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

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List of Acronyms and Abbreviations

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

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

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

As of October 2016, the network is comprised of 95 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC Foster Wheeler (AMEC) is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

1.2 Project Objectives

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

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

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

Some or all of the additional monitored variables, NOy, CO, and SO₂ have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, ROM206, and BEL116. Those variables were audited at the BVL130 station during third quarter 2016. All of the trace gas results for those audits were found to be within acceptance criteria. The preliminary reports of those results were delivered following the audits and are not included in this report.

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	\leq ±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	TemperatureAccuracyComparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)		≤± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$
Shelter Temperature	Accuracy	Comparison to station temperature sensor	$\leq \pm 2.0^{\circ} \mathrm{C}$
Wind Direction	Wind DirectionOrientation AccuracyParallel 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	I 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

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ of designated rate
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$
Ozone	Intercept	point test gas concentration as	-5.0 ppb \leq b \leq 5.0 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 2016

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the third quarter (July through September) of 2016. The locations and dates of the site visits for complete audits are presented in Table 2.

<u>Side ID</u>	<u>Audit Type</u>	<u>Sponsor</u>	Site Visit Date	Station Name
DEN417	Without Met	NPS	07/07/2016	Denali National Park
SAL133	Without Met	EPA	07/19/2016	Salamonie Reservoir
MKG113	Without Met	EPA	08/15/2016	M. K. Goddard St. Park
ANA115	Without Met	EPA	08/15/2016	Ann Arbor
UVL124	Without Met	EPA	08/16/2016	Unionville
KEF112	Without Met	EPA	08/17/2016	Kane Experimental Forest
HOX148	Without Met	EPA	08/18/2016	Hoxeyville
PSU106	Without Met	EPA	08/22/2016	Penn State
RED004	Flow only	EPA	08/30/2016	Red Lake Nation
WST109	Without Met	EPA	09/15/2016	Woodstock
ABT147	Without Met	EPA	09/17/2016	Abington

 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 Performance Evaluations (PE).

Side ID	<u>PE Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
STK138	Ozone	EPA	07/20/2016	Stockton
ALH157	Ozone	EPA	07/21/2016	Alhambra
VIN140	Ozone	EPA	07/22/2016	Vincennes
CNT169	Ozone	EPA	08/18/2016	Centennial
LRL117	Ozone	EPA	08/23/2016	Laurel Hill
NEC602	Ozone	BLM	08/24/2016	Newcastle
VOY413	Ozone	NPS	08/29/2016	Voyageurs NP
PRK134	Ozone	EPA	09/01/2016	Perkinstown
SAN189	Ozone	EPA	09/09/2016	Santee Sioux
GRB411	Ozone	NPS	09/18/2016	Great Basin NP
BVL130	Ozone, NO _y , SO ₂ , CO	EPA	09/24/2016	Bondville
GLR468	Ozone	NPS	09/26/2016	Glacier NP

 Table 3.
 TTP Pollutant PE Visits

1.4 Audit Results

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

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

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

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

2.0 NADP Quarterly Report

2.1 Introduction

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

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

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

2.2 **Project Objectives**

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

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

2.3 Sites Visited Third Quarter 2016

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

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

 Table 4. Sites Surveyed – Third Quarter 2016

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

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

2.4 Survey Results

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

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

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

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

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environment	al Sys 2274	DE	N417	Martin Valvur	07/07/2016	DAS	Primary
Das Date:	7 /7 /2016	Audit Date	7 /7 /2016	Mfg	HY	Parameter	DAS
Das Time: Das Day:	8.20.00	Audit Time	189	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Chann	el:	High Channe	el:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0	003 0.0002	2 0.0003	Cert Date	6/15/201	4 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740243	Tfer Desc.	DVM
				Tfer ID	01312		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/23/201	5 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0004	-0.0005	V	V	-0.0001	
7	0.1000	0.0994	0.0997	V	V	0.0003	
7	0.3000	0.2996	0.2997	V	V	0.0001	
7	0.5000	0.4994	0.4997	V	V	0.0003	
7	0.7000	0.7002	0.6999	V	V	-0.0003	
7	0.9000	0.8996	0.8999	V	V	0.0003	
7	1.0000	1.0000	1.0001	V	V	0.0001	

Flow Data Form

Mfg	Seri	ial Numb	oer Ta	Site	Те	chnician	Site Visit Date Parame		neter Owner ID	
Tylan	AW	/9706011		DEN417	М	artin Valvur	07/07/2016	Flow F	Rate	90966
Mfg	Tylan					Mfg	BIOS	F	Parameter Flow	w Rate
SN/Owner ID	FP9706	6004	90967			Serial Number	122974	1	fer Desc. BIO	S 220-H
Parameter	MFC po	ower supp	bly			Tfer ID	01416			
						Slope	0.9	9895 Int	ercept	0.01185
						Cert Date	2/10/	/2016 Co	rrCoff	1.00000
DAS 1:		Γ	DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max 9	% Di A	A Avg %	Dif A Max	% Di	Cal Factor F	ull Scale		0	
0.61%	(0.64%				Rotometer R	eading:		0	
Desc.	Test	type	Input l/m	Input Corr_	MfcDisp	. OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump of	off	0.000	0.000	-0.19	-0.146	-0.06	l/m	l/m	
primary	leak che	eck	0.000	0.000	-0.18	-0.141	-0.05	l/m	l/m	
primary	test pt 1	1	2.992	2.980	2.58	2.586	3.00	l/m	l/m	0.60%
primary	test pt 2	2	2.992	2.980	2.58	2.586	3.00	l/m	l/m	0.64%
primary	test pt 3	3	2.989	2.980	2.58	2.586	3.00	l/m	l/m	0.60%
Sensor Comp	onent Le	eak Test			Conditi	on		Statu	s pass	
Sensor Comp	onent T	ubing Cor	ndition		Condition	on Good		Status	s pass	
Sensor Comp	onent Fi	ilter Posit	ion		Conditi	on Poor		Statu	s Fail	
Sensor Comp	onent R	otometer	Conditio	n	Conditi	on Clean and dry		Statu	s pass	
Sensor Comp	onent M	loisture P	resent		Conditi	on No moisture pr	resent	Statu	s pass	
Sensor Comp	onent Fi	ilter Dista	ince		Conditi	on 5.0 cm		Statu	s pass	
Sensor Comp	onent Fi	ilter Deptl	h		Conditi	on -0.5 cm		Status	s fail	
Sensor Comp	onent Fi	ilter Azim	uth		Conditi	on 10 deg		Statu	s pass	
Sensor Comp	onent S	system Me	emo		Conditi	on See comments	3	Statu	s pass	

Ozone Data Form

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	49C-77	033-384	DEN417	М	artin Valv	ur	07/07/20	016	Ozone		90778	
Slope: Intercept CorrCoff	-^ (1.06973 1.07240).99999	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7 01110	Electron 70008-3	Inc Pa	rameter ozc er Desc. Oz	one one primary	y stan
DAS 1: A Avg % D 4.7)iff: A N 7%	Iax % D 6.1	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	1	0.9983 /29/201	2 Inter 6 Corr	·cept ·Coff	-0.26	6452 0000
UseDes prin prin prin prin prin	cription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw -0.06 27.93 50.31 80.18 110.40	Tfer 0. 28 50 80 110	Corr 20 .24 .65 .57 .85	Si -0. 28 53 85 117	ite 69 .88 .20 .02 .02 	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	2.27% 5.03% 5.52% 6.09%	
Sensor Co	ompone	nt Samp	le Train	^	Conditi	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	degree rule		Conditi	on				Status	pass		
Sensor Co	ompone	nt Inlet F	Filter Conditio	n	Conditi	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditi	on N/A				Status	pass		
Sensor Co	ompone	nt Offset	t		Conditi	on 1.2				Status	pass		_
Sensor Co	omponei	nt Span			Conditi	on 1.030				Status	pass		
Sensor Co	ompone	nt Zero	Voltage		Conditi	on -0.001	16			Status	pass		
Sensor Co	omponei	nt Fullso	ale Voltage		Conditi	on 0.999	0			Status	pass		
Sonsor Co	ompone		Freq		Conditi	on 117.1	kH7			Status	nass		
Sensor C	ompone		Noino		Conditi		h			Status	2000		
Sensor Co	omponei		Flam		Conditio	on U.o pr				Status	pass		
Sensor Co	ompone				Conditi	on 0.65 I	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditi	on 6.78.7	' mmHg			Status	pass		_
Sensor Co	ompone	nt Cell A	Tmp.		Conditi	on 33.3 (2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditi	on 90.9 k	κHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Condition	on 0.69 l	pm			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Condition	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	S Tmp.		Conditi	on N/A				Status	pass		
Sensor Co	ompone	nt Line L	OSS		Conditi	on < 1 %				Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditi	on				Status	pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Seria	al Number	r Ta Site		1	Fechnicia	an	Site Vis	sit Date	Paramet	er	Owner ID
RM Young	018	533	DEN4	17		Martin Va	alvur	07/07/2	2016	Temperat	ure2meter	none
						Mfg		Fluke		Para	ameter Tem	perature
						Serial	Number	327514	3	Tfer	Desc. RTD	•
						Tfer l	D	01229]		
DAS 1:		DA	AS 2:			Slope			0.99980	Interc	ept	-0.02840
Abs Avg Err	Abs Max	Er Ab	os Avg Err	Abs Ma	x Er	Cert l	Date		1/19/2016	CorrC	Coff	1.00000
0.12		0.28										
UseDescription	Test	t type	InputTmpRa	w Inpu	tTmpCo	orrected	OutputTm	pSignal	OutputSi	ignalEng	OSE Unit	Difference
primary	Temp L	ow Rang	0.	04		0.07		0.000		0.13	С	0.06
primary	Temp M	lid Rang	23.	33		23.36		0.000		23.34	С	-0.02
primary	Temp H	ligh Rang	48.	71		48.75		0.000		48.47	С	-0.28
Sensor Compo	nent Pro	operly Site	d		Condi	tion Pro	perly sited			Status P	ass	
Sensor Compo	nent Sh	ield			Condi	tion Clea	an			Status P	ass	
Sensor Compo	nent Blo	ower			Condi	tion Fun	ctioning			Status P	ass	
Sensor Compo	nent Blo	ower Statu	s Switch		Condi	tion N/A				Status P	ass	
Sensor Compo	nent Sy	stem Merr	10		Condi	tion				Status P	ass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	006	DEN417	Martin Valvur	07/07/2016	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg ErrA1.35	2.90	Err Abs Max Er	Serial Number	3275143	Tfer Desc. RTE)
			Tfer ID	01229		
			Slope	0.9998	0 Intercept	-0.02840
			Cert Date	1/19/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.51	22.54	0.000	23.6	С	1.01
primary	Temp Mid Range	20.66	20.69	0.000	23.6	С	2.9
primary	Temp Mid Range	23.97	24.00	0.000	24.1	С	0.14
Sensor Component System Memo			Condition		Status	pass	

Infrastructure Data For

Site ID	DEN417	Technician M	artin Valvur Site V	Visit Date 07/07/2016
Shelter M	Make	Shelter Model	Shelter Size	
Ekto		8814	896 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	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

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

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 Parameter: ShelterCleanNotes

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

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Site ID DEN417	Technician Martin Valvur	Site Visit Date 07/0	7/2016			
Site Sponsor (agency)	NPS/EPA	USGS Map	Healy C-4			
Operating Group	NPS	Map Scale				
AQS #	02-068-0003	Map Date				
Meteorological Type	Climatronics					
Air Pollutant Analyzer	ozone, IMPROVE	QAPP Latitude				
Deposition Measurement	dry, wet	QAPP Longitude				
Land Use	woodland - mixed	QAPP Elevation Meters				
Terrain	complex	QAPP Declination				
Conforms to MLM	No	QAPP Declination Date				
Site Telephone	(907) 683-9638	Audit Latitude	63.7232			
Site Address 1	mile 238 Parks Highway	Audit Longitude	-148.9676			
Site Address 2		Audit Elevation	663			
County	Denali Borough	Audit Declination	19.3			
City, State	Denali Park, AK	Present				
Zip Code	99755	Fire Extinguisher				
Time Zone	Alaska Time Zone	First Aid Kit				
Primary Operator		Safety Glasses				
Primary Op. Phone #		Safety Hard Hat				
Primary Op. E-mail		Climbing Belt				
Backup Operator		Security Fence				
Backup Op. Phone #		Secure Shelter				
Backup Op. E-mail		Stable Entry Step 🗹				
Shelter Working Room ✓	Make Ekto M	odel 8814	Shelter Size896 cuft			
Shelter Clean	Notes The shelter is in good condition	n, clean, neat, and very well org	ganized.			
Site OK	Notes					
Driving Directions From either Anchorage or Fairbanks, take the Parks Highway (route 3) north or south respectively. Just south of the town of Healy turn west into Denali National Park. The road is well marked. Continue on the park road a few miles to the Park Headquarters. The site is approximately 100 yards up a residential road on the opposite side of the street from the headquarters parking lot.						

DEN417

F-02058-1500-S2-rev002

Site ID

Techn

Technician Martin Valvur

Site Visit Date 07/07/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		\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 - 30 m	
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	DEN417 Technician Martin Valvur		Site Visit Date 07/07/2016				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?	✓	N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓					
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)						
6	Is the solar radiation sensor plumb?	✓	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A				
8	Is the rain gauge plumb?	✓	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A				
11	Is it inclined approximately 30 degrees?	✓	N/A				
Pro nat	wide any additional explanation (photograph or sketch if neco 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	DEN417	Technician	Martin Valvur		Site Visit Date 07/07/2016
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 reporting	ne meteorological sens g data?	sors operational	l online, and	✓	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 s?	lens clean and f	ree of	✓	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		

Provide any additional 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		F-02058-1500-S5-rev002
Site	e ID	DEN417	Technician Martin Valvur		Site Visit Date 07/07/2016
	Siting C	riteria: Are the pollut	ant analyzers and deposition	<u>ı equipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at le	ast a 270 degree arc of		
2	Are the	sample inlets 3 - 15 me	eters above the ground?	✓	
3	Are the and 20 1	sample inlets > 1 mete meters from trees?	r from any major obstructio	on, ⊻	
	<u>Pollutar</u>	nt analyzers and depos	ition equipment operations	and mai	ntenance
1	Do the a condition	analyzers and equipme on and well maintained	nt appear to be in good ?		
2	Are the reportir	analyzers and monitor ng data?	rs operational, 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 line? (if yes		At inlet only
6	Are san obstruc	ple lines clean, free of tions?	kinks, moisture, and	\checkmark	
7	Is the ze	ero air supply desiccan	t unsaturated?	\checkmark	
8	Are the	re moisture traps in the	e sample lines?		
9	Is there clean?	a rotometer in the dry	deposition filter 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					F-02	2058-15	500-S6-rev002
Site	e ID	DEN417	Technician	Martin Valvur		Site Visi	it Date	07/07/2016	6	
	DAS, sei	nsor translators, and p	<u>eripheral equi</u>	pment operatio	ons and	maintena	<u>nce</u>			
1	Do the D well mai	DAS instruments appeantained?	ar to be in good	l condition and						
2	Are all t modem,	he components of the l backup, etc)	DAS operation	al? (printers,						
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	nal leads pass	through						
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	e instrument shelter ha	ve a stable pov	ver source?						
8	Is the ins	strument shelter temp	erature contro	lled?						
9	Is the mo	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 Sy	stems Data F	orm	l				F-02	058-1	500-S7-rev002
Site ID	DEN417	Т	echnician	Martin Valvu	r	Site Visit Date	07/07/2016	;	
Document	ation								
Does the si	ite have the required	instru	ment and	equipment n	nanuals?				
Wind speed s Wind direction	Ye sensor	es 1] [] [A D D)ata logger)ata logger		Yes	No ✓	N/A □ ✓
Temperature	e sensor			S	trip chart	recorder			
Relative hum	idity sensor			C	Computer			\checkmark	
Solar radiation	on sensor			Ν	Iodem			\checkmark	
Surface wetn	ess sensor			Р	rinter				
Wind sensor	translator			Z	ero air pu	mp			
Temperature	e translator			F	ilter flow p	oump			
Humidity sen	sor translator			S	urge prote	ctor			
Solar radiation	on translator] [U	PS				
Tipping buck	ket rain gauge] [L	ightning p	rotection device		\checkmark	
Ozone analyz	ver 🗸	•		S	helter heat	er		\checkmark	
Filter pack fl	ow controller			S	helter air o	conditioner	\checkmark		
Filter pack M	IFC power supply] [
Does the	site have the require	d and	most rece	nt QC docun	nents and r	<u>eport forms?</u>			
	P	resent					Curre	nt	
Station Log		\checkmark	Datavie	W					
SSRF			Datario						
Site Ops Mar	nual								
HASP									
Field Ops Ma	anual								
Calibration F	Reports	\checkmark					\checkmark		
Ozone z/s/p C	Control Charts	\checkmark	Datavie	W			\checkmark		
Preventive m	aintenance schedul								
1 Is the sta	ation log properly co	mplete	d during	every site vis	it? 🗸				
2 Are the current?	Site Status Report Fo	orms b	eing comp	oleted and					
3 Are the sample t	chain-of-custody form transfer to and from D	ns pro lab?	perly used	l to documen	nt 🔽				
4 Are ozor current?	ne z/s/p control chart ?	s prop	erly comp	leted and	√ Da	taview			
Provide any a	additional explanatio	n (pho	tograph o	r sketch if no	ecessary) r	egarding condit	ions listed	above, oi	r any other features,

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

Site	ID	DEN417	Technician	Martin Valvur		Site Visit Date	07/07/2016				
1	Site ope Has the course?	<u>ration procedures</u> site operator attended If yes, when and who	d a formal CAS instructed?	TNET training	✓	Site operator trained	I on-site by ARS emp	oloy	ye	Э	
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?							
3	Is the site schedule	e visited regularly on ?	the required T u	ıesday	✓						
4	Are the s flollowed	tandard CASTNET of by the site operator?	operational pro	cedures being	✓						
5	Is the site the requi	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

Frequency

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

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

QC	Check	Perf	ormed
----	-------	------	-------

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 analyz
Sample Line Check for Dirt/Water
Zero Air Desiccant Check

Frequency	
Semiannually	
Daily	
Monthly	
Daily	
Alarm values only	
Quarterly	
N/A	
Semiannually	

- **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
✓	
✓	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:

Compliant

Compliant

✓

✓

✓

✓

✓

✓

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	orm					F-02058 -	1500-S9-rev002
Sit	e ID	DEN417	Tech	nician	Martin Valvur		Site Visit Date	07/07/2016	
	<u>Site ope</u>	eration procedures							
1	Is the fi	lter pack being change	ed every	Tuesda	ay as scheduled?		Filter changed vario	ous times	
2	Are the correctl	Site Status Report Fo	rms bein	g comj	pleted and filed				
3	Are dat schedul	a downloads and back ed?	ups bein	g perfo	ormed as		No longer required		
4	Are gen	eral observations bein	g made a	and ree	corded? How?	✓	SSRF		
5	Are site fashion	supplies on-hand and ?	replenis	hed in	a timely				
6	Are san	nple flow rates recorde	ed? How	?		✓	SSRF		
7	Are san fashion	nples sent to the lab on ?	a regula	ar sche	dule in a timely				
8	Are filte and shij	ers protected from con pping? How?	taminat	ion dui	ring handling	✓	One set of gloves o	nly	
9	Are the operation	site conditions reporte ons manager or staff?	ed regula	arly to	the field				
QC	Check P	erformed		Free	quency			Compliant	
I	Multi-poi	nt MFC Calibrations	•	Sem	iannually			\checkmark	
I	Flow Syst	em Leak Checks	•	✓ Wee	kly			\checkmark	
I	Filter Pac	k Inspection		✓ Wee	kly			\checkmark	
I	Flow Rate	e Setting Checks		✓ Wee	kly			\checkmark	
	visual Ch	eck of Flow Rate Roto	meter 🖣	✓ Wee	kly			\checkmark	
1	n-line Fil	ter Inspection/Replace	ement 🛛	🖊 As n	eeded			\checkmark	
5	Sample Li	ine Check for Dirt/Wa	ter	🖊 As n	leeded			\checkmark	
Dros	ido ony c	ditional avalanation	(nhotog	ronh o	r skatah if nagas	COPT) regarding conditi	one listed above a	ar any other features

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

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

DEN417

F-02058-1500-S10-rev002

Site ID

Tech

Technician Martin Valvur

Site Visit Date 07/07/2016

Site Visit Sensors

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

Site Inventory by Site Visit

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

DAS Data Form

DAS Time Max Error:

0

Mfg	g Serial Number Sit		. 1	Fechnician	Site Visit Date	Parameter	Use Desc.		
Campbell	2129	SAI	L133	Sandy Grenville	07/19/2016	DAS	Primary		
Das Date: Das Time: Das Day:	7 /19/2016 18:51:00 201	Audit Date Audit Time Audit Day	7 /19/2016 18:51:00 201	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D		
Low Channe Avg Diff.	1: Max Diff•	Avo Diff.	Max Diff.						
0.000	1 0.0	001 0.000	1 0.0001						
				Mfg	Fluke	DAS			
				Serial Number	95740135 Tfer Desc. DVM				
				Tfer ID	01311				
				Slope	1.0000	1.00000 Intercept			
				Cert Date	12/23/201	5 CorrCoff	1.00000		
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference			
7	0.0000	0.0000	0.0000) V	V	0.0000			
7	0.1000	0.0999	0.0999	V	V	0.0000			
7	0.3000	0.2998	0.2997	V V	V	-0.0001			
7	0.5000	0.4996	0.4996	5 V	V	0.0000			
7	0.7000	0.6996	0.6995	v V	V	-0.0001			
7	0.9000	0.8994	0.8993	V V	V	-0.0001			
7	1.0000	0.9993	0.9992	2 V	V	-0.0001			

Flow Data Form

Mfg	Serial Number Ta Site		Tec	hnician	Site Visit I	Date Paran	neter	Owner ID		
Арех	illegible	SAL133		Sai	ndy Grenville	07/19/201	6 Flow F	Rate	000599	
					Mfg	BIOS	F	arameter F	low Rate	
					Serial Number	103471		fer Desc	exus	
						01400	*			
					Ifer ID	01420				
					Slope	0.	99091 Int	ercept	0.03172	
					Cert Date	8/2016 Co	rrCoff	0.99988		
				Mfg	BIOS	F	arameter Flow Rate			
					Serial Number	103424	1	Tfer Desc. BIOS cell		
					Tfer ID	01410				
								Γ		
					Slope	0.	99091 Int	ercept	0.03172	
					Cert Date 2/28		8/2016 Co	rrCoff	0.99988	
DAS 1:		DAS 2:			Cal Factor Z	ero		0		
A Avg % Diff: A Max % Di A Avg %Dif A Max %			: % Di	Cal Factor F		0				
1.75% 1.96%				Rotometer R	eading:		0			
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	-0.03	l/m	l/m		
primary	leak check	0.000	0.000	0.01	0.000	-0.04	l/m	l/m		
primary	test pt 1	1.542	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%	
primary test pt 2 1.		1.545	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%	
primary	test pt 3	1.545	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%	
Sensor Compo	onent Leak Tes	t		Condition	n		Statu	pass		
Sensor Compo	onent Tubing C	ondition		Condition	n Good		Statu	pass		
Sensor Component Filter Position				Condition	n Good		Statu	pass		
Sensor Component Rotometer Condition				Condition	Clean and dry		Status	pass		
Sensor Component Moisture Present				Condition	No moisture p	resent	Status	pass		
Sensor Component Filter Distance				Condition	1 2.5 cm		Statu	pass		
Sensor Component Filter Depth				Condition	1 2.3 cm		Statu	pass		
Sensor Component Filter Azimuth			Condition	180 deg		Status	pass			
Sensor Compo	onent System M	lemo		Condition	n		Statu	pass		

Ozone Data Form

Mfg		Serial Number Ta		Site T		Technician		Site Visit Date		Parameter		Owner I	D
ThermoElectron Inc		110534	7316	SAL133	Sa	Sandy Grenville		07/19/2016		Ozone		000741	
Slope: Intercept CorrCoff	().98516).28944).99998	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 04196069 01112	lectron 966	Inc Pa	rameter ozc er Desc. Ozc	one one primary	/ stan
DAS 1: A Avg % D 0.7)iff: A N 7%	Iax % D 1.5'	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Date		0.99524 Inter 1/28/2016 Corr		rcept -0.33070 rCoff 1.00000		8070 9000	
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.01 30.02 50.04 80.13 110.30	Tfer 0 30. 50. 80. 111	Corr 34 .49 .61 .84 15	Si 0. 30 50 80 109	ite 32 .47 .43 .10 0.50	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	-0.07% -0.36% -0.92% -1.48%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	ilter Conditic	n	Conditio	on Clean	1			Status	pass		
Sensor Component		nt Batter	Battery Backup		Condition N/A				Status	pass			
Sensor Component		nt Offset	Offset		Condition 0.10				Status	s pass			
Sensor Component		nt Span	Span			Condition 1.020				Status	s pass		
Sensor Component		nt Zero	Zero Voltage			Condition N/A				Status	IS pass		
Sensor Co	ompone	nt Fullsc	Fullscale Voltage			Condition N/A				Status	pass		
Sensor C	ompone		Cell A Freq			Condition 114.7 kHz				Status			
Sensor C	ompone				Condition 0.8 pph				Status				
Sensor Co	omponei				Condition 0.5 pp				Status				
Sensor Component									Status				
Sensor Component		nt Cell A			Condition 732.7 mmHg				Status	s pass			
Sensor Component		nt Cell A	Cell A Tmp.		Condition 38.6 C				Status	s pass			
Sensor Component		nt Cell B	Cell B Freq.		Condition 96.5 kHz				Status	IS pass			
Sensor Component		nt Cell B	Cell B Noise		Condition 0.6 ppb				Status	IS pass			
Sensor Component		nt Cell B	Cell B Flow		Condition 0.55 lpm				Status	us pass			
Sensor Component		nt Cell B	Cell B Pressure		Conditio	dition 732.4 mmHg			Status	s pass			
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.OSS		Conditio	on Not te	sted			Status	pass		
Sensor Component		nt Syste	System Memo			condition				Status	pass		
Temperature Data Form

Mfg	Serial Number Ta	a Site	r	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	14043	SAL133		Sandy Grenville		07/19	9/2016	Temper	ature	06410	
			Mfg		Extec	h	Pa	arameter Temperature			
				Serial Number		H232734 Tf		fer Desc. RTD			
				Tfer ID		01227					
DAS 1: DAS 2:				Slope		1.00772 Inte		ercept 0.1251		14	
Abs Avg Err Abs Max Er Abs Avg E		vg Err Abs	bs Max Er		Cert Date		2/28/2016 Cor		crCoff 1.00000		00
0.10	0.16										
UseDesc.	Test type I	nputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.18	0.05		0.000 0.		0.2	2	С	0.16	
primary Tem	p Mid Range	25.15	24.83	3	0.000		24.9		С	0.04	
primary Tem	p High Range	47.84	47.35	5	0.000		47.	3	С	-0.09	
Sensor Compone	ent Shield		Condi	Condition Clean				Status	pass		
Sensor Component Blower				Condition N/A				Status	s pass		
Sensor Component Blower Status Switch				ondition N/A				Status	IS pass		
Sensor Component System Memo				ondition Status pass							

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none SAL133		Sandy Grenville	07/19/2016 Shelter Temperature		urenone
DAS 1:	DAS 2:		Mfg	Extech	Parameter	Shelter Temperatur
Abs Avg ErrAl0.46	0.79 0.79	Err Abs Max Er	Serial Number	H232734 Tfer Desc. RTI		RTD
			Tfer ID	01227		
			Slope	1.0077	2 Intercept	0.12514
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	26.21	25.89	0.000	26.7	С	0.79	
primary	Temp Mid Range	26.10	25.78	0.000	26.3	С	0.55	
primary	Temp Mid Range	28.78	28.44	0.000	28.4	С	-0.04	
Sensor Component System Memo			Condition	status pass				

Infrastructure Data For

SAL133

Site ID

Technician Sandy Grenville

Site Visit Date 07/19/2016

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	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	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 inlet filter is replaced and the sample train is leak tested every two weeks.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

Field Systems Data Form	

F-02058-1500-S1-rev002

Site ID SAL133	Technician Sandy Grenville	Site Visit Date 07/19	9/2016	
Site Sponsor (agency)	EPA	USGS Map	Lagro	
Operating Group	private	Map Scale		
AQS #	18-169-9991	Map Date		
Meteorological Type	Climatronics			
Air Pollutant Analyzer	Ozone	QAPP Latitude		
Deposition Measurement	dry	QAPP Longitude		
Land Use	agriculture	QAPP Elevation Meters		
Terrain	flat	QAPP Declination		
Conforms to MLM	Yes	QAPP Declination Date		
Site Telephone	(260) 782-2428	Audit Latitude	40.816038	
Site Address 1	Hamilton Road	Audit Longitude	-85.661407	
Site Address 2		Audit Elevation	250	
County	Wabash	Audit Declination	-5	
City, State	Lagro, IN	Present		
Zip Code	46941	Fire Extinguisher 🔽	New in 2015	
Time Zone	Eastern	First Aid Kit		
Primary Operator		Safety Glasses		
Primary Op. Phone #		Safety Hard Hat		
Primary Op. E-mail		Climbing Belt		
Backup Operator		Security Fence		
Backup Op. Phone #		Secure Shelter		
Backup Op. E-mail		Stable Entry Step 🗹		
Shelter Working Room ✓	Make Ekto Me	odel 8810	Shelter Size 640 cuft	
Shelter Clean	Notes The shelter is in fair condition a present. It is clean neat and	and there is evidence of a leak well organized. Only one light i	in the shelter roof and ants are	
Site OK	Notes			
Driving Directions From severa next ro	Huntington, IN take route 9 south a few m al miles to S 750 E, turn left (south). Turn bad, Hamilton or 725E. The site is about	iles to Division Road. Turn rigl right (west) at the first intersed 1 mile on the right.	ht (west) on Division and continue ction (E 50 S). Turn left (south) at the	

SAL133

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 07/19/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		\checkmark
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		\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.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	ID SAL133 Technician Sandy Grenville		Site Visit Date 07/19/2016
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?		N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A
10	Is the surface wetness sensor sited with the grid surface facing north?		N/A
11	Is it inclined approximately 30 degrees?		N/A
Pro nat	wide 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,

Field Systems Data Form F-02058-1500-S4-rev002 Site ID SAL133 Technician Sandy Grenville Site Visit Date 07/19/2016 Temperature only Do all the meterological sensors appear to be intact, in go condition, and well maintained? Are all the meteorological sensors operational online, and

3	Are the shields for the temperature and RH sensors clean?
4	Are the aspirated motors working?
5	Is the solar radiation sensor's lens clean and free of scratches?
6	Is the surface wetness sensor grid clean and undamaged?

