Report**

Data Compiled:

5/10/2016 5:35:03 PM

# SiteVisitDateSiteTechnician09/25/2014ARE128Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.19	с	Р
2	Temperature max error	Р	4	0.5	9	0.24	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99159	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.17333	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.0	%	Р
7	Ozone % difference max	Р	7	10	4	1.8	%	Р
8	Flow Rate average % difference	Р	10	5	4	0.22	%	Р
9	Flow Rate max % difference	Р	10	5	4	0.67	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0000	V	Р

# **Field Systems Comments**

1 Parameter: DasComments

The meteorological tower is grounded but the lightning rod has been removed. The sample tower is not grounded.

2 Parameter: SitingCriteriaCom

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

3 Parameter: MetOpMaintCom

The 10-meter temperature sensor is being operated and maintained on the meteorological tower.
**Data Compiled:** 1/23/2015 12:34:36 PM

SiteVisitDate Site Technician

07/17/2	2014 BAS601	Eric Hebert						
Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96978	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.45325	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.0	%	Р
5	Ozone % difference max	Р	7	10	4	2.9	%	Р

# **Field Performance Comments**

1	Parameter:	Ozone	SensorComponent:	Cell B Freq.	CommentCode	99						
	This analyzer diagnostic check is outside the manufacturer's recommended value.											
2	Parameter:	Ozone	SensorComponent:	Cell A Freq.	CommentCode	99						
	This analyzer diagnostic check is outside the manufacturer's recommended value.											
3	Parameter:	Ozone	SensorComponent:	Cell A Tmp.	CommentCode	99						
	70°1' 1			1 1 1								

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

Data Compiled:

ed: 1/23/2015 1:08:34 PM

SiteVisitDate	Site	Technician
09/20/2014	BVL130	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96651	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.76544	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.0	%	Р
5	Ozone % difference max	Р	7	10	4	2.7	%	Р

3 Flow Rate average % difference

4 Flow Rate max % difference

**Data Compiled:** 5/11/2016 6:12:47 PM

SiteV	isitDate	Site		Technician						
09/26/2014		CAT175		Eric Hebert						
Line	Audited	l Parameter		DAS	Ch. #	Criteria +/-				
1	Temperat	ure average error		Р	4	0.5				
2	Temperat	ure max error		Р	4	0.5				

# **Field Performance Comments**

1 Parameter: Flow Rate

Р

Р

10

10

SensorComponent: Filter Position

CommentCode 71

**Counts QaResult** 

0.06

0.11

3.21

3.21

12

12

2

2

5

5

Units

с

с

%

%

Pass/Fail

Р

Р

Р

Р

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**

#### Parameter: SiteOpsProcComm 1

The site operator was not available to meet with the auditor during the audit visit due to a personal family matter. Audit information was obtained from review of the site documentation.

2 **Parameter:** DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered.

3 Parameter: ShelterCleanNotes

The shelter is neat and clean. The vegetation has been allowed to grow. The shelter roof has been repaired.

Parameter: PollAnalyzerCom 4

Ozone monitoring is no longer being conducted at the site.

Data Compiled:

iled: 2/9/2015 12:25:52 PM

SiteVisitDate	Site	Technician
08/23/2014	CNT169	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99705	unitless	Р
2	Ozone Intercept	Р	0	5	4	-1.82502	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.8	%	Р
5	Ozone % difference max	Р	7	10	4	6.3	%	Р

Data Compiled:

5/10/2016 5:06:26 PM

# SiteVisitDateSiteTechnician09/05/2014CTH110Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.11	с	Р
2	Temperature max error	Р	4	0.5	9	0.22	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97108	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.71838	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.5	%	Р
7	Ozone % difference max	Р	7	10	4	2.3	%	Р
8	Flow Rate average % difference	Р	10	5	4	0.22	%	Р
9	Flow Rate max % difference	Р	10	5	4	0.67	%	Р
10	DAS Time maximum error	Р	0	5	1	0.05	min	Р
11	DAS Voltage average error	Р	7	0.003	35	0.0003	V	Р

### **Field Performance Comments**

1	Parameter:	Flow Rate	SensorComponent:	Moisture Present	CommentCode	70
	A 1411- 41	.1	: 4 G 1 4 : .		· · · , ,	

Although there currently is no moisture in the flow sample train, there is evidence of previous moisture events.

## **Field Systems Comments**

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions.

**Data Compiled:** 

12

13

14

DAS Voltage average error

Shelter Temperature average error

Shelter Temperature max error

7/31/2015 8:15:06 PM

#### SiteVisitDate Site Technician 07/15/2014 DIN431 Eric Hebert

Line Audited Parameter DAS Criteria +/- Counts QaResult Ch. # Units Temperature average error Р 4 0.5 3 0.44 1 Р 4 0.5 3 0.54 2 Temperature max error 3 Ozone Slope Р 0 1.1 4 0.99366 unitless Ozone Intercept Р 0 5 ppb 4 4 0.33934 Ozone correlation 0.995 4 Р 0 0.99996 5 unitless 6 Ozone % difference avg Р 7 10 4 0.9 7 Ozone % difference max Р 7 10 4 2.4 8 Flow Rate average % difference Р 9 5 8 0.24 9 Flow Rate max % difference Р 9 5 8 0.28 5 10 DAS Time maximum error Р 0 1 1.25 min DAS Voltage average error Р 9 0.003 42 0.0002 11

Р

Р

Р

2

5

5

0.003

1

1

42

3

3

0.0002

0.23

0.49

Pass/Fail

Р

Fail

Р

Р

Р

Р

Р

Р

Р

Р

Р

Р

Р

Р

с

с

%

%

%

%

V

V

с

с

07/15/2014 DIN431

Technician

Eric Hebert

#### **Field Performance Comments**

1 Parameter: Temperature SensorComponent: System Memo

CommentCode 141

The temperature sensor is mounted directly above the shelter roof.

### **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

The site operator was observed to lower the sample tower and replace the filter pack with the sample pump running and the channel marked as valid. Although gloves were used to handle the filter, they were kept in a pants pocket until needed and many items were touched between handling the filters. The operator was not completely familiar with the CASTNET procedures.

2 **Parameter:** DasComments

All sensors, filter pack, and ozone sample inlet are on a single, crank-down tower.

#### 3 Parameter: SiteOpsProcedures

The site operator is not responsible for manual zero/span/precision checks of the ozone analyzer.

#### 4 Parameter: DocumentationCo

There is very little documentation of onsite activities. No manual entries in Dataview. The COC section of the SSRF is not being used.

5 Parameter: SitingCriteriaCom

A small parking lot for park service employees is located approximately 40 meters north of the site.

6 Parameter: ShelterCleanNotes

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

7 Parameter: MetSensorComme

The ambient temperature sensor is mounted approximately 8 meters from the ground and above the shelter roof.

**Data Compiled:** 

5/10/2016 4:26:35 PM

<b>SiteVisitDate</b> 08/28/2014		Site	Technician				
		EGB181	Eric Hebert	Hebert			
Line	Audited	d Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult
1	Temperat	ure average error	Р	4	0.5	9	0.06
2	Temperat	ure max error	Р	4	0.5	9	0.08
3	Flow Rat	e average % difference	Р	10	5	3	2.41

-		-	-		-		-	_
2	Temperature max error	Р	4	0.5	9	0.08	с	Р
3	Flow Rate average % difference	Р	10	5	3	2.41	%	Р
4	Flow Rate max % difference	Р	10	5	3	2.63	%	Р
5	DAS Time maximum error	Р	0	5	1	1.33	min	Р
6	DAS Voltage average error	Р	7	0.003	21	0.0002	V	Р

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

Filters are sent 4 at a time and stored in a refrigerator before and after sampling prior to shipment to the lab.

#### 2 **Parameter:** DasComments

The sample tower is badly damaged at the hinge point and should be replaced.

#### Parameter: DocumentationCo 3

The site operator no longer uses the station logbook during routine site visits.

Parameter: ShelterCleanNotes 4

The shelter is provided by the Center for Atmospheric Research and is clean, organized, and spacious.

#### 5 Parameter: PollAnalyzerCom

Ozone concentration is not measured at EGB181 as part of CASTNET.

Units

С

Pass/Fail

Р

20 Flow Rate max % difference

5/10/2016 3:29:09 PM

Data Compiled:

SiteV	/isitDate	Site	Tech	nician						
07/21/2	2014	FOR605	Eric H	ebert						
Line	Audited	d Parameter		DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Spo	eed average error below 5m	/s in m/s	Р	3	0.5	4	0.07	m/s	Р
2	Wind Spo	eed max error below 5m/s in	n m/s	Р	3	0.5	4	0.17	m/s	Р
3	Wind Spo	eed average % difference at	oove 5 m/s	Р	3	5	4	0.6	%	Р
4	Wind Spo	eed max % difference above	e 5 m/s	Р	3	5	4	1.3	%	Р
5	Wind Spo	eed Torque average error		Р	3	0.5	1	0.00	g-cm	Р
6	Wind Spo	eed Torque max error		Р	3	0.5	1	0.0	g-cm	Р
7	Wind Di	ection Input Deg True aver	age error (de	Р	2	5	8	3.5	degrees	Р
8	Wind Di	ection Input Deg True max	error (deg)	Р	2	5	8	5	degrees	Р
9	Temperat	ure average error		Р	4	0.5	3	0.67	с	Fail
10	Temperat	ure max error		Р	4	0.5	3	1.45	с	Fail
11	Relative	Humidity average above 85	%	Р	6	10	1	6.5	%	Р
12	Relative	Humidity max above 85%		Р	6	10	1	6.5	%	Р
13	Relative	Humidity average below 85	%	Р	6	10	2	3.5	%	Р
14	Relative	Humidity max below 85%		Р	6	10	2	4.7	%	Р
15	Solar Rad	liation % diff of avg		Р	9	10	2	2.29	%	Р
16	Solar Rad	liation % diff of max STD	value	Р	9	10	2	1.7	%	Р
17	Precipitat	tion average % difference		Р	1	10	2	9.7	%	Р
18	Precipitat	tion max % difference		Р	1	10	2	10.3	%	Fail
19	Flow Rat	e average % difference		Р	10	5	2	6.56	%	Fail

Р

10

5

2

6.82

%

Fail

07/21/2014 FOR605

#### Eric Hebert

### **Field Performance Comments**

1	Parameter:	Flow Rate	SensorComponent:	System Memo	CommentCode	174
	Additional det	ails can be found in the h	ardcopy of the site audit r	eport.		
2	Parameter:	Temperature	SensorComponent:	System Memo	CommentCode	174

Additional details can be found in the hardcopy of the site audit report.

### **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The dry deposition sample height is approximately 6 meters and not 10 meters.

2 **Parameter:** DocumentationCo

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office.

3 Parameter: SitingCriteriaCom

The site is located in a wellfield with oil and gas operations nearby.

4 **Parameter:** ShelterCleanNotes

This is a small footprint site with instruments mounted in enclosure on tripod tower.

5 **Parameter:** MetOpMaintCom

The temperature and relative humidity sensor is a combination sensor which cannot be submersed making it difficult to audit throughout a range of temperatures.

