2017 – 4th Quarter Report Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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Prepared for:

U. S. Environmental Protection Agency

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List of Acronyms and Abbreviations

% diff	percent difference		
A/D	analog to digital converter		
ARS	Air Resource Specialist, Inc.		
ASTM	American Society for Testing and Materials		
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 using a continuous collection filter aggregated over a one week period, and/or other forms of atmospheric pollution. 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 Community Multi-scale Air Quality (CMAQ) Model is used to derive deposition velocity estimates.

As of January 2018, 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. Wood Group (Wood) 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 Wood continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185, and PAL190. Six sites in WY sponsored by EPA and operated by the BLM/ARS also operate

meteorological sensors and are PND165, BAS601, NEC602, BUF603, FOR604, and SHE604. The NPS added a new site at Chaco Culture National Historical Park (CHC432) which also monitors meteorological variables. The state of Maine with cooperation from the NPS operates meteorological sensors at Acadia National Park (ACA416). The meteorological sensors at sites ACA416 and BVL130 were audited during the station audits performed in fourth quarter 2017.

Some or all of the additional monitored variables, NOy, CO, and SO₂ have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, ROM206, and DUK008. Those variables were audited at sites HWF187, BVL130, MAC426, GRS420, and PNF126 during fourth quarter 2017. 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	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	$\leq \pm 0.5^{\circ} \mathrm{C}$
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$
Shelter Temperature	Accuracy	Comparison to station temperature sensor	$\leq \pm 2.0^{\circ} \mathrm{C}$
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	$\leq \pm 5^{\circ}$ from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	$\leq \pm 5^{\circ}$ mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ of designated rate
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	$0.9950 \le r$
Ozone	Percent Difference	Comparison with Level 2 standard concentration	$\leq \pm 15.1\%$ of test gas concentration
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 Fourth Quarter 2017

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the fourth quarter (October through December) of 2017. 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>	<u>Site Visit Date</u>	Station Name
WFM007	Flow Only	EPA	10/02/2017	Whiteface Mountain
GTH161	Without Met	EPA	10/03/2017	Gothic
ACA416	With Met	Maine/NPS	10/10/2017	Acadia NP
WNC429	Without Met	NPS	10/12/2017	Wind Cave NP
EGB181	Flow Only	EPA	10/13/2017	Egbert, ON
PRK134	Without Met	EPA	10/22/2017	Perkinstown
STK138	Without Met	EPA	10/25/2017	Stockton
ALH157	Without Met	EPA	10/27/2017	Alhambra
VIN140	Without Met	EPA	10/30/2017	Vincennes
BVL130	With Met	EPA	11/9/2017	Bondville
MAC426	Without Met	NPS	11/13/2017	Mammoth Cave NP
GRS420	Without Met	NPS	11/15/2017	Great Smoky Mountains NP

Table 2. Site Audit Visits

<u>Side ID</u>	<u>Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
CND125	Without Met	EPA	11/19/2017	Candor
BFT142	Without Met	EPA	11/27/2017	Beaufort
BWR139	Without Met	EPA	11/27/2017	Blackwater NWR
WSP144	Without Met	EPA	11/28/2017	Washington Crossing St. Park
SHN418	Without Met	NPS	11/29/2017	Shenandoah NP - Big Meadows

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).

<u>Side ID</u>	<u>PE Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
DIN431	Ozone	NPS	10/04/2017	Dinosaur NM
ARE128	Ozone	EPA	10/08/2017	Arendtsville
PSU106	Ozone	EPA	10/9/2017	Penn State University
CTH110	Ozone	EPA	10/11/2017	Connecticut Hill
HOW191	Ozone	EPA	10/12/2017	Howland
ASH135	Ozone	EPA	10/13/2017	Ashland
HWF187	Ozone & NOy	EPA	10/18/2017	Huntington Wildlife Forest
ANA115	Ozone	EPA	10/19/2017	Ann Arbor
SAL133	Ozone	EPA	10/19/2017	Salamonie Reservoir
HOX148	Ozone	EPA	10/20/2017	Hoxeyville

Table 3.	TTP Pollutant PE Visits	5
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Side ID	<u>PE Audit Type</u>	<u>Sponsor</u>	<u>Site Visit Date</u>	Station Name
UVL124	Ozone		10/20/2017	Unionville
DEN417	Ozone	NPS	10/24/2017	Denali NP
BVL130	SO2, CO, NOy	EPA	11/11/2017	Bondville
MAC426	NOy	NPS	11/13/2017	Mammoth Cave NP
GRS420	NOy	NPS	11/15/2017	Great Smoky Mountains NP
PNF126	Ozone & NOy	EPA	11/16/2017	Cranberry
BEL116	Ozone	EPA	11/20/2017	Beltsville

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

2.2 **Project Objectives**

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

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

2.3 NADP Sites Visited Fourth Quarter 2017

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

<u>Side ID</u>	Network	<u>Visit Date</u>	Station Name
CAN5	NTN	10/16/2017	Frelighsburg
CO10	NTN	10/3/2017	Gothic
CO97	MDN/NTN	10/17/2017	Buffalo Pass-Summit Lake
IA08	NTN	10/26/2017	Big Springs Fish Hatchery
IL46	AMoN	10/27/2017	Alhambra
ME00	MDN/NTN	10/13/2017	Caribou
ME94	NTN	10/9/2017	Indian Township
ME98	MDN/NTN	10/10/2017	Acadia National Park-McFarland Hill
MI52	AMon	10/19/2017	Ann Arbor
MN08	NTN	10/24/2017	Hovland
MN99	NTN	10/24/17	Wolf Ridge
MT00	NTN	10/13/2017	Little Bighorn Battlefield National Monument
NF19	MDN	10/4/2017	Stephenville
NS01	MDN/AMoN	10/6/2017	Kejimkujik National Park
NY08	NTN	10/11/2017	Aurora Research Farm
NY20	MDN/NTN/AMoN	10/18/2017	Huntington Wildlife
NY67	AIRMoN/AMoN	10/10/2017	Ithaca
ON07	MDN	10/13/2017	Egbert
PA15	NTN	10/9/2017	Penn State
SD18	MDN	10/11/2017	Eagle Butte

 Table 4. Sites Surveyed – Fourth Quarter 2017

Side ID	Network	<u>Visit Date</u>	Station Name
SD99	NTN	10/10/2017	Huron Well Field
WI35	NTN/AMoN	10/23/2017	Perkinstown
WI37	NTN	10/23/2017	Spooner
WY99	NTN	10/12/2017	Newcastle
IL11	AMoN	11/11/207	Bondville
MD99	MDN/NTN/AMoN	11/21/2017	Beltsville
NC03	NTN	11/21/2017	Lewiston
NC06	AMoN	11/27/2017	Beaufort
NC08	MDN	11/28/2017	Waccamaw State Park
NC34	NTN	11/20/2017	Piedmont Research Station
NC41	NTN	11/20/2017	Finley Farm
VA28	MDN/NTN	11/29/2017	Shenandoah National Park-Big Meadow
AL10	NTN	12/12/2017	Marion Junction

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		
WFM007-Eric Hebert-10/02/2017								
1	10/2/2017	DAS	Campbell	000834	CR850	32796		
2	10/2/2017	elevation	Elevation	none	none	none		
3	10/2/2017	Filter pack flow pump	Permotec	none	BL30EB	Illegible		
4	10/2/2017	Flow Rate	Арех	000833	AXMC105LPMDPCV	illegible		
5	10/2/2017	Infrastructure	Infrastructure	none	none	none		
6	10/2/2017	Modem	Sierra wireless	06950	unknown	unknown		
7	10/2/2017	siting criteria	Siting Criteria	none	none	None		
8	10/2/2017	Temperature	RM Young	06958	41342	024085		

Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Те	chnician	Site Visit I	Date Paran	neter	Owner ID
Apex	illegible	WFM007		Er	ic Hebert	10/02/201	7 Flow F	late	000833
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	122974	1	fer Desc. BIC	S 220-H
					Tfer ID	01416			
					Slope	1.	.00732 Int	ercept	-0.02202
					Cert Date	3/	8/2017 Co	rrCoff	0.99970
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.02	28	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.99	96	
0.77%	0.99%				Rotometer R	eading:	3	.2	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	test pt 1	3.018	3.020	2.95	0.000	3.00	l/m	l/m	-0.66%
primary	test pt 2	3.023	3.020	2.95	0.000	3.00	l/m	l/m	-0.66%
primary	test pt 3	3.029	3.030	2.95	0.000	3.00	l/m	l/m	-0.99%
Sensor Compo	onent Leak Tes	st		Conditio	on		Status	pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Status		
Sensor Compo	onent Filter Pos	sition		Conditio	Good		Status	pass	
Sensor Compo	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Component Filter Distance			Conditio	ition 4.5 cm		Status	pass		
Sensor Compo	onent Filter Dep	oth		Conditio	2.0 cm		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	270 deg		Status	pass	
Sensor Compo	onent System M	/lemo		Conditio	on		Status	pass	

Temperature Data Form

Mfg	Serial Number Ta	Site		Techn	ician	Site V	isit Date/	Param	eter	Owner ID	
RM Young	024085	WFM007		Eric H	ebert	10/02	2/2017	Temper	ature	06958	
				Mf	g	Extec	h	Pa	rameter Temperature		
				Sei	rial Number	H232	679	Tf	er Desc. R	D	
				Tfe	er ID	01228					
DAS 1:	DAS 2			Slo	ppe		1.0065	6 Inte	ercept -0.03341		11
Abs Avg Err Abs Max Er Abs Avg Err Abs		g Err Abs	Max Er	Cert Date		2/4/2017 Corr		rCoff 1.00000			
0.02	0.04										
UseDesc.	Test type In	putTmpRaw	InputTm	Corr.	OutputTmpSignal C		OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	Low Range	-0.01	0.02	2 0.000		0.1		С	0.04		
primary Temp	Mid Range	25.94	25.8	0	0.000		25.	8	С	0.01	
primary Temp	High Range	36.64	36.4	3	0.000		36.	4	С	-0.02	
Sensor Compone	nt Shield		Cond	ition 🕻	Clean			Status	pass		
Sensor Component Blower				Condition N/A				Status	pass		
Sensor Component Blower Status Switch				Condition N/A			Status pass				
Sensor Compone	nt System Memo		Cond	Condition				Status	pass		

Infrastructure Data For

Site ID WFM007	Technician Eric He	bert Site Visit Date 10/02/2017
Shelter Make	Shelter Model	Shelter Size

Sensor Component	Sample Tower Type	Condition	N/A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	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

Field Systems Comments

1 Parameter: DasComments

The sample tower is approximately one meter in height mounted to and accessed directly from the roof of the facility.

2 Parameter: DocumentationCo

There is no logbook onsite to record site visit information.

3 Parameter: SitingCriteriaCom

The site is located at the summit of Whiteface Mountain on the roof of the ASRC facility with other monitoring instrumentation.

4 Parameter: MetSensorComme

The temperature sensor is mounted approximately one meter above a black roof.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID WF	ID WFM007 Technician Eric Heber		Site Visit Date 10/02	2/2017
Site Sponsor (ag	ency)	EPA	USGS Map	
Operating Group	p	SUNY	Map Scale	
AQS #			Map Date	
Meteorological T	Гуре			
Air Pollutant An	nalyzer		QAPP Latitude	
Deposition Meas	surement		QAPP Longitude	
Land Use	[QAPP Elevation Meters	
Terrain	[QAPP Declination	
Conforms to ML	LM		QAPP Declination Date	
Site Telephone			Audit Latitude	44.365885
Site Address 1			Audit Longitude	-73.903102
Site Address 2	[Audit Elevation	1473
County	[Audit Declination	-15
City, State	[Wilmington, NY	Present	
Zip Code	[12997	Fire Extinguisher 🔽	
Time Zone	[Eastern	First Aid Kit	
Primary Operate	or		Safety Glasses	
Primary Op. Ph	none #		Safety Hard Hat	
Primary Op. E-n	mail		Climbing Belt	
Backup Operato)r		Security Fence	
Backup Op. Pho	one #		Secure Shelter	
Backup Op. E-n	nail		Stable Entry Step 🔽	
Shelter Working	g Room 🗹	Make Ma	odel	Shelter Size
Shelter Clean		Notes		
Site OK		Notes		
Driving Direction	ons			

Field Systems Data Form

WFM007

F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 10/02/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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		
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 is located at the summit of Whiteface Mountain on the roof of the ASRC facility with other monitoring instrumentation.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	ID WFM007 Technician Eric Hebert		Site Visit Date 10/02/2017
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?	✓	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		one meter above 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 nat	vide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameter	essar s:	y) regarding conditions listed above, or any other features,

The temperature sensor is mounted approximately one meter above a black roof.

Field Systems Data Form

F-02058-1500-S4-rev002

Site	e ID	WFM007	Technician	Eric Hebert		Site Visit Date 10/02/2017
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?						Temperature only
2	2 Are all the meteorological sensors operational online, and reporting data?					Temperature only
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓	
4	Are the aspirated motors working?				✓	N/A
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 n, and well maintaine	ver cables intact d?	, in good	✓	
8	Are the s from the	ensor signal and pow elements and well ma	ver cable connec aintained?	tions protected	✓	

Provide any additional 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	ield Systems Data Form		F-02058-1500-S5-rev002
Site	te ID WFM007 Technicia	n Eric Hebert	Site Visit Date 10/02/2017
	Siting Criteria: Are the pollutant analyzers	and deposition equip	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 deg unrestricted airflow?	ree arc of	
2	Are the sample inlets 3 - 15 meters above th	ne ground?	
3	Are the sample inlets > 1 meter from any m and 20 meters from trees?	najor obstruction, 🔽	
	Pollutant analyzers and deposition equipme	ent operations and ma	<u>intenance</u>
1	Do the analyzers and equipment appear to condition and well maintained?	be in good	
2	Are the analyzers and monitors operationa reporting data?	l, on-line, and 🔽	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 6 meters
5	Are in-line filters used in the ozone sample indicate location)	line? (if yes	N/A
6	Are sample lines clean, free of kinks, moist obstructions?	ure, and	
7	Is the zero air supply desiccant unsaturated	1? ✓	N/A
8	Are there moisture traps in the sample line	s?	
9	Is there a rotometer in the dry deposition fice clean?	ilter line, and is it 🛛	

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

Field Systems Data Form							F-0 2	2058-15	00-S6-rev002
Site	e ID	WFM007	Technician	Eric Hebert		Site Visit Da	ate 10/02/201	7	
	DAS, ser	nsor translators, and j	peripheral equi	pment operation	<u>is an</u>	<u>l maintenance</u>			
1	Do the I well mai	OAS instruments appe ntained?	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?	gnal leads pass	through					
4	Are the well mai	signal connections pro ntained?	otected from the	e weather and					
5	Are the	signal leads connected	to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter	properly					
7	Does the	instrument shelter ha	ave a stable pov	ver source?					
8	8 Is the instrument shelter temperature controlled?				⊻ 1	N/A			
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	10 Is the sample tower stable and grounded?								
11 Tower comments?									

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

The sample tower is approximately one meter in height mounted to and accessed directly from the roof of the facility.

Field Systems Data Form							F-02058-1500-S7-rev00				1500-S7-rev002
Site	ID	WFM007		Tech	nician	Eric Hebert		Site Visit Date	10/02/2017		
<u>D</u> (<u>ocument</u>	ation									
D	oes the s	ite have the requir	ed ins	strume	nt and	equipment n	nanuals?				
		-	Yes	No	N/ /	A			Yes	No	N/A
Wine	d speed s	sensor			\checkmark	D	ata logge	er		\checkmark	
Wine	d directi	on sensor			\checkmark	D	ata logge	er			
Tem	perature	e sensor				S	trip char	t recorder			
Rela	tive hum	nidity sensor			\checkmark	C	computer				
Sola	r radiati	on sensor			\checkmark	N	Iodem			\checkmark	
Surfa	ace wetn	ess sensor				P	rinter				
Wine	d sensor	translator				Z	ero air p	ump			
Tem	perature	e translator				F	ilter flow	pump			
Hum	idity ser	nsor translator				S	urge prot	tector			
Sola	r radiati	on translator				U	PS				
Tipp	ing buck	ket rain gauge				L	ightning	protection device			
Ozor	ie analyz	zer				S.	helter hea	ater			
Filte	r pack fl	ow controller				S.	helter air	· conditioner			
Filte	r pack N	IFC power supply			\checkmark						
1	Does the	site have the requ	ired a	<u>nd mo</u>	<u>st rece</u>	<u>nt QC docun</u>	<u>nents and</u>	report forms?			
			Pres	ent					Currei	nt	
Stati	on Log		[Not pre	sent					
SSRI	F		ŀ								
Site	Ops Mai	nual	ŀ								
HAS	P		Ŀ								
Field	l Ops Ma	anual	ľ								
Calif	bration I	Reports	L		Not pre	sent					
Ozor	ie z/s/p (Control Charts	l								
Prev	entive m	laintenance schedu									
1	Is the st	ation log properly	comp	leted d	luring	every site vis	it? 🗌 N	lo logbook			
2	Are the current	Site Status Report ?	Forn	ıs bein	g comp	pleted and					
3	Are the sample (chain-of-custody f transfer to and fro	orms m lab	propei ?	rly used	d to documen	nt 🔽				
4	Are ozo current	ne z/s/p control ch ?	arts p	roperl	y comp	oleted and	✓ N	I/A			
Prov natu	ide any a ral or m	additional explana an-made, that may	tion (affeo	photog t the n	raph o nonitor	or sketch if ne ring paramet	ecessary) ers:	regarding condit	ions listed a	bove, o	r any other features,
There	e is no lo	abook onsite to reco	ord site	e visit ir	oformat	ion.					

Field Systems Data Form

Site ID WFM007 Technician Eric Hebert Site Visit Date 10/02/2017 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 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 Cl	ieck P	erforme	ed
-------	--------	---------	----

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	Weekly	

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	\checkmark
In-line Filter Replacement (at inlet)	N/A	\checkmark
In-line Filter Replacement (at analyze	N/A	\checkmark
Sample Line Check for Dirt/Water	N/A	\checkmark
Zero Air Desiccant Check	N/A	
1 Do multi point collibustion googs so through		

- 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	
	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:

Compliant

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	rm				F-02058-1500-S9-rev002		
Sit	e ID	WFM007	Technicia	Eric Hebert		Site Visit Date	10/02/2017]	
	<u>Site ope</u>	ration procedures							
1	Is the fi	lter pack being changed	d every Tue	sday as scheduled	? ✓	Filter changed morr	nings		
2 Are the Site Status Report Forms being completed and filed correctly?				✓					
3	3 Are data downloads and backups being performed as scheduled?					No longer required			
4	4 Are general observations being made and recorded? How?				✓	SSRF			
5	Are site supplies on-hand and replenished in a timely fashion?				✓				
6	Are sample flow rates recorded? How?			✓	SSRF, call-in				
7	Are san fashion	uples sent to the lab on ?	a regular sc	hedule in a timely					
8	Are filte and shij	ers protected from cont oping? How?	amination o	luring handling	✓	Clean gloves on and off			
9	Are the operation	site conditions reported ons manager or staff?	d regularly	to the field	✓				
QC	Check P	erformed	F	requency			Compliant		
I	Multi-poi	nt MFC Calibrations	✓ s	emiannually					
]	Flow System Leak Checks								
]	Filter Pack Inspection Weekly								
]	Flow Rate Setting Checks								
1	Visual Ch	eck of Flow Rate Rotor	meter 🗹 🕅	/eekly			\checkmark		
]	In-line Fil	ter Inspection/Replace	ment 🗹 S	emiannually					
5	Sample Li	ine Check for Dirt/Wat	er 🗹 M	leekly					

Provide any additional 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 Fo	rm		F-02058-1500-S10-rev00	2
Site ID	WFM007	Technician Eric Hebert	Site Visit Date	10/02/2017	

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	32796	000834
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	Illegible	none
Flow Rate	Арех	AXMC105LPMDPC	illegible	000833
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	06950
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	024085	06958

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
GTH	GTH161-Martin Valvur-10/03/2017									
1	10/3/2017	Computer	Dell	000251	D520	5HFNHB1				
2	10/3/2017	DAS	Campbell	000416	CR3000	2513				
3	10/3/2017	Elevation	Elevation	None	1	None				
4	10/3/2017	Filter pack flow pump	Thomas	00517	107CAB18	100300020817				
5	10/3/2017	Flow Rate	Арех	000558	AXMC105LPMDPCV	50735				
6	10/3/2017	Infrastructure	Infrastructure	none	none	none				
7	10/3/2017	Modem	Raven	06611	H4223-C	0844355568				
8	10/3/2017	Ozone	ThermoElectron Inc	000517	49i A1NAA	1009241760				
9	10/3/2017	Ozone Standard	ThermoElectron Inc	000208	49i A3NAA	0611416461				
10	10/3/2017	Sample Tower	Aluma Tower	03564	A	none				
11	10/3/2017	Shelter Temperature	Campbell	none	107-L	none				
12	10/3/2017	Siting Criteria	Siting Criteria	None	1	None				
13	10/3/2017	Temperature	RM Young	06120	41342VC	11742				
14	10/3/2017	Zero air pump	Werther International	06927	P 70/4	000836211				

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number S	Site	Technician	Site Visit Date Parameter		Use Desc.
Campbell	2513		GTH161	Martin Valvur	10/03/2017	DAS	Primary
Das Date: [Das Time: [Das Day: [Low Channe Avg Diff:	10/3 /2017 11:43:00 276	Audit Da Audit Tir Audit Da High Char Avg Diff:	te 10/3 /2017 ne 11:43:00 y 276 nnel: Max Diff:	Mfg Serial Number Tfer ID	HY 12010039329 01322	Parameter Tfer Desc.	• DAS Source generator (D
Avg bill. Max bill. Avg bill. Max bill. 0.0004 0.0025 0.0004 0.0025				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	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.000	-0.002	8 V	V	-0.0025	
7	0.1000	0.099	0.099	6 V	V	-0.0001	

7	0.0000	-0.0003	-0.0028	V	V	-0.0025
7	0.1000	0.0997	0.0996	V	V	-0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4998	0.4999	V	V	0.0001
7	0.7000	0.6999	0.6997	V	V	-0.0002
7	0.9000	0.9003	0.9003	V	V	0.0000
7	1.0000	0.9998	0.9997	V	V	-0.0001

Flow Data Form

Mfg	Serial Nun	ıber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	Owner ID
Apex	50735		GTH161	Ma	artin Valvur	10/03/2017	Flow F	late	000558
					Mfg	BIOS	P	arameter Flow	w Rate
					Serial Number	148613	Г	fer Desc. BIO	S 220-H
					Tfer ID	01421			
					Slope	1.(00153 Int	ercept	0.00366
					Cert Date	1/25	5/2017 Co	rrCoff	1.00000
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.()2	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	99	
0.33%	0.33%				Rotometer R	eading:	3.8	35	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.02	0.000	-0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	test pt 1	3.000	2.990	3.00	0.000	3.00	l/m	l/m	0.33%
primary	test pt 2	3.000	2.990	3.00	0.000	3.00	l/m	l/m	0.33%
primary	test pt 3	3.000	2.990	3.00	0.000	3.00	l/m	l/m	0.33%
Sensor Comp	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	nent Rotomete	er Conditio	n	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 5.5 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	n 1.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 225 deg		Status	pass	
Sensor Comp	onent System N	/lemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg	1	Serial N	umber Ta	Site	Те	chnician		Site Visi	it Date	Paramo	eter	Owner I	D
ThermoElec	tron Inc	100924	1760	GTH161	M	artin Valv	ur	10/03/2	017	Ozone		000517	
Slope: [Intercept [CorrCoff [02	0.98580 Slope: 0.0000 2.61367 Intercept 0.0000 0.99987 CorrCoff 0.0000		Mfg Serial Number Tfer ID		ThermoElectron Inc Part 49CPS-70008-364 Tfo 01110		irameter ozone		y stan			
DAS 1: DAS 2: A Avg % Diff: A Max % Di A Avg % Dif 4.5% 7.3%		bDif A Max	Slope Cert Date		1.00801 Inter 9/11/2017 Corr		ccept Coff	-0.05	5199 0000				
UseDeso prim prim prim prim prim	cription nary nary nary nary nary nary		I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.50 17.15 35.03 65.04 110.45	Tfer 0.: 17. 34. 64. 109	Corr 54 06 80 57 .62	Si 3.1 18 37 66 110	114 89 .30 .16 .39 0.70	Sit ppb ppb ppb ppb ppb	e Unit	PctDi	fference 7.27% 6.78% 2.82% 0.99%	
Sensor Co	mponen	t Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	mponen	t 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	mponen	t Inlet F	ilter Conditio	n	Conditio	on Clean	1			Status	pass		
Sensor Co	omponen	t Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	mponen	t Offset	:		Conditio	on 0.000				Status	pass		
Sensor Co	omponen	t Span			Conditio	n 1.018				Status	pass		
Sensor Co	mponen	t Zero \	/oltage		Conditio	n N/A				Status	pass		
Sensor Co	mnonen	t Fullsc	ale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	mponen		Freq		Conditio	n 89.9 k	(Hz			Status	pass		
Sensor Co	mponen		Noise		Conditio	0.8 pr				Status	nass		
Sensor Co	mponen		Flow		Conditio	0.61	nm			Status	nass		
	mponen		Drocouro		Conditio	521 7	mm⊔a			Status	pass		
Sensor Co	mponen		Teen		Conditio)n 521.7	nining			Status	pass		
Sensor Co	omponen		Tmp.		Conditio	on 31.1 (, 			Status	pass		
Sensor Co	omponen	t Cell B	Freq.		Conditio	on 95.8 k	KHZ			Status	pass		
Sensor Co	omponen	t Cell B	Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor Co	omponen	t Cell B	Flow		Conditio	on 0.55 l	pm			Status	pass		
Sensor Co	omponen	t Cell B	Pressure		Conditio	on 521.1	mmHg			Status	pass		
Sensor Co	omponen	t Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Line L	.0SS		Conditio	on Not te	ested			Status	pass		
Sensor Component System Memo		Conditio	on				Status	pass					

Temperature Data Form

Mfg	Serial Number T	'a Site	,	Techn	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	11742	GTH161		Martin	Valvur	10/03	3/2017	Temper	ature	06120	
				Mf	g	Fluke		Pa	rameter Te	mperature	
				Serial Number		3275143 T		fer Desc. RTD			
				Tfe	er ID	01229)				
DAS 1:	DAS	2:		Slo	pe		1.0000	6 Inte	rcept	0.03191	1
Abs Avg Err Ab	s Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		1/23/201	7 Cor	rCoff	1.00000)
0.06	0.07										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.14	0.11		0.000		0.2	2	С	0.07	
primary Tem	p Mid Range	25.02	24.9	9	0.000		25.	1	С	0.06	
primary Tem	p High Range	47.53	47.50	0	0.000		47.	6	С	0.05	
Sensor Compone	nt Shield		Condi	ition C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Component Blower Status Switch			Condi	Condition N/A				Status	s pass		
Sensor Component 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	GTH161	Martin Valvur	10/03/2017	Shelter Temperature	none
DAS 1:	DAS 2:	Fare Alex Mars Far	Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg Err Al 0.69	1.55	Err ADS MAX Er	Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.59	24.56	0.000	26.1	С	1.55
primary	Temp Mid Range	25.86	25.83	0.000	26.0	С	0.2
primary	Temp Mid Range	27.13	27.10	0.000	27.4	С	0.31
Sensor Component System Memo			Condition		Status	pass	

Infrastructure Data For

Site ID	GTH161	Technician Martin Va	alvur Site Visit Date 10/03/2017
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2149-12)	640 cuft

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

Due to the remote location of the site, it can take up to a week to return the filter sample to the lab after it is removed from the tower in the winter.

2 Parameter: ShelterCleanNotes

Some floor tiles are damaged.

3 Parameter: MetSensorComme

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

4 Parameter: MetOpMaintCom

The temperature signal cable is showing signs of wear.
F-02058-1500-S1-rev002

Site ID GTH161	Technician Martin Valvur	Site Visit Date 10/0	3/2017
Site Sponsor (agency)	EPA	USGS Map	Gothic
Operating Group	RMBL	Map Scale	
AQS #	08-051-9991	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	QAPP Latitude	38.9573
Deposition Measurement	dry, wet	QAPP Longitude	-106.9854
Land Use	mountain meadow, woodland - mixed	QAPP Elevation Meters	2926
Terrain	complex	QAPP Declination	10.75
Conforms to MLM	No	QAPP Declination Date	2/23/2006
Site Telephone	(970) 349-5691	Audit Latitude	38.95627
Site Address 1	RMBL	Audit Longitude	-106.98587
Site Address 2	Gothic	Audit Elevation	2915
County	Gunnison	Audit Declination	9.6
City, State	Crested Butte, CO	Present	
Zip Code	81224	Fire Extinguisher 🗹	Inspected July 2015
Time Zone	Mountain	First Aid Kit 🗹	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🗹	
Primary Op. E-mail		Climbing Belt	
Backup Operator		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🗹	
Shelter Working Room ✓	Make Ekto M	odel 8810 (s/n 2149-12)	Shelter Size 640 cuft
Shelter Clean	Notes Some floor tiles are damaged.		
Site OK	Notes		
Driving Directions From throug appro appro	Gunnison take route 135 north to Crester gh town past the fire station and the road ximately three miles and park at the visito ximately 200 meters on the path up the h	d Butte. Continue through town maintenance facility onto the di or area at the bottom of the hill b ill.	to Mount Crested Butte. Continue rt road to Gothic. Continue below the site. The site is

GTH161

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 10/03/2017

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form		F-02058-1500-S3-rev002			
Site	GTH161 Technician Martin Valvur		Site Visit Date 10/03/2017			
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A			
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A			
3	Are the tower and sensors plumb?		N/A			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?		South			
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		Over shelter			
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	vide any additional explanation (photograph or sketch if nece	ssary	y) regarding conditions listed above, or any other features,			

E 02058 1500 83 mov002

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

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

F-02058-1500-S4-rev002

Site	e ID	GTH161	Technician Martin Valvur		Site Visit Date	10/03/2017	
1	Do all th condition	e meterological sensor n, and well maintained	s appear to be intact, in good ?	✓			
2	Are all the reporting	he meteorological sens g data?	ors operational online, and	✓			
3	Are the s	shields for the tempera	ture and RH sensors clean?	✓			
4	Are the a	aspirated motors work	ing?		N/A		
5	Is the sol scratches	lar radiation sensor's l s?	ens clean and free of	✓	N/A		
6	Is the su	rface wetness sensor g	rid clean and undamaged?	✓	N/A		
7	Are the s condition	sensor signal and powe n, and well maintained	er cables intact, in good !?	✓			
8	Are the s from the	sensor signal and powe e elements and well ma	er cable connections protected intained?	✓			

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

The temperature signal cable is showing signs of wear.

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	GTH161 Technician Martin Valvur		Site Visit Date 10/03/2017
	Siting Criteria: Are the pollutant analyzers and deposition ed	luibi	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?		
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
	Pollutant analyzers and deposition equipment operations and	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 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?	✓	
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	Field Systems Data Form						F-02	2058-15	00-S6-rev002
Site	e ID	GTH161	Technician	Martin Valvur		Site Visit Date	10/03/2017	7	
	DAS, sei	<u>nsor translators, and p</u>	eripheral equi	pment operatio	ns ai	<u>nd maintenance</u>			
1	Do the D well mai	OAS 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		Met sensors only			
4	Are the swell mai	signal connections pro ntained?	tected from the	e weather and	✓				
5	Are the	signal leads connected	to the correct	DAS channel?					
6	Are the grounde	DAS, sensor translator d?	rs, and shelter	properly	✓				
7	Does the	instrument shelter ha	we a stable pov	ver source?	✓				
8	Is the ins	strument shelter temp	erature control	lled?					
9	Is the m	et tower stable and gro	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower c	omments?				Tower does not hav	e ground ro	d but is bolte	ed to shelter.

Fie	ld Systems Data	Form	l			F-02	058-	1500-S 7	7-rev002
Site 1	ID GTH161	Те	echnician Mar	tin Valvur	Site Visit Date	10/03/2017	•		
Do Do	ocumentation bes the site have the requi	ired instru	ment and equi	ipment manuals	<u>?</u>				
Wind Wind Temp Relat Solar Surfa Wind Temp Humi Solar Tippi Ozon Filter Filter	I speed sensor I direction sensor perature sensor tive humidity sensor radiation sensor ace wetness sensor I sensor translator perature translator idity sensor translator radiation translator ing bucket rain gauge te analyzer r pack flow controller r pack MFC power suppl Does the site have the req	Yes M □ [□ [□ [□ [□ [□ [□ [□ [□ [□ [No N/A Image: Constraint of the second of the se	Data logg Data logg Strip cha Compute Modem Printer Zero air Filter flo Surge pr UPS Lightnin Shelter h Shelter a	ger ger art recorder er pump w pump otector g protection device eater ir conditioner	Yes □ □ □ □ □ □	No V		
		Present				Curre	nt		
Static SSRF Site C HASI Field Calib Ozon Preve	on Log 7 Ops Manual P Ops Manual oration Reports a z/s/p Control Charts entive maintenance sched		Oct 2001 July 1990						
1	Is the station log properly	y complete	ed during ever	y site visit? 🔽					
2	Are the Site Status Repor current?	rt Forms b	eing complete	d and 🗸					
3	Are the chain-of-custody sample transfer to and fr	forms pro om lab?	perly used to	document 🔽					
4	Are ozone z/s/p control cl current?	harts prop	erly completed	d and	Control charts not us	ed			

GTH161 Technician Martin Valvur Site Visit Date 10/03/2017 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 Has the backup operator attended a formal CASTNET 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	Perfo	ormed
------	-------	-------	-------

Frequency

Frequency

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

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

- 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, 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-rev00						
Site	e ID	GTH161	Techn	ician	Martin Valvur		Site Visit Date	10/03/2017					
	<u>Site ope</u>	eration procedures											
1	Is the fi	lter pack being change	ed every T	[uesd	ay as scheduled	?	Filter changed morir	nings					
2	Are the correct	Site Status Report Fo ly?	rms being	g com	pleted and filed								
3	Are dat schedul	a downloads and back ed?	ups being	g perf	ormed as		No longer required						
4	Are gen	neral observations bein	ıg made a	nd re	corded? How?	✓	SSRF, logbook						
5	Are site fashion	e supplies on-hand and ?	replenisl	ned in	a timely								
6	Are san	nple flow rates recorde	ed? How?			✓	SSRF, call-in						
7	Are san fashion	nples sent to the lab on ?	a regula	r sche	edule in a timely								
8	Are filt and shi	ers protected from con pping? How?	itaminatio	on du	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					
N	/Iulti-poi	nt MFC Calibrations	V	Sen	niannually								
F	low Syst	em Leak Checks	\checkmark	Wee	ekly			\checkmark					
F	Filter Pack Inspection												
F	Flow Rate Setting Checks Veekly				əkly								
V	Visual Check of Flow Rate Rotometer 🗹 Weekly				əkly								
I	In-line Filter Inspection/Replacement Semiannually												
S	ample L	ine Check for Dirt/Wa	iter 🔽	Wee	ekly			\checkmark					
Prov	ride anv a	additional explanation	(photogr	aph o	r sketch if neces	sary) regarding conditi	ons listed above,	or any other features,				

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

Due to the remote location of the site, it can take up to a week to return the filter sample to the lab after it is removed from the tower in the winter.