1

2

reporting data?

- 7 Are the sensor signal and power cables intact, in good condition, and well maintained?
- Are the sensor signal and power cable connections protec 8 from the elements and well maintained?

00	U	
I		Temperature only
1?	✓	
	✓	N/A
		N/A
		N/A
ted		

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

Field Systems Data Form						F-02058-1500-S5-rev00			
Site	e ID	SAL133	Technician	Sandy Grenville		Site Visit Date 07/19/2016			
	Siting C	riteria: 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	ample inlets have at le cted airflow?	east a 270 degre	e arc of	✓				
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?			or obstruction,					
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	<u>ntenance</u>			
1	Do the a conditio	nalyzers and equipme n 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.				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)	ozone sample lin	ne? (if yes	✓	At inlet only			
6	Are sam obstruct	ple lines clean, free of tions?	' kinks, moistur	e, and	✓				
7	Is the ze	ero air supply desiccan	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	v deposition filte	er line, and is it		Clean and dry			

Fi	eld Systems Data Form	F-02058-1500-S6-rev002				
Site	B SAL133 Technician Sandy Grenville	e	Site Visit Date	07/19/2010	6	
	DAS, sensor translators, and peripheral equipment operation	ons a	and maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)					
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	✓	Met sensors only			
4	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?					
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?					

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016	
DAS, sensor translators, and peripheral equipment operations and maintenance						

Field S	ystems Data	For	·m				F-02	058- 1	1500-S7-rev002
Site ID	SAL133		Technician	Sandy Grenv	ille	Site Visit Date	07/19/2016		
Docume	ntation								
Does the	site have the requir	ed ins	trument an	<u>d equipment n</u>	nanuals?				
Wind speed Wind direc	l sensor tion sensor	Yes	No N	/A D D D	ata logger ata logger		Yes	No ✓	<mark>N/A</mark> □ ✓
Temperatu Relative hu Solar radia	re sensor Imidity sensor Ition sensor				trip chart i omputer Iodem	recorder			
Surface we Wind senso Temperatu	tness sensor or translator re translator			P. P. Z. Z. F.	rinter ero air pui ilter flow p	np pump			
Humidity s Solar radia Tipping bu	ensor translator tion translator cket rain gauge				urge prote PS ightning p	ctor rotection device			
Ozone anal Filter pack Filter pack	yzer flow controller MFC power supply			SI SI SI	helter heat helter air c	er conditioner		✓ ✓	
Does th	ne site have the requ	ired a	nd most rec	ent QC docum	ients and r	eport forms?			
	-	Pres	ent				Currer	nt	
Station Log SSRF Site Ops M	g anual								
HASP Field Ops M Calibration	Manual 1 Reports 2 Control Charts		Noven	nber 2009					
Preventive	maintenance schedu	.] [
1 Is the	station log properly	comp	leted during	g every site vis	it? 🗸				
2 Are th curren	e Site Status Report nt?	Form	ns being con	pleted and					
3 Are th sample	e chain-of-custody f e transfer to and fro	orms m lab	properly us ?	ed to documen	it 🔽				
4 Are oz currer	zone z/s/p control ch nt?	arts p	roperly com	pleted and		ntrol charts not us	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:									
Site ID	SAL133		Technician	Sandy Grenv	ille	Site Visit Date)7/19/2016		
Docume	ntation								

3

Site	ID	SAL133	Technician	Sandy Grenville		Site Visit Date	07/19/2016	
1	Site ope Has the course?	<u>ration procedures</u> site operator attended If yes, when and who	l a formal CAS instructed?	TNET training	✓	Trained on-site by E	SE employee (JBA)	
2	Has the training	backup operator atter course? If yes, when a	nded a formal (and who instrue	CASTNET cted?				
3	Is the site	e visited regularly on t ?	the required Tu	iesday	✓			
4	Are the s flollowed	standard CASTNET o l by the site operator?	perational proc	edures being	✓			
5	Is the sit	a anaratar(s) knowlad	apple of and a	ble to norferm	\checkmark			

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 mstruments:
--

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		Frequency	Compliant
Multi-point Calibrations	\checkmark	Semiannually	\checkmark
Automatic Zero/Span Tests	\checkmark	Daily	\checkmark
Manual Zero/Span Tests			\checkmark
Automatic Precision Level Tests	✓	Daily	\checkmark
Manual Precision Level Test			\checkmark
Analyzer Diagnostics Tests	\checkmark	Weekly	\checkmark
In-line Filter Replacement (at inlet)	\checkmark	Every 2 weeks	\checkmark
In-line Filter Replacement (at analyze	\checkmark	N/A	\checkmark
Sample Line Check for Dirt/Water	\checkmark	Weekly	\checkmark
Zero Air Desiccant Check		Weekly	\checkmark
1 Do multi-point calibration gases go thro	ugh the	complete Unknown	

sample train including all filters?

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

Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?

reported? If yes, how?

	UIKIOWI
V	
\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:

The ozone inlet filter is replaced and the sample train is leak tested every two weeks.						
Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016	

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Compliant

✓ ✓ ✓ ✓ ✓ ✓

te ID SAL133 Technician Sandy Grenville				Site Visit Date 07/19/2016		
<u>Site or</u>	eration procedures					
Is the	filter pack being changed ever	y Tuesday as scheduled?		Filter changed afternoons		
Are th correc	e Site Status Report Forms be tly?	ing completed and filed	✓			
Are da schedu	ita downloads and backups be iled?	ing performed as		No longer required		
Are general observations being made and recorded? How?				SSRF, logbook		
5 Are sit fashio	e supplies on-hand and replen n?	ished in a timely				
Are sample flow rates recorded? How?				SSRF, call-in		
Are samples sent to the lab on a regular schedule in a timely fashion?			✓			
Are fil and sh	ters protected from contamina ipping? How?	ation during handling		Clean gloves on and off		
Are th operat	e site conditions reported reguing ions manager or staff?	llarly to the field				
C Check	Performed	Frequency		Compliant		
Multi-po Flow Sys Filter Pa Flow Ra Visual C In-line F Sample I ovide any	sint MFC Calibrations stem Leak Checks ock Inspection te Setting Checks heck of Flow Rate Rotometer ilter Inspection/Replacement Line Check for Dirt/Water additional explanation (photo	 Semiannually Weekly Weekly Weekly Semiannually Semiannually Weekly 	sary	y) regarding conditions listed above, or any other features,		

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

SAL133

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 07/19/2016

Site Visit Sensors

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

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
MKG	3113-Sandy	Grenville-08/15/2016				
1	8/15/2016	Computer	Dell	07030	Inspiron 15	Unknown
2	8/15/2016	DAS	Campbell	000404	CR3000	2521
3	8/15/2016	Elevation	Elevation	None	1	None
4	8/15/2016	Filter pack flow pump	Thomas	03639	107CAB18	049400004427
5	8/15/2016	Flow Rate	Арех	000637	AXMC105LPMDPCV	illegible
6	8/15/2016	Infrastructure	Infrastructure	none	none	none
7	8/15/2016	Modem	Raven	06593	V4221-V	0844350394
8	8/15/2016	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
9	8/15/2016	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
10	8/15/2016	Sample Tower	Aluma Tower	666362	В	AT-5107-E-4-11
11	8/15/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/15/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/15/2016	Temperature	RM Young	04313	41342	4010
14	8/15/2016	Zero air pump	Werther International	06937	C 70/4	000821896

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial N	Number Site	r	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2521	MK	G113	Sandy Grenville	08/15/2016	DAS	Primary
Das Date: Das Time: Das Time: Das Day: Das Day: Das Day: Channel: Avg Diff: 0,0001	8 /15/2016 17:30:10 228 : Max Diff:	Audit Date Audit Time Audit Day High Channe Avg Diff:	8 /15/2016 17:30:10 228 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 12/23/201	 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	o v	V	0.0000	
7	0.1000	0.0999	0.0999	9 V	V	0.0000	
7	0.3000	0.2997	0.2997	7 V	V	0.0000	
7	0.5000	0.4996	0.4996	6 V	V	0.0000	
7	0.7000	0.6996	0.6995	5 V	V	-0.0001	
7	0.9000	0.8994	0.8993	3 V	V	-0.0001	
7	1.0000	0.9993	0.9991	1 V	V	-0.0002	

Flow Data Form

Mfg	Serial Num	ber Ta	Site	Тес	hnician	Site Visit Date Parame		eter Owner ID		
Apex	illegible		MKG113	Sa	ndy Grenville	08/15/2016	Flow R	late	000637	
					Mfg	BIOS	P	arameter Flo	ow Rate	
					Serial Number	103471	Т	fer Desc. ne	exus	
					Tfer ID	01420				
					Slope	0.9	99091 Int	ercept	0.03172	
					Cert Date	2/28	2016 Co	rrCoff	0.99988	
					Mfg	BIOS	P	arameter Flo	ow Rate	
					Serial Number	103424	Т	fer Desc. Bl	OS cell	
					Tfer ID	01410				
					Slope	0.9	99091 Int	ercept	0.03172	
					Cert Date	2/28	2016 Co	rrCoff	0.99988	
DAS 1:		DAS 2:			Cal Factor Z	ero		0		
A Avg % Diff:	A Max % Di	A Avg %l	Dif A Max	% Di	Cal Factor F	ull Scale	1.00	01		
0.22%	0.67%				Rotometer R	eading:	1	.6		
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	ll PctDifference	
primary	pump off	0.000	0.000	-0.09	0.000	-0.01	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m		
primary	test pt 1	1.514	1.500	1.50	0.000	1.51	l/m	l/m	0.67%	
primary	test pt 2	1.516	1.500	1.50	0.000	1.50	l/m	l/m	0.00%	
primary	test pt 3	1.516	1.500	1.50	0.000	1.50	l/m	l/m	0.00%	
Sensor Compo	onent Leak Tes	t		Condition	n		Status	pass		
Sensor Compo	onent Tubing C	ondition		Condition	n Good		Status	pass		
Sensor Compo	onent Filter Pos	ition		Condition	n Good		Status	pass		
Sensor Compo	onent Rotomete	er Conditior	1	Condition	Clean and dry		Status	pass		
Sensor Component Moisture Present			Condition	No moisture p	resent	Status	pass			
Sensor Compo	nent Filter Dist	ance		Condition	n 3.0 cm		Status	s pass		
Sensor Compo	onent Filter Dep	oth		Condition	n 2.5 cm		Status	pass		
Sensor Compo	Dent Filter Azir	muth		Condition	n 180 deg		Status	pass		
Sensor Component System Memo				Condition	Status pass			pass		

Ozone Data Form

Mfg		Serial N	umber Ta	Site	Technician S		Site Visi	Site Visit Date Parame		eter	Owner I	D	
ThermoElec	tron Inc	103024	4805	MKG113	Sa	andy Grei	nville	08/15/20	016	Ozone		000703	
Slope: Intercept CorrCoff	-(1.00272).79901).99998	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0419606 01112	electron	Inc Pa	rameter ozo er Desc. Oz	one one primar <u>i</u>	y stan
DAS 1: A Avg % D 1.(Diff: A N D%	lax % D 2.0'	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	ıte	1	0.9952 /28/201	4 Inter 6 Corr	rcept •Coff	-0.33	3070)000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.02 30.02 50.06 80.33 110.07	Tfer 0 30. 50. 81. 110	Corr 35 .49 .63 .04 .92	Si -0. 29 50 80 110	ite 73 .87 .24 .70 0.10	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	-2.03% -0.77% -0.42% -0.74%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass	I	
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	omponei	nt Inlet F	ilter Conditic	n	Conditio	on Clean				Status	pass		
Sensor Co	omponei	nt Batter	y Backup		Conditio	on N/A				Status	pass		_
Sensor Co	ompone	nt Offset	t		Conditio	on 0.10				Status	pass		
Sensor Co	omponei	nt Span			Conditio	on 1.010				Status	pass		
Sensor Co	ompone	nt Zero \	/oltage		Conditio	on N/A				Status	pass		
Sensor C	ompone		ale Voltage		Conditi					Status	nass		
Sensor C	ompone		Erea		Conditio	01 03.8	·H-7			Status	nass		
Sensor Co	omponei		Neise		Conditio					Status	pass		
Sensor Co	ompone	nt Cell A	NOISE		Conditio	on 0.9 pp	ad			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.74	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 705.5	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 38.0 (2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 88.4 k	κHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 1.0 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 1.01 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 705.5	mmHg			Status	pass		_
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.OSS		Conditio	on Not te	sted			Status	pass		
Sensor C	ompone	nt Svste	m Memo		Conditi	on [Statue	pass		
	mpone				Condition					Status			

Temperature Data Form

Mfg	Serial Number Ta	a Site	,	Techni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	4010	MKG113		Sandy	Grenville	08/15	5/2016	Temper	rature	04313	
				Mfg		Extec	h	Pa	arameter Te	emperature	
				Serial Number		H232	H232734 TI		fer Desc. RTD		
				Tfe	er ID	01227	7				
DAS 1:	DAS 2	:		Slo	pe		1.0077	2 Inte	rcept	0.1251	4
Abs Avg Err Ab	s Max Er Abs A	vg Err Abs	Max Er	fax Er Cert Date			2/28/201	6 Cor	rCoff	1.0000	0
0.04	0.06										
UseDesc.	Test type I	nputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	ignal OutputSignalEng		OSE Unit	Difference	
primary Tem	b Low Range	0.19	0.06	ó	0.000		0.1	1	С	0.04	
primary Tem	o Mid Range	25.12	24.8	0	0.000		24.	8	С	0.01	
primary Tem	b High Range	48.00	47.5	1	0.000		47.	5	C	-0.06	
Sensor Compone	nt Shield		Cond	ition C	Clean			Status	pass		
Sensor Compone	nt Blower		Cond	ition 🛚	N/A			Status	pass		
Sensor Compone	nt Blower Status St	witch	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	08/15/2016	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err Ab	S Max Er Abs Avg 0.13	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RT)
			Tfer ID	01227		
			Slope	1.0077	2 Intercept	0.12514
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.32	27.98	0.000	28.0	С	0.03
primary	Temp Mid Range	27.77	27.43	0.000	27.3	С	-0.13
primary	Temp Mid Range	27.94	27.60	0.000	27.6	С	0.04
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	MKG113	Technician Sandy G	renville Site Visit Date 08/15/2016
Shelter 1	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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: ShelterCleanNotes

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

F-02058-1500-S1-rev002

Site ID	MKG113	3		Technician San	dy Grenville	9	Site Visit I)ate 08/1	5/2016]	
						USCO	Mon		Hadley		
Site Sponsor ((agency)		EPA			USGS	мар		i lauley		
Operating Gr	oup		PA/privat	e		Map Scale					
AQS #			42-085-9	991		Map Date					
Meteorologica	al Type		Climatro	nics							
Air Pollutant	Analyze	r	Ozone, I	MPROVE		QAPP Latitude			41.4250		
Deposition M	easurem	ent	dry			QAPI	P Longitude		-80.1447		
Land Use	Land Use		woodland - mixed, agriculture			QAPI	P Elevation I	Meters	384		
Terrain			gently rolling			QAPI	P Declination	1	9.25		
Conforms to 3	MLM		Marginally			QAPI	P Declination	n Date	2/22/2006		
Site Telephon	ie		(724) 253-3685			Audit	Latitude		41.426847		
Site Address 1			M. K. Go	ddard St. Park		Audit	Longitude			-	80.145247
Site Address 2	2		684 Lake	Wilhelm Rd.		Audit	Elevation				377
County			Mercer			Audit	Declination		-9.3		
City, State			Sandy Lake, PA				F	Present			
Zip Code			16145			Fire F	Extinguisher	\checkmark	New in 2014		
Time Zone			Eastern			First	Aid Kit	\checkmark			
Primary Ope	rator					Safety	Glasses	\checkmark			
Primary Op.	Phone #	ŧ				Safety	Hard Hat	\checkmark			
Primary Op.	E-mail					Clim	oing Belt	\checkmark			
Backup Oper	ator					Secur	ity Fence				
Backup Op.	Phone #					Secur	e Shelter	\checkmark			
Backup Op.	E-mail					Stable	e Entry Step	\checkmark			
Shelter Work	ing Room	m ✓	Make	Ekto	Μ	odel 8	810 (s/n 2116	6-4)	Shelter Size	640 cuft	
Shelter Clean	l	✓	Notes	The shelter is clean counter. Mold begin	and organ	ized. Le alls and	ak and rot be floor.	low the ai	r conditioner and	on the floor (under the
Site OK		✓	Notes								
Driving Direc	ctions F t t	From I he sto he site	l-79 take o op sign, al e will be v	9 take exit 130 (route 358). Go west and bear right onto Sheakleyville Road. Continue less than a mile to sign, and turn right onto Lake Wilhelm Road. Continue approximately 1.5 miles, just after crossing the lake will be visible on the right at the state park headquarters facility.							

MKG113

F-02058-1500-S2-rev002

Site ID

Tec

Technician Sandy Grenville

Site Visit Date 08/15/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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

			F-02058-1500-S3-rev002				
Site	ID MKG113 Technician Sandy Grenville		Site Visit Date 08/15/2016				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?	✓	N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓					
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)						
6	Is the solar radiation sensor plumb?	✓	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A				
8	Is the rain gauge plumb?	✓	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A				
11	Is it inclined approximately 30 degrees?	✓	N/A				

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

Field Systems Data Form F-02058-1500-S4-rev002 Site ID MKG113 Technician Sandy Grenville Site Visit Date 08/15/2016 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and

	reporting data?
3	Are the shields for the temperature and RH sensors clean?
4	Are the aspirated motors working?
5	Is the solar radiation sensor's lens clean and free of scratches?
_	

1

2

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

\checkmark	Temperature only
✓	Temperature only
✓	
✓	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:

Fi	eld Sy	stems Data Fo	orm				F-02058	-1500-S5-rev002
Site	e ID	MKG113	Technician	Sandy Grenville		Site Visit Date	08/15/2016	
	<u>Siting C</u>	riteria: Are the pollut	ant analyzers a	nd deposition eq	uipr	nent sited in accore	dance with 40 Cl	FR 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,		One tree as tall as i	nlet within 12 met	ers
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	l mai	intenance		
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be l?	e in good	✓			
2	Are the reportin	analyzers and moniton ng data?	rs operational, o	on-line, and	✓			
3	Describ	e ozone sample tube.				1/4 teflon by 15 met	ters	
4	Describ	e dry dep sample tube.				3/8 teflon by 15 met	ters	
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?	' kinks, moistur	e, and	✓			
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	v deposition filte	er line, and is it	✓	Clean and dry		

Field Systems Data Form		F-02058-1500-S6-rev002				
Site	e ID MKG113 Technician Sandy Grenville	3	Site Visit Date	08/15/2016	6	
	DAS, sensor translators, and peripheral equipment operation	ons a	and maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)					
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?		Met sensors only			
4	Are the signal connections protected from the weather and well maintained?					
5	Are the signal leads connected to the correct DAS channel?					
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?					
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?		Met tower removed			

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

Field Sy	ystems Data	F-02058-1500-S7-rev002						
Site ID	MKG113		Techni	cian	Sandy Grenville Site Visit Date 0	8/15/2010	6	
Documen	<u>itation</u>							
Does the	site have the requ	ired ins	strumen	t and	<u>equipment manuals?</u>			
		Yes	No	N/ /	k	Yes	No	N/A
Wind speed	sensor			✓	Data logger		\checkmark	
Wind direct	ion sensor			✓	Data logger			\checkmark
Temperatur	e sensor		\checkmark		Strip chart recorder			
Relative hu	nidity sensor			✓	Computer	\checkmark		
Solar radiat	ion sensor				Modem		\checkmark	
Surface wet	ness sensor				Printer			\checkmark
Wind sensor	r translator				Zero air pump		\checkmark	
Temperatur	e translator				Filter flow pump		\checkmark	
Humidity se	ensor translator				Surge protector			\checkmark
Solar radiat	ion translator				UPS			\checkmark
Tipping buc	ket rain gauge				Lightning protection device			
Ozone analy	zer				Shelter heater		\checkmark	
Filter pack f	flow controller				Shelter air conditioner		\checkmark	
Filter pack	MFC power suppl	у 🗆		\checkmark				
Does the	<u>e site have the req</u>	uired a	nd most	rece	nt QC documents and report forms?			