Data Compiled:

2/9/2015 11:17:01 AM

SiteVisitDate	Site	Technician
08/23/2014	GLR468	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98527	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.12602	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.4	%	Р
5	Ozone % difference max	Р	7	10	4	1.7	%	Р

Data Compiled:

led: 2/9/2015 12:10:28 PM

SiteVisitDate	Site	Technician
08/21/2014	GTH161	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.95395	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.665	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99984	unitless	Р
4	Ozone % difference avg	Р	7	10	4	5.3	%	Р
5	Ozone % difference max	Р	7	10	4	6.3	%	Р

Data Compiled:

5/10/2016 9:46:36 AM

# SiteVisitDateSiteTechnician08/25/2014HOX148Eric Hebert

l ine	Audited Parameter	DAS	Ch #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
LIIIC		DAO	<b>U</b> II. <i>n</i>		oounts	QuiteSuit	Onito	1 455/1 411
1	Temperature average error	Р	4	0.5	6	0.11	с	Р
2	Temperature max error	Р	4	0.5	6	0.18	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97404	unitless	Р
4	Ozone Intercept	Р	0	5	4	1.20525	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.4	%	Р
7	Ozone % difference max	Р	7	10	4	2.2	%	Р
8	Flow Rate average % difference	Р	10	5	4	0.67	%	Р
9	Flow Rate max % difference	Р	10	5	4	0.67	%	Р
10	DAS Time maximum error	Р	0	5	1	0.75	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р

08/25/2014 HOX148

## **Field Performance Comments**

1Parameter:Flow RateSensorComponent:Moisture PresentCommentCode70

Although there currently is no moisture in the flow sample train, there is evidence of previous moisture events.

2 Parameter: Shelter Temperatur SensorComponent: System Memo CommentCode 215

The shelter thermostat for cooling has been bypassed and the air conditioning system is no longer being controlled by the shelter thermostat.

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

The ozone analyzer sample train is leak-checked every two weeks.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is clean, neat, well organized.

4 Parameter: MetSensorComme

Met tower and 10 meter temperature operating and audited.

Data Compiled:

d: 5/11/2016 5:25:56 PM

# SiteVisitDateSiteTechnician09/30/2014HWF187Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.14	с	Р
2	Temperature max error	Р	4	0.5	12	0.29	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97152	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.17924	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.2	%	Р
7	Ozone % difference max	Р	7	10	4	3.4	%	Р
8	Flow Rate average % difference	Р	10	5	2	1.12	%	Р
9	Flow Rate max % difference	Р	10	5	2	1.35	%	Р
10	DAS Time maximum error	Р	0	5	1	0.25	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0002	V	Р

## **Field Performance Comments**

1	Parameter:	Flow Rate	SensorComponent:	Moisture Present	CommentCode	72
	The filter samp	ble tubing has drops of m	oisture in low sections out	side the shelter.		
2	Parameter:	Ozone	SensorComponent:	Cell A Flow	CommentCode	99

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

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

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

#### 2 Parameter: ShelterCleanNotes

The shelter is in good condition.

Data Compiled:

5/10/2016 6:09:55 PM

# SiteVisitDateSiteTechnician09/23/2014KEF112Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.18	c	Р
2	Temperature max error	Р	4	0.5	9	0.37	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00924	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.71974	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99968	unitless	Р
6	Ozone % difference avg	Р	7	10	4	3.5	%	Р
7	Ozone % difference max	Р	7	10	4	8.0	%	Р
8	Flow Rate average % difference	Р	10	5	3	1.54	%	Р
9	Flow Rate max % difference	Р	10	5	3	1.97	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

2 **Parameter:** SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

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

#### 4 Parameter: PollAnalyzerCom

The MFC was observed to fluctuate from 1.4 to 1.6 lpm. Trees to the east are within 20 meters of the ozone inlet.

5 Parameter: MetSensorComme

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

 Data Compiled:
 1/27/2015 6:24:16 PM

SiteVisitDate	Site	Technician
09/19/2014	LRL117	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
								_
1	Ozone Slope	Р	0	1.1	4	0.99928	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.45197	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	2.0	%	Р

Data Compiled: 5

d: 5/11/2016 1:01:23 PM

# SiteVisitDateSiteTechnician09/20/2014MKG113Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.09	c	Р
2	Temperature max error	Р	4	0.5	9	0.19	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00307	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.04993	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.3	%	Р
7	Ozone % difference max	Р	7	10	4	0.6	%	Р
8	Flow Rate average % difference	Р	10	5	2	0.66	%	Р
9	Flow Rate max % difference	Р	10	5	2	0.66	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р

## **Field Performance Comments**

1	Parameter:	Ozone	SensorComponent:	Cell A Flow	CommentCode	99
	This analyzer d	lingpostic check is outsid	a the manufacturar's raco	nmandad valua		

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

## **Field Systems Comments**

1 Parameter: ShelterCleanNotes

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

2 Parameter: MetOpMaintCom

The temperature shield forced-air blower has a loose connection and the operation is intermittent.

**Data Compiled:** 1/23/2015 12:53:57 PM

SiteVisitDate	Site	Technician
07/22/2014	NEC602	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96496	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.39273	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.5	%	Р
5	Ozone % difference max	Р	7	10	4	3.5	%	Р

Data Compiled: 1/23/2015 12:32:41 PM

SiteVisitDate	Site	Technician
07/16/2014	PND165	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97661	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.15722	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.1	%	Р
5	Ozone % difference max	Р	7	10	4	2.6	%	Р

Data Compiled:

1/23/2015 1:07:01 PM

SiteVisitDate	Site	Technician
09/10/2014	PRK134	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97063	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.08659	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.1	%	Р
5	Ozone % difference max	Р	7	10	4	3.3	%	Р

Data Compiled:

5/11/2016 1:26:54 PM

# SiteVisitDateSiteTechnician09/23/2014PSU106Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.17	с	Р
2	Temperature max error	Р	4	0.5	12	0.35	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99612	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.5623	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99986	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.6	%	Р
7	Ozone % difference max	Р	7	10	4	2.5	%	Р
8	Flow Rate average % difference	Р	10	5	3	0.66	%	Р
9	Flow Rate max % difference	Р	10	5	3	0.66	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р

# **Field Systems Comments**

1 Parameter: DasComments

The meteorological tower has been removed.

#### 2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

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

4 Parameter: MetOpMaintCom

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

Data Compiled: 5/11/2016 2:19:04 PM

isitDate	Site	Technician						
2014	RED004	Alison Ray						
Audited	Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
Flow Rate	e average % difference	Р	10	5	2	0.99	%	Р
Flow Rate	e max % difference	Р	10	5	2	0.99	%	Р
	isitDate 2014 Audited Flow Rate	isitDate     Site       2014     RED004       Audited     Parameter       Flow Rate     average % difference       Flow Rate     max % difference	isitDateSiteTechnician2014RED004Alison RayAuditedParameterDASFlow Rateaverage % differencePFlow Ratewax % differenceP	isitDateSiteTechnician2014RED004Alison RayAudited ParameterDASCh. #Flow Rate average % differenceP10Flow Rate max % differenceP10	isitDate     Site     Technician       2014     RED004     Alison Ray       Audited     Parameter     DAS     Ch. #     Criteria +/-       Flow Rate     average % difference     P     10     5       Flow Rate     was % difference     P     10     5	isitDateSiteTechnician2014RED004Alison RayAudited ParameterDASCh. #Criteria +/-CountsFlow Rateaverage % differenceP1052Flow Ratewas % differenceP1052	isitDate       Site       Technician         2014       RED004       Alison Ray         Audited Parameter       DAS       Ch. #       Criteria +/-       Counts       QaResult         Flow Rate average % difference       P       10       5       2       0.99         Flow Rate max % difference       P       10       5       2       0.99	isitDateSiteTechnician2014RED004Alison RayAudited ParameterDASCh. #Criteria +/-CountsQaResultUnitsFlow Rate average % differenceP10520.99%Flow Rate way & differenceP10520.99%

# **Field Systems Comments**

#### Parameter: DocumentationCo 1

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

#### Parameter: ShelterCleanNotes 2

Small footprint site with enclosure for instruments only.

Data Compiled: 1/23/2015 12:59:15 PM

SiteVisitDate		Site	Technicia	n								
08/16/2014		ROM206	Eric Hebert	Eric Hebert								
Line	Audited	l Parameter	DAS	6 Ch.#	Criteria +/-	Counts	QaResult	Units				
1	Ozone Sle	ope	Р	0	1.1	4	0.99749	unitless				
2	Ozone Int	tercept	Р	0	5	4	1.26437	ppb				
3	Ozone co	rrelation	Р	0	0.995	4	1.00000	unitless				
4	Ozone %	difference avg	Р	7	10	4	2.4	%				
5	Ozone %	difference max	Р	7	10	4	4.9	%				

## **Field Performance Comments**

1Parameter:OzoneSensorComponent:Cell B FlowCommentCode99

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

Pass/Fail

P P P P

Data Compiled:

iled: 1/23/2015 1:01:10 PM

SiteVisitDate	Site	Technician			
08/16/2014	ROM406	Eric Hebert			

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97262	unitless	Р
2	Ozone Intercept	Р	0	5	4	1.35157	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.5	%	Р
5	Ozone % difference max	Р	7	10	4	3.0	%	Р

**Data Compiled:** 

5/10/2016 10:14:19 AM

#### SiteVisitDate Site Technician 07/19/2014 SAL133 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.10	с	Р
2	Temperature max error	Р	4	0.5	3	0.18	с	Р
3	Ozone Slope	Р	0	1.1	4	1.01925	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.3512	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.4	%	Р
7	Ozone % difference max	Р	7	10	4	1.6	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.12	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.35	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0001	V	Р

# **Field Systems Comments**

1 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

There is evidence of a leak in the shelter roof, and the condition has deteriorated since the previous audit visit. Only one light is working. There are signs of ants in the shelter.

**Data Compiled:** 1/23/2015 12:37:02 PM

SiteVisitDate	Site	Technician
07/21/2014	STK138	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00334	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.41983	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	2.1	%	Р

Data Compiled: 2/

iled: 2/9/2015 12:11:08 PM

SiteVisitDate	Site	Technician
08/25/2014	THR422	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01485	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.46186	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.2	%	Р
5	Ozone % difference max	Р	7	10	4	2.9	%	Р

Data Compiled:

5/5/2016 3:41:21 PM

# SiteVisitDateSiteTechnician08/26/2014UVL124Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
			••••	••••••			••••••	
1	Temperature average error	Р	4	0.5	9	0.08	с	Р
2	Temperature max error	Р	4	0.5	9	0.11	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99192	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.80640	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.9	%	Р
7	Ozone % difference max	Р	7	10	4	2.2	%	Р
8	Flow Rate average % difference	Р	10	5	2	0.67	%	Р
9	Flow Rate max % difference	Р	10	5	2	0.67	%	Р
10	DAS Time maximum error	Р	0	5	1	0.02	min	Р
11	DAS Voltage average error	Р	7	0.003	42	0.0002	V	Р

08/26/2014 UVL124

Technician Eric Hebert

# **Field Performance Comments**

 1
 Parameter:
 Flow Rate
 SensorComponent:
 Moisture Present
 CommentCode
 70

Although there currently is no moisture in the flow sample train, there is evidence of previous moisture events.

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

Ozone sample train leak-check performed every two weeks.

#### 2 Parameter: DocumentationCo

The ozone diagnostic and observation sections of the SSRF were completed during the filter removal visit and not the installation visit as indicated on the form.

#### 3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

The shelter is clean and in good condition.

5 Parameter: MetOpMaintCom

Met tower and 10 meter temperature operating and audited.

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SiteVisitDate	Site	Technician
07/23/2014	VIN140	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99454	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.34110	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.7	%	Р
5	Ozone % difference max	Р	7	10	4	1.6	%	Р

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SiteVisitDate	Site	Technician
09/08/2014	VOY413	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98467	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.48500	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.1	%	Р

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SiteVisitDate		Site	Technician								
07/23/2014		WNC429	Eric Hebert								
Line	Audited	l Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units			
1	Ozone Sl	ope	Р	0	1.1	4	0.95292	unitless			
2	Ozone In	tercept	Р	0	5	4	0.08442	ppb			
3	Ozone co	rrelation	Р	0	0.995	4	0.99995	unitless			
4	Ozone %	difference avg	Р	7	10	4	4.3	%			
5	Ozone %	difference max	Р	7	10	4	4.8	%			

# **Field Performance Comments**

1	Parameter:	Ozone	SensorComponent:	Cell B Freq.	CommentCode	99			
	This analyzer of	liagnostic check is outsid	le the manufacturer's recor	nmended value.					
2	Parameter:	Ozone	SensorComponent:	Cell A Freq.	CommentCode	99			
	This analyzer diagnostic check is outside the manufacturer's recommended value.								