GTH161

F-02058-1500-S10-rev002

Site ID

Technician Martin Valvur

Site Visit Date 10/03/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	5HFNHB1	000251
DAS	Campbell	CR3000	2513	000416
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	100300020817	00517
Flow Rate	Арех	AXMC105LPMDPC	50735	000558
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844355568	06611
Ozone	ThermoElectron Inc	49i A1NAA	1009241760	000517
Ozone Standard	ThermoElectron Inc	49i A3NAA	0611416461	000208
Sample Tower	Aluma Tower	A	none	03564
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	11742	06120
Zero air pump	Werther International	P 70/4	000836211	06927

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ACA	A416-Eric H	lebert-10/10/2017				
1	10/10/2017	DAS	Environmental Sys Corp	ACADIA1	8832	unknown2
2	10/10/2017	Elevation	Elevation	None	1	None
3	10/10/2017	F460 translator	Climatronics	none	100163	683
4	10/10/2017	Filter pack flow pump	Thomas	none	107CAB11	10950000040
5	10/10/2017	Flow Rate	Tylan	none	FC260	AW02213003
6	10/10/2017	Infrastructure	Infrastructure	none	none	none
7	10/10/2017	Mainframe	Climatronics	01342	100081	1288
8	10/10/2017	Met tower	Climatronics	none	unknown	illegible
9	10/10/2017	MFC power supply	Tylan	none	RO-32	none
10	10/10/2017	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
11	10/10/2017	Precipitation	Climatronics	01322	100508-2	illegible
12	10/10/2017	Relative Humidity	Vaisala	none	missing	missing
13	10/10/2017	Sample Tower	Aluma Tower	none	В	AT-71103-7I-3
14	10/10/2017	Shelter Temperature	Agilaire	none	Unknown	None
15	10/10/2017	Shield (2 meter)	Climatronics	none	100325	illegible
16	10/10/2017	Siting Criteria	Siting Criteria	None	1	None
17	10/10/2017	Solar Radiation	Licor	none	LI-200	PY16746
18	10/10/2017	Solar Radiation Translator	Climatronics	none	100144	309
19	10/10/2017	Surface Wetness	RM Young	none	58101	none
20	10/10/2017	Temperature Translator	Climatronics	03630	100088-2	401
21	10/10/2017	Temperature2meter	Climatronics	none	100093	missing
22	10/10/2017	Wind Direction	Climatronics	none	100076	illegible
23	10/10/2017	Wind Speed	Climatronics	none	100075	illegible
24	10/10/2017	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

DAS Data Form

DAS Time Max Error: 2.6

Mfg	Serial Nu	mber Sit	e 7	Sechnician	Site Visit Date	Parameter	Use Desc.
Environmental S	Sys unknown2	2 A(CA416	Eric Hebert	10/10/2017	DAS	Primary
Das Date: 1 Das Time:	0/11/2017 10:23:36	Audit Date Audit Time	10/11/2017 10:21:00	Mfg Serial Number	Datel 4000392	Parameter Tfer Desc.	DAS Source generator (D
Low Channel:	204	Audit Day High Chanr	204	Tfer ID	01321		·
Avg Diff: 0.0000	Max Diff: 0.0000	Avg Diff:	Max Diff: 00 0.0000	Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
1	1.0000	0.0000	0.0000	V	V	0.0000	

Flow Data Form

Mfg	S	Serial Nun	ıber Ta	Site	Te	chnician	Site Visit I	Date Paran	neter	Owner ID
Tylan		AW022130	003	ACA416	Er	ic Hebert	10/10/2017	7 Flow R	Rate	none
Mfg	Tylaı	า				Mfg	BIOS	P	arameter Flow	w Rate
SN/Owner ID	none)	none			Serial Number	122974	Г	fer Desc. BIO	S 220-H
Parameter	MFC	power sup	oply			Tfer ID	01416			
						Slope	1.	00732 Int	ercept	-0.02202
						Cert Date	3/8	8/2017 Co	rrCoff	0.99970
DAS 1:			DAS 2:			Cal Factor Z	ero	-0.00	08	
A Avg % Diff:	A Ma	ax % Di	A Avg %	Dif A Max	% Di	Cal Factor F	ull Scale	5	.1	
0.91%		1.13%				Rotometer R	eading:	1	.5	
Desc.	T	est type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pum	p off	0.000	0.000	0.00	0.0000	0.06	l/m	l/m	
primary	leak	check	0.000	0.000	0.01	0.0000	0.07	l/m	l/m	
primary	test p	pt 1	1.492	1.500	1.50	0.0000	1.52	l/m	l/m	1.13%
primary	test p	pt 2	1.494	1.500	1.50	0.0000	1.52	l/m	l/m	1.13%
primary	test p	pt 3	1.501	1.510	1.50	0.0000	1.52	l/m	l/m	0.46%
Sensor Comp	onent	Leak Tes	t		Conditio	on		Status	pass	
Sensor Compo	onent	Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent	Filter Pos	sition		Conditio	n Fair		Status	pass	
Sensor Comp	onent	Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent	Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Comp	onent	Filter Dist	tance		Conditio	n 5.5 cm		Status	pass	
Sensor Comp	onent	Filter Dep	oth		Conditio	n 0.0 cm		Status	pass	
Sensor Comp	onent	Filter Azir	muth		Conditio	on		Status	pass	
Sensor Comp	onent	System N	lemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg		Serial N	lumber Ta	a Site		Technician		Site Visit Date Para		Parame	eter	Owner I	D
ThermoElec	tron Inc	49C-74	536-376	ACA416	Er	ic Hebert		10/10/20	17	Ozone		90744	
Slope: [Intercept [CorrCoff [-(1.02812).51449).99981	Slope: Intercept CorrCoff	0.00000	Mfg Serial Number Tfer ID		ThermoElectron IncPar0517112167Tfe01113		rameter ozo er Desc. Ozo	ne one primary	/ stan		
DAS 1: A Avg % D 2.0	Diff: AN D%	<mark>1ax % D</mark> 4.2	DAS 2: bi A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9/	1.0050/ 12/201	4 Inter 7 Corr	ccept Coff	0.32	915 0000
UseDese prin prin prin prin prin	cription nary nary nary nary nary		oncGroup 1 2 3 4 5	Tfer Raw 0.27 11.11 34.57 68.65 112.67	Tfer -0. 10. 34. 67.	Corr 05 72 06 97 77	Si -0. 10 35 68 114	ite [99] [.81] [.49] [.00] [.90] [Site opb opb opb opb	e Unit	PctDiff	erence 0.84% 4.20% 0.04% 2.80%	
Sensor Co	ompone	nt Samp	le Train		Conditio	n Fair		1		Status	pass	210070	
Sensor Co	omponei	nt 22.5 c	degree rule		Conditio	on 🗌				Status	pass		
Sensor Co	ompone	nt Inlet F	- ilter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Co	omponei	nt Batter	ry Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponei	nt Offset	t		Conditio	n 1.5				Status	pass		
Sensor Co	ompone	nt Span			Conditio	n 1.096				Status	pass		
Sensor Co	ompone	nt Zero	Voltage		Conditio	n N/A				Status	pass		
Sensor Co	mpone	nt Fullso	ale Voltage		Conditio	N/A				Status	nass		
Sensor Co			Freq		Conditio	103.7	レ니ㅋ			Status	naee		
	ompone		Noine		Conditio	1.0 pr	ki 12			Status	2222		
Sensor Co	omponei				Conditio	on 1.0 pt	00			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.74 I	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 735.2	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 32.0 0	2			Status	pass		
Sensor Co	ompone	nt Cell B	B Freq.		Conditio	n 109.2	kHz			Status	pass		
Sensor Co	ompone	nt Cell B	8 Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	B Flow		Conditio	on 0.73 l	pm			Status	pass		
Sensor Co	ompone	nt Cell B	B Pressure		Conditio	734.6	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	8 Tmp.		Conditio	on				Status	pass		
Sensor Co	ompone	nt Line L	LOSS		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Wind Speed Data Form

Mfg	\$	Serial Number	r Ta Site		Тес	hnician	Site Visit Date	Parameter	Owner I	D	
Climatronics	i	llegible	ACA41	6	Eri	c Hebert	10/10/2017	Wind Speed	none		
Mfg	Clim	atronics				Mfg	RM Young	Paramet	ter wind speed		
SN/Owner ID	683	r	none			Serial Number		Tfer Desc. wind speed motor			
Parameter	F46	0 translator				Tfer ID	01262				
Prop or Cups S	N	2033				Slope	1.000	00 Intercept	0.00	000	
Prop or Cups T	orqu	1e 0	.4 to		0.4	Cert Date	1/26/20	17 CorrCoff	1.00	000	
Prop Correction	n Fa	ct N/A									
I	DAS	1:	Ι	OAS 2:							
1	Low Range High Range Low Range High Range										
Abs Avg Err		0.18	1.07%								
Abs Max Er 0.20 2.62%											
UseDescription:	I	nput Device	Input RPM	In	put m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM	
primary		none	0		0.20	0.0	0.0		-0.18		
primary		01262	50		1.40	0.0	1.2		-0.20		
primary		01262	100		2.57	0.0	2.4		-0.18		
primary		01262	170		4.22	0.0	4.1		-0.17		
primary		01262	250		6.10	0.0	5.9	-2.62%			
primary		01262	500		11.97	0.0	11.9	-1.00%			
primary		01262	800		19.02	0.0	19.0	-0.37%			
primary		01262	2000		47.22	0.0	47.4	0.28%			
Sensor Compe	onen	t Condition			Conditio	n Good		Status pass]	
Sensor Comp	onen	t Prop or Cups	s Condition		Conditio	n Good		Status pass			
Sensor Comp	onen	t Sensor Heat	er		Conditio	n Functioning		Status pass]	
Sensor Comp	onen	t Torque			Conditio	n		Status pass]	
Sensor Comp	onen	t Sensor Plum	b		Conditio	n Plumb		Status pass			
Sensor Componen		t System Merr	10		Conditio	n		Status pass			

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID	
Climatronics	illegible	ACA416	Eric Hebert	10/10/2017	Wind Direction	none	
Mfg	Climatronics		Mfg	RM Young	Parameter win	d direction	
SN/Owner ID	683 none		Serial Number	None	Tfer Desc. win	d direction wheel	
Parameter	F460 translator		Tfer ID	01458			
Vane SN: 14	91 C. A	A. Align. deg. true:	Slope	1.0000	0 Intercept	0.00000	
VaneTorque	8 to 10	360	Cert Date	1/1/201	7 CorrCoff	1.00000	
			Mfg	Ushikata	Parameter win	d direction	
			Serial Number	191832	Tfer Desc. trar	nsit	
			Tfer ID	01272			
			Slope	1.0000	0 Intercept	0.00000	
			Cert Date	2/8/201	7 CorrCoff	1.00000	
г	NAS 1.	DAS 2:	L				

	DAS 1:		DAS 2:	
	Orientation	Linearity:	Orientation	Linearity:
Abs Avg Err	3.5	1.8		
Abs Max Er	4	5		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error 1
primary	01458	0	\checkmark	0.0000	356	4	43.7	-1.31
primary	01458	45	\checkmark	0.0000	37	8	41.61	-3.39
primary	01458	90	\checkmark	0.0000	87	3	49.99	4.99
primary	01458	135	\checkmark	0.0000	132	4	44.4	-0.54
primary	01458	180	\checkmark	0.0000	175	5	43.4	-1.59
primary	01458	225	\checkmark	0.0000	221	4	46.3	1.29
primary	01458	270	✓	0.0000	267	3	46	1
primary	01458	315	\checkmark	0.0000	312	3	44.6	-0.39
primary	01272	90		0.0000	87	3		3
primary	01272	180		0.0000	176	4		4
primary	01272	270		0.0000	267	3		3
primary	01272	360		0.0000	356	4		4
Sensor Compon	ent Condition		Condi	tion Good		Status	pass	
Sensor Compon	ent Mast		Condi	tion Good		Status	pass	
Sensor Compon	ent Sensor Heate	Pr	Condi	tion Function	ing	Status	pass	
Sensor Compon	ent Sensor Plumb	0	Condi	tion Plumb		Status	pass	
Sensor Compon	ent Torque		Condi	ition		Status	pass	
Sensor Compon	Vane Condition	on	Condi	tion Good		Status	pass	
Sensor Compon	ent System Memo	0	Condi	ition		Status	pass	

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Numb	er Ta Site	7	Technicia	n	Site Vis	it Date	Paramet	er	Owner ID
Climatronics	missing	ACA416		Eric Hebe	ert	10/10/2	2017	Temperat	ure2meter	none
Mfg	Climatronics			Mfg		Extech		Par	ameter Tem	perature
SN/Owner ID	401	03630		Serial	l Number H232679		Tfe	Tfer Desc. RTD		
Parameter Temperature Translator			Tfer I	Tfer ID 01228						
DAS 1: DAS 2:			Slope 1.00656 Intercep		ept	-0.03341				
Abs Avg Err	Abs Max Er A	bs Avg Err Al	bs Max Er	Cert l	Date		2/4/201	7 Corr(Coff	1.00000
0.2	0.25									
UseDescription	Test type	InputTmpRaw	InputTmpC	orrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	g -0.04		-0.01		0.0000		0.13	С	0.14
primary	Temp Mid Rang	23.97		23.85		0.0000		23.60	С	-0.25
primary	Temp High Ran	g 49.35		49.06		0.0000		48.85	С	-0.21
Sensor Compo	nent Properly Si	ted	Condi	ition Prop	perly sited			Status P	ass	
Sensor Compo	nent Shield		Condi	ition Clea	an			Status P	ass	
Sensor Component Blower		Condi	ition Fun	ctioning			Status P	ass		
Sensor Compo	nent Blower Stat	us Switch	Condi	ition N/A				Status P	ass	
Sensor Compo	nent System Me	mo	Condi	ition				Status P	ass	

Solar Radiation Data Form

Mfg	Serial Numbe	er Ta Site	T	echnic	cian	Site Visit Date	Param	eter	Ow	ner ID
Licor	PY16746	ACA416	E	Eric He	bert	10/10/2017	Solar R	adiation	non	e
Mfg	Climatronics]	Mfg	5	Eppley	Pa	arameter S	olar radi	ation
SN/Owner ID	309	none]	Seri	al Number	10765	Tí	fer Desc.	SR transf	fer translat
Parameter	Solar Radiation Tr	anslator		Tfer	r ID	01246				
DAS 1:	DA	AS 2:		Slop	be	1.0000	0 Inte	rcept		0.00000
% Diff of Avg	%Diff of Max %	Diff of Avg %	Diff of Max	Cert	t Date	2/10/201	7 Cor	rCoff		1.00000
				Mfg	ţ	Eppley	Pa	arameter s	olar radi	ation
				Seri	al Number	34341F3	Tí	fer Desc. S	SR transf	fer sensor
				Tfer	r ID	01245				
				Slop	De	1.0000	0 Inte	rcept		0.00000
				Cert	t Date	2/10/201	7 Cor	rCoff		1.00000
4.8%	2.9%	0.0%	0.0%							
UseDescription	Measure Date	MeasureTime	Tfer Ray	w	Tfer Corr	DAS w/	/m2	PctDiffer	rence	
primary	10/11/2017	9:00	558		558	509			-8.8%	
primary	10/11/2017	10:00	570		570	536			-5.9%	
primary	10/11/2017	11:00	630		630	612			-2.9%	
primary	10/11/2017	12:00	597		597	575			-3.7%	
primary	10/11/2017	13:00	470		470	432			-8.1%	
primary	10/11/2017	14:00	193		193	210			8.8%	
Sensor Compo	onent Sensor Clea	n	Conditi	ion Cl	lean		Status	pass		
Sensor Compo	onent Sensor Leve	el	Conditi	ion Le	evel		Status	pass		
Sensor Component Properly Sited			Conditi	ion Pr	roperly sited		Status	pass		
Sensor Compo	Sensor Component System Memo				ion Status pass					

Humidity Data Form

Mfg	Serial Nun	nber Ta	Site		Technician	echnician		isit Date Parame		neter	Owner ID
Vaisala	missing		ACA416		Eric Hebert		10/10/2	2017	Relativ	e Humidity	none
						Mfg Serial Number Tfer ID		Rotronic 124432 01225		Parameter Relative Humidi Tfer Desc. Hygroclip	
					Slope			0.8748	8 Inte	ercept	5.14795
	DAS 1:		DAS	2:	Cert Date	•	1	0/10/201	7 Cor	rCoff	0.99493
	Low Range	High Ran	ge Low	Range	High Range	•					
Abs Avg Err	2.7										
Abs Max Er	6.2										
UseDesc.	Test type	Devic	e Inpu	t RH	GTL Raw	RH (Corr.	DAS V	olts	DAS %RH	Difference
primary	RH Low Range	Hygroc	clip 3	2.8	32.7	32	.8	0.000	0	39.1	6.2
primary	RH Low Range	Hygroc	lip 5	2.9	53.6	52	.9	0.000	0	53.1	0.2
primary	RH Low Range	Hygroc	lip 7.	5.3	70.0	75	.3	0.000	0	72.0	-3.3
primary	RH Low Range	Ambie	ent		46.3	47	.0	0.000	0	46.1	-0.9
Sensor Com	ponent RH Filter			Con	dition Clean				Status	pass	
Sensor Com	ponent Shield			Con	dition Clean				Status	pass	
Sensor Component Blower Co			Con	ndition N/A				Status	pass		
Sensor Component Blower Status Switch Con			dition N/A				Status	pass			
Sensor Com	ponent System N	/lemo		Con	dition				Status	pass	

Precipitation Data Form

Mfg	Seria	al Number Ta	Site		Tee	Fechnician			Visit Date	Parameter			Owner ID	
Climatronics	illeg	ible	ACA416		Er	ic Hebert		10/*	10/2017	Precipita	ation		01322	
						Mfg		PMF)	Pa	rameter	Preci	pitation	
DAS 1:		DAS 2:				Serial Nun	ıber	EW-	06134-50	Tf	er Desc.	250m	nl graduate	
A Avg % Dif	f: A Max %	6 Di A Avg %	6Dif A N	Aax % Di		Tfer ID		0125	50					
5.0%		6.0%				CI			4 0000				0.000	00
						Slope			1.0000	Inter	cept		0.000	00
						Cert Date			9/5/200)5 Corr	Coff		1.000	00
UseDesc	Test type	. TferVolume	Iteration	TimePerT	in	Ea Ht	DAS	eng	Ea HtUnit	OSE Un	it TferI	Inits P	ctDifferen	CE
primary	test 1	231.5	1	8 sec	P	5.00 4.70		mm	mm	m	l l	-6.04	%	
primary	test 2	231.5	2	10 sec		5.00	4.	80	mm	mm	m	ıl	-4.09	%
Sensor Com	ponent Pro	operly Sited		Cond	ondition 45 degree rule					Status	Fail			
Sensor Com	ponent Ga	uge Drain Scree	en	Cond	Condition Not installed				Status	Fail				
Sensor Com	ponent Fu	nnel Clean		Cond	itio	Clean				Status pass				
Sensor Com	ponent Co	ndition		Cond	itio	Good				Status pass				
Sensor Com	ponent Ga	uge Screen		Cond	itio	n Installed				Status	pass			
Sensor Component Gauge Clean		Cond	itio	Clean				Status	pass					
Sensor Component Level		Cond	itio	n Level				Status pass						
Sensor Component Sensor Heater			Cond	itio	ition Functioning				Status pass					
Sensor Com	ponent Sy	stem Memo		Cond	itio	on				Status pass				

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	ACA416	Eric Hebert	10/10/2017	Surface Wetness	none
			Mfg	Ohmite	Parameter St	urface wetness
			Serial Number	296-1200	Tfer Desc. de	ecade box
			Tfer ID	01210		
			Slope	1.0000	0 Intercept	0.00000
			Cert Date	1/4/201	1 CorrCoff	1.00000

Manual Test Pass

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	dry	N/A	0.0030	0.30	V	N/A	% Wet
primary	primary wet N/A		1.0040	100.40 V		N/A	% Wet
Sensor Compor	nent Properly Sited	Ł	Condition	Properly sited	Sta	tus pass	
S	Crid Cloop			Condition Clean			
Sensor Compor	nent Giu Clean			Clean	Sta	us pass	
Sensor Compor	nent Grid Angle		Condition	Condition About 30 deg			
Samaan Cammaa	Grid Orioptati	02	Canditian	North	<u>Sta</u>		
Sensor Compor	nent Giu Oneniali	011	Condition	NOTUT	Sta	us pass	
Sensor Compor	nent Grid Condition	n	Condition	Fair	Sta	tus pass	
Samaan Cammaa				Carditian Grid without holos			
Sensor Compor	Giu i ype		Condition		Sta	us pass	
Sensor Compor	nent System Memo	C	Condition		Sta	tus pass	

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Agilaire	Agilaire None ACA416 Er		Eric Hebert	10/10/2017	Shelter Temperature	none
DAS 1: Abs Avg Err Ab 0.74	DAS 2: s Max Er Abs Avg 1.05	Err Abs Max Er	Mfg Serial Number	Extech H232679	Parameter She Tfer Desc. RT	elter Temperatur
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference		
primary	Temp Mid Range	22.66	22.55	0.000	23.6	С	1.05		
primary	Temp Mid Range	24.24	24.12	0.000	23.7	С	-0.42		
Sensor Component System Memo Condition Status pass									

Infrastructure Data For

Site ID	ACA416	Technician Eric Heb	ert Site Visit Date 10/10/2017
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8818 (s/n 2920-1)	1152 cuft

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

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Site ID ACA416	ID ACA416 Technician Eric Hebert		0/2017					
Site Sponsor (agency)	NPS/EPA	USGS Map	Salsbury Cove					
Operating Group	NPS/MEDEP	Map Scale						
AQS #	23-009-0103	Map Date						
Meteorological Type	Climatronics							
Air Pollutant Analyzer	Ozone, SO2, NOx, NOy, PM, VOC	QAPP Latitude	44.3770					
Deposition Measurement	dry, wet, Hg	QAPP Longitude	-68.2610					
Land Use	Costal, woodland - mixed	QAPP Elevation Meters	158					
Terrain	rolling	QAPP Declination						
Conforms to MLM	No	QAPP Declination Date						
Site Telephone	(432) 288-9322	Audit Latitude	44.377086					
Site Address 1	Route 233	Audit Longitude	-68.2608					
Site Address 2		Audit Elevation	153					
County	Hancock	Audit Declination	-16.4					
City, State	Bar Harbor, ME	Present						
Zip Code	04609	Fire Extinguisher 🗹	Inspected Aug 2017					
Time Zone	Eastern	First Aid Kit						
Primary Operator		Safety Glasses						
Primary Op. Phone #		Safety Hard Hat						
Primary Op. E-mail		Climbing Belt						
Backup Operator		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Step 🗹						
Shelter Working Room	Make Custom M	odel Unknown	Shelter Size Unknown					
Shelter Clean	Notes The shelter is new, clean and	well organized. Equipment is s	ill being moved from the old shelter.					
Site OK	Notes							
Driving Directions From Bangor go east on 1A to Ellsworth. From Ellsworth take route 3 east to Bar Harbor. At the west edge of town, take Eagle Lake Rd (route 233) west toward Acadia National Park. The site is through a gate, at the end of a gravel road, across from the Park Headquarters.								

ACA416

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Site ID

Technician Eric Hebert

Site Visit Date 10/10/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		
Major industrial complex	10 to 20 km		\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	25 m	
Obstacles to wind	10 times obstacle height		\checkmark

Siting Distances OK

Siting Criteria Comment

Fi	eld Sy	stems Data F	orm		F-02058-1500-S3-re					
Site	e ID	ACA416	Technician	Eric Hebert		Site Visit Date	10/10/2017]	
1	Are win being in	d speed and direction fluenced by obstructi	sensors sited so) as to avoid						
2 Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)										
3	Are the	tower and sensors plu	umb?							
4	Are the avoid ra	temperature shields j adiated heat sources s	pointed north or uch as buildings	positioned to s, walls, etc?	✓					
5	5 Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas o standing water should be avoided)									
6	Is the so	blar radiation sensor J	plumb?							
7	Is it site light?	d to avoid shading, or	r any artificial o	r reflected						
8	Is the ra	ain gauge plumb?								
9	Is it site towers,	d to avoid sheltering etc?	effects from bui	ldings, trees,		45 degree rule viola	ation			
10	Is the su facing n	urface wetness sensor oorth?	sited with the g	rid surface						
11	Is it inc	lined approximately 3	30 degrees?							
D)	tions lists J - J			

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Site	ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/10/2017	
1	Do all th condition	e meterological senso 1, and well maintained	rs appear to be i 1?	intact, in good			
2	Are all the reporting	he meteorological sens g data?	sors operational	online, and			
3	Are the s	hields for the tempera	ature and RH se	ensors clean?			
4	Are the a	aspirated motors work	king?				
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of			
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?			
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 connect aintained?	tions protected			

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

The sensor signal cables are beginning to show signs of wear. Some are being replaced as instruments are installed in the new shelter.

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ACA416 Technician Eric Hebert		Site Visit Date 10/10/2017
	Siting Criteria: Are the pollutant analyzers and deposition e	quip	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.		3/8 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?		
8	Are there moisture traps in the sample lines?		
9	Is there a rotometer in the dry deposition filter line, and is it clean?	✓	Clean and dry

New sample lines have been installed in the new shelter. The ozone inlet was not approved material but was replaced shortly after the audit.

Field Systems Data Form								F-02	2058-15	00-S6-rev002
Site	e ID	ACA416	Technician	Eric Hebert		Site Visi	t Date	10/10/2017	7	
	DAS, se	nsor translators, and p	eripheral equi	oment operatio	<u>ns anc</u>	<u>l maintena</u>	<u>nce</u>			
1	Do the I well mai	DAS instruments appea 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?	nal leads pass t	hrough						
4	Are the signal connections protected from the weather and well maintained?			weather and						
5	Are the	signal leads connected	to the correct l	DAS channel?						
6	Are the grounde	DAS, sensor translator rd?	rs, and shelter J	properly						
7	Does the	e instrument shelter ha	we a stable pow	ver source?						
8	Is the in	strument shelter temp	erature control	led?						
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	10 Is the sample tower stable and grounded?									
11 Tower comments?					_					

The accuracy of the DAS was not tested due to poor wiring conditions at the logger and lack of wiring documentation. It was decided that it was safer not to disturb the signal connections. The sensors will be moved to the new logger in the near future.

Field	l Systems Data F	or	m				F-02	058-	1500-S7-rev002
Site ID	ACA416		Technician	Eric Hebert		Site Visit Date 10	0/10/2017	,	
<u>Doci</u>	umentation								
Does	s the site have the required	l inst	rument and	equipment ma	nuals?				
	Y	es	No N/	A			Yes	No	N/A
Wind s	peed sensor			Dat	a logge	r			
Wind d	lirection sensor			Dat	a logge	r			
Tempe	rature sensor	✓		Stri	p chart	recorder			
Relativ	e humidity sensor			Con	nputer			✓	
Solar r	adiation sensor	✓		Moo	lem			\checkmark	
Surface	e wetness sensor			Prir	ter			\checkmark	
Wind s	ensor translator			Zer	o air pu	ımp		\checkmark	
Temper	rature translator			Filte	er flow	pump		\checkmark	
Humid	ity sensor translator			Sur	ge prot	ector		\checkmark	
Solar ra	adiation translator	✓		UPS	5			\checkmark	
Tipping	g bucket rain gauge	✓		Ligl	ntning j	protection device		\checkmark	
Ozone	analyzer	✓		She	lter hea	iter		\checkmark	
Filter p	ack flow controller			She	lter air	conditioner		\checkmark	
Filter p	ack MFC power supply								
Do	es the site have the require	ed an	nd most rece	nt OC documer	its and	report forms?			
		Proco	nt				Curre	nt	
Station	Log							m	
SSRF	Lug			W					
Site On	as Manual			200					
наяр				00					
Field O	ing Manual]						
Calibra	ps Manual								
Ozono	z/s/n Control Charts								
Drovon	tive maintenance schedul								
rreven	tive maintenance schedur	V					V		
1 Is	the station log properly co	omple	eted during	every site visit?	✓ Date	ataview			
2 An cu	re the Site Status Report F rrent?	orm	s being comj	pleted and					
3 An san	e the chain-of-custody for mple transfer to and from	ms p lab?	properly use	d to document					
4 An cu	e ozone z/s/p control char rrent?	ts pr	operly comp	leted and		ontrol charts not use	d		
Provide natural	e any additional explanatio	on (p offect	hotograph o	or sketch if nece	ssary)	regarding condition	ns listed a	above, o	or any other features,

Site	ID	ACA416	Technician	Eric Hebert		Site Visit Date	10/10/2017	
1	<u>Site ope</u> Has the course?	<u>ration procedures</u> site operator attended If yes, when and who	l a formal CAS instructed?	TNET training				
2	Has the training	backup operator atter course? If yes, when a	nded a formal (and who instrue	CASTNET cted?	✓	Trained on-site by A	RS during site install	ation
3	Is the sit schedule	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	✓	Operator procedures	s are very good for fill	er replacement
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

\checkmark	Semiannually by MEDEP	\checkmark
\checkmark	Weekly	\checkmark
\checkmark	Semiannually	\checkmark
\checkmark	Monthly	\checkmark
\checkmark	Weekly	\checkmark
	Not performed	
	 > > > > 	 ✓ Semiannually by MEDEP ✓ Weekly ✓ Semiannually ✓ Monthly ✓ Weekly ✓ Not performed

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

OC	Check	Performed
VU.	CIICCA	I CITOI IIICU

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

	Frequency	Co
✓	Monthly	✓
✓	Weekly	✓
✓	Monthly	✓
	N/A	✓
✓	Weekly	✓
✓	Weekly	✓

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

	_
V	Results are recorded weekly on a checklist

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

✓

✓

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

Compliant

Compliant

F-02058-1500-S8-rev002

Field Systems Data Form F-02058-1500-S9-rev002 ACA416 Technician Eric Hebert Site Visit Date 10/10/2017 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? Filter changed morinings, 90% 1 Flow and general observation sections only Are the Site Status Report Forms being completed and filed 2 correctly? No longer required 3 Are data downloads and backups being performed as scheduled? \checkmark SSRF Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF Are sample flow rates recorded? How? 6 \checkmark Are samples sent to the lab on a regular schedule in a timely 🗹 7 fashion? \checkmark 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** Frequency Compliant \checkmark Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks** Not performed **Filter Pack Inspection** ✓ Weekly \checkmark **Flow Rate Setting Checks** ✓ Weekly \checkmark Visual Check of Flow Rate Rotometer ✓ As needed \checkmark **In-line Filter Inspection/Replacement** \square Not performed 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:

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

ACA416

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Site ID

Technician Eric Hebert

Site Visit Date 10/10/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID	
DAS	Environmental Sys Corp	8832	unknown2	ACADIA1	
Elevation	Elevation	1	None	None	
F460 translator	Climatronics	100163	683	none	
Filter pack flow pump	Thomas	107CAB11	10950000040	none	
Flow Rate	Tylan	FC260	AW02213003	none	
Infrastructure	Infrastructure	none	none	none	
Mainframe	Climatronics	100081	1288	01342	
Met tower	Climatronics	unknown	illegible	none	
MFC power supply	Tylan	RO-32	none	none	
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744	
Precipitation	Climatronics	100508-2	illegible	01322	
Relative Humidity	Vaisala	missing	missing	none	
Sample Tower	Aluma Tower	В	AT-71103-7I-3	none	
Shelter Temperature	Agilaire	Unknown	None	none	
Shield (2 meter)	Climatronics	100325	illegible	none	
Siting Criteria	Siting Criteria	1	None	None	
Solar Radiation	Licor	LI-200	PY16746	none	
Solar Radiation Translator	Climatronics	100144	309	none	
Surface Wetness	RM Young	58101	none	none	
Temperature Translator	Climatronics	100088-2	401	03630	
Temperature2meter	Climatronics	100093	missing	none	
Wind Direction	Climatronics	100076	illegible	none	
Wind Speed	Climatronics	100075	illegible	none	
Zero air pump	ThermoElectron Inc	111	111-30215-237	none	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
WN	NC429-Martin Valvur-10/12/2017									
1	10/12/2017	Computer	Hewlett Packard	none	6560 b	5CB1520H5J				
2	10/12/2017	DAS	Environmental Sys Corp	None	8832	A4868				
3	10/12/2017	Elevation	Elevation	None	1	None				
4	10/12/2017	Filter pack flow pump	Thomas	none	107CAB18	0688001767				
5	10/12/2017	flow rate	Tylan	03379	FC280AV	AW9403023				
6	10/12/2017	Infrastructure	Infrastructure	none	none	none				
7	10/12/2017	Met tower	unknown	none	unknown	none				
8	10/12/2017	MFC power supply	Tylan	03684	RO-32	FP9404003				
9	10/12/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	0615817056				
10	10/12/2017	Ozone Standard	ThermoElectron Inc	none	49i PSA2AB	0807328333				
11	10/12/2017	Sample Tower	Aluma Tower	none	В	none				
12	10/12/2017	Shelter Temperature	RM Young	none	41342	018819				
13	10/12/2017	Shield (2 meter)	RM Young	none	43532	none				
14	10/12/2017	Siting Criteria	Siting Criteria	None	1	None				
15	10/12/2017	Temperature2meter	RM Young	none	41342	14264				
16	10/12/2017	Zero air pump	ThermoElectron Inc	none	111	111-78387-388				

DAS Data Form

DAS Time Max Error: 3.32

Mfg	Serial	Number Site	е Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmenta	al Sys A4868	B WN	VC429	Martin Valvur	10/12/2017	DAS	Primary
Das Date:	10/12/2017	Audit Date	10/12/2017 8:28:45	Mfg	HY	Parameter	DAS
Das Time: Das Day:	285	Audit Time Audit Day	285	Serial Number	12010039329	Tfer Desc.	Source generator (D
Low Channe	el:	High Channe	el:	Tfer ID	01322		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	3 0.00	0.000	3 0.0004	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	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
1	0.0000	-0.0005	-0.0004	V	V	0.0001	
1	0.1000	0.0996	0.0994	V	V	-0.0002	
1	0.3000	0.2997	0.3000	V	V	0.0003	
1	0.5000	0.4996	0.4993	V	V	-0.0003	
1	0.7000	0.6994	0.6997	V	V	0.0003	
1	0.9000	0.8993	0.8996	V	V	0.0003	
1	1.0000	0.9993	0.9989	V	V	-0.0004	

Flow Data Form

Mfg	5	Serial Nun	iber Ta	Site	Те	echnician	Site Visit l	Date Para	meter	Owner ID	
Tylan	AW940302		23	3 WNC429		lartin Valvur	10/12/201	7 flow	rate	03379	
Mfg	Tyla	an				Mfg	BIOS		Parameter Flow Rate		
SN/Owner ID	FP9	9404003 03684				Serial Number	ial Number 148613		Tfer Desc. BIOS 220-H		
Parameter	MFC	c power sup	oply			Tfer ID	01421				
						Slope	1.	.00153 Ir	ntercept	0.00366	
						Cert Date	1/2	5/2017 C	orrCoff	1.00000	
DAS 1:	DAS 1: DAS 2:					Cal Factor Z	0.	0.392			
A Avg % Diff:	Avg % Diff: A Max % Di A Avg %			Dif A Max % Di Cal Factor Fi			ull Scale	ale 5.866			
1.01%		1.11%			Rotometer Ro		eading:	3.3			
Desc.	Т	'est type	Input l/m	Input Corr_	MfcDisp	. OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference	
primary	pump off		0.000	0.000	-0.38	0.0000	0.05	l/m	l/m		
primary	leak check		0.000	0.000	-0.38	0.0000	0.05	l/m	l/m		
primary	test pt 1		2.980	2.970	2.63	0.0000	3.00	l/m	l/m	1.11%	
primary	test	pt 2	2.980	2.970	2.64	0.0000	3.00	l/m	l/m	1.11%	
primary	test	pt 3	2.990	2.980	2.60	0.0000	3.00	l/m	l/m	0.81%	
Sensor Comp	t Leak Tes	Leak Test			Condition		Stat	us pass			
Sensor Componen		Tubing Condition			Conditi	Condition Good		Stat	us pass		
Sensor Componen		Filter Position			Conditi	Condition Poor		Stat	us Fail		
Sensor Component		Rotometer Condition			Conditi	Condition Clean and dry		Stat	s pass		
Sensor Comp	Moisture Present			Conditi	tion No moisture present		Stat	us pass	pass		
Sensor Component Filter			Iter Distance			on 6.5 cm		Stat	us pass	pass	
Sensor Component Filter Depth					Conditi	on -1.5 cm		Stat	s Fail		
Sensor Comp	onen	Filter Azimuth			Conditi	ion 90 deg		Stat	us pass	pass	
Sensor Comp	System N	System Memo			on	Stat	Status pass				
Ozone Data Form

Mfg		Serial N	umber Ta	Site	Te	Technician S		Site Visi	it Date	te Parameter		Owner]	D
ThermoElec	tron Inc	061581	7056	WNC429	M	artin Valv	ur	10/12/20	017	Ozone		none	
Slope: Intercept CorrCoff	(-(0.96148 0.00563 1.00000	Slope: Intercept CorrCoff	0.00000))	Mfg Serial N Tfer ID	umber	ThermoE 49CPS-7 01110	Electron 70008-3	Inc Pa 64 Tf	er Desc.	ozone Ozone primar	y stan
DAS 1: DAS 2: A Avg % Diff: A Max % Di A Avg %Dif 3.7% 3.9%		bDif A Max 9	% Di	Slope Cert Da	te	9	1.00801 Intercept 9/11/2017 CorrCo		rcept :Coff	-0.0	5199 0000		
UseDes prin prin prin prin prin	cription nary nary nary nary		nncGroup 1 2 3 4 5	Tfer Raw 0.07 16.48 34.48 67.32 112.28	Tfer 0. 16. 34. 66.	Corr 12 .40 .25 .83 .43	Si -0. 15 32 64	1te 01 .87 .96 .26	Sit ppb ppb ppb ppb	e Unit	PctD	-3.23% -3.77% -3.85% -3.89%	
Sensor Co	omponer omponer	nt Samp nt 22.5 d	le Train legree rule	112.20	Condition Condition	on Good	107	.10		Status Status	pass pass	-3.8970	
Sensor Component Inlet Filter Condition Sensor Component Battery Backup Sensor Component Offcot		n	Condition Condition	Condition N/A				Status Status Status	pass pass				
Sensor Co Sensor Co	ompone ompone	nt Span	/oltage		Conditio	idition 1.408				Status Status	pass pass		
Sensor Co	ompone ompone	nt Fullsc nt Cell A	ale Voltage Freq.		Condition	Condition 10.0018 Condition 95.2 kHz				Status Status	pass pass		
Sensor Co Sensor Co	ompone ompone	nt Cell A nt Cell A	Noise Flow		Condition	ondition 0.4 ppb ondition 0.62 lpm				Status Status	pass pass		
Sensor Co Sensor Co	ompone ompone	nt Cell A nt Cell A	Pressure Tmp.		Condition	Condition 620.9 mmHg				Status Status	pass pass		
Sensor Co Sensor Co	ompone ompone	ponent Cell B Freq.			Condition Condition	lition 95.4 kHz				Status Status	pass pass		
Sensor Component Cell B Flow Sensor Component Cell B Pressure		Conditio	tion 1.33 lpm tion 620.9 mmHg				Status Status	pass pass					
Sensor Co Sensor Co	ompone ompone	nt Cell B nt Line L	Tmp.		Condition Condition	on Not tested				Status Status	pass		
Sensor Co	ompone	nt Syster	m Memo		Conditio	on				Status	pass		

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Numbe	r Ta Site	Т	Technician		Site Vis	it Date	Paramete	er	Owner ID
RM Young	14264	WNC429		Martin Valvur		10/12/2	2017	Temperat	ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229]		
DAS 1:	DA	AS 2:		Slope			1.00006	Interco	ept	0.03191
Abs Avg Err	Abs Max Er Ab	os Avg Err Ab	os Max Er	Cert I	Date		1/23/2017	CorrC	off	1.00000
0.15	0.31			L						
UseDescription	Test type	InputTmpRaw	InputTmpCon	rrected	OutputTm	pSignal	OutputSi	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.27		0.24		0.0000		0.12	С	-0.12
primary	Temp Mid Rang	24.46		24.43		0.0000		24.41	С	-0.02
primary	Temp High Rang	47.67		47.64		0.0000		47.33	С	-0.31
Sensor Compo	nent Properly Site	ed	Conditi	ion Prop	perly sited			Status pa	ass	
Sensor Compo	nent Shield		Conditi	ion Clea	an			Status Pa	ass	
Sensor Component Blower		Conditi	ion Fun	ctioning			Status Pa	ass		
Sensor Component Blower Status Switch			Conditi	Condition N/A				Status pa	ass	
Sensor Component System Memo			Conditi	ndition Status pass						

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018819	WNC429	Martin Valvur	10/12/2017	Shelter Temperature	none
DAS 1:	DAS 2:	-	Mfg	Fluke	Parameter She	Iter Temperatur
Abs Avg Err 0.95	Avg Err Abs Max Er Abs Avg Err Abs N 0.95 1.74		Serial Number	3275143	Tfer Desc. RTD)
			Tfer ID	01229		
			Slope	1.0000	6 Intercept	0.03191
			Cert Date	1/23/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	21.48	21.45	0.000	22.1	С	0.66	
primary	Temp Mid Range	21.42	21.39	0.000	21.8	С	0.45	
primary	Temp Mid Range	21.45	21.42	0.000	19.7	С	-1.74	
Sensor Component System Memo			Condition	status pass				

Infrastructure Data For

Site ID	WNC429	Technician Martin V	alvur Site Visit Date 10/12/2017
Shelter 1	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 3034-1)	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	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	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	WNC429	Martin Valvur	10/12/2017	Filter Position	Tylan	1345		

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 general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack.

2 Parameter: SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota. There is no means for introducing routine test gas at the sample inlet and all routine checks are performed at the back of the analyzer. Audit test gas was introduced through the sample inlet flooding the glass manifold.

3 Parameter: DocumentationCo

Records of the routine checks performed by the state personnel are kept onsite in a logbook.

4 Parameter: ShelterCleanNotes

One shelter houses the gas analyzers and is in good condition and clean. The analyzer sample train is a glass manifold with an exhaust fan. The second shelter houses the flow system, met translator, and IMPROVE. It is older and not climate controlled.

5 Parameter: PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter. The ozone sample train is a 3 meter glass manifold with a 1/4 inch Teflon tubing connection to the analyzer.

6 Parameter: MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

F-02058-1500-S1-rev002

Site ID WNC429	Technician Martin Valvur	Site Visit Date 10/12	2/2017				
		r					
Site Sponsor (agency)	NPS	USGS Map	Wind Cave				
Operating Group	NPS and state of SD	Map Scale					
AQS #	46-033-0132	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, NOx, PM2.5, PM10, IMPROVE	QAPP Latitude43.5578					
Deposition Measurement	dry, wet	QAPP Longitude	-103.4839				
Land Use	prairie - woodland - evergreen	QAPP Elevation Meters	1292				
Terrain	rolling	QAPP Declination					
Conforms to MLM	Marginally	QAPP Declination Date					
Site Telephone		Audit Latitude	43.557639				
Site Address 1	Visitor Center	Audit Longitude	-103.483856				
Site Address 2	Route 385 Wind Cave National Park	Audit Elevation	1288				
County	Custer	Audit Declination	8.1				
City, State	Hot Springs, SD	Present					
Zip Code	57747	Fire Extinguisher					
Time Zone	Mountain	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat					
Primary Op. E-mail		Climbing Belt					
Backup Operator		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Step 🔽					
Shelter Working Room	Make Ekto	lodel 8810 (s/n 3034-1)	Shelter Size640 cuft				
Shelter Clean	Notes One shelter houses the gas a is a glass manifold with an exl and IMPROVE. It is older and	analyzers and is in good condition and clean. The analyzer sample train khaust fan. The second shelter houses the flow system, met translator, d not climate controlled.					
Site OK	Notes						
Driving Directions From Hot Springs proceed north on 385 into Wind Cave National Park. Turn left onto the visitor center loop road. The site operator's office is in the visitors center. The site is up the gravel access road to the park water supply on the opposite side of the parking lot from the visitor center.							

WNC429

F-02058-1500-S2-rev002

Site ID

Technician Martin Valvur

Site Visit Date 10/12/2017

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

Siting Distances OK

Siting Criteria Comment

Fi	eld Systems Data Form	F-02058-1500-S3-rev002					
Site	WNC429 Technician Martin Valvur		Site Visit Date 10/12/2017				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?	✓	N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓					
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)						
6	Is the solar radiation sensor plumb?	✓	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A				
8	Is the rain gauge plumb?	✓	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A				
11	Is it inclined approximately 30 degrees?	✓	N/A				
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,				

F-02058-1500-S4-rev002

Site	e ID	WNC429	Technician	Martin Valvur		Site Visit Date	10/12/2017	
1	Do all th condition	e meterological senso 1, and well maintaine	rs appear to be d?	intact, in good				
2	Are all the reporting	ne meteorological sen g data?	sors operationa	l online, and				
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	aspirated motors wor	king?		✓			
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of	✓	N/A		
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	\checkmark	N/A		
7	Are the sensor signal and power cables intact, in good condition, and well maintained?					Signs of wear		
8	Are the s from the	ensor signal and pow elements and well m	ver cable connec aintained?	tions protected	\checkmark			

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

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	WNC429	Technician	Martin Valvur		Site Visit Date 10/12/2017
	Siting C	riteria: 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	ample inlets have at lo cted airflow?	east a 270 degre	e arc of		
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	3 meter glass
3	Are the and 20 r	sample inlets > 1 meten neters from trees?	er from any ma	jor obstruction,		
	<u>Pollutar</u>	t analyzers and depos	sition equipmen	t operations and	mai	<u>intenance</u>
1	Do the a conditio	nalyzers and equipmon n and well maintained	ent appear to be 1?	e in good		
2	Are the analyzers and monitors operational, on-line, and reporting data?					
3	Describe	e ozone sample tube.				3 meter glass manifold and 1/4 inch teflon with tee fittings
4	Describe	e dry dep sample tube	•			3/8 teflon by 12 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lii	ne? (if yes		At analyzer only
6	Are sam obstruct	ple lines clean, free of tions?	f kinks, moistur	e, and		
7	Is the ze	ro air supply desiccar	nt unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?			
9	Is there clean?	a rotometer in the dry	y deposition filt	er line, and is it		Clean and dry

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

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter. The ozone sample train is a 3 meter glass manifold with a 1/4 inch Teflon tubing connection to the analyzer.