Present		Current
\checkmark		\checkmark
\checkmark		\checkmark
\checkmark	Feb 2014	
\checkmark	Feb 2014	\checkmark
\checkmark	Feb 2014	\checkmark
\checkmark		\checkmark
		\checkmark
	'resent ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	resent ✓ ✓ ✓ Feb 2014 ✓ Feb 2014 ✓ Feb 2014 ✓ Feb 2014 ✓ Image: State

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

Site	ID	MKG113	Technician	Sandy Grenville	 Site Visit Date	08/15/2016]
1	Site oper Has the s	<u>ation procedures</u>	a formal CAS	TNFT training	July 2006, refresher	training by Howell and	d Lavery
•	course?	If yes, when and who	instructed?	inter training			,
2	Has the l training	backup operator atter course? If yes, when a	nded a formal (and who instru	CASTNET cted?			
3	Is the site schedule?	e visited regularly on t	the required T	ıesday			
4	Are the st flollowed	tandard CASTNET o by the site operator?	perational pro	cedures being			
5	Is the site the requi	e operator(s) knowled red site activities? (in	geable of, and a cluding docum	able to perform entation)			

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	Semiannually	✓
Visual Inspections	✓	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

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 \checkmark As needed ✓ ✓ Weekly ✓ ✓ Every 2 weeks \checkmark \checkmark N/A \checkmark \checkmark 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, 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

Compliant

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	orm				F-02058 -	1500-S9-rev002
Sit	e ID	MKG113	Technicia	n Sandy Grenville)	Site Visit Date	08/15/2016	
	<u>Site ope</u>	ration procedures						
1	Is the fi	lter pack being change	ed every Tues	sday as scheduled	?⊻	Filter changed vario	ous times of day	
2	Are the correctl	Site Status Report For y?	rms being co	mpleted and filed	✓			
3	Are dat schedul	a downloads and back ed?	ups being pe	rformed as		No longer required		
4	Are gen	eral observations bein	g made and	recorded? How?	✓	SSRF		
5	Are site fashion	supplies on-hand and ?	replenished	in a timely	✓			
6	Are san	nple flow rates recorde	ed? How?		✓	SSRF, logbook, cal	l-in	
7	Are san fashion	nples sent to the lab on ?	a regular sc	hedule in a timely				
8	Are filte and shi	ers protected from con pping? How?	tamination d	uring handling	✓	Clean gloves on an	d off	
9	Are the operation	site conditions reporte ons manager or staff?	ed regularly (to the field				
QC	Check P	erformed	F	requency			Compliant	
I	Multi-poi	nt MFC Calibrations	Se Se	emiannually			\checkmark	
I	Flow Syst	em Leak Checks	🗹 W	eekly			\checkmark	
I	Filter Pac	k Inspection	🖌 🗸	eekly			\checkmark	
I	Flow Rate	e Setting Checks	✓ W	eekly			\checkmark	
	Visual Ch	eck of Flow Rate Roto	meter 🗹 🛛	eekly			\checkmark	
]	In-line Fil	ter Inspection/Replace	ement 🗹 Se	emiannually			\checkmark	
5	Sample L	ine Check for Dirt/Wa	ter 🗹 🛛	eekly				
	de energi	dditional annlanation	(mb starmanh	an alaatah if maaa) manual and the	and let al above a	n ann ath an faatanaa

MKG113

F-02058-1500-S10-rev002

Site ID

Techr

Technician Sandy Grenville

Site Visit Date 08/15/2016

Site Visit Sensors

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

Site Inventory by Site Visit

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

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial Number		• 1	Technician	Site Visit Date	Parameter	Use Desc.		
Campbell	2117 AI		A115	Eric Hebert	08/15/2016	DAS	Primary		
Das Date: Das Time:	8 /15/2016 10:12:00	Audit Date Audit Time	8 /15/2016 10:12:00	Mfg	Datel	Parameter	DAS		
Das Day:	227 Audit Day		227	Serial Number	4000392	Tfer Desc.	Source generator (D		
Low Channe	el:	High Channe	el:	Tfer ID	01321				
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:						
0.000	0.00	0.000	0.0001						
				Mfg	Fluke	Parameter	Parameter DAS		
				Serial Number	86590148	DVM			
				Tfer ID	01310				
				Slope	1.0000	0 Intercept	0.00000		
				Cert Date	12/23/201	5 CorrCoff	1.00000		
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference			
7	0.0000	0.0000	0.0000	V	V	0.0000			
7	0.1000	0.1000	0.0999	V	V	-0.0001			
7	0.3000	0.3000	0.2999	V	V	-0.0001			
7	0.5000	0.4999	0.4999	V	V	0.0000			
7	0.7000	0.6999	0.6998	V	V	-0.0001			
7	0.9000	0.8999	0.8998	V	V	-0.0001			
7	1.0000	0.9998	0.9998	V	V	0.0000			

Flow Data Form

Mfg	Serial Number Ta Site		Тес	chnician	Site Visit Da	ate Paran	neter	Owner ID			
Apex illegible			ANA115		c Hebert	08/15/2016	Flow R	ate	000809		
					Mfg	BIOS	P	arameter Flow	v Rate		
					Serial Number	148613	Т	fer Desc. BIO	S 220-H		
					Tfer ID	01421					
					Slope	1.0	0309 Inte	ercept	-0.00231		
				Cert Date		4/21/2016		rCoff	1.00000		
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.0)3			
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0.9	0.99			
0.45%	0.67%				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	-0.02	l/m	l/m			
primary	leak check	0.000	0.000	0.01	0.000	-0.01	l/m	l/m			
primary	test pt 1	1.490	1.490	1.51	0.000	1.50	l/m	l/m	0.67%		
primary	test pt 2	1.491	1.490	1.51	0.000	1.50	l/m	l/m	0.67%		
primary	test pt 3	1.498	1.500	1.51	0.000	1.50	l/m	l/m	0.00%		
Sensor Comp	onent Leak Tes	Leak Test			n			pass			
Sensor Comp	onent Tubing C	bing Condition		Conditio	Condition Good		Status	status pass			
Sensor Comp	onent Filter Pos	sition		Conditio	on Good		Status	pass			
Sensor Comp	onent Rotomete	tometer Condition Cond			dition Clean and dry			Status pass			
Sensor Comp	onent Moisture	Moisture Present			lition See comments			us pass			
Sensor Component Filter Distance				Condition 5.0 cm		Status pass		pass			
Sensor Comp	onent Filter Dep	Filter Depth			n 1.5 cm	Status	Status pass				
Sensor Comp	onent Filter Azi	Filter Azimuth			n 225 deg	Status	Status pass				
Sensor Comp	onent System M	System Memo			n	Status	Status pass				

Ozone Data Form

Mfg		Serial Number Ta		Site		Technician		Site Visit Date		Parameter		Owner I	Owner ID
ThermoElectron Inc		103024	4799	ANA115	Er	Fric Hebert		08/15/2016		Ozone		000702	
Slope: Intercept CorrCoff	().99502).55491 I.00000	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoEl 05171121 01113	ectron 67	Inc Pa	rameter ozo er Desc. Oz	one one primar <u>i</u>	y stan
DAS 1: A Avg % D 0.6	Diff: A N 5%	<mark>Iax % D</mark> 1.3	DAS 2: i A Avg %	6Dif A Max	% Di	Slope i Cert Date		1.00500 Interv 1/28/2016 Corr		rcept -0.28841 rCoff 1.00000		3841)000	
UseDes prin prin prin prin prin	cription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw -0.23 27.89 49.89 79.82 104.68	Tfer 0.0 28 49 79 104	Corr 05 .03 .92 .70 I.44	Si 0. 28 50 79 104	ite 60 p .38 p .29 p .94 p I.40 p	Site opb opb opb opb opb	e Unit	PctDiff	Terence 1.25% 0.74% 0.30% -0.04%	
Sensor Co	ompone	nt Samp	le Train	·	Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	Filter Conditio	n	Conditio	on Clean	1			Status	pass		
Sensor Component		nt Batter	Battery Backup		Condition N/A				Status	s pass			
Sensor Component		nt Offset	Offset		Condition 0.10				Status	s pass		_	
Sensor Component		nt Span	Span			Condition 1.003				Status	s pass		
Sensor Component		nt Zero	Zero Voltage		Condition N/A				Status	IS pass			
Sensor Co	ompone	nt Fullsc	Fullscale Voltage			Condition N/A				Status	pass		
Sonsor Co	ompone				Condition 89.7 kHz				Status				
Sensor C	ompone				Condition 0.6 nph				Status				
Sensor Co	omponei				Condition 0.31 lpm				Status				
Sensor Component									Status				
Sensor Component		nt Cell A			Condition 712.5 mmHg				Status	<u>8</u> hass			
Sensor Component		nt Cell A	Cell A Tmp.		Condition 37.7 C				Status	s pass			
Sensor Component		nt Cell B	Cell B Freq.		Condition 102.9 kHz				Status	s pass			
Sensor Component		nt Cell B	Cell B Noise		Condition 0.8 ppb				Status	IS pass			
Sensor Component		nt Cell B	Cell B Flow		Conditio	Condition 0.68 lpm				Status	1s pass		
Sensor Component		nt Cell B	Cell B Pressure		Conditio	ition 712.2 mmHg			Status	s pass			
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.OSS		Conditio	on Not te	sted			Status	pass		
Sensor Component		nt Syste	System Memo		Conditio	lition				Status pass			
Temperature Data Form

Mfg	Serial Number T	'a Site	,	Techn i	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	14796	ANA115		Eric Hebert		08/15	5/2016	Temper	ature	06535	
					Mfg		Extech Pa		rameter Temperature		
					Serial Number		H232679 Ti		fer Desc. RTD		
				Tfer ID		01228	3				
DAS 1:	DAS		Slope		1.00760 Inte		ercept -0.05710)		
Abs Avg Err Ab	Max Er	Ce	rt Date		2/28/201	6 Cor	rCoff	1.00000)		
0.08	0.12										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	. OutputTmpSignal O		OutputSignalEng		OSE Unit	Difference	
primary Tem	p Low Range	0.11	0.17	0.17 0.000		0.2		C	0.06		
primary Tem	p Mid Range	25.74	25.6	0	0.000		25.	7	С	0.05	
primary Tem	p High Range	50.10	49.78	8	0.000		49.	9	С	0.12	
Sensor Compone	nt Shield		Condi	ition	Clean			Status	pass		
Sensor Component Blower				Condition N/A				Status	pass		
Sensor Compone	Condi	Condition N/A			Status		pass				
Sensor Compone	nt System Memo		Condi	Condition				Status	pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ANA115	Eric Hebert	08/15/2016	Shelter Temperature	none
DAS 1:	DAS 2:	Euro Alex Mars Eu	Mfg	Extech	Parameter She	Iter Temperatur
ADS AVg Err AI 0.75 0.75	1.11	EFF ADS MAX EF	Serial Number	H232679	Tfer Desc. RTD)
·			Tfer ID	01228		
			Slope	1.0076	0 Intercept	-0.05710
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.28	24.15	0.000	24.8	С	0.61
primary	Temp Mid Range	28.65	28.49	0.000	28.0	С	-0.54
primary	Temp Mid Range	25.80	25.66	0.000	26.8	С	1.11
Sensor Con	ponent System Memo)	Condition		Status	pass	

Infrastructure Data For

ANA115 Site ID

Technician Eric Hebert

Site Visit Date 08/15/2016

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	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard Problem			
Flow Rate	ANA115	Eric Hebert	08/15/2016	Moisture Present	Apex	3990				
The filter sample tubing has drops of moisture in low sections outside the shelter.										

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is in fair condition, however somewhat cluttered.

4 Parameter: PollAnalyzerCom

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

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Site ID	ANA115		Technician	Eric Hebert	Site V	isit D	ate 08/1	5/2016]
Site Sponsor (a	agency)	EPA			USGS Map			Pinckney	
Operating Gro	oup	University	/ of MI		Map Scale				
AQS #		26-161-9	991		Map Date				
Meteorological	І Туре	Climatror	lics						
Air Pollutant A	Analyzer	Ozone			QAPP Latitu	ıde			
Deposition Me	asurement	dry, wet,	Hg	QAPP Long					
Land Use		woodland	woodland - mixed			tion M	Ieters		
Terrain flat			at			nation			
Conforms to MLM Ma			Marginally			nation	Date		
Site Telephone	(734) 426	(734) 426-0060			de		42.416636		
Site Address 1	8420 Stra	8420 Strawberry Lake Rd.			Audit Longitude			-83.90218	
Site Address 2					ion			266	
County		Washten	aw		Audit Declin	ation		-6.6	
City, State		Dexter, M	Dexter, MI			P	resent		
Zip Code		48130	48130			Fire Extinguisher 🔽			
Time Zone		Eastern			First Aid Kit				
Primary Opera	ator				Safety Glass	es			
Primary Op. I	Phone #				Safety Hard Hat 🔽				
Primary Op. E	2-mail				Climbing Be	lt			
Backup Opera	tor				Security Fen	ce	✓		
Backup Op. P	hone #				Secure Shelt	er	\checkmark		
Backup Op. E	-mail				Stable Entry	Step	✓		
Shelter Workin	ng Room	Make	Ekto	Μ	odel 8810			Shelter Size	640 cuft
Shelter Clean	V	Notes	The shelter is i	in fair condition,	however some	vhat cl	uttered.		
Site OK		Notes							
Driving Direct	ions Fror sign Con Driv Terr Stra	From Ann Arbor take I-94 west to exit 169 to Dexter, turning right (north) to Dexter. Continue a few miles to the stop ign 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 Cerritorial 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

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Site ID

Technician Eric Hebert

Site Visit Date 08/15/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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.

Fi	eld Systems Data Form	F-02058-1500-S3-rev00					
Site	ANA115 Technician Eric Hebert		Site Visit Date 08/15/2016				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?		N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?						
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)						
6	Is the solar radiation sensor plumb?		N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A				
8	Is the rain gauge plumb?		N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?		N/A				
11	Is it inclined approximately 30 degrees?		N/A				
Pro nat	wide any additional explanation (photograph or sketch if neco ural or man-made, that may affect the monitoring parameter	essary 5:) regarding conditions listed above, or any other features,				

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

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

eld Systems Data Form	F-02058-1500-S5-rev										
ANA115 Technician Eric Hebert		Site Visit Date 08/15/2016									
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 maintenance											
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									
	eID ANA115 Technician Eric Hebert Siting Criteria: Are the pollutant analyzers and deposition equiparties and the position equiparties and the position equiparties and the position equiparties and the pollutant analyzers and deposition equiparties and equiparties andefinit analyzer and equipartis and equiparties andefi	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? (if yes indicate location) Are in-line filters used in the ozone sample line? (if yes indicate location) Image: Criteria analyzers and color and and and and analyzers analyzers analyzers analyzers analyzers and analyzers 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:

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002						
Site	e ID	ANA115	Technician	Eric Hebert		Site Visit Date	08/15/2016	;				
	DAS, se	nsor translators, and j	peripheral equi	pment operation	is ai	<u>nd maintenance</u>						
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	Do the a lightning	nalyzer and sensor sig g protection circuitry?	through		Met sensors only							
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 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	perature control	lled?	✓							
9	Is the m	et tower stable and gr	ounded?					Grounded				
10	Is the sa	mple tower stable and	l grounded?									
11	Tower c	omments?				Sample tower not g	rounded					

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

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

Fie	Field Systems Data Form F-02058-1500-S7-rev002									
Site	ID ANA115		Tech	nician E	Eric Hebert	Site Visit Date	08/15/2016			
De	ocumentation									
	as the site have the requi	rod in	strumo	nt and a	quinmont monuols?					
	the site have the requi	Vec	<u>Sti unic</u> No	N/A	quipment manuals;		Ves	No	N/A	
Wind	l speed sensor				Data logger	r				
Wind	l direction sensor			\checkmark	Data logger	r				
Tem	perature sensor		\checkmark		Strip chart	recorder			\checkmark	
Relat	tive humidity sensor				Computer					
Solar	radiation sensor				Modem			\checkmark		
Surfa	ace wetness sensor			\checkmark	Printer			\checkmark		
Wind	l sensor translator			\checkmark	Zero air pu	ımp		\checkmark		
Temp	perature translator			\checkmark	Filter flow	pump				
Hum	idity sensor translator			\checkmark	Surge prote	ector			\checkmark	
Solar	radiation translator			\checkmark	UPS				\checkmark	
Tippi	ing bucket rain gauge			\checkmark	Lightning p	protection device			\checkmark	
Ozon	e analyzer	\checkmark			Shelter hea	iter		\checkmark		
Filter	r pack flow controller	\checkmark			Shelter air	conditioner		\checkmark		
Filter	r pack MFC power supply	у 🗌		\checkmark						
Ī	<u>Does the site have the requ</u>	ired a	and mo	st recent	t QC documents and	report forms?				
		Pre	sent				Curre	nt		
Statio	on Log									
SSRE	7									
Site (Ops Manual									
HAS	P			Oct 2014						
Field	Ops Manual									
Calib	oration Reports						\checkmark			
Ozon	e z/s/p Control Charts									
Preve	entive maintenance sched	ul					\checkmark			
1	Is the station log properly	/ comj	pleted d	luring ev	very site visit? 🗹					
2	Are the Site Status Repor current?	t Fori	ns bein	ig comple	eted and 🔽					
3	Are the chain-of-custody sample transfer to and from the second sec	forms om lal	prope	rly used t	to document 🔽					

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:

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

- 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
----	-------	-----------

schedule?

1

2

3

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?

OC	Check	Performe	ł
$\sim \sim$	Chiech	I CITOI IIIC	-

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	Cu
✓	Semiannually	✓
✓	Daily	\checkmark
\checkmark	Daily	
\checkmark	Weekly	
\checkmark	Every 2 weeks	\checkmark
\checkmark	N/A	\checkmark
\checkmark	Weekly	\checkmark
\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?
- 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:

Compliant

Compliant

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Fi	eld Sy	stems Data Forn	n				F-02058	-1500-S9-rev002		
Sit	e ID	ANA115 T	echniciar	Eric Hebert		Site Visit Date	08/15/2016			
	<u>Site ope</u>	ration procedures								
1	Is the fi	lter pack being changed ev	ery Tueso	lay as scheduled	<mark>?</mark> 🗸	Filter changed vario	us times			
2	Are the correctl	Site Status Report Forms y?	being con	pleted and filed						
3	Are dat schedul	a downloads and backups ed?	being per	formed as		No longer required				
4	Are gen	eral observations being ma	de and r	ecorded? How?	✓	SSRF, logbook				
5	Are site fashion	supplies on-hand and repl ?	enished i	n a timely						
6	Are sample flow rates recorded? How?					SSRF, logbook, call-in				
7	Are san fashion	ples sent to the lab on a re ?	gular sch	edule in a timely						
8	Are filte and shij	ers protected from contami oping? How?	nation du	iring handling	✓	Clean gloves on and	d off			
9	Are the operation	site conditions reported re ons manager or staff?	gularly to) the field						
QC	Check P	erformed	Fr	equency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ Se	miannually						
I	Flow Syst	em Leak Checks	☑ We	ekly			\checkmark			
I	Filter Pac	k Inspection								
1	Flow Rate	e Setting Checks	✓ We	ekly			\checkmark			
	Visual Ch	eck of Flow Rate Rotomete	er 🗹 We	ekly			\checkmark			
I	n-line Fil	ter Inspection/Replacemen	t 🗹 Se	miannually			\checkmark			
5	Sample Li	ine Check for Dirt/Water	✓ We	ekly			\checkmark			
	ido onvo	dditional employation (nha	toquanh	an alvatah if naaaa) normaling conditi	and listed above	an ann ath an factures		

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

Technician Eric Hebert

Field Systems Data Form

ANA115

Site ID

F-02058-1500-S10-rev002

Site Visit Date 08/15/2016

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
UVL	124-Eric H	ebert-08/16/2016				
1	8/16/2016	Computer	Dell	07012	Inspiron 15	Unknown
2	8/16/2016	DAS	Campbell	000423	CR3000	2517
3	8/16/2016	Elevation	Elevation	None	1	None
4	8/16/2016	Filter pack flow pump	Thomas	02973	107CAB18	0493002467
5	8/16/2016	Flow Rate	Арех	000600	AXMC105LPMDPCV	illegible
6	8/16/2016	Infrastructure	Infrastructure	none	none	none
7	8/16/2016	Modem	Raven	06466	V4221-V	0808339409
8	8/16/2016	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347315
9	8/16/2016	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
10	8/16/2016	Sample Tower	Aluma Tower	03557	А	none
11	8/16/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/16/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/16/2016	Temperature	RM Young	06504	41342	14624
14	8/16/2016	Zero air pump	Werther International	06936	C 70/4	000829169

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial	Number Site	e 1	Fechnician	Site Visit Date	Parameter	Use Desc.	
Campbell	2517	UV	′L124	Eric Hebert	08/16/2016	DAS	Primary	
Das Date:	8 /16/2016	Audit Date	Audit Date 8 /16/2016		Datel	Parameter	DAS	
Das Day:	229	Audit Day	229	Serial Number	4000392	Tfer Desc.	Source generator (D	
Low Channe	el:	High Channe	el:	Tfer ID	01321			
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:					
0.000	0.0	0.000	0 0.0000					
				Mfg	Fluke	DAS		
			in the second se					
				Serial Number	86590148	11er Desc. DVW		
				Tfer ID	01310			
				Slope	1.0000	1.00000 Intercept		
				Cert Date	12/23/201	5 CorrCoff	1.00000	
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference		
7	0.0000	0.0000	0.0000) V	V	0.0000		
7	0.1000	0.1000	0.1000) V	V	0.0000		
7	0.3000	0.3000	0.3000) V	V	0.0000		
7	0.5000	0.4999	0.4999	V V	V	0.0000		
7	0.7000	0.6999	0.6999	V V	V	0.0000		
7	0.9000	0.8999	0.8999	v V	V	0.0000		
7	1.0000	0.9999	0.9999	V	V	0.0000		

Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	Owner ID
Apex	illegible		UVL124	Eri	ic Hebert	08/16/2016	6 Flow F	Rate	000600
				Mfg	BIOS	F	arameter Flow	w Rate	
					Serial Number	148613	1	fer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.(00309 Int	ercept	-0.00231
					Cert Date	4/21	/2016 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.0	02	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	99	
0.44%	0.67%				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	0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	test pt 1	1.497	1.490	1.51	0.000	1.50	l/m	1/m	0.67%
primary	test pt 2	1.504	1.500	1.50	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.516	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%
Sensor Comp	onent Leak Tes	st		Conditio	n	Statu		, pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Statu	pass	
Sensor Comp	onent Rotomete	er Conditior	ı	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	esent	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	2.5 cm		Statu	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 360 deg		Statu	pass	
Sensor Comp	onent System M	/lemo		Conditio	n		Statu	pass	

Ozone Data Form

Mfg	Serial Number Ta Site		Site	Technician			Site Visit Date I		Parameter		Owner I	D	
ThermoElec	tron Inc	110534	7315	UVL124	Eric Hebert		08/16/201	08/16/2016 Ozone			000745		
Slope: Intercept CorrCoff	1 -C	.00000 0.57786 0.99996	Slope: Intercept CorrCoff	0.00000)))	Mfg Serial N Tfer ID	umber	ThermoEle 051711216 01113	ectron I 67	nc Pa	rameter ozo er Desc. Oz	one one primary	' stan
DAS 1: DAS 2: A Avg % Diff: A Max % Di 1.1% 3.0%		6Dif A Max 9	x % Di Cert Date		ıte	1.	1.00500 Int 1/28/2016 Co		cept Coff	-0.28 1.00	841 000		
UseDes prin prin prin prin prin	acription nary nary nary nary nary nary		I I 2 3 3 4 5 5	Tfer Raw -0.10 27.33 50.12 80.01 104.98	Tfer 0.1 271. 501. 791. 104.	Corr 18 48 15 89 74	Si -0. 26 50 79 103	tte pr 57 pr .67 pr .14 pr .51 pr 8.80 pr	Site ob ob ob ob	Unit	PctDiff	-2.95% -0.02% -0.48% -0.90%	
Sensor Co	omponer	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	omponei	nt 22.5 c	degree rule		Conditio	on				Status	pass		
Sensor Co	omponer	nt Inlet F	Filter Conditic	n	Conditio	on Clean				Status	pass		
Sensor Co	omponei	nt Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponei	nt Offset	t		Conditio	on 0.000				Status	pass		
Sensor Co	omponei	nt Span			Condition 1.011					Status	pass		
Sensor Co	omponei	t Zero	Voltage		Condition N/A				Status	pass			
Sensor Co	omponei	t Fullsc	ale Voltage		Condition N/A				Status	nass			
Sensor C			Erog		Conditio		·U-7			Status	pace		
Sensor Co	omponer				Conditio	on 94.0 r				Status	pass		
Sensor Co	omponer	nt Cell A	Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Co	omponer	nt Cell A	Flow		Conditio	on 0.71 l	om			Status	pass		
Sensor Co	omponei	t Cell A	Pressure		Conditio	on 717.2	mmHg			Status	pass		
Sensor Co	omponei	nt Cell A	Tmp.		Conditio	on 39.0 0)			Status	pass		
Sensor Co	omponer	nt Cell B	Freq.		Conditio	on 96.8 k	Hz			Status	pass		
Sensor Co	omponer	nt Cell B	Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Co	sor Component Cell B Flow			Conditio	on 0.00 l	om			Status	pass		_	
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 717.4	mmHg			Status	pass		_
Sensor Co	- omponei	t Cell B	S Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	t Line L	_OSS		Conditio	n Not te	sted			Status	pass		
Songor C	omponer	t System	m Memo		Conditio					Status	nass		
Sensor Co	omponer	IL Oysie			Conuitio					Status	pubb		



Temperature Data Form

Mfg	Serial Number T	a Site]	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	14624	UVL124		Eric Hebert		08/16	6/2016	Temper	ature	06504	
				Mf	g	Extec	h	Ра	rameter Te	emperature	
				Ser	rial Number	H2326	H232679 T		er Desc. R	ſD	
				Tfer ID		01228	}				
DAS 1:	DAS		Slo	ре	1.00760 Inte		rcept	-0.0571	0		
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma				Er Cert Date		2/28/2016 Cor		rCoff 1.00000		0	
0.04	0.08										
UseDesc.	Test type	InputTmpRaw	InputTmp	pCorr. OutputTmpS		signal OutputSignalEng		OSE Unit	Difference		
primary Tem	p Low Range	2.10	2.14		0.000		2.1		C	-0.02	
primary Tem	p Mid Range	26.67	26.53	3	0.000		26.	5	С	-0.03	
primary Ten	p High Range	49.63	49.31		0.000		49.	2	С	-0.08	
Sensor Compon	ent Shield		Condi	tion C	Clean			Status	pass		
Sensor Compon	Sensor Component Blower			tion N	I/A			Status	pass		
Sensor Compon	ent Blower Status S	Switch	Condi	Condition N/A				Status	pass		
Sensor Compon	ent System Memo		Condi	Condition				Status	pass		

Shelter Temperature Data For

Mfg Serial Number Ta Site T		Technician	Site Visit Date	Parameter	Owner ID	
Campbell	one	UVL124	Eric Hebert	08/16/2016	Shelter Temperature	none
DAS 1: Abs Avg Err Abs M 0.57	DAS 2: [ax Er Abs Avg] 0.60	Err Abs Max Er	Mfg Serial Number Tfer ID Slope Cert Date	Extech H232679 01228 1.0076 2/28/201	Parameter She Tfer Desc. RTL Intercept CorrCoff	elter Temperatur

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.15	26.01	0.000	26.6	С	0.6
primary Temp Mid Range		25.88	25.74	0.000	26.3	С	0.54
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	UVL124	Technician Eric He	oert Site Visit Date 08/16/2016
Shelter M	ſake	Shelter Model	Shelter Size
Ekto		8810	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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: SiteOpsProcedures

Ozone sample train leak-check performed every two weeks.

2 Parameter: DocumentationCo

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

3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

The shelter is clean and in good condition.

5 Parameter: MetOpMaintCom

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

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Site ID UVL124	Technician Eric Hebert	Site Visit Date 08/16	/2016
Site Sponsor (agency)	EPA	USGS Map	Ellington
Operating Group	private	Map Scale	
AOS #	26-157-9991	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	OAPP Latitude	
Denosition Measurement	drv wet	OAPP Longitude	
Lond Use	agriculture	OAPP Elevation Maters	
Lanu Use	flat	QAPP Declination	
		QAPP Declination	
Conforms to MLM	Y es	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 🗹	New in 2015
Time Zone	Eastern	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🔽	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🔽	
Shelter Working Room ✓	Make Ekto 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 (north interse behind	Saginaw MI, take route 81 east through 0) on Colwood. There is a large church at ection of Dickerson road. Turn left (west) d the first farmhouse, where Fred Matt, th	Caro. About 2.9 miles past the ju that intersection. Continue on C at the stop sign. The site is on e landowner resides.	Inction of SR24 and 81, turn left Colwood for about 6 miles to the the right (north) side on the road

UVL124

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/16/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		\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	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 08/16/2016
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?	✓	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	✓	N/A
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	UVL124	Technician	Eric Hebert		Site Visit Date	08/16/2016	
1	Do all the condition	e meterological sensor , and well maintained	rs appear to be l?	intact, in good		Temperature only		
2	Are all th reporting	ne meteorological sens g data?	ors operational	l online, and		Temperature only		
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors work	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 iintained?	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 removed and temperature mounted in naturally aspirated shield on sample tower.