Page 1 of 1

Pass/Fail P P P P P P

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SiteVisitDate	Site	Technician			
08/24/2014	YEL408	Sandy Grenville			

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99470	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.81971	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	1.6	%	Р

#### **APPENDIX C**

**CASTNET Ozone Performance Evaluation Forms** 

Data Compiled: 1/23/2015 12:32:41 PM

SiteVisitDate	Site	Technician			
07/16/2014	PND165	Eric Hebert			

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail				
1	Ozone Slope	Р	0	1.1	4	0.97661	unitless	Р				
2	Ozone Intercept	Р	0	5	4	0.15722	ppb	Р				
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р				
4	Ozone % difference avg	Р	7	10	4	2.1	%	Р				
5	Ozone % difference max	Р	7	10	4	2.6	%	Р				
Mfg	Se	rial Number Ta	Site	Те	chnician		Site Visit	t Date	Parame	ter	Owner I	D
-------------------	--------	-----------------------	-------------------	---------	-----------------	--------	-----------------	----------	---------------	-----------	--------------	--------
ThermoElectron In	c 10	009241791	PND165	E	ric Hebert	:	07/16/20	)14	Ozone		000619	
Slope:	0.97	7661 <b>Slope:</b>	0.0000	0	Mfg		ThermoE	lectron	Inc Pa	rameter	zone	
Intercept	0.1	5722 Intercept	0.0000	0	Serial N	lumber	49CPS-7	0008-36	64 <b>Tfe</b>	er Desc.	zone primary	y stan
CorrCoff	0.99	0998 CorrCoff	0.0000	0	Tfer ID		01110					
DAS 1:		<b>DAS 2:</b>			Slope			1.00707	7 Inter	cept	-0.21	032
A Avg % Diff: A	Max	x % Di A Avg %	<b>6Dif</b> A Max	% Di	Cert De	nte		1/8/2014	4 Corr	- Coff	1.00	000
2.1%		2.6%										
UseDescription	n:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary		1	0.28	0.	48	0.0	58 1	ppb				
primary		2	31.20	31	.18	30.	38 j	ppb			-2.57%	
primary		3	49.31	49	.17	48.	51 j	ppb			-1.34%	
primary		4	104.20	/0	.94	/5.	$\frac{03}{60}$	ppo			-2.48%	
prinary	. 1	<u> </u>	104.29	10.	5.70	101	.00 ]	ppo	~ [		-2.0870	
Sensor Compon	ient _	Cell B Noise		Conditi	on 0.5 pp	ac			Status	pass		
Sensor Compon	ent	Cell B Tmp.		Conditi	on				Status	pass		
Sensor Compon	ent	Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Compon	ent	Inlet Filter Conditio	n	Conditi	on Clean	l			Status	pass		
Sensor Compon	ent	Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Compon	ent	Offset		Conditi	on -0.60				Status	pass		
Sensor Compon	ent	Span		Conditi	on 1.033				Status	pass		
Sensor Compon	ent	Cell B Freq.		Conditi	on 94.5 k	κHz			Status	pass		
Sensor Compon	ent	System Memo		Conditi	on				Status	pass		
Sensor Compon	ent	Sample Train		Conditi	on Good				Status	pass		
Sensor Compon	ent	Cell B Pressure		Conditi	on				Status	pass		
Sensor Compon	ent	Cell B Flow		Conditi	on 0.62 l	pm			Status	pass		
Sensor Compon	ent	Cell A Tmp.		Conditi	on 34.9 (	2			Status	pass		
Sensor Compon	ent	Cell A Pressure		Conditi	on 562 m	nmHg			Status	pass		
Sensor Compon	ent	Cell A Noise		Conditi	on 0.6 pp	b			Status	pass		
Sensor Compon	ent	Cell A Freq.		Conditi	<b>on</b> 100.4	kHz			Status	pass		
Sensor Compon	ent	Cell A Flow		Conditi	on 0.62 l	pm			Status	pass		
Sensor Compon	ent	Battery Backup		Conditi	on N/A				Status	pass		
Sensor Compon	ent	Zero Voltage		Conditi	on N/A				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
PND	165-Eric H	lebert-07/16/2014				
1	7/16/2014	DAS	Campbell	000403	CR3000	2516
2	7/16/2014	Modem	Raven	06474	H4222-C	0808311240
3	7/16/2014	Ozone	ThermoElectron Inc	000619	49i A1NAA	1009241791
4	7/16/2014	Ozone Standard	ThermoElectron Inc	000329	49i A3NAA	0622717853
5	7/16/2014	Sample Tower	Aluma Tower	000055	В	AT-81213-J12
6	7/16/2014	Zero air pump	Werther International	06926	PC70/4	000836218

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SiteVisitDate Site Technician

07/17/2	2014 BAS601	Eric Hebert						
Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96978	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.45325	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.0	%	Р
5	Ozone % difference max	Р	7	10	4	2.9	%	Р

## **Field Performance Comments**

1	Parameter:	Ozone	SensorComponent:	Cell B Freq.	CommentCode	99
	This analyzer of	liagnostic check is outsid	le the manufacturer's recor	nmended value.		
2	Parameter:	Ozone	SensorComponent:	Cell A Freq.	CommentCode	99
	This analyzer of	liagnostic check is outsid	le the manufacturer's recor	nmended value.		
3	Parameter:	Ozone	SensorComponent:	Cell A Tmp.	CommentCode	99
	70°1' 1			1 1 1		

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

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner ]	D
ThermoElectron Inc	1214552973	BAS601	Er	ric Hebert		07/17/20	014	Ozone		L053468	4
Slope: C Intercept C CorrCoff C	0.96978       Slope:         0.45325       Intercept         0.99997       CorrCoff	0.00000	D D D	Mfg Serial N	lumber	ThermoE 49CPS-7	Electron 70008-36	Inc Pa 64 Tfe	rameter o er Desc. C	ozone Dzone primar	y stan
DAS 1: A Avg % Diff: A M 2.0%	DAS 2: Iax % Di A Avg % 2.9%	6Dif A Max	% Di	Slope Cert Da	ıte		1.00707 1/8/2014	7 Inter 4 Corr	cept Coff	-0.2	1032 )000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.04	0.2	24	0.4	46	ppb	emt.	10021		
primary	2	25.63	25.	.65	25.	.19	ppb			-1.79%	
primary	3	48.59	48.	.45	47.	.83	ppb			-1.28%	
primary	4	79.40	79.	.05	77.	.45	ppb			-2.02%	
primary	5	116.11	115	5.50	112	.10	ppb			-2.94%	
Sensor Componer	nt Cell B Noise		Conditio	on 0.5 pp	b			Status	pass		
Sensor Componer	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Componer	t Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Componer	1t Inlet Filter Condition	งท	Conditio	on Clean				Status	pass		
Sensor Componer	t Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Componer	1t Offset		Conditio	on -0.2				Status	pass		
Sensor Componer	1t Span		Conditio	on 1.030				Status	pass		
Sensor Componer	t Cell B Freq.		Conditio	on 56.7 k	Hz			Status	pass		
Sensor Componer	t System Memo		Conditio	on See c	omments			Status	pass		
Sensor Componer	t Sample Train		Conditio	on Good				Status	pass		
Sensor Componer	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Componer	t Cell B Flow		Conditio	on 0.68 l	om			Status	pass		
Sensor Componer	t Cell A Tmp.		Conditio	on 46.4 (	)			Status	fail		
Sensor Componer	t Cell A Pressure		Conditio	on 643 m	mHg			Status	pass		
Sensor Componer	t Cell A Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Componer	t Cell A Freq.		Conditio	on 52.7 k	Hz			Status	fail		
Sensor Componer	t Cell A Flow		Conditio	on 0.65 l	om			Status	pass		
Sensor Componen	t Battery Backup		Conditio	on N/A				Status	pass		
Sensor Componer	t Zero Voltage		Conditio	on N/A				Status	pass		

### **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone This analyzer diagnostic	BAS601 check is outside	Eric Hebert the manufacturer's	07/17/2014 recommended v	Cell B Freq. /alue.	ThermoElectron	3802		
Ozone This analyzer diagnostic	BAS601 check is outside	Eric Hebert the manufacturer's	07/17/2014 recommended v	Cell A Freq. value.	ThermoElectron	3802		
Ozone This analyzer diagnostic	BAS601 check is outside	Eric Hebert the manufacturer's	07/17/2014 recommended v	Cell A Tmp.	ThermoElectron	3802		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
BAS6	601-Eric H	ebert-07/17/2014				
1	7/17/2014	DAS	Campbell	none	CR1000	unknown1
2	7/17/2014	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
3	7/17/2014	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971
4	7/17/2014	Zero air pump	Thomas	none	107CAB18	100800031636

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SiteVisitDate	Site	Technician
07/21/2014	STK138	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00334	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.41983	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	2.1	%	Р

Mfg	Serial Number Ta	Site	Тес	chnician		Site Visi	it Date	Parame	ter	Owner ]	D
ThermoElectron Inc	1105347321	STK138	Sa	ndy Grei	nville	07/21/20	014	Ozone		000743	
Slope: Intercept CorrCoff	1.00334       Slope:         0.41983       Intercept         1.00000       CorrCoff	0.0000	0	Mfg Serial N	lumber	ThermoE 49C-731	Electron	Inc Par	rameter 02 er Desc. 0	zone zone transfe	>r
				Tfer ID		01100					
DAS 1:	DAS 2:		0( )	Slope			1.00458	3 Inter	cept	-0.1	1484
A Avg % Diff: A N 1.2%	1ax % Di       A Avg %         2.1%	<b>6Dif</b> A Max	% Di	Cert Da	ite	12	2/10/2013	B Corr	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDif	ference:	
primary	1	0.55	0.6	6	1.(	)5	ppb				
primary	2	30.41	30.	38	31.	02	ppb			2.11%	
primary	3	50.13	50.	01	50.	54	ppb			1.06%	
primary	4	80.79	80.	53	81.	10	ppb			0.71%	
primary	5	99.60	99.	26	100	.10	ppb			0.85%	
Sensor Componen	nt Cell B Noise		Conditio	<b>n</b> 0.8 pp	b			Status	pass		
Sensor Componer	nt Cell B Tmp.		Conditio	n				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	n Clean				Status	pass		
Sensor Compone	nt Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Componer	nt Offset		Conditio	<b>n</b> -0.50				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 0.997				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	<b>n</b> 92.1 k	Hz			Status	pass		
Sensor Compone	nt System Memo		Conditio	n				Status	pass		
Sensor Compone	nt Sample Train		Conditio	n Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	n				Status	pass		
Sensor Compone	nt Cell B Flow		Conditio	<b>n</b> 0.67 l	pm			Status	pass		
Sensor Componer	nt Cell A Tmp.		Conditio	<b>n</b> 35.0 0	)			Status	pass		
Sensor Componer	nt Cell A Pressure		Conditio	<b>n</b> 709 m	nmHg			Status	pass		
Sensor Componer	nt Cell A Noise		Conditio	<b>n</b> 0.7 pp	b			Status	pass		
Sensor Componen	Cell A Freq.		Conditio	<b>n</b> 91.5 k	κHz			Status	pass		
Sensor Componen	t Cell A Flow		Conditio	<b>n</b> 0.70 l	pm			Status	pass		
Sensor Componen	nt Battery Backup		Conditio	N/A				Status	pass		
Sensor Componen	nt Zero Voltage		Conditio	N/A				Status	pass		