Fi	eld Sy	stems Data Fo	orm					F-02	058-15	500-S6-rev002
Site	e ID	WNC429	Technician	Martin Valvur		Site Visit	Date	10/12/2017	,	
	<u>DAS, se</u>	ensor translators, and	peripheral equi	pment operation	ns ai	nd maintenan	<u>ce</u>			
1	Do the l well ma	DAS instruments appe intained?	ear 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 sing protection circuitry	gnal leads pass ?	through	✓	Met sensors c	only			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓	Signs of wear				
5	Are the	signal leads connected	d to the correct	DAS channel?						
6	Are the ground	DAS, sensor translate ed?	ors, and shelter	properly	✓					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the ir	nstrument shelter temp	perature contro	lled?		Both on				
9	Is the m	net tower stable and gr	counded?			Stable			Grounded	1
10	Is the sa	ample tower stable and	d grounded?							
11	Tower	comments?							•	

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

Fiel	d Systems Dat	a For	m			F-02	2058-	1500-S7-re	v002
Site II	D WNC429		Technician	Martin Valvur	Site Visit Date	10/12/2017	7		
Doc	<u>cumentation</u>								
Doe	es the site have the req	uired inst	trument and	d equipment manua	<u>lls?</u>				
Wind = Wind = Tempo Relativ Solar = Surfac Wind = Tempo Solar = Tippin Ozone Filter =	speed sensor direction sensor erature sensor ve humidity sensor radiation sensor se wetness sensor sensor translator erature translator lity sensor translator radiation translator ng bucket rain gauge analyzer pack flow controller	Yes		/A Data lo Data lo Data lo Data lo Strip cl Compu Moden Printer Zero ai Filter f Surge j UPS Lightni Shelter	egger ogger hart recorder iter n r pump low pump protector ing protection device heater air conditioner	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	No V V V V V V V V V V V V	N/A V	
D	hes the site have the re	ny <u>–</u> mired ar	nd most reco	- ent OC documents :	and report forms?				
	es the site have the re	Prese	nt			Curre	nt		
Station SSRF Site Oj HASP Field C Calibr Ozone Prever	n Log ps Manual Ops Manual ation Reports z/s/p Control Charts ntive maintenance sche		Datavi Jan 20 Jan 20	ew 006					
1 Is 2 A cu	re the Site Status Repo arrent?	ly compl	eted during s being com	pleted and					
3 A	re the chain-of-custod ample transfer to and f	y forms p from lab?	properly use	ed to document					
4 A cu	re ozone z/s/p control urrent?	charts pr	operly com	pleted and	Control charts not u	used			
Provid natura	le any additional expla ll or man-made, that n	nation (p nay affect	ohotograph t the monito	or sketch if necessa oring parameters:	ry) regarding condi	tions listed	above, o	or any other featu	ıres,

Records of the routine checks performed by the state personnel are kept onsite in a logbook.

reported? If yes, how?

Site	ID	WNC429	Technician	Martin Valvur		Site Visit Date 10/12/2017
1	Site ope Has the course?	ration procedures site operator attende If yes, when and who	d a formal CAS instructed?	TNET training	✓	Trained during site installation
2	Has the training	backup operator atte course? If yes, when	nded a formal (and who instru	CASTNET cted?		Trained by site operator
3	Is the sit schedule	e visited regularly on ?	the required T u	ıesday	✓	
4	Are the s flollowed	standard CASTNET of by the site operator?	operational pro	cedures being	✓	
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	geable of, and a	able to perform entation)	✓	

F-02058-1500-S8-rev002

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

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

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

QC	Check Performed		Frequency	Compliant
Mu	lti-point Calibrations		Quarterly	
Au	tomatic Zero/Span Tests			
Ma	nual Zero/Span Tests		Every 2 weeks	
Au	tomatic Precision Level Tests			
Ma	nual Precision Level Test	\checkmark	Every 2 weeks	
An	alyzer Diagnostics Tests			
In-	line Filter Replacement (at inlet)			
In-	line Filter Replacement (at analyze			
Sar	nple Line Check for Dirt/Water			
Zei	o Air Desiccant Check			
1	Do multi-point calibration gases go throug sample train including all filters?	h the	complete	
4	complete sample train including all filters			
3	Are the automatic and manual z/s/p check	s mon	itored and 🗹 Logbook	

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

The ozone analyzer is operated by the state of South Dakota. There is no means for introducing routine test gas at the sample inlet and all routine checks are performed at the back of the analyzer. Audit test gas was introduced through the sample inlet flooding the glass manifold.

Fi	eld Sy	stems Data Forn	1				F-02058-1	500-S9-rev002
Sit	e ID	WNC429 T	echnicia	n Martin Valvur		Site Visit Date	10/12/2017	
	<u>Site ope</u>	eration procedures						
1	Is the fi	lter pack being changed ev	ery Tues	day as scheduled	?⊻	Filter changed morin	nings	
2	Are the correctl	Site Status Report Forms y?	being co	mpleted and filed				
3	Are dat schedul	a downloads and backups ed?	being pe	rformed as		no longer required		
4	Are gen	eral observations being ma	ide and i	recorded? How?				
5	Are site fashion	supplies on-hand and repl ?	enished	in a timely	✓			
6	Are san	ple flow rates recorded? H	low?		✓	SSRF		
7	Are san fashion	ples sent to the lab on a re?	gular scl	hedule in a timely				
8	Are filte and shij	ers protected from contami pping? How?	nation d	uring handling		Gloves not used		
9	Are the operation	site conditions reported re ons manager or staff?	gularly t	to the field				
QC	Check P	erformed	Fi	requency			Compliant	
I	Multi-poi	nt MFC Calibrations	✓ Se	emiannually				
I	Flow Syst	em Leak Checks	v	eekly				
I	Filter Pac	k Inspection						
I	Flow Rate Setting Checks			eekly				
	Visual Check of Flow Rate Rotometer Veek			eekly				
I	n-line Filter Inspection/Replacement			s needed			\checkmark	
5	Sample Li	ine Check for Dirt/Water						
Prov	vide anv a	dditional explanation (pho	togranh	or sketch if neces	sarv	y) regarding conditi	ons listed above, or	any other features

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

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack.

WNC429

F-02058-1500-S10-rev002

Site ID

Techn

Technician Martin Valvur

Site Visit Date 10/12/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H5J	none
DAS	Environmental Sys Co	p 8832	A4868	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0688001767	none
flow rate	Tylan	FC280AV	AW9403023	03379
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
MFC power supply	Tylan	RO-32	FP9404003	03684
Ozone	ThermoElectron Inc	49i A3NAA	0615817056	none
Ozone Standard	ThermoElectron Inc	49i PSA2AB	0807328333	none
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	RM Young	41342	018819	none
Shield (2 meter)	RM Young	43532	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	14264	none
Zero air pump	ThermoElectron Inc	111	111-78387-388	none

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PRK	134-Sandy	Grenville-10/22/2017				
1	10/22/2017	Computer	Dell	07021	Inspiron 15	2884848822
2	10/22/2017	DAS	Campbell	000411	CR3000	2509
3	10/22/2017	Elevation	Elevation	None	1	None
4	10/22/2017	Filter pack flow pump	Thomas	03633	107CAB18	049400004507
5	10/22/2017	Flow Rate	Арех	000656	AXMC105LPMDPCV	illegible
6	10/22/2017	Infrastructure	Infrastructure	none	none	none
7	10/22/2017	Modem	Raven	06460	H4223-C	0808334384
8	10/22/2017	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
9	10/22/2017	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124890
10	10/22/2017	Sample Tower	Aluma Tower	000930	В	AT214072-Z-7-2
11	10/22/2017	Shelter Temperature	Campbell	none	107-L	unknown
12	10/22/2017	Siting Criteria	Siting Criteria	None	1	None
13	10/22/2017	Temperature	RM Young	06306	41342VC	12545
14	10/22/2017	Zero air pump	Werther International	06905	C 70/4	000821907

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2509	PRI	K134 S	Sandy Grenville	10/22/2017	DAS	Primary
Das Date:	10/22/2017	Audit Date	10/22/2017	Mfg	Datel	Parameter	DAS
Das Time:	12:17:01 295	Audit Time_ Audit Day	12:17:01 295	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Chann	el:	High Channe	d:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0	000 0.0000	0.0000	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4996	V	V	0.0000	
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	V	V	0.0000	

Flow Data Form

Mfg Serial Num		ber Ta	Site T		hnician	Site Visit D	te Parameter		Owner ID
Apex	illegible		PRK134	Sa	ndy Grenville	10/22/2017	Flow F	Rate	000656
					Mfg	BIOS	F	Parameter F	low Rate
					Serial Number	103471		fer Desc. ne	exus
					Tfor ID	01420			
					Tier ID	01420		-	
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date		/2017 Co	rrCoff	0.99991
					Mfg BIOS		BIOS Paramet		low Rate
					Serial Number	103424	1	fer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7/	/2017 Co	rrCoff	0.99991
DAS 1.									
DAS 1: DA		DAS 2:	D.C. A. M.C	0/ D !	Cal Factor Z	ero		0	
A AVg % Diff: .	A Max % Di	A AVg %	DII A Max	% D1	Cal Factor F	ull Scale	0.:	90 55	
1.3276	1.52 /0	X . 1/			Kotollieter K				
Desc.	Test type	Input I/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	all PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	1/m	1/m	
primary	tost pt 1	1.526	1.520	1.55	0.000	1.50	1/111 1/m	1/111 1/m	1 3204
primary	test pt 1	1.520	1.520	1.55	0.000	1.50	1/111 1/m	1/111 1/m	-1.32%
primary	test pt 2	1.525	1.520	1.55	0.000	1.50	1/m	1/m	-1.32%
Sensor Compo	onent Leak Tes	t	1.020	Conditio	n	1.00	Statu	s pass	1.5270
Sensor Compo	ment Tubing Co	ondition		Conditio	n Good		Status pass		
Sensor Compo	nent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Compo	nent Rotomete	er Condition	1	Conditio	Clean and dry		Statu	s pass	
Sensor Compo	ment Moisture	Present		Conditio	No moisture p	resent	Statu	s pass	
Sensor Compo	Sensor Component Filter Distance			Conditio	n 4.0 cm		Statu	s pass	
Sensor Compo	onent Filter Dep	oth		Conditio	n 0.5 cm		Statu	s pass	
Sensor Compo	onent Filter Azir	muth		Conditio	n 85 deg		Statu	s pass	
Sensor Compo	onent System M	lemo		Conditio	n		Status	s pass	

Ozone Data Form

Mfg S		Serial N	umber Ta	Site Tec		Sechnician S		Site Visit	t Date	Parame	eter	Owner II	D
ThermoElec	tron Inc	103024	4800	PRK134	Sa	andy Grei	nville	10/22/20	17	Ozone		000690	
Slope: Intercept CorrCoff	()).98190).28944 I.00000	Slope: Intercept CorrCoff	0.00000)))	Mfg Serial N Tfer ID	lumber	ThermoE 51711217 01111	lectron 75	Inc Pa	rameter ozo er Desc. Ozo	one one primary	stan
DAS 1: A Avg % D 1.1	Diff: A M 1%	fax % D 1.7°	DAS 2: i A Avg % %	6Dif A Max 9	% Di	Slope Cert Da	ıte	3/	1.0025 /21/201	0 Inter 7 Corr	rcept ·Coff	0.45	870 000
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 0.45 15.01 35.01 68.02 110.14	Tfer Corr 0.00 14.51 34.46 67.39 109.40		Si 0. 14 34 66 107	ite Si 31 ppb .44 ppb .10 ppb .67 ppb 7.60 ppb		e Unit PctDif		-0.48% -1.04% -1.07% -1.65%	
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good				Status	pass]
Sensor Component 22.5 degree rule			Condition					Status	pass]		
Sensor Co	Sensor Component Inlet Filter Condition		n	Conditio	on Clean				Status	pass]	
Sensor Component Battery Backup			Conditio	on N/A				Status	pass]		
Sensor Co	ompone	nt Offset	t		Conditio	on -0.40				Status	pass		7
Sensor Co	ompone	nt Span		Condit		n 1.020				Status	pass		_ _
Sensor C	ompone	t Zero \		Condit		ion N/A				Status	nass		J T
Sensor C	ompone									Status	pace		
Sensor Co	ompone				Conditio	10n N/A				Status pass			
Sensor Co	ompone	nt Cell A	Freq.		Conditio	on 123.5 kHz			Status		s pass		
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.65 l	om			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 700.6	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	. Tmp.		Conditio	on 35.6 C)			Status	pass]
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 99.9 k	Hz			Status pass			
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 0.3 pp	b			Status	pass		7
Sensor Co	omponei	nt Cell B	Flow		Conditio	on 0.75 l	om			Status pass			-
Sensor Co	omponei	nt Cell B	Pressure		Conditio	701.5	mmHa			Status	pass		J
Sensor C	ompone	nt Cell B	Tmp.		Conditi	on [5			Statue	pass		-
Sensor C	ompone		088		Conditi	Not to	stad			Status	nass]
Sensor Co	omponei		.035		Conditio					Status	4000 		
Sensor Co	ompone	nt Syster	m Memo		Conditio	on				Status	pass		

Temperature Data Form

Mfg	'a Site	Site 7		Fechnician		isit Date	Param	eter	Owner ID		
RM Young	12545	PRK134		Sandy	Grenville	10/22	2/2017	Temper	ature	06306	
				Mfg			h	Pa	rameter Te	mperature	
				Ser	rial Number	H232	H232734 Tf		er Desc. R	D	
		Tfer ID		01227							
DAS 1:		Slo	pe	1.00759 Inter		rcept 0.147					
Abs Avg Err Abs Max Er Abs Avg Err Abs M				ax Er Cert Date			2/4/2017 Corr		rCoff	1.00000	
0.13	0.26										
UseDesc.	Test type	InputTmpRaw	InputTmp	InputTmpCorr. Output		Signal OutputSignall		gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.16	0.01		0.000		0.1		С	0.05	
primary Tem	p Mid Range	25.83	25.4	9	0.000		25.	2	С	-0.26	
primary Tem	p High Range	49.00	48.4	8	0.000		48.	4	С	-0.08	
Sensor Compon	Sensor Component Shield			ition C	Clean			Status	pass		
Sensor Component Blower				ition 🛚	N/A		Status pass		pass		
Sensor Component Blower Status Switch				Condition N/A			Status		s pass		
Sensor Compon	Sensor Component System Memo				Condition				pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	PRK134	Sandy Grenville	10/22/2017	Shelter Temperatur	e none
DAS 1:	DAS 2:		Mfg	Extech	Parameter St	elter Temperatur
Abs Avg ErrAbs0.19	Max Er Abs Avg 0.31	Err Abs Max Er	Serial Number	H232734	Tfer Desc. R	D
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.08	23.75	0.000	23.4	С	-0.31
primary	Temp Mid Range	18.28	18.00	0.000	18.2	С	0.24
primary	Temp Mid Range	23.15	22.83	0.000	22.8	С	0.01
Sensor Con	ponent System Memo)	Condition		Status	pass	

Infrastructure Data For

Site ID	PRK134	Technician Sandy Gr	renville Site Visit Date 10/22/2017
Shelter M	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-11)	640 cuft
and the second second			

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 and guy wires have been replaced.

2 Parameter: SitingCriteriaCom

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

3 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized.

F-02058-1500-S1-rev002

Site ID PRK134	Technician Sandy Grenville	Site Visit Date 10/2	2/2017					
Site Sponsor (agency)	EPA	USGS Map	Perkinstown					
Operating Group	Private	Map Scale						
AQS #	55-119-9991	Map Date						
Meteorological Type	R.M. Young							
Air Pollutant Analyzer	Ozone, PM2.5	QAPP Latitude	45.2066					
Deposition Measurement	dry, wet	QAPP Longitude	-90.5972					
Land Use	woodland - mixed	QAPP Elevation Meters	472					
Terrain	gently rolling	QAPP Declination	1.6					
Conforms to MLM	Yes	QAPP Declination Date	2/22/2006					
Site Telephone		Audit Latitude	45.206525					
Site Address 1	W 10776 CTH M	Audit Longitude	-90.597209					
Site Address 2		Audit Elevation	462					
County	Taylor	Audit Declination	-1.3					
City, State	Medford, WI	Present						
Zip Code	54451	Fire Extinguisher 🗹	new in 2015					
Time Zone	Central	First Aid Kit						
Primary Operator		Safety Glasses						
Primary Op. Phone #		Safety Hard Hat 🛛 🗹						
Primary Op. E-mail		Climbing Belt						
Backup Operator		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Step 🗹						
Shelter Working Room ✓	Make Ekto M	odel 8810 (s/n 2116-11)	Shelter Size 640 cuft					
Shelter Clean	Notes The shelter is clean, neat, and	well organized.						
Site OK	Notes							
Driving Directions From approximate the site	Driving Directions From Medford continue north on 13 approximately 4.5 miles and turn left (west) onto county route M. Continue approximately 13 miles. Before reaching Perkinstown, and just after crossing a small creek and two sharp curves, the site will be visible behind the landowners house on the right.							

PRK134

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 10/22/2017

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

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

Fi	eld Systems Data Form	F-02058-1500-S3-rev00					
Site	PRK134 Technician Sandy Grenville	!	Site Visit Date 10/22/2017				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?	✓	N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?		Mounted to sample tower				
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)						
6	Is the solar radiation sensor plumb?	✓	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A				
8	Is the rain gauge plumb?	✓	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?		N/A				
11	Is it inclined approximately 30 degrees?	✓	N/A				
Pro nat	ovide any additional explanation (photograph or sketch if neco ural or man-made, that may affect the monitoring parameter	essar s:	y) regarding conditions listed above, or any other features,				

r -02030-1300-34-rev002	F-02058-1	500-S4-	rev002
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Site	e ID	PRK134	Technician	Sandy Grenville		Site Visit Date	10/22/2017	
1	Do all the condition	e meterological senso 1, and well maintained	rs appear to be 1?	intact, in good	✓			
2	Are all th reporting	ne meteorological sens g data?	sors operationa	l online, and				
3	Are the s	hields for the tempera	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors worl	king?		✓	N/A		
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	free of		N/A		
6	Is the sur	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7	Are the s condition	ensor signal and pow a, and well maintained	er cables intact 1?	, in good		N/A		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected	✓	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	PRK134	Technician	Sandy Grenville		Site Visit Date 10/22/2017
	Siting C	Criteria: Are the pollut	ant analyzers a	nd deposition equ	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	sample inlets have at lo icted airflow?	east a 270 degree	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?		
3	Are the and 20 i	sample inlets > 1 mete meters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	sition equipment	t operations and	mai	ntenance
1	Do the a condition	analyzers and equipme on and well maintained	ent appear to be 1?	in good	✓	
2	Are the reportir	analyzers and monito ng data?	rs operational, o	on-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 15 meters
4	Describ	e dry dep sample tube	•			3/8 teflon by 15 meters
5	Are in-l indicate	ine filters used in the o e location)	ozone sample lin	e? (if yes		At inlet only
6	Are san obstruc	nple 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	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	y deposition filte	er line, and is it	✓	Clean and dry

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev002				
Sit	e ID	PRK134	Technician	Sandy Grenville		Site Visit l	Date	10/22/2017		
	DAS, se	nsor translators, and j	peripheral equij	oment operation	ns ai	nd maintenanc	<u>:e</u>			
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?	hrough		Met sensors or	nly				
4	Are the well mai	signal connections pro intained?	otected from the	e weather and	✓					
5	Are the	signal leads connected	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 pow	ver source?	✓					
8	Is the in	strument shelter temp	perature control	led?						
9	Is the m	et tower stable and gr	ounded?			Stable		(Grounded	
10	Is the sa	mple tower stable and	l grounded?							
11	Tower c	omments?								

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

The sample tower and guy wires have been replaced.

Field Systems Data Form						F-02058-1500-S7-rev0				
Site ID	PRK134		Technician Sandy Gree		Sandy Grenville	Site Visit Date 10/22/2017				
Document	ation									
Does the si	ite have the requir	ed ins	strument	and	<u>equipment manuals?</u>					
		Yes	No	N/	L Contraction of the second seco		Yes	No	N/A	
Wind speed s	ensor			✓	Data logger			\checkmark		
Wind direction	on sensor			✓	Data logger				\checkmark	
Temperature	sensor	✓			Strip chart re	corder			\checkmark	
Relative hum	idity sensor			✓	Computer					
Solar radiatio	on sensor			✓	Modem			\checkmark		
Surface weth	ess sensor				Printer				\checkmark	
Wind sensor	translator				Zero air pum	p		\checkmark		
Temperature	translator				Filter flow pu	mp		\checkmark		
Humidity sen	sor translator				Surge protect	or			\checkmark	
Solar radiatio	on translator				UPS				\checkmark	
Tipping buck	et rain gauge				Lightning pro	tection device			\checkmark	
Ozone analyz	ær				Shelter heater	•				
Filter pack fl	ow controller	\checkmark			Shelter air co	nditioner				
Filter pack M	IFC power supply									
Does the	site have the requi	ired a	nd most	rece	nt QC documents and rej	port forms?				
		Pres	ent				Currer	nt		

Station Log			\checkmark
SSRF	\checkmark		\checkmark
Site Ops Manual	\checkmark	Feb 2001	
HASP	\checkmark	Fe b 2014	\checkmark
Field Ops Manual	\checkmark	July 1990	
Calibration Reports	\checkmark		\checkmark
Ozone z/s/p Control Charts			
Preventive maintenance schedul			

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

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

Site	ID	PRK134	Technician	Sandy Grenville		Site Visit Date	10/22/2017		
1	Site ope Has the course?	<u>eration procedures</u> site operator attended If yes, when and who	l a formal CAS instructed?	STNET training					
2	Has the training	backup operator atte g course? If yes, when a	nded a formal (and who instru	CASTNET acted?					
3	Is the sit schedule	e visited regularly on t ?	the required T	uesday	✓				
4	Are the s flollowed	standard CASTNET o d by the site operator?	perational pro	cedures being	✓	Channels up during	ozone diagnostics		
5	Is the sit the requ	e operator(s) knowled ired site activities? (in	geable of, and a	able to perform entation)	✓				
	Are regular operational QA/QC checks performed on meteorological instruments?								

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

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

() (Cł	iec	k	P	'eı	for	med
_	_	_					_		

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	Со
✓	Semiannually	
\checkmark	Daily	
\checkmark	As needed	
\checkmark	Daily	
\checkmark	As needed	
\checkmark	Weekly	
\checkmark	Every 2 weeks	
\checkmark	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?

✓	
✓	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

F-02058-1500-S8-rev002

Field Systems Data Form						F-02058-1500-S9-rev0				
Sit	Site ID PRK134 Te		Technicia	Sandy Grenville	;	Site Visit Date	10/22/2017			
	<u>Site ope</u>	ration procedures								
1	Is the fi	lter pack being change	d every Tues	day as scheduled	?⊻	Filter changed mori	nings			
2	Are the Site Status Report Forms being completed and filed correctly?									
3	Are dat schedul	a downloads and backu ed?	ups being per	formed 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 san	ple flow rates recorde	d? How?			SSRF, logbook, call-in				
7	Are san fashion	ples sent to the lab on ?	a regular sch	edule in a timely						
8	Are filte and shij	ers protected from cont oping? How?	tamination du	uring handling	✓	Clean gloves on an	d off			
9	Are the operation	site conditions reporte ons manager or staff?	d regularly to	o the field						
QC	Check P	erformed	Fr	equency			Compliant			
I	Aulti-poi	nt MFC Calibrations	✓ Se	miannually						
I	Flow Syst	em Leak Checks	✓ We	eekly						
I	Filter Pac	k Inspection								
I	Flow Rate Setting Checks					\checkmark				
	Visual Check of Flow Rate Rotometer Weekly					\checkmark				
Ι	n-line Fil	ter Inspection/Replace	ment 🗹 Se	miannually			\checkmark			
5	ample Li	ine Check for Dirt/Wat	ter 🗹 We	ekly			\checkmark			
	• •	1.1.4	(b - f - - - - - b	1 (1 *0						

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

PRK134

F-02058-1500-S10-rev002

Site ID

Techi

Technician Sandy Grenville

Site Visit Date 10/22/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2884848822	07021
DAS	Campbell	CR3000	2509	000411
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	049400004507	03633
Flow Rate	Apex	AXMC105LPMDPC	illegible	000656
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0808334384	06460
Ozone	ThermoElectron Inc	49i A1NAA	1030244800	000690
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124890	000369
Sample Tower	Aluma Tower	В	AT214072-Z-7-2	000930
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12545	06306
Zero air pump	Werther International	C 70/4	000821907	06905

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
STK	TK138-Sandy Grenville-10/25/2017							
1	10/25/2017	Computer	Dell	07022	Inspiron 15	34UMC12		
2	10/25/2017	DAS	Campbell	000349	CR3000	2128		
3	10/25/2017	Elevation	Elevation	None	1	None		
4	10/25/2017	Filter pack flow pump	Thomas	04923	107CAB18	060300019959		
5	10/25/2017	Flow Rate	Арех	000661	AXMC105LPMDPCV	illegible		
6	10/25/2017	Infrastructure	Infrastructure	none	none	none		
7	10/25/2017	Modem	Raven	06603	H4223-C	0844356279		
8	10/25/2017	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321		
9	10/25/2017	Ozone Standard	ThermoElectron Inc	000688	49i A3NAA	1030244817		
10	10/25/2017	Sample Tower	Aluma Tower	03554	А	none		
11	10/25/2017	Shelter Temperature	Campbell	none	107-L	unknown		
12	10/25/2017	Siting Criteria	Siting Criteria	None	1	None		
13	10/25/2017	Temperature	RM Young	06407	41342VC	14040		
14	10/25/2017	Zero air pump	Werther International	06915	C 70/4	000829162		

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial	Number Site	1	Fechnician	Site Visit Date	Parameter	Use Desc.
Campbell	2128	ST	K138	Sandy Grenville	10/25/2017	DAS	Primary
Das Date:	10/25/2017 14:33:00	Audit Date Audit Time	10/25/2017 14:33:00	Mfg	Datel	Parameter	DAS
Das Day:	298	Audit Day	298	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	el:	High Channe	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	1 0.00	0.000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	0.0000	V	V	0.0001	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4995	0.4996	V	V	0.0001	
7	0.7000	0.6994	0.6995	V	V	0.0001	
7	0.9000	0.8993	0.8994	V	V	0.0001	
7	1.0000	0.9992	0.9992	V	V	0.0000	
Flow Data Form

Mfg	Serial Num	ıber Ta	Site	Тес	hnician	Site Visit D	ate Parar	neter	Owner ID
Apex	illegible		STK138	Sa	ndy Grenville	10/25/2017	Flow F	Rate	000661
					Mfg	BIOS	I	Parameter F	ow Rate
					Serial Number	103471			exus
						04.400			
					Tfer ID	01420			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7/2017		rrCoff	0.99991
					Mfg	BIOS	1	Parameter F	ow Rate
					Serial Number	103424]	Ffer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7	/2017 Co	rrCoff [0.99991
DAS 1:		DAS 2:		L	Cal Factor Z	lero	-0.	02	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.	99	
1.75%	1.96%				Rotometer R	leading:	1	1.4	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	ll PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.532	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.533	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.526	1.520	1.50	0.000	1.50	l/m	l/m	-1.32%
Sensor Comp	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dist	ance		Conditio	n 4.5 cm		Statu	s pass	
Sensor Component Filter Depth			Conditio	n 1.5 cm		Statu	s pass		
Sensor Comp	onent Filter Azir	muth		Conditio	n 200 deg		Statu	s pass	
Sensor Comp	onent System M	lemo		Conditio	n		Statu	s pass	

Ozone Data Form

Mfg	S	erial N	umber Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner II	D
ThermoElec	ctron Inc 1	10534	7321	STK138	Sa	andy Grei	nville	10/25/20	017	Ozone		000743	
Slope: Intercept CorrCoff	1.0 -0.0 0.9)1407)6140)9998	Slope: Intercept CorrCoff	0.00000)	Mfg Serial N Tfer ID	umber	ThermoE 5171121 01111	Electron 75	Inc Pa	rameter 02 er Desc. 0	zone zone primary	stan
DAS 1: A Avg % D 1.3	Diff: A Ma 3%	x % D 2.49	DAS 2: i A Avg %	bDif A Max (% Di	Slope Cert Da	ıte	3	1.0025 /21/201	0 Inter 7 Corr	·cept ·Coff	0.458	370 000
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 0.01 15.01 34.93 68.04 110.04	Tfer -0. 14. 34. 67.	Corr 44 51 38 41	Si -0 14 34 68	ite .34 .86 .41 .09	Sit ppb ppb ppb ppb	e Unit	PctDi	2.41% 0.09% 1.01%	
Sensor Co	omponent	Samp	le Train	110.04	Conditio	on Good	11	1.00		Status	pass	1.3070]
Sensor Co Sensor Co Sensor Co	omponent omponent omponent	22.5 d Inlet F Batter	ilter Conditio y Backup	n	Conditio Conditio	on Clean on N/A				Status Status Status	pass pass pass		
Sensor Co	omponent	Offset			Conditio	on 0.40				Status	pass		
Sensor Co Sensor Co	omponent omponent	Span Zero \	/oltage		Conditio	on 1.038				Status Status	pass pass		
Sensor Co	omponent	Fullsc	ale Voltage		Conditio	n N/A				Status	pass		
Sensor Co Sensor Co	omponent omponent	Cell A Cell A	Freq.		Condition Condition	on 108.0	kHz ob			Status Status	pass pass		
Sensor Co	omponent	Cell A	Flow		Conditio	on 0.68 l	om			Status	pass		
Sensor C	omponent	Cell A	Pressure		Conditio)n 691.2	mmHg			Status	pass		
Sensor Co	omponent	Cell A	Tmp. Freg.		Conditio	on 32.0 (C Hz			Status Status	pass]
Sensor Co	omponent	Cell B	Noise		Conditio	on 0.6 pp	b			Status	pass		
Sensor C	omponent	Cell B	Flow		Conditio	on 0.64	om			Status	pass		
Sensor Co	omponent	Cell B	Pressure		Conditio	on 690.6	mmHg			Status	pass		
Sensor Co Sensor Co	omponent omponent	Line L	ımp. .oss		Conditio	on Not te	sted			Status Status	pass pass		
Sensor Co	omponent	Syster	m Memo		Conditio	on				Status	pass		

Temperature Data Form

Mfg	Serial Number	Fa Site	,	Techni	ician	Site V	isit Date/	visit Date Parame		Owner ID	
RM Young	14040	STK138		Sandy	Grenville	10/2	5/2017	Temper	ature	06407	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	H232734		er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	pe		1.0075	9 Inte	rcept	0.14754	
Abs Avg Err Abs Max Er Abs Avg Err Abs Max			Max Er	x Er Cert Date			2/4/201	7 Cor	rCoff	1.00000	1
0.03	0.04										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Ter	np Low Range	0.13	-0.02	2	0.000	0.0		С	0.03		
primary Ter	np Mid Range	25.38	25.04	4	0.000	25.1		1	С	0.03	
primary Ter	np High Range	49.12	48.60	0	0.000		48.	6	С	-0.04	
Sensor Compon	nent Shield		Condi	ition C	Clean			Status	pass		
Sensor Compon	Condi	Condition N/A				Status	pass				
Sensor Compon	Condi	ition 🛚	N/A			Status	pass				
Sensor Compon	ent System Memo		Condi	Condition				Status	s pass		

Shelter Temperature Data For

Mfg Serial Number Ta Site		Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	STK138	Sandy Grenville	10/25/2017	Shelter Temperature	e none
DAS 1:	DAS 2:		Mfg	Extech	Parameter Sh	elter Temperatur
Abs Avg Err Abs	Max Er Abs Avg 1.28	Err Abs Max Er	Serial Number	H232734	Tfer Desc. RT	D
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	22.02	21.71	0.000	22.6	С	0.86	
primary	Temp Mid Range	20.22	19.92	0.000	21.2	С	1.28	
primary	Temp Mid Range	17.61	17.33	0.000	18.5	С	1.18	
Sensor Con	ponent System Memo)	Condition	status pass				

Infrastructure Data For

Site ID	STK138	Technician Sa	andy Grenville	Site Visit Date	10/25/2017	
Shelter Ma	ake	Shelter Model	Shelte	r Size		
Ekto		8810 (s/n 2149-21)) 640 cu	ft		
10 million and the second				520227458265574554574		

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	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: SiteOpsProcedures

The ozone sample train is leak tested every 2 weeks.

2 Parameter: SitingCriteriaCom

The site is located in a corn field on a cattle farm. Corn is planted within 10 meters.

3 Parameter: ShelterCleanNotes

The shelter is somewhat dirty and cluttered. There are signs of leaks on the walls and floor rot.

Field Syste	ms Data Fo	rm

F-02058-1500-S1-rev002

Site ID	STK138	Technician Sandy Grenville		Ð	Site Visit Date 10/25		5/2017		
Site Sponsor	(agency)	EPA			USG	S Map		Kent	
Operating G	roup	Private			Map	Scale			
AQS #		17-085-9	991		Map	Date			
Meteorologic	al Type	R.M. You	ing						
Air Pollutant	Analyzer	Ozone			QAF	P Latitude		42.2872	
Deposition M	leasurement	dry			QAF	P Longitude		-89.9998	
Land Use		agricultur	al		QAF	P Elevation I	Meters	274	
Terrain		rolling			QAF	P Declination	1	1.3	
Conforms to	MLM	Yes			QAF	P Declination	n Date	2/22/2006	
Site Telephor	ne				Aud	it Latitude		42.287216	
Site Address	1	10939 E.	Parker Road		Aud	it Longitude		-89.99995	
Site Address	2				Aud	it Elevation		281	
County		Jo Davie:	SS		Aud	it Declination	L	-1.3	
City, State		Stockton	, IL			I	Present		
Zip Code		61085			Fire	Extinguisher	\checkmark	new in 2015	
Time Zone		Central			First	Aid Kit	\checkmark		
Primary Ope	erator				Safe	ty Glasses			
Primary Op.	Phone #				Safe	ty Hard Hat	\checkmark		
Primary Op.	E-mail				Clin	bing Belt			
Backup Oper	rator				Secu	rity Fence			
Backup Op.	Phone #				Secu	re Shelter			
Backup Op.	E-mail				Stab	le Entry Step	\checkmark		
Shelter Work	xing Room ✓	Make	Ekto	Μ	odel	3810 (s/n 2149	9-21)	Shelter Size 640 cuft	
Shelter Clear	n	Notes	The shelter is a	somewhat dirty	and clu	ttered. There	are signs	of leaks on the walls and floor rot.	
Site OK	\checkmark	Notes							
Driving Diree	Driving Directions From Stockton go south on 78 (Main Street) for approximately 2.5 miles. As the road turns sharply to the right, continue straight onto a dirt road. There will be a stop sign at another dirt road intersection within 100 yards. Continue through that intersection, the site will be visible in the distance on a hill-side to the left. Continue another 1.5 miles bearing to the left on dirt roads to the Evans farm. The site is past both houses in the hay field.								

STK138

F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 10/25/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		\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	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 in a corn field on a cattle farm. Corn is planted within 10 meters.

Sita T			F-02058-1500-S3-rev002					
Site	D STK138 Technician Sandy Grenville		Site Visit Date 10/25/2017					
1 /	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A					
2 A () H t	Are wind sensors mounted so as to minimize tower effects? i.e. wind sensors should be mounted atop the tower or on a norizontally extended boom >2x the max diameter of the ower into the prevailing wind)		N/A					
3 A	Are the tower and sensors plumb?	✓	N/A					
4 <i>I</i>	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?		Mounted to sample tower					
5 A c s s	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 I	s the solar radiation sensor plumb?	✓	N/A					
7 I 1	is it sited to avoid shading, or any artificial or reflected ight?		N/A					
8 I	is the rain gauge plumb?		N/A					
9 I t	is it sited to avoid sheltering effects from buildings, trees, owers, etc?		N/A					
10 I f	s the surface wetness sensor sited with the grid surface acing north?	✓	N/A					
11 I	s it inclined approximately 30 degrees?	✓	N/A					

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

F-02058-1500-S4-rev002

Site	ID	STK138	Technician	Sandy Grenville		Site Visit Date	10/25/2017	
1	Do all the condition	e meterological senso 1, and well maintained	rs appear to be i 1?	intact, in good	✓			
2	Are all th reporting	ne meteorological sens g data?	sors operational	online, and	✓			
3	Are the s	hields for the temper	ature and RH se	ensors clean?	✓			
4	Are the a	spirated motors worl	king?		✓	N/A		
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	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	✓	N/A		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connect aintained?	tions protected	✓	N/A		

Fi	Field Systems Data Form					F-02058-1500-S5-rev002
Site	e ID	STK138	Technician	Sandy Grenville		Site Visit Date 10/25/2017
	Siting C	riteria: Are the pollu	itant analyzers an	d deposition equ	<u>iipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at a contract of the second s	least a 270 degree	arc of	✓	
2	Are the	sample inlets 3 - 15 n	neters above the g	round?	✓	
3	Are the and 20 1	sample inlets > 1 met meters from trees?	t <mark>er from any maj</mark> o	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depo	sition equipment	operations and	mai	ntenance
1	Do the a conditio	analyzers and equipm on and well maintaine	ent appear to be i ed?	in good	✓	
2	Are the reportin	analyzers and moniteng data?	ors operational, or	n-line, and	✓	
3	Describ	e ozone sample tube.				1/4 teflon by 18 meters
4	Describ	e dry dep sample tub	e.			3/8 teflon by 18 meters
5	Are in-li indicate	ine filters used in the location)	ozone sample line	e? (if yes		At inlet only
6	Are sam obstruct	nple lines clean, free o tions?	of kinks, moisture	, and	✓	
7	Is the ze	ero air supply desicca	nt unsaturated?	[✓	
8	Are the	re moisture traps in t	he sample lines?	[✓	Flow line only
9	Is there clean?	a rotometer in the di	ry deposition filter	r line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S6-rev00					
Site	e ID	STK138	Technician	Sandy Grenville		Site Visit I	Date 10/	25/2017			
	DAS, set	nsor translators, and	peripheral equi	pment operation	ns ai	nd maintenance	<u>e</u>				
1	Do the I well mai	DAS instruments appe intained?	ear 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	gnal leads pass (?	through		Met sensors on	lly				
4	Are the well mai	signal connections pro intained?	otected from the	e weather and							
5	Are the	signal leads connected	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 h	ave a stable pow	ver source?	✓						
8	Is the in	strument shelter temp	oerature control	lled?							
9	Is the m	et tower stable and gr	ounded?			Stable		0	Frounded		
10	Is the sa	mple tower stable and	l grounded?								
11	Tower c	omments?									