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	UVL124 Technician Eric Hebert		Site Visit Date 08/16/2016
	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	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:

Fi	eld Systems Data Form		F-0205	58-15 0	0-S6-rev002	
Site	e ID UVL124 Technician Eric Hebert		Site Visit Date	08/16/2016		
	DAS, sensor translators, and peripheral equipment operation	ons a	and maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	✓				
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	✓	Met sensors only			
4	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?	✓				
9	Is the met tower stable and grounded?		Stable	Gro	ounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?		Tower not grounder	d		

Provide any additional 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				F-02	058-	-1500-S7-
Site ID UVL124		Techni	cian	Eric Hebert	Site Visit Date	8/16/2016		
Documentation								
Does the site have the requ	ired in	strument	t and	equipment manuals?				
	Yes	No	N/ .	A		Yes	No	N/A
Wind speed sensor			✓	Data logger	•		\checkmark	
Wind direction sensor			✓	Data logger	•			\checkmark
Temperature sensor	\checkmark			Strip chart	recorder			
Relative humidity sensor			✓	Computer			\checkmark	
Solar radiation sensor				Modem			\checkmark	
Surface wetness sensor			\checkmark	Printer				
Wind sensor translator				Zero air pu	mp		\checkmark	
Temperature translator				Filter flow 1	pump		\checkmark	
Humidity sensor translator				Surge prote	ector			
Solar radiation translator				UPS		\checkmark		
Tinning bucket rain gauge				Lightning n	protection device			
Ozone analyzer				Shelter heat	ter			
Filter nack flow controller				Shelter air a	conditioner			
Filter pack MEC nower gunn				Shelter and	conunioner			
ritter pack wir C power suppl	ly 💌							
Does the site have the req	uired a	and most	rece	nt QC documents and 1	<u>report forms?</u>			
	Pres	sent				Currer	nt	

2

Station Log	\checkmark]
SSRF	\checkmark		
Site Ops Manual	\checkmark	Oct 2014	
HASP	\checkmark	Oct 2014	
Field Ops Manual			
Calibration Reports	\checkmark	4/14/2016	
Ozone z/s/p Control Charts			
Preventive maintenance schedul			
]

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

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

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

UVL124 Technician Eric Hebert Site Visit Date 08/16/2016 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	✓
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?

OC	Check	Perf	formed
VV.	Check	1	ormeu

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**

\checkmark	Semiannually	
✓	Daily	
✓	Daily	
✓	Weekly	
\checkmark	Every 2 weeks	
✓	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:

Ozone sample train leak-check performed every two weeks.

Compliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 UVL124 Technician Eric Hebert Site Visit Date 08/16/2016 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed mornings 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:

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

Technician Eric Hebert

Field Systems Data Form

UVL124

Site ID

Site Visit Sensors

F-02058-1500-S10-rev002

Site Visit Date 08/16/2016

Site Inventory by Site Visit

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

DAS Data Form

DAS Time Max Error: 0.07

Mfg	Serial Nu	ımber Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2537	KEF	112	Sandy Grenville	08/17/2016	DAS	Primary
Das Date:	8 /17/2016	Audit Date	8 /17/2016	Mfg	Datel	Parameter	DAS
Das Day:	230	Audit Day	230	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel	l:	High Channe	l:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0001	0.0001	0.0001	0.0001				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
		Tfer ID	01311				
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/23/201	5 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2998	V	V	0.0001	
7	0.5000	0.4996	0.4997	V	V	0.0001	
7	0.7000	0.6996	0.6996	V	V	0.0000	
7	0.9000	0.8994	0.8995	V	V	0.0001	
7	1.0000	0.9993	0.9994	V	V	0.0001	
Flow Data Form

Mfg	Serial Num	ber Ta S	Site	Tec	hnician	Site Visit D	ate Paran	neter	Owner ID
Арех	illegible		KEF112	Sa	ndy Grenville	08/17/2016	Flow F	late	000671
					Mfg	BIOS	P	arameter FI	ow Rate
					Serial Number	103471		fer Desc. ne	exus
					Tfer ID	01420			
					Slope	0.0	9001 Int	anaant	0.03172
					Stope	2/29	2/2016		0.00088
					Cert Date	2/20			0.99900
					Mfg	BIOS	P	arameter FI	ow Rate
					Serial Number	103424	1	fer Desc. B	OS cell
					Tfer ID	01410			
					Slope	0.9	99091 Int	ercept	0.03172
					Cert Date	2/28	/2016 Co	rrCoff	0.99988
DAS 1:		DAS 2:		L	Cal Factor Z	ero	0.0	05	
A Avg % Diff:	A Max % Di	A Avg %I	Dif A Max	: % Di	Cal Factor F	ull Scale	0.9	79	
1.62%	1.71%				Rotometer R	eading:	1.	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	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.538	1.520	1.53	0.000	1.50	l/m	l/m	-1.58%
primary	test pt 2	1.535	1.520	1.53	0.000	1.49	l/m	l/m	-1.71%
primary	test pt 3	1.536	1.520	1.53	0.000	1.50	l/m	l/m	-1.58%
Sensor Compo	nent Leak Tes	t		Conditio	n		Status	pass	
Sensor Compo	ment Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Compo	nent Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Compo	nent Rotomete	er Condition	1	Conditio	n Clean and dry		Status	pass	
Sensor Component Moisture Present			Conditio	n See comments	6	Status	pass		
Sensor Compo	nent Filter Dist	ance		Conditio	1 4.0 cm		Status	pass	
Sensor Compo	nent Filter Dep	oth		Conditio	n 1.5 cm		Status	pass	
Sensor Compo	nent Filter Azir	nuth		Conditio	n 20 deg	20 deg S			
Sensor Compo	onent System M	lemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg		Serial N	umber Ta	Site	Te	chnician		Site Visi	Site Visit Date Parameter		eter	Owner I	D
ThermoElec	tron Inc	110534	7306	KEF112	Sa	andy Grei	nville	08/17/20	016	Ozone		000728	
Slope: Intercept CorrCoff	().98447).27377).99995	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0419606 01112	ilectron 966	Inc Pa	rameter ozo er Desc. Oz	one one primary	/ stan
DAS 1: A Avg % D 1.3	Diff: A N 3%	<mark>Iax % D</mark> 2.2	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	1	0.9952 /28/201	4 Inter 6 Corr	·cept ·Coff	-0.33	3070)000
UseDes prin prin prin prin prin	cription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.03 30.01 50.14 80.07 110.34	Tfer 0 30. 50. 80. 111	Corr 36 .48 .71 .78 .20	Si 0. 30 49 80 109	ite 94 .11 .60 .30 0.70	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	-1.21% -2.19% -0.59% -1.35%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	degree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	Filter Conditio	n	Conditio	on Clean	1			Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditio	on N/A				Status	pass		_
Sensor Co	ompone	nt Offset	t		Conditio	on 0.10				Status	pass		_
Sensor Co	omponei	nt Span			Conditio	on 1.011				Status	pass		
Sensor Co	ompone	nt Zero	Voltage		Condition N/A				Status	pass			
Sensor Co	ompone	nt Fullso	ale Voltage		Condition N/A				Status	pass			
Sonsor Co	ompone		Freq						Status	nass			
Sensor C	omponer		Noiso						Status	pass			
Sensor Co	omponei		Flam						Status	pass			
Sensor Co	ompone				Conditio	Condition 0.71 lpm				Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	Condition 684.8 mmHg				Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 37.7 (2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 92.4 k	κHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 0.9 lp	m			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.73 l	pm			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Conditio	on 684.2	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	S Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	OSS		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Temperature Data Form

Mfg	Serial Number T	'a Site	7	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	13992	KEF112		Sandy	Grenville	08/17	7/2016	Temper	ature	06388	
				Mf	g	Extec	h	Pa	arameter Te	emperature	
				Serial Number		H2327	H232734 Tf		fer Desc. RTD		
				Tfer ID 01227			7				
DAS 1:	DAS	2:		Slo	pe		1.0077	2 Inte	rcept	0.12514	4
Abs Avg Err Ab	s Max Er Abs A	Avg Err Abs	Max Er	Ce	ert Date 2/28/20 ⁻		2/28/201	6 Cor	rCoff	1.00000	C
0.08	0.18										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	Corr. OutputTmpS		Signal OutputSignalEng		OSE Unit	Difference	
primary Tem	p Low Range	0.17	0.04		0.000	0.1		С	0.06		
primary Tem	p Mid Range	25.51	25.19)	0.000		25.	2	С	-0.01	
primary Tem	p High Range	49.69	49.19)	0.000		49.	0	С	-0.18	
Sensor Compone	nt Shield		Condi	tion	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Compone	nt Blower Status S	Switch	Condi	Condition N/A				Status	, pass		
Sensor Compone	ent System Memo		Condi	Condition				Status	s pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date Parameter		Owner ID
Campbell	none	KEF112	Sandy Grenville	08/17/2016	Shelter Temperatu	ire none
DAS 1:	DAS 2:	-	Mfg	Extech	Parameter S	Shelter Temperatur
Abs Avg ErrAl0.56	0.75	g Err Abs Max Er	Serial Number	H232734	Tfer Desc.	RTD
			Tfer ID	01227		
			Slope	1.0077	2 Intercept	0.12514
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	25.71	25.39	0.000	25.7	С	0.32	
primary	Temp Mid Range	29.16	28.81	0.000	28.2	С	-0.61	
primary	Temp Mid Range	24.34	24.03	0.000	24.8	С	0.75	
Sensor Component System Memo			Condition	Status pass				

Infrastructure Data For

Site ID	KEF112	Technician Sandy Gr	enville Site Visit Date 08/17/2016
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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	KEF112	Sandy Grenville	08/17/2016	Moisture Present	Apex	3652		
The filter sample tubing has drops of moisture in low sections outside the shelter.								

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

4 Parameter: PollAnalyzerCom

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

5 Parameter: MetSensorComme

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

Field Systems Data Form	
rielu Systems Data ruim	

F-02058-1500-S1-rev002

Site ID KEF1	12		Technician	andy Grenvill	е	Site Visit	Date 08/1	7/2016]
					USG	S Man		James City	
Site Sponsor (agenc	y)	EPA			050				
Operating Group		PAFS/pri	vate		Map	Scale			
AQS #		42-047-9	991		Map	Date			
Meteorological Typ	eorological Type R.M. Young								
Air Pollutant Analy	ant Analyzer Ozone		QAI	QAPP Latitude41.5981					
Deposition Measure	ment	dry, wet			QAPP Longitude			-78.7683	
Land Use		woodland	I - mixed		QAI	QAPP Elevation Meters 622			
Terrain		rolling			QAI	PP Declinatio	n	10.5	
Conforms to MLM		Yes			QAI	PP Declinatio	n Date	2/24/2006	
Site Telephone		(814) 837	7-8069		Aud	it Latitude			41.598119
Site Address 1 Kane Experimental Forest Hdqts			Audit Longitude				-78.767866		
Site Address 2 Seven Mile Road		Aud	it Elevation			618			
County	ty Elk		Aud	it Declination	n	-10.3			
City, State		Kane, PA	L				Present		
Zip Code		16735			Fire	Extinguishe	<mark>r</mark> ✓	New in 2015	
Time Zone		Eastern			First	t Aid Kit	\checkmark		
Primary Operator					Safe	ty Glasses	\checkmark		
Primary Op. Phone	e #				Safe	ty Hard Hat	\checkmark		
Primary Op. E-mail	l				Clin	ibing Belt			
Backup Operator					Secu	rity Fence			
Backup Op. Phone	#				Secu	re Shelter	\checkmark		
Backup Op. E-mail					Stab	le Entry Stej	•		
Shelter Working Ro	om⊻	Make	Ekto	Μ	odel	8810 (s/n 214	9-14)	Shelter Size	640 cuft
Shelter Clean	✓	Notes	The shelter is cl	ean and very	well org	anized. The	floor and b	ottom of walls are	e beginning to
Site OK		Notes							
Driving Directions	From sign ju About Forest Forest	Kane go s ist over th 0.5 mile p Experime Service b	otes ine go south on route 66 for approximately 1 mile. Just past the 2nd cemetery turn left. Continue to the stop over the railroad tracks. Turn right and continue approximately 3.2 miles through the town of Lamont. 5 mile past Lamont, turn left on a gravel road which is marked with a brown Forest Service sign for the NE experimental Station. Continue approximately 2 miles and bear left at the fork. The site is behind the green Service buildings on the left.						

Field Systems Data Form

KEF112

F-02058-1500-S2-rev002

Site ID

Tec

Technician Sandy Grenville

Site Visit Date 08/17/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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		\checkmark

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 08/17/2016					
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓ N/A					
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	✓ N/A					
3	Are the tower and sensors plumb?	✓ N/A					
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?						
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	Temperature sensor mounted over shelter roof					
6	Is the solar radiation sensor plumb?	✓ N/A					
7	Is it sited to avoid shading, or any artificial or reflected light?	✓ N/A					
8	Is the rain gauge plumb?	✓ N/A					
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	N/A					
10	Is the surface wetness sensor sited with the grid surface facing north?	✓ N/A					
11	Is it inclined approximately 30 degrees?	✓ N/A					
Pro	wide any additional explanation (photograph or sketch if nece	ssary) regarding conditions listed above, or any other features,					

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

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

Field Systems Data Form F-02058-1500-S4-rev002 Site ID KEF112 Technician Sandy Grenville Site Visit Date 08/17/2016 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data?

3	Are the shields for	• the temp	erature and	RH sensors	clean?
•	The one shields for	the temp	ci avai e ana		cicuii.

Are the aspirated motors working? 4

1

2

- Is the solar radiation sensor's lens clean and free of 5 scratches?
- Is the surface wetness sensor grid clean and undamaged? 6
- 7 Are the sensor signal and power cables intact, in good condition, and well maintained?
- Are the sensor signal and power cable connections protected 8 from the elements and well maintained?

I	✓	Temperature only
	✓	Temperature only
	✓	N/A
		N/A
	✓	N/A
	✓	
d		

Provide any additional 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 08/17/2016		
	Siting Criteria: Are the pollutant analyzers and deposition e	<u>quip</u>	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	<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 15 meters		
4	Describe dry dep sample tube.		3/8 teflon by 12 meters		
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only		
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓			
7	Is the zero air supply desiccant unsaturated?	✓			
8	Are there moisture traps in the sample lines?	✓	Flow line only		
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry		

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

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002			
Site	Site ID KEF112		Technician	Sandy Grenville		Site Visit Date	08/17/2016	;	
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns ai	nd maintenance			
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	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 grounde	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	mple tower stable and	l grounded?						
11	Tower c	comments?				Met Tower removed	l, SampleTo	ower 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 Systems Data	Fo	rm			F-02058-1500-S7-rev			
Site ID KEF112		Technician Sandy Grenville		dy Grenville Site Visit Date 0	8/17/201	6		
Documentation								
Does the site have the requi	red in	strumen	<u>t and equi</u>	<u>pment manuals?</u>				
Wind speed sensorWind direction sensorTemperature sensorRelative humidity sensorSolar radiation sensorSurface wetness sensorWind sensor translatorTemperature translatorHumidity sensor translatorSolar radiation translatorTipping bucket rain gaugeOzone analyzerFilter pack flow controller				Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater Shelter air conditioner	Yes			
Filter pack MFC power supply Does the site have the requ	iired a	nd most	✓ recent Q	C documents and report forms?				

02

	Present		Current
Station Log	\checkmark		\checkmark
SSRF	\checkmark		\checkmark
Site Ops Manual	\checkmark	Feb 2014	
HASP	\checkmark	Feb 2014	\checkmark
Field Ops Manual	\checkmark	Oct 2011	\checkmark
Calibration Reports	\checkmark		\checkmark
Ozone z/s/p Control Charts			\checkmark
Preventive maintenance schedul			

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

- 3 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 4 current?

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	KEF112	Technician	Sandy Grenville		Site Visit Date	08/17/2016			
1	Site ope Has the course?	eration procedures site operator attended If yes, when and who	l a formal CAS instructed?	TNET training		Current operator tra by previous operato	ined by previous op r	perator	r, who was	trained
2	Has the training	backup operator atter g course? If yes, when a	nded a formal (and who instrue	CASTNET cted?						
3	Is the sit schedule	e visited regularly on t ?	the required Tu	lesday	✓					
4	Are the s flollowed	standard CASTNET o l by the site operator?	perational proc	edures being	✓					
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	geable of, and a cluding docume	ble to perform entation)						

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	Semiannually	✓
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	\checkmark	Weekly	\checkmark
Test Surface Wetness Response		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
- **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 inlet filter is replaced and the ozone sample train is leak tested every two weeks.

Compliant

Compliant

F-02058-1500-S8-rev002

Fi	ield Systems Data Form						F-02058-1500-S9-rev002					
Site	e ID	KEF112	Techni	cian	Sandy Grenville		Site Visit Date	08/17/2016]		
	<u>Site ope</u>	eration procedures										
1	Is the fi	lter pack being change	d every T	uesda	ay as scheduled?		✓ Filter changed morinings 90% of the time					
2	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 san	nple flow rates recorde	d? How?			✓	SSRF, logbook, cal	II-in				
7	Are san fashion	nples sent to the lab on ?	a regular	sche	dule in a timely							
8	Are filte and shij	ers protected from con pping? How?	taminatio	n du	ring handling	✓	Clean gloves on an	d off				
9	Are the operation	site conditions reporte	d regular	ly to	the field							
QC	Check P	erformed		Fre	quency			Compliant				
N	Aulti-poi	nt MFC Calibrations	\checkmark	Sem	niannually							
I	Flow Syst	em Leak Checks	\checkmark	Wee	ekly							
I	Filter Pac	k Inspection										
I	Flow Rate	e Setting Checks	\checkmark	Wee	ekly							
Visual Check of Flow Rate Rotometer Veekly												
In-line Filter Inspection/Replacement												
8	Sample Li	ine Check for Dirt/Wa	ter 🗸	Wee	ekly							
Dros	ido onv s	ditional evaluation	(nhotogra	nh o	r skatch if nacas	corv) regarding conditi	ions listed abo	vo or a	ny other features		

Provide any additional 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

KEF112

F-02058-1500-S10-rev002

Site ID

Tecl

Technician Sandy Grenville

Site Visit Date 08/17/2016

Site Visit Sensors

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

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
HOX	148-Eric H	lebert-08/18/2016				
1	8/18/2016	Computer	Dell	07062	Inspiron 15	Unknown
2	8/18/2016	DAS	Campbell	000426	CR3000	2533
3	8/18/2016	Elevation	Elevation	None	1	None
4	8/18/2016	Filter pack flow pump	Thomas	04927	107CAB18	110300021225
5	8/18/2016	Flow Rate	Арех	000526	AXMC105LPMDPCV	48099
6	8/18/2016	Infrastructure	Infrastructure	none	none	none
7	8/18/2016	Modem	Raven	06480	H4222-C	0808311145
8	8/18/2016	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
9	8/18/2016	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
10	8/18/2016	Sample Tower	Aluma Tower	000131	В	none
11	8/18/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/18/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/18/2016	Temperature	RM Young	06544	41342	14805
14	8/18/2016	Zero air pump	Werther International	06938	C 70/4	000829164

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Nu	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2533	НОХ	(148 E	Eric Hebert	08/18/2016	DAS	Primary
Das Date:	8 /18/2016	Audit Date	8 /18/2016	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	231	Audit Time Audit Day	231	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel	l:	High Channel	•	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0000	0.0001	0.0000	0.0001				
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/23/201	5 CorrCoff	1.00000
Channel	Input D	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.1000	0.1000	V	V	0.0000	
7	0.3000	0.3000	0.3000	V	V	0.0000	
7	0.5000	0.5000	0.5000	V	V	0.0000	
7	0.7000	0.7000	0.7001	V	V	0.0001	
7	0.9000	0.9000	0.9001	V	V	0.0001	
7	1.0000	1.0000	1.0000	V	V	0.0000	

Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	Owner ID
Apex	48099		HOX148	Eri	c Hebert	08/18/2016	Flow R	late	000526
					Mfg	BIOS	Р	arameter Flow	v Rate
					Serial Number	148613	Т	fer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.0	0309 Inte	ercept	-0.00231
					Cert Date	4/21	/2016 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	0.0)5	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	1.(06	
0.44%	0.67%				Rotometer R	eading:	1.4	45	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.08	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.03	l/m	l/m	
primary	test pt 1	1.493	1.490	1.43	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.500	1.500	1.43	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.508	1.510	1.43	0.000	1.50	l/m	l/m	-0.66%
Sensor 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 Conditior	ı	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	n 5.0 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 3.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 235 deg		Status	pass	
Sensor Comp	onent System M	/lemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg	ł	Serial Numb	er Ta	Site	Те	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	ctron Inc	1009241794		HOX148	Er	ric Hebert		08/18/20	016	Ozone		000614	
Slope: Intercept CorrCoff	0 0 0	.98573 Slop .47845 Inte .99998 Cor	pe: ercept rCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	lectron	Inc Pa	rameter oz er Desc. Oz	one cone primary	y stan
DAS 1: A Avg % E 0.8	Diff: A M 8%	D ax % Di A 0.9%	AS 2: Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	1	1.0050 /28/201	0 Inter 6 Corr	ccept Coff	-0.28	3841 0000
UseDes prin prin prin prin prin prin	scription nary nary nary nary nary nary	ConcGr 1 2 3 4 5	oup	Tfer Raw 0.05 27.87 49.94 79.81 104.46	Tfer 0 28 49 79 104	Corr 33 .01 .97 .69 I.22	Si 1. 27 49 79 103	ite 08 .75 .66 .08 3.30	Site ppb ppb ppb ppb ppb	e Unit	PctDif	ference -0.93% -0.62% -0.77% -0.88%	
Sensor C	omponen	t Sample Tra	iin		Conditio	on Good				Status	pass		
Sensor C	omponen	t 22.5 degree	e rule		Conditio	on				Status	pass		7
Sensor C	omponen	t Inlet Filter C	Conditic	n	Conditio	on Clean				Status	pass		7
Sensor C	omponen	t Battery Bac	:kup		Condition	on N/A				Status	pass		7
Sensor C	omponen	t Offset			Condition	on -0.60				Status	pass		7
Sensor C	omponen	t Span			Conditio	on 1.022				Status	pass		7
Sensor C	omponen	t Zero Voltag	je		Conditio	on N/A				Status	pass		
Sensor C	omponen	t Fullscale Vo	oltage		Conditi	on N/A				Status	pass		-
Sensor C	omponen	t Cell A Freq			Conditio	on 90.7 k	Hz			Status	pass		
Sensor C	omponen	t Cell A Noise	e		Conditi	on 0.9 pr	b			Status	pass		
Sonsor C	omponen	t Cell A Flow			Conditi	on 0.89 l	nm			Status	nass		
Sensor C	omponen		SUITO		Conditi	on 715 1	mmHa			Status	nass		
Sensor C	omponen		Suic		Conditio					Status	Foil		
Sensor C	omponen		•		Conditio	on 41.90	, 			Status	raii		
Sensor C	omponen		•		Conditio	on 93.9 k	.HZ			Status	pass		
Sensor C	omponen	t Cell B Nois	e		Conditio	on 0.6 pp	DD			Status	pass		
Sensor C	omponen	t Cell B Flow			Condition	on 0.72 l	pm			Status	pass		
Sensor C	omponen	t Cell B Pres	sure		Conditio	on 715.7	mmHg			Status	pass		
Sensor C	omponen	t Cell B Tmp			Conditio	on				Status	pass		
Sensor C	omponen	t Line Loss			Conditio	on Not te	sted			Status	pass		
Sensor C	omponen	t System Me	mo		Conditio	on See c	omments	;		Status	pass		

Temperature Data Form

Mfg	Serial Number 7	Fa Site	,	Techni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	14805	HOX148		Eric H	ebert	08/18	3/2016	Temper	ature	06544	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H2326	679	Tf	er Desc. R	٢D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	pe		1.0076	0 Inte	rcept	-0.057	10
Abs Avg Err A	bs Max Er Abs	Avg Err Abs	Max Er	Ce	rt Date		2/28/201	6 Cor	rCoff	1.000	00
0.12	0.24			<u></u>							
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Ten	np Low Range	0.03	0.09)	0.000		0.1	l	С	-0.02	
primary Ten	np Mid Range	30.98	30.8	0	0.000		30.	9	С	0.1	
primary Ten	np High Range	49.78	49.4	6	0.000		49.	7	С	0.24	
Sensor Compon	ent Shield		Cond	ition N	Moderately clea	an		Status	pass		
Sensor Compon	ent Blower		Cond	ition 🛚	N/A			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 S	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	HOX148	Eric Hebert	08/18/2016	Shelter Temperature	none
DAS 1: Abs Avg Err Abs 1 0.52	DAS 2: Max Er Abs Avg 0.89	Err Abs Max Er	Mfg Serial Number Tfer ID Slope Cert Date	Extech H232679 01228 1.0076 2/28/201	Parameter She Tfer Desc. RTI	elter Temperatur

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.70	29.53	0.000	29.7	С	0.16
primary	Temp Mid Range	24.01	23.89	0.000	24.8	С	0.89
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	HOX148	Technician Eric He	bert Site Visit Date 08/18/2016
Shelter 1	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	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Not functioning	Status	Fail
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID HOX148	Technician Eric Hebert	Site Visit Date 08/1	8/2016
Site Sponsor (agency)	EPA	USGS Map	Hoxeyville
Operating Group	private	Map Scale	
AQS #	26-165-9991	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	QAPP Latitude	
Deposition Measurement	dry	QAPP Longitude	
Land Use	woodlands - mixed	QAPP Elevation Meters	
Terrain	gently rolling	QAPP Declination	
Conforms to MLM	Yes	QAPP Declination Date	
Site Telephone	(231) 862-3750	Audit Latitude	44.18089
Site Address 1	10637 South 9 Rd.	Audit Longitude	-85.73898
Site Address 2		Audit Elevation	297
County	Wexford	Audit Declination	-5
City, State	Cadillac, MI	Present	
Zip Code	49601	Fire Extinguisher 🗹	New in 2015
Time Zone	Eastern	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🗹	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🗹	
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size 640 cuft
Shelter Clean	Notes The shelter is clean, neat, well	organized. Major repairs are u	inderway to the floor of the shelter.
Site OK	Notes		
Driving Directions From and co approximate the site	Cadillac proceed west on route 55 for app ontinue approximately 2 miles to the first s ximately 2 miles to 9 road. Turn left (sout e is on the left.	proximately 12.5 miles. Turn le stop sign. Turn right (west) on th) on 9 road which is not paved	ft (south) on Hoxeyville Road (S13) an unmarked road and continue d and continue approximately 1 mile,

Field Systems Data Form

HOX148

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 08/18/2016

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

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 Systems Data Form		F-02058-1500-S3-rev002				
Site	HOX148 Technician Eric Hebert		Site Visit Date 08/18/2016				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?	\checkmark	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?	\checkmark	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 nec ural or man-made, that may affect the monitoring parameter	essary s:	7) regarding conditions listed above, or any other features,				

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site	ID	HOX148	Technician	Eric Hebert		Site Visit Date 08/18/2016
1	Do all the condition	e meterological sensor 1, and well maintained	rs appear to be 1?	intact, in good		Temperature only
2	reporting	g data?		i onnie, and		
3	Are the s	hields for the tempera	ature and KH s	ensors clean?		
4	Are the a	spirated motors work	cing?			
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 h, and well maintained	er cables intact 1?	, in good	\checkmark	
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	ite ID HOX148 Technician Eric Hebert		Site Visit Date 08/18/2016				
	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 and	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 15 meters				
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only				
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓					
7	Is the zero air supply desiccant unsaturated?	✓					
8	Are there moisture traps in the sample lines?	✓	Flow line only				
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry				

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

Field Systems Data Form							F	-02058-15	500-S6-rev002
Site	e ID	HOX148	Technician	Eric Hebert		Site Visi	it Date 08/18	3/2016]
DAS, sensor translators, and peripheral equipment operation						<u>nd maintena</u>	nce		
1	Do the I well mai	DAS 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 lightnin	nalyzer and sensor sig g protection circuitry?	gnal leads pass (?	hrough	✓				
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	DAS channel?					
6	Are the grounde	DAS, sensor translato cd?	ors, and shelter j	properly	✓				
7	Does the	e instrument shelter ha	ave a stable pov	ver source?					
8	Is the in	strument shelter temp	perature control	led?		Temperature	e control off		
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 re	emoved		

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

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

Field Systems Data Form								F-02058-1500-S7-rev002			
Site ID	HOX148		Tech	nician	Eric Hebert	Site Visit Da	te 08/18/201	6			
Document a	ation										
Does the si	te have the requir	ed ins	strume	nt and	equipment manuals?						
Wind speed so Wind direction Temperature Relative humin Solar radiation	ensor on sensor sensor idity sensor on sensor	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	No		A Data logge Data logge Strip chart Computer Modem	r r t recorder	Yes □ □ □ ✓		N/A ☑ ☑ ☑		
Surface wetne Wind sensor f Temperature Humidity sen Solar radiatio Tipping buck Ozone analyz Filter pack flo Filter pack M	ess sensor translator translator sor translator on translator et rain gauge er ow controller FC power supply site have the requ		 	 ✓ ✓<	Printer Zero air pu Filter flow Surge prot UPS Lightning j Shelter hea Shelter air	Imp pump ector protection devi ater conditioner <u>report forms?</u>	✓ 				
Station Log SSRF Site Ops Man HASP	ual		ent	Oct 201	4			ent			

Field Ops Manual **Calibration Reports**

Ozone z/s/p Control Charts

Preventive maintenance schedul

✓

 \checkmark

Oct 2014	
Oct 2014	
June 1987	
	ĺ

✓

✓

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

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

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	Weekly	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

|--|

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**

✓	Semiannually	✓
\checkmark	Daily	✓
	Daily	
\checkmark		
	Weekly	
	Every 2 weeks	✓
\checkmark	N/A	
	Weekly	
\checkmark	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?