Site \	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
STK	138-Sandy	Grenville-07/21/2014				
1	7/21/2014	DAS	Campbell	000349	CR3000	2128
2	7/21/2014	Modem	Raven	06603	H4223-C	0844356279
3	7/21/2014	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
4	7/21/2014	Ozone Standard	ThermoElectron Inc	000450	49i A3NAA	CM08200026
5	7/21/2014	Sample Tower	Aluma Tower	03554	A	none
6	7/21/2014	Zero air pump	Werther International	06915	C 70/4	000829162

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SiteVisitDate	Site	Technician
07/22/2014	ALH157	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99162	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.55984	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99994	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.0	%	Р
5	Ozone % difference max	Р	7	10	4	3.0	%	Р

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner ]	D
ThermoElectron Inc	1030244798	ALH157	Sa	indy Grei	nville	07/22/20	014	Ozone		000683	
Slope: 0 Intercept 0 CorrCoff 0	D.99162       Slope:         D.55984       Intercept         D.99994       CorrCoff	0.0000	0	Mfg Serial N	umber	ThermoE 49C-731	Electron	Inc Par	rameter 02 er Desc. 0	zone zone transfe	)r
			_	Tfer ID		01100					
DAS 1:	<b>DAS 2:</b>			Slope			1.00458	B Inter	cept	-0.1	1484
A Avg % Diff: A N 1.0%	Iax % Di       A Avg %         3.0%	6Dif A Max	% Di	Cert Da	ite	12	2/10/2013	3 Corr	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDif	ference:	
primary	1	0.24	0.3	35	0.6	57	ppb				
primary	2	30.05	30.	02	30.	91	ppb			2.96%	
primary	3	50.03	49.	91	49.	93	ppb			0.04%	
primary	4	81.22	80.	96	80.	30	ppb			-0.82%	
primary	5	102.64	102	.28	102	.30	ppb			0.02%	
Sensor Compone	nt Cell B Noise		Conditio	<b>n</b> 0.6 pp	b			Status	pass		
Sensor Componer	nt Cell B Tmp.		Conditio	n				Status	pass		
Sensor Componer	nt Fullscale Voltage		Conditio	N/A				Status	pass		
Sensor Componer	nt Inlet Filter Condition	on	Conditio	Clean				Status	pass		
Sensor Compone	nt Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditio	<b>n</b> -0.10				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 0.989				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	94.7 k	Hz			Status	pass		
Sensor Compone	nt System Memo		Conditio	on				Status	pass		
Sensor Compone	nt Sample Train		Conditio	Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	n				Status	pass		
Sensor Componer	nt Cell B Flow		Conditio	0.73 l	om			Status	pass		
Sensor Componen	nt Cell A Tmp.		Conditio	<b>n</b> 34.7 (	)			Status	pass		
Sensor Componen	nt Cell A Pressure		Conditio	<b>n</b> 722 m	mHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	0.9 pp	b			Status	pass		
Sensor Componen	nt Cell A Freq.		Conditio	95.4 k	Hz			Status	pass		
Sensor Componen	t Cell A Flow		Conditio	0.74 l	om			Status	pass		
Sensor Componen	nt Battery Backup		Conditio	n N/A				Status	pass		
Sensor Componen	t Zero Voltage		Conditio	N/A				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ALH.	157-Sandy	Grenville-07/22/2014				
1	7/22/2014	DAS	Campbell	000405	CR3000	2522
2	7/22/2014	Modem	Raven	06605	H4222-C	0844355805
3	7/22/2014	Ozone	ThermoElectron Inc	000683	49i A1NAA	1030244798
4	7/22/2014	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016
5	7/22/2014	Sample Tower	Aluma Tower	illegible	В	none
6	7/22/2014	Zero air pump	Werther International	06910	C 70/4	000829160

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SiteVisitDate	Site	Technician
07/22/2014	NEC602	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96496	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.39273	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.5	%	Р
5	Ozone % difference max	Р	7	10	4	3.5	%	Р

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner I	D
ThermoElectron Inc	1214552974	NEC602	E	ric Hebert		07/22/20	014	Ozone		none	
Slope: Intercept CorrCoff	0.96496       Slope:         0.39273       Intercept         0.99997       CorrCoff	0.0000 0.0000 0.0000	0 0 0	Mfg Serial N	lumber	ThermoE 49CPS-7	Electron I 70008-36	Inc Par 34 Tfe	rameter o er Desc. C	zone )zone primary	/ stan
DAC 1.	DAS 2.					01110	4 0 0 7 0 7	-			
DAS 1. A Avg % Diff: A N	DAS 2: Max % Di A Avg 9	<b>%Dif</b> A Max	% Di	Slope			1.00707	Inter	cept	-0.21	032
2.5%	3.5%			Cert Da	ite		1/8/2014	4 Corr	Coff	1.00	000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.12	0.	32	0.4	14	ppb				
primary	2	24.68	24	.71	24.	30	ppb			-1.66%	
primary	3	47.87	47	.74	46.	57	ppb			-2.45%	
primary	4	77.61	77	.27	75.	43	ppb			-2.38%	
primary	5	112.92	112	2.33	108	.40	ppb			-3.50%	
Sensor Compone	ent Cell B Noise		Conditi	on 1.0 pp	b			Status	pass		
Sensor Compone	ent Cell B Tmp.		Condition	on				Status	pass		
Sensor Compone	Ent Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Compone	nt Inlet Filter Conditi	on	Conditi	on Clean	1			Status	pass		
Sensor Compone	Ent Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Compone	ent Offset		Conditi	on -0.6				Status	pass		
Sensor Compone	ent Span		Condition	on 1.013				Status	pass		
Sensor Compone	Cell B Freq.		Conditi	on 66.1 k	κHz			Status	pass		
Sensor Compone	system Memo		Conditi	on				Status	pass		
Sensor Compone	ent Sample Train		Conditi	on Good				Status	pass		
Sensor Compone	ent Cell B Pressure		Conditi	on				Status [	pass		
Sensor Compone	Cell B Flow		Condition	on 0.63 l	pm			Status	pass		
Sensor Compone	Cell A Tmp.		Conditi	on 37.6 (	)			Status	pass		
Sensor Compone	Cell A Pressure		Condition	on 633 m	nmHg			Status	pass		
Sensor Compone	Cell A Noise		Condition	on 0.9 pp	b			Status	pass		
Sensor Compone	ent Cell A Freq.		Condition	on 83.1 k	Hz			Status	pass		
Sensor Compone	ent Cell A Flow		Condition	on 0.61 l	pm			Status	pass		
Sensor Compone	ent Battery Backup		Condition	on N/A				Status	pass		
Sensor Compone	Tero Voltage		Conditi	on N/A				Status	pass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
NEC	602-Eric H	lebert-07/22/2014				
1	7/22/2014	DAS	Campbell	none	CR1000	41007
2	7/22/2014	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
3	7/22/2014	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
4	7/22/2014	Zero air pump	ThermoElectron Inc	none	107CAB18	106580-00

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SiteVisitDate	Site	Technician
07/23/2014	VIN140	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99454	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.34110	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.7	%	Р
5	Ozone % difference max	Р	7	10	4	1.6	%	Р

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	it Date	Parame	ter	Owner l	D
ThermoElectron Inc	1009241798	VIN140	Sa	ndy Grei	nville	07/23/20	014	Ozone		000630	
Slope: 0	0.99454 Slope: 0.34110 Intercept	0.0000	0	Mfg Serial N	lumber	ThermoE 49C-731	Electron 04-373	Inc Par	rameter <sup>oz</sup> er Desc. O	zone zone transfe	
	CorrColl	0.0000	0	Tfer ID		01100					
DAS 1:	<b>DAS 2:</b>			Slope			1.00458	3 Inter	cept	-0.11	1484
A Avg % Diff: A N	Iax % Di A Avg %	<b>6Dif</b> A Max	% Di	Cert Da	ite	12	2/10/201:	Gorr	Coff	1.00	000
0.7%	1.6%										
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDif	ference:	
primary	1	0.04	0.1	5	0.1	18	ppb				
primary	2	31.02	30.	99	31.	49	ppb			1.61%	
primary	3	50.05	49.	93	50.	20	ppb			0.54%	
primary	4	81.56	81.	30	81.	10	ppb			-0.25%	
primary	5	100.78	100	.43	100	.10	ppb			-0.33%	
Sensor Compone	nt Cell B Noise		Conditio	<b>n</b> 0.6 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	n Clean	1			Status [	pass		
Sensor Compone	nt Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditio	<b>n</b> 0.30				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 1.015				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	<b>n</b> 100 k	Hz			Status	pass		
Sensor Compone	nt System Memo		Conditio	n				Status	pass		
Sensor Compone	nt Sample Train		Conditio	n Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	n				Status	pass		
Sensor Compone	nt Cell B Flow		Conditio	<b>n</b> 0.69 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	<b>n</b> 36.7 (	2			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditio	<b>n</b> 725 m	nmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	<b>n</b> 0.5 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	93.4 k	κHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditio	<b>n</b> 0.65 l	pm			Status	pass		
Sensor Compone	nt Battery Backup		Conditio	N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	N/A				Status	pass		

Site \	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
VINI	40-Sandy	Grenville-07/23/2014				
1	7/23/2014	DAS	Campbell	000358	CR3000	2136
2	7/23/2014	Modem	Raven	06461	V4221-V	0808338875
3	7/23/2014	Ozone	ThermoElectron Inc	000630	49i A1NAA	1009241798
4	7/23/2014	Ozone Standard	ThermoElectron Inc	000513	49i A3NAA	0922236889
5	7/23/2014	Sample Tower	Aluma Tower	000137	В	none
6	7/23/2014	Zero air pump	Werther International	06906	C 70/4	000821908

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SiteVisitDate		Site	Technician					
07/23/2	2014	WNC429	Eric Hebert					
Line	Audited	l Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units
1	Ozone Sl	ope	Р	0	1.1	4	0.95292	unitless
2	Ozone In	tercept	Р	0	5	4	0.08442	ppb
3	Ozone co	rrelation	Р	0	0.995	4	0.99995	unitless
4	Ozone %	difference avg	Р	7	10	4	4.3	%
5	Ozone %	difference max	Р	7	10	4	4.8	%

### **Field Performance Comments**

1	Parameter:	Ozone	SensorComponent:	Cell B Freq.	CommentCode	99				
	This analyzer of									
2	2 Parameter: Ozone SensorComponent: Cell A Freq. CommentCode									
	This analyzer diagnostic check is outside the manufacturer's recommended value.									