Field Sy	stems Data	Fo	rm					F-0 2	2058-	1500-	S7-rev00
Site ID	STK138		Tecł	nnician	Sandy Grenville	e	Site Visit Date	10/25/201	7		
Documen	<u>tation</u>										
Does the	site have the requi	red in	<u>strum</u>	ent and	l equipment ma	nuals?					
		Yes	No	N/ .	A			Yes	No	N/A	
Wind speed	sensor			✓	Dat	t <mark>a logg</mark> e	er		\checkmark		
Wind direct	ion sensor			✓	Dat	t <mark>a logg</mark> e	er			\checkmark	
Temperatur	e sensor	\checkmark			Str	ip char	t recorder			\checkmark	
Relative hur	nidity sensor			\checkmark	Cor	mputer					
Solar radiat	ion sensor			\checkmark	Mo	dem			\checkmark		
Surface wet	ness sensor			\checkmark	Pri	nter				\checkmark	
Wind sensor	r translator			\checkmark	Zer	o air p	ump		\checkmark		
Temperatur	e translator			\checkmark	Filt	er flow	pump		\checkmark		
Humidity se	nsor translator			\checkmark	Sur	ge pro	tector				
Solar radiat	ion translator			\checkmark	UP	S					
Tipping buc	ket rain gauge			\checkmark	Lig	htning	protection device			\checkmark	
Ozone analy	zer		\checkmark		She	elter he	ater		\checkmark		
Filter pack f	low controller	\checkmark			She	elter aiı	r conditioner	\checkmark			
Filter pack I	MFC power supply	· 🗌		\checkmark]						
Does the	e site have the requ	ired a	nd m	ost rece	ent QC docume	nts and	l report forms?				
		Pres	sent					Curr	ent		
Station Log		[✓					\checkmark]		
SSRF		[✓					✓]		
Site Ops Ma	nual	[✓	Oct 20 ²	10]		
HASP		[✓	Oct 20	10			[]		
Field Ops M	anual	[✓	July 19	90]		
Calibration	Reports	[]		

7

1 Is the station log properly completed during every site visit? ☑ Minimal information

2 Are the Site Status Report Forms being completed and current?

Ozone z/s/p Control Charts

Preventive maintenance schedul

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

Control charts not used

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

✓

Site	ID STK138 Technician Sandy Grenville		Site Visit Date	10/25/2017	
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?		Trained on site during	g installation	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?				
3	Is the site visited regularly on the required Tuesday schedule?	✓			
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	✓			
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)				

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

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

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

QC	Check	Performed
----	-------	-----------

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

	Frequency	Co
✓	Semiannually	\checkmark
✓	Daily	\checkmark
✓	As needed	\checkmark
✓	Daily	\checkmark
✓	As needed	\checkmark
✓	Weekly	\checkmark
✓	Monthly	\checkmark
	N/A	\checkmark
∕	Weekly	\checkmark
<	Weekly	\checkmark

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

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

 □
 Unknown

 ✓
 Call-in only

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

The ozone sample train is leak tested every 2 weeks.

Compliant

Compliant

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F-02058-1500-S8-rev002

Fi	Field Systems Data Form							F-02058	8-1500-S9-rev002		
Sit	e ID	STK138	Tech	nician	Sandy Grenville		Site Visit Date	10/25/2017			
	<u>Site ope</u>	ration procedures									
1	Is the fi	lter pack being change	ed every	Tuesd	ay as scheduled?		Filter changed vario	ous times			
2	Are the Site Status Report Forms being completed and filed correctly?										
3	Are dat schedul	a downloads and back ed?	ups bein	g perf	ormed 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 san	ple flow rates recorde	ed? How	?			SSRF, call-in				
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 com oping? How?	taminat	ion du	ring handling	✓	Clean gloves on an	d off			
9	Are the operation	site conditions report ons manager or staff?	ed regula	arly to	the field						
QC	Check P	erformed		Fre	quency			Compliant			
I	Multi-poi	nt MFC Calibrations		Sem	niannually			\checkmark			
J	Flow Syst	em Leak Checks	•	✓ Wee	ekly						
J	Filter Pac	k Inspection	[
]	Flow Rate	e Setting Checks	Ŀ	🖊 Wee	ekly			\checkmark			
	Visual Ch	eck of Flow Rate Roto	ometer 🤄	🖌 Wee	ekly			\checkmark			
J	n-line Fil	ter Inspection/Replace	ement [Sem	niannually			\checkmark			
5	Sample Li	ine Check for Dirt/Wa	ter -	✔ Wee	ekly			\checkmark			
Duca	do onvo	dditional auplanation	(nhotog	nonh o	n alzatah if nagaa) nocondina conditi	and listed above	an ann ath an faatanaa		

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STK138

F-02058-1500-S10-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 10/25/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	34UMC12	07022
DAS	Campbell	CR3000	2128	000349
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019959	04923
Flow Rate	Apex	AXMC105LPMDPC	illegible	000661
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844356279	06603
Ozone	ThermoElectron Inc	49i A1NAA	1105347321	000743
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244817	000688
Sample Tower	Aluma Tower	A	none	03554
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14040	06407
Zero air pump	Werther International	C 70/4	000829162	06915

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
ALH	LH157-Sandy Grenville-10/27/2017								
1	10/27/2017	Computer	Dell	07052	Inspiron 15	DB3MC12			
2	10/27/2017	DAS	Campbell	000428	CR3000	2534			
3	10/27/2017	Elevation	Elevation	None	1	None			
4	10/27/2017	Filter pack flow pump	Thomas	06285	107CA18	0990007057			
5	10/27/2017	Flow Rate	Арех	000604	AXMC105LPMDPCV	unknown			
6	10/27/2017	Infrastructure	Infrastructure	none	none	none			
7	10/27/2017	Modem	Raven	06605	H4222-C	0844355805			
8	10/27/2017	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801			
9	10/27/2017	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016			
10	10/27/2017	Sample Tower	Aluma Tower	illegible	В	none			
11	10/27/2017	Shelter Temperature	Campbell	none	107-L	none			
12	10/27/2017	Siting Criteria	Siting Criteria	None	1	None			
13	10/27/2017	Temperature	RM Young	04942	41342	8894			
14	10/27/2017	Zero air pump	Werther International	06910	C 70/4	000829160			

DAS Data Form

DAS Time Max Error:

0

Mfg	Serial Number Site T		Technician	Site Visit Date	Parameter	Use Desc.	
Campbell	2534	AL	H157	Sandy Grenville	10/27/2017	DAS	Primary
Das Date:	10/27/2017	Audit Date	10/27/2017	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	300	Audit Time Audit Day	300	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	el:	High Channe	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.0	0.000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2996	0.2997	V	V	0.0001	
7	0.5000	0.4995	0.4995	V	V	0.0000	
7	0.7000	0.6994	0.6994	V	V	0.0000	
7	0.9000	0.8993	0.8992	V	V	-0.0001	
7	1.0000	0.9992	0.9991	V	V	-0.0001	

Flow Data Form

Mfg	Serial Num	iber Ta	Site	Tec	Technician S		ate Parar	neter	Owner ID
Арех	unknown		ALH157	Sa	ndy Grenville	10/27/2017	Flow F	Rate	000604
					Mfg	BIOS	I	Parameter	low Rate
					Serial Number	103471		Ffer Desc n	exus
						04.400			
					Tfer ID	01420			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7/	/2017 Co	rrCoff	0.99991
					Mfg	BIOS	I	Parameter F	low Rate
					Serial Number	103424]	Ffer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7	/2017 Co	rrCoff	0.99991
DAS 1:		DAS 2:			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0.	99	
1.01%	1.32%				Rotometer R	eading:	1	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	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.516	1.510	1.51	0.000	1.50	l/m	l/m	-0.60%
primary	test pt 2	1.521	1.520	1.51	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.518	1.520	1.51	0.000	1.50	l/m	l/m	-1.12%
Sensor Compo	onent Leak Tes	t		Conditio	n		Statu	s pass	
Sensor Compo	onent Tubing Co	ondition		Conditio	n Good		Statu	s pass	
Sensor Compo	onent Filter Pos	ition		Conditio	n Good		Statu	s pass	
Sensor Compo	onent Rotomete	er Conditior	ı	Conditio	n Clean and dry		Statu	s pass	
Sensor Component Moisture Present				Conditio	n No moisture p	resent	Statu	s pass	
Sensor Component Filter Distance				Conditio	n 2.0 cm		Statu	s pass	
Sensor Component Filter Depth				Conditio	n 3.0 cm		Statu	s pass	
Sensor Component Filter Azimuth				Conditio	n 360 deg	Statu	s pass		
Sensor Compo	onent System M	lemo		Conditio	n Status pass				

Ozone Data Form

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visit	t Date	Parame	ter	Owner II	D
ThermoElec	tron Inc	103024	4801	ALH157	Sa	andy Grer	nville	10/27/20	10/27/2017 Ozo			000695	
Slope: Intercept CorrCoff	(-(().99956).04828).99996	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial Number Tfer ID		ThermoElectron IncPar517112175Tfe01111		rameter ozone er Desc. Ozone primary s		stan	
DAS 1: A Avg % D 0.8	Diff: A N 3%	fax % D 2.1'	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	te	3/	1.0025 /21/201	0 Inter 7 Corr	ccept Coff	0.458	870 000
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 0.30 15.01 35.02 68.10 110.54	Tfer -0. 14. 34. 67. 109	Corr 115 .51 .47 .47 .47 .80	Si -0. 14. 34. 67. 109	ite 70 1 .82 1 .46 1 .78 1 0.40 1	Site ppb ppb ppb ppb ppb	e Unit	PctDiff	2.14% -0.03% 0.46% -0.36%	
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	Conditi	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Condition	on N/A				Status	pass		
Sensor Co	ompone	nt Offset	:		Conditio	on 0.60				Status	pass]
Sensor Co	omponei	nt Span			Conditi	on 1.041				Status	pass		
Sensor Co	ompone	nt Zero	/oltage		Conditio	on N/A				Status	pass		
Sensor Co	ompone	nt Fullsc	ale Voltage		Conditi	on N/A				Status	pass]
Sonsor Co	ompone		Freq		Conditi	69.2 k	H7			Status	nass		
Sensor C	ompone		Noino		Conditio					Status	2000		
Sensor Co	omponei		Flam		Conditio	on 0.0 pp				Status	pass		
Sensor Co	ompone		FIOW		Conditio	on 0.74 I				Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 723.8	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Condition	on 26.5 C	;			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Condition	on 63.1 k	Hz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Condition	on 0.6 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.73 l	om			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Conditio	on 724.1	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		Conditi	on				Status	pass		

Temperature Data Form

Mfg	Serial Number Ta	a Site	7	Techn i	ician	Site V	isit Date/	Param	eter	Owner ID	
RM Young	8894	ALH157		Sandy	Grenville	10/27	7/2017	Temper	ature	04942	
		Mfg			h	Pa	arameter Temperature				
				Ser	rial Number	H2327	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS 2	:		Slo	pe	1.00759 Inte		ercept 0.1475			
Abs Avg Err Abs Max Er Abs Avg Err Abs Ma				ax Er Cert Date			2/4/201	7 Cor	rCoff	1.00000	
0.12	0.16										
UseDesc.	Test type I	nputTmpRaw	InputTmp	nputTmpCorr. OutputTmp			Signal OutputSignalEng		OSE Unit	Difference	
primary Temp	b Low Range	0.14	-0.01	l	0.000	0.1		l	С	0.15	
primary Temp	o Mid Range	25.23	24.89	9	0.000		25.	1	С	0.16	
primary Temp	High Range	47.58	47.08	8	0.000		47.	0	С	-0.05	
Sensor Compone	nt Shield		Condi	ition C	Clean			Status	pass		
Sensor Compone	Condi	Condition N/A				Status	s pass				
Sensor Compone	nt Blower Status St	Condi	Condition N/A				Status	IS pass			
Sensor Compone	nt System Memo		Condi	Condition				Status	IS pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ALH157	Sandy Grenville	10/27/2017	Shelter Temperatu	ire none
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	Shelter Temperatur
Abs Avg Err Abs 0.44 0.44	s Max Er Abs Avg 0.67	Err Abs Max Er	Serial Number	H232734	Tfer Desc.	RTD
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	19.28	18.99	0.000	19.1	С	0.06	
primary	Temp Mid Range	17.71	17.43	0.000	18.1	С	0.67	
primary	Temp Mid Range	17.23	16.95	0.000	17.6	С	0.6	
Sensor Con	ponent System Memo)	Condition	status pass				

Infrastructure Data For

Site ID	ALH157	Technician Sandy	Grenville Site Visit Date 10/27/2017
Shelter I	Make	Shelter Model	Shelter Size
Ekto		8810 (2149-7)	640 cuft
a and a second			

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	Poor	Status	Fail
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 Parameter: SiteOpsProcComm

The backup site operator is not always consistently using gloves to handle the filter pack.

2 Parameter: SitingCriteriaCom

The site is located on a privately operated farm which rotates corn and soy bean crops.

3 Parameter: ShelterCleanNotes

The shelter floor is soft and deteriorating and many tiles are loose. Walls have signs of leaks.

4 Parameter: MetSensorComme

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

Eald Crustomer Date Former	
Field Systems Data Form	

F-02058-1500-S1-rev002

Site ID	ALH157	1157		Technician Sandy Grenville		е	Site Visit I	Date 10/2	7/2017			
			504				S Mon		Pocabontas			
Site Sponsor	(agency)		EPA				is wiap		1 ocanonitas			
Operating Gr	roup		private				Scale					
AQS #			17-119-9991				Map Date					
Meteorological Type			Climatronics									
Air Pollutant Analyzer		r	Ozone				PP Latitude		38.8690			
Deposition M	easurem	ent	dry, wet			QAI	PP Longitude		-89.6229			
Land Use			agricultur	al		QAI	PP Elevation 1	Meters	164			
Terrain			flat			QAI	PP Declination	n	0.9			
Conforms to 2	MLM		Yes				PP Declination	n Date	1/28/2004			
Site Telephon	ie						it Latitude		38.869001			
Site Address 1			Fairview	Road		Aud	it Longitude		-89.622815			
Site Address 2						Aud	it Elevation				164	
County			Madison			Aud	it Declination	L	-1.1			
City, State			Pocahontas, IL				I	Present				
Zip Code			62275				Extinguisher		new in 2015			
Time Zone			Central				t Aid Kit	\checkmark				
Primary Ope	rator					Safe	ty Glasses					
Primary Op.	Phone #					Safe	ty Hard Hat	\checkmark				
Primary Op.	E-mail					Clin	bing Belt	\checkmark				
Backup Oper	ator					Secu	rity Fence					
Backup Op.	Phone #					Secu	re Shelter	\checkmark				
Backup Op.	E-mail					Stab	le Entry Step					
Shelter Work	ting Roor	n⊻	Make	Ekto	Ν	lodel	8810 (2149-7)		Shelter Size	640 cuft		
Shelter Clean	L	✓	Notes	The shelter floo	or is soft and d	eteriora	ing and many	tiles are lo	oose. Walls have	e signs of leaks.		
Site OK			Notes									
Driving Direc	ctions F a A	rom l pprox (fter t bad u	m I-70 take exit 36 (Pokey Road) north to the intersection of route 140. Turn left (west) on route 140 and continue roximately 1.5 miles. Turn left (south) onto CR 5. At the first intersection turn right (west) onto Meffert road. For the road turns left 90 degrees, turn at the first farm on the left. The site is approximately 1/2 mile on the dirt d under the power lines.									

ALH157

F-02058-1500-S2-rev002

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 10/27/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		\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		\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 is located on a privately operated farm which rotates corn and soy bean crops.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	ALH157 Technician Sandy Grenville		Site Visit Date 10/27/2017
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?	✓	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?		N/A
11	Is it inclined approximately 30 degrees?	✓	N/A

natural or man-made, that may affect the monitoring parameters: Met tower removed, temperature mounted in naturally aspirated shield on sample tower.

F-02058-1500-S4-rev002

Site	ID	ALH157	Technician	Sandy Grenville		Site Visit Date	10/27/2017	
						-		
1	Do all the condition	e meterological senso , and well maintained	rs appear to be : 1?	intact, in good	✓			
2	Are all th reporting	ne meteorological sens g data?	sors operational	l online, and				
3	Are the s	hields for the temper	ature and RH s	ensors clean?				
4	Are the a	spirated motors worl	king?		✓	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	grid clean and u	ndamaged?	✓	N/A		
7	Are the s conditior	ensor signal and pow , and well maintained	er cables intact, 1?	, in good	✓	N/A		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected	✓	N/A		

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	ALH157	Technician	Technician Sandy Grenville		Site Visit Date 10/27/2017
	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	sample inlets have at le icted airflow?	east a 270 degre	e arc of		
2	Are the	sample inlets 3 - 15 mo	eters above the	ground?	✓	
3	Are the and 20 1	sample inlets > 1 mete meters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	intenance
1	Do the a conditio	analyzers and equipme on and well maintained	ent appear to be	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 12 meters
5	Are in-l indicate	ine filters used in the o location)	ozone sample lin	ne? (if yes		At inlet only
6	Are sam	ple lines clean, free of tions?	kinks, moisture	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	ALH157	Technician	Sandy Grenville	1	Site Visit Date	e 10/27/201	7		
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns a	nd maintenance				
1	Do the I well mai	DAS instruments appe intained?	ear 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 lightnin	nalyzer and sensor sig g protection circuitry	gnal leads pass (?	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	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 h	ave a stable pow	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	d grounded?							
11	Tower c	omments?				Met tower remove	d			

Field Systems Data	Fo	rm				F-02	058	-1500-	S7-rev	7002
Site ID ALH157		Tech	nician	Sandy Grenville	Site Visit Date	10/27/2017				
Documentation										
Does the site have the requi	red in	strume	ent and	equipment manuals?	_					
	Yes	No	N/ .	4		Yes	No	N/A		
Wind speed sensor			✓	Data logg	er		✓			
Wind direction sensor			✓	Data logg	er			\checkmark		
Temperature sensor	\checkmark			Strip char	rt recorder			\checkmark		
Relative humidity sensor			\checkmark	Computer	t	\checkmark				
Solar radiation sensor			\checkmark	Modem			\checkmark			
Surface wetness sensor			\checkmark	Printer				\checkmark		
Wind sensor translator			\checkmark	Zero air p	oump		\checkmark			
Temperature translator			\checkmark	Filter flow	v pump		\checkmark			
Humidity sensor translator			\checkmark	Surge pro	tector			\checkmark		
Solar radiation translator			\checkmark	UPS						
Tipping bucket rain gauge			\checkmark	Lightning	protection device			\checkmark		
Ozone analyzer		\checkmark		Shelter he	eater		\checkmark			
Filter pack flow controller		\checkmark		Shelter ai	r conditioner	\checkmark				
Filter pack MFC power supply	у 🗌		\checkmark							
Does the site have the requ	uired a	and mo	ost rece	nt QC documents and	l report forms?					
	Pres	sent				Curre	nt			
Station Log		✓				\checkmark				

\checkmark		\checkmark
\checkmark		\checkmark
\checkmark	Oct 2001	\checkmark
\checkmark	Feb 2014	\checkmark
\checkmark	July 1990	\checkmark
\checkmark		\checkmark
	 > ><	 ✓ ✓ ✓ Oct 2001 ✓ Feb 2014 ✓ July 1990 ✓ ✓ ✓

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 ALH157 Technician Sandy Grenville	le Site Visit Date 10/27/2017
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	ng ✔ 1987 at ESE in FL
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	
3	Is the site visited regularly on the required Tuesday schedule?	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	m 🗹

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

QC Check Performed		Frequency
Multipoint Calibrations	\checkmark	N/A
Visual Inspections	\checkmark	N/A
Translator Zero/Span Tests (climatronics)	\checkmark	N/A
Manual Rain Gauge Test	\checkmark	N/A
Confirm Reasonableness of Current Values	\checkmark	N/A
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	
Automatic Zero/Span Tests	✓	Daily	\checkmark
Manual Zero/Span Tests			\checkmark
Automatic Precision Level Tests	\checkmark	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		N/A	\checkmark
Sample Line Check for Dirt/Water	\checkmark	Weekly	\checkmark
Zero Air Desiccant Check			
1 Do multi point colibration gasas go throu	ah tha		

- 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?

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:

F-02058-1500-S8-rev002

Compliant

✓

✓ ✓ ✓ ✓ ✓

Field Systems Data Form					F-02058-1500-S9-rev002				
Site	EID ALH157 Tec	hnician	Sandy Grenville	•	Site Visit Date	10/27/2017			
	Site operation procedures								
1	Is the filter pack being changed every	y Tuesda	ay as scheduled	? ✓	Filter changed mori	nings			
2	Are the Site Status Report Forms be correctly?	ing comj	pleted and filed	✓					
3	Are data downloads and backups bei scheduled?	ing perfo	ormed as		No longer required				
4	Are general observations being made	e and rec	corded? How?	✓	SSRF, logbook				
5	Are site supplies on-hand and replen fashion?	ished in	a timely	✓					
6	Are sample flow rates recorded? How	w?		✓	SSRF, logbook, cal	l-in			
7	Are samples sent to the lab on a regu fashion?	lar sche	dule in a timely	✓					
8	Are filters protected from contamina and shipping? How?	tion dur	ring handling	✓	Clean gloves on and	d off			
9	Are the site conditions reported regu operations manager or staff?	larly to	the field	✓					
QC	Check Performed	Free	quency			Compliant			
N	Iulti-point MFC Calibrations	Sem	niannually						
F	low System Leak Checks	✓ Wee	kly						
F	ilter Pack Inspection								
F	low Rate Setting Checks	✓ Wee	ekly						
V	visual Check of Flow Rate Rotometer	✓ Wee	ekly						
I	n-line Filter Inspection/Replacement	Sem	niannually			\checkmark			
S	ample Line Check for Dirt/Water	✓ Wee	ekly						
Prov	ide any additional explanation (photo	graph o	r sketch if neces	sary	y) regarding conditi	ons listed above, or	any other features,		

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

The backup site operator is not always consistently using gloves to handle the filter pack.

ALH157

F-02058-1500-S10-rev002

Site ID

Techn

Technician Sandy Grenville

Site Visit Date 10/27/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	DB3MC12	07052
DAS	Campbell	CR3000	2534	000428
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0990007057	06285
Flow Rate	Apex	AXMC105LPMDPC	unknown	000604
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0844355805	06605
Ozone	ThermoElectron Inc	49i A1NAA	1030244801	000695
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200016	000440
Sample Tower	Aluma Tower	В	none	illegible
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	8894	04942
Zero air pump	Werther International	C 70/4	000829160	06910

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
VIN140-Sandy Grenville-10/30/2017											
1	10/30/2017	Computer	Dell	07040	Inspiron 15	6K2MC12					
2	10/30/2017	DAS	Campbell	000358	CR3000	2136					
3	10/30/2017	Elevation	Elevation	None	1	None					
4	10/30/2017	Filter pack flow pump	Thomas	04920	107CAB18	060300019956					
5	10/30/2017	Flow Rate	Арех	000465	AXMC105LPMDPCV	43974					
6	10/30/2017	Infrastructure	Infrastructure	none	none	none					
7	10/30/2017	Modem	Raven	06461	V4221-V	0808338875					
8	10/30/2017	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311					
9	10/30/2017	Ozone Standard	ThermoElectron Inc	000546	49i A3NAA	0929938239					
10	10/30/2017	Sample Tower	Aluma Tower	000137	В	none					
11	10/30/2017	Shelter Temperature	Campbell	none	107-L	none					
12	10/30/2017	Siting Criteria	Siting Criteria	None	1	None					
13	10/30/2017	Temperature	RM Young	04687	41342	6701					
14	10/30/2017	Zero air pump	Werther International	06906	C 70/4	000821908					

DAS Data Form

Mfg

Serial Number

Site

DAS Time Max Error:

0 Technician Site Visit Date Parameter Use Desc.

Campbell	2136	VII	N140	Sandy Grenville	10/30/2017	DAS	Primary
Das Date:	10/30/2017	Audit Date	10/30/2017	Mfg	Datel	Parameter	DAS
Das Time:	11:19:52	Audit Time	11:19:52				
Das Day:	303	Audit Day	303	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	el:	High Chann	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.000	00 Intercept	0.00000
0.0001 0.0002 0.0001 0.0002				Cert Date	2/13/20	12 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.000	00 Intercept	0.00000
				Cert Date	1/23/20	17 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0998	0.0999	V	V	0.0001	
7	0.3000	0.2996	0.2998	v v	V	0.0002	
7	0.5000	0.4995	0.4997	v v	V	0.0002	
7	0.7000	0.6994	0.6996	i V	V	0.0002	
7	0.9000	0.8993	0.8994	V	V	0.0001	
7	1.0000	0.9991	0.9993	v	V	0.0002	
Flow Data Form

Mfg	Serial Num	iber Ta	Site	Tec	Technician S		ate Paran	neter	Owner ID
Apex	43974		VIN140	Sa	ndy Grenville	10/30/2017	Flow F	Rate	000465
					Mfg	BIOS	P	arameter Flo	ow Rate
					Serial Number	103471	1	fer Desc. ne	xus
					Tfer ID	01420			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7	/2017 Co	rrCoff	0.99991
					Mfg	BIOS	P	arameter Flo	ow Rate
					Serial Number	103424	 1	fer Desc. Bl	OS cell
					Tfor ID	01410			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7	/2017 Co	rrCoff	0.99991
DAS 1:		DAS 2:			Cal Factor Z	ero	-0.0	12	
A Avg % Diff:	A Max % Di	A Avg %]	Dif A Max	: % Di	Cal Factor F	ull Scale	0.9	79	
0.48%	0.66%				Rotometer R	eading:	1	.5	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.10	0.000	0.09	l/m	l/m	
primary	test pt 1	1.515	1.510	1.52	0.000	1.51	l/m	l/m	-0.13%
primary	test pt 2	1.516	1.510	1.52	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.517	1.510	1.52	0.000	1.50	l/m	l/m	-0.66%
Sensor Compo	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Compo	onent Tubing Co	ondition		Conditio	n Good		Status	pass	
Sensor Compo	onent Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Compo	onent Rotomete	er Conditior	1	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture p	resent	Status	pass	
Sensor Compo	onent Filter Dist	ance		Conditio	n 4.0 cm		Status	pass	
Sensor Compo	onent Filter Dep	oth		Conditio	n 2.0 cm		Status	pass	
Sensor Compo	onent Filter Azir	nuth		Conditio	n 280 deg	Status	pass		
Sensor Compo	onent System M	lemo		Conditio	n		Status	pass	

Ozone Data Form

Mfg	1	Serial N	lumber Ta	Site	Te	chnician		Site Visi	it Date	Param	eter	Owner 1	D
ThermoElec	ctron Inc	110534	7311	VIN140	Sa	andy Grei	nville	10/30/2	017	Ozone		000740	
Slope: Intercept CorrCoff	0 -0 0	.99697 .04294 .99999	Slope: Intercept CorrCoff	0.00000)))	Mfg Serial N Tfer ID	Jumber	ThermoE 5171121 01111	Electron 75	Inc Pa	rameter o	zone Dzone primar	y stan
DAS 1: A Avg % D 0.7	Diff: A M 7%	ax % D	DAS 2: i A Avg %	bDif A Max (% Di	Slope Cert Da	ıte	3	1.0025 3/21/201	0 Inte	rcept rCoff	0.4	5870 2000
UseDes	scription	Co	oncGroup	Tfer Raw	Tfer	Corr	Si	ite	Sit	e Unit	PctDi	fference	
prin	nary		1	0.44	-0.	01	0.	01	ppb				
prin	nary		2	14.99	14.	49	14	.17	ppb			-2.21%	
prin	nary	_	3	35.04	34. 67	49 46	34	.48	ppb			-0.03%	
prin	nary	_	5	110.50	109	40	109	.33	ppo ppb			-0.19%	
Sensor Co	omponen	t Samp	le Train		Conditio	on Good	105			Status	pass	011270	
Sensor Co	omponen	t 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	omponen	t Inlet F	ilter Conditio	n	Conditio	on Clean	1			Status	pass		
Sensor Co	omponen	t Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponen	t Offset	t		Conditio	on 0.10				Status	pass		
Sensor Co	omponen	t Span			Conditio	ndition 1.026				Status	pass		
Sensor Co	omponen	t Zero \	/oltage		Condition N/A					Status	pass		
Sensor Co	omponen	t Fullsc	ale Voltage		Condition N/A					Status	pass		
Sensor Co	omponen	t Cell A	Freq.		Condition 91.2 kHz					Status	pass		
Sensor Co	omponen	t Cell A	Noise		Condition 0.6 ppb					Status	pass		
Sensor Co	omponen	t Cell A	Flow		Condition 0.72 lpm					Status	pass		
Sensor Co	omponen	t Cell A	Pressure		Condition 703.8 mmHg					Status	pass		
Sensor Co	omponen	t Cell A	Tmp.		Conditio	on 29.7 (C			Status	pass		
Sensor Co	omponen	t Cell B	Freq.		Conditio	on 89.6 k	κHz			Status	pass		
Sensor Co	omponen	t Cell B	Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Co	omponen	t Cell B	Flow		Condition 0.71 lpm					Status	pass		
Sensor Co	omponen	t Cell B	Pressure		Conditio	n Not te	ested			Status	pass		
Sensor Co	omponen	t Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Line L	OSS		Conditio	n Not te	ested			Status	pass		
Sensor Co	omponent System Memo			Conditio	on				Status	pass			

Temperature Data Form

Mfg	Serial Number T	a Site	,	Technician		Site V	isit Date	Param	eter	Owner ID	
RM Young	6701	VIN140		Sandy	Grenville	10/30	0/2017	Temper	ature	04687	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	ppe		1.0075	9 Inte	rcept	0.14754	ł
Abs Avg Err Abs Max Er Abs Avg Err Abs Max			Max Er	x Er Cert Date			2/4/201	7 Cor	rCoff	1.00000)
0.08	0.10										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.16	0.01		0.000		0.0)	C	-0.05	
primary Tem	p Mid Range	25.44	25.1	0	0.000		25.	0	С	-0.1	
primary Tem	p High Range	49.32	48.8	0	0.000		48.	7	С	-0.1	
Sensor Compone	ent Shield		Cond	ition C	Clean			Status	pass		
Sensor Component Blower			Cond	Condition N/A				Status	IS pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass		
Sensor Compone	ent System Memo		Cond	Condition				Status	, pass		

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	VIN140	Sandy Grenville	10/30/2017	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg ErrA0.55	Abs Max Er Abs Avg	g Err Abs Max Er	Serial Number	H232734	Tfer Desc. RTD)
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	18.78	18.49	0.000	18.7	С	0.17	
primary	Temp Mid Range	22.79	22.47	0.000	22.1	С	-0.37	
primary	Temp Mid Range	16.58	16.31	0.000	17.4	С	1.1	
Sensor Component System Memo			Condition	Status pass				

Infrastructure Data For

Site ID	VIN140	Technician Sandy G	renville Site Visit Date 10/30/2017
Shelter M	ſake	Shelter Model	Shelter Size
Ekto		8810 (s/n 2116-1)	640 cuft
and the second second			

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 sample tower ground wire is broken.

2 Parameter: SitingCriteriaCom

The site is in an agricultural research center with farm activities adjacent to the site. A train track is approximately 200 meters to the north.

3 Parameter: ShelterCleanNotes

The shelter is in good condition and well maintained, however rot is beginning to form at the bottom of the walls.

4 Parameter: MetSensorComme

The temperature sensor is mounted on the sample tower.

F-02058-1500-S1-rev002

Site ID VIN140	Technician Sandy Grenville	e Site Visit Date 10/3	0/2017					
Site Sponsor (agency)	FΡΔ	USGS Map	Fritchton					
Site Sponsor (agency)		Man Scale						
Operating Group		Map Scale						
AQS #	18-083-9991	Map Date						
Meteorological Type	Climatronics							
Air Pollutant Analyzer	Ozone	QAPP Latitude	38.7406					
Deposition Measurement	dry, wet	QAPP Longitude	-87.4844					
Land Use	agriculture	QAPP Elevation Meters	134					
Terrain	flat	QAPP Declination	4.25					
Conforms to MLM	Yes	QAPP Declination Date	2/23/2006					
Site Telephone		Audit Latitude	38.740792					
Site Address 1	Southwest Purdue Agricultural Center	Audit Longitude	-87.484923					
Site Address 2	4669 North Purdue Road	Audit Elevation	136					
County	Knox	Audit Declination	-2.7					
City, State	Vincennes, IN	Present						
Zip Code	47591	Fire Extinguisher 🗹	New in 2015					
Time Zone	Central	First Aid Kit						
Primary Operator		Safety Glasses						
Primary Op. Phone #		Safety Hard Hat 🗹						
Primary Op. E-mail		Climbing Belt						
Backup Operator		Security Fence						
Backup Op. Phone #		Secure Shelter						
Backup Op. E-mail		Stable Entry Step 🔽						
Shelter Working Room	Make Ekto M	odel 8810 (s/n 2116-1)	Shelter Size 640 cuft					
Shelter Clean	Notes The shelter is in good condition of the walls.	n and well maintained, however	rot is beginning to form at the bottom					
Site OK	Notes							
Driving Directions From Agricu	Vincennes go approximately 3 miles north on route 41. Turn left at the sign for the Southwest Purdue Itural Center. The site is just over the hill on the dirt road to the right.							

VIN140

F-02058-1500-S2-rev002

Site ID

Technician Sandy Grenville

Site Visit Date 10/30/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		\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	200 m	
Limited agricultural operations	200 m	10 m	
Large parking lot	200 m		\checkmark
Small parking lot	100 m		\checkmark
Tree line	50 m		\checkmark
Obstacles to wind	10 times obstacle height		

Siting Distances OK

Siting Criteria Comment

The site is in an agricultural research center with farm activities adjacent to the site. A train track is approximately 200 meters to the north.

Fi	eld Systems Data Form	F-02058-1500-S3-rev002
Site	Technician Sandy	Grenville Site Visit Date 10/30/2017
1	Are wind speed and direction sensors sited so as to a being influenced by obstructions?	void 🗹 N/A
2	Are wind sensors mounted so as to minimize tower of (i.e. wind sensors should be mounted atop the tower horizontally extended boom >2x the max diameter of tower into the prevailing wind)	ffects? N/A or on a f the
3	Are the tower and sensors plumb?	✓ N/A
4	Are the temperature shields pointed north or position avoid radiated heat sources such as buildings, walls,	ned to 🔽 etc?
5	Are temperature and RH sensors sited to avoid unn conditions? (i.e. ground below sensors should be nat surface and not steeply sloped. Ridges, hollows, and standing water should be avoided)	itural 🗹 iral areas of
6	Is the solar radiation sensor plumb?	N/A
7	Is it sited to avoid shading, or any artificial or reflec light?	ed V N/A
8	Is the rain gauge plumb?	N/A
9	Is it sited to avoid sheltering effects from buildings, towers, etc?	rees, 🔽 N/A
10	Is the surface wetness sensor sited with the grid surfacing north?	ace N/A
11	Is it inclined approximately 30 degrees?	✓ N/A

The temperature sensor is mounted on the sample tower.

F-02058-1500-S4-rev002

Site	ID	VIN140	Technician	Sandy Grenville		Site Visit Date	10/30/2017	
1	Do all the condition	e meterological senso a, and well maintained	rs appear to be 1?	intact, in good				
2	Are all the meteorological sensors operational online, and reporting data?							
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓			
4	Are the a	spirated motors worl	king?			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	grid clean and u	indamaged?		N/A		
7	Are the s conditior	ensor signal and pow a, and well maintained	er cables intact 1?	, in good		N/A		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected		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	VIN140	Technician	Sandy Grenville		Site Visit Date 10/30/2017
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition equ	<u>iipn</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?					
	Pollutar	nt analyzers and depos	ition equipmen	t operations and	mai	intenance
1	Do the a conditio	nalyzers and equipme n and well maintained	ent appear to be l?	e in good	✓	
2	Are the reportin	analyzers and monito ng data?	rs operational, o	on-line, and	✓	
3	Describe	e ozone sample tube.				1/4 teflon by 18 meters
4	Describe	e dry dep sample tube				3/8 teflon by 18 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	[°] 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	y deposition filte	er line, and is it		Clean and dry

Field Systems Data Form			F-02058-1500-S6-rev						
Site	e ID	VIN140	Technician	Sandy Grenville		Site Visit Date	10/30/2017	,	
	DAS, se	nsor translators, and j	peripheral equip	oment operation	<u>15 a</u> i	nd maintenance			
1	Do the I well mai	OAS instruments appe intained?	ar to be in good	condition and					
2	Are all t modem,	he components of the backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightning	nalyzer and sensor sig g protection circuitry?	gnal leads pass t	hrough	✓	Met sensors only			
4	Are the well mai	signal connections pro intained?	otected from the	weather and					
5	Are the	signal leads connected	l to the correct l	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato d?	rs, and shelter j	properly	✓				
7	Does the	e instrument shelter ha	ave a stable pow	er source?	✓				
8	Is the in	strument shelter temp	erature control	led?					
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	l grounded?						
11	Tower c	omments?				ground wire broken			

The sample tower ground wire is broken.