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. The shelter climate control is disabled during repairs to the shelter. Although the shelter temperature is currently within acceptable limits there is an "Alarm High" temperature flag present on the site ozone monitor.

Compliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form							500-S9-rev002			
Sit	e ID	HOX148 1	echnici	Eric Hebert		Site Visit Date	08/18/2016			
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being changed ev	ery Tue	sday as scheduled	?⊻	Filter changed morr	nings			
2	Are the Site Status Report Forms being completed and filed correctly?									
3	Are dat schedul	a downloads and backups ed?	being po	erformed as		No longer required				
4	Are gen	eral observations being ma	ade and	recorded? How?	✓	SSRF, logbook				
5	Are site supplies on-hand and replenished in a timely fashion?									
6	Are sample flow rates recorded? How?					SSRF, call-in				
7	Are samples sent to the lab on a regular schedule in a timely fashion?									
8	Are filters protected from contamination during handling and shipping? How?				✓	Clean gloves on and	d off			
9	Are the operation	site conditions reported re ons manager or staff?	gularly	to the field	✓					
QC	Check P	erformed	F	requency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ s	emiannually						
I	Flow Syst	em Leak Checks	✓ V	/eekly						
Filter Pack Inspection										
Flow Rate Setting Checks Veekly										
Visual Check of Flow Rate Rotometer Veekly										
I	In-line Filter Inspection/Replacement Semiannually					\checkmark				
Sample Line Check for Dirt/Water Weekly						\checkmark				
Duca	ido onvo	ditional amplemation (nh	tognon	on skatah if naaa) maganding aanditi	and listed above on	any other features		

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

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

Technician Eric Hebert

Field Systems Data Form

HOX148

Site ID

Site Visit Sensors

F-02058-1500-S10-rev002

Site Visit Date 08/18/2016

Site Inventory by Site Visit

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

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Nu	mber Site	Т	Sechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2512	PSU	106	Sandy Grenville	08/22/2016	DAS	Primary
Das Date:	8 /21/2016	Audit Date	8 /21/2016	Mfg	Datel	Parameter	DAS
Das Day:	234	Audit Thile	234	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel	:	· – High Channel	:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0000	0.0001	0.0000	0.0001				
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/23/201	5 CorrCoff	1.00000
Channel	Input D	VM 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	ıber Ta	Site	Tec	hnician	Site Visit D	Site Visit Date Paramete		Owner ID
Apex	50732		PSU106	Sa	ndy Grenville	08/22/2016 Flow R		Rate	000560
					Mfg	BIOS	I	Parameter F	low Rate
					Serial Number	103471]	lfer Desc. n	exus
					Tfer ID	01420			
					Slope	0.9	99091 Int	ercept	0.03172
					Cert Date	2/28	/2016 Co	rrCoff	0.99988
					Mfg	BIOS	I	Parameter	low Rate
					Serial Number	103424]	lfer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	0.9	99091 Int	ercept	0.03172
					Cert Date	2/28	/2016 Co	rrCoff	0.99988
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.	05	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.	94	
0.66%	0.66%				Rotometer R	eading:	1	.5	
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	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.03	l/m	l/m	
primary	test pt 1	1.525	1.510	1.58	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.528	1.510	1.58	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.529	1.510	1.58	0.000	1.50	l/m	l/m	-0.66%
Sensor 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 Fair		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 Compo	onent Filter Dist	ance		Conditio	n 4.0 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 0.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	n 90 deg		Statu	s pass	
Sensor Comp	onent System M	1emo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg	1	Serial N	umber Ta	Site	Te	chnician		Site Visi	it Date	Param	eter	Owner]	D
ThermoElect	ron Inc	103024	4791	PSU106	Sa	andy Gre	nville	08/22/2	016	Ozone		000678	
Slope: Intercept CorrCoff	0 0 1	.98609 .18438 .00000	Slope: Intercept CorrCoff	0.00000)))	Mfg Serial N Tfer ID	Jumber	ThermoE 0419606 01112	Electron	Inc Pa	irameter C	ozone Ozone primar	y stan
DAS 1: A Avg % Di 1.0	iff: A M %	ax % D	DAS 2: i A Avg %	bDif A Max (% Di	Slope Cert Da	nte		0.9952	Inte	rcept rCoff	-0.3	3070 0000
UseDesc prim prim prim prim	ary ary ary ary ary ary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw -0.01 30.03 50.03 80.16 110.13	Tfer 0.3 30. 50. 80.	Corr 32 50 60 87	Si 0. 30 50 79	ite 49 .27 .07 .96	Sit ppb ppb ppb ppb	e Unit	PctD	-0.75% -1.05% -1.13% -1.24%	
Sensor Co	mponen	t Samp	le Train		Conditio	on Good	107		PP	Status	pass	112170	
Sensor Co	mponen	t 22.5 d	legree rule		Conditio	on				Status	pass		
Sensor Co	mponen	t Inlet F	ilter Conditio	n	Conditio	n Clear	<u> </u>			Status	pass		
Sensor Co	mponen	t Batter	v Backup		Conditio	n N/A				Status	pass		
Sonsor Co	mponen	t Offset	у — ала тар		Conditio	0.40				Status	nass		
Sensor Co	mponen				Conditio					Status	pass		
Sensor Co	mponen		/altaria		Conditio	n 1.000				Status	pass		
Sensor Co	mponen				Conditio					Status	pass		
Sensor Co	mponen	t Fullsc	ale voltage		Conditio	on N/A				Status	pass		
Sensor Co	mponen	t Cell A	Freq.		Conditio	on 96.7	κHz			Status	pass		
Sensor Co	mponen	t Cell A	Noise		Condition 0.8 ppb					Status	pass		
Sensor Co	mponen	t Cell A	Flow		Conditio	on 0.81 l	pm			Status	pass		
Sensor Co	mponen	t Cell A	Pressure		Conditio	704.1	mmHg			Status	pass		
Sensor Co	mponen	t Cell A	Tmp.		Conditio	on 34.6 (C			Status	pass		
Sensor Co	mponen	t Cell B	Freq.		Conditio	on 94.9 k	κHz			Status	pass		
Sensor Co	mponen	t Cell B	Noise		Conditio	on 0.9 pp	ob			Status	pass		_
Sensor Co	mponen	t Cell B	Flow		Conditio	on 0.68 l	pm			Status	pass		
Sensor Co	mponen	t Cell B	Pressure		Conditio	n Not te	ested			Status	pass		
Sensor Co	mponen	t Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	mponen	t Line L			Conditio	n Not te	ested			Status	pass		
Sensor Co	mpopop	t Syster	m Memo		Conditi	on [Status	pass		
	mponen				Conuitin					Status			

Temperature Data Form

Mfg	Serial Number	Га Site	,	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	9683	PSU106		Sandy Grenville		08/22	2/2016	Temper	ature	05048	
				Mf	g	Extec	h	Pa	arameter Te	mperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	D	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	pe		1.0077	2 Inte	rcept	0.12514	
Abs Avg Err Abs Max Er Abs Avg Err Abs Max		Max Er	x Er Cert Date		2/28/2016 Cor		rCoff 1.00000				
0.27	0.33										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.18	0.05	0.05 0.00		0.3		С	0.22		
primary Tem	p Mid Range	25.08	24.7	6	0.000		25.	1	С	0.33	
primary Tem	p High Range	48.74	48.24	4	0.000		48.	5	С	0.26	
Sensor Compone	ent Shield		Cond	ition C	Clean			Status	pass		
Sensor Compone	ent Blower		Cond	ition 🛚	N/A			Status	pass		
Sensor Component Blower Status Switch			Cond	Condition N/A			Status		s pass		
Sensor Compone	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	PSU106	Sandy Grenville	08/22/2016	Shelter Temperatu	ire none
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	Shelter Temperatur
Abs Avg Err Abs	Max Er Abs Avg 0.51	Err Abs Max Er	Serial Number	H232734	Tfer Desc.	RTD
			Tfer ID	01227		
			Slope	1.0077	2 Intercept	0.12514
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.48	25.16	0.000	25.7	С	0.51
primary	Temp Mid Range	25.70	25.38	0.000	25.7	С	0.36
primary	Temp Mid Range	26.00	25.68	0.000	25.9	С	0.22
Sensor Component System Memo Condition Status pass							

Infrastructure Data For

Site ID	PSU106	Technician Sandy G	renville Site Visit Date 08/22/2016
Shelter 1	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	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 Parameter: DasComments

The meteorological tower has been removed.

3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

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

5 Parameter: MetOpMaintCom

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

F-02058-1500-S1-rev002

Site ID PSU106	Technician Sandy Grenvill	e Site Visit Date 08/2	2/2016
			Dires Orecce Mills
Site Sponsor (agency)	EPA	USGS Map	Pine Grove Mills
Operating Group	PSU	Map Scale	
AQS #	42-027-9991	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	QAPP Latitude	40.7209
Deposition Measurement	dry	QAPP Longitude	-77.9316
Land Use	agriculture	QAPP Elevation Meters	376
Terrain	rolling - complex	QAPP Declination	10.9
Conforms to MLM	Marginally	QAPP Declination Date	9/16/2005
Site Telephone	(814) 237-5778	Audit Latitude	40.720902
Site Address 1	PSU Agriculture Research Farm	Audit Longitude	-77.931759
Site Address 2	Tadpole Road	Audit Elevation	364
County	Centre	Audit Declination	-10.7
City, State	Rockspring, PA	Present	
Zip Code	16865	Fire Extinguisher 🗹	new in 2015
Time Zone	Eastern	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🗹	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🗹	
Shelter Working Room ✓	Make PSU M	lodel N/A	Shelter Size 3840 cuft
Shelter Clean	Notes The shelter is owned by the unnetwork.	niversity and is clean and orderl	y. The site is part of the Surfrad
Site OK	Notes		
Driving Directions From SR 30 on Ta	322 on the east side of State College, tal 024 will change to Whitehall Road. Contin dpole Road in Fairbrook at the church.	ke SR 3024 south. After the tra nue on Whitehall road for appro Continue approximately 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.

PSU106

F-02058-1500-S2-rev002

Site ID

Techn

Technician Sandy Grenville

Site Visit Date 08/22/2016

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

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.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002			
Site	PSU106 Technician Sandy Grenville)	Site Visit Date 08/22/2016			
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A			
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A			
3	Are the tower and sensors plumb?	✓	N/A			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	\checkmark				
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?	\checkmark	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 nec	essar	y) regarding conditions listed above, or any other features.			

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

Field Systems Data Form F-02058-1500-S4-rev002 Site ID PSU106 Technician Sandy Grenville Site Visit Date 08/22/2016 Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and

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?

1

2

reporting data?

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

✓	Temperature only
✓	Temperature only
✓	
✓	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.

Field Systems Data Form						F-02058-1500-S5-rev002
Site	e ID	PSU106	Technician	Sandy Grenville		Site Visit Date 08/22/2016
	Siting C	criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at located airflow?	east a 270 degre	e arc of		
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?					
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	intenance
1	Do the a condition	analyzers and equipmo on and well maintained	ent appear to be l?	e in good		
2	Are the reportir	analyzers and monito ng data?	rs operational,	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 lii	ne? (if yes		At inlet only
6	Are san obstruc	ple lines clean, free of tions?	[°] 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

Field Systems Data Form							F-02	058-15	00-S6-rev002
Site	e ID	PSU106	Technician	Sandy Grenville		Site Visit Date	08/22/2016	;	
	DAS, se	nsor translators, and j	peripheral equi	pment operation	<u>is a</u> i	nd maintenance			
1	Do the I well mai	DAS 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 (?	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]	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato ed?	ors, and shelter j	properly	✓				
7	Does the	e instrument shelter ha	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	oerature 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	comments?				Met tower removed			

The meteorological tower has been removed.

Field Sy	stems Data	Fo	rm				F-02	2058-	1500-	S7-rev002
Site ID	PSU106		Technician Sandy Grenville		Sandy Grenville	Site Visit Da	nte 08/22/2016	6		
Documen	<u>tation</u>									
Does the	site have the requir	ed in	strume	nt and	equipment manuals?	2				
		Yes	No	N/ .	A		Yes	No	N/A	
Wind speed	sensor			\checkmark	Data logg	er		✓		
Wind direct	ion sensor			\checkmark	Data logg	er			\checkmark	
Temperatur	e sensor		✓		Strip cha	rt recorder			\checkmark	
Relative hur	nidity sensor			\checkmark	Compute	r		✓		
Solar radiat	ion sensor			\checkmark	Modem			\checkmark		
Surface wet	ness sensor			\checkmark	Printer				\checkmark	
Wind sensor	r translator			\checkmark	Zero air p	oump		\checkmark		
Temperatur	e translator			\checkmark	Filter flov	v pump		\checkmark		
Humidity se	nsor translator			\checkmark	Surge pro	otector			\checkmark	
Solar radiat	ion translator			\checkmark	UPS				\checkmark	
Tipping buc	ket rain gauge			\checkmark	Lightning	protection dev	ice		\checkmark	
Ozone analy	zer		\checkmark		Shelter he	eater			\checkmark	
Filter pack f	low controller	\checkmark			Shelter ai	r conditioner				
Filter pack I	MFC power supply			\checkmark						
Does the	<u>e site have the requ</u>	ired a	and mo	<u>st rece</u>	nt QC documents and	d report forms?	<u>.</u>			
		Pres	sent				Curre	ent		
Station Log			✓				\checkmark			
SSRF			✓				\checkmark			

SSRF	\checkmark		
Site Ops Manual	\checkmark	Feb 2014	\checkmark
HASP	\checkmark	Feb 2014	\checkmark
Field Ops Manual	\checkmark		
Calibration Reports	\checkmark		
Ozone z/s/p Control Charts			
Preventive maintenance schedul			

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

Site	ID	PSU106	Technician	Sandy Grenville		Site Visit Date	08/22/2016		
1	Site ope Has the course?	<u>ration procedures</u> site operator attende If yes, when and who	d a formal CAS instructed?	TNET training		Trained by previous	operator		
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?				No backup operator				
3	Is the site schedule	e visited regularly on ?	the required T	ıesday	✓				
4	Are the s flollowed	standard CASTNET of by the site operator?	perational pro	cedures being	✓				
5	Is the site the requi	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

Frequency

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	\checkmark	Weekly	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\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

	Frequency	Co
✓	Semiannually	
✓	Daily	
	As needed	
✓	Daily	
	As needed	
✓	Weekly	
✓	Every 2 weeks	
✓	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?

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

Unknown
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

Fi	Field Systems Data Form					F-02058-1500-S9-rev00					
Site	Site ID PSU106 Tech		Technician	ician Sandy Grenville		Site Visit Date	08/22/2016				
	<u>Site ope</u>	ration procedures									
1	Is the fil	lter pack being change	ed every Tuesda	ay as scheduled?		Filter changed morinings					
2	Are the correctl	Site Status Report For y?	rms being com	pleted and filed							
3	Are data schedule	a downloads and back ed?	ups being perfo	ormed as		No longer required					
4	Are gen	eral observations bein	g made and ree	corded? How?		SSRF, logbook					
5	Are site fashion	supplies on-hand and ?	replenished in	a timely	✓						
6	Are sample flow rates recorded? How?					SSRF, logbook, call-in					
7	Are sam fashion	pples sent to the lab on ?	a regular sche	dule in a timely	✓						
8	Are filte and ship	ers protected from con oping? How?	tamination du	ring handling		gloves are not used					
9	Are the operation	site conditions reporte ons manager or staff?	ed regularly to	the field							
QC	Check P	erformed	Fre	quency			Compliant				
N	Iulti-poir	nt MFC Calibrations	Sem	iannually							
Flow System Leak Checks		ekly			\checkmark						
F	Filter Pack Inspection										
F	Flow Rate Setting Checks Veekly										
V	Visual Check of Flow Rate Rotometer Veekly		kly			\checkmark					
I	n-line Fil	ter Inspection/Replace	ement 🗹 Sem	iannually							
S	ample Li	ine Check for Dirt/Wa	iter 🗹 Wee	ekly							
Prov	ide any a	dditional explanation	(photograph o	r sketch if neces	sary) regarding conditi	ons listed abov	e, or an	y other features,		

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

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

PSU106

F-02058-1500-S10-rev002

Site	ID	

Tech

Technician Sandy Grenville

Site Visit Date 08/22/2016

Site Visit Sensors

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

Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
RED	004-Eric H	lebert-08/30/2016				
1	8/30/2016	DAS	Campbell	none	CR850	28383
2	8/30/2016	elevation	Elevation	none	none	none
3	8/30/2016	Filter pack flow pump	Thomas	none	1420 VP	42624821
4	8/30/2016	Flow Rate	Арех	000527	AXMC105LPMDPCV	48100
5	8/30/2016	Infrastructure	Infrastructure	none	none	none
6	8/30/2016	Modem	Sierra wireless	07000	unknown	unknown
7	8/30/2016	Sample Tower	Aluma Tower	000813	В	unknown
8	8/30/2016	siting criteria	Siting Criteria	none	none	None
9	8/30/2016	Temperature	RM Young	06986	41342	024087

DAS Data Form

0 DAS Time Max Error:

Mfg	Serial Nur	nber S	ite	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	28383	F	RED004	Eric Hebert	08/30/2016	DAS	Primary
Das Date:	8 /30/2016	Audit Dat	e 8/30/2016				
Das Time:	8:00:58	Audit Tin	ne 8:01:00				
Das Day:	243	Audit Day	243				
Low Channel:		High Char	mel:				
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.0000	0.0000	0.00	0.000 0.000				

Flow Data Form

Mfg	Serial Nun	ıber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	Owner ID
Apex	48100		RED004	Eri	c Hebert	08/30/2016	Flow R	late	000527
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	148613	Т	fer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.0	00309 Int	ercept	-0.00231
					Cert Date	4/21	/2016 Cor	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.3	38	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.98	37	
0.00%	0.00%				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	0.0000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	-0.03	l/m	l/m	
primary	test pt 1	3.013	3.010	3.01	0.0000	3.01	l/m	l/m	0.00%
primary	test pt 2	3.021	3.010	3.01	0.0000	3.01	l/m	l/m	0.00%
primary	test pt 3	3.021	3.010	3.01	0.0000	3.01	l/m	l/m	0.00%
Sensor Compo	onent Leak Tes	it		Conditio	n		Status	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	nent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Compo	onent Filter Dis	tance		Conditio	n 2.0 cm		Status	pass	
Sensor Compo	onent Filter Dep	oth		Conditio	n 2.5 cm		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	n 270 deg		Status	pass	
Sensor Compo	onent System M	/lemo		Conditio	n		Status	pass	

Temperature Data Form

Mfg	Serial Number T	fa Site	1	Techni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	024087	RED004		Eric H	ebert	08/30	0/2016	Temper	ature	06986	
				Mf	g	Extec	h	Pa	rameter Te	mperature	
				Ser	rial Number	H2326	679	Tf	er Desc. R	D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	pe		1.0076	0 Inte	rcept	-0.0571	10
Abs Avg Err Ab	os Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		2/28/201	6 Cor	rCoff	1.0000	00
0.07	0.18										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.09	0.15	5	0.0000		0.0)	С	-0.18	
primary Tem	p Mid Range	23.91	23.7	9	0.0000		23.	8	С	-0.04	
primary Tem	p High Range	50.58	50.2	6	0.0000		50.	3	С	0	
Sensor Compone	ent Shield		Cond	ition C	Clean			Status	pass		
Sensor Compone	ent Blower		Cond	ition 🛚	N/A			Status	pass		
Sensor Compone	ent Blower Status S	Switch	Cond	ition 🛚	N/A			Status	pass		
Sensor Compone	ent System Memo		Cond	ition				Status	pass		

Infrastructure Data For

Site ID	RED004	Technician Eric He	ebert Site Visit Date 08/30/2016
Shelter M	ſake	Shelter Model	Shelter Size

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	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	Status	pass
Sensor Component	Shelter Floor	Condition	N/A	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	RED004	Eric Hebert	08/30/2016	Moisture Present	Apex	3319		
The filter sample tubing h	as drops of mois	ture in low sections	outside the she	lter.				

Field Systems Comments

1 Parameter: DocumentationCo

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

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Site ID RED004	Technician Eric Hebert	Site Visit Date 08/30)/2016
Site Spanson (aganay)	FDΔ	USGS Map	
Site Sponsor (agency)		Man Seele	
Operating Group	Red Lake Nation / AMEC	Map Scale	
AQS #		Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		QAPP Latitude	
Deposition Measurement	dry	QAPP Longitude	
Land Use		QAPP Elevation Meters	
Terrain		QAPP Declination	
Conforms to MLM		QAPP Declination Date	
Site Telephone		Audit Latitude	47.86382
Site Address 1		Audit Longitude	-94.83535
Site Address 2		Audit Elevation	374
County	Beltrami	Audit Declination	
City, State	Redby, MN	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 Mo	odel	Shelter Size
Shelter Clean	Notes Small footprint site with enclose	ure for instruments only. No sh	elter.
Site OK	Notes		
Driving Directions			

RED004

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Site ID

Technician Eric Hebert

Site Visit Date 08/30/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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

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

Fi	eld Sy	stems Data	Form		F-02058-1500-S3-rev00
Site	e ID	RED004	Technician Eric Hebert		Site Visit Date 08/30/2016
1	Are win being in	d speed and direct fluenced by obstru	ion sensors sited so as to avoid uctions?	✓	N/A
2	Are win (i.e. wind horizont tower in	d sensors mounted d sensors should b ally extended boom to the prevailing v	l so as to minimize tower effects? e mounted atop the tower or on a m >2x the max diameter of the vind)		N/A
3	3 Are the tower and sensors plumb?				N/A
4	Are the avoid ra	temperature shield diated heat source	ls pointed north or positioned to s such as buildings, walls, etc?		
5	Are tem conditio surface a standing	perature and RH s ns? (i.e. ground be and not steeply slo g water should be a	sensors sited to avoid unnatural clow sensors should be natural ped. Ridges, hollows, and areas of avoided)		
6	Is the so	lar radiation sense	or plumb?	✓	N/A
7	Is it site light?	d to avoid shading	, or any artificial or reflected	✓	N/A
8	Is the rain gauge plumb?				N/A
9	Is it site towers,	d to avoid shelterii etc?	ng effects from buildings, trees,	✓	N/A
10	Is the su facing n	rface wetness sens orth?	or sited with the grid surface	✓	N/A
11	Is it inc	lined approximate	ly 30 degrees?	✓	N/A

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

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Site	e ID	RED004	Technician	Eric Hebert		Site Visit Date 08/30/2016					
1	1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?					Temperature only					
2	Are all the meteorological sensors operational online, and reporting data?					Temperature only					
3	Are the shields for the temperature and RH sensors clean?				✓						
4	Are the aspirated motors working?					N/A					
5	Is the 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 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	ID RED004 Technician Eric Hebert		Site Visit Date 08/30/2016
	Siting Criteria: Are the pollutant analyzers and deposition e	quipı	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	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 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	Eric Hebert		Site Visi	it Date	08/30/2016	6	
	DAS, se	nsor translators, and j	peripheral equi	pment operatio	ns ar	<u>ıd maintena</u>	<u>nce</u>			
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)	al? (printers,	✓						
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	perature 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 S	Systems Data 1	For	m					F-02	2058-	1500-	S7-rev	v002
Site ID	RED004		Tech	nician	Eric Hebert	Site Visi	it Date 08	/30/2016	6			
D												
Docum	ientation											
<u>Does th</u>	<u>he site have the require</u>	<u>d ins</u>	trume	ent and	<u>equipment manu</u>	<u>als?</u>		**				
Wind sne	ed sensor	(es	NO		A Data l	ngger		Yes	No V	N/A		
Wind dire	ection sensor				Data I Data I	ngger						
Temperat	ture sensor				Strin	bart recorder						
Relative k	umidity sensor				Comp	uter						
Solar rad	iation sensor				Mode	n						
Surface w	vetness sensor				Printe	r						
Wind sen	sor translator				Zero a	ir pump						
Temperat	ture translator				Filter	flow pump			\checkmark			
Humidity	sensor translator				Surge	protector						
Solar rad	iation translator				UPS					\checkmark		
Tipping b	oucket rain gauge				Light	ing protection	1 device			\checkmark		
Ozone an	alyzer			\checkmark	Shelte	r heater						
Filter pac	k flow controller		\checkmark		Shelte	r air condition	ner			\checkmark		
Filter pac	k MFC power supply			\checkmark								
Does	the site have the requir	ed a	nd mo	st rece	nt QC documents	and report for	<u>rms?</u>					
		Pres	ent					Curre	ent			
Station L	og											
SSRF								\checkmark				
Site Ops I	Manual			Oct 201	4			\checkmark				
HASP				Oct 201	4			\checkmark				
Field Ops	Manual			Oct 201	4			\checkmark				
Calibratio	on Reports											
Ozone z/s	/p Control Charts											
Preventiv	e maintenance schedul											
1 Is the	e station log properly c	omp	leted o	during	every site visit?] No Logbook	(
2 Are t	the Site Status Report 1 ent?	Form	ıs beir	ng comp	oleted and							
3 Are samp	the chain-of-custody fo ple transfer to and fron	rms j 1 lab	prope ?	rly used	l to document							
4 Are curre	ozone z/s/p control cha ent?	rts pi	roperl	y comp	leted and] N/A						
Provide a	ny additional explanat	ion (j	photog	graph o	r sketch if necess	ary) regarding	g condition	s listed	above, o	or any oth	ner featu	res,

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

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

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

- 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?