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Pass/Fail P P P P P P

Mfg	Sei	rial Number Ta	Site	Те	chnician		Site Visit	Date	Parame	ter	Owner I	D
ThermoElectron Inc	: 06	15817056	WNC429	E	ric Hebert		07/23/20	14	Ozone		none	
Slope:	0.95	292 Slope:	0.00000	)	Mfg		ThermoEl	lectron	Inc Pa	rameter 02	zone	
Intercept	0.08	442 Intercept	0.00000	כ	Serial N	lumber	49CPS-70	0008-36	64 <b>Tfe</b>	er Desc. O	zone primary	/ stan
CorrCoff	0.99	995 CorrCoff	0.00000	D	Tfer ID		01110					
DAS 1:		<b>DAS 2:</b>			Slope			1.0070	7 Inter	cent	-0.21	032
A Avg % Diff: A	Max	% Di A Avg %	6Dif A Max 9	% Di	C			1/0/201			1.00	000
4.3%		4.8%			Cert Da	ite		1/8/201	4 Corr	Coff	1.00	000
UseDescription	:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	e Unit:	PctDif	fference:	
primary		1	0.13	0.	33	0.0	)5 p	opb				
primary		2	25.66	25	.68	24.	52 p	opb			-4.52%	
primary		3	49.19	49	.05	47.	54 p	opb			-3.08%	
primary		4	80.84	80	.48	76.	65 p	ppb			-4.76%	
primary		5	117.44	116	5.82	111	.20 p	opb			-4.81%	
Sensor Compone	ent (	Cell B Noise		Conditi	on 0.6 pp	b			Status	pass		
Sensor Compone	ent C	Cell B Tmp.		Conditi	on				Status	pass		
Sensor Compone	ent F	Fullscale Voltage		Conditi	on 9.998	2			Status	pass		
Sensor Compone	ent	nlet Filter Conditio	n	Conditi	on Clean	 			Status	pass		
Sensor Compone	ent I	Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Compone	ent	Offset		Conditi	on 0.000				Status	pass		
Sensor Compone	ent	Span		Conditi	on 1.353				Status	pass		
Sensor Compone	ent	Cell B Freq.		Conditi	on 56.4 k	κHz			Status	fail		
Sensor Compone	ent	System Memo		Conditi	on See c	omments			Status	pass		
Sensor Compone	ent	Sample Train		Conditi	on Good				Status	pass		
Sensor Compone	ent	Cell B Pressure		Conditi	on				Status	pass		
Sensor Compone	ent	Cell B Flow		Conditi	on 1.33 l	pm			Status	pass		
Sensor Compone	ent (	Cell A Tmp.		Conditi	on 32.6 (	<b>)</b>			Status	pass		
Sensor Compone	ent (	Cell A Pressure		Conditi	on 647 m	nmHg			Status	pass		
Sensor Compone	ent	Cell A Noise		Conditi	on 0.7 pp	b			Status	pass		
Sensor Compone	ent (	Cell A Freq.		Conditi	on 49.4 k	κHz			Status	fail		
Sensor Compone	ent	Cell A Flow		Conditi	<b>on</b> 0.64 l	pm			Status	pass		
Sensor Compone	ent	Battery Backup		Conditi	on N/A				Status	pass		
Sensor Compone	ent	Zero Voltage		Conditi	on 0.007	5			Status	pass		

### **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem	
Ozone This analyzer disapostics	WNC429	Eric Hebert	07/23/2014	Cell B Freq.	ThermoElectron	3398			
This analyzer diagnostic of	check is outside t	ne manufacturer's r	ecommended va	aue.					
Ozone	WNC429	Eric Hebert	07/23/2014	Cell A Freq.	ThermoElectron	3398			
This analyzer diagnostic check is outside the manufacturer's recommended value.									

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
WNC429-Eric Hebert-07/23/2014								
1	7/23/2014	DAS	Environmental Sys Corp	missing	8816	4159		
2	7/23/2014	Modem	US Robotics	none	56k fax modem	unknown		
3	7/23/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	0615817056		
4	7/23/2014	Ozone Standard	ThermoElectron Inc	none	49i PSA2AB	0807328333		
5	7/23/2014	Zero air pump	ThermoElectron Inc	none	111	111-78387-388		

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SiteV	isitDate	Site	Technicia	n									
08/16/2	2014	ROM206	Eric Hebert	Eric Hebert									
Line	Audited	l Parameter	DAS	6 Ch.#	Criteria +/-	Counts	QaResult	Units					
1	Ozone Sle	ope	Р	0	1.1	4	0.99749	unitless					
2	Ozone Int	tercept	Р	0	5	4	1.26437	ppb					
3	Ozone co	rrelation	Р	0	0.995	4	1.00000	unitless					
4	Ozone %	difference avg	Р	7	10	4	2.4	%					
5	Ozone %	difference max	Р	7	10	4	4.9	%					

### **Field Performance Comments**

1Parameter:OzoneSensorComponent:Cell B FlowCommentCode99

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

Pass/Fail

P P P P

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner I	D
ThermoElectron Inc	1009241798	ROM206	E	ric Hebert		08/16/20	014	Ozone		000621	
Slope: Intercept CorrCoff	0.99749 Slope: 1.26437 Intercept 1.00000 CorrCoff	0.0000	0 Mfg 0 Serial Number			ThermoElectron Inc Parameter Ozd   49CPS-70008-364 Tfer Desc. Ozd			zone Dzone primar	y stan	
				Tfer ID		01110					
DAS 1:	<b>DAS 2:</b>			Slope			1.00707	7 Inter	cept	-0.21	1032
A Avg % Diff: A N 2.4%	Max % Di A Avg 9 4.9%	<b>%Dif</b> A Max	% Di	Cert Da	ite		1/8/201	4 Corr	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary	1	0.40	0.	60	1.1	75	ppb				
primary	2	26.54	26	.56	27.	.87	ppb			4.93%	
primary	3	49.36	49	.22	50.	.39	ppb			2.38%	
primary	4	76.55	76	.22	77.	.32	ppb			1.44%	
primary	5	115.18	114	4.58	115	.50	ppb			0.80%	
Sensor Compone	Cell B Noise		Conditi	on 0.5 pp	b			Status	pass		
Sensor Compone	ent Cell B Tmp.		Conditi	on				Status	pass		
Sensor Compone	ent Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditi	on Clean	1			Status	pass		
Sensor Compone	Ent Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Compone	ent Offset		Conditi	on -1.8				Status	pass		
Sensor Compone	ent Span		Conditi	on 1.023				Status	pass		
Sensor Compone	Cell B Freq.		Conditi	on 98.8 k	κHz			Status	pass		
Sensor Compone	System Memo		Conditi	on See c	omments	,		Status	pass		
Sensor Compone	ent Sample Train		Conditi	on Good				Status	pass		
Sensor Compone	ent Cell B Pressure		Conditi	on				Status	pass		
Sensor Compone	ent Cell B Flow		Conditi	on 1.4 lp	m			Status	fail		
Sensor Compone	ent Cell A Tmp.		Conditi	on 33.3 (	2			Status	pass		
Sensor Compone	Cell A Pressure		Conditi	on 525 m	nmHg			Status	pass		
Sensor Compone	Cell A Noise		Conditi	on 0.8 pp	b			Status	pass		
Sensor Compone	Cell A Freq.		Conditi	on 104.5	kHz			Status	pass		
Sensor Compone	Cell A Flow		Conditi	on 0.59 I	pm			Status	pass		
Sensor Compone	Battery Backup		Conditi	on N/A				Status	pass		
Sensor Compone	ent Zero Voltage		Conditi	on N/A				Status	pass		

### **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem	
Ozone	ROM206	Eric Hebert	08/16/2014	Cell B Flow	ThermoElectron	3460			
This analyzer diagnostic check is outside the manufacturer's recommended value.									

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
ROM	ROM206-Eric Hebert-08/16/2014									
1	8/16/2014	DAS	Campbell	000428	CR3000	2534				
2	8/16/2014	Modem	Raven	06473	V4221-V	0808311135				
3	8/16/2014	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798				
4	8/16/2014	Ozone Standard	ThermoElectron Inc	000514	49i A3NAA	0922236892				
5	8/16/2014	Sample Tower	Aluma Tower	666369	В	illegible				
6	8/16/2014	Zero air pump	Teledyne	000777	701H	607				

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SiteVisitDate	Site	Technician			
08/16/2014	ROM406	Eric Hebert			

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97262	unitless	Р
2	Ozone Intercept	Р	0	5	4	1.35157	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.5	%	Р
5	Ozone % difference max	Р	7	10	4	3.0	%	Р

Mfg	Se	erial N	umber Ta	Site		Те	chnician		Site Vis	it Date	Parame	eter	<b>Owner</b>	D
Teledyne	2	551		RON	1406	E	ric Hebert	:	08/16/2	014	Ozone		WYDEQ	!
Slope: [ Intercept [ CorrCoff [	0.9 1.3 0.9	7262 5157 9999	Slope: Intercept CorrCoff		0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	Thermole 49CPS-7	Electron 70008-36	Inc Pa 64 Tf	rameter C	ozone Dzone primar	y stan
DAS 1:			<b>DAS 2:</b>				Slope			1.00707	7 Inter	rcent	-0.2	1032
<b>A Avg % D</b> 1.5	iff: A Max	<b>x % D</b> 3.09	i A Avg %	6Dif	A Max	% Di	Cert Da	ite		1/8/201	4 Corr	:Coff	1.0	0000
UseDesc	cription:	Co	oncGroup:	Tfe	er Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDi	ifference:	
prin	nary		1		0.14	0.	34	1.0	53	ppb				
prin	nary		2	2	.6.77	26	.79	27.	.59	ppb			2.99%	
prin	nary	_	3	4	9.72	49	.57	49.	.34	ppb			-0.46%	
prin	nary	_	4	1	7.52	77	.18	76.	.54	ppb			-0.83%	
prin	nary		5	1	16.56	115	5.95	114	.10	ррь			-1.60%	<u> </u>
Sensor Co	omponent	Cell B	Noise			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Cell B	Tmp.			Condition	on N/A				Status	pass		
Sensor Co	omponent	Fullsc	ale Voltage			Condition	on N/A				Status	pass		
Sensor Co	omponent	Inlet F	ilter Conditio	n		Conditi	on Clean	1			Status	pass		
Sensor Co	omponent	Line L	.OSS			Conditi	on Not te	sted			Status	pass		
Sensor Co	omponent	Offset	;			Conditi	on -0.4				Status	pass		
Sensor Co	omponent	Span				Conditi	on 0.987				Status	pass		
Sensor Co	omponent	Cell B	Freq.			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Syster	m Memo			Conditi	on				Status	pass		
Sensor Co	omponent	Samp	le Train			Conditi	on Good				Status	pass		
Sensor Co	omponent	Cell B	Pressure			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Cell B	Flow			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Cell A	Tmp.			Conditi	on 38.7 (	2			Status	pass		
Sensor Co	omponent	Cell A	Pressure			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Cell A	Noise			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Cell A	Freq.			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Cell A	Flow			Conditi	on 0.57 l	pm			Status	pass		
Sensor Co	omponent	Batter	y Backup			Conditi	on N/A				Status	pass		
Sensor Co	omponent	Zero \	/oltage			Conditi	on N/A				Status	pass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
RON	ROM406-Eric Hebert-08/16/2014									
1	8/16/2014	DAS	Environmental Sys Corp	90535	8816	2025				
2	8/16/2014	Modem	US Robotics	none	33.6 fax modem	unknown				
3	8/16/2014	Ozone	Teledyne	WYDEQ	400E	2551				
4	8/16/2014	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	1030745086				
5	8/16/2014	Sample Tower	Aluma Tower	illegible	В	none				
6	8/16/2014	Zero air pump	Werther International	none	PC70/4	531392				

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SiteVisitDate	Site	Technician
08/21/2014	GTH161	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.95395	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.665	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99984	unitless	Р
4	Ozone % difference avg	Р	7	10	4	5.3	%	Р
5	Ozone % difference max	Р	7	10	4	6.3	%	Р