Field Sy	stems Data	For	m			F	-02	058-	1500-	S7-rev	v002
Site ID	VIN140		Techni	cian	Sandy Grenville Site Visi	t Date 10/30/	2017				
Document	ation										
Does the s	ite have the requir	ed ins	strument	and	<u>equipment manuals?</u>						
		Yes	No	N/ /	L	Y	es	No	N/A		
Wind speed s	sensor			\checkmark	Data logger			\checkmark			
Wind directi	on sensor			\checkmark	Data logger	L			\checkmark		
Temperature	e sensor		\checkmark		Strip chart recorder				\checkmark		
Relative hum	nidity sensor			\checkmark	Computer			\checkmark			
Solar radiati	on sensor			\checkmark	Modem						
Surface wetn	ess sensor				Printer				\checkmark		
Wind sensor	translator				Zero air pump	V					
Temperature	e translator				Filter flow pump			\checkmark			
Humidity ser	nsor translator				Surge protector						
Solar radiati	on translator				UPS						
Tipping buck	xet rain gauge				Lightning protection	device					
Ozone analyz	zer				Shelter heater			\checkmark			
Filter nack fl	ow controller				Shelter air condition	e r					
Filter pack N	IFC power supply							_			
Does the	site have the requ	ired a	nd most	rece	nt QC documents and report for	<u>ms?</u>					
		Pres	ent			C	urrei	nt			

Station Log	\checkmark		
SSRF	\checkmark		
Site Ops Manual	\checkmark	Feb 2014	
HASP	\checkmark	Feb 2014	
Field Ops Manual	\checkmark	Oct 2001	
Calibration Reports			
Ozone z/s/p Control Charts			
Preventive maintenance schedul			j

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	e ID	VIN140	Technician	Sandy Grenville		Site Visit Date	10/30/2017		
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 the previ	ous site operator	r	
2	Has the training	backup operator atte course? If yes, when	ended a formal (and who instru	CASTNET cted?					
3	Is the site schedule	e visited regularly on ?	the required T	uesday	✓				
4	Are the s flollowed	tandard CASTNET by the site operator	o <mark>perational pro</mark> ?	cedures being	✓				
5	Is the site the requi	e operator(s) knowled ired site activities? (in	dgeable of, and a ncluding 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	N/A	\checkmark
Translator Zero/Span Tests (climatronics)		N/A	\checkmark
Manual Rain Gauge Test	\checkmark	N/A	\checkmark
Confirm Reasonableness of Current Values	\checkmark	N/A	\checkmark
Test Surface Wetness Response	\checkmark	N/A	\checkmark

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

UC Check Periorme	d
--------------------------	---

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**

	rrequency	C
✓	Semiannually	✓
✓	Daily	\checkmark
\checkmark	As needed	✓
\checkmark	Daily	✓
\checkmark	As needed	✓
\checkmark	Weekly	✓
\checkmark	Every 2 weeks	✓
	N/A	✓
\checkmark	Weekly	\checkmark
\checkmark	Weekly	 Image: A start of the start of

- 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
✓	
✓	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

Field Systems Data Form					F-02058-1	500-S9-rev002
Site ID VIN140 Tec	hnician	Sandy Grenville	!	Site Visit Date	10/30/2017	
Site operation procedures						
1 Is the filter pack being changed ever	y Tuesda	ay as scheduled?	<mark>?</mark> 🗸	Filter changed morir	nings	
2 Are the Site Status Report Forms be correctly?	ing comp	pleted and filed	✓			
3 Are data downloads and backups be scheduled?	ing perfo	ormed as		No longer required		
4 Are general observations being made	e and rec	corded? How?	✓	SSRF		
5 Are site supplies on-hand and replen fashion?	ished in	a timely	✓			
6 Are sample flow rates recorded? Ho	w?		✓	SSRF, logbook, call	-in	
7 Are samples sent to the lab on a regulation fashion?	ılar sche	dule in a timely	✓			
8 Are filters protected from contamina and shipping? How?	ation dur	ing handling	✓	Clean gloves on and	d off	
9 Are the site conditions reported regulations manager or staff?	ilarly to 1	the field				
QC Check Performed	Free	quency			Compliant	
Multi-point MFC Calibrations	✓ Sem	iannually				
Flow System Leak Checks	✓ Wee	kly				
Filter Pack Inspection						
Flow Rate Setting Checks	✓ Wee	kly				
Visual Check of Flow Rate Rotometer	✓ Wee	kly				
In-line Filter Inspection/Replacement	✓ Sem	iannually				
Sample Line Check for Dirt/Water	✓ Wee	kly				