✓	N/A
✓	N/A
\checkmark	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

Fi	eld Sy	stems Data Form					F-02058-1 5	500-S9-rev002		
Site	e ID	RED004 Te	chniciar	Eric Hebert		Site Visit Date	08/30/2016]		
	<u>Site ope</u>	ration procedures								
1	Is the fil	lter pack being changed eve	ry Tueso	lay as scheduled?	∕	Filter changed vario	us times			
2	2 Are the Site Status Report Forms being completed and filed correctly?									
3	Are data schedule	a downloads and backups b ed?	eing per	formed as		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 sam	ple flow rates recorded? Ho	w?		✓	SSRF				
7	Are sam fashion	nples sent to the lab on a reg ?	ular sch	edule in a timely	✓					
8	Are filte and shij	ers protected from contamin oping? How?	ation du	ıring handling	✓	Clean gloves on and	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	✓ Set	miannually						
I	Flow Syst	em Leak Checks	🗹 We	ekly						
I	Filter Pack Inspection									
I	Flow Rate Setting Checks									
Ţ	Visual Check of Flow Rate Rotometer Weekly					\checkmark				
I	n-line Fil	ter Inspection/Replacement	✓ Set	miannually						
5	Sample Li	ine Check for Dirt/Water	✓ We	ekly						
D	de energe	dditional annianation (mb at		an alaatah if maaaa	~ ~ ~ ~ ~) manageding and 144	and listed above on a	oth on footman		

Field Sy	stems Data Fo	rm	F-02058-1500-S10-rev002			
Site ID	RED004	Technician	Eric Hebert	Site Visit Date	08/30/2016	

Site Visit Sensors

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

Site Inventory by Site Visit

Site \	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
WST	VST109-Sandy Grenville-09/15/2016									
1	9/15/2016	Computer	Dell	07026	Inspiron 15	2Z2MC12				
2	9/15/2016	DAS	Campbell	000427	CR3000	2526				
3	9/15/2016	Elevation	Elevation	None	1	None				
4	9/15/2016	Filter pack flow pump	Thomas	00476	107CA18	000025705				
5	9/15/2016	Flow Rate	Арех	000466	AXMC105LPMDPCV	43970				
6	9/15/2016	Infrastructure	Infrastructure	none	none	none				
7	9/15/2016	Modem	Raven	06598	V4221-V	0844349943				
8	9/15/2016	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795				
9	9/15/2016	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812				
10	9/15/2016	Sample Tower	Aluma Tower	missing	В	unknown				
11	9/15/2016	Shelter Temperature	Campbell	none	107-L	none				
12	9/15/2016	Siting Criteria	Siting Criteria	None	1	None				
13	9/15/2016	Temperature	RM Young	04317	41342	4014				
14	9/15/2016	Zero air pump	Werther International	06934	P 70/4	000821881				

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial	Number Site	e I	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2526	W	ST109	Sandy Grenville	09/15/2016	DAS	Primary
Das Date: [Das Time: [Das Day: [9 /15/2016 13:11:00 259	Audit Date Audit Time Audit Day High Chopp	9 /15/2016 13:11:00 259	Mfg Serial Number Tfer ID	Datel 15510194 01320	Parameter Tfer Desc.	DAS Source generator (D
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.000	0.0	002 0.000	1 0.0002				
				Mfg Serial Number Tfer ID Slope Cert Date	Fluke 95740135 01311 1.0000 12/23/201	Parameter Tfer Desc.	DAS DVM 0.00000 1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000) V	V	0.0001	
7	0.1000	0.0998	0.0999) V	V	0.0001	
7	0.3000	0.2996	0.2997	V V	V	0.0001	
7	0.5000	0.4994	0.4996	5 V	V	0.0002	
7	0.7000	0.6993	0.6995	5 V	V	0.0002	
7	0.9000	0.8993	0.8993	S V	V	0.0000	
7	1.0000	0.9992	0.9992	2 V	V	0.0000	

Flow Data Form

Mfg	Serial Num	ber Ta	Site	Tec	hnician	Site Visit D	ate Para	meter	Owner ID
Арех	43970		WST109	Sa	ndy Grenville	09/15/2016	6 Flow	Rate	000466
					Mfg	BIOS]	Parameter FI	ow Rate
					Serial Number	103471	,	Tfer Desc. ne	exus
					Tfer ID	01420			
					Slope	0.9	99091 In	tercept	0.03172
					Cert Date	2/28	3/2016 C o	orrCoff	0.99988
					Mfg	BIOS]	Parameter FI	ow Rate
					Serial Number	103424	,	Ifer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	0.9	99091 In	tercept	0.03172
					Cert Date	2/28	3/2016 C a	orrCoff	0.99988
DAS 1:		DAS 2:			Cal Factor Z	ero	0.0	02	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale		1	
1.92%	2.11%				Rotometer R	eading:		1.5	
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	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.491	1.470	1.50	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.493	1.470	1.50	0.000	1.50	l/m	l/m	2.11%
primary	test pt 3	1.495	1.480	1.50	0.000	1.50	l/m	l/m	1.62%
Sensor Component Leak Test			Conditio	n		Statu	is pass		
Sensor Component Tubing Condition			Conditio	n Good		Statu	is pass		
Sensor Component Filter Position			Conditio	Good		Statu	is pass		
Sensor Component Rotometer Condition			Conditio	Clean and dry		Statu	is pass		
Sensor Component Moisture Present			Conditio	No moisture present		Statu	pass		
Sensor Component Filter Distance			Conditio	4.5 cm		Statu	Is pass	pass	
Sensor Component Filter Depth			Conditio	2.0 cm		Statu	s pass		
Sensor Component Filter Azimuth			Conditio	n 90 deg	90 deg		s pass		
Sensor Comp	onent System M	lemo		Conditio	n		Statu	s pass	
Ozone Data Form

Mfg		Serial N	lumber Ta	Site	Те	Technician Site		Site Visi	e Visit Date Parameter		Owner I	D	
ThermoElec	tron Inc	100924	1795	WST109	Sa	andy Grei	nville	09/15/20	016	Ozone		000611	
Slope: Intercept CorrCoff	(0.99396 0.48937 0.99999	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 04196069 01112	ilectron 966	Inc Pa	rameter ozo er Desc. Oz	one one primary	y stan
DAS 1: A Avg % D 0.2	Diff: A N 2%	1ax % D 0.3'	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	ıte	1.	0.9952 /28/201	4 Inter 6 Corr	·cept ·Coff	-0.33	3070)000
UseDes prin prin prin prin prin	acription nary nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw -0.02 29.96 49.97 79.96 109.95	Tfer 0.3 30. 50. 80. 110	Corr 31 43 54 67 0.80	Si 0.1 30 50 80 110	ite 94 .51 .70 .80 0.60	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	O.26% 0.32% 0.16% -0.18%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	ilter Conditic	n	Conditio	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	ompone	nt Offset	t		Conditio	on -0.20				Status	pass		_
Sensor Co	ompone	nt Span			Conditio	n 1.005				Status	pass		
Sensor Co	ompone	nt Zero	/oltage		Conditio	Condition N/A				Status	pass		
Sensor Co	ompone	nt Fullsc	ale Voltage		Conditio	n N/A				Status			
Sensor C	ompone		Freq		Condition 01.2 kHz				Status	nass			
Sensor C	ompone		Noino				5 12 5 5			Status	2000		
Sensor Co	ompone		Flam		Conditio	o 74 k				Status	pass		
Sensor Co	ompone				Conditio	on 0.74				Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on /17.9	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 35.6 (;			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 91.9 k	Hz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.75 l	om			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Conditio	on 717.6	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.OSS		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Temperature Data Form

Mfg	Serial Number 7	la Site	7	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	4014	WST109		Sandy	Grenville	09/15	5/2016	Temper	ature	04317	
				Mfg		Extec	Extech Parameter		arameter Te	emperature	
				Serial Number		H2327	H232734 1		fer Desc. RTD		
				Tfer ID		01227	7				
DAS 1. DAS 2.				Slo	pe		1.0077	72 Intercept 0.125		0.12514	4
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma		Max Er	ax Er Cert Date			2/28/2016 CorrCoff 1.00000			0		
0.11	0.21			L							
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	al OutputSignalEng		OSE Unit	Difference	
primary Tem	o Low Range	0.17	0.04		0.000		0.3	3	С	0.21	
primary Tem	p Mid Range	25.93	25.6	1	0.000		25.	7	С	0.12	
primary Tem	o High Range	49.10	48.60)	0.000		48.	6	С	-0.01	
Sensor Compone	nt Shield		Condi	ition	Clean			Status	pass		
Sensor Component Blower				Condition N/A				Status	pass		
Sensor Compone	Condi	ition N	N/A			Status	pass				
Sensor Compone	nt System Memo		Condi	Condition				Status	s pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WST109	Sandy Grenville	09/15/2016	09/15/2016 Shelter Temperature	
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrAbs0.67	S Max Er Abs Avg 1.08	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTE)
			Tfer ID	01227		
			Slope	1.0077	2 Intercept	0.12514
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	30.11	29.76	0.000	29.1	С	-0.68	
primary	Temp Mid Range	26.27	25.94	0.000	27.0	С	1.08	
primary	Temp Mid Range	29.80	29.45	0.000	29.2	С	-0.26	
Sensor Con	ponent System Memo)	Condition	Status pass				

Infrastructure Data For

Site ID	WST109	Technician Sandy Gr	renville Site Visit Date 09/15/2016
Shelter M	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-16)	640 cuft
and the second sec			

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	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SiteOpsProcedures

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

3 Parameter: SitingCriteriaCom

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

4 Parameter: SiteOKNotes

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

5 Parameter: MetSensorComme

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

F-02058-1500-S1-rev002

Site ID WST109	Technician Sandy Grenville	Site Visit Date 09/1	5/2016				
Site Sponsor (agency)	EPA	USGS Map	Woodstock				
Operating Group	IES/USFS	Map Scale					
AQS #	33-009-9991	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone	QAPP Latitude	43.9446				
Deposition Measurement	dry, wet	QAPP Longitude	-71.7008				
Land Use	woodland - mixed	QAPP Elevation Meters	258				
Terrain	complex	QAPP Declination	15.9				
Conforms to MLM	No	QAPP Declination Date	12/28/2004				
Site Telephone	(603) 726-4935	Audit Latitude	43.944519				
Site Address 1	234 Mirror Lake Road	Audit Longitude	-71.700787				
Site Address 2		Audit Elevation	255				
County	Grafton	Audit Declination	-15.3				
City, State	Campton, NH	Present					
Zip Code	03223	Fire Extinguisher ☑ New in 2015					
Time Zone	Eastern	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat 🗹					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Step 🗹					
Shelter Working Room ✓	Make Ekto M	odel 8810 (s/n 2149-16)	Shelter Size 640 cuft				
Shelter Clean	Notes						
Site OK	Notes State of NH Department of Env tfazzina@DES.state.NH.US	vironmental Services contact is	Tom Fazzina (603) 271-0911 and				
Driving Directions From contin	Directions From I-93 take exit 30 and go south on route 3 for approximately 2 miles. Turn right on Mirror Lake road and continue to the end of the road. The site is through the gate on the right.						

WST109

F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 09/15/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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	50 m	
Tree line	50 m	10 - 30 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

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

Fi	eld Systems Data Form	F-02058-1500-S3-rev002					
Site	WST109 Technician Sandy Grenville	Site Visit Date 09/15/2016					
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	I/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)	I/A					
3	Are the tower and sensors plumb?	I/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?	I/A					
7	Is it sited to avoid shading, or any artificial or reflected light?	I/A					
8	Is the rain gauge plumb?	I/A					
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	I/A					
10	Is the surface wetness sensor sited with the grid surface facing north?	I/A					
11	Is it inclined approximately 30 degrees?	I/A					
Pro nat	wide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters	regarding conditions listed abov	e, or any other features,				

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

F-02058-1500-S4-rev002

Site	ID	WST109	Technician	Sandy Grenville		Site Visit Date	09/15/2016	
1	Do all th condition	e meterological senso 1, and well maintaine	rs appear to be 1?	intact, in good		Temperature only		
2	Are all the reporting	he meteorological sens g data?	sors operationa	l online, and		Temperature only		
3	Are the s	shields for the temper	ature and RH s	ensors clean?	✓	Moderately clean		
4	Are the a	aspirated motors wor	king?			N/A		
5	Is the sol scratche	ar 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 condition	sensor 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 Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	WST109	Technician	Sandy Grenville		Site Visit Date 09/15/2016
	Siting C	criteria: Are the pollut	t <mark>ant analyzers a</mark>	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	east a 270 degre	e arc of		
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?					
	<u>Pollutar</u>	nt analyzers and depos	sition equipmen	t operations and	mai	ntenance
1	Do the a conditio	analyzers and equipmon and well maintained	ent appear to be 1?	in good	✓	
2	Are the reportin	analyzers and monitong 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-li indicate	ine filters used in the elocation)	ozone sample lin	e? (if yes	✓	At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	f kinks, moisture	e, and	✓	
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 dry	y deposition filte	er line, and is it		Clean and dry

Fi	eld Systems Data Form		F-02058-1500-S6-rev002				
Site	e ID WST109 Technician Sandy Grenvil	e	Site Visit Da	ate 09/15/2016	6		
	DAS, sensor translators, and peripheral equipment operati	<u>ons a</u>	and maintenance				
1	Do the DAS instruments appear to be in good condition and well maintained?	<u>1</u>					
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?		Met tower remov	red			

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

Field Sy	stems Data	Fo	rm]	F -02	058-1	1500-8	S7-rev	7002
Site ID	WST109		Techni	cian	Sandy Grenville Site V	isit Date 09/1	5/2016				
Document	ation										
Does the s	ite have the requi	red in	strument	t and	<u>equipment manuals?</u>						
		Yes	No	N/	A	3	Yes	No	N/A		
Wind speed s	sensor			✓	Data logger			\checkmark			
Wind direction	on sensor			✓	Data logger						
Temperature	e sensor		\checkmark		Strip chart recorde	er			\checkmark		
Relative hum	nidity sensor			✓	Computer		\checkmark				
Solar radiati	on sensor				Modem			\checkmark			
Surface wetn	ess sensor				Printer						
Wind sensor	translator			✓	Zero air pump			\checkmark			
Temperature	e translator				Filter flow pump						
Humidity ser	nsor translator				Surge protector						
Solar radiati	on translator				UPS			\checkmark			
Tipping buck	ket rain gauge				Lightning protection	on device					
Ozone analyz	<i>x</i> er				Shelter heater			\checkmark			
Filter pack fl	ow controller				Shelter air conditio	mer					
Filter pack M	IFC power supply	7									
Does the	site have the requ	ired a	and most	rece	nt QC documents and report f	orms?					
		Pres	sent				Currer	nt			

	Present		Curre
Station Log			
SSRF	\checkmark		\checkmark
Site Ops Manual		Oct 2001	
HASP	\checkmark	Nov 2014	\checkmark
Field Ops Manual		July 1990	
Calibration Reports			
Ozone z/s/p Control Charts			
Preventive maintenance schedu			\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

Site	ID	WST109	Technician	Sandy Grenville		Site Visit Date	09/15/2016]
1	Site ope Has the course?	<u>ration procedures</u> site operator attendec If yes, when and who	l a formal CAS instructed?	TNET training		The site operator wa trained by the previo	as trained by the previo	ous operator, who was
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?				
3	Is the site schedule	e visited regularly on ?	the required T ı	ıesday	✓			
4	Are the s flollowed	standard CASTNET of by the site operator?	perational pro	cedures being	✓			
5	Is the site the requi	e operator(s) knowled ired site activities? (in	geable of, and a cluding docum	able to perform entation)				

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

QC Check Performed

Frequency

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	\checkmark	Weekly	✓
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

	OC	Check	Perfo	rmed
--	-----------	-------	-------	------

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 analyz
Sample Line Check for Dirt/Water
Zero Air Desiccant Check

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

Unknown

logbook, call-in

- 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 chee	cks monitored and
	reported? If yes, how?	

reported? If yes, now?				
Provide any additional explanation (photograph or sketch if necessary	y) regarding conditions listed above, or any other features,			

✓

✓

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

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

Compliant

Compliant

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	orm					F-02058-1	500-S9-rev002
Sit	e ID	WST109	Techr	nician	Sandy Grenville		Site Visit Date	09/15/2016	
	<u>Site ope</u>	ration procedures							
1	Is the fi	lter pack being change	ed every [Fuesda	ay as scheduled?		Filter changed morir	nings	
2	Are the correctl	Site Status Report Fo y?	rms bein _i	g comj	pleted and filed				
3	Are data schedule	a downloads and back ed?	ups being	g perf	ormed as		No longer required		
4	Are gen	eral observations bein	ıg made a	nd ree	corded? How?	✓	SSRF, logbook		
5	Are site fashion	supplies on-hand and ?	replenis	hed in	a timely	✓			
6 Are sample flow rates recorded? How?			✓	SSRF, logbook, call-in					
7	Are sam fashion	pples sent to the lab on ?	a regula	r sche	dule in a timely				
8	8 Are filters protected from contamination during handling and shipping? How?			ring handling	✓	Clean gloves on and	d off		
9	Are the operation	site conditions report ons manager or staff?	ed regula	rly to	the field	✓			
QC	Check P	erformed		Fre	quency			Compliant	
I	Multi-poi	nt MFC Calibrations		Sem	niannually				
I	Flow Syste	em Leak Checks		Wee	ekly				
I	Filter Pac	k Inspection							
I	Flow Rate	Setting Checks		Wee	ekly			\checkmark	
	visual Ch	eck of Flow Rate Rote	ometer	Wee	ekly			\checkmark	
I	n-line Fil	ter Inspection/Replace	ement	Sem	niannually			\checkmark	
5	Sample Li	ne Check for Dirt/Wa	iter 🔽	Wee	ekly			\checkmark	
	• •	11.4. 1 1 4.	(1)		1 (1 10			1. 4 1 1	

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WST109

F-02058-1500-S10-rev002

Site ID

Techn

Technician Sandy Grenville

Site Visit Date 09/15/2016

Site Visit Sensors

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

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ABT	147-Sandy	Grenville-09/17/2016				
1	9/17/2016	Computer	Dell	07023	Inspiron 15	5C4MC12
2	9/17/2016	DAS	Campbell	000413	CR3000	2519
3	9/17/2016	Elevation	Elevation	None	1	None
4	9/17/2016	Filter pack flow pump	Thomas	02974	107CAB18	0493002469
5	9/17/2016	Flow Rate	Арех	000550	AXMC105LPMDPCV	50740
6	9/17/2016	Infrastructure	Infrastructure	none	none	none
7	9/17/2016	Modem	Raven	06609	H4223-C	0844356221
8	9/17/2016	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
9	9/17/2016	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
10	9/17/2016	Sample Tower	Aluma Tower	000017	В	AT-61152-A-H8-C
11	9/17/2016	Shelter Temperature	Campbell	none	107-L	none
12	9/17/2016	Siting Criteria	Siting Criteria	None	1	None
13	9/17/2016	Temperature	RM Young	06503	41342	14623
14	9/17/2016	Zero air pump	Werther International	06930	P 70/4	000829168

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	1	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2519	AB	T147	Sandy Grenville	09/17/2016	DAS	Primary
Das Date: Das Time: Das Day:	9 /17/2016 12:36:00 261	Audit Date Audit Time Audit Day	9 /17/2016 12:36:00 261	Mfg Serial Number	Datel 15510194	Parameter Tfer Desc.	DAS Source generator (D
Low Channe	d:	High Channe	el:	Tter ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:				
0.000	1 0.0	0.000	0.0001				
				Mfg Serial Number	Fluke 95740135	Parameter	DAS
				ber lai r tumber			
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	12/23/201	5 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	V	V	0.0001	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2996	0.2997	V	V	0.0001	
7	0.5000	0.4995	0.4996	i V	V	0.0001	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8993	0.8993	V	V	0.0000	
7	1.0000	0.9992	0.9992	l V	V	0.0000	

Flow Data Form

Mfg	Serial Num	ıber Ta	Site	Tec	hnician	Site Visit D	ate Parai	neter	Owner ID
Apex	50740		ABT147	Sa	ndy Grenville	09/17/2016	Flow I	Rate	000550
					Mfg	BIOS]	Parameter F	low Rate
					Serial Number	103471		Ffer Desc. n	exus
					Tfer ID	01420			
					Slope	0.9	99091 Int	ercept	0.03172
					Cert Date	2/28	3/2016 Co	rrCoff	0.99988
					Mfg	BIOS]	Parameter F	low Rate
					Serial Number	103424		Ffer Desc.	IOS cell
					Tfer ID	01410			
					Slope	0.9	99091 In t	ercept	0.03172
					Cert Date	2/28	3/2016 Co	rrCoff	0.99988
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.	04	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.	98	
0.44%	0.66%				Rotometer R	eading:		1.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	all PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.00	l/m	l/m	
primary	test pt 1	1.521	1.500	1.52	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.524	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.526	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%
Sensor Comp	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing Co	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 See comments	3	Statu	s pass	
Sensor Compo	onent Filter Dist	ance		Conditio	n 4.5 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.5 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	n 250 deg		Statu	s pass	
Sensor Comp	onent System M	1emo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg		Serial N	lumber Ta	Site	Те	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	100924	1772	ABT147	Sa	andy Grei	nville	09/17/20	016	Ozone		000627	
Slope: Intercept CorrCoff	().97593).31758).99999	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 04196069 01112	ilectron 966	Inc Pa	rameter ozo er Desc. Oz	one one primar <u>i</u>	y stan
DAS 1: A Avg % D 1.9)iff: A N 9%	Iax % D 2.3'	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	1.	0.9952 /28/201	4 Inter 6 Corr	·cept ·Coff	-0.33	3070)000
UseDes prin prin prin prin prin prin	acription nary nary nary nary nary		DncGroup 1 2 3 4 5	Tfer Raw 0.01 29.99 49.99 80.00 109.99	Tfer 0.3 30. 50. 80. 110	Corr 34 46 56 71 .84	Si 0. 30 49 79 108	ite 74 .11 .42 .06 3.60	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	-1.15% -2.25% -2.04% -2.02%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	omponei	nt 22.5 c	legree rule		Conditio	on				Status	pass		_
Sensor Co	omponei	nt Inlet F	Filter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Co	omponei	nt Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponei	1t Offset	t		Conditio	on 0.20				Status	pass		
Sensor Co	ompone	t Span			Conditio	on 0.997				Status	pass		
Sensor C	ompone				Conditio	N/Δ				Status	nass		
Sensor C	ompone				Conditio					Status	pass		
Sensor Co	omponei				Conditio					Status	pass		
Sensor Co	ompone	t Cell A	Freq.		Conditio	on 89.3 k	HZ			Status	pass		
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 717.4	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	. Tmp.		Conditio	on 38.4 (2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 94.2 k	κHz			Status	pass		
Sensor Co	omponei	nt Cell B	Noise		Conditio	on 0.9 pp	b			Status	pass		
Sensor Co	omponei	nt Cell B	Flow		Conditio	on 0.67 l	pm			Status	pass		
Sensor Co	- omponei	nt Cell B	Pressure		Conditio	on 717.4	mmHg			Status	pass		
Sensor Co	ompone	t Cell B	Tmp.		Conditio	on				Status	pass		
Sonsor C	ompone		055		Conditi	n Not te	sted			Status	pass		
Sensor Co	omponel		m Mama		Conditio					Status	P000		
Sensor Co	ompone	nt Syste			Conditio	on				Status	pass		

Temperature Data Form

Mfg	Serial Number	la Site	7	Fechn i	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	14623	ABT147		Sandy	Grenville	09/17	7/2016	Temper	ature	06503	
				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	ре		1.0077	2 Inte	rcept	0.12514	4
Abs Avg Err Ab	os Max Er Abs	Avg Err Abs	Max Er	Ce	rt Date		2/28/201	6 Cor	rCoff	1.00000	0
0.80	1.67										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.18	0.05		0.000		0.0)	С	-0.01	
primary Tem	p Mid Range	26.02	25.70)	0.000		25.	0	С	-0.73	
primary Tem	p High Range	49.58	49.08	3	0.000		47.	4	С	-1.67	
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	ABT147	Sandy Grenville	09/17/2016	Shelter Temperature	none
DAS 1:	DAS 2:	For Abo Mars For	Mfg	Extech	Parameter She	lter Temperatur
Abs Avg Err Abs 0.28	0.37 OS MAX EF ADS AVg	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTI)
]	Tfer ID	01227		
			Slope	1.0077	2 Intercept	0.12514
			Cert Date	2/28/201	6 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.40	27.07	0.000	27.3	С	0.2
primary	Temp Mid Range	27.59	27.25	0.000	27.5	С	0.26
primary	Temp Mid Range	26.41	26.08	0.000	25.7	С	-0.37
Sensor Con	ponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID ABT	147	Technician	Sandy Grenville		Site Visit Date	09/17/2016	
Shelter Make	Sh	elter Model	1	Shelte	r Size		
Ekto	88	10 (s/n 2149-9))	640 cu	ft		
				10101027010			

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	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ABT147	Sandy Grenville	09/17/2016	Moisture Present	Apex	3683		
The filter sample tubing h	as drops of mois	ture in low sections	outside the she	lter.				

Field Systems Comments

1 Parameter: DasComments

The met tower has been removed.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is clean and well organized.

4 Parameter: MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

Fald Crustome Data Farmer	
Field Systems Data Form	

F-02058-1500-S1-rev002

Site ID	ABT147		Technician Sandy G	renvill	e	Site Visit	Date 09/1	7/2016		
Site Sponsor	(agency)	EPA			USG	S Map		Hampton		
Operating Gr	roup	private			Map	Scale				
AQS #		09-015-9	991		Map	Date				
Meteorologic	al Type	R.M. You	ng							
Air Pollutant	Analyzer	Ozone			QAF	P Latitude		41.8402		
Deposition M	leasurement	dry, wet			QAF	P Longitude	•	-72.0111		
Land Use		agricultur	e, woodland - mixed		QAF	P Elevation	Meters	209		
Terrain		rolling			QAF	P Declinatio	n	14.8		
Conforms to	MLM	Marginall	у		QAF	P Declinatio	n Date	2/22/2006		
Site Telephon	ie	(860) 974-2273			Aud	it Latitude				41.84046
Site Address	1	80 Ayers	Road		Aud	it Longitude				-72.010368
Site Address 2					Aud	it Elevation				202
County		Windham	L		Aud	it Declination	n	-14.5		
City, State		Abington	, CT				Present			
Zip Code		06230			Fire	Extinguishe	r 🗸	New in 2015		
Time Zone		Eastern			First	Aid Kit	\checkmark			
Primary Ope	rator				Safe	ty Glasses	\checkmark			
Primary Op.	Phone #				Safe	ty Hard Hat	\checkmark			
Primary Op.	E-mail				Clin	bing Belt				
Backup Oper	ator				Secu	rity Fence				
Backup Op. Phone #					Secu	re Shelter	\checkmark			
Backup Op.	E-mail				Stab	le Entry Step	<mark>)</mark> 🗸			
Shelter Work	ting Room ✓	Make	Ekto	Μ	odel	3810 (s/n 214	9-9)	Shelter Size	640 cuft	
Shelter Clean		Notes	The shelter is clean and	l well c	rganize	ed.				
Site OK	\checkmark	Notes								
Driving Direc	Driving Directions From Hartford take I-84 east to exit 69. Continue on route 74 east to route 44. Take route 44 east to Abington. At the traffic light in Abington, turn right (south) on route 97. Continue approximately 1.3 miles to Ayers Road which will be on the left. Ayers Road is a single lane paved road. The site is through the gate at the end of the road, in the field at the top of the bill past the barn.									