Mfg	Se	erial Number Ta	Site	Те	chnician		Site Visi	t Date	Parame	ter	Owner I	D
ThermoElectron	Inc 1	008241788	GTH161	AI	ison Ray		08/21/20	014	Ozone		unknown	
Slope:	0.9	5395 <b>Slope:</b>	0.0000	0	Mfg		ThermoE	lectron	Inc Pa	rameter 0	zone	
Intercept	-0.6	6500 Intercept	0.0000	0	Serial N	umber	49CPS-7	0008-36	64 <b>Tfe</b>	er Desc.	zone primary	/ stan
CorrCoff	0.9	9984 CorrCoff	0.0000	0	Tfer ID		01110					
DAS 1:		<b>DAS 2:</b>			Slope			1.00707	7 Inter	cent	-0.21	032
A Avg % Diff:	A Max	x % Di A Avg %	6Dif A Max	% Di	Stope						4.00	000
5.3%		6.3%			Cert Da	ite		1/8/2014	4 Corr	Coff	1.00	000
UseDescript	tion:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary		1	-0.10	0.	10	-1.	20	ppb				
primary		2	29.90	29.	.89	28.	.00	ppb			-6.32%	
primary		3	50.50	50.	.35	48.	.56	ppb			-3.56%	
primary		4	81.00	80.	.64	75.	.79	ppb			-6.01%	
primary	•	5	109.60	109	0.03	103	.10	ppb			-5.44%	
Sensor Comp	onent	Cell B Noise		Conditio	Not te	sted			Status	pass		
Sensor Comp	onent	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Comp	onent	Fullscale Voltage		Conditio	on N/A				Status	pass		
Sensor Comp	onent	Inlet Filter Condition	n	Conditio	on Clean				Status [	pass		
Sensor Comp	onent	Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Offset		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Span		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Cell B Freq.		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	System Memo		Conditio	on				Status	pass		
Sensor Comp	onent	Sample Train		Conditio	on Good				Status	pass		
Sensor Comp	onent	Cell B Pressure		Conditio	on				Status	pass		
Sensor Comp	onent	Cell B Flow		Conditio	on 0.57 lj	om			Status	pass		
Sensor Comp	onent	Cell A Tmp.		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Cell A Pressure		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Cell A Noise		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Cell A Freq.		Conditio	on Not te	sted			Status	pass		
Sensor Comp	onent	Cell A Flow		Conditio	on 0.56 l	om			Status	pass		
Sensor Comp	onent	Battery Backup		Conditio	on N/A				Status	pass		
Sensor Comp	onent	Zero Voltage		Conditio	on N/A				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GTH	161-Alison	Ray-08/21/2014				
1	8/21/2014	DAS	Campbell	000416	CR3000	2513
2	8/21/2014	Modem	Raven	06589	H4223-C	0844321356
3	8/21/2014	Ozone	ThermoElectron Inc	unknown	49i A1NAA	1008241788
4	8/21/2014	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015
5	8/21/2014	Zero air pump	Werther International	06927	P 70/4	000836211

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SiteVisitDate	Site	Technician				
08/23/2014	CNT169	Alison Ray				

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99705	unitless	Р
2	Ozone Intercept	Р	0	5	4	-1.82502	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.8	%	Р
5	Ozone % difference max	Р	7	10	4	6.3	%	Р

Mfg	Serial Number Ta	Site	Те	chnician		Site Visi	it Date	Parame	eter	<b>Owner</b>	D
ThermoElectron Inc	1030244804	CNT169	Ali	son Ray		08/23/2	014	Ozone		000699	
Slope: C Intercept -1 CorrCoff 1	Slope:         .70626       Intercept         .00000       CorrCoff	0.0000	0	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7 01110	Electron   70008-36	Inc Pa	rameter ( er Desc. (	ozone Ozone primar	y stan
DAS 1.	DAS 2.			Classe			1 00707	7 Tastas		0.2	1022
A Avg % Diff: A M	Iax % Di A Avg %	<b>6</b> Dif A Max	% Di	Slope			1.00707	Inter	rcept	-0.2	1032
3.9%	6.3%			Cert Da	ite		1/8/2014	4 Corr	Coff	1.0	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctD	ifference:	
primary	1	0.10	0.3	30	-1.	46	ppb				
primary	2	29.43	29.	43	27.	.57	ppb			-6.32%	
primary	3	49.43	49.	29	47.	.32	ppb			-4.00%	
primary	4	79.37	79.	02	76.	.58	ppb			-3.09%	
primary	5	109.50	108	.94	106	5.50	ppb			-2.24%	
Sensor Componer	t Cell B Noise		Conditio	n Not te	sted			Status	pass		
Sensor Componer	t Cell B Tmp.		Conditio	n				Status	pass		
Sensor Componer	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Componer	nt Inlet Filter Condition	on	Conditio	n Clean				Status	pass		
Sensor Componer	t Line Loss		Conditio	n Not te	sted			Status	pass		
Sensor Componer	t Offset		Conditio	n Not te	sted			Status	pass		-
Sensor Componer	nt Span		Conditio	n Not te	sted			Status	pass		
Sensor Componer	t Cell B Freq.		Conditio	n Not te	sted			Status	pass		7
Sensor Componer	t System Memo		Conditio	n				Status	pass		
Sensor Componer	t Sample Train		Conditio	n Good				Status	pass		
Sensor Componer	t Cell B Pressure		Conditio	n				Status	pass		
Sensor Componer	t Cell B Flow		Conditio	<b>n</b> 0.54 l	pm			Status	pass		
Sensor Componer	t Cell A Tmp.		Conditio	n Not te	sted			Status	pass		
Sensor Componer	t Cell A Pressure		Conditio	n Not te	sted			Status	pass		
Sensor Componer	t Cell A Noise		Conditio	n Not te	sted			Status	pass		
Sensor Componer	t Cell A Freq.		Conditio	n Not te	sted			Status	pass		
Sensor Componer	Cell A Flow		Conditio	<b>n</b> 0.54 l	pm			Status	pass		
Sensor Componer	t Battery Backup		Conditio	n N/A				Status	pass		
Sensor Componer	t Zero Voltage		Conditio	N/A				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
CNT	169-Alison	Ray-08/23/2014				
1	8/23/2014	DAS	Campbell	000417	CR3000	2515
2	8/23/2014	Modem	Raven	06600	V4221-V	0844349098
3	8/23/2014	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
4	8/23/2014	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
5	8/23/2014	Zero air pump	Werther International	06925	P 70/4	000836220

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SiteVisitDate	Site	Technician			
08/23/2014	GLR468	Sandy Grenville			

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail		
1	Ozone Slope	Р	0	1.1	4	0.98527	unitless	Р		
2	Ozone Intercept	Р	0	5	4	0.12602	ppb	Р		
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р		
4	Ozone % difference avg	Р	7	10	4	1.4	%	Р		
5	Ozone % difference max	Р	7	10	4	1.7	%	Р		
Mfg	Serial Number Ta	Site	Те	echnician		Site Visi	t Date	Paramet	er Owr	ier ID
--------------------	--------------------------	------------	-----------	------------------	--------	-----------	-------------	----------	-------------------	----------
ThermoElectron Inc	1023943901	GLR468	Sa	andy Grei	nville	08/23/20	014	Ozone	none	;
Slope: 0.	98527 Slope:	0.0000	0	Mfg		ThermoE	electron li	nc Par	ameter ozone	nofor
CorrCoff 0.	99997 CorrCoff	0.0000	0	Serial N	umber	490-731	04-373		r Desc. Ozone tra	nsier
				Tfer ID		01100				
DAS 1:	<b>DAS 2:</b>			Slope			1.00458	Interc	cept -	0.11484
A Avg % Diff: A Ma	ax % Di A Avg %	6Dif A Max	% Di	Cert Da	ite	12	/10/2013	Corr(	Coff	1.00000
1.470	1.7 76									
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDifference:	<u>:</u>
primary	2	30.79	30	50 76	30	82 39	ppo nnh		-1.2	0%
primary	3	50.42	50	.70	49.	45	ppb		-1.6	9%
primary	4	82.21	81	.94	80.	.57	ppb		-1.6	7%
primary	5	100.86	100	).51	99.	.52	ppb		-0.9	8%
Sensor Componen	t Cell B Noise		Conditi	on 0.4 pp	b			Status [	bass	
Sensor Componen	t Cell B Tmp.		Conditi	on				Status F	bass	
Sensor Componen	t Fullscale Voltage		Conditi	on Not te	sted			Status [	Dass	
Sensor Componen	t Inlet Filter Condition	n	Conditi	on Clean				Status F	Dass	
Sensor Componen	t Line Loss		Conditi	on Not te	sted			Status F	bass	
Sensor Componen	t Offset		Conditi	on 0.2				Status F	bass	
Sensor Componen	t Span		Conditi	on 1.023				Status F	Dass	
Sensor Componen	t Cell B Freq.		Condition	on 84.4 k	Hz			Status F	Dass	
Sensor Componen	t System Memo		Condition	on				Status F	Dass	
Sensor Componen	t Sample Train		Conditi	on Good				Status F	bass	
Sensor Componen	t Cell B Pressure		Conditi	on				Status F	Dass	
Sensor Componen	t Cell B Flow		Conditi	<b>on</b> 0.69 l	om			Status F	Dass	
Sensor Componen	t Cell A Tmp.		Condition	on 36.1 (	)			Status F	Dass	
Sensor Componen	t Cell A Pressure		Conditi	on 672 m	mHg			Status F	Dass	
Sensor Componen	t Cell A Noise		Conditi	on 0.7 pp	b			Status F	Dass	
Sensor Componen	t Cell A Freq.		Conditi	on 82.6 k	Hz			Status [	Dass	
Sensor Componen	t Cell A Flow		Conditi	on 0.69 l	om			Status F	Dass	
Sensor Componen	t Battery Backup		Conditi	on Funct	ioning			Status F	Dass	
Sensor Componen	t Zero Voltage		Conditi	on Not te	sted			Status F	bass	

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GLR-	468-Sandy	Grenville-08/23/2014				
1	8/23/2014	DAS	Environmental Sys Corp	90653	8816	2566
2	8/23/2014	Modem	US Robotics	none	56k	unknown
3	8/23/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
4	8/23/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
5	8/23/2014	Printer	Hewlett Packard	none	842C	unknown
6	8/23/2014	Sample Tower	Aluma Tower	none	В	none
7	8/23/2014	Zero air pump	Werther International	none	PC70/4	000756725

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SiteVisitDate	Site	Technician
08/24/2014	YEL408	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99470	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.81971	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	1.6	%	Р