VIN140

F-02058-1500-S10-rev002

Site	ID	
~~~~		

Techni

Technician Sandy Grenville

Site Visit Date 10/30/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	6K2MC12	07040
DAS	Campbell	CR3000	2136	000358
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019956	04920
Flow Rate	Apex	AXMC105LPMDPC	43974	000465
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808338875	06461
Ozone	ThermoElectron Inc	49i A1NAA	1105347311	000740
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938239	000546
Sample Tower	Aluma Tower	В	none	000137
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	6701	04687
Zero air pump	Werther International	C 70/4	000821908	06906

# Site Inventory by Site Visit

Site \	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BVL	130-Eric H	ebert-11/09/2017				
1	11/9/2017	СО	Teledyne	000760	T300U	87
2	11/9/2017	Computer	Dell	07073	Inspiron 15	B94MC12
3	11/9/2017	DAS	Campbell	000424	CR3000	2539
4	11/9/2017	Elevation	Elevation	None	1	None
5	11/9/2017	Filter pack flow pump	Thomas	04860	107CAB18	060300019995
6	11/9/2017	Flow Rate	Apex	000595	AXMC105LPMDPCV	illegible
7	11/9/2017	Infrastructure	Infrastructure	none	none	none
8	11/9/2017	Met tower	Climatronics	02738	14 inch taper	none
9	11/9/2017	Modem	Raven	06610	H4223-C	0844355827
10	11/9/2017	Noy	Teledyne	000805	T200U	110
11	11/9/2017	Ozone	ThermoElectron Inc	000739	49i A1NAA	1105347318
12	11/9/2017	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
13	11/9/2017	Precipitation	Climatronics	02704	100508-2	illegible
14	11/9/2017	Relative Humidity	Vaisala	07117	HMP45A	850853
15	11/9/2017	Sample Tower	Aluma Tower	000182	В	unknown
16	11/9/2017	Shelter Temperature	Campbell	none	107-L	unknown
17	11/9/2017	Shield (10 meter)	RM Young	06206	Aspirated 43408	none
18	11/9/2017	Shield (2 meter)	RM Young	06635	Aspirated 43408	none
19	11/9/2017	Siting Criteria	Siting Criteria	None	1	None
20	11/9/2017	SO2	Teledyne	000787	T100U	94
21	11/9/2017	Solar Radiation	Licor	04566	LI-200	PY10653
22	11/9/2017	Solar Radiation Translator	RM Young	04340	70101-X	none
23	11/9/2017	Surface Wetness	RM Young	06153	58101	none
24	11/9/2017	Temperature	RM Young	04690	41342	6704
25	11/9/2017	Temperature2meter	RM Young	06404	41342	14037
26	11/9/2017	Wind Direction	RM Young	04866	AQ05305	58322wdr
27	11/9/2017	Wind Speed	RM Young	04866	AQ05305	58322wsp
28	11/9/2017	Zero air pump	Werther International	06926	PC70/4	000836218

Site V	'isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
29	11/9/2017	Zero air pump	Teledyne	000759	701H	576

## **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial N	umber Site	r	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2539	BVI	L130	Eric Hebert	11/09/2017	DAS	Primary
Das Date:	11/10/2017	Audit Date	11/10/2017	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	9:30:00	Audit Time_ Audit Day	9:30:00 314	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	d:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.000	0.0000	0.0001	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	D V	V	0.0000	
7	0.1000	0.1000	0.1000	0 V	V	0.0000	
7	0.3000	0.3000	0.3000	0 V	V	0.0000	
7	0.5000	0.5000	0.5001	1 V	V	0.0001	
7	0.7000	0.7001	0.7001	1 V	V	0.0000	
7	0.9000	0.9001	0.9001	1 V	V	0.0000	
7	1.0000	1.0001	1.0002	2 V	V	0.0001	

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
Apex	illegible		BVL130	Eri	c Hebert	11/09/2017	Flow R	late	000595
					Mfg	BIOS	P	arameter Flow	v Rate
					Serial Number	122974	Т	fer Desc. BIO	S 220-H
					Tfer ID	01416			
					Slope	1.0	00732 Int	ercept	-0.02202
					Cert Date	3/8	/2017 <b>Co</b>	rrCoff	0.99970
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	0.0	01	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	0.9	94	
2.60%	2.60%				Rotometer R	eading:	1.4	45	
Desc.	Test type	Input l/m	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.02	l/m	l/m	
primary	test pt 1	1.527	1.540	1.61	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.529	1.540	1.61	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 3	1.529	1.540	1.61	0.000	1.50	l/m	l/m	-2.60%
Sensor Compo	onent Leak Tes	st		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	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Compo	onent Filter Dis	tance		Conditio	<b>n</b> 3.0 cm		Status	pass	
Sensor Compo	onent Filter Dep	oth		Conditio	<b>n</b> 3.0 cm		Status	pass	
Sensor Compo	onent Filter Azi	muth		Conditio	n 225 deg		Status	pass	
Sensor Compo	onent System M	/lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	S	erial N	umber Ta	Site	Te	chnician		Site Visi	it Date	Paramo	eter	Owner ]	D
ThermoElec	ctron Inc	110534	7318	BVL130	Er	ic Hebert	:	11/09/2	017	Ozone		000739	
Slope: Intercept CorrCoff	0. -0. 0.	99042 28650 99999	Slope: Intercept CorrCoff	0.00000	) ) )	Mfg Serial N Tfer ID	lumber	Thermole 0517112 01113	Electron	Inc Pa	er Desc.	zone )zone primar	y stan
DAS 1: A Avg % D 1.3	Diff: A Ma	<b>nx % D</b> 1.49	DAS 2: i A Avg %	bDif A Max (	% Di	Slope Cert Da	ıte		1.0050 9/12/201	4 Inter 7 Corr	rcept :Coff	0.32	2915 0000
UseDes prin prin prin prin prin	scription nary nary nary nary nary		I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.35 13.69 37.42 68.36 109.21	Tfer 0.0 13. 36. 67.	Corr 02 29 90 68 33	Si -0. 13 36 66	ite .60 .11 .44 .77	Sit ppb ppb ppb ppb	e Unit	PctDi	fference -1.35% -1.25% -1.34%	
Sensor Co	omponent	Samp	Je Train	107.21	Conditio	n Good	100		ppo	Status	pass	1.5270	
Sensor C	omnonent	22.5 c	learee rule		Conditio	)n				Status	pass		
Sensor C	omponent		ilter Conditio	n	Conditio					Status	nass		
Selisor Co	omponent	Detter			Conditio		l			Status	pass		
Sensor C	omponent	Batter	у васкир		Conditio	on IN/A				Status	pass		
Sensor C	omponent	Offset			Conditio	<b>on</b> 0.10				Status	pass		
Sensor Co	omponent	Span			Conditio	<b>n</b> 1.015				Status	pass		
Sensor C	omponent	Zero \	/oltage		Conditio	on N/A				Status	pass		
Sensor Co	omponent	Fullsc	ale Voltage		Conditio	n N/A				Status	pass		
Sensor Co	omponent	Cell A	Freq.		Conditio	<b>n</b> 106.8	kHz			Status	pass		
Sensor C	omponent	Cell A	Noise		Conditio	on 0.6 pr	b			Status	pass		
Sensor C	omnonent	Cell A	Flow		Conditio	0.661	pm			Status	pass		
Sensor C	omponent		Pressure		Conditio	724.8	mmHa			Status	nass		
Selisor C	omponen		Tmp		Conditio	26.7.0	-			Status	pass		
Sensor Co	omponent		Tmp.		Conditio	on 36.7 (	, 			Status	pass		
Sensor Co	omponent	Cell B	Freq.		Conditio	on 94.5 k	κHz			Status	pass		
Sensor C	omponent	Cell B	Noise		Conditio	<b>on</b> 0.6 pp	b			Status	pass		
Sensor C	omponent	Cell B	Flow		Conditio	on 0.69 l	pm			Status	pass		
Sensor Co	omponent	Cell B	Pressure		Conditio	<b>n</b> 725.4	mmHg			Status	pass		
Sensor C	omponent	Cell B	Tmp.		Conditio	on				Status	pass		
Sensor C	omponent	Line L	.0SS		Conditio	n Not te	ested			Status	pass		
Sensor C	omponent	Syster	m Memo		Conditio	on				Status	pass		
											·		

# Wind Speed Data Form

Mfg	Se	erial Numl	oer Ta	Site		Te	chnician	Site Visit Date	Parameter	Owner I	D
RM Young	58	3322wsp		BVL1	30	Er	ic Hebert	11/09/2017	Wind Speed	04866	
							Mfg Serial Number	RM Young	Paramet	ter wind speed	otor (h
Prop or Cups S Prop or Cups S Prop Correction	SN Torque on Fact	68622 0.0512	0.3 <b>to</b>		0.	4	Tfer ID Slope Cert Date	01262 1.000 1/26/20	00 Intercept 17 CorrCoff	0.00	000
Abs Avg Err	DAS 1 Low R	ange H 0.06	l <mark>igh Rar</mark> 0. 0	lge 00%	DAS 2: Low Ran	ige H	ligh Range				
LisoDescription	. Inr		Innu		Inn	ut m/s	Out V	DAS m/s	Diff/ % Diff	Diff	WeM
primary	1. 111	none	mpt	0	. IIIp	1.175				-0.20	VV 51V1
primary		01262		200		.02	0.0	1.0		0.00	
primary		01262	4	400		2.05	0.0	2.1		0.00	
primary		01262	5	300	4	4.10	0.0	4.1		-0.02	
primary		01262	1	200	(	5.14	0.0	6.1	0.00%		
primary		01262	2	400	1	2.29	0.0	12.3	0.00%		
primary		01262	4	000	2	0.48	0.0	20.5	0.00%		
primary		01262	9	400	4	8.13	0.0	48.1	0.00%		
Sensor Comp	ponent	Condition				Conditio	Good		Status pass		
Sensor Comp	ponent	Prop or Cu	ips Conc	lition		Conditio	Good		Status pass		
Sensor Comp	ponent	Sensor He	ater			Conditio	N/A		Status pass		
Sensor Comp	ponent	Torque				Conditio	on		Status pass		
Sensor Comp	ponent	Sensor Plu	ımb			Conditio	Plumb		Status pass		
Sensor Component System Memo				Conditio	n	Status pass					

### Wind Direction Data Form

primary

Mfg	Serial Number		Site	T		Technician		Site Visit	Date 1	Parar	neter	Owner I	D
RM Young	ng 58322wdr		BVL1	30		Eric Hebert		11/09/201	7	Wind	Direction	04866	
						Mfg		RM Young	)		Parameter	vind direction	
						Serial Nun	nber	None		1	<b>Ffer Desc.</b> ⊻	vind direction v	wheel
						Tfer ID		01458		]			
Vane SN:	N/A	<b>C.</b>	A. Aligi	ı. deg.	true:	Slope		1	.00000	Int	tercept	0.00	000
VaneTorque	10 <b>to</b>	12			180	Cert Date		1,	/1/2017	Co	orrCoff	1.00	000
						Mfg		Ushikata	Pa		Parameter	vind direction	
						Serial Nun	191832			Tfer Desc. transit			
					<b>Tfer ID</b> 01272				]				
						Slope		1	.00000	Int	tercept	0.00	000
						Cert Date		2	/8/2017	Co	orrCoff	1.00	000
	DAS 1:			DAS	2:								
	Orientation	Lineari	ty:	Orier	ntation	Linearity:							
Abs Avg Err	2.0		0.9										
Abs Max Er	3		2										
UseDescriptio	on TferID	]	nput Ra	w I	Linearity	Output V	Outj	out Deg.	Differe	ence	Change	Error	
primary	01458		0			0.000		1		1	43.8	-1.2	
primary	01458		45			0.000		46		1	44.2	-0.7	
primary	01458		90		✓	0.000		91		1	45.2	0.1	
primary	01458		135		$\checkmark$	0.000		136		1	45.5	0.5	

1 0								
primary	01458	180	$\checkmark$	0.000	183	3	46.9	1.8
primary	01458	225	$\checkmark$	0.000	229	4	46.1	1.1
primary	01458	270	$\checkmark$	0.000	273	3	43.8	-1.1
primary	01458	315	$\checkmark$	0.000	318	3	44.5	-0.5
primary	01272	90		0.000	91	1		1
primary	01272	180		0.000	183	3		3
primary	01272	270		0.000	273	3		3
primary	01272	360		0.000	1	1		1
Sensor Compon	ent Condition		Condi	ition Good		Status	pass	
Sensor Compon	ent Mast		Condi	ition Good	Status	pass		
Sensor Compon	ent Sensor Heate	er	Condi	ition N/A		Status	pass	
Sensor Compon	ent Sensor Plum	0	Condi	ition Plumb		Status	pass	
Sensor Compon	ent Torque	Torque		ition			pass	
Sensor Compon	ponent Vane Condition		Condi	ition Good		Status	pass	
Sensor Compon	nsor Component System Memo			ition		Status	pass	

# Temperature Data Form

Mfg	Serial Number Ta	n Site	1	Techn	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
RM Young	6704	BVL130		Eric H	ebert	11/09	9/2017	Temper	ature	04690	
				Mf	g	Extec	h	Pa	rameter Te	mperature	
				Sei	rial Number	H232	679	Tf	er Desc. R	D	
				Tfe	er ID	01228	3				
DAS 1:	DAS 2	:		Slo	pe		1.0065	6 Inte	rcept	-0.03341	1
Abs Avg Err Abs	s Max Er Abs A	Max Er	Ce	rt Date		2/4/201	7 Cor	rCoff	1.00000	כ	
0.13 0.16											
UseDesc.	Test type II	nputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Temp	b Low Range	-0.08	-0.0	5	0.000		0.0	8	C	0.13	
primary Temp	o Mid Range	25.95	25.8	1	0.000		25.7	72	С	-0.09	
primary Temp	High Range	49.12	48.8	3	0.000		48.6	57	С	-0.16	
Sensor Compone	nt Shield		Cond	ition (	Clean			Status	pass		
Sensor Component Blower				Condition Functioning			Status		pass		
Sensor Component Blower Status Switch				Condition N/A				Status	1s pass		
Sensor Compone	Sensor Component System Memo				Condition			Status	s pass		

# 2 Meter Temperature Data Form

Calc. Difference

Mfg	Se	erial Numb	er Ta	Site			Tec	hnicia	in	Site Vis	sit Date	Parame	ter		Owner ID	
RM Young	1	4037		BVL13	0		Eric	c Hebe	ert	11/09/2	2017	Temper	ature2mete	r	06404	
							]	Mfg		Extech		Pa	rameter Te	emp	perature	
							5	Serial	Number	H23267	9	Tf	er Desc. R	TD		
								Tfer I	D	01228						
DAS 1:		D	AS 2:				5	Slope			1.0065	6 Inter	cept		-0.0334	1
Abs Avg Err A	bs M	fax Er A	bs Avg	Err 2	Abs Ma	x Er	•	Cert I	Date		2/4/201	7 Cori	Coff		1.0000	00
0.2		0.28					]									
UseDescription	]	Fest type	Input	TmpRav	v Inpu	ıtTmp	Corre	ected	OutputTm	pSignal	OutputS	SignalEng	g OSE Un	nit	Difference	
primary	Tem	p Low Rang		-0.0	)8			-0.05		0.000		0.2	3 C		0.28	3
primary	Tem	p Mid Rang		25.9	95			25.81		0.000		25.7	2 C		-0.09	)
primary	Tem	p High Rang	5	49.1	2			48.83		0.000		48.6	1 C		-0.22	2
Sensor Compo	nent	Properly Sit	ed			Cond	litior	n Prop	perly sited			Status	pass			
Sensor Compo	nent	Shield				Cond	litior	n Clea	an			Status	pass			
Sensor Compo	nent	Blower				Cond	litior	n Fun	ctioning			Status	pass			
Sensor Compo	nent	Blower Stat	us Swit	ch		Cond	litior	N/A				Status	pass			
Sensor Compo	nent	System Me	no			Cond	litior	n				Status	pass			

# Humidity Data Form

Mfg	Serial Nur	nber Ta	Site		Tech	nician		Site Vis	sit Date	Param	neter	<b>Owner ID</b>	
Vaisala	850853		BVL130		Eric I	Hebert		11/09/2	2017	Relativ	e Humidity	07117	
					M Se	lfg erial Nun	nber	Rotronio	C	P T	arameter Rel	ative Humidi groclip	ty
					Tí	fer ID		01225					
					SI	lope			0.8748	8 Inte	ercept	5.147	95
	DAS 1:		DAS	2:	C	ert Date		1	0/10/201	7 Cor	rCoff	0.994	93
	Low Range	High Ran	ge Low	Range	Hig	h Range							
Abs Avg Err	15.1												
Abs Max Er	24.9												
UseDesc.	Test type	Devic	e Inpu	t RH	GTL	Raw	RH (	Corr.	DAS V	olts	DAS %RH	Difference	e
primary	RH Low Range	Hygroc	clip 3	2.8	36	5.5	32	.8	0.000	)	45.8	13	.0
primary	RH Low Range	Hygroc	clip 5	2.9	57	7.4	52	.9	0.000	)	65.9	13	.0
primary	RH Low Range	Hygroc	clip 7	5.3	76	5.1	75	.3	0.000	)	100.2	24	.9
primary	RH Low Range	Ambie	ent		29	9.8	29	.0	0.000	)	38.6	9	.6
Sensor Com	ponent RH Filter			Con	dition	Clean				Status	pass		
Sensor Com	Sensor Component Shield			Con	dition	Clean				Status	pass		
Sensor Com	ponent Blower			Con	dition	N/A				Status	pass		
Sensor Component Blower Status Switch			Condition N/A					Status	pass				
Sensor Com	Sensor Component System Memo			Conditi		dition				Status	pass		

## Solar Radiation Data Form

Mfg	Serial Numbe	r Ta Site	Т	echni	ician	Site Visit Date	Param	eter O	wner ID
Licor	PY10653	BVL130	I	Eric H	ebert	11/09/2017	Solar R	adiation 04	4566
Mfg SN/Owner ID	RM Young	04340		Mf Ser	g rial Number	Eppley 10765	Pa Ti	arameter solar ra fer Desc. SR trai	adiation
Parameter	Solar Radiation Tra	anslator		Tfe	er ID	01246			
DAS 1: % Diff of Avg	DA %Diff of Max %	AS 2: Diff of Avg %D	iff of Max	Slo Cei	ope rt Date	1.0000 2/10/201	0 Inte 7 Cor	rcept rCoff	0.00000
				Mf Ser Tfe	[°] g rial Number er ID	Eppley 34341F3 01245	Pa Ti	arameter solar ra fer Desc. SR tra	adiation
				Slo	ope rt Date	2/10/201	0 Inte 7 Cor	rcept	0.00000
0.5%	10.40	0.0%	0.00(						
8.5%	10.1%	0.0%	0.0%						
UseDescription	Measure Date	MeasureTime	Tfer Ra	W	Tfer Corr	DAS w/	/m2	PctDifference	·
primary	11/10/2017	10:00	415		415	3/1		-10.69	0
primary	11/10/2017	11:00	540		540	481		-11.09	0
primary	11/10/2017	12:00	5/19		5/19	502		-10.17	<u>/</u>
primary	11/10/2017	14:00	456		456	423		-7.29	<u>/</u>
primary	11/10/2017	15:00	326		326	310		-4.89	ó
primary	11/10/2017	16:00	134		134	138		2.89	ó
Sensor Compo	nent Sensor Clea	n	Condit	tion C	Clean		Status	pass	
Sensor Compo	nent Sensor Leve	I	Condit	tion L	_evel		Status	pass	
Sensor Compo	nent Properly Site	ed	Condit	tion F	Properly sited		Status	pass	
Sensor Compo	Sensor Component System Memo						Status	s pass	

# Precipitation Data Form

Mfg	Serial	Number Ta	Site		Tecl	hnician		Site	Visit Date	Parame	ter	<b>Owner ID</b>
Climatronics	illegibl	e	BVL130		Eric	c Hebert		11/0	09/2017	Precipita	tion	02704
					I	Mfg		PMF	)	Pa	rameter P	recipitation
<b>DAS 1:</b>		<b>DAS 2:</b>			5	Serial Nun	ıber	EW-	06134-50	Tfe	er Desc. 2	50ml graduate
A Avg % Diff	: A Max % ]	Di A Avg %	6 <b>Dif</b> A I	Max % Di		Tfer ID		0125	50			
1.0%	2.0	0%			_						Г	
						Slope			1.0000	0 Inter	cept	0.00000
						Cert Date			9/5/200	5 Corr	Coff	1.00000
		I										
UseDesc.	Test type	TferVolume	Iteration	TimePerT	ip	Eq.Ht	DAS	eng	Eq.HtUnit	OSE Uni	it TferUni	ts PctDifference
primary	test 1	231.5	1	10 sec	_	0.50	0.	51	1n in	1n in	ml	2.0%
primary		231.3		10 sec		0.30	0.	50		- 111		0.0%
Sensor Com	ponent Prop	erly Sited		Cond	litior	tion 45 degree rule				Status	oass	
Sensor Com	ponent Gau	ge Drain Scree	en	Cond	litior	ition Installed				Status	oass	
Sensor Com	ponent Funr	el Clean		Cond	litior	ition Clean				Status	pass	
Sensor Com	ponent Cond	lition		Cond	litior	ition Good				Status	pass	
Sensor Com	ponent Gau	ge Screen		Cond	litior	n Installed				Status	oass	
Sensor Component Gauge Clean C		Cond	litior	tion Clean				Status pass				
Sensor Component Level		Cond	litior	tion Level				Status	oass			
Sensor Com	ponent Sens	or Heater		Cond	litior	tion Functioning				Status	oass	
Sensor Com	ponent Syste	em Memo		Cond	litior	on				Status pass		

## **Surface Wetness Data Form**

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
RM Young	none	BVL130	Eric Hebert	11/09/2017	Surface Wetness	06153
			Mfg	Ohmite	Parameter su	rface wetness
			Serial Number	296-1200	Tfer Desc. de	cade box
			Tfer ID	01210		
			Slope	1.0000	0 Intercept	0.00000
			Cert Date	1/4/201	1 CorrCoff	1.00000

#### Manual Test Pass

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	dry	N/A	0.000	0.01	V	N/A	V
primary	wet	N/A	0.000	1.01	V	N/A	V
Sensor Compor	nent Properly Sited	k	Condition	Properly sited	Sta	tus pass	
Sangan Campa	Grid Clean		Condition	Clean	Sta		
Sensor Compor	Giù Clean			Clean	Sta	us pass	
Sensor Compor	nent Grid Angle		Condition	About 30 deg	Star	Status pass	
Sansan Compos	Grid Orientati	on	Condition	North		Status Dass	
Sensor Compor				Condition		Status pass	
Sensor Compor	Sensor Component Grid Condition		Condition	Condition Good		t <mark>us</mark> pass	
Sonsor Compo	Grid Type		Condition	Grid without bo		nass	
Sensor Compor	lent ond type				Sta	us pass	
Sensor Compor	nent System Memo	0	Condition		Star	tus pass	

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	unknown	BVL130	Eric Hebert	11/09/2017	Shelter Temperatu	renone
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperatur
Abs Avg ErrAb0.27	0.54 0.54	Err Abs Max Er	Serial Number	H232679	Tfer Desc. R	TD
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.66	24.53	0.000	24.0	С	-0.54
primary	Temp Mid Range	25.55	25.42	0.000	25.4	С	-0.07
primary	Temp Mid Range	24.38	24.25	0.000	24.1	С	-0.19
Sensor Component System Memo			Condition		Status	pass	

#### **Infrastructure Data For**

Site ID	BVL130	Technician Eric Heb	ert Site Visit Date 11/09/2017
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810 (s/n 2140-1)	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	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: SiteOpsProcedures

Ozone and NCORE sample line filters are replaced, and the sample lines are leaked tested, every 2 weeks.

#### 2 Parameter: SitingCriteriaCom

The site is located in an agricultural and atmospheric research center. There are crops within 50 meters.

#### 3 Parameter: ShelterCleanNotes

The shelter is somewhat cluttered but is improved since the previous audit visit.

#### 4 Parameter: MetSensorComme

The tipping bucket rain gage is mounted near the meteorological tower and in violation of the 45 degree rule.

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

Site ID BVL130	Technician Eric Hebert	Site Visit Date 11/09	9/2017		
		USCS Mon	Bondville		
Site Sponsor (agency)	EPA	USGS Map	Dondville		
<b>Operating Group</b>	ISWS	Map Scale			
AQS #	17-019-1001	Map Date			
Meteorological Type	Climatronics				
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	40.0520		
<b>Deposition Measurement</b>	dry, wet, Hg	QAPP Longitude	-88.3725		
Land Use	agricultural	<b>QAPP Elevation Meters</b>	212		
Terrain	flat	QAPP Declination	-2.1		
Conforms to MLM	Yes	QAPP Declination Date	9/16/2005		
Site Telephone	(217) 863-2602	Audit Latitude	40.052021		
Site Address 1	Bondville Road Research Station	Audit Longitude	-88.372481		
Site Address 2		Audit Elevation	213		
County	Champaign	Audit Declination	-2.9		
City, State	Seymour, IL	Present			
Zip Code	61875	Fire Extinguisher 🔽	New in 2015		
Time Zone	Central	First Aid Kit			
Primary Operator		Safety Glasses			
Primary Op. Phone #		Safety Hard Hat			
Primary Op. E-mail		Climbing Belt			
Backup Operator		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Step 🔽			
Shelter Working Room ✓	Shelter Working Room Make Ekto Mo		Shelter Size 640 cuft		
Shelter Clean	Notes The shelter is somewhat clutte	red but is improved since the p	revious audit visit.		
Site OK	Notes				
Driving Directions From Champaign take I-57 south to exit 229, route CR 18. Go west on CR 18 approximately 2.5 miles and turn right (north) on CR 500E. Continue approximately 1.7 miles to the Bondville Road Research Center on the left. The site is visible in the field on the right.					

BVL130

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

Site ID

Technician Eric Hebert

Site Visit Date 11/09/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		$\checkmark$
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	50 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 agricultural and atmospheric research center. There are crops within 50 meters.

F 10	eld Sy	stems Data F	orm				F-0205	8-15	00-83-rev	002
Site	e ID	BVL130	Technician	Eric Hebert		Site Visit Date	11/09/2017			
1	Are win being in	nd speed and direction afluenced by obstruction	n sensors sited so ions?	as to avoid						
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)									
3	Are the tower and sensors plumb?									
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?									
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)									
6	Is the so	olar radiation sensor	plumb?							
7	Is it site light?	ed to avoid shading, o	r any artificial o	r reflected						
8	Is the ra	ain gauge plumb?								
9	Is it site towers,	ed to avoid sheltering etc?	effects from buil	dings, trees,		violation of 45 degr	ee rule			
10	Is the su facing n	urface wetness sensor north?	sited with the g	id surface						
11	Is it inc	clined approximately	30 degrees?							

4 = 0 0

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_ _

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

The tipping bucket rain gage is mounted near the meteorological tower and in violation of the 45 degree rule.

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

Site	ID	BVL130	Technician Eric Hebert		Site Visit Date 11/09/2017
1	Do all th condition	e meterological sensor n, and well maintained	s appear to be intact, in good		
2	Are all t reportin	he meteorological sens g data?	ors operational online, and		
3	Are the shields for the temperature and RH sensors clean?				
4	Are the	aspirated motors work	ing?		
5	Is the so scratche	lar radiation sensor's l s?	ens clean and free of		
6	Is the su	rface wetness sensor g	rid clean and undamaged?		
7	Are the s	sensor signal and powe	er cables intact, in good !?		
8	Are the s from the	sensor signal and powe elements and well ma	er cable connections protected intained?		

Provide any additional 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	BVL130 Technician Eric Hebert		Site Visit Date 11/09/2017
	Siting Criteria: Are the pollutant analyzers and deposition eq	luipi	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
	Pollutant analyzers and deposition equipment operations and	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		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, SO2, and CO line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fi	eld Sy	stems Data Fo	orm	F-02058-1500-S6-rev002						
Site	e ID	BVL130	Technician	Eric Hebert		Site Visi	it Date	11/09/2017	7	
	DAS, sei	nsor translators, and p	eripheral equi	pment operation	ns ai	nd maintena	<u>nce</u>			
1	Do the I well mai	OAS instruments appeantained?	ar to be in good	l condition and						
2	Are all t modem,	he components of the l backup, etc)	DAS operation	al? (printers,						
3	Do the a lightning	✓	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	6 Are the DAS, sensor translators, and shelter properly grounded?									
7	Does the instrument shelter have a stable power source?									
8	8 Is the instrument shelter temperature controlled?									
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?								

Field Systems Data	Form	1			<b>F-020</b>	58-1500-S7-rev002
Site ID BVL130	Т	echnician E	Eric Hebert	Site Visit Date	11/09/2017	
<b>Documentation</b>						
Does the site have the requir	ed instru	iment and e	quipment manu	als?		
Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator	Yes         1           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I           ✓         I         I           ✓         I         I         I           ✓         I         I         I           ✓         I         I         I         I           ✓         I         I         I         I           ✓         I         I		Data I Data I Strip o Comp Moder Printe Zero a Filter Surge UPS	ogger ogger chart recorder uter m r ir pump flow pump protector	Yes I □ □ □ □ □ □	No       N/A         Image: Constraint of the state of t
Tipping bucket rain gauge Ozone analyzer Filter pack flow controller Filter pack MFC power supply <u>Does the site have the requi</u>	✓ ( ✓ ( □ ( □ ( red and	■ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Lighti Shelte Shelte	ning protection device r heater r air conditioner <u>and report forms?</u>		
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedu	Present	Nov 2014 Nov 2014	1 1 1		Current	
1 Is the station log properly	complete	ed during ev	very site visit?			
<ol> <li>Are the Site Status Report current?</li> <li>Are the chain-of-custody for sample transfer to and from</li> </ol>	Forms b orms pro n lab?	oeing comple operly used t	eted and to document			

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

Control charts not used

#### BVL130 Technician Eric Hebert Site Visit Date 11/09/2017 Site ID Site operation procedures at ESE in 1986 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

Multipoint Calibrations	$\checkmark$	Semiannually
Visual Inspections	$\checkmark$	Daily
Translator Zero/Span Tests (climatronics)		N/A
Manual Rain Gauge Test	$\checkmark$	Weekly
Confirm Reasonableness of Current Values	$\checkmark$	Weekly
Test Surface Wetness Response	$\checkmark$	Weekly
L'est surface : , ethess Response		

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

	<b>OC</b>	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	Co
✓	Semiannually	
$\checkmark$	Daily	
✓	As needed	
$\checkmark$	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, 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 and NCORE sample line filters are replaced, and the sample lines are leaked tested, every 2 weeks.

### mpliant

## Compliant

 $\checkmark$ 

 $\checkmark$ 

 $\checkmark$ 

 $\checkmark$ 

✓

 $\checkmark$ 

F-02058-1500-S8-rev002

Fi	Field Systems Data Form							F-02058-1500-S9-rev002		
Sit	e ID	BVL130	Techni	ician	Eric Hebert		Site Visit Date	11/09/2017		
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being change	d every T	uesd	ay as scheduled		Filter changed mori	nings		
2	Are the correctl	Site Status Report Foi y?	ms being	com	pleted and filed					
3	Are dat schedul	a downloads and back ed?	ups being	perf	formed as		No longer required			
4	Are gen	eral observations being	g made ar	nd re	corded? How?	✓	SSRF			
5	Are site supplies on-hand and replenished in a timely fashion?									
6	Are sample flow rates recorded? How?				✓	SSRF, call-in				
7	Are samples sent to the lab on a regular schedule in a timely fashion?									
8	Are 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		
I	Multi-poi	nt MFC Calibrations	$\checkmark$	Sem	niannually			$\checkmark$		
I	Flow Syst	em Leak Checks	$\checkmark$	Wee	ekly			$\checkmark$		
I	Filter Pac	k Inspection								
I	Flow Rate	e Setting Checks	$\checkmark$	Wee	ekly			$\checkmark$		
Ţ	Visual Ch	eck of Flow Rate Roto	meter 🗹	Wee	ekly			$\checkmark$		
I	n-line Fil	ter Inspection/Replace	ment	Sen	niannually			$\checkmark$		
5	Sample Li	ine Check for Dirt/Wa	ter 🗹	Wee	əkly			$\checkmark$		
D		dditional annianation	(		n alaatah if maaaa	~ ~ ~ ~ ~	) maganding and iti		an ann ath an factures	

Parameter	Manufacturer	Model	S/N	Client ID
СО	Teledyne	T300U	87	000760
Computer	Dell	Inspiron 15	B94MC12	07073
DAS	Campbell	CR3000	2539	000424
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019995	04860
Flow Rate	Арех	AXMC105LPMDPC	illegible	000595
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	14 inch taper	none	02738
Modem	Raven	H4223-C	0844355827	06610
Noy	Teledyne	T200U	110	000805
Ozone	ThermoElectron Inc	49i A1NAA	1105347318	000739
Ozone Standard	ThermoElectron Inc	49i A3NAA	0922236890	000512
Precipitation	Climatronics	100508-2	illegible	02704
Relative Humidity	Vaisala	HMP45A	850853	07117
Sample Tower	Aluma Tower	В	unknown	000182
Shelter Temperature	Campbell	107-L	unknown	none
Shield (10 meter)	RM Young	Aspirated 43408	none	06206
Shield (2 meter)	RM Young	Aspirated 43408	none	06635
Siting Criteria	Siting Criteria	1	None	None
SO2	Teledyne	T100U	94	000787
Solar Radiation	Licor	LI-200	PY10653	04566
Solar Radiation Translator	RM Young	70101-X	none	04340
Surface Wetness	RM Young	58101	none	06153
Temperature	RM Young	41342	6704	04690
Temperature2meter	RM Young	41342	14037	06404
Wind Direction	RM Young	AQ05305	58322wdr	04866
Wind Speed	RM Young	AQ05305	58322wsp	04866
Zero air pump	Teledyne	701H	576	000759

Technician Eric Hebert

Werther International

PC70/4

000836218

## **Field Systems Data Form**

BVL130

Site ID

Site Visit Sensors

Zero air pump

## F-02058-1500-S10-rev002

06926

Site Visit Date 11/09/2017

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
MA	AC426-Eric Hebert-11/13/2017										
1	11/13/2017	Computer	Hewlett Packard	none	6560 b	5CB1520H70					
2	11/13/2017	DAS	Environmental Sys Corp	3027	8832	A3027					
3	11/13/2017	Elevation	Elevation	None	1	None					
4	11/13/2017	Filter pack flow pump	Thomas	none	107CAB18B	070000012920					
5	11/13/2017	Flow Rate	Tylan	none	FC280	AW02213005					
6	11/13/2017	Infrastructure	Infrastructure	none	none	none					
7	11/13/2017	Met tower	Climatronics	none	illegible	illegible					
8	11/13/2017	MFC power supply	Tylan	03677	RO-32	illegible					
9	11/13/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745085					
10	11/13/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1015543061					
11	11/13/2017	Sample Tower	Aluma Tower	none	В	none					
12	11/13/2017	Shelter Temperature	ARS	60	none	none					
13	11/13/2017	Siting Criteria	Siting Criteria	None	1	None					
14	11/13/2017	Temperature2meter	RM Young	none	41342	15104					
15	11/13/2017	Zero air pump	Werther International	none	PC70/4	606489					

## **DAS Data Form**

DAS Time Max Error: 2.38

Mfg	Serial N	Number Site	]	Fechnician	Site Visit Date	Parameter	Use Desc.
Environmenta	Il Sys A3027	MA	.C426	Eric Hebert	11/13/2017	DAS	Primary
Das Date:	11/13/2017	Audit Date	11/13/2017	Mfg	Datel	Parameter	DAS
Das Time:	9.38.23 317	Audit Time	317	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	l:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.000	02 0.000	0.0002	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
16	0.0000	0.0000	0.0000	) V	V	0.0000	
16	0.1000	0.1000	0.0998	8 V	V	-0.0002	
16	0.3000	0.3000	0.3001	V	V	0.0001	
16	0.5000	0.5001	0.5000	) V	V	-0.0001	
16	0.7000	0.7001	0.7002	2 V	V	0.0001	
16	0.9000	0.9002	0.9003	B V	V	0.0001	
16	1.0000	1.0002	1.0004	V V	V	0.0002	

## Flow Data Form

Mfg	Serial Nu	nber Ta	Site	Те	chnician	Site Visit D	Date Paran	neter	Owner ID
Tylan	AW02213	005	MAC426	Eri	ic Hebert	11/13/2017	7 Flow F	Rate	none
Mfg	Tylan				Mfg	BIOS	P	arameter Flow	v Rate
SN/Owner ID	illegible	03677			Serial Number	122974	Г	fer Desc. BIO	S 220-H
Parameter	MFC power su	pply			Tfer ID	01416			
					Slope	1.0	00732 Int	ercept	-0.02202
					Cert Date	3/8	3/2017 <b>Co</b>	rrCoff	0.99970
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	0.06	65	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale	11.	16	
6.61%	6.61%				Rotometer R	eading:	1	.6	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.15	0.0000	-0.07	l/m	l/m	
primary	leak check	0.000	0.000	-0.14	0.0000	-0.06	l/m	l/m	
primary	test pt 1	1.644	1.650	1.32	0.0000	1.54	l/m	l/m	-6.61%
primary	test pt 2	1.643	1.650	1.32	0.0000	1.54	l/m	l/m	-6.61%
primary	test pt 3	1.638	1.650	1.32	0.0000	1.54	l/m	l/m	-6.61%
Sensor Comp	onent Leak Te	st		Conditio	on		Status	pass	
Sensor Compo	onent Tubing C	Condition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Po	sition		Conditio	Poor		Status	pass	
Sensor Comp	onent Rotomet	er Conditio	า	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	<b>n</b> 6.5 cm		Status	pass	
Sensor Comp	onent Filter De	pth		Conditio	<b>n</b> -3.0 cm		Status	pass	
Sensor Comp	onent Filter Az	imuth		Conditio	n 235 deg		Status	pass	
Sensor Comp	onent System	Vemo		Conditio	on		Status	pass	

## **Ozone Data Form**

Mfg		Serial N	lumber Ta	Site	Те	chnician		Site Visi	t Date	Parame	eter	Owner l	D
ThermoElec	tron Inc	103074	5085	MAC426	Er	ic Hebert		11/13/20	017	Ozone		none	
Slope: Intercept CorrCoff	(	).98285 ).16574 ).99998	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	Electron	Inc Pa	rameter oz er Desc. Oz	one zone primar	y stan
DAS 1: A Avg % D 1.8	<b>Diff: A N</b> 3%	<b>Iax % D</b> 2.4'	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	ıte	9	1.0050 )/12/201	4 Inter 7 Corr	ccept Coff	0.32	2915 0000
UseDes prin prin prin prin prin	acription nary nary nary nary		ncGroup 1 2 3 4 5	Tfer Raw           0.51           14.89           37.93           68.40           108.00	Tfer 0. 14. 37. 67.	Corr 17 .48 .41 .72	Si 0. 14 36 66	ite 09 .83 .82 .57	Sit ppb ppb ppb ppb	e Unit	PctDif	iference           2.42%           -1.58%           -1.70%	
Sensor Co		t Samp	J le Train	108.99	Conditio	on Good	100	5.50	рро	Statue	nass	-1.49%	
Sensor C	ompone	1 22.5 c			Conditio					Status	nass		
Sensor Co	ompone	1 22.50			Conditio					Status	pass		
Sensor Co	ompone	nt Inlet F	-liter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditio	on N/A				Status	pass		
Sensor Co	ompone	nt Offset	t		Conditio	<b>on</b> -0.10				Status	pass		
Sensor Co	ompone	nt Span			Conditio	on 1.009				Status	pass		
Sensor Co	omponei	nt Zero	Voltage		Conditio	on N/A				Status	pass		
Sensor Co	omponei	1t Fullsc	ale Voltage		Conditio	n N/A				Status	pass		_
Songor C	ompono		Freq		Conditi	108 1	kH7			Statue	nass		
Sensor Co	ompone		Naiaa		Condition					Status			
Sensor Co	omponei		INDISE		Conditio	on 0.8 pt	00			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.73 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	<b>on</b> 740.4	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 33.9 0	)			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 85.4 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 0.90 l	pm			Status	pass		_
Sensor Co	- omponei	nt Cell B	Pressure		Conditio	on 739.5	mmHg			Status	pass		
Sensor C	ompone	t Cell B	S Tmp.		Conditi	on	0			Statue	pass		
Songon C			099		Conditi	Not to	eted			Status	nass		
Sensor Co	omponei		.035		Conditio		อเซน			Status	μαοο		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

# 2 Meter Temperature Data Form

**Calc. Difference** 

Mfg	S	erial Numb	er Ta	Site			Tec	hnicia	in	Site Vis	sit Date	Parame	ter	<b>Owner ID</b>	
RM Young	1	5104		MAC42	6		Eric	c Hebe	ert	11/13/2	2017	Tempera	ature2meter	none	
							]	Mfg		Extech		Pa	rameter Ter	nperature	
							5	Serial	Number	H23267	9	Tfe	er Desc. RT	)	
							-	Tfer I	D	01228					
DAS 1:		D	AS 2:				\$	Slope			1.0065	6 Inter	cept	-0.03341	
Abs Avg Err	Abs N	fax Er A	bs Avg	Err A	bs Ma	x Er		Cert I	Date		2/4/201	7 Corr	Coff	1.00000	
0.2		0.25					]								
UseDescription		Fest type	Input	ГтрRaw	/ Inpu	tTmpC	Corre	ected	OutputTm	pSignal	OutputS	SignalEng	OSE Unit	Difference	
primary	Tem	p Low Rang		0.0	7			0.10		0.0000		0.2	5 C	0.15	
primary	Tem	p Mid Rang		26.1	2			25.98		0.0000		25.7	3 C	-0.25	
primary	Tem	p High Rang	5	49.8	0			49.51		0.0000		49.3	0 C	-0.21	
Sensor Compo	nent	Properly Sit	ed			Cond	litior	n Prop	perly sited			Status	pass		
Sensor Compo	nent	Shield				Cond	litior	n Moc	lerately cle	an		Status	pass		
Sensor Compo	nent	Blower				Cond	litior	n Fun	ctioning			Status	pass		
Sensor Compo	nent	Blower Stat	us Swito	ch		Cond	litior	n N/A				Status	pass		
Sensor Compo	nent	System Mer	no			Cond	litior	n				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MAC426	Eric Hebert	11/13/2017	Shelter Temperature	60
DAS 1: Abs Avg Err Ab 0.29	DAS 2: s Max Er Abs Avg 0.51	Err Abs Max Er	Mfg Serial Number Tfer ID Slope	Extech H232679 01228 1.0065	Parameter She         Tfer Desc. RTI         1         6	olter Temperatur
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.06	24.93	0.000	25.4	С	0.51
primary	Temp Mid Range	25.63	25.50	0.000	25.7	С	0.18
primary	Temp Mid Range	25.67	25.54	0.000	25.7	С	0.18
Sensor Component System Memo		)	Condition		Status	pass	

### **Infrastructure Data For**

Site ID	MAC426	Technician Eric Heb	Site Visit Date 11/13/2017
Shelter I	Make	Shelter Model	Shelter Size
custom		N/A	1536 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	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	MAC426	Eric Hebert	11/13/2017	Filter Position	Tylan	4410		

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

### 2 Parameter: SitingCriteriaCom

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

### 3 Parameter: ShelterCleanNotes

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

## F-02058-1500-S1-rev002

Site ID	MAC426		Technician	Eric Hebert		Site Visit I	Date 11/1	3/2017		
Sita Spansor	(aganay)	NPS			US	GS Map		Rhoda		
	(agency)				Ma	n Scale				
Operating G	roup	INP3								
AQS #		21-061-0	501			p Date				
Meteorologic	al Type	Climatron	ics							
Air Pollutant	Analyzer	Ozone, S	O2, NOy, Hg, II	MPROVE, PN	QA	PP Latitude		37.2806		
<b>Deposition</b> M	easurement	dry, wet,	Hg		QA	PP Longitude	:	-86.2639		
Land Use		agricultur	e, woodland - m	ixed	QA	<b>PP Elevation</b>	Meters	236		
Terrain		rolling			QA	PP Declinatio	n	3		
Conforms to	MLM	Marginall	y		QA	PP Declinatio	n Date	12/27/2004		
Site Telephon	ne	(270) 758	-2136		Auc	lit Latitude				37.131794
Site Address	1	Alfred Co	ok Road		Auc	lit Longitude			-	-86.142953
Site Address	2				Auc	lit Elevation				230
County		Edmonso	n		Auc	lit Declinatior	ı	-4.0		
City, State		Smiths G	rove, KY			]	Present			
Zip Code		42171			Fire	e Extinguisher	· 🗸	inspected March	2011	
Time Zone		Eastern			Firs	st Aid Kit	$\checkmark$			
Primary Ope	rator				Saf	ety Glasses				
Primary Op.	Phone #				Saf	ety Hard Hat				
Primary Op.	E-mail				Clin	nbing Belt	$\checkmark$			
Backup Oper	ator				Sec	urity Fence	$\checkmark$			
Backup Op.	Phone #				Sec	ure Shelter	$\checkmark$			
Backup Op.	E-mail				Sta	ble Entry Step				
Shelter Work	ting Room ✓	Make	custom		Model	N/A		Shelter Size	1536 cuft	
Shelter Clean		Notes	The shelter is w	vell maintaine	d, clean	, neat, and wel	I organize	ed.		
Site OK	$\checkmark$	Notes								
Driving Direc	ctions 259, Take Conti	Bowling G or Brownsv the 2nd lef nue straigh	reen go east on ille Road. Cont t past the churc t onto Alfred Cc	31W. Turn I inue approxir h on the left o ook Road. Th	eft (nort nately 1 onto Cha e site w	n) on 442 towa mile, just past jumount Road. ill be on the left	rd Pig. At two churc Then tak t approxim	t the stop sign in F hes (one on each ke the first left onto nately 0.6 miles.	Pig, turn right side of the r Doyle Road	t on route oad). d.

MAC426

## F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 11/13/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		$\checkmark$
City > 50,000 population	40 km	35 km	
City 10,000 to 50,000 population	10 km		$\checkmark$
City 1,000 to 10,000 population	5 km		$\checkmark$
Major highway, airport or rail yard	2 km		$\checkmark$
Secondary road, heavily traveled	500 m		$\checkmark$
Secondary road, lightly traveled	200 m		$\checkmark$
Feedlot operations	500 m		$\checkmark$
Intensive agricultural ops (including aerial spraying)	500 m		$\checkmark$
Limited agricultural operations	200 m	10 m	
Large parking lot	200 m		$\checkmark$
Small parking lot	100 m		$\checkmark$
Tree line	50 m		$\checkmark$
Obstacles to wind	10 times obstacle height	]	

## Siting Distances OK

### **Siting Criteria Comment**

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

Fi	eld Systems Data Form	F-02058-1500-S3-rev002					
Site	e ID MAC426 Technician Eric Hebert		Site Visit Date 11/13/2017				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A				
3	Are the tower and sensors plumb?	✓	N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?						
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)						
6	Is the solar radiation sensor plumb?	✓	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A				
8	Is the rain gauge plumb?		N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A				
11	Is it inclined approximately 30 degrees?	✓	N/A				
Pro nat	ovide any additional explanation (photograph or sketch if nece sural or man-made, that may affect the monitoring parameters	ssar	y) regarding conditions listed above, or any other features,				

## F-02058-1500-S4-rev002

Site	e ID	MAC426	Technician	Eric Hebert		Site Visit Date 11/13/2017
1 2	Do all th condition Are all th	e meterological senso 1, and well maintained 1e meteorological sens 9 data?	rs appear to be 1? sors operationa	intact, in good l online, and	<b>&gt;</b>	2 meter Temperature only 2 meter Temperature only
3	Are the s	shields for the tempera	ature and RH s	ensors clean?	✓	
4	Are the a	spirated motors worl	king?		✓	
5	Is the sol scratches	ar radiation sensor's	lens clean and f	free of		N/A
6	Is the su	rface wetness sensor g	rid clean and u	indamaged?	✓	N/A
7	Are the s condition	ensor signal and pow 1, and well maintained	er cables intact 1?	, in good		
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec iintained?	etions protected		

Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S5-rev002
Site	e ID	MAC426	Technician Eric	Hebert	Site Visit Date 11/13/2017
	Siting C	Criteria: Are the pollut	ant analyzers and de	eposition equip	ment sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	sample inlets have at le icted airflow?	ast a 270 degree arc	e of	
2	Are the	sample inlets 3 - 15 me	eters above the grou	nd?	
3	Are the and 20 i	sample inlets > 1 mete meters from trees?	r from any major o	bstruction, 🗹	
	<u>Pollutar</u>	nt analyzers and deposit	ition equipment ope	rations and ma	aintenance
1	Do the a conditio	analyzers and equipme on and well maintained	nt appear to be in g ?	ood	
2	Are the reportir	analyzers and monitor 1g data?	rs operational, on-lin	ne, and	
3	Describ	e ozone sample tube.			1/4 teflon by 10 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? (i	f yes 🗸	At inlet only
6	Are san obstruc	nple lines clean, free of tions?	kinks, moisture, ar	ıd ✓	
7	Is the ze	ero air supply desiccan	t unsaturated?		
8	Are the	re moisture traps in the	e sample lines?		
9	Is there clean?	a rotometer in the dry	deposition filter lin	e, and is it 🗹	Clean and dry

Fi	eld Sy	stems Data Fo	orm					<b>F-02</b>	058-15	500-S6-rev002
Site	e ID	MAC426	Technician	Eric Hebert		Site Visit	Date	11/13/2017	,	]
	DAS, sei	nsor translators, and p	peripheral equi	pment operation	ns ai	<u>nd maintenan</u>	<u>ce</u>			
1	Do the I well mai	DAS instruments appeaintained?	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?	gnal leads pass (	through	✓	Met sensors o	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 translator cd?	rs, and shelter	properly	✓					
7	Does the	e instrument shelter ha	ave a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	erature control	lled?						
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	I
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?							<u> </u>	

Field Sy	stems Data F	or	m				<b>F-02</b>	058-1	.500-S7-rev002
Site ID	MAC426		Technicia	n Eric H	ebert	Site Visit Date	11/13/2017		
<b>Document</b>	ation								
Does the s	ite have the required	l inst	rument a	nd equip	nent manuals	<u>?</u>			
Wind speed s Wind directi Temperature Relative hun Solar radiati Surface weth Wind sensor Temperature Humidity sen Solar radiati Tipping buck Ozone analyz Filter pack fl	Y sensor on sensor e sensor hidity sensor on sensor ess sensor translator e translator on translator on translator set rain gauge zer ow controller				Data logg Data logg Strip cha Compute Modem Printer Zero air j Filter flor Surge pro UPS Lightning Shelter h Shelter ai	ger ger rt recorder r pump w pump otector g protection devic eater ir conditioner	Yes ✓ □ □ □ □ □ □ □ □ □ □ □ □ □		N/A ↓ ✓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
Filter pack M	IFC power supply								
Does the	site have the require	ed an	id most re	ecent QC	documents an	<u>d report forms?</u>			
	F	rese	nt				Currer	ıt	
Station Log		✓	¹ Data	View2			$\checkmark$		
SSRF		✓							
Site Ops Mai	nual	✓	'						
HASP									
Field Ops Ma	anual								
Calibration 1	Reports	✓	'						
Ozone z/s/p ( Preventive m	Control Charts naintenance schedul								
1 Is the st	ation log properly co	mple	eted durii	ng every s	ite visit? 🔽	DataView			
2 Are the current	Site Status Report F ?	orm	s being co	mpleted a	and 🔽				
3 Are the sample	chain-of-custody for transfer to and from	ms p lab?	oroperly u	sed to do	cument 🔽				
4 Are ozo current	ne z/s/p control char ?	ts pr	operly co	mpleted a	ind 🗌	Control charts not	used		
Provide any and any and any and any and any and any	additional explanation an-made, that may a	on (p ffect	hotograp the moni	h or sketo toring pa	ch if necessary rameters:	) regarding condi	tions listed a	bove, or	any other features,

#### MAC426 Technician Eric Hebert Site Visit Date 11/13/2017 Site ID Site operation procedures Receives training every 6 months during calibration visits 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 Receives training every 6 months during calibration visits $\checkmark$ 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**

Multipo

Visual 1

Transla

Manual

Confirm

**Test Su** 

### Frequency

oint Calibrations	$\checkmark$	Semiannually
Inspections	$\checkmark$	Weekly
tor Zero/Span Tests (climatronics)		N/A
Rain Gauge Test	$\checkmark$	Monthly
n Reasonableness of Current Values	$\checkmark$	Weekly
rface Wetness Response	$\checkmark$	N/A

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

### **QC Check Performed**

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

	Frequency	(
✓	Semiannually	
/	Daily	
/	Monthly	
	Daily	
	N/A	
	Alarm values only	
	Monthly	
	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 monitore 3 reported? If yes, how?

е	✓	
d and		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:

✓

### mpliant

 $\checkmark$ 

✓

✓

 $\checkmark$ 

✓

✓

**Compliant** 

F-02058-1500-S8-rev002

Fi	eld Sy	stems Data Fo	orm				F-02058-1500-S9-rev002				
Sit	e ID	MAC426	Techn	ician	Eric Hebert		Site Visit Date	11/13/2017			
	<u>Site ope</u>	ration procedures									
1	Is the fil	lter pack being change	ed every 7	Tuesda	ay as scheduled?		Filter changed vario	ous times			
2	2 Are the Site Status Report Forms being completed and filed correctly?										
3	Are data schedule	a downloads and back ed?	ups being	g perfo	ormed as		No longer required				
4	Are gen	eral observations bein	g made a	nd ree	corded? How?	✓	SSRF, logbook				
5	Are site supplies on-hand and replenished in a timely fashion?										
6	Are sam	ple flow rates recorde	ed? How?			✓	SSRF				
7	Are sam fashion?	ples sent to the lab on ?	a regula	r sche	dule in a timely						
8	Are filte and ship	ers protected from con pping? How?	taminatio	on dui	ring handling	✓	Clean gloves on an	d off			
9	Are the operation	site conditions reporte ons manager or staff?	ed regula	rly to	the field						
QC	Check Po	erformed		Free	quency			Compliant			
I	Aulti-poir	nt MFC Calibrations	$\checkmark$	Sem	iannually						
I	Flow Syste	em Leak Checks	$\checkmark$	Wee	kly			$\checkmark$			
I	Filter Pack Inspection										
I	Flow Rate Setting Checks										
Ţ	visual Ch	eck of Flow Rate Roto	meter 🔽	Wee	kly			$\checkmark$			
I	n-line Fil	ter Inspection/Replace	ement 🔽	Sem	iannually and as	nee	ded	$\checkmark$			
5	Sample Li	ine Check for Dirt/Wa	ter 🔽	Wee	ekly			$\checkmark$			
Dros	ido ony o	ditional avalanction	(nhotogr	onh o	r skatah if nasas	COPT	) regarding conditi	ions 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:

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

MAC426

## F-02058-1500-S10-rev002

Site ID

Technician Eric Hebert

Site Visit Date 11/13/2017

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H70	none
DAS	Environmental Sys Cor	o 8832	A3027	3027
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	070000012920	none
Flow Rate	Tylan	FC280	AW02213005	none
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	illegible	illegible	none
MFC power supply	Tylan	RO-32	illegible	03677
Ozone	ThermoElectron Inc	49i A3NAA	1030745085	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1015543061	none
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	ARS	none	none	60
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	15104	none
Zero air pump	Werther International	PC70/4	606489	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
GRS420-Eric Hebert-11/15/2017											
1	11/15/2017	Computer	Hewlett Packard	none	6730b	USH01700BY					
2	11/15/2017	DAS	Environmental Sys Corp	none	8832	A4115K					
3	11/15/2017	Elevation	Elevation	None	1	None					
4	11/15/2017	Filter pack flow pump	Thomas	02488	107CAB18	1089005307					
5	11/15/2017	flow rate	Tylan	none	FC280SAV	AW9706012					
6	11/15/2017	Infrastructure	Infrastructure	none	none	none					
7	11/15/2017	Met tower	Rohn	none	unknown	none					
8	11/15/2017	MFC power supply	Tylan	03944	RO-32	FP9605010					
9	11/15/2017	Modem	US Robotics	none	V.92	unknown					
10	11/15/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943903					
11	11/15/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193					
12	11/15/2017	Sample Tower	Aluma Tower	90945	В	none					
13	11/15/2017	Shelter Temperature	ARS	none	none	none					
14	11/15/2017	Siting Criteria	Siting Criteria	None	1	None					
15	11/15/2017	Temperature2meter	RM Young	none	41342	7297					
16	11/15/2017	Zero air pump	Werther International	none	PC70/4	531385					

## **DAS Data Form**

DAS Time Max Error: 0.72

Mfg	Serial Number Site		echnician	Site Visit Date	Parameter	Use Desc.			
Environmenta	al Sys A4115	K GR	S420	Eric Hebert	11/15/2017	DAS	Primary		
Das Date:	11/15/2017	Audit Date	11/15/2017	Mfg	Datel	Parameter	DAS		
Das Time: Das Day:	8.32.00 319	Audit Time Audit Day	8.32.43 319	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:	Slope	1.0000	0 Intercept	0.00000		
0.000	0.00	0.000	00.0001	Cert Date	1/22/201	5 CorrCoff	1.00000		
				Mfg	Fluke Parameter DAS				
				Serial Number	86590148	Tfer Desc.	DVM		
				Tfer ID	01310				
				Slope	1.0000	0 Intercept	0.00000		
				Cert Date	2/23/201	7 CorrCoff	1.00000		
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference			
2	0.0000	0.0000	-0.0001	V	V	-0.0001			
2	0.1000	0.1000	0.0999	V	V	-0.0001			
2	0.3000	0.3000	0.3000	V	V	0.0000			
2	0.5000	0.5001	0.5001	V	V	0.0000			
2	0.7000	0.7001	0.7001	V	V	0.0000			