ABT147

F-02058-1500-S2-rev002

Site ID

Tec

Technician Sandy Grenville

Site Visit Date 09/17/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		
Feedlot operations	500 m		\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		
Tree line	50 m		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

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

Fi	eld Systems Data Form	F-02058-1500-S3-rev002			
Site	ID ABT147 Technician Sandy Grenville	Site Vis	sit Date 09/17/2016		
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	N/A			
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	N/A			
3	Are the tower and sensors plumb?	N/A			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?				
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)				
6	Is the solar radiation sensor plumb?	N/A			
7	Is it sited to avoid shading, or any artificial or reflected light?	N/A			
8	Is the rain gauge plumb?	N/A			
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	N/A			
10	Is the surface wetness sensor sited with the grid surface facing north?	N/A			
11	Is it inclined approximately 30 degrees?	N/A			

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

Temperature mounted in naturally aspirated shield on sample tower.

ABT147

Site ID

scratches?

ata Form F-02058-1500-S4-rev002 Technician Sandy Grenville Site Visit Date 09/17/2016

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

✓	N/A
✓	N/A
✓	N/A
✓	N/A
✓	N/A
✓	
✓	

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002				
Site	e ID	ABT147	Technician	Sandy Grenville		Site Visit Date 09/17/2016				
	<u>Siting C</u>	riteria: Are the pollut	ant analyzers ar	ıd deposition eq	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E				
1	Do the s unrestri	cample inlets have at le	east a 270 degree	e arc of						
2	Are the	sample inlets 3 - 15 me	eters above the g	ground?	✓					
3	Are the and 20 I	sample inlets > 1 mete meters from trees?	r from any maje	or obstruction,						
	<u>Pollutar</u>	nt analyzers and depos	ition equipment	operations and	mai	intenance				
1	Do the a condition	analyzers and equipme on and well maintained	ent appear to be	in good						
2	Are the reportir	analyzers and monitor ng data?	rs operational, o	n-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)	zone sample lin	e? (if yes	✓	At inlet only				
6	Are san obstruc	ple lines clean, free of tions?	kinks, moisture	, and		Moisture in tubing only				
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 filte	r line, and is it		Clean and dry				

Field Systems Data Form							F-02	058-15	00-S6-rev002
Site	e ID	ABT147	Technician	Sandy Grenville		Site Visit Date	09/17/2016	;	
	<u>DAS, se</u>	nsor translators, and	peripheral equi	pment operation	<u>is a</u>	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 th	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	oerature control	lled?	✓				
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?						
11	Tower o	comments?				Met tower removed			

The met tower has been removed.

Field Systems Data	a Fo	rm				F-02	058-	-1500-	S7-rev0	02
Site ID ABT147		Tech	nician	Sandy Grenville	Site Visit Date	09/17/2016				
Documentation										
Does the site have the requ	ired in	strume	ent and	<u>equipment manuals?</u>						
Wind speed sensor Wind direction sensor	Yes	No	N/4 ✓ ✓	A Data logge Data logge	er	Yes	No ✓	N/A □ ✓		
Temperature sensor		\checkmark		Strip char	t recorder			\checkmark		
Relative humidity sensor			✓	Computer						
Solar radiation sensor			✓	Modem			\checkmark			
Surface wetness sensor			\checkmark	Printer				\checkmark		
Wind sensor translator			\checkmark	Zero air p	ump		\checkmark			
Temperature translator			\checkmark	Filter flow	pump		\checkmark			
Humidity sensor translator			\checkmark	Surge prot	tector		\checkmark			
Solar radiation translator			\checkmark	UPS			\checkmark			
Tipping bucket rain gauge			\checkmark	Lightning	protection device			\checkmark		
Ozone analyzer		\checkmark		Shelter hea	ater		\checkmark			
Filter pack flow controller	\checkmark			Shelter air	conditioner		\checkmark			
Filter pack MFC power supp	ly 🗌		\checkmark							
Does the site have the req	uired a	and mo	ost recei	nt QC documents and	report forms?					
	Pre	sent				Currer	nt			
Station Log		✓				\checkmark				

Station Log			\checkmark
SSRF	\checkmark		\checkmark
Site Ops Manual	\checkmark	Sept 2016	\checkmark
HASP	\checkmark	Sept 2016	\checkmark
Field Ops Manual			
Calibration Reports	\checkmark		\checkmark
Ozone z/s/p Control Charts			
Preventive maintenance schedul			

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

Site	ABT147 Technician Sandy Gre	nville	Site Visit Date	09/17/2016	
1	Site operation procedures Has the site operator attended a formal CASTNET trai course? If yes, when and who instructed?	ining 🗌			
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 be flollowed by the site operator?	ing 🗹			
5	Is the site operator(s) knowledgeable of, and able to per the required site activities? (including documentation)	form 🗹			

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

QC Check Performed

Frequency

Multipoint Calibrations	\checkmark	N/A	\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	\checkmark	Weekly	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

QC	Check	Perfo	ormed
----	-------	-------	-------

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
\checkmark	Semiannually	
\checkmark	Daily	
\checkmark	As needed	
✓	Daily	
\checkmark	As needed	✓
\checkmark	Weekly	✓
\checkmark	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?
- 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:

F-02058-1500-S8-rev002

mpliant

Compliant

Field Systems Data Form						F-02058-1500-S9-rev00					
Site	e ID	ABT147	Technicia	an Sandy Grenville	9	Site Visit Date	09/17/2016				
	<u>Site ope</u>	eration procedures									
1	Is the fi	lter pack being change	ed every Tue	sday as scheduled	?⊻	Filter changed morinings					
2	2 Are the Site Status Report Forms being completed and filed correctly?										
3	Are dat schedul	a downloads and back ed?	ups being pe	erformed as		No longer required					
4	Are general observations being made and recorded? How?				✓	SSRF, logbook					
5	Are site supplies on-hand and replenished in a timely fashion?				✓						
6	Are sample flow rates recorded? How?					SSRF, logbook, call-in					
7	Are samples sent to the lab on a regular schedule in a timely fashion?				~						
8	Are filters protected from contamination during handling and shipping? How?			✓	Clean gloves on an	d off					
9	Are the site conditions reported regularly to the field operations manager or staff?			✓							
QC	Check P	erformed	F	requency			Compliant				
N	Aulti-poi	nt MFC Calibrations	✓ s	emiannually							
I	Flow System Leak Checks										
Filter Pack Inspection											
I	Flow Rate Setting Checks										
Visual Check of Flow Rate Rotometer Weekly											
Ι	In-line Filter Inspection/Replacement Semiannually					\checkmark					
Sample Line Check for Dirt/Water Veekly						\checkmark					
Duor	ido onv c	ditional avalanation	(nhotogran)	on skotch if noor		y) recording conditi	iona listad abava	on any other features			

ABT147

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 09/17/2016

Site Visit Sensors

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

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

SiteVisitDate Site Technician

09/17/2016 ABT147 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.80	с	Fail
2	Temperature max error	Р	4	0.5	12	1.67	с	Fail
3	Ozone Slope	Р	0	1.1	4	0.97593	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.31758	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.9	%	Р
7	Ozone % difference max	Р	7	10	4	2.3	%	Р
8	Flow Rate average % difference	Р	10	5	3	0.44	%	Р
9	Flow Rate max % difference	Р	10	5	3	0.66	%	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
12	Shelter Temperature average error	Р	5	2	12	0.28	с	Р
13	Shelter Temperature max error	Р	5	2	12	0.37	с	Р

Records without valid pass/fail criteria

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

09/17/2016 ABT147

Sandy Grenville

Field Performance Comments

 1
 Parameter:
 Flow Rate
 SensorComponent:
 Moisture Present

CommentCode: 72

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

Field Systems Comments

1 Parameter: DasComments

The met tower has been removed.

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is clean and well organized.

4 Parameter: MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

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

SiteVisitDate	Site	Technician
07/21/2016	ALH157	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97394	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.53928	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.6	%	Р
5	Ozone % difference max	Р	7	10	4	2.5	%	Р

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SiteVisitDate Site Technician

08/15/2016 ANA115 Eric Hebert

Records with valid pass/fail criteria

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

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

08/15/2016 ANA115

Technician

Eric Hebert

Field Performance Comments

1 Parameter: Flow Rate SensorComponent: Moisture Present

CommentCode: 72

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

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

The shelter is in fair condition, however somewhat cluttered.

4 Parameter: PollAnalyzerCom

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

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

SiteVisitDate	Site	Technician
09/24/2016	BVL130	Eric Hebert

Records with valid pass/fail criteria

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

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

SiteVisitDate	Site	Technician
08/18/2016	CNT169	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.07153	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.45958	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	6.4	%	Р
5	Ozone % difference max	Р	7	10	4	6.8	%	Р

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

SiteVisitDate Site Technician

07/07/2016 DEN417 Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.12	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.28	с	Р
3	Ozone Slope	Р	0	1.1	4	1.06973	unitless	Р
4	Ozone Intercept	Р	0	5	4	-1.0724	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.7	%	Р
7	Ozone % difference max	Р	7	10	4	6.1	%	Р
8	Flow Rate average % difference	Р	10	5	6	0.62	%	Р
9	Flow Rate max % difference	Р	10	5	6	0.64	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	56	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	15	1.35	с	Р
13	Shelter Temperature max error	Р	5	2	15	2.9	с	Fail

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

07/07/2016 **DEN417** Technician

Martin Valvur

Field Performance Comments

1 Parameter: Flow Rate

SensorComponent: Filter Position

CommentCode: 71

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

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 Parameter: ShelterCleanNotes

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

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

SiteVisitDate	Site	Technician
09/26/2016	GLR468	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.0788	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.12526	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	7.7	%	Р
5	Ozone % difference max	Р	7	10	4	8.1	%	Р

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SiteVisitDate	Site	Technician
09/18/2016	GRB411	Martin Valvur

Records with valid pass/fail criteria

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

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SiteVisitDate Site Technician

08/18/2016 HOX148 Eric Hebert

Records with valid pass/fail criteria

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

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

08/18/2016 HOX148

Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SiteOpsProcedures

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

3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

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

5 Parameter: MetSensorComme

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

SiteVisitDate Site Technician

08/17/2016 KEF112 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.08	с	Р
2	Temperature max error	Р	4	0.5	12	0.18	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98447	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.27377	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.3	%	Р
7	Ozone % difference max	Р	7	10	4	2.2	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.62	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.71	%	Р
10	DAS Time maximum error	Р	0	5	1	0.07	min	Р
11	DAS Voltage average error	Р	7	0.003	49	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.56	с	Р
13	Shelter Temperature max error	Р	5	2	12	0.75	с	Р

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

08/17/2016 KEF112

Sandy Grenville

Field Performance Comments

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

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

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

4 Parameter: PollAnalyzerCom

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

5 Parameter: MetSensorComme

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

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

SiteVisitDate	Site	Technician
08/23/2016	LRL117	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97730	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.56697	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	2.0	%	Р

SiteVisitDate Site Technician

08/15/2016 MKG113 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.04	с	Р
2	Temperature max error	Р	4	0.5	3	0.06	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00272	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.79901	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.0	%	Р
7	Ozone % difference max	Р	7	10	4	2.0	%	Р
8	Flow Rate average % difference	Р	10	5	3	0.22	%	Р
9	Flow Rate max % difference	Р	10	5	3	0.67	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	49	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.07	c	Р
13	Shelter Temperature max error	Р	5	2	12	0.13	с	Р

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

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: ShelterCleanNotes

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

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

SiteVisitDate	Site	Technician
08/24/2016	NEC602	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97977	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.18790	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.7	%	Р
5	Ozone % difference max	Р	7	10	4	2.3	%	Р

Records without valid pass/fail criteria

Field Performance Comments

1 Parameter: Ozone

SensorComponent: Cell B Freq.

CommentCode: 99

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

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

SiteVisitDate	Site	Technician		
09/01/2016	PRK134	Eric Hebert		

Records with valid pass/fail criteria

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

SiteVisitDate Site Technician

08/22/2016 PSU106 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.27	c	Р
2	Temperature max error	Р	4	0.5	9	0.33	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98609	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.18438	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.0	%	Р
7	Ozone % difference max	Р	7	10	4	1.2	%	Р
8	Flow Rate average % difference	Р	10	5	4	0.66	%	Р
9	Flow Rate max % difference	Р	10	5	4	0.66	%	Р
10	DAS Time maximum error	Р	0	5	1	0.08	min	Р
11	DAS Voltage average error	Р	7	0.003	49	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.36	c	Р
13	Shelter Temperature max error	Р	5	2	12	0.51	с	Р

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

08/22/2016 PSU106

Field Systems Comments

1 Parameter: SiteOpsProcComm

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

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

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

5 Parameter: MetOpMaintCom

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

Data Complica.)/4/2010 0.30.21 TW	
		T

SitevisitDate	Site	Technician
08/30/2016	RED004	Eric Hebert

Records with valid pass/fail criteria

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

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

08/30/2016 RED004

Eric Hebert

Field Performance Comments

1Parameter:Flow RateSensorComponent:Moisture PresentCom

CommentCode: 72

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

Field Systems Comments

1 Parameter: DocumentationCo

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

2 Parameter: SitingCriteriaCom

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

3 Parameter: ShelterCleanNotes

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

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

SiteVisitDate Site Technician

07/19/2016 SAL133 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.10	с	Р
2	Temperature max error	Р	4	0.5	6	0.16	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98516	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.28944	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р
7	Ozone % difference max	Р	7	10	4	1.5	%	Р
8	Flow Rate average % difference	Р	10	5	3	1.75	%	Р
9	Flow Rate max % difference	Р	10	5	3	1.96	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	49	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.46	с	Р
13	Shelter Temperature max error	Р	5	2	12	0.79	с	Р

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

07/19/2016 SAL133 Sandy Grenville

Field Systems Comments

1 Parameter: SiteOpsProcedures

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

Parameter: SitingCriteriaCom 2

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

3 Parameter: ShelterCleanNotes

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

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

SiteVisitDate	Site	Technician		
09/09/2016	SAN189	Martin Valvur		

Records with valid pass/fail criteria

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

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

SiteVisitDate	Site	Technician			
07/20/2016	STK138	Sandy Grenville			

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.97109	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.68618	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.4	%	Р
5	Ozone % difference max	Р	7	10	4	2.4	%	Р

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

SiteVisitDate Site Technician

08/16/2016 UVL124 Eric Hebert

Records with valid pass/fail criteria

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

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

08/16/2016 UVL124

Field Systems Comments

1 Parameter: SiteOpsProcedures

Ozone sample train leak-check performed every two weeks.

2 Parameter: DocumentationCo

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

3 Parameter: SitingCriteriaCom

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

4 Parameter: ShelterCleanNotes

The shelter is clean and in good condition.

5 Parameter: MetOpMaintCom

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

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

SiteVisitDate	Site	Technician
07/22/2016	VIN140	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98104	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.18851	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.5	%	Р
5	Ozone % difference max	Р	7	10	4	4.4	%	Р

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

SiteVisitDate	Site	Technician		
08/29/2016	VOY413	Eric Hebert		

Records with valid pass/fail criteria

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

Records without valid pass/fail criteria

Field Performance Comments

1 Parameter: Ozone

SensorComponent: Cell A Freq.

CommentCode: 99

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

SiteVisitDate Site Technician

09/15/2016 WST109 Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	6	0.11	c	Р
2	Temperature max error	Р	4	0.5	6	0.21	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99396	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.48937	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.2	%	Р
7	Ozone % difference max	Р	7	10	4	0.3	%	Р
8	Flow Rate average % difference	Р	10	5	6	1.92	%	Р
9	Flow Rate max % difference	Р	10	5	6	2.11	%	Р
10	DAS Time maximum error	Р	0	5	1	0.00	min	Р
11	DAS Voltage average error	Р	7	0.003	49	0.0001	V	Р
12	Shelter Temperature average error	Р	5	2	12	0.67	c	Р
13	Shelter Temperature max error	Р	5	2	12	1.08	с	Р

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

09/15/2016 WST109

Field Systems Comments

1 Parameter: DasComments

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

2 Parameter: SiteOpsProcedures

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

3 Parameter: SitingCriteriaCom

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

4 Parameter: SiteOKNotes

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

5 Parameter: MetSensorComme

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

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
STKI	38-Sandy	Grenville-07/20/2016				
1	7/20/2016	DAS	Campbell	000349	CR3000	2128
2	7/20/2016	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
3	7/20/2016	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
4	7/20/2016	Zero air pump	Werther International	06915	C 70/4	000829162

Ozone Data Form

Mfg		Serial Number Ta		Site		Technician		Site Visit Date		Parameter		Owner ID	
ThermoElectron Inc		110534	7321	STK138		Sandy Grenville		07/20/2016		Ozone		000743	
Slope: Intercept CorrCoff	().97109).68618).99999	Slope: Intercept CorrCoff	0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID		ThermoElectron Inc 1 0419606966 01112		Inc Pa	Parameter ozone [fer Desc. Ozone primat		y stan
DAS 1: A Avg % D 1.4)iff: A N 4%	lax % D 2.4	DAS 2: i A Avg %	6Dif A Max % Di		Slope Cert Date		0.99524 Inter 1/28/2016 Corr		•cept -0.3307(•Coff 1.0000(3070)000	
UseDescription primary primary primary primary primary			DINCGROUP 1 2 3 4 5	Tfer Raw 0.02 30.02 50.03 80.02 109.89	Tfer 0 30 50 80 110	Tfer Corr 0.35 30.49 50.60 80.73 110.74		ite Si 77 ppb .50 ppb .04 ppb .04 ppb 3.10 ppb		e Unit PctDiff		O.03% -1.11% -2.09% -2.38%	
Sensor Component		nt Samp	le Train		Conditio	on Good				Status pass			
Sensor Component		nt 22.5 c	22.5 degree rule		Condition	on				Status	pass		
Sensor Component		nt Inlet F	Inlet Filter Condition		Condition Clean					Status	pass		
Sensor Component		nt Batter	Battery Backup		Condition N/A				Status	pass			
Sensor Component		nt Offset	Offset			Condition -0.50				Status	pass		
Sensor Component		nt Span	Span			Condition 0.997				Status	pass		
Sensor Component		at Zero \	Zero Voltage			Condition N/A				Status	pass		
Sensor Component			Fullscale Voltage			Condition N/A				Status	nass		
Sensor Component						Condition 08.0 kHz				Status			
Sensor Component													
Sensor Component		nt Cell A								Status	; pass		
Sensor Component		nt Cell A				Condition 0.72 lpm				Status	pass		
Sensor Component		nt Cell A	Cell A Pressure			Condition 709.4 mmHg				Status	pass		
Sensor Component		nt Cell A	Cell A Tmp.			Condition 36.5 C				Status	pass		
Sensor Component		nt Cell B	Cell B Freq.			Condition 91.5 kHz				Status	pass		
Sensor Component		nt Cell B	Cell B Noise			Condition 0.3 ppb				Status	pass		
Sensor Component		nt Cell B	Cell B Flow			Condition 0.72 lpm				Status	pass		
Sensor Component		nt Cell B	Cell B Pressure			Condition 710.0 mmHg				Status	pass		
Sensor Component		nt Cell B	Cell B Tmp.			Condition				Status	s pass		
Sensor Component		nt Line L	Line Loss			dition Not tested				Status	IS pass		
Sensor Component		nt Syste	System Memo			Condition				Status	pass		
	1	-									L		
Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number							
--------	------------	----------------------	-----------------------	----------	--------------	---------------							
ALH.	157-Sandy	Grenville-07/21/2016											
1	7/21/2016	DAS	Campbell	000405	CR3000	2522							
2	7/21/2016	Ozone	ThermoElectron Inc	000683	49i A1NAA	1030244798							
3	7/21/2016	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016							
4	7/21/2016	Zero air pump	Werther International	06910	C 70/4	000829160							

Mfg	1	Serial N	umber Ta	Site	Te	chnician		Site Visi	it Date	Param	eter	Owner]	D
ThermoElect	tron Inc	103024	4798	ALH157	Sa	andy Grei	nville	07/21/2	016	Ozone		000683	
Slope: [Intercept [CorrCoff [0	.97394 .53928 .99998	Slope: Intercept CorrCoff	0.00000)	Mfg Serial N Tfer ID	Jumber	ThermoE 0419606 01112	Electron	Inc Pa	rameter O	ozone Dzone primar	y stan
DAS 1: A Avg % D 1.6	iff: A M %	ax % D 2.5°	DAS 2: i A Avg %	bDif A Max (% Di	Slope Cert Da	nte		0.9952 1/28/201	4 Inte	rcept rCoff	-0.3	3070 0000
UseDesc prim prim prim prim prim	cription hary hary hary hary hary		2 3 4 5	Tfer Raw -0.02 30.10 50.00 80.10 110.00	Tfer 0.3 30. 50. 80. 110	Corr 31 57 57 81 .85	Si 0. 30 50 78 108	ite 87 .20 .10 .82 3.70	Sit ppb ppb ppb ppb ppb	e Unit	PetD	-1.21% -0.93% -2.46% -1.94%	
Sensor Co	mponen	t Samp	le Train		Conditio	Good	1			Status	pass	I	
Sensor Co	mponen	t 22.5 d	legree rule		Conditio	on 🗌				Status	pass		
Sensor Co	mponen	t Inlet F	ilter Conditio	n	Conditio	on Clean	1			Status	pass		
Sensor Co	, mponen	t Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	mnonen	of Offset			Conditio	-0.10				Status	pass		
Sonsor Co	mponen	t Snan			Conditio	0 989				Status	nass		
Sensor Co	mponen		/oltage		Conditio	N/Δ				Status	nass		
Sensor Co	mponen				Conditio					Status	pass		
Sensor Co	omponen	Tulisc			Conditio	on IN/A				Status	pass		
Sensor Co	omponen	t Cell A	Freq.		Conditio	on 97.2 k	KHZ			Status	pass		
Sensor Co	omponen	t Cell A	Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Co	omponen	t Cell A	Flow		Conditio	on 0.64 l	pm			Status	pass		
Sensor Co	omponen	t Cell A	Pressure		Conditio	n 722.2	mmHg			Status	pass		
Sensor Co	omponen	t Cell A	Tmp.		Conditio	on 38.4 (C			Status	pass		
Sensor Co	omponen	t Cell B	Freq.		Conditio	on 91.6 k	кНz			Status	pass		
Sensor Co	mponen	t Cell B	Noise		Conditio	on 0.6 pp	ob			Status	pass		
Sensor Co	mponen	t Cell B	Flow		Conditio	on 0.64 l	pm			Status	pass		
Sensor Co	mponen	t Cell B	Pressure		Conditio	on 722.2	mmHg			Status	pass		
Sensor Co	mponen	t Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	mponen	t Line L	.0SS		Conditio	n Not te	ested			Status	pass		
Sensor Co	mponen	t Svster	m Memo		Conditio	on 🗌				Status	pass		
					Somutil					Status			

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
VIN1	40-Sandy	Grenville-07/22/2016				
1	7/22/2016	DAS	Campbell	000358	CR3000	2136
2	7/22/2016	Ozone	ThermoElectron Inc	000630	49i A1NAA	1009241798
3	7/22/2016	Ozone Standard	ThermoElectron Inc	000546	49i A3NAA	0929938239
4	7/22/2016	Zero air pump	Werther International	06906	C 70/4	000821908

Mfg		Serial N	lumber Ta	Site	Те	chnician		Site Visit	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	100924	1798	VIN140	Sa	andy Grei	nville	07/22/20	16	Ozone		000630	
Slope: Intercept CorrCoff	((().98104).18851).99996	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 04196069 01112	lectron 966	Inc Pa	rameter ozo er Desc. Oz	one one primary	y stan
DAS 1: A Avg % D 2.5	Diff: A N 5%	<mark>1ax % D</mark> 4.4	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	ıte	1/	0.9952 ⁄28/201	4 Inter 6 Corr	ccept Coff	-0.33	3070)000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.01 30.18 48.87 79.03 109.96	Tfer 0.3 30. 49. 79. 110	Corr 34 65 43 74 0.81	Si 0. 29 48 78 108	ite 33 I .31 I .62 I .23 I 3.40 I	Site opb opb opb opb opb	e Unit	PctDiff	-4.37% -1.64% -1.89% -2.17%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	degree rule		Conditio	on				Status	pass		
Sensor Co	ompone	nt Inlet F	Filter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditio	n N/A				Status	pass		_
Sensor Co	ompone	nt Offset	t		Conditio	on 0.30				Status	pass		
Sensor Co	ompone	nt Span			Conditio	n 1.015				Status	pass		
Sensor C	ompone	nt Zero	Voltage		Conditio	n N/A				Status	pass		
Sensor C	ompone	nt Fullso	ale Voltage		Conditio	N/A				Status	nass		
Sensor C			Freq		Conditio		·U7			Status	pass		
Sensor Co	ompone		Neise		Conditio		.1 1Z			Status	pass		
Sensor Co	ompone				Conditio	on 0.3 pt	d			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.60 l	om			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	n 725.3	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 37.7 ()			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	n 101.5	kHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	0.4 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	6 Flow		Conditio	on 0.72 l	om			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Conditio	n 725.3	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	5 Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.0SS		Conditio	n Not te	sted			Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
CNT	169-Martin	v Valvur-08/18/2016				
1	8/18/2016	DAS	Campbell	000417	CR3000	2515
2	8/18/2016	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
3	8/18/2016	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
4	8/18/2016	Zero air pump	Werther International	06925	P 70/4	000836220