Mfg	S	Serial Number Ta	Site	Те	chnician		Site Visi	t Date	Paramet	ter	Owner I	D
ThermoElect	tron Inc	49C-66828-354	YEL408	Sa	andy Grer	nville	08/24/20	014	Ozone		90714	
Slope:	0.9	99470 <b>Slope:</b>	0.0000	2	Mfg		ThermoE		Inc Par	ameter	ozone	
CorrCoff	1.0	00000 CorrCoff	0.00000	5 D	Serial N	umber	49C-7310	04-373	Tfe	r Desc. 🕻	Jzone transfe	r
			L		Tfer ID		01100					
DAS 1:		<b>DAS 2:</b>			Slope			1.00458	8 Inter	cept	-0.11	484
A Avg % D	iff: A Ma	ax % Di A Avg %	6Dif A Max	% Di	Cort Do	to	12	/10/201	3 Corre	Coff	1.00	0000
0.9	9%	1.6%						,10,201				
UseDesc	cription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDi	ifference:	
prim	nary	1	0.10	0.	21	1.	16	ppb				
prim	nary	2	30.69	30	.66	31.	.15	ppb			1.60%	
prim	nary	3	50.17	50	.05	50.	.60	ppb			1.10%	
prim	nary	4	80.80	80	.54	80.	.87	ppb			0.41%	
prim	nary	5	100.96	100	).61	101	.00	ppb			0.39%	
Sensor Co	omponent	Cell B Noise		Conditi	on 1.7 pp	b			Status	oass		
Sensor Co	omponent	Cell B Tmp.		Conditi	on				Status	oass		
Sensor Co	omponent	Fullscale Voltage		Conditi	on N/A				Status	oass		
Sensor Co	omponent	Inlet Filter Condition	on	Conditi	on Clean				Status	oass		
Sensor Co	omponent	Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Co	omponent	Offset		Conditi	<b>on</b> 0.4				Status	oass		
Sensor Co	omponent	Span		Conditi	<b>on</b> 1.004				Status	pass		
Sensor Co	omponent	Cell B Freq.		Conditi	<mark>on</mark> 76.6 k	Hz			Status	oass		
Sensor Co	omponent	System Memo		Conditi	on				Status	pass		
Sensor Co	omponent	Sample Train		Conditi	on Good				Status	oass		
Sensor Co	omponent	Cell B Pressure		Conditi	on				Status	oass		
Sensor Co	omponent	Cell B Flow		Conditi	on 0.66 l	om			Status	oass		
Sensor Co	omponent	Cell A Tmp.		Conditi	on 36.8 (	>			Status	oass		
Sensor Co	omponent	Cell A Pressure		Conditi	on 561 m	mHg			Status	oass		
Sensor Co	omponent	Cell A Noise		Conditi	on 0.6 pp	b			Status	oass		
Sensor Co	omponent	Cell A Freq.		Conditi	on 95.2 k	Hz			Status	oass		
Sensor Co	omponent	Cell A Flow		Conditi	<b>on</b> 0.64 l	om			Status	oass		
Sensor Co	omponent	Battery Backup		Conditi	on N/A				Status	oass		
Sensor Co	omponent	Zero Voltage		Conditi	on N/A				Status	oass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
YEL-	408-Sandy	Grenville-08/24/2014				
1	8/24/2014	Computer	Gateway	none	Solo	2500251339
2	8/24/2014	DAS	Environmental Sys Corp	90647	8816	2560
3	8/24/2014	Modem	US Robotics	none	56k fax modem	unknown
4	8/24/2014	Ozone	ThermoElectron Inc	90714	49C	49C-66828-354
5	8/24/2014	Ozone Standard	ThermoElectron Inc	90605	49C	49C-62025-333
6	8/24/2014	Sample Tower	Aluma Tower	illegible	В	none
7	8/24/2014	Zero air pump	Werther International	none	PC70/4	531393

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SiteVisitDate	Site	Technician
08/25/2014	THR422	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01485	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.46186	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.2	%	Р
5	Ozone % difference max	Р	7	10	4	2.9	%	Р

Mfg S	erial Number Ta	Site	Te	chnician		Site Visi	t Date	Parame	ter	Owner I	D
ThermoElectron Inc	0632119500	THR422	Sa	andy Grer	nville	08/25/20	014	Ozone		none	
Slope:1.0Intercept0.4CorrCoff0.5	O1485Slope:46186Intercept99998CorrCoff	0.00000		Mfg Serial N	umber	ThermoE 49C-731	Electron 04-373	Inc Par	rameter ozo er Desc. Oz	one one transfe	r
				Tfer ID		01100					
DAS 1:	DAS 2:			Slope			1.0045	8 Inter	cept	-0.11	484
A Avg % Diff: A Ma 2.2%	2.9%	blif A Max	% Di	Cert Da	ite	12	2/10/201	3 Corr	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	e Unit:	PctDiff	erence:	
primary	1	0.15	0.2	26	0.8	87	ppb				
primary	2	30.37	30.	.34	31.	.22	ppb			2.90%	
primary	3	51.54	51.	.41	52.	.27	ppb			1.67%	
primary	4	81.23	80.	.97	82.	.93	ppb			2.42%	
primary	5	100.05	99.	.70	101	.60	ppb			1.91%	
Sensor Component	Cell B Noise		Conditio	<b>on</b> 1.0 pp	b			Status	pass		
Sensor Component	Cell B Tmp.		Conditio	on				Status	pass		
Sensor Component	Fullscale Voltage		Conditio	on Not te	sted			Status	pass		
Sensor Component	Inlet Filter Conditio	n	Conditio	on Dirty				Status	Fail		
Sensor Component	Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Component	Offset		Conditio	on 0.5				Status	pass		
Sensor Component	Span		Conditio	on 1.016				Status	pass		
Sensor Component	Cell B Freq.		Conditio	on 67.9 k	Hz			Status	pass		_
Sensor Component	System Memo		Conditio	on				Status	pass		_
Sensor Component	Sample Train		Conditio	on Good				Status	pass		_
Sensor Component	Cell B Pressure		Conditio	on				Status	pass		
Sensor Component	Cell B Flow		Conditio	on 0.68 lj	om			Status	pass		_
Sensor Component	Cell A Tmp.		Conditio	on 30.6 C	)			Status	pass		
Sensor Component	Cell A Pressure		Conditio	on 680 m	mHg			Status	pass		
Sensor Component	Cell A Noise		Conditio	on 1.4 pp	b			Status	pass		
Sensor Component	Cell A Freq.		Conditio	on 103.6	kHz			Status	pass		
Sensor Component	Cell A Flow		Conditio	on 0.65 l	om			Status	pass		
Sensor Component	Battery Backup		Conditio	on Funct	ioning			Status	pass		
Sensor Component	Zero Voltage		Conditio	on Not te	sted			Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
THR	422-Sandy	Grenville-08/25/2014				
1	8/25/2014	Computer	Hewlett Packard	none	65606	5CB1520H68
2	8/25/2014	DAS	Environmental Sys Corp	90656	8816	2600
3	8/25/2014	Modem	US Robotics	none	14.4 fax modem	9244894
4	8/25/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	0632119500
5	8/25/2014	Sample Tower	Aluma Tower	none	В	AT-81077-J5
6	8/25/2014	UPS	APC	none	RS500	unknown
7	8/25/2014	Zero air pump	Thomas	none	607CA22C	039500000348

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SiteVisitDate	Site	Technician
09/08/2014	VOY413	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98467	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.48500	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.1	%	Р

Mfg	Serial Number Ta	Site	Te	chnician		Site Visit Date		e Parameter		<b>Owner</b>	D
ThermoElectron Inc	49C-70522-366	VOY413	Ali	ison Ray		09/08/2	014	Ozone		90730	
Slope: C Intercept C CorrCoff C	Slope:           0.48500         Intercept           0.99998         CorrCoff	0.0000	0	Mfg Serial N Tfer ID	lumber	Thermol 49CPS-7	Electron I 70008-36	Inc Pa	rameter ( er Desc. (	ozone Ozone primar	y stan
DAS 1.	DAS 2.			C1			1 00707			0.2	1022
A Avg % Diff: A M	Iax % Di A Avg %	<b>6</b> Dif A Max	% Di	Slope			1.00707	Inter	cept	-0.2	1032
0.8%	1.1%			Cert Da	ite		1/8/2014	4 Corr	Coff	1.0	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Si	te:	Site	Unit:	PctD	ifference:	
primary	1	0.00	0.2	20	0.9	91	ppb				
primary	2	29.63	29.	63	29.	.63	ppb			0.00%	
primary	3	49.45	49.	31	48.	.75	ppb			-1.14%	
primary	4	79.48	79.	13	78.	.23	ppb			-1.14%	
primary	5	109.44	108	.88	107	.96	ppb			-0.84%	
Sensor Componer	t Cell B Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Componer	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Componer	t Fullscale Voltage		Conditio	n N/A				Status	pass		
Sensor Compone	t Inlet Filter Condition	on	Conditio	n Clean				Status	pass		
Sensor Componer	t Line Loss		Conditio	n Not te	sted			Status	pass		
Sensor Compone	1t Offset		Conditio	<b>n</b> -0.8				Status	pass		5
Sensor Compone	1t Span		Conditio	<b>n</b> 0.988				Status	pass		5
Sensor Componer	t Cell B Freq.		Conditio	<b>)n</b> 88.1 k	κHz			Status	pass		
Sensor Componer	t System Memo		Conditio	on				Status	pass		
Sensor Componer	t Sample Train		Conditio	on Good				Status	pass		
Sensor Componer	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Componer	t Cell B Flow		Conditio	<b>n</b> 0.76 l	pm			Status	pass		
Sensor Componer	t Cell A Tmp.		Conditio	on 35.3 (	<b>)</b>			Status	pass		
Sensor Componer	t Cell A Pressure		Conditio	<b>n</b> 705 m	mHg			Status	pass		
Sensor Componer	t Cell A Noise		Conditio	<b>0.6</b> pp	b			Status	pass		
Sensor Componen	t Cell A Freq.		Conditio	<b>95.6</b>	Hz			Status	pass		
Sensor Componen	Cell A Flow		Conditio	<b>0.71</b> l	pm			Status	pass		
Sensor Componen	t Battery Backup		Conditio	n N/A				Status	pass		
Sensor Componer	t Zero Voltage		Conditio	n N/A				Status	pass		

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
VOY4	13-Alison	Ray-09/08/2014				
1	9/8/2014	DAS	Environmental Sys Corp	none	8816	4059
2	9/8/2014	Ozone	ThermoElectron Inc	90730	49C	49C-70522-366
3	9/8/2014	Ozone Standard	ThermoElectron Inc	90717	49C	49C-66823-354
4	9/8/2014	Sample Tower	Aluma Tower	none	В	AT-51159-11-G
5	9/8/2014	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

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SiteVisitDate	Site	Technician
09/10/2014	PRK134	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97063	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.08659	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.1	%	Р
5	Ozone % difference max	Р	7	10	4	3.3	%	Р

Mfg	Serial Number Ta	Site	Te	chnician		Site Visi	t Date	Parameter		Owner I	D
ThermoElectron Inc	1030244800	PRK134	AI	ison Ray		09/10/20	014	Ozone		000690	
Slope: 0. Intercept -0.	97063 Slope: 08659 Intercept	0.00000	D D	Mfg Serial N	umber	ThermoE 49CPS-7	Electron I 20008-36	nc Par 4 Tfe	ameter o r Desc. C	zone Dzone primary	y stan
				Tfer ID		01110					
DAS 1:	<b>DAS 2:</b>			Slope			1.00707	Inter	cept	-0.21	1032
A Avg % Diff: A Ma 3.1%	ax % Di         A Avg %           3.3%	6Dif A Max 9	% Di	Cert Da	ite		1/8/2014	4 Corre	Coff	1.00	0000
UseDescription:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Si	te:	Site	Unit:	PctDi	fference:	
primary	1	0.24	0.4	44	0.3	30	ppb				
primary	2	27.45	27.	.46	26.	56	ppb			-3.28%	
primary	3	47.19	47.	.06	45.	.67	ppb			-2.95%	
primary	4	80.01	79.	.65	77.	22	ppb			-3.05%	
primary	5	116.22	115	5.61	112	.10	ppb			-3.04%	
Sensor Componen	t Cell B Noise		Conditio	on 0.5 pp	b			Status	pass		
Sensor Componen	t Cell B Tmp.		Conditio	on				Status	pass		
Sensor Componen	t Fullscale Voltage		Conditio	on N/A				Status [	pass		
Sensor Componen	t Inlet Filter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Componen	t Line Loss		Conditio	on Not te	sted			Status	pass		
Sensor Componen	t Offset		Conditio	on -0.4				Status [	pass		
Sensor Componen	t Span		Conditio	on 1.020				Status	pass		
Sensor Componen	t Cell B Freq.		Conditio	on 86.9 k	Hz			Status	pass		
Sensor Componen	t System Memo		Conditio	on				Status	pass		
Sensor Componen	t Sample Train		Conditio	on Good				Status	pass		
Sensor Componen	t Cell B Pressure		Conditio	on				Status	pass		
Sensor Componen	t Cell B Flow		Conditio	on .70 lp	m			Status	pass		
Sensor Componen	t Cell A Tmp.		Conditio	on 32.8 (	)			Status	pass		
Sensor Componen	t Cell A Pressure		Conditio	on 698 m	mHg			Status	pass		
Sensor Componen	t Cell A Noise		Conditio	<b>on</b> 0.6 pp	b			Status	pass		
Sensor Componen	t Cell A Freq.		Conditio	on 96.3 k	Hz			Status	pass		
Sensor Componen	t Cell A Flow		Conditio	on 0.71 l	om			Status	pass		
Sensor Componen	t Battery Backup		Conditio	on N/A				<b>Status</b>	pass		
Sensor Componen	t Zero Voltage		Conditio	on N/A				<b>Status</b>	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
PRK	134-Alison	Ray-09/10/2014				
1	9/10/2014	DAS	Campbell	000411	CR3000	2509
2	9/10/2014	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
3	9/10/2014	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
4	9/10/2014	Sample Tower	Aluma Tower	03518	A	none
5	9/10/2014	Zero air pump	Werther International	06905	C 70/4	000821907