2	0.9000	0.9002	0.9001	V	V	-0.0001			
2	1.0000	1.0002	1.0002	V	V	0.0000			

## Flow Data Form

Mfg	Serial Nu	mber Ta	Site	Tee	chnician	Site Visit D	ate Paran	neter	Owner ID
Tylan	AW97060	12	GRS420	Eri	ic Hebert	11/15/2017	flow ra	te	none
Mfg	Tylan				Mfg	BIOS	P	arameter Flov	v Rate
SN/Owner ID	FP9605010	03944			Serial Number	122974	Г	fer Desc. BIO	S 220-H
Parameter	MFC power su	ipply			Tfer ID	01416			
					Slope	1.0	00732 Int	ercept	-0.02202
					Cert Date	3/8	/2017 <b>Co</b>	rrCoff	0.99970
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale		0	
0.24%	0.46%				Rotometer R	eading:	3.0	05	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.42	0.0000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.41	0.0000	0.00	l/m	l/m	
primary	test pt 1	3.014	3.010	2.38	0.0000	3.01	l/m	l/m	-0.13%
primary	test pt 2	3.014	3.010	2.38	0.0000	3.01	l/m	l/m	-0.13%
primary	test pt 3	3.015	3.020	2.38	0.0000	3.01	l/m	l/m	-0.46%
Sensor Comp	onent Leak Te	st		Conditio	n		Status	pass	
Sensor Compo	onent Tubing (	Condition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Po	sition		Conditio	n Poor		Status	pass	
Sensor Comp	onent Rotomet	er Conditio	n	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture pr	resent	Status	pass	
Sensor Comp	onent Filter Dis	stance		Conditio	<b>n</b> 5.0 cm		Status	pass	
Sensor Comp	onent Filter De	pth		Conditio	<b>n</b> -0.5 cm		Status	pass	
Sensor Comp	onent Filter Az	imuth		Conditio	n 270 deg		Status	pass	
Sensor Comp	onent System	Memo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	102394	3903	GRS420	Er	ric Hebert		11/15/20	017	Ozone		none	
Slope: Intercept CorrCoff	(	1.00748 ).18955 1.00000	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	Electron 167	Inc Pa	rameter ozo er Desc. Oz	one one primar	y stan
DAS 1: A Avg % D 1.0	Diff: A M	<b>Iax % D</b> 1.2°	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9	1.0050 )/12/201	4 Inter 7 Corr	ccept Coff	0.32	2915 0000
UseDes prin prin prin prin prin	cription nary nary nary nary nary		DINCGROUP 1 2 3 4 5	Tfer Raw -0.07 15.40 35.05 67.11 106.07	Tfer -0. 14 34 66 105	Corr 39 .99 .54 .44 5.21	Si -0. 15 34 67 106	ite 03 .10 .95 .17 5.20	Sit ppb ppb ppb ppb ppb	e Unit	PctDiff	Cerence           0.73%           1.19%           1.10%           0.94%	
Sensor Co	ompone	nt Samp	le Train	1	Conditi	on Good				Status	pass		
Sensor Co	ompone	nt 22.5 c	legree rule		Condition	on				Status	pass		
Sensor Co	ompone	nt Inlet F	Filter Conditio	n	Condition	on Clean				Status	pass		
Sensor Co	ompone	nt Batter	y Backup		Conditi	on N/A				Status	pass		
Sensor Co	omponei	nt Offset	t		Conditi	on 0.000				Status	pass		
Sensor Co	omponei	nt Span			Conditio	on 1.010				Status	pass		
Sensor Co	ompone	at Zero \	/oltage		Conditio	on N/A				Status	pass		
Sensor C	ompone				Conditi	$\frac{N}{\Delta}$				Status	nass		
Sensor C	ompone		Erog		Conditio		,⊔→			Status	2000		
Sensor Co	omponei				Conditio	on 07.7 r				Status	pass		
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.9 pp	DD			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Condition	on 0.67 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 685.5	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 33.0 0	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 94.8 k	κHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditi	on 0.6 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.70 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 684.6	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	sted			Status	pass		
Sensor Co	ompone	nt Svste	m Memo		Conditi	on				Status	pass		
										2 June Park	·		

# 2 Meter Temperature Data Form

**Calc. Difference** 

Mfg	Serial Numbe	er Ta Site	T	Fechnicia	n	Site Vis	it Date	Paramete	er	Owner ID
RM Young	7297	GRS420		Eric Hebe	ert	11/15/2	2017	Temperati	ure2meter	none
				Mfg		Extech		Para	meter Tem	perature
				Serial	Number	H23267	9	Tfer	Desc. RTD	
				Tfer I	D	01228				
DAS 1:	DA	AS 2:		Slope			1.00656	Interco	ept	-0.03341
Abs Avg Err	Abs Max Er Al	os Avg Err Al	os Max Er	Cert I	Date		2/4/2017	CorrC	off	1.00000
0.22	0.3									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputSi	gnalEng	OSE Unit	Difference
primary	Temp Low Rang	-0.09		-0.06		0.0000		0.24	С	0.3
primary	Temp Mid Rang	25.99		25.85		0.0000		25.72	С	-0.13
primary	Temp High Rang	48.72		48.44		0.0000		48.22	С	-0.22
Sensor Compo	nent Properly Site	ed	Condi	tion See	comments			Status pa	ass	
Sensor Compo	nent Shield		Condi	tion Clea	an			Status pa	ass	
Sensor Compo	nent Blower		Condi	tion Fun	ctioning			Status Pa	ass	
Sensor Component Blower S		atus Switch Cor		ondition N/A				Status Pa	ass	
Sensor Compo	nent System Men	no	Condi	tion				Status Pa	ass	

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
ARS	none	GRS420	Eric Hebert	11/15/2017	Shelter Temperatu	renone
DAS 1:	DAS 2:		Mfg	Extech	Parameter S	helter Temperatur
Abs Avg Err 1.05	Abs Max Er Abs Avg 1.65	g Err Abs Max Er	Serial Number	H232679	Tfer Desc. R	TD
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	21.10	21.00	0.000	22.4	С	1.4	
primary	Temp Mid Range	22.30	22.19	0.000	22.1	С	-0.1	
primary	Temp Mid Range	24.85	24.72	0.000	23.1	С	-1.65	
Sensor Component System Memo			Condition	Status pass				

### **Infrastructure Data For**

Site ID	GRS420	Technician Eric Heb	ert Site Visit Date 11/15/2017
Shelter M	<b>/lake</b>	Shelter Model	Shelter Size
Ekto		8810 (s/n 2961-1)	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	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	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	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	
Temperature2meter	GRS420	Eric Hebert	11/15/2017	Properly Sited	RM Young	4413			
The lower (two meter temperature sensor) shield is not mounted at 2 meters above the ground as stated in the QAPP.									

# **Field Systems Comments**

### 1 Parameter: SiteOpsProcedures

The ozone sample train is leak-tested each week after the inlet filter is changed.

### 2 Parameter: SitingCriteriaCom

The site is located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.

### 3 Parameter: MetSensorComme

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground.

### 4 Parameter: ShelterCleanNotes

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

## F-02058-1500-S1-rev002

Site ID GRS420	Technician Eric Hebert	Site Visit Date 11/1	5/2017				
Site Sponsor (agency)	NPS	USGS Map	Blockhouse				
One optime Crown	NDS	Man Scale					
Operating Group		Man Data					
AQS #	47-009-0101	Map Date					
Meteorological Type	R.M. Young						
Air Pollutant Analyzer	Ozone, Hg, SO2, NOx, PM2.5, PM10,	QAPP Latitude	35.6331				
<b>Deposition Measurement</b>	dry	QAPP Longitude	-83.9422				
Land Use	woodland - mixed	<b>QAPP Elevation Meters</b>	793				
Terrain	complex (ridge-top)	QAPP Declination					
Conforms to MLM	No	QAPP Declination Date					
Site Telephone		Audit Latitude	35.633482				
Site Address 1	Look Rock	Audit Longitude	-83.941606				
Site Address 2	Foothills Parkway	Audit Elevation	801				
County	Blount	Audit Declination	5.5				
City, State	Maryville, TN	Present					
Zip Code	37803	Fire Extinguisher 🗹	inspected Aug 2017				
Time Zone	Eastern	First Aid Kit					
Primary Operator		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat 🗹					
Primary Op. E-mail		Climbing Belt					
<b>Backup Operator</b>		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Step 🔽					
Shelter Working Room	Make Ekto M	odel 8810 (s/n 2961-1)	Shelter Size   640 cuft				
Shelter Clean	Notes The shelter is in good condition	n, clean, neat, and well organiz	ed.				
Site OK	Notes						
Driving Directions From Maryville proceed east on 321 and turn right (south) onto the Foothills Parkway. Continue approximately 11 miles. Just before reaching the Look Rock parking area and trail, turn right on a gravel road through a locked NPS gate. The site is approximately 200 meters up the trail on the right.							

GRS420

## F-02058-1500-S2-rev002

Site ID

Technician Eric Hebert

Site Visit Date 11/15/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km	35 km	
City 10,000 to 50,000 population	10 km		
City 1,000 to 10,000 population	5 km		
Major highway, airport or rail yard	2 km		
Secondary road, heavily traveled	500 m		
Secondary road, lightly traveled	200 m		$\checkmark$
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		
Small parking lot	100 m		$\checkmark$
Tree line	50 m	20 m	
Obstacles to wind	10 times obstacle height		

Siting Distances OK

### **Siting Criteria Comment**

The site is located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.
Fi	eld Systems Data Form		F-02058-1500-S3-rev002			
Site	GRS420 Technician Eric Hebert	Site Visit Date 11/15/2017				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A			
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A			
3	Are the tower and sensors plumb?	✓	N/A			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓				
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)					
6	Is the solar radiation sensor plumb?	✓	N/A			
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A			
8	Is the rain gauge plumb?	✓	N/A			
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A			
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A			
11	Is it inclined approximately 30 degrees?	✓	N/A			
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,			

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground.

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

Site	e ID	GRS420	Technician Eric Hebert		Site Visit Date 11/15/2017
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?				✓	
2	2 Are all the meteorological sensors operational online, and reporting data?				
3	Are the s	shields for the tempera	nture and RH sensors clean?	✓	
4	Are the a	aspirated motors work	ing?	✓	
5	Is the sol scratches	lar radiation sensor's l s?	ens clean and free of	✓	N/A
6	Is the su	rface wetness sensor g	rid clean and undamaged?		N/A
7	Are the s condition	sensor signal and powe n, and well maintained	er cables intact, in good !?	✓	
8	Are the s from the	sensor signal and powe elements and well ma	er cable connections protected intained?	✓	

Field Systems Data Form					F-02058-1500-S5-rev002			
Site	e ID	GRS420	Technician	Eric Hebert		Site Visit Date 11/15/2017		
	Siting C	Criteria: Are the pollut	ant analyzers an	d deposition eq	uipr	nent sited in accordance with 40 CFR 58, Appendix E		
1	Do the s unrestri	sample inlets have at le icted airflow?	east a 270 degree	arc of				
2	Are the	sample inlets 3 - 15 mo	eters above the g	ground?	✓			
3	Are the and 20 i	sample inlets > 1 mete meters from trees?	er from any majo	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 moniton ng data?	rs operational, o	n-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)	ozone sample line	e? (if yes		At inlet only		
6	Are san obstruc	nple lines clean, free of tions?	' kinks, moisture	, and				
7	Is the ze	ero air supply desiccan	t unsaturated?					
8	Are the	re moisture traps in th	e sample lines?					
9	Is there clean?	a rotometer in the dry	v deposition filte	r line, and is it				

Field Systems Data Form						F-02058-1500-S6-rev002				
Site	e ID	GRS420	Technician	Eric Hebert		Site Visi	it Date	11/15/201	7	]
	DAS, sei	nsor translators, and p	eripheral equi	pment operation	ns ai	nd maintena	<u>nce</u>			
1	Do the D well mai	AS instruments appeantained?	ar to be in good	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 (	hrough		Met sensors	only			
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 j	properly	✓					
7	Does the	instrument shelter ha	we a stable pow	ver source?	✓					
8	Is the ins	strument shelter temp	erature control	led?						
9	Is the m	et tower stable and gro	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	grounded?							
11	Tower c	omments?				Sample towe	er groun	ded to she	✓ Iter, and slig	htly bent at hinge.

Field	Systems Data	n Fo	rm				<b>F-0</b> 2	2058-	1500-87	/-rev002
Site ID	GRS420		Techn	ician Eric	Hebert	Site Visit Date	11/15/201	7		
<b>Docu</b>	<u>mentation</u>									
Does t	the site have the requi	ired in	strumer	nt and equi	pment manuals?					
	_	Yes	No	N/A			Yes	No	N/A	
Wind sp	eed sensor				Data logge	er				
Wind di	rection sensor				Data logge	er				
Tempera	ature sensor				Strip char	t recorder				
Relative	humidity sensor				Computer					
Solar rad	diation sensor				Modem					
Surface	wetness sensor				Printer					
Wind ser	nsor translator				Zero air p	ump				
Tempera	ature translator				Filter flow	y pump				
Humidit	y sensor translator				Surge prot	tector				
Solar rad	diation translator				UPS					
Tipping	bucket rain gauge				Lightning	protection device				
Ozone a	nalyzer				Shelter he	ater				
Filter pa	ck flow controller				Shelter air	conditioner	V			
Filter pa	ck MFC power suppl	<b>y</b> 🗹								
Does	s the site have the req	uired a	and mos	t recent Q	<u>C documents and</u>	report forms?				
		Pres	sent				Curre	ent		
Station I	Log			ataview			$\checkmark$			
SSRF		I	✓				$\checkmark$			
Site Ops	Manual	I	✓				$\checkmark$			
HASP		I	✓				$\checkmark$			
Field Op	s Manual	I	✓				$\checkmark$			
Calibrat	ion Reports		✓ 1	0/30/2016						
Ozone z/	s/p Control Charts									
Preventi	ve maintenance sched	lul								
1 Is the	he station log properly	y comp	pleted d	uring every	y site visit? 🗹 🛛	Dataview				
2 Are	the Site Status Repor rent?	rt Forn	ns being	completed	d and 🗹 F	low & observation s	sections			
3 Are sam	e the chain-of-custody ple transfer to and fr	forms om lat	proper o?	ly used to d	locument 🔽					
4 Are	ozone z/s/p control cl rent?	harts p	properly	completed	l and 🗌 C	Control charts not us	sed			
Provide natural (	any additional explan or man-made, that ma	ation ( ay affe	photogr ct the m	caph or ske onitoring J	etch if necessary) parameters:	regarding conditi	ons listed	above,	or any other	features,

#### GRS420 Technician Eric Hebert Site Visit Date 11/15/2017 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 Cł	neck ]	Perf	ormed
-------	--------	------	-------

#### Frequency

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

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

<b>QC</b> Check Pe	erformed
--------------------	----------

**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	
Daily	
Weekly	
Daily	
Alarm values only	
Weekly	
N/A	
Weekly	
As needed	

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

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

✓

✓

✓

Dataview

The ozone sample train is leak-tested each week after the inlet filter is changed.

#### Compliant

**Compliant** 

F-02058-1500-S8-rev002

Field Systems Data Form				500-S9-rev002				
Sit	e ID	GRS420	Technician	Eric Hebert		Site Visit Date	11/15/2017	
	<u>Site ope</u>	ration procedures						
1	Is the fi	lter pack being changed	l every Tuesda	ay as scheduled?	<b>~</b>	Filter changed mori	nings in winter, chang	ed in afternoon in
2	Are the correctl	Site Status Report For y?	ms being com	pleted and filed				
3	Are dat schedul	a downloads and backu ed?	ips being perfe	ormed as		No longer required		
4	Are gen	eral observations being	made and ree	corded? How?	✓	SSRF		
5	Are site fashion	supplies on-hand and 1 ?	replenished in	a timely				
6	Are san	ple flow rates recorded	l? How?		✓	SSRF		
7	Are san fashion	uples sent to the lab on a ?	a regular sche	dule in a timely	✓			
8	Are filte and shij	ers protected from cont oping? How?	amination du	ring handling		Clean gloves on and off		
9	Are the operation	site conditions reported ons manager or staff?	d regularly to	the field				
QC	Check P	erformed	Fre	quency			Compliant	
]	Multi-poi	nt MFC Calibrations	✓ Serr	niannually				
]	Flow Syst	em Leak Checks	✓ Wee	ekly				
]	Filter Pac	k Inspection						
]	Flow Rate	e Setting Checks	✓ Wee	ekly			$\checkmark$	
1	Visual Ch	eck of Flow Rate Rotor	neter 🗹 Wee	ekly			$\checkmark$	
]	In-line Fil	ter Inspection/Replace	ment 🗹 As r	needed			$\checkmark$	
1	Sample Li	ine Check for Dirt/Wat	er 🗹 Wee	ekly				

GRS420

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

Site ID

Technician Eric Hebert

Site Visit Date 11/15/2017

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	USH01700BY	none
DAS	Environmental Sys Cor	p 8832	A4115K	none
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1089005307	02488
flow rate	Tylan	FC280SAV	AW9706012	none
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP9605010	03944
Modem	US Robotics	V.92	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943903	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450193	none
Sample Tower	Aluma Tower	В	none	90945
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	7297	none
Zero air pump	Werther International	PC70/4	531385	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CNL	D125-Sandy	Grenville-11/19/2017				
1	11/19/2017	Computer	Dell	07015	Inspiron 15	BQ3MC12
2	11/19/2017	DAS	Campbell	000847	CR3000	11444
3	11/19/2017	Elevation	Elevation	None	1	None
4	11/19/2017	Filter pack flow pump	Thomas	01235	107CA18	illegible
5	11/19/2017	Flow Rate	Арех	000838	AXMC105LPMDPCV	54781
6	11/19/2017	Infrastructure	Infrastructure	none	none	none
7	11/19/2017	Modem	Raven	06596	V4221-V	0844350327
8	11/19/2017	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
9	11/19/2017	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
10	11/19/2017	Sample Tower	Aluma Tower	03495	A	none
11	11/19/2017	Shelter Temperature	Campbell	none	107-L	none
12	11/19/2017	Siting Criteria	Siting Criteria	None	1	None
13	11/19/2017	Temperature	RM Young	06402	41342VC	14035
14	11/19/2017	Zero air pump	Werther International	06868	C 70/4	000814284

## **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial N	lumber Site	1	<b>Cechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	11444	CNI	D125	Sandy Grenville	11/19/2017	DAS	Primary
Das Date:	11/19/2017	Audit Date	11/19/2017	Mfg	Datel	Parameter	DAS
Das Time: Das Dav:	17:19:10 323	Audit Time_ Audit Dav	17:19:11 323	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Chann	el:	High Channe	l:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.000	0.0000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0000	V	V	0.0000	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6994	V	V	-0.0001	
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 Nun	ıber Ta	Site	Тес	hnician	Site Visit D	ate Parai	neter	<b>Owner ID</b>
Арех	54781		CND125	Sa	ndy Grenville	11/19/2017	Flow I	Rate	000838
					Mfg	BIOS	]	Parameter F	low Rate
					Serial Number	103471		Ffer Desc. n	exus
					Tfer ID	01420			
					Slope	0.9	99825 <b>In</b>	ercept	0.00497
					Cert Date	2/7	7/2017 Co	orrCoff	0.99991
					Mfg	BIOS	]	Parameter F	low Rate
					Serial Number	103424		Ffer Desc. B	IOS cell
					Tfer ID	01410			
					Slope	0.9	99825 <b>In</b> t	ercept	0.00497
					Cert Date	2/7	7/2017 <b>Co</b>	rrCoff	0.99991
<b>DAS 1:</b>		<b>DAS 2:</b>		L	Cal Factor Z	ero	-0.	01	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	x % Di	Cal Factor F	ull Scale		1	
1.96%	1.96%				Rotometer R	eading:	1.	35	
Desc.	Test type	Input l/n	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	all 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	0.00	l/m	l/m	
primary	test pt 1	1.530	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.529	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.533	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
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	sition		Conditio	n Good		Statu	s pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Conditio	n No moisture p	resent	Statu	s pass	
Sensor Comp	onent Filter Dist	tance		Conditio	<b>n</b> 4.5 cm		Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 1.0 cm		Statu	s pass	
Sensor Comp	onent Filter Azir	muth		Conditio	n 120 deg		Statu	s pass	
Sensor Comp	onent System M	lemo		Conditio	n		Statu	s pass	

## **Ozone Data Form**

Mfg		Serial N	umber Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	103024	4803	CND125	Sa	andy Grei	nville	11/19/20	017	Ozone		000692	
Slope: Intercept CorrCoff	(	).99229 ).44188 ).99999	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 5171121 01111	ilectron	Inc Pa	rameter ozo er Desc. Oz	one one primar <u>i</u>	/ stan
DAS 1: A Avg % D 1.3	<b>)iff: A N</b> 3%	<b>lax % D</b> 4.6'	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	3	1.0025 /21/201	0 Inter 7 Corr	·cept ·Coff	0.45	5870 0000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw 0.34 14.99 34.99 68.01 110.04	Tfer -0. 14. 34. 67.	Corr 11 49 44 38	Si 0.1 15 34 67	ite 20 .15 .36 .36 .36	Sit ppb ppb ppb ppb	e Unit	PctDiff	4.55%           -0.23%           -0.03%           -0.37%	
Sensor Co	omponei	nt Samp	le Train	110.01	Conditio	on Good	100		PPU	Status	pass	0.3770	
Sensor Co	omponei	nt 22.5 c	legree rule		Conditio	on 🗌				Status	pass		
Sensor Co	omponei	nt Inlet F	ilter Conditio	'n	Conditio	on Clean				Status	pass		
Sensor Co	omponei	nt Batter	v Backup		Conditio	n N/A				Status	pass		
Sensor Co	ompone	nt Offset			Conditio	-0.20				Status	pass		
Sensor Co	ompone	nt Span			Conditio	$\frac{1003}{1003}$				Status	pass		
Sensor C	ompone	Tero	/oltage		Conditio					Status	nass		
Sensor C	ompone				Conditio					Status	nase		
Sensor Co	omponei				Conditio					Status	pass		
Sensor Co	ompone	nt Cell A	Freq.		Conditio	on 87.1 F	HZ			Status	pass		_
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.67 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	<b>on</b> 724.4	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 34.5 0	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 95.3 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 0.66 l	pm			Status	pass		_
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 724.4	mmHg			Status	pass		
Sensor Co	ompone	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	omnone	nt Line L	.0SS		Conditi	n Not te	sted			Status	pass		
Sensor C	ompono	nt Svster	m Memo		Conditi	on [	-			Status	pass		
School C	omponel				Conditio					Blaius	F 400		

## Temperature Data Form

Mfg	Serial Number T	'a Site	7	<b>Techn</b> i	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
RM Young	14035	CND125		Sandy	Grenville	11/19	9/2017	Temper	ature	06402	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	pe		1.0075	9 Inte	rcept	0.14754	ŀ
Abs Avg Err Ab	s Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		2/4/201	7 Cor	rCoff	1.00000	)
0.06	0.14										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.22	0.07		0.000		0.1	l .	С	0.02	
primary Tem	p Mid Range	25.40	25.00	6	0.000		25.	0	С	-0.03	
primary Tem	p High Range	48.15	47.64	4	0.000		47.	5	С	-0.14	
Sensor Compone	nt Shield		Condi	ition C	Clean			Status	pass		
Sensor Component Blower			Condi	Condition N/A				Status	pass		
Sensor Compone	Sensor Component Blower Status Switch			Condition N/A				Status	pass		
Sensor Compone	nt System Memo		Condi	ition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CND125	Sandy Grenville	11/19/2017	Shelter Temperature	none
DAS 1:	DAS 2:	For Aba Mara Fa	Mfg	Extech	Parameter She	Iter Temperatur
Abs Avg Err At 0.72	1.16 Abs Avg	EFF ADS MAX EF	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.31	21.00	0.000	22.2	С	1.16
primary	Temp Mid Range	21.51	21.20	0.000	21.7	С	0.5
primary	Temp Mid Range	19.52	19.23	0.000	19.7	С	0.49
Sensor Component System Memo			Condition		Status	pass	

#### **Infrastructure Data For**

Site ID	CND125	Technician Sand	y Grenville Site Visit Date 11/19/2017
Shelter	Make	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: SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and will be harvested in the near future.

2 Parameter: ShelterCleanNotes

The shelter is well maintained, clean and well organized.

3 Parameter: MetOpMaintCom

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

<b>Field Systems</b>	<b>Data Form</b>	

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

Site ID CND125	Technician Sandy Grenvill	e Site Visit Date 11/19/2017					
Site Sponsor (agency)	EPA	USGS Map					
<b>Operating Group</b>	private	Map Scale					
AQS #	37-123-9991	Map Date					
Meteorological Type	Climatronics						
Air Pollutant Analyzer	Ozone	QAPP Latitude					
Deposition Measureme	nt dry, Hg, PM2.5, PM10	QAPP Longitude					
Land Use	woodland	QAPP Elevation Meters					
Terrain	rolling	QAPP Declination					
Conforms to MLM	Marginally	QAPP Declination Date					
Site Telephone		Audit Latitude 35.26333					
Site Address 1	136 Perry Drive	Audit Longitude -79.83754					
Site Address 2		Audit Elevation 172					
County	Montgomery	Audit Declination -8					
City, State	Candor, NC	Present					
Zip Code	27229	Fire Extinguisher         Image: Market 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	Iodel8810Shelter Size640 cuft					
Shelter Clean	✓ Notes The shelter is well maintained	, clean and well organized.					
Site OK	✓ Notes						
Driving Directions From (Science) on interview for the second sec	Driving Directions       From Greensboro take Hwy 220 (future I-73) south to Candor. Exit at 211 west to Candor. At the traffic light turn left (south) onto 220 south and 731 west. Continue approximately 1.3 miles which will take you out of town. Bear right onto 731 west at the split. Take an immediate right onto McCallum Rd. (there is a sign for E-KU-SUMEE at the intersection). Continue approximately 5.4 miles to Perry Drive which is on the left. Turn left onto the gravel road and follow it to the end. The site is behind the house, drive around the grapevines on the left.						

CND125

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

Site ID

Techn

Technician Sandy Grenville

Site Visit Date 11/19/2017

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

#### Siting Distances OK

#### **Siting Criteria Comment**

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and will be harvested in the near future.

Fi	eld Systems Data Form		F-02058-1500-S3-rev00		
Site	CND125 Technician Sandy Grenville		Site Visit Date 11/19/2017		
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A		
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A		
3	Are the tower and sensors plumb?	✓	N/A		
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?				
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)				
6	Is the solar radiation sensor plumb?	✓	N/A		
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A		
8	Is the rain gauge plumb?	✓	N/A		
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A		
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A		
11	Is it inclined approximately 30 degrees?		N/A		

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

Site	ID	CND125	Technician	Sandy Grenville		Site Visit Date 11/19/2017	
1	Do all the conditior	e meterological senso 1, and well maintaine	rs appear to be d?	intact, in good			
2	Are all th reporting	ne meteorological sens g data?	sors operational	l online, and			
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓		
4	Are the a	spirated motors wor	king?			N/A	
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 conditior	ensor signal and pow a, and well maintained	er cables intact, d?	, in good		N/A N/A	
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected	✓	N/A	

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

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

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	CND125	Technician	Sandy Grenville		Site Visit Date 11/19/2017
	Siting C	Criteria: Are the pollut	<u>ant analyzers a</u>	nd deposition eq	<u>uipr</u>	ment sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	sample inlets have at le icted airflow?	east a 270 degre	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3	Are the and 20 i	sample inlets > 1 mete meters from trees?	er from any ma	jor obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	ition equipmen	t operations and	mai	<u>intenance</u>
1	Do the a condition	analyzers and equipme on and well maintained	ent appear to be l?	e in good	✓	
2	Are the reportir	analyzers and moniton 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)	ozone sample lii	ne? (if yes		At inlet only
6	Are san obstruc	nple 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	y deposition filt	er line, and is it		Clean and dry

Fi	eld Sy	stems Data Fo	orm				<b>F-02</b>	2058-15	00-S6-rev002
Site	e ID	CND125	Technician	Sandy Grenville	1	Site Visit Date	11/19/2017	7	
	DAS, sei	nsor translators, and	peripheral equi	pment operatio	ns ai	nd maintenance			
1	Do the E well mai	AS instruments appe ntained?	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	gnal leads pass † ?	through	✓				
4	Are the swell mai	signal connections pro ntained?	otected from the	e weather and	✓	Met sensors only			
5	Are the	signal leads connected	l to the correct	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato d?	ors, and shelter	properly	✓				
7	Does the	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	omments?							

Field Sy	stems Data	Foi	rm				<b>F-02</b>	058-	-1500-S7-rev002
Site ID	CND125		Tech	nician	Sandy Grenville	Site Visit Date	11/19/2017		
Document	tation								
Does the s	<u>ite have the requi</u>	red in	strume	nt and	d equipment manuals	<u>?</u>			
Wind speed	sensor	Yes	No	N/. ✓	/A Data logg	ger	Yes	No ✓	N/A
Wind directi	on sensor			$\checkmark$	Data logg	ger			
Temperature	e sensor		$\checkmark$		Strip cha	rt recorder			
Relative hun	nidity sensor			$\checkmark$	Compute	r			
Solar radiati	on sensor			$\checkmark$	Modem			$\checkmark$	
Surface wetn	less sensor			$\checkmark$	Printer				
Wind sensor	translator			$\checkmark$	Zero air	pump			
Temperature	e translator			$\checkmark$	Filter flor	w pump		$\checkmark$	
Humidity ser	nsor translator			$\checkmark$	Surge pro	otector			$\checkmark$
Solar radiati	on translator			$\checkmark$	UPS				$\checkmark$
<b>Tipping buck</b>	ket rain gauge			$\checkmark$	Lightning	g protection devic	e 🗌		$\checkmark$
Ozone analyz	zer	$\checkmark$			Shelter h	eater		$\checkmark$	
Filter pack f	low controller		$\checkmark$		Shelter a	ir conditioner		$\checkmark$	
Filter pack M	<b>IFC power supply</b>	у 🗌		$\checkmark$					
Does the	site have the requ	uired a	nd mo	<u>st rece</u>	ent QC documents an	<u>d report forms?</u>			
		Pres	ent				Curre	nt	
Station Log		[	✓						
SSRF		[	✓				$\checkmark$		
Site Ops Mar	nual	[	✓	Feb 20	)14		$\checkmark$		
HASP		[	✓	Feb 20	)14		$\checkmark$		
Field Ops Ma	anual	[							
Calibration I	Reports	[	✓						

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

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

**Preventive maintenance schedul** 

Site	ID	CND125	Technician	Sandy Grenville	Site Visit Date	11/19/2017	
1	Site ope Has the course?	<u>ration procedures</u> site operator attender If yes, when and who	d a formal CAS instructed?	TNET training			
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 Tu	iesday			
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**

Fre	qu	en	cy
			•

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

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

<b>UC CHECK PERIORHEU</b>	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 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?
- Are the automatic and manual z/s/p checks monitored and 3 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	eld Systems Data Form				F-02058-1500-S9-rev002					
Sit	e ID CND125 Tec	hnician	Sandy Grenville		Site Visit Date	11/19/2017				
	Site operation procedures									
1	Is the filter pack being changed ever	y Tuesda	ay as scheduled?		Filter changed morn	ings				
2	Are the Site Status Report Forms be correctly?	ing comj	pleted and filed							
3	Are data downloads and backups bei scheduled?	ing perfo	ormed as		No longer required					
4	Are general observations being made	corded? How?	✓	SSRF, logbook						
5	Are site supplies on-hand and replen fashion?	a timely								
6	6 Are sample flow rates recorded? How?				SSRF, logbook, call-in					
7	Are samples sent to the lab on a regu fashion?	lar sche	dule in a timely	✓						
8	Are filters protected from contamina and shipping? How?	tion dur	ring handling	✓	Clean gloves on and off					
9	Are the site conditions reported regu operations manager or staff?	larly to	the field	✓						
QC	Check Performed	Free	quency			Compliant				
I	Multi-point MFC Calibrations	Sem	niannually							
]	Flow System Leak Checks	✓ Wee	ekly							
]	Filter Pack Inspection									
]	Flow Rate Setting Checks Weekly									
	Visual Check of Flow Rate Rotometer Veekly									
I	In-line Filter Inspection/Replacement					$\checkmark$				
5	Sample Line Check for Dirt/Water	✓ Wee	ekly							
	······································	anan haa	n alaatah if maaaa	~ ~ ~ ~ ~	) was and in a sam diff.	and listed above on	and ath an factures			

CND125

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

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 11/19/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	BQ3MC12	07015
DAS	Campbell	CR3000	11444	000847
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	illegible	01235
Flow Rate	Apex	AXMC105LPMDPC	54781	000838
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844350327	06596
Ozone	ThermoElectron Inc	49i A1NAA	1030244803	000692
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124693	000376
Sample Tower	Aluma Tower	A	none	03495
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14035	06402
Zero air pump	Werther International	C 70/4	000814284	06868

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BWI	R139-Eric H	lebert-11/27/2017				
1	11/27/2017	Computer	Dell	000321	D520	unknown
2	11/27/2017	DAS	Campbell	000431	CR3000	2536
3	11/27/2017	Elevation	Elevation	None	1	None
4	11/27/2017	Filter pack flow pump	Thomas	06031	107CAB18	608102A
5	11/27/2017	Flow Rate	Арех	000670	AXMC105LPMDPCV	54758
6	11/27/2017	Infrastructure	Infrastructure	none	none	none
7	11/27/2017	Modem	Raven	06456	V4221-V	0808507415
8	11/27/2017	Ozone	ThermoElectron Inc	000618	49i A1NAA	1009241789
9	11/27/2017	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
10	11/27/2017	Sample Tower	Aluma Tower	missing	В	none
11	11/27/2017	Shelter Temperature	Campbell	none	107-L	none
12	11/27/2017	Siting Criteria	Siting Criteria	None	1	None
13	11/27/2017	Temperature	RM Young	04315	41342	4012
14	11/27/2017	Zero air pump	Werther International	06877	C 70/4	000815258

### **DAS Data Form**

DAS Time Max Error: 0.03

Mfg	Serial N	lumber Site	e T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2536	BW	/R139	Eric Hebert	11/27/2017	DAS	Primary
Das Date:	11/27/2017	Audit Date	11/27/2017	Mfg	Datel	Parameter	DAS
Das Time:	331	Audit Time Audit Day	331	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channe	l:	High Channe	el:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.000	0.0000	0 0.0001	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 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	0.1001	V	V	0.0001	
7	0.3000	0.3005	0.3004	V	V	-0.0001	
7	0.5000	0.5005	0.5005	V	V	0.0000	
7	0.7000	0.7008	0.7008	V	V	0.0000	
7	0.9000	0.9013	0.9013	V	V	0.0000	
7	1.0000	1.0011	1.0012	V	V	0.0001	

## Flow Data Form

Mfg	Serial Nur	nber Ta	Site	Тес	chnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
Apex	54758		BWR139	Eri	ic Hebert	11/27/2017	Flow R	late	000670
					Mfg Serial Number	BIOS	P T	arameter Flow	v Rate
						01446	•		0 220 11
					Tter ID	01416			
					Slope	1.0	0732 Inte	ercept	-0.02202
					Cert Date	3/8/	/2017 <b>Co</b>	rrCoff	0.99970
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero	-0.0	)2	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	0.9	99	
2.60%	2.60%				<b>Rotometer R</b>	eading:	1	.5	
Desc.	Test type	Input l/n	n Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.01	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	1.532	1.540	1.51	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.532	1.540	1.51	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 3	1.531	1.540	1.51	0.000	1.50	l/m	l/m	-2.60%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomet	er Conditic	n	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	<b>n</b> 5.0 cm		Status	pass	
Sensor Comp	onent Filter De	pth		Conditio	<b>n</b> 4.0 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 15 deg		Status	pass	
Sensor Comp	onent System M	Nemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg		Serial N	umber Ta	Site	Te	chnician		Site Visit	t Date	Parameter		Owner II	D
ThermoElec	tron Inc	100924	1789	BWR139	Er	ic Hebert		11/27/20	17	Ozone		000618	
Slope: Intercept CorrCoff	1 -(	1.02079 ).55573 ).99995	Slope: Intercept CorrCoff	0.00000	) ) )	Mfg Serial N Tfer ID	umber	ThermoE 0517112 ⁻ 01113	lectron 167	Inc Pa	rameter ozo er Desc. Oz	one one primary	stan
DAS 1: A Avg % D 0.8	<b>Diff: A N</b> 3%	<b>Iax % D</b> 2.0'	DAS 2: i A Avg %	6Dif A Max 9	Dif A Max % Di Cert Date		9,	1.0050 /12/201	4 Inter 7 Corr	•cept •Coff	0.32	915 000	
UseDes prin prin prin prin prin	cription nary nary nary nary nary		I           2           3           4           5	Tfer Raw           -0.11           15.21           32.63           67.86           108.36	Tfer -0. 14. 32. 67. 107	Corr 43 80 13 19 7.48	Si -0. 14. 32. 67. 109	ite 76   .65   .15   .35   0.60	Site ppb ppb ppb ppb ppb	e Unit	PctDiff	-1.01%           0.06%           0.24%           1.97%	
Sensor Co	omponei	nt Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	omponer	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	nt Offset	t		Conditio	<b>0.10</b>				Status	pass		]
Sensor Co	omponei	nt Span			Conditio	<b>n</b> 1.048				Status	pass		]
Sensor Co	omponei	nt Zero V	/oltage		Conditio	n N/A				Status	pass		]
Sensor Co	omponei	nt Fullsc	ale Voltage		Conditio	n N/A				Status	pass		]
Sensor Co	omponei	nt Cell A	Freq		Conditio	n 101.3	kHz			Status	pass		_ 
Sensor Co	ompone		Noise		Conditio		b			Status	nass		
Sensor Co	omponer		Flow		Conditio		no no			Status	nase		
Sensor Co	omponer		Drosouro		Conditio		mmHa			Status			
Sensor Co	omponei		Tees		Conditio	<b>on</b> 733.0	,			Status	pass		
Sensor Co	omponei				Conditio	on 31.0 C				Status	pass		
Sensor Co	omponei	nt Cell B	Freq.		Conditio	on 102.0	kHz			Status	pass		
Sensor Co	omponei	nt Cell B	Noise		Conditio	on 0.8 pp	b			Status	pass		
Sensor Co	omponei	nt Cell B	Flow		Conditio	on 0.70 l	om			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	<b>734.0</b>	mmHg			Status	pass		
Sensor Co	omponer	nt Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	omponei	nt Line L	OSS		Conditio	Not te	sted			Status	pass		
Sensor Co	omponei	nt Syste	m Memo		Conditio	on				Status	pass		

## Temperature Data Form

Mfg	Serial Number T	a Site	,	Techni	ician	Site V	isit Date/	Param	eter	<b>Owner ID</b>	
RM Young	4012	BWR139		Eric H	ebert	11/27	7/2017	Temper	ature	04315	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	679	Tí	er Desc. R	٢D	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	pe		1.0065	6 Inte	rcept	-0.03341	1
Abs Avg Err Ab	Abs Avg Err   Abs Max Er   Abs Avg Err   Abs M			ax Er Cert Date		2/4/2017 Cor		7 Cor	rCoff 1.00000		0
0.11	0.25										
UseDesc.	Test type	InputTmpRaw	InputTmp	oCorr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	b Low Range	-0.01	0.02	2	0.000		0.3	3	С	0.25	
primary Tem	p Mid Range	27.24	27.1	0	0.000		27.	2	C	0.06	
primary Tem	p High Range	49.24	48.9	5	0.000		48.	9	С	-0.01	
Sensor Compone	nt Shield		Cond	ition N	Moderately clea	an		Status	pass		
Sensor Component Blower				ition 🕨	N/A			Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	atus pass		
Sensor Compone	nt System Memo		Cond	ition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	none	BWR139	Eric Hebert	11/27/2017	Shelter Temperatu	renone
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter S	helter Temperatur
Abs Avg Err 1.43	Abs Max Er Abs Avg 1.96	g Err Abs Max Er	Serial Number	H232679	Tfer Desc.	TD
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	20.80	20.70	0.000	22.7	С	1.96	
primary	Temp Mid Range	21.64	21.53	0.000	23.0	С	1.43	
primary	Temp Mid Range	23.10	22.98	0.000	23.9	С	0.89	
Sensor Component System Memo			Condition	Status pass				

#### **Infrastructure Data For**

Site ID	BWR139	Technician Eric He	bert Site Visit Date 11/27/2017
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	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	Poor	Status	Fail
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Poor	Status	Fail
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem		
Flow Rate	BWR139	Eric Hebert	11/27/2017	Moisture Present	Apex	3906				
The filter sample tubing has drops of moisture in low sections outside the shelter.										

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

The ozone sample train is leak checked every two weeks following the inlet filter change.

#### 2 Parameter: SitingCriteriaCom

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

#### 3 Parameter: ShelterCleanNotes

The shelter is showing signs of deterioration with leaks and rot at bottom of walls.

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

Site ID	BWR139		Technician	Eric Hebert		Site Visit I	Date 1	11/27/2017	
Site Spanson (	(aganay)	FPA			USC	S Map			
Site Sponsor (agency)						Scolo			
<b>Operating Group</b>		BNWR/private			[NIA]				
AQS #		24-019-9991		Maj	o Date				
Meteorological Type		R.M. Young							
Air Pollutant Analyzer		Ozone			QA	PP Latitude			
<b>Deposition Measurement</b>		dry			QA	QAPP Longitude			
Land Use	woodlands - mixed, wetlands		QA	PP Elevation	Meter	·s			
Terrain	flat		QA	PP Declinatio	n				
Conforms to 3	Conforms to MLM Yes			QA	PP Declinatio	n Date	e		
Site Telephone					Auc	lit Latitude		38.444971	
Site Address	ite Address 1 Blackwater Nat Wildlife Refuge			lefuge	Aud	lit Longitude		-76.111274	
Site Address	2	2145 Key Wallace Dr.			Auc	lit Elevation		1	
County		Dorchester			Auc	lit Declinatior	ı	-11.2	
City, State		Cambridge, MD				Present			
Zip Code		21613			Fire	Extinguisher	· 🗸	dated 2015	
Time Zone Easter		Eastern	astern			t Aid Kit	$\checkmark$		
Primary Ope	rator				Safe	ety Glasses	$\checkmark$		
Primary Op.	Phone #				Safe	ety Hard Hat	$\checkmark$		
Primary Op.	E-mail				Clir	nbing Belt	$\checkmark$		
Backup Oper	ator				Sec	irity Fence			
Backup Op.	Phone #				Sec	ire Shelter	$\checkmark$		
Backup Op.	E-mail				Stal	ole Entry Step			
Shelter Work	ing Room ☑	Make	Ekto		Model	8810		Shelter Size         640 cuft	
Shelter Clean		Notes The shelter is showing signs of deterioration with leaks and rot at bottom of walls.							
Site OK	$\checkmark$	Notes							
Driving Directions From I95 take route 50 east to Cambridge, MD. At mile marker 81 turn right on Woods Rd. Continue approximately 1 mile to the stop sign, turn right onto SR 16 west. Continue approximately 1.7 miles, past the school, and turn left onto Egypt Road. Continue approximately 7.1 miles to the stop sign. Turn right onto Key Wallace Drive towards the visitors center. Continue approximately 0.8 mile to the gate on the left. The site will be visible.									
BWR139

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

Site ID

Technician Eric Hebert

Site Visit Date 11/27/2017

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

Siting Distances OK

**Siting Criteria Comment** 

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

Fi	eld Systems Data Form	F-02058-1500-S3-rev002			
Site	BWR139 Technician Eric Hebert		Site Visit Date 11/27/2017		
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A		
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A		
3	Are the tower and sensors plumb?	✓	N/A		
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓			
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)				
6	Is the solar radiation sensor plumb?	✓	N/A		
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A		
8	Is the rain gauge plumb?	✓	N/A		
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A		
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A		
11	Is it inclined approximately 30 degrees?	✓	N/A		
Pro nat	wide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters	essar 5:	y) regarding conditions listed above, or any other features,		

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

Site	ID	BWR139	Technician Eric Hebert		Site Visit Date 11/27/2017
1	Do all th condition	e meterological sensor 1, and well maintained	s appear to be intact, in good ?	✓	
2	Are all the reporting	he meteorological sens g data?	ors operational online, and	✓	
3	Are the s	shields for the tempera	ture and RH sensors clean?	✓	Moderately clean
4	Are the a	aspirated motors work	ing?	✓	N/A
5	Is the sol scratches	ar radiation sensor's l s?	ens clean and free of	✓	N/A
6	Is the su	rface wetness sensor g	rid clean and undamaged?		N/A
7	Are the s condition	sensor signal and powe	er cables intact, in good ?	✓	N/A
8	Are the s from the	sensor signal and powe elements and well ma	er cable connections protected intained?	✓	N/A

Fi	eld Systems Data Form		F-02058-1500-S5-rev00			
Site	Site ID         BWR139         Technician         Eric Hebert		Site Visit Date 11/27/2017			
	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 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			

Fie	eld Systems Data Form			F-02058-1500-S6-rev002				
Site	e ID BWR139 Tech	nician Eric Hebert		Site Visit I	Date 11/27/201	7		
	DAS, sensor translators, and peripher	ral equipment operati	ons a	nd maintenance	<u>e</u>			
1	Do the DAS instruments appear to be well maintained?	in good condition an	d 🗹					
2	Are all the components of the DAS op modem, backup, etc)	erational? (printers,						
3	Do the analyzer and sensor signal lead lightning protection circuitry?	ls pass through		Met sensors on	lly			
4	Are the signal connections protected f well maintained?	rom the weather and						
5	Are the signal leads connected to the o	correct DAS channel?						
6	Are the DAS, sensor translators, and s grounded?	shelter properly						
7	Does the instrument shelter have a sta	able power source?	✓					
8	Is the instrument shelter temperature	controlled?	$\checkmark$					
9	Is the met tower stable and grounded	?		Stable		Grounded		
10	Is the sample tower stable and ground	led?						
11	Tower comments?			Met tower remo	oved			

Field Sy	vstems Data F	orm			<b>F-02</b>	058-1	500-S7-rev002
Site ID	BWR139	Technician	Eric Hebert	Site Visit Date 1	1/27/2017		
<u>Documen</u>	tation						
Does the	site have the required	instrument and	equipment manuals?				
Does the s Wind speed Wind direct Temperatur Relative hur Solar radiat Surface weth Wind sensor Temperatur Humidity se Solar radiat Tipping buc Ozone analy	site have the required         Ye         sensor         ion sensor         e sensor         midity sensor         ion sensor         ion sensor         ion sensor         ion sensor         e translator         e translator         ion translator         ion translator         ket rain gauge         zer	Instrument and         Image: Solution of the second state of the sec	A Data logg Data logg Strip char Computer Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter he	er er er et recorder ump 7 pump tector protection device ater	Yes □ □ □ □ □ □	No	N/A □ ✓ ✓ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
Filter nack f	low controller		Shelter au	r conditioner			
Filter pack I	MFC power supply		Sherter an	conuntioner			
Doos the	$\sim$ site have the require	d and most room	nt OC documents and	roport forms?			
Does the	e site nave the require		int QC documents and		C	- 4	
Station Log	P	resent			Curre	αι	
Station Log							
Site One Me	nuol						
HASP	illuai						
Field Ons M	anual						
Calibration	Renorts						
Ozone z/s/n	Control Charts						
Preventive n	naintenance schedul						
1 Is the s	tation log properly co	mpleted during	every site visit? 🖌				
2 Are the current	Site Status Report Fo	orms being com	pleted and 🗹				
3 Are the sample	e chain-of-custody forr transfer to and from l	ns properly use lab?	d to document 🔽				
4 Are ozo current	one z/s/p control charts ?	s properly com	oleted and	Control charts not use	d		
Provide any natural or m	additional explanation nan-made, that may af	n (photograph o fect the monitor	or sketch if necessary) ring parameters:	regarding condition	ns listed a	bove, or	any other features,

#### Site Visit Date 11/27/2017 Site ID BWR139 Technician Eric Hebert 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? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

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

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

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

	Unknown	
✓		
✓	SSRF, logbook, call-in	

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

The ozone sample train is leak checked every two weeks following the inlet filter change.

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F-02058-1500-S8-rev
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Fi	Field Systems Data Form						<b>F-02058-1500-S9-rev</b>				
Sit	e ID	BWR139	Tech	nician	Eric Hebert		Site Visit Date	11/27/2017			
	<u>Site ope</u>	ration procedures									
1	Is the fil	lter pack being change	d every	Tuesda	ay as scheduled?		Filter changed morr	nings 90%			
2	Are the correctly	Site Status Report For y?	rms bein	g comj	pleted and filed						
3	Are data schedule	a downloads and back ed?	ups bein	g perfo	ormed as		No longer required				
4	4 Are general observations being made and recorded? How?				✓	SSRF, logbook					
5	Are site fashion?	supplies on-hand and	replenis	hed in	a timely						
6	5 Are sample flow rates recorded? How?			✓	SSRF, logbook, call-in						
7	Are sam fashion?	ples sent to the lab on	a regula	r sche	dule in a timely						
8	Are filte and ship	ers protected from con oping? How?	taminati	on dui	ring handling	✓	Clean gloves on an	d off			
9	Are the operation	site conditions reporte ons manager or staff?	ed regula	rly to	the field						
QC	Check Po	erformed		Free	quency			Compliant			
I	Multi-poir	nt MFC Calibrations		Sem	niannually			$\checkmark$			
I	Flow Syste	em Leak Checks		Vee Wee	ekly			$\checkmark$			
I	Filter Pac	k Inspection									
I	Flow Rate	Setting Checks		Vee Wee	ekly			$\checkmark$			
	visual Ch	eck of Flow Rate Roto	meter 🛽	∠ Wee	ekly			$\checkmark$			
I	n-line Fil	ter Inspection/Replace	ement	Sem	niannually			$\checkmark$			
5	Sample Li	ine Check for Dirt/Wa	ter	∠ Wee	ekly			$\checkmark$			
Dros	ido ony o	dditional ovaluation	(nhotog	onh o	r skatah if nagas	COPT	) regarding conditi	one listed above or	any other features		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000321
DAS	Campbell	CR3000	2536	000431
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	608102A	06031
Flow Rate	Арех	AXMC105LPMDPC	54758	000670
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808507415	06456
Ozone	ThermoElectron Inc	49i A1NAA	1009241789	000618
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244814	000697
Sample Tower	Aluma Tower	В	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4012	04315