The same Florest Landstream in the same states in								-	Owner ID	
I nermoElectron Inc 1030244804	ermoElectron Inc 1030244804 CN1169		artin Valv	ur	08/18/201	6 Oz	zone		000699	
Slope: 1.07153 Slop Intercept -0.45958 Inte CorrCoff 0.99999 Corr	oe: 0.000 rcept 0.000 rCoff 0.000	00 00 00	Mfg Serial N Tfer ID	umber	ThermoEle 49CPS-700 01110	ectron Inc	C Par	ameter ozon r Desc. Ozor	e ne primary sta	an
DAS 1: D. A Avg % Diff: A Max % Di A 6.4% 6.8%	AS 2: Avg %Dif A Max	x % Di	Slope Cert Da	te	0	.99832 9/2016	Intero Corro	cept Coff	-0.26452	2 0
UseDescriptionConcGrprimary1primary2primary3primary4primary5	oup Tfer Raw 0.04 27.83 49.95 80.05 111.02 111.02	Tfer 0 28. 50. 80.	Corr 30 .14 .29 .44	Si -0. 29. 53. 85.	te pr 27 pr 71 pr 56 pr 90 pr	Site U ob ob ob	Jnit	PctDiffe	5.58% 6.50% 6.79%	
Sensor Component Sample Tra Sensor Component 22.5 degree	in erule	Condition Condition	on Good	110	.80 pf	Si Si	status F Status F	Dass		
Sensor Component Inlet Filter C Sensor Component Battery Bac Sensor Component Offset	kup	Conditio	on Clean on N/A on 0.9				status 	pass pass pass		
Sensor ComponentSpanSensor ComponentZero Voltage	e	Conditio	on 1.013 on N/A			Si	status [Status [pass		
Sensor Component Fullscale Vol Sensor Component Cell A Freq.	bltage	Condition Condition	on N/A on 103.5	kHz		Si Si	status F	oass oass		
Sensor ComponentCell A NoiseSensor ComponentCell A Flow	9	Conditio	on 1.0 pp on 0.58 lp	b om		Si	status F Status F	Dass		
Sensor Component Cell A Press Sensor Component Cell A Tmp.	Sure	Conditio	on 505.8 on Not te	mmHg sted		Si Si	status [oass oass		
Sensor Component Cell B Freq. Sensor Component Cell B Noise	9	Conditio	on 101.6 on 1.7 pp	kHz b			status F Status F	oass oass		
Sensor Component Cell B Flow Sensor Component Cell B Press	Sure	Conditio	on 0.54 lp on 505.8	om mmHg			status [Status [
Sensor Component Line Loss Sensor Component System Mer	mo	Conditio	on Not te	sted			status Status Status	Dass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
LRL	117-Sandy	Grenville-08/23/2016				
1	8/23/2016	DAS	Campbell	000344	CR300	2123
2	8/23/2016	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
3	8/23/2016	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
4	8/23/2016	Zero air pump	Werther International	06904	C 70/4	000821901

Mfg		Serial N	lumber Ta	Site	Te	Technician Site Vis		t Date	Parame	eter	Owner ID)	
ThermoElec	ctron Inc	103024	4808	LRL117	Sa	andy Grer	nville	08/23/20	016	Ozone		000701	
Slope: Intercept CorrCoff		0.97730 0.56697 0.99998	Slope: Intercept CorrCoff	0.00000))	Mfg Serial N	umber	ThermoE 0419606	Electron 966	Inc Pa	rameter ozo er Desc. Ozo	ne one primary :	stan
DIGA						Tter ID		01112					
DAS 1: A Avg % D	Diff: A N	Iax % D	DAS 2: i A Avg %	Dif A Max 9	% Di	Slope			0.9952	4 Inter	rcept	-0.330)70
1.2	2%	2.0	%			Cert Da	ite	1	/28/201	6 Corr	Coff	1.000	00
UseDes	scription	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	ite	Sit	e Unit	PctDiffe	erence	
prin	nary		1	-0.01	0.	32	0.	80	ppb				
prin	nary		2	30.17	30.	.64	30	.56	ppb			-0.26%	
prin	nary		3	49.95	50.	.52 72	49	.80	ppb ppb			-1.43%	
prin	narv		5	109.87	110	.72	108	.90 3.50	ppo ppb			-2.01%	
Sensor Co	ompone	nt Samp	le Train	10,10,	Conditio	on Good				Status	pass]
Sensor C	ompone	nt 22.5 c	legree rule		Conditi	on				Status	pass]
Sensor C	ompone	nt Inlet F	Filter Conditio	n	Conditi	on Clean				Status	pass]
Sensor C	ompone	nt Batter	y Backup		Conditio	on N/A				Status	pass]
Sensor C	ompone	nt Offset	t		Conditi	on -0.10				Status	pass]
Sensor C	ompone	nt Span			Conditi	on 1.011				Status	pass]
Sensor Co	ompone	nt Zero \	/oltage		Conditi	on N/A				Status	pass]
Sensor C	ompone	nt Fullsc	ale Voltage		Conditio	on N/A				Status	pass]
Sensor C	ompone	nt Cell A	Freq.		Conditi	on 112.6	kHz			Status	pass]
Sensor C	ompone	nt Cell A	Noise		Conditi	on 1.0 pp	b			Status	pass]
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.69 l	om			Status	pass]
Sensor C	ompone	nt Cell A	Pressure		Conditio	on 698.8	mmHg			Status	pass]
Sensor C	ompone	nt Cell A	Tmp.		Conditi	on 36.6 C)			Status	pass]
Sensor C	ompone	nt Cell B	Freq.		Conditio	on 91.6 k	Hz			Status	Pass]
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 1.0 pp	b			Status	pass]
Sensor C	ompone	nt Cell B	Flow		Conditio	on 0.83 lp	om			Status	pass]
Sensor C	ompone	nt Cell B	Pressure		Conditio	on Not te	sted			Status	pass]
Sensor C	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass]
Sensor C	ompone	nt Line L	.OSS		Conditio	on Not te	sted			Status	pass]
Sensor C	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
NEC	602-Martin	n Valvur-08/24/2016				
1	8/24/2016	DAS	Campbell	none	CR1000	41007
2	8/24/2016	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
3	8/24/2016	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
4	8/24/2016	Zero air pump	Thomas	none	107C9818D	049400004418

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElec	ctron Inc	121455	2974	NEC602	М	artin Valv	ur	08/24/2	016	Ozone		none	
Slope: Intercept CorrCoff).97977).18790).99995	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	umber	ThermoE 49CPS-7 01110	Electron 70008-3	Inc Pa 64 Tf	rameter 02 er Desc. 0	cone zone primary	y stan
DAS 1: A Avg % I 1.	Diff: A N 7%	Iax % D 2.3	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	te	1	0.9983 /29/201	2 Inter 6 Corr	ccept Coff	-0.26	3452)000
UseDes prir prir prir prir	scription nary nary nary nary		ncGroup 1 2 3 4	Tfer Raw 0.35 28.81 46.96 75.15	Tfer 0. 29 47 75	Corr 61 .12 .30 .54	Si 0. 28 46 74	ite 77 .45 .60 .80	Sit ppb ppb ppb ppb	e Unit	PctDif	-2.30% -1.48% -0.98%	
Sensor C Sensor C	nary omponei omponei	nt Samp	5 Ie Train degree rule	105.50	Conditio	o.94 on Good on	103	3.60	ppb	Status Status	pass	-2.21%]]
Sensor C Sensor C Sensor C	omponei omponei	nt Inlet F nt Batter	Filter Conditio	n	Conditio	on Not te on N/A	sted			Status Status Status	pass pass		
Sensor C Sensor C	omponei omponei	nt Offset	t		Condition	on -0.6 on 1.026				Status Status	pass pass		
Sensor C Sensor C	ompone ompone	nt Zerov nt Fullsc	Voltage ale Voltage		Condition Condition	on N/A on N/A				Status Status	pass pass		
Sensor C Sensor C	ompone	nt Cell A	Freq.		Conditio	on 65.2 k	Hz b			Status Status	pass		
Sensor C	ompone	nt Cell A	Flow		Conditio	on 0.66	om			Status	pass		
Sensor C Sensor C	omponei omponei	nt Cell A	Tmp.		Conditio	on 833.8 on 36.3 (mm⊓g C			Status	pass		
Sensor C Sensor C	omponei omponei	nt Cell B nt Cell B	5 Freq. 5 Noise		Condition Condition	on 49.9 k on 0.5 pp	Hz b			Status Status	Fail pass		
Sensor C Sensor C	omponei omponei	nt Cell B	Flow Pressure		Condition Condition	on 0.67 on 633.3	om mmHg			Status Status	pass pass		
Sensor C	ompone	nt Cell B	S Tmp.		Conditi	on Not to	stad			Status	pass		
Sensor C Sensor C	omponei omponei	nt Syste	m Memo		Conditio	on See c	omments	;		Status	pass		

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	NEC602	Martin Valvur	08/24/2016	Cell B Freq.	ThermoElectron	3838		
This analyzer diagnostic	check is outside t	he manufacturer's 1	ecommended va	alue.				

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Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
VOY	413-Eric H	ebert-08/29/2016				
1	8/29/2016	DAS	Environmental Sys Corp	none	8816	4059
2	8/29/2016	Ozone	ThermoElectron Inc	90730	49C	49C-70522-366
3	8/29/2016	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
4	8/29/2016	Sample Tower	Aluma Tower	none	В	AT-51159-11-G
5	8/29/2016	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

Mfg Serial Number Ta		Site	Technician S		Site Visit Date Parame			neter Owner ID		D			
ThermoElec	tron Inc	49C-70	522-366	VOY413	Er	ic Hebert	:	08/29/20)16	Ozone		90730	
Slope: Intercept CorrCoff	().97748).57243).99994	Slope: 0.00000 57243 Intercept 0.00000 99994 CorrCoff 0.00000		0 0 0	Mfg Serial Number Tfer ID		ThermoE 0517112 01113	lectron	Inc Pa	rameter ozo er Desc. Oz	one one primar <u>i</u>	y stan
DAS 1: A Avg % D 1.1)iff: A M 1%	lax % D 2.2	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	1	1.0050 /28/201	0 Inter 6 Corr	ccept Coff	-0.28	3841)000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw -0.59 29.72 45.59 76.60 104.90	Tfer -0. 29. 45. 76. 104	Corr 30 85 65 50 .66	Si 0. 29 45 76 102	ite 19 .56 .27 .03 2.40	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	-0.97% -0.83% -0.61% -2.16%	
Sensor Co	ompone	nt Samp	le Train	•	Conditio	on Good				Status	pass	I	
Sensor Co	ompone	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	omponei	nt Inlet F	ilter Conditic	n	Conditio	on Clean	1			Status	pass		
Sensor Co	omponei	nt Batter	y Backup		Conditio	on N/A				Status	pass		
Sensor Co	ompone	nt Offset	t		Conditio	on 0.000				Status	pass		
Sensor Co	omponei	nt Span			Conditio	n 1.006				Status	pass		
Sensor Co	ompone	nt Zero \	/oltage		Conditio	on 0.000	2			Status	pass		
Sensor C	ompone		ale Voltage		Conditi	1 000	3			Status	nass		
Sensor C	ompone		Erea		Conditio	50.84	с /Ц-7			Status	Fail		
Sensor Co	omponei		Neise		Conditio	0.7.5				Status			
Sensor Co	ompone	nt Cell A	NOISE		Conditio	on 0.7 pp	ad			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.41 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 714.3	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 33.1 0	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	<mark>on</mark> 70.5 k	κHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.75 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 714.1	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.0SS		Conditio	on Not te	ested			Status	pass		
Sensor Co	ompone	nt Svste	m Memo		Conditio	on See c	omments	3		Status	pass		
	Ponel										·		

Site Vi	sit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PRK13	34-Eric H	ebert-09/01/2016				
1	9/1/2016	DAS	Campbell	000411	CR3000	2509
2	9/1/2016	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
3	9/1/2016	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
4	9/1/2016	Sample Tower	Aluma Tower	03518	A	none
5	9/1/2016	UPS	APC	06744	RS900	unknown
6	9/1/2016	Zero air pump	Werther International	06905	C 70/4	000821907

Mfg	Serial Number Ta Site		a Site	Technician			Site Visit Da	ite Param	neter Owner ID		
ThermoElec	ctron Inc	1030244800	PRK134	E	ric Hebert		09/01/2016	Ozone		000690	
Slope: Intercept CorrCoff	0. -0. 0.	95671 Slope: 02669 Interce 99997 CorrCo	71 Slope: 0.0000 69 Intercept 0.0000 97 CorrCoff 0.0000		Mfg Serial Number Tfer ID		ThermoElectron IncPa0517112167Tf01113		rameter ozor čer Desc. Ozo	ne primary stan	
DAS 1: A Avg % E 4.2	Diff: A M 2%	DAS ax % Di A Av 4.7%	2: g %Dif A Max	% Di	Slope Cert Da	ıte	1.00	2016 Cor	rcept rCoff	-0.28841 1.00000	
UseDes prin prin prin prin prin prin	scription nary nary nary nary nary nary	ConcGroup 1 2 3 4 5	Tfer Raw 0.49 27.84 49.65 77.55 110.89	Tfer 0. 27 49 77 110	Corr 77 .98 .68 .45 62	Si 0. 26 47 74 105	ite ppb 48 ppb .98 ppb .35 ppb .52 ppb 5.50 ppb	Site Unit	PctDiffe	-3.57% -4.69% -3.78% -4.63%	
Sensor C	omponen	t Sample Train		Conditi	on Good			Status	pass		
Sensor C	omponen	t 22.5 degree rul	9	Conditi	on			Status	pass		
Sensor C	omponen	t Inlet Filter Cond	lition	Conditi	on Clean			Status	pass		
Sensor C	omponen	t Battery Backup		Conditi	on Funct	ioning		Status	pass		
Sensor C	omponen	t Offset	Offset		on -0.40			Status	pass		
Sensor C	omponen	t Span		_ Conditi	on 1.020			Status	pass		
Sensor C	omponen	t Zero Voltage		_ Conditi	on N/A				pass		
Sensor C	omponen	f Fullscale Voltad	e	Condition N/A				Status	pass		
Sensor C	omponen	t Cell A Freq	-	Conditi	on 99.2 k	(Hz		Status	nass		
Sensor C	omponen			 Conditi	on 1.8 pr			Status	pass		
Selisor C	omponen								pass		
Sensor C	omponen				on 0.051			Status	pass		
Sensor C	omponen			Conditi	on /10.7	mmHg		Status	pass		
Sensor C	omponen	t Cell A Imp.		_ Conditi _	on 37.0 (;		Status	pass		
Sensor C	omponen	t Cell B Freq.		Conditi	on 83.4 k	κHz		Status	pass		
Sensor C	omponen	t Cell B Noise		Conditi	on 0.8 pp	b		Status	pass		
Sensor C	omponen	t Cell B Flow		Conditi	on 0.57 l	pm		Status	pass		
Sensor C	omponen	t Cell B Pressure		Conditi	on 710.7	mmHg		Status	pass		
Sensor C	omponen	t Cell B Tmp.		Conditi	on			Status	pass		
Sensor C	omponen	t Line Loss		Conditi	lition Not tested			Status	IS pass		
Sensor C	omponen	System Memo		Conditi	tion			Status	pass		

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SAN18	89-Martin	Valvur-09/09/2016				
1	9/9/2016	DAS	Campbell	000360	CR3000	2138
2	9/9/2016	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311
3	9/9/2016	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683
4	9/9/2016	Zero air pump	Werther International	06875	C 70/4	000814272

Mfg Serial Number Ta		Site	Technician S		Site Visit Date Parame			neter Owner ID		D			
ThermoElec	ctron Inc	110534	7311	SAN189	М	artin Valv	rur	09/09/20	16	Ozone		000740	
Slope: Intercept CorrCoff	((().99074).92556).99994	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	Jumber	ThermoEl 49CPS-70 01110	ectron)008-3(Inc Pa	rameter oz er Desc. Oz	one cone primar	y stan
DAS 1: A Avg % I 2.8	Diff: A N 8%	Iax % D 4.1	DAS 2: bi A Avg %	6Dif A Max	% Di	Slope Cert Da	nte	(0.9983 29/201	2 Inter 6 Corr	·cept ·Coff	-0.26 1.00	6452 0000
UseDes prir prir prir prir prir	scription nary nary nary nary nary nary		0ncGroup 1 2 3 4 5	Tfer Raw 0.59 34.53 51.63 81.05 111.45	Tfer 0. 34 51 81 111	Corr 85 .85 .98 .45 1.90	Si 0. 33 50 79 110	ite 26 p .44 p .47 p .13 p 0.50 p	Site opb opb opb opb opb	e Unit	PctDif	ference -4.05% -2.90% -2.85% -1.25%	
Sensor C	ompone	nt Samp	le Train	1	Conditi	on Good	1		-	Status	pass		
Sensor C	ompone	nt 22.5 c	degree rule		Conditi	on				Status	pass		
Sensor C	ompone	nt Inlet F	Filter Conditic	n	Conditi	on Clean	<u> </u>			Status	pass		_
Sensor C	ompone	nt Batter	ry Backup		Conditi	on N/A				Status	pass		_
Sensor C	ompone	nt Offset	t		Conditi	on -0.10				Status	pass		
Sensor C	ompone	nt Span			Conditi	on 1.005				Status	pass		
Sensor C	ompone	nt Zero	Voltage		Conditi	on N/A				Status	pass		
Sensor C	ompone		ale Voltage		Conditi	on N/A				Status	nass		
Sensor C	ompone		Freq		Conditi	on 06.8 k	/H ₇			Status	pass		
Selisor C	ompone		Naiaa		Conditio	0.0 m	\ 12			Status	pass		
Sensor C	ompone				Conditi	on 0.6 pt	מכ			Status	pass		
Sensor C	ompone	nt Cell A	Flow		Conditi	on 0.69 l	pm			Status	pass		
Sensor C	ompone	nt Cell A	Pressure		Conditi	on 690.7	mmHg			Status	pass		
Sensor C	ompone	nt Cell A	Tmp.		Conditi	on 34.0 (0			Status	pass		
Sensor C	ompone	nt Cell B	8 Freq.		Conditi	on 85.2 k	κHz			Status	pass		
Sensor C	ompone	nt Cell B	8 Noise		Conditi	on 0.8 pp	b			Status	pass		
Sensor C	ompone	nt Cell B	B Flow		Conditi	on 1.44	pm			Status	pass		
Sensor C	ompone	nt Cell B	Pressure		Conditi	on 690.7	mmHg			Status	pass		
Sensor C	ompone	nt Cell B	B Tmp.		Conditi	on				Status	pass		
Sensor C	ompone	nt Line L	LOSS		Conditi	on Not te	ested			Status	pass		
Samaan C	omnone	nt Syste	m Memo		Conditi	on				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRB4	411-Martin	v Valvur-09/18/2016				
1	9/18/2016	DAS	Environmental Sys Corp	90635	8816	2507
2	9/18/2016	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
3	9/18/2016	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
4	9/18/2016	Sample Tower	Aluma Tower	none	В	AT-5381-F9-2
5	9/18/2016	Zero air pump	Werther International	90722	TT70/4E	507782

Mfg Serial Number Ta		Site	Technician Si		Site Visit Date Parame			eter	Owner I	D			
ThermoElec	tron Inc	49C-59	285-322	GRB411	М	artin Valv	ur	09/18/20	16	Ozone		90565	
Slope: Intercept CorrCoff	(-(().94866).61043).99996	866 Slope: 0.0000 043 Intercept 0.0000 996 CorrCoff 0.00000		0 0 0	Mfg Serial Number Tfer ID		ThermoE 49CPS-70 01110	lectron 0008-3	Inc Pa 64 Tf	rameter ozo er Desc. Ozo	one one primary	y stan
DAS 1: A Avg % D 6.6	Diff: A N 5%	Iax % D 8.8	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9/	0.9995 12/201	3 Inter 6 Corr	ccept Coff	-0.18 1.00	3527)000
UseDes prin prin prin prin prin	cription nary nary nary nary nary		I I 2 3 3 4 5 5	Tfer Raw 0.85 33.07 52.32 77.74 107.44	Tfer 1.0 33 52 77 107	Corr 03 27 52 96 2.67	Si 0. 30 49 73 101	ite 65 I .36 I .30 I .65 I .45 I	Site opb opb opb opb opb	e Unit	PctDiff	-8.75% -6.13% -5.53% -5.78%	
Sensor Co	omponei	nt Samp	le Train		Conditio	on Good				Status	pass	I	
Sensor Co	omponei	nt 22.5 c	degree rule		Conditio	on				Status	pass		
Sensor Co	omponei	nt Inlet F	Filter Conditio	n	Condition	Dirty				Status	Fail		
Sensor Co	omponei	nt Batter	y Backup		Conditio	on N/A				Status	pass		_
Sensor Co	omponei	nt Offset	t		Conditio	on -0.20				Status	pass		
Sensor Co	omponei	nt Span			Conditio	on 0.998				Status	pass		
Sensor Co	omponei	t Zero	Voltage		Conditi	on -0.000)7			Status	pass		
Sensor C	ompone	t Fullso	ale Voltage		Conditi	0 999	2			Status	nass		
Sensor C	omponei		Freq		Conditi	77.1 k	- /Hz			Status	nase		
Sensor Co	omponei		Neise		Conditio					Status	pass		
Sensor Co	omponei	t Cell A	NOISE		Conditio	on 0.6 pp	d			Status	pass		
Sensor Co	omponei	nt Cell A	Flow		Condition	on 0.70 l	pm			Status	pass		
Sensor Co	omponei	nt Cell A	Pressure		Condition	on 582.2	mmHg			Status	pass		
Sensor Co	omponer	nt Cell A	Tmp.		Conditi	on 37.4 (2			Status	pass		
Sensor Co	omponer	nt Cell B	Freq.		Conditio	on 68.0 k	κHz			Status	pass		
Sensor Co	omponei	nt Cell B	Noise		Conditi	on 2.3 pp	b			Status	pass		
Sensor Co	omponei	nt Cell B	Flow		Conditio	on 0.65 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 582.7	mmHg			Status	pass		_
Sensor Co	omponei	nt Cell B	S Tmp.		Conditio	on				Status	pass		
Sensor Co	omponei	nt Line L	.oss		Conditio	on 7%				Status	Fail		
Sensor Co	ompone	nt Svste	m Memo		Conditi	on				Status	pass		
	- Ponel		-								·		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BVL	130-Eric H	ebert-09/24/2016				
1	9/24/2016	DAS	Campbell	000424	CR3000	2539
2	9/24/2016	Ozone	ThermoElectron Inc	000625	49i A1NAA	1009241797
3	9/24/2016	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
4	9/24/2016	Zero air pump	Werther International	06926	PC70/4	000836218

Mfg Serial Number Ta		Site	Technician S		Site Visit Date Parame			ter	Owner I	D			
ThermoElec	tron Inc	100924	1797	BVL130	Er	ic Hebert		09/24/20	16	Ozone		000625	
Slope: Intercept CorrCoff	(-(().99046).34535).99999	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial Number Tfer ID		ThermoEl 05171121 01113	lectron 67	Inc Pa	rameter ozo er Desc. Ozo	ne one primary	/ stan
DAS 1: A Avg % D 1.8)iff: A N 3%	Iax % D 2.5'	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9/	1.0026 14/201	1 Inter 6 Corr	cept Coff	-0.15 1.00	5202 0000
UseDes prin prin prin prin prin	acription nary nary nary nary		ncGroup 1 2 3 4 5	Tfer Raw 0.64 29.19 48.38 76.01	Tfer 0.7 29 48 75	Corr 78 26 40 96 20	Si 0. 28 47 75	ite 57 [.53 [.39 [.05 [.05]	Site opb opb opb opb	e Unit	PctDiffe	-2.49% -2.09% -1.20%	
Sensor Co	ompone	1t Samp	le Train	111.54	Conditio	on Good	102		,po	Status	pass	-1.2070	
Sensor Co	omponei	1 22.5 c	learee rule		Conditio	on [Status	pass		
Sensor Co	omponei	nt Inlet F	Filter Conditio	n	Conditio	n Clean				Status	pass		
Sensor Co	ompone	at Batter	v Backup		Conditio	n N/A				Status	pass		
Sensor Co	ompone	at Offset	,		Conditio	-0 40				Status	pass		
Sensor C	ompone	t Span	•		Conditio	1 012				Status	nass		
Sensor C	ompone				Conditio	N/A				Status	nass		
Sensor C	ompone				Conditio					Status	2000		
Sensor Co	omponei				Conditio					Status	pass		
Sensor Co	ompone	nt Cell A	Freq.		Conditio	on 96.7 k	ίΗz			Status	pass		
Sensor Co	ompone	nt Cell A	Noise		Conditio	Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.79 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	716.7	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	. Tmp.		Conditio	on 34.9 0)			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	n 100.8	kHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	n Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.72 l	om			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 716.7	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	.0SS		Conditio	n Not te	sted			Status	pass		
Sensor Co	omnone	nt Svste	m Memo		Conditi	on				Status	pass		
	Pone				Condition					, status			

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
GLR4	468-Martin	Valvur-09/26/2016				
1	9/26/2016	DAS	Environmental Sys Corp	90653	8816	2566
2	9/26/2016	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
3	9/26/2016	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	0733726104
4	9/26/2016	Zero air pump	Werther International	none	PC70/4	000756725

Mfg	5	Serial Number Ta Site		Site	Technician Si		Site Visit Date Parame			neter Owner ID		D	
ThermoElec	ctron Inc	1023943	3901	GLR468	М	artin Valv	ur	09/26/20	016	Ozone		none	
Slope: Intercept CorrCoff	1. -0. 0.	07880 12526 99998	O7880 Slope: 0.0000 12526 Intercept 0.0000 99998 CorrCoff 0.0000		Mfg Serial Number Tfer ID		ThermoElectron IncPar49CPS-70008-364Tfe01110		rameter ozo er Desc. Ozo	ne one primary	/ stan		
DAS 1: A Avg % E 7.7)iff: A M : 7%	ax % D i 8.29	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9	0.9995)/12/201	3 Inter 6 Corr	rcept :Coff	-0.18 1.00	8527 0000
UseDes prin prin prin prin prin	scription nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.50 28.06 50.01 81.04	Tfer 0. 28 50 81	Corr 68 .25 .21 .26	Si 0 30 54 87	tte 55 .40 .30 .09	Sit ppb ppb ppb ppb	e Unit	PctDiff	7.61% 8.15% 7.17% 7.95%	
Sensor C	omponen	t Sampl	le Train	111.05	Conditi	on Good	120	.10	ppo	Status	pass	1.7570	
Sensor C	omponen	t 22.5 d	legree rule		Conditi	on				Status	pass		
Sensor C	omponen	t Inlet F	ilter Conditio	'n	Conditi	on Clean	1			Status	pass		_
Sensor C	omponen	t Batter	y Backup		Conditi	on N/A				Status	pass		
Sensor Co	omponen	t Offset			Conditi	on -0.4				Status	pass		
Sensor C	omponen	t Span			Conditi	on 1.017				Status	pass		
Sensor C	omponen	t Zero V	/oltage		Conditi	on -0.00'	10			Status	pass		
Sensor C	omponen	t Fullsca	ale Voltage		Conditi	on 0.998	9			Status	pass		
Sensor C	omponen	t Cell A	Freq.		Conditi	on 72.3 k	κHz			Status	pass		
Sensor C	omponen	t Cell A	Noise		Conditi	on 0.8 pr	ob			Status	pass		
Sensor C	omponen		Flow		Conditi	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 54 \\ 0 \end{array}$	nm			Status	nass		
Sensor C	omponen		Pressure		Conditi	on 678.3	mmHa			Status	nass		
Sensor C	omponen		Tmp		Conditi	$\frac{337}{2}$	~			Status	nass		
Sensor C	omponen		Frog		Conditio		,U-,			Status	pass		
Sensor Co	omponen		Neise		Conditio	00.0 r				Status	pass		
Sensor C	omponen		Noise		Conditio	on 0.6 pp	DD			Status	pass		
Sensor Co	omponen	t Cell B	Flow		Conditi	on 0.53 l	pm			Status	pass		
Sensor Co	omponen	t Cell B	Pressure		Conditi	on 678.3	mmHg			Status	pass		
Sensor Co	omponen	t Cell B	Tmp.		Conditi	on				Status	pass		
Sensor Co	omponen	t Line L	OSS		Conditi	on Not te	ested			Status	pass		
Sensor C	omponen	t Syster	m Memo		Condition	on				Status	pass		