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SiteVisitDate	Site	Technician
09/19/2014	LRL117	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
								_
1	Ozone Slope	Р	0	1.1	4	0.99928	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.45197	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.9	%	Р
5	Ozone % difference max	Р	7	10	4	2.0	%	Р

Mfg	Serial Number Ta	Site	Те	chnician		Site Visit Date		e Parameter		Owner I	D
ThermoElectron Inc	1030244808	LRL117	Sa	andy Grei	nville	09/19/20	014	Ozone		000701	
Slope:	0.99928 Slope:	0.0000	0	Mfg		ThermoE	Electron	Inc Par	rameter 020	ne	
Intercept	0.45197 Intercept	0.0000	0	Serial N	umber	49C-731	04-373	Tfe	er Desc. Ozo	one transfe	r
CorrCoff	0.999999 CorrCoff	0.0000	0	Tfer ID		01100					
DAS 1:	<b>DAS 2:</b>			Slope			1.00458	B Inter	cept	-0.11	484
A Avg % Diff: A N	/Iax % Di A Avg %	<b>6Dif</b> A Max	% Di	Cont Do	to	12	2/10/201 <sup>•</sup>		Coff	1.00	000
0.9%	2.0%						., 10, 2010				
UseDescription:	ConcGroup:	Tfer Raw:	Tfer (	Corr:	Sit	te:	Site	Unit:	PctDiffe	erence:	
primary	1	0.05	0.1	6	0.5	53	ppb				
primary	2	30.63	30.	60	31.	20	ppb			1.96%	
primary	3	50.88	50.	76	51.	02	ppb			0.51%	
primary	4	80.37	80.	11	80.	70	ppb			0.74%	
primary	5	101.20	100	.85	101	.10	ppb			0.25%	
Sensor Compone	nt Cell B Noise		Conditio	<b>n</b> 1.0 pp	b			Status	pass		
Sensor Compone	nt Cell B Tmp.		Conditio	on				Status	pass		
Sensor Compone	nt Fullscale Voltage		Conditio	N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditio	n Clean				Status	pass		
Sensor Compone	nt Line Loss		Conditio	Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditio	<b>n</b> -0.1				Status	pass		
Sensor Compone	nt Span		Conditio	<b>n</b> 1.011				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditio	<b>n</b> 92.9 k	Hz			Status	pass		
Sensor Compone	nt System Memo		Conditio	on				Status	pass		
Sensor Compone	nt Sample Train		Conditio	Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditio	on				Status	pass		
Sensor Compone	nt Cell B Flow		Conditio	<b>n</b> 0.70 l	pm			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditio	<b>n</b> 33.3 (	>			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditio	<b>n</b> 699.1	mmHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditio	<b>n</b> 0.8 pp	b			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditio	<b>n</b> 105.6	kHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditio	<b>n</b> 0.68 l	om			Status	pass		
Sensor Compone	nt Battery Backup		Conditio	n N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditio	N/A				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
LRLI	17-Sandy	Grenville-09/19/2014				
1	9/19/2014	DAS	Campbell	000344	CR300	2123
2	9/19/2014	Modem	Raven	06612	H4223-C	0844355815
3	9/19/2014	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
4	9/19/2014	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
5	9/19/2014	Sample Tower	Aluma Tower	03446	A	none
6	9/19/2014	Zero air pump	Werther International	06904	C 70/4	000821901

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SiteVisitDate	Site	Technician
09/20/2014	BVL130	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96651	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.76544	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.0	%	Р
5	Ozone % difference max	Р	7	10	4	2.7	%	Р

Mfg	Serial Number Ta	Site	Те	chnician		Site Visit	t Date	Parame	ter	Owner I	D
ThermoElectron Inc	1009241797	BVL130	E	ric Hebert		09/20/20	)14	Ozone		000625	
Slope: Intercept CorrCoff	0.96651 <b>Slope:</b> 0.76544 <b>Intercept</b> 0.99999 <b>CorrCoff</b>	0.0000	0 0 0	Mfg Serial N	umber	ThermoE 04196069	lectron 966	Inc Par	rameter oz er Desc. O	zone zone primary	y stan
DAS 1: A Avg % Diff: A N 2 0%	DAS 2: Max % Di A Avg 9	%Dif A Max	% Di	Slope Cert Da	te		1.00928 1/8/2014	3 Inter 4 Corr	cept Coff	0.11	1780 0000
2.070				<u> </u>			0.1	TT */		cc.	
UseDescription:	ConcGroup:	Tter Raw:	Tfer	Corr:	S11	te:	Site	Unit:	PctDi	ference:	
primary	2	-0.33	-0.	36	28	24 j 9/ i	ppo			-1/13%	
primary	3	49.56	48	.98	48.	09	nnh			-1.82%	
primary	4	80.76	79	.90	78.	14	ppb		_	-2.20%	
primary	5	116.43	115	5.24	112	.10	ppb			-2.72%	
Sensor Compone	nt Cell B Noise		Conditi	on Not te	sted	<u>`</u>		Status	pass		7
Sensor Compone	nt Cell B Tmp.		Conditi	on				Status [	pass		
Sensor Compone	nt Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Compone	nt Inlet Filter Condition	on	Conditi	on Clean				Status	pass		
Sensor Compone	nt Line Loss		Conditi	on Not te	sted			Status	pass		
Sensor Compone	nt Offset		Conditi	on -0.40				Status	pass		
Sensor Compone	nt Span		Conditi	on 1.012				Status	pass		
Sensor Compone	nt Cell B Freq.		Conditi	on 100.8	kHz			Status	pass		
Sensor Compone	nt System Memo		Conditi	on				Status	pass		
Sensor Compone	nt Sample Train		Conditi	on Good				Status	pass		
Sensor Compone	nt Cell B Pressure		Conditi	on				Status	pass		
Sensor Compone	nt Cell B Flow		Conditi	on 0.76 l	om			Status	pass		
Sensor Compone	nt Cell A Tmp.		Conditi	on 35.3 (	;			Status	pass		
Sensor Compone	nt Cell A Pressure		Conditi	on 714 m	imHg			Status	pass		
Sensor Compone	nt Cell A Noise		Conditi	on Not te	sted			Status	pass		
Sensor Compone	nt Cell A Freq.		Conditi	on 100.1	kHz			Status	pass		
Sensor Compone	nt Cell A Flow		Conditi	on 0.80 l	om			Status	pass		
Sensor Compone	nt Battery Backup		Conditi	on N/A				Status	pass		
Sensor Compone	nt Zero Voltage		Conditi	on N/A				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BVL	130-Eric He	ebert-09/20/2014				
1	9/20/2014	DAS	Campbell	000424	CR3000	2539
2	9/20/2014	Modem	Raven	06610	H4223-C	0844355827
3	9/20/2014	Ozone	ThermoElectron Inc	000625	49i A1NAA	1009241797
4	9/20/2014	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
5	9/20/2014	Sample Tower	Aluma Tower	000182	В	unknown
6	9/20/2014	Zero air pump	Teledyne	000759	701H	576

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SiteVisitDate	Site	Technician
09/24/2014	ANA115	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97366	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.48989	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.6	%	Р
5	Ozone % difference max	Р	7	10	4	2.4	%	Р

Mfg	Se	rial Number Ta	Site	Te	chnician		Site Visit	t Date	Parame	ter	Owner I	D
ThermoElectron Inc	: 10	09241778	ANA115	E	ric Hebert		09/24/20	14	Ozone		000610	
Sloper	0.07	7366 Sloper	0.0000	h	Mfg		ThermoE	lectron	Inc Pa	rameter 0	zone	
Slope:	0.97	300 Slope:	0.00000	2	Gental N	<b>n</b>	04106060		Te			( atop
CorrCoff	0.99	9999 CorrCoff	0.00000	) )	Serial N	umber	04190008	900	110	er Desc. 🖸	zone primary	/ Starr
				_	Tfer ID		01112					
DAS 1:		<b>DAS 2:</b>			Slope			1.00928	B Inter	cept	0.11	780
A Avg % Diff: A	Max	% Di A Avg %	6Dif A Max 9	% Di	Cont Do	to		1/8/2014	4 Com	Coff	1.00	000
1.6%		2.4%			Cert Da			1/0/201-			1.00	
UseDescription	:	ConcGroup:	Tfer Raw:	Tfer	Corr:	Sit	te:	Site	Unit:	PctDi	fference:	
primary		1	-0.43	-0.	.54	-0.	25 J	opb				
primary		2	28.80	28	.41	28.	22 J	ppb			-0.67%	
primary		3	53.24	52	.63	51.	94 l	ppb			-1.31%	
primary		4	82.56	81	.68	80.	20 j	ppb			-1.81%	
primary		5	115.76	114	1.57	111	.80 1	opb			-2.42%	
Sensor Compone	ent	Cell B Noise		Conditi	on 1.4 pp	b			Status	pass		
Sensor Compone	ent	Cell B Tmp.		Conditi	on				Status	pass		
Sensor Compone	ent	Fullscale Voltage		Conditi	on N/A				Status	pass		
Sensor Compone	ent	Inlet Filter Conditio	n	Conditi	on Clean				Status	pass		
Sensor Compone	ent	Line Loss		Conditi	on Not te	sted			Status	pass		
	_	o										5
Sensor Compone	ent _	Offset		Conditi	on 0.000				Status	pass		
Sensor Compone	ent	Span		Conditi	on 1.004				Status	pass		
Sensor Compone	ent (	Cell B Freq.		Conditi	on 97.3 k	Hz			Status	pass		
Sensor Compone	ent	System Memo		Conditi	on				Status	pass		
Sensor Compone	ent	Sample Train		Condition	on Good				Status	pass		
Sensor Compone	ent	Cell B Pressure		Conditi	on				Status	pass		
Sensor Compone	ent	Cell B Flow		Conditi	on 0.66 l	om			Status	pass		
Sensor Compone	ent	Cell A Tmp.		Conditi	on 35.0 (	)			Status	pass		
Sensor Compone	ent	Cell A Pressure		Conditi	<mark>on</mark> 720 m	mHg			Status	pass		
Sensor Compone	ent	Cell A Noise		Conditi	on 1.9 pp	b			Status	pass		
Sensor Compone	ent	Cell A Freq.		Conditi	on 97.7 k	Hz			Status	pass		
Sensor Compone	ent	Cell A Flow		Conditi	on 0.65 l	om			Status	pass		
Sensor Compone	ent	Battery Backup		Conditi	on N/A				Status	pass		
Sensor Compone	ent	Zero Voltage		Conditi	on N/A				Status	pass		

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ANA	115-Eric H	lebert-09/24/2014				
1	9/24/2014	DAS	Campbell	000338	CR3000	2117
2	9/24/2014	Ozone	ThermoElectron Inc	000610	49i A1NAA	1009241778
3	9/24/2014	Ozone Standard	ThermoElectron Inc	000364	49i A3NAA	0726124687
4	9/24/2014	Zero air pump	Werther International	06933	C 70/4	000836202