Zero air pump	Werther International	C 70/4	000815258	06877

Technician Eric Hebert

# **Field Systems Data Form**

BWR139

Site ID

**Site Visit Sensors** 

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

Site Visit Date 11/27/2017

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BFT	142-Sandy	Grenville-11/27/2017				
1	11/27/2017	Computer	Dell	07007	Inspiron 15	Unknown
2	11/27/2017	DAS	Campbell	000498	CR3000	3815
3	11/27/2017	Elevation	Elevation	None	1	None
4	11/27/2017	Filter pack flow pump	Thomas	00808	107CA18	00002460587
5	11/27/2017	Flow Rate	Арех	000463	AXMC105LPMDPCV	42230
6	11/27/2017	Infrastructure	Infrastructure	none	none	none
7	11/27/2017	Modem	Raven	06383	V4221-V	0802325832
8	11/27/2017	Ozone	ThermoElectron Inc	000685	49i A1NAA	1030244789
9	11/27/2017	Ozone Standard	ThermoElectron Inc	000453	49i A3NAA	CM08200027
10	11/27/2017	Sample Tower	Aluma Tower	000632	В	unknown
11	11/27/2017	Shelter Temperature	Campbell	none	107-L	none
12	11/27/2017	Siting Criteria	Siting Criteria	None	1	None
13	11/27/2017	Temperature	RM Young	04444	41342VO	4542
14	11/27/2017	Zero air pump	Werther International	06897	C 70/4	000821893

## **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial 1	Number Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	3815	BF	T142	Sandy Grenville	11/27/2017	DAS	Primary
Das Date:	11/27/2017	Audit Date	11/27/2017	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	13:31:49 331	Audit Time Audit Day	13:31:49 331	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channe	el:	High Channe	el:	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.000	0.00	0.000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/23/201	7 CorrCoff	1.00000
Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	V	V	0.0001	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4996	V	V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8994	0.8993	V	V	-0.0001	
7	1.0000	0.9992	0.9992	V	V	0.0000	

## Flow Data Form

Mfg	Serial Num	ber Ta	Site	Тес	hnician	Site Visit D	ate Paran	neter	<b>Owner ID</b>
Apex	42230		BFT142	Sa	ndy Grenville	11/27/2017	Flow R	late	000463
					Mfg	BIOS	P	arameter Flo	ow Rate
					Serial Number	103471	Г	fer Desc. ne	xus
					Tfer ID	01420			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7/	/2017 <b>Co</b>	rrCoff	0.99991
					Mfg	BIOS	P	arameter Flo	ow Rate
					Serial Number	103424	Т	fer Desc. Bl	OS cell
					Tfer ID	01410			
					Slope	0.9	9825 Int	ercept	0.00497
					Cert Date	2/7,	/2017 <b>Co</b>	rrCoff	0.99991
DAS 1:		<b>DAS 2:</b>			Cal Factor Z	ero		0	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale		1	
0.89%	1.34%				Rotometer R	eading:		0	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	I PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.491	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.490	1.490	1.51	0.000	1.51	l/m	1/m	1.34%
primary	test pt 3	1.489	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
Sensor Compo	onent Leak Tes	t		Conditio	n		Status	pass	
Sensor Compo	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Compo	ment Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Compo	onent Rotomete	er Conditior	1	Conditio	n Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Conditio	n No moisture p	resent	Status	pass	
Sensor Compo	<b>nent</b> Filter Dist	ance		Conditio	n 3.5 cm		Status	pass	
Sensor Compo	ment Filter Dep	oth		Conditio	<b>n</b> 0.5 cm		Status	pass	
Sensor Compo	onent Filter Azir	muth		Conditio	n 180 deg		Status	pass	
Sensor Compo	onent System M	lemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg	1	Serial N	umber Ta	Site	Te	chnician		Site Visi	it Date	Parame	eter	Owner I	D
ThermoElect	tron Inc	103024	4789	BFT142	Sa	andy Grei	nville	11/27/20	017	Ozone		000685	
Slope: Intercept CorrCoff	0	.98365 .45817 .99999	Slope: Intercept CorrCoff	0.00000	Mfg Serial Number		ThermoE 5171121 01111	ThermoElectron IncPar517112175Tfe01111		rameter o er Desc. C	rameter ozone er Desc. Ozone primary stan		
DAS 1: A Avg % Di 0.84	iff: A M %	<b>ax % D</b> 1.2°	DAS 2: i A Avg %	bDif A Max (	% Di	Slope Cert Da	ıte	3	1.0025 3/21/201	0 Inter 7 Corr	ccept Coff	0.45	870 0000
UseDesc prim prim prim prim	cription ary ary ary ary ary		oncGroup 1 2 3 4	Tfer Raw 0.02 15.00 35.00 68.02	Tfer -0. 14. 34. 67.	Corr 43 50 45 39	S 0. 14 34 66	ite 28 .57 .17 .76	Sit ppb ppb ppb ppb	e Unit	PctDi	oldstate         oldstate	
prim	ary		5	110.00	109	.26	108	3.00	ppb			-1.15%	
Sensor Co	omponen	t Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	mponen	t 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	mponen	t Inlet F	ilter Conditio	n	Conditio	on Clean				Status	pass		
Sensor Co	mponen	t Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	mponen	t Offset	t		Conditio	<b>n</b> -0.10				Status	pass		
Sensor Co	mponen	t Span			Conditio	on 0.999				Status	pass		_
Sensor Co	mponen	t Zero V	/oltage		Conditio	n N/A				Status	pass		
Sensor Co	mponen	t Fullsc	ale Voltage		Condition N/A				Status	Status pass			
Sensor Co	mnonen	t Cell A	Freq		Conditio	Condition 01.3 kHz				Status	pass		
Sensor Co	mponen		Noise		Conditio	1 3 pr				Status	nass		
Sensor Co	mponen		Flam		Conditio	0.701				Status	pass		
Sensor Co	mponen		FIOW		Conditio	n 0.701	pm 			Status	pass		
Sensor Co	mponen	t Cell A	Pressure		Conditio	on 728.8	mmHg			Status	pass		
Sensor Co	mponen	t Cell A	Tmp.		Conditio	on 33.3 (	)			Status	pass		
Sensor Co	mponen	t Cell B	Freq.		Conditio	<b>91.8</b>	κHz			Status	pass		
Sensor Co	mponen	t Cell B	Noise		Conditio	<b>0.7</b> pp	b			Status	pass		
Sensor Co	mponen	t Cell B	Flow		Conditio	on 0.71 l	pm			Status	pass		
Sensor Co	mponen	t Cell B	Pressure		Conditio	<b>n</b> 729.4	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	sted			Status	pass		
Sensor Co	mponen	t Syste	m Memo		Conditio	on				Status	pass		

# Temperature Data Form

Mfg	Serial Number T	a Site	7	Technician		Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	4542	BFT142		Sandy	Grenville	11/27	7/2017	Temper	ature	04444	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	734	Tf	er Desc. R	ſD	
				Tfe	er ID	01227	7				
DAS 1:	DAS	2:		Slo	ре		1.0075	9 Inte	rcept	0.14754	
Abs Avg Err Abs Max Er Abs Avg Err Abs Max I			Max Er	x Er Cert Date			2/4/201	7 Cor	rCoff	1.00000	
0.18	0.30										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Tem	p Low Range	0.22	0.07		0.000		0.2	2	С	0.1	
primary Tem	p Mid Range	25.64	25.30	0	0.000		25.	0	С	-0.3	
primary Tem	p High Range	47.81	47.30	)	0.000		47.	2	С	-0.15	
Sensor Compone	nt Shield		Condi	ition	Noderately clea	an		Status	pass		
Sensor Compone	nt Blower		Condi	ition 🛚	I/A			Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	s pass		
Sensor Compone	ent System Memo		Condi	Condition				Status	IS pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	none	BFT142	Sandy Grenville	11/27/2017	Shelter Temperatu	renone
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter S	helter Temperatur
Abs Avg Err 0.22	Abs Max Er Abs Avg 0.32	g Err Abs Max Er	Serial Number	H232734	Tfer Desc.	TD
			Tfer ID	01227	7	
			Slope	1.0075	9 Intercept	0.14754
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	27.80	27.44	0.000	27.4	С	-0.04	
primary	Temp Mid Range	26.16	25.82	0.000	25.5	С	-0.32	
primary	Temp Mid Range	28.28	27.92	0.000	27.6	С	-0.3	
Sensor Con	ponent System Memo	)	Condition	Status pass				

#### **Infrastructure Data For**

Site ID	BFT142	Technician Sandy (	Grenville Site Visit Date 11/27/2017
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	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	Poor	Status	Fail
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

# **Field Systems Comments**

#### 1 Parameter: DasComments

The sample tower is attached to the shelter. The sample tower is not grounded.

#### 2 Parameter: SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

#### 3 Parameter: ShelterCleanNotes

The shelter roof is leaking. There are buckets on the counter to catch the rain water.

#### 4 Parameter: MetOpMaintCom

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

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Site ID	BFT142		Technician Sand	dy Grenville	Site Visit D	Date 11/27	7/2017		
Site Sponsor	(agency)	EPA			USGS Map		Williston		
<b>Operating Gr</b>	oup	UNC-IMS			Map Scale				
AQS #		37-031-99	91		Map Date				
Meteorologica	al Type	R.M. You	ng						
Air Pollutant	Analyzer	Ozone			QAPP Latitude				
Deposition M	easurement	dry, wet			QAPP Longitude				
Land Use		agriculture			QAPP Elevation M	Meters			
Terrain		flat		QAPP Declination	1				
<b>Conforms to</b>	MLM	Yes		QAPP Declination	n Date				
Site Telephon	ie				Audit Latitude		34.884668		
Site Address	1	Open Gro	unds Farm		Audit Longitude		-76.620666		
Site Address 2	2	100 Nelsc	n Bay Rd.		Audit Elevation		5.3		
County		Carteret			Audit Declination		-9.9		
City, State		Beaufort,	NC		P	Present			
Zip Code		28516			Fire Extinguisher	$\checkmark$	Inspected July 2000		
Time Zone		Eastern			First Aid Kit	$\checkmark$			
Primary Ope	rator				Safety Glasses	$\checkmark$			
Primary Op.	Phone #				Safety Hard Hat	$\checkmark$			
Primary Op.	E-mail				Climbing Belt				
Backup Oper	ator				Security Fence				
Backup Op.	Phone #				Secure Shelter				
Backup Op.	E-mail				Stable Entry Step	$\checkmark$			
Shelter Work	ing Room ✓	Make	Ekto	Mo	odel 8810		Shelter Size   640 cuft		
Shelter Clean		Notes	The shelter roof is le	eaking. The	ere are buckets on th	e counter	to catch the rain water.		
Site OK	$\checkmark$	Notes							
Driving Directions From I-95 take highway 70 east through Morehead City and over the bridge. Continue through Beaufort staying on route 70 east. At East Carteret High School, route 70 turns to the right at a traffic light. Continue straight through the light on Merrimon Rd. (SR 1300), do not follow 70 to the right. Open Grounds Farm will be on the right approximately 6 miles on Merrimon Rd. Sign in at the guard house. Continue on the dirt road into the farm. Turn left at the first dirt road. The site will be visible in the corner of the field. Follow the dirt road around the field to the site									

BFT142

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

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 11/27/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		
City > 50,000 population	40 km		
City 10,000 to 50,000 population	10 km		$\checkmark$
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	20 m	
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 is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

<b>F</b> 10	eld Systems Data Form		F-02058-1500-S3-rev002			
Site	BFT142 Technician Sandy Grenville		Site Visit Date 11/27/2017			
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?		N/A			
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A			
3	Are the tower and sensors plumb?	✓	N/A			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?					
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)					
6	Is the solar radiation sensor plumb?	✓	N/A			
7	Is it sited to avoid shading, or any artificial or reflected light?		N/A			
8	Is the rain gauge plumb?	✓	N/A			
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		N/A			
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A			
	Is it inclined approximately 30 degrees?	✓	N/A			

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

Site	e ID	BFT142	Technician	Sandy Grenville		Site Visit Date 11/27/2017	
1	Do all the condition	e meterological senso a, and well maintained	rs appear to be 1?	intact, in good			
2	Are all th reporting	ne meteorological sens g data?	sors operational	l online, and			
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓		
4	Are the a	spirated motors wor	king?		✓	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		N/A	
8	Are the s from the	ensor signal and pow elements and well ma	er cable connec aintained?	tions protected		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 meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

Fi	eld Sy	stems Data I	Form		F-02058-1500-S5-rev002
Site	e ID	BFT142	Technician Sandy Gren	ville	Site Visit Date 11/27/2017
	Siting C	riteria: Are the poll	utant analyzers and deposition	on equipn	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the s unrestri	cample inlets have at acted airflow?	least a 270 degree arc of		
2	Are the	sample inlets 3 - 15	meters above the ground?		
3	Are the and 20 1	sample inlets > 1 me meters from trees?	ter from any major obstruct	ion, 🗹	
	<u>Pollutar</u>	nt analyzers and dep	osition equipment operations	s and mai	ntenance
1	Do the a conditio	analyzers and equipr on and well maintain	nent appear to be in good ed?		
2	Are the reportin	analyzers and moniting data?	tors operational, on-line, and		
3	Describ	e ozone sample tube.			1/4 teflon by 10 meters
4	Describ	e dry dep sample tul	De.		3/8 teflon by 10 meters
5	Are in-l indicate	ine filters used in the location)	e ozone sample line? (if yes		At inlet only
6	Are sam	nple lines clean, free tions?	of kinks, moisture, and		
7	Is the ze	ero air supply desicca	ant unsaturated?		
8	Are the	re moisture traps in	the sample lines?		Flow line only
9	Is there clean?	a rotometer in the d	ry deposition filter line, and	is it 🔽	Clean and dry

Fi	eld Sy	stems Data Fo	orm				<b>F-02</b>	058-15	00-S6-rev002
Site	e ID	BFT142	Technician	Sandy Grenville		Site Visit Date	11/27/2017		
	DAS, se	nsor translators, and	peripheral equi	pment operatio	ns ai	nd maintenance			
1	Do the l well ma	DAS instruments appe intained?	ear to be in good	l condition and					
2	Are all modem,	the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3	Do the a lightnin	analyzer and sensor sig g protection circuitry	gnal leads pass † ?	through	✓	Met sensors only			
4	Are the well ma	signal connections pro intained?	otected from the	e weather and	✓				
5	Are the	signal leads connected	l to the correct	DAS channel?					
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly	✓				
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	perature control	lled?					
9	Is the m	et tower stable and gr	ounded?			Stable	(	Grounded	
10	Is the sa	ample tower stable and	d grounded?						
11	Tower o	comments?				Met tower removed.			

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

The sample tower is attached to the shelter. The sample tower is not grounded.

Field S	Systems Data	Fo	rm				<b>F-02</b>	058-	-1500-S7-rev00
Site ID	BFT142		Tech	nician Sa	andy Grenville	Site Visit Date	11/27/2017		
<b>Docum</b>	entation								
Does th	e site have the requi	red in	strume	ent and eq	uipment manuals?				
		Yes	No	N/A			Yes	No	N/A
Wind spee	ed sensor			$\checkmark$	Data logger	•			
Wind dire	ection sensor			$\checkmark$	Data logger	•			$\checkmark$
Temperat	ure sensor				Strip chart	recorder			
Relative h	umidity sensor			$\checkmark$	Computer			$\checkmark$	
Solar radi	ation sensor			$\checkmark$	Modem			$\checkmark$	
Surface w	etness sensor			$\checkmark$	Printer				
Wind sens	sor translator			$\checkmark$	Zero air pu	mp			
Temperat	ure translator			$\checkmark$	Filter flow	pump			
Humidity	sensor translator			$\checkmark$	Surge prote	ector			$\checkmark$
Solar radi	ation translator			$\checkmark$	UPS				$\checkmark$
Tipping b	ucket rain gauge			$\checkmark$	Lightning p	protection device			$\checkmark$
Ozone ana	alyzer		$\checkmark$		Shelter hea	ter		$\checkmark$	
Filter pac	k flow controller		$\checkmark$		Shelter air	conditioner		$\checkmark$	
Filter pac	k MFC power supply	у 🗌							
Does t	the site have the requ	uired a	and mo	st recent	<b>OC documents and</b>	report forms?			
		Pres	sent				Curre	nt	
Station Lo	og	l	✓				$\checkmark$		
SSRF		I	✓				$\checkmark$		
Site Ops M	Ianual	I	✓	Oct 2001					
HASP									
Field Ops	Manual		✓	Oct 2001					
Calibratio	on Reports		✓						
Ozone z/s/	p Control Charts	[							
Preventive	e maintenance sched	ul							
1 Is the	e station log properly	y comp	oleted o	luring eve	ery site visit? 🗹				
2 Are t curre	he Site Status Repor ent?	rt Forn	ns beir	ng complet	ted and				

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

Control charts not used

Site	ID	BFT142	Technician	Sandy Grenville	Site Visit Date	11/27/2017	
1	<u>Site oper</u> Has the	ration procedures site operator attended	l a formal CAS	TNET training 🗸	]		
	course?	If yes, when and who	instructed?				
2	Has the training	backup operator atter course? If yes, when	nded a formal ( and who instru	CASTNET			
3	Is the site schedule	e visited regularly on t ?	the required <b>T</b> u	iesday 🗸			
4	Are the s flollowed	tandard CASTNET o 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	Compliant
Multipoint Calibrations	$\checkmark$	N/A	
Visual Inspections	$\checkmark$	N/A	$\checkmark$
Translator Zero/Span Tests (climatronics)		N/A	$\checkmark$
Manual Rain Gauge Test	$\checkmark$	N/A	$\checkmark$
Confirm Reasonableness of Current Values	$\checkmark$	N/A	
Test Surface Wetness Response	$\checkmark$	N/A	$\checkmark$

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

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

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

•	
	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:

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Field Systems Data Form						<b>F-02058-1500-S9-rev</b>				
Sit	e ID	BFT142	Technician	Sandy Grenville		Site Visit Date	11/27/2017			
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being change	ed every Tuesda	ay as scheduled?		Filter changed mori	nings			
2	Are the correctl	Site Status Report For y?	rms being com	pleted and filed						
3	Are dat schedul	a downloads and back ed?	ups being perf	ormed as		No longer required				
4	Are gen	eral observations bein	g made and re	corded? 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 sche	dule in a timely	✓					
8	Are filte and shij	ers protected from con pping? How?	tamination du	ring 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	Fre	quency			Compliant			
I	Multi-poi	nt MFC Calibrations	✓ Sem	niannually			$\checkmark$			
1	Flow Syst	em Leak Checks	✓ Wee	ekly						
I	Filter Pac	k Inspection								
I	Flow Rate	e Setting Checks	✓ Wee	ekly			$\checkmark$			
	Visual Ch	eck of Flow Rate Roto	meter 🗹 Wee	ekly			$\checkmark$			
I	n-line Fil	ter Inspection/Replace	ement 🗹 Sem	niannually			$\checkmark$			
5	Sample Li	ine Check for Dirt/Wa	ter 🗹 Wee	ekly			$\checkmark$			
	de enco	dditional annian - the	( <b>b</b> - <b>f</b> - <b>-</b> - <b>b</b> - <b>-</b>	n alaatah if maaa	~~~~	)	and listed ab	· · · · · · · · · · · · · · · · · · ·		

BFT142

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

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 11/27/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07007
DAS	Campbell	CR3000	3815	000498
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00002460587	00808
Flow Rate	Apex	AXMC105LPMDPC	42230	000463
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0802325832	06383
Ozone	ThermoElectron Inc	49i A1NAA	1030244789	000685
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200027	000453
Sample Tower	Aluma Tower	В	unknown	000632
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4542	04444
Zero air pump	Werther International	C 70/4	000821893	06897

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WSF	P144-Eric H	ebert-11/28/2017				
1	11/28/2017	Computer	Dell	07037	Inspiron 15	Unknown
2	11/28/2017	DAS	Campbell	000430	CR3000	2525
3	11/28/2017	Elevation	Elevation	None	1	None
4	11/28/2017	Filter pack flow pump	Thomas	00087	107CA110	83403-10
5	11/28/2017	Flow Rate	Арех	000639	AXMC105LPMDPCV	54780
6	11/28/2017	Infrastructure	Infrastructure	none	none	none
7	11/28/2017	Modem	Raven	06454	V4221-V	0808338332
8	11/28/2017	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
9	11/28/2017	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
10	11/28/2017	Sample Tower	Aluma Tower	000126	В	none
11	11/28/2017	Shelter Temperature	Campbell	none	107-L	none
12	11/28/2017	Siting Criteria	Siting Criteria	None	1	None
13	11/28/2017	Temperature	RM Young	06387	41342VC	13960
14	11/28/2017	Zero air pump	Werther International	06880	C 70/4	000814273

## **DAS Data Form**

DAS Time Max Error: 0.03

Mfg	Serial Number Site		Т	<b>Sechnician</b>	Site Visit Date	Parameter	Use Desc.
Campbell	2525	WSF	P144	Eric Hebert	11/28/2017	DAS	Primary
Das Date:	11/28/2017	Audit Date	11/28/2017	Mfg	Datel	Parameter	DAS
Das Time:	12:27:32 332	Audit Time_ Audit Dav	12:27:30 332	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel:	:	High Channel		Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0000	0.0000	0.0000	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 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	0.1000	0.1000	V	V	0.0000	
7	0.3000	0.3002	0.3002	V	V	0.0000	
7	0.5000	0.5003	0.5003	V	V	0.0000	
7	0.7000	0.7004	0.7004	V	V	0.0000	
7	0.9000	0.9005	0.9005	V	V	0.0000	
7	1.0000	1.0006	1.0006	V	V	0.0000	

## Flow Data Form

Mfg	Serial Nun	nber Ta	Site	Tec	hnician	Site Visit Da	ate Param	ieter	<b>Owner ID</b>
Apex	54780		WSP144	Eri	c Hebert	11/28/2017	Flow R	ate	000639
					Mfg	BIOS	Р	arameter Flow	v Rate
					Serial Number	122974	Т	fer Desc. BIO	S 220-H
					Tfer ID	01416			
					CI.	10	0700 7		0.00000
					Slope	1.0	0732 Inte	ercept	-0.02202
					Cert Date	3/8/	2017 Cor	rCoff	0.99970
DAS 1:		<b>DAS 2:</b>		_	Cal Factor Z	ero	-0.0	)1	
A Avg % Diff:	A Max % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	1.0	)1	
1.54%	1.97%				Rotometer R	eading:	1	.3	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.10	l/m	l/m	
primary	test pt 1	1.504	1.510	1.48	0.000	1.49	l/m	l/m	-1.32%
primary	test pt 2	1.503	1.510	1.48	0.000	1.49	l/m	l/m	-1.32%
primary	test pt 3	1.507	1.520	1.48	0.000	1.49	l/m	l/m	-1.97%
Sensor Comp	onent Leak Tes	st		Conditio	n		Status	pass	
Sensor Comp	onent Tubing C	ondition		Conditio	n Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	n Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Comp	onent Filter Dis	tance		Conditio	<b>n</b> 4.5 cm		Status	pass	
Sensor Comp	onent Filter Dep	oth		Conditio	<b>n</b> 3.5 cm		Status	pass	
Sensor Comp	onent Filter Azi	muth		Conditio	n 270 deg		Status	pass	
Sensor Comp	onent System M	Nemo		Conditio	n		Status	pass	

## **Ozone Data Form**

Mfg		Serial N	umber Ta	Site	Te	chnician		Site Visi	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	110534	7317	WSP144	Er	ic Hebert		11/28/20	017	Ozone		000734	
Slope: Intercept CorrCoff	( ( (	).97433 ).75095 ).99999	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	lectron	Inc Pa	rameter ozo er Desc. Oz	one one primary	y stan
DAS 1: A Avg % D 5.3	<b>)iff: A M</b> 3%	<b>Iax % D</b> 8.9	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9	1.0050 /12/201	4 Inter 7 Corr	ccept Coff	0.32	2915 0000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw           0.29           15.74           33.78           68.38           110.35	Tfer -0. 15. 33. 67. 109	Corr 03 33 28 70 0.46	Si -0. 13 31 65 106	ite .47 .96 .53 .17 5.00	Site ppb ppb ppb ppb ppb	e Unit	PctDiff	-8.94% -5.26% -3.74% -3.16%	
Sensor Co	omponei	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	on N/A				Status	pass		
Sensor Co	omponei	nt Offset	t		Conditio	on 0.40				Status	pass		
Sensor Co	omponei	nt Span			Conditio	n 1.045				Status	pass		
Sensor Co	ompone	at Zero \	/oltage		Conditio	n N/A				Status	pass		
Sensor C	ompone				Conditio	$N/\Delta$				Status	nass		
Sensor C	ompone		Erog		Conditio					Status	2000		
Sensor Co	omponei				Conditio	on 102.7				Status	pass		
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.9 pp	DD			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.73 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 736.3	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 37.2 (	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 100.9	kHz			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 0.71 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 737.2	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	sted			Status	pass		
Sensor Co	ompone	nt Svste	m Memo		Conditio	on				Status	pass		
	mpone				Condition					Status			

# Temperature Data Form

Mfg	Serial Number T	fa Site	,	Techni	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>	
RM Young	13960	WSP144		Eric H	ebert	11/28	3/2017	Temper	ature	06387	
				Mf	g	Extec	h	Pa	rameter Te	emperature	
				Ser	rial Number	H232	679	Tf	er Desc. R	ſD	
				Tfe	er ID	01228	3				
DAS 1:	DAS	2:		Slo	pe		1.0065	6 Inte	rcept	-0.0334	1
Abs Avg Err Al	bs Max Er Abs A	Avg Err Abs	Max Er	Ce	rt Date		2/4/201	7 Cor	rCoff	1.0000	0
0.22	0.33										
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference	
primary Ten	np Low Range	-0.07	-0.04	1	0.000		0.3	3	С	0.33	
primary Ten	np Mid Range	22.55	22.44	4	0.000		22.	3	С	-0.13	
primary Ten	np High Range	46.51	46.24	4	0.000		46.	0	С	-0.21	
Sensor Compon	ent Shield		Condi	ition C	Clean			Status	pass		
Sensor Compon	ent Blower		Condi	ition 🕨	N/A			Status	pass		
Sensor Component Blower Status Switch				Condition N/A				Status	pass		
Sensor Compon	ent System Memo		Condi	ition				Status	pass		

# Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	<b>Owner ID</b>
Campbell	none	WSP144	Eric Hebert	11/28/2017	11/28/2017 Shelter Temperature	
DAS 1:	DAS 2:	-	Mfg	Extech	Parameter St	elter Temperatur
Abs Avg Err Abs	Max Er Abs Avg	Err Abs Max Er	Serial Number	H232679	Tfer Desc. R	ſD
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference	
primary	Temp Mid Range	21.83	21.72	0.000	23.7	С	1.99	
primary	Temp Mid Range	26.08	25.94	0.000	25.3	С	-0.61	
primary	Temp Mid Range	25.40	25.27	0.000	26.0	С	0.71	
Sensor Component System Memo			Condition	Status pass				

#### **Infrastructure Data For**

Site ID	WSP144	Technician Eric He	bert Site Visit Date 11/28/2017
Shelter	Make	Shelter Model	Shelter Size
Ekto		8810	640 cuft
100			

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	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	WSP144	Eric Hebert	11/28/2017	Moisture Present	Apex	3875				
The filter sample tubing has drops of moisture in low sections outside the shelter.										

# **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

Ozone sample line leak-checks are conducted every two weeks.

2 Parameter: SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

3 Parameter: ShelterCleanNotes

The shelter is in good condition, clean, very neat, and well organized.
## F-02058-1500-S1-rev002

Site ID WSP144	Technician Eric Hebert	Site Visit Date 11/28	3/2017
Site Sponsor (agency)	EPA	USGS Map	Pennington
Operating Group	NJDEP / WCRC	Map Scale	
AOS #	34-021-9991	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	OAPP Latitude	
Deposition Measurement	dry, PM2.5, PM10	OAPP Longitude	
Land Use	woodland. urban agriculture	OAPP Elevation Meters	
Terrain	rolling	OAPP Declination	
Conforms to MI M	Marginally	OAPP Declination Date	
		QATT Decimation Date	
Site Telephone		Audit Latitude	40.312303
Site Address 1	WCRC-FA	Audit Longitude	-74.872663
Site Address 2	Church Rd.	Audit Elevation	59
County	Mercer	Audit Declination	-12.5
City, State	Titusville, NJ	Present	
Zip Code	08560	Fire Extinguisher 🔽	dated 2015
Time Zone	Eastern	First Aid Kit	
Primary Operator		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat 🔽	
Primary Op. E-mail		Climbing Belt	
<b>Backup Operator</b>		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Step 🔽	
Shelter Working Room ✓	Make Ekto M	odel 8810	Shelter Size 640 cuft
Shelter Clean	Notes The shelter is in good condition	n, clean, very neat, and well org	janized.
Site OK	Notes		
Driving Directions From just ov the particular of the particular o	Philadelphia take I-95 north. Cross the D ver the bridge. Continue approximately 4 rk. Turn right onto Church road at the tra the right. The combination to the lock is d turn right along the edge of the field. For	elaware River into New Jersey miles through the traffic light at ffic light. Continue approximat 1903. Continue through the ga blow the gravel road to the site	and take the first exit, route 29 north, the intersection of 546 and through ely 0.5 miles to the gate for the WCRC- ate up the gravel road to the top of the in the chain-link fenced area.

WSP144

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

Site ID

Technician Eric Hebert

Site Visit Date 11/28/2017

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

Siting Distances OK

**Siting Criteria Comment** 

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	WSP144 Technician Eric Hebert		Site Visit Date 11/28/2017
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	✓	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)		N/A
3	Are the tower and sensors plumb?	✓	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?		
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)		
6	Is the solar radiation sensor plumb?	✓	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	✓	N/A
8	Is the rain gauge plumb?	✓	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	✓	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	✓	N/A
Pro nat	ovide any additional explanation (photograph or sketch if nece sural or man-made, that may affect the monitoring parameters	ssar	y) regarding conditions listed above, or any other features,

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Site	e ID	WSP144	Technician Eric Hebert		Site Visit Date 11/28/2017
1	Do all th condition	e meterological sensor 1, and well maintained	s appear to be intact, in good ?	✓	
2	Are all the reporting	he meteorological sens g data?	ors operational online, and		
3	Are the s	shields for the tempera	ture and RH sensors clean?	✓	
4	Are the a	aspirated motors work	ing?		
5	Is the sol scratches	ar radiation sensor's l s?	ens clean and free of	✓	N/A
6	Is the su	rface wetness sensor g	rid clean and undamaged?	✓	N/A
7	Are the s condition	sensor signal and powe 1, and well maintained	er cables intact, in good ?		
8	Are the s from the	ensor signal and powe elements and well ma	er cable connections protected intained?		

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	<b>WSP144 Technician</b> Eric Hebert		Site Visit Date 11/28/2017
	Siting Criteria: Are the pollutant analyzers and deposition ec	uipi	<u>ment sited in accordance with 40 CFR 58, Appendix E</u>
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
	Pollutant analyzers and deposition equipment operations and	l ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	✓	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

Fie	eld Systems Data Form	n	F-02058-1500-S6-rev002				
Site	e ID WSP144	Technician Eric Hebe	rt	Site Visi	it Date 11/28/20	17	
	DAS, sensor translators, and peri	pheral equipment ope	erations a	nd maintena	nce		
1	Do the DAS instruments appear t well maintained?	o be in good condition	and 🗹				
2	Are all the components of the DA modem, backup, etc)	S operational? (printe	ers, 🔽				
3	Do the analyzer and sensor signal lightning protection circuitry?		Met sensors	only			
4	Are the signal connections protect well maintained?	ted from the weather	and 🔽				
5	Are the signal leads connected to	the correct DAS chan	nel? 🔽				
6	Are the DAS, sensor translators, a grounded?	and shelter properly					
7	Does the instrument shelter have	a stable power source	?				
8	Is the instrument shelter tempera	ture controlled?					
9	Is the met tower stable and groun	ided?		Stable		Grounded	
10	Is the sample tower stable and gro	ounded?					
11	Tower comments?			Met tower re	moved		

Field Sy	stems Data F	or	m				<b>F-02</b>	058-1	500-S7-rev002
Site ID	WSP144		Techr	nician	Eric Hebert	Site Visit Date	11/28/2017		
Document	ation								
Does the s	ite have the required	l ins	trume	nt and	equipment manuals?				
	Y	es	No	<b>N/</b> .	A		Yes	No	N/A
Wind speed s	sensor				Data logge	r			
Wind directi	on sensor			✓	Data logge	r			
Temperature	e sensor	✓			Strip chart	recorder			
Relative hun	nidity sensor			$\checkmark$	Computer				
Solar radiati	on sensor			✓	Modem			$\checkmark$	
Surface wetn	ess sensor			$\checkmark$	Printer				
Wind sensor	translator			$\checkmark$	Zero air pu	ımp			
Temperature	e translator			$\checkmark$	Filter flow	pump		$\checkmark$	
Humidity ser	nsor translator			$\checkmark$	Surge prot	ector			
Solar radiati	on translator			$\checkmark$	UPS			$\checkmark$	
Tipping buck	ket rain gauge			$\checkmark$	Lightning	protection device			$\checkmark$
Ozone analyz	zer	✓			Shelter hea	iter			
Filter pack fl	low controller	✓			Shelter air	conditioner	$\checkmark$		
Filter pack M	IFC power supply			$\checkmark$					
Does the	site have the require	ed ai	nd mos	<u>st rece</u>	nt QC documents and	<u>report forms?</u>			
	I	Prese	ent				Currei	nt	
Station Log							$\checkmark$		
SSRF							$\checkmark$		
Site Ops Mar	nual	V		Dct 201	1		$\checkmark$		
HASP				Dct 201	1		$\checkmark$		
Field Ops Ma	anual						$\checkmark$		
Calibration I	Reports								
Ozone z/s/p (	Control Charts								
Preventive m	aintenance 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

#### WSP144 Technician Eric Hebert Site Visit Date 11/28/2017 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 $\checkmark$ training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	$\checkmark$	Semiannually	
Automatic Zero/Span Tests	$\checkmark$	Daily	$\checkmark$
Manual Zero/Span Tests			$\checkmark$
Automatic Precision Level Tests	$\checkmark$	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		N/A	$\checkmark$
Sample Line Check for Dirt/Water	$\checkmark$	Weekly	$\checkmark$
Zero Air Desiccant Check	$\checkmark$	Weekly	$\checkmark$

- Do multi-point calibration gases go through the complete 1 sample train including all filters?
- Do automatic and manual z/s/p gasses go through the 2 complete sample train including all filters?
- 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 line leak-checks are conducted every two weeks.

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

Fi	Field Systems Data Form							<b>F-02058</b>	-1500-S9-rev002	
Sit	ite ID WSP144 Technician Eric Hebert						Site Visit Date	11/28/2017		
	<u>Site ope</u>	eration procedures								
1	Is the fi	lter pack being changed e	every Tu	esda	ay as scheduled?		Filter changed mori	nings		
2	Are the correctl	Site Status Report Forms y?	s being c	omp	pleted and filed					
3	Are dat schedul	a downloads and backups ed?	s being p	oerfo	ormed 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 san	nple flow rates recorded?	How?			✓	SSRF, logbook, call-in			
7	Are san fashion	nples sent to the lab on a 1 ?	regular s	sche	dule in a timely					
8	Are filte and shij	ers protected from contan pping? How?	nination	dur	ing handling	✓	Clean gloves on an	d off		
9	Are the operation	site conditions reported 1 ons manager or staff?	regularly	y <b>to</b> 1	the field					
QC	Check P	erformed		Freq	quency			Compliant		
I	Multi-poi	nt MFC Calibrations		Sem	iannually					
J	Flow Syst	em Leak Checks		Wee	kly					
]	Filter Pac	k Inspection		Wee	kly					
]	Flow Rate Setting Checks						$\checkmark$			
•	Visual Ch	eck of Flow Rate Rotome	eter 🗹	Wee	kly			$\checkmark$		
]	In-line Fil	ter Inspection/Replaceme	ent 🗹	Sem	iannually			$\checkmark$		
5	Sample Li	ine Check for Dirt/Water		Wee	kly			$\checkmark$		
Duco	de enve	dditional amplemation (n	otomor	ha	. alrotak if naaaa		) recording conditi	and listed above	an any other features	

Field	Su	stems	Data	Form
I'ICIU	<b>N</b>	SUCHIS	Data	I'UI III

WSP144

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

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

Technician Eric Hebert

Site Visit Date 11/28/2017

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07037
DAS	Campbell	CR3000	2525	000430
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	83403-10	00087
Flow Rate	Apex	AXMC105LPMDPC	54780	000639
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808338332	06454
Ozone	ThermoElectron Inc	49i A1NAA	1105347317	000734
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938240	000543
Sample Tower	Aluma Tower	В	none	000126
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13960	06387
Zero air pump	Werther International	C 70/4	000814273	06880

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SHN	1418-Eric H	lebert-11/29/2017				
1	11/29/2017	Computer	Hewlett Packard	none	8460p	CNU13607B3
2	11/29/2017	DAS	Environmental Sys Corp	90658	8816	2643
3	11/29/2017	Elevation	Elevation	None	1	None
4	11/29/2017	Filter pack flow pump	Thomas	00443	107CA110	0288714888
5	11/29/2017	flow rate	Tylan	03942	FC280	AW9605202
6	11/29/2017	Infrastructure	Infrastructure	none	none	none
7	11/29/2017	MFC power supply	Tylan	03485	RO-32	FP9404009
8	11/29/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535
9	11/29/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
10	11/29/2017	Sample Tower	Aluma Tower	923307	В	none
11	11/29/2017	Shelter Temperature	ARS	none	none	none
12	11/29/2017	Siting Criteria	Siting Criteria	None	1	None
13	11/29/2017	Temperature2meter	RM Young	none	41342VC	14265
14	11/29/2017	Zero air pump	Werther International	none	C 70/4	000855578

## **DAS Data Form**

DAS Time Max Error: 1.42

Mfg	Serial N	umber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2643	SHN	418	Eric Hebert	11/29/2017	DAS	Primary
Das Date:	11/29/2017	Audit Date	11/29/2017	Mfg	Datel	Parameter	DAS
Das Time: Das Day:	333	Audit Time	333	Serial Number	4000392	Tfer Desc.	Source generator (D
Low Channel	:	High Channel	:	Tfer ID	01321		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0003	0.000	5 0.0003	0.0005	Cert Date	1/22/201	5 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	86590148	Tfer Desc.	DVM
				Tfer ID	01310		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	2/23/201	7 CorrCoff	1.00000
Channel	Input I	OVM Output	DAS Output	InputUnit	OutputUnit	Difference	
2	0.0000	0.0000	0.0000	V	V	0.0000	
2	0.1000	0.1000	0.1001	V	V	0.0001	
2	0.3000	0.3002	0.3003	V	V	0.0001	
2	0.5000	0.5003	0.5005	V	V	0.0002	
2	0.7000	0.7004	0.7008	V	V	0.0004	
2	0.9000	0.9005	0.9010	V	V	0.0005	
2	1.0000	1.0006	1.0011	V	V	0.0005	

## Flow Data Form

Mfg	5	Serial Nun	ıber Ta	Site	Te	echnician	Site Visit	Date Para	ameter	Owner ID
Tylan		AW960520	)2	SHN418	E	ric Hebert	11/29/201	7 flow	rate	03942
Mfg	Tyla	n				Mfg	BIOS		Parameter Flo	ow Rate
SN/Owner ID	FP9	404009	03485			Serial Number	122974		Tfer Desc. BI	OS 220-H
Parameter	arameter MFC power supply				Tfer ID	01416				
						Slope	1	.00732	ntercept	-0.02202
						Cert Date	3/	/8/2017	CorrCoff	0.99970
DAS 1:			<b>DAS 2:</b>			Cal Factor Z	ero	-0	.307	
A Avg % Diff:	A Ma	ax % Di	A Avg %	Dif A Max	: % Di	Cal Factor F	ull Scale	4	.833	
1.52%		1.57%				Rotometer R	eading:		1.7	
Desc.	Т	est type	Input l/m	Input Corr_	MfcDisp	. OutputSignal	Output S E	InputUni	t OutputSigna	ll PctDifference
primary	pum	p off	0.000	0.000	0.27	0.0000	0.00	l/m	l/m	
primary	leak	check	0.000	0.000	0.28	0.0000	0.00	l/m	l/m	
primary	test	pt 1	1.524	1.530	1.75	0.0000	1.51	l/m	l/m	-1.50%
primary	test	pt 2	1.524	1.530	1.75	0.0000	1.51	l/m	l/m	-1.57%
primary	test	pt 3	1.524	1.530	1.75	0.0000	1.51	l/m	l/m	-1.50%
Sensor Comp	onen	t Leak Tes	t		Conditio	on		Stat	tus pass	
Sensor Compo	onen	t Tubing C	ondition		Conditio	on Good		Stat	tus pass	
Sensor Comp	onen	t Filter Pos	sition		Condition	on Poor		Stat	tus Fail	
Sensor Comp	onen	Rotomete	er Conditio	n	Conditio	on Clean and dry		Stat	tus pass	
Sensor Comp	onen	t Moisture	Present		Conditio	on No moisture pr	esent	Stat	tus pass	
Sensor Component Filter Distance			Conditio	on 5.5 cm		Stat	tus pass			
Sensor Component Filter Depth			Conditio	on -1.0 cm	Stat	tus Fail				
Sensor Comp	onen	Filter Azir	muth		Condition	on 270 deg	Stat	tus pass		
Sensor Comp	onen	t System N	lemo		Conditio	on		Stat	tus pass	

## **Ozone Data Form**

Mfg		Serial N	umber Ta	Site	Te	Technician Site Visit Dat		it Date	Parame	eter	Owner I	D	
ThermoElec	tron Inc	090333	4535	SHN418	Er	ic Hebert	:	11/29/20	017	Ozone		none	
Slope: Intercept CorrCoff	( -( (	).97938 ).18335 ).99997	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	Electron	Inc Pa	rameter ozo er Desc. Oz	one one primar <u>i</u>	/ stan
DAS 1: DAS 2:   A Avg % Diff: A Max % Di A Avg % Dif   2.1% 4.0%		6Dif A Max	Slope [ Cert Date		9	1.00504     Intercept       9/12/2017     CorrCoff		ccept Coff	0.32	2915 0000			
UseDes prin prin prin prin prin prin	acription nary nary nary nary nary		DINCGROUP 1 2 3 4 5	Tfer Raw       0.29       13.78       34.61       68.08       110.22	Tfer -0. 13. 34. 67. 109	Corr 03 38 10 41 2,34	Si -0. 13 32 65 100	ite .34 .37 .74 .99 5.90	Sit ppb ppb ppb ppb	e Unit	PctDiff	-0.07%       -3.99%       -2.11%       -2.23%	
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	ompone	nt Inlet F	Filter Conditio	n	Conditio	on Clean	l			Status	pass		]
Sensor Co	omponei	nt Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor Co	omponei	1t Offset	t		Conditio	on 0.40				Status	pass		
Sensor Co	ompone	t Span			Conditio	Condition 0.984				Status	pass		
Sensor C	ompone				Condition 0.0003				Status	nass			
Sensor C	ompone				Condition 0.0003				Status	pass			
Sensor Co	omponei				Conditio		-			Status	pass		
Sensor Co	ompone	t Cell A	Freq.		Conditio	on 95.7 k	(HZ			Status	pass		_
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.7 pp	b			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.65 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 663.4	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	. Tmp.		Conditio	on 34.8 0	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 108.0	kHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 0.8 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 663.1	mmHg			Status	pass		
Sensor Co	ompone	t Cell B	Tmp.		Conditi	on				Status	pass		
Sensor C	omnono	t line l	OSS		Conditi	n Not te	ested			Status	pass		
Sensor Co	omponel		m Mama		Conditio					Status	P000		
Sensor Co	ompone	at Syste			Conditio	on				Status	pass		

## 2 Meter Temperature Data Form

**Calc. Difference** 

Mfg	Serial Numb	er Ta Site		Technicia	n	Site Vis	it Date	Paramete	er	Owner ID
RM Young	14265	SHN418	3	Eric Hebe	ert	11/29/2	017	Temperat	ure2meter	none
				Mfg		Extech		Para	ameter Tem	perature
				Serial	Number	H23267	9	Tfer	Desc. RTD	
				Tfer I	D	01228		]		
DAS 1:	D	AS 2:		Slope			1.00656	Interc	ept	-0.03341
Abs Avg Err A	bs Max Er A	bs Avg Err A	bs Max Er	Cert I	Date		2/4/2017	CorrC	Coff	1.00000
0.18	0.27			]						
UseDescription	Test type	InputTmpRaw	InputTmpC	Corrected	OutputTm	pSignal	OutputSi	ignalEng	OSE Unit	Difference
primary	Temp Low Rang	g 0.06	5	0.09		0.0000		0.24	С	0.15
primary	Temp Mid Rang	23.05	5	22.93		0.0000		22.82	С	-0.11
primary	Temp High Rang	g 48.99	)	48.70		0.0000		48.43	С	-0.27
Sensor Compo	nent Properly Sit	ted	Cond	lition Prop	perly sited			Status P	ass	
Sensor Compo	nent Shield		Cond	lition Mod	lerately clea	an		Status P	ass	
Sensor Compo	nent Blower		Cond	l <mark>ition</mark> Fun	ctioning			Status P	ass	
Sensor Component Blower Status Switch		Cond	Condition N/A				Status P	ass		
Sensor Compo	nent System Me	mo	Cond	lition				Status P	ass	

## Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Site Visit Date Parameter	
ARS	none	SHN418	Eric Hebert	11/29/2017 Shelter Temperatu		none
DAS 1:	DAS 2:	En Aba Man En	Mfg	Extech	Parameter She	elter Temperatur
Abs Avg ErrAbs0.92	0.95	EFF ADS MAX EF	Serial Number	H232679	Tfer Desc. RTI	)
			Tfer ID	01228		
			Slope	1.0065	6 Intercept	-0.03341
			Cert Date	2/4/201	7 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.23	25.10	0.000	26.1	С	0.95
primary	Temp Mid Range	25.32	25.19	0.000	26.1	С	0.9
Sensor Component     System Memo     Condition     Status     pass							

#### **Infrastructure Data For**

Site ID	SHN418	Technician Eric He	bert Site Visit Date 11/29/2017
Shelter	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	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	n
Flow Rate	SHN418	Eric Hebert	11/29/2017	Filter Position	Tylan	56		

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: SiteOpsProcedures

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

2 Parameter: ShelterCleanNotes

The shelter is in good condition, clean and well organized

## F-02058-1500-S1-rev002

Site ID SHN418	Technician Eric Hebert	Site Visit Date 11/29	9/2017		
Site Sponsor (agency)	NPS/EPA	USGS Map	Big Meadows		
<b>Operating Group</b>	NPS	Map Scale			
AQS #	51-113-003	Map Date			
Meteorological Type	Climatronics				
Air Pollutant Analyzer	Ozone, PM2.5	QAPP Latitude			
<b>Deposition Measurement</b>	dry, wet, Hg, IMPROVE	QAPP Longitude			
Land Use	woodland - mixed	QAPP Elevation Meters			
Terrain	complex	QAPP Declination			
Conforms to MLM	No	QAPP Declination Date			
Site Telephone		Audit Latitude	38.5231		
Site Address 1	Shenandoah National Park	Audit Longitude	-78.43471		
Site Address 2	3655 US Hwy 211 East	Audit Elevation	1068		
County	Madison	Audit Declination	-9.9		
City, State	Luray, VA	Present			
Zip Code	22835	Fire Extinguisher 🔽	Inspected Oct 2017		
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 8814	Shelter Size 896 cuft		
Shelter Clean	Notes The shelter is in good condition	n, clean and well organized			
Site OK	Notes				
Driving Directions Note: arrange for a "EB submaster" key 4 days in advance to be left at Big Meadows Visitor Center. From DC take 460 west to 29N to 33W to Skyline Drive North. Exit into Big Meadows Visitors Center. Go toward lodge and take the first right. Take the gravel road from the parking lot on the left to the site.					

SHN418

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

Site ID

Technician Eric Hebert

Site Visit Date 11/29/2017

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		✓
Major industrial complex	10 to 20 km		$\checkmark$
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		
Small parking lot	100 m		$\checkmark$
Tree line	50 m	10 - 30 m	
Obstacles to wind	10 times obstacle height		$\checkmark$

Siting Distances OK

Siting Criteria Comment

Field Systems Data Form					F-02058-1500-S3-rev0			
Site	e ID	SHN418	Technician Eric Hebert		Site Visit Date 11/29/2017			
1	Are win being in	d speed and direction fluenced by obstructio	sensors sited so as to avoid ons?		N/A			
2	Are win (i.e. win horizon tower in	d sensors mounted so d sensors should be m tally extended boom > to the prevailing wind	as to minimize tower effects ounted atop the tower or on 2x the max diameter of the l)	? ⊻ a	N/A			
3	Are the	tower and sensors plu	mb?	$\checkmark$	N/A			
4	Are the avoid ra	temperature shields p diated heat sources su	ointed north or positioned to 10 as buildings, walls, etc?					
5	5 Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)							
6	Is the so	lar radiation sensor p	lumb?	$\checkmark$	N/A			
7	Is it site light?	d to avoid shading, or	any artificial or reflected		N/A			
8	Is the ra	in gauge plumb?		$\checkmark$	N/A			
9	Is it site towers,	d to avoid sheltering e etc?	ffects from buildings, trees,		N/A			
10	Is the su facing n	rface wetness sensor s orth?	sited with the grid surface	$\checkmark$	N/A			
11	Is it inc	lined approximately 3	0 degrees?	✓	N/A			
Pro	ovide any	additional explanatio	n (photograph or sketch if n	ecessar	y) regarding conditions listed above, or any other features,			

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

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

Site	e ID SHN418 Technician Eric Heber	Site Visit Date 11/29/2017	
1	Do all the meterological sensors appear to be intact, in g condition, and well maintained?	od 🗹	
2	Are all the meteorological sensors operational online, an reporting data?		
3	Are the shields for the temperature and RH sensors clea	2	
4	Are the aspirated motors working?		
5	Is the solar radiation sensor's lens clean and free of scratches?	✓ N/A	
6	Is the surface wetness sensor grid clean and undamaged	✓ N/A	
7	Are the sensor signal and power cables intact, in good condition, and well maintained?		
8	Are the sensor signal and power cable connections proto from the elements and well maintained?	ed 🔽	

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	te ID SHN418 Technician Eric Hebert			Site Visit Date 11/29/2017		
	Siting C	riteria: Are the pollut	ant analyzers ai	nd deposition eq	<u>uipr</u>	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	2 Are the sample inlets 3 - 15 meters above the ground?					
3	Are the and 20 r	sample inlets > 1 meten neters from trees?	er from any maj	or obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	ition equipment	t operations and	mai	<u>ntenance</u>
1	Do the a conditio	nalyzers and equipme on and well maintained	ent appear to be	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 12 meters
5	Are in-li indicate	ine filters used in the o location)	ozone sample lin	e? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of tions?	' kinks, moisture	e, and		
7	Is the ze	ero air supply desiccan	t unsaturated?		✓	
8	Are the	re moisture traps in th	e sample lines?			
9	Is there clean?	a rotometer in the dry	v deposition filte	er line, and is it		Clean and dry

Field Systems Data Form								<b>F-02</b>	2058-15	00-S6-rev002
Site ID     SHN418     Technician     Eric Hebert			Site Visit	t Date	11/29/2017	7				
	DAS, sei	nsor translators, and p	pment operation	ns ai	nd maintenar	<u>1ce</u>				
1 Do the DAS instruments appear to be in good condition and <b>✓</b> well maintained?					✓					
2 Are all the components of the DAS operational? (printers, modem, backup, etc) ✓										
<b>3</b> Do the analyzer and sensor signal leads pass through lightning protection circuitry?					✓	Met sensors	only			
4 Are the signal connections protected from the weather and well maintained?				✓						
5	Are the	signal leads connected	to the correct	DAS channel?	✓					
6	Are the grounde	DAS, sensor translato d?	rs, and shelter j	properly	✓					
7	Does the	instrument shelter ha	ave a stable pow	ver source?	✓					
8 Is the instrument shelter temperature controlled?					✓					
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	mple tower stable and	l grounded?							
11	Tower c	omments?								

Field Sy	ystems Data F	orn	n				<b>F-02</b>	058-	1500-S7-rev002
Site ID	SHN418	1	<b>Sechnician</b>	Eric Hebert		Site Visit Date 1	1/29/2017	•	
<u>Documen</u>	<u>tation</u>								
<b>Does the</b>	site have the required	instr	ument and	equipment mar	<u>uals?</u>				
	Ye	es	No N/A	 L			Yes	No	N/A
Wind speed	sensor			Data	a logger	•			
Wind direct	ion sensor			Data	a logger	•			
Temperatur	e sensor			Strij	p chart	recorder			
Relative hur	nidity sensor			Con	puter				
Solar radiat	ion sensor			Mod	lem				
Surface wet	ness sensor			Prin	ter				
Wind sensor	r translator			Zero	) air pu	mp			
Temperatur	e translator			Filte	er flow j	pump			
Humidity se	nsor translator			Surg	ge prote	ector		$\checkmark$	
Solar radiat	ion translator			UPS					
Tipping buc	ket rain gauge 🛛 🗹			Ligh	ntning p	protection device		$\checkmark$	
Ozone analy	vzer 🗸			Shel	ter hea	ter		$\checkmark$	
Filter pack f	low controller			Shel	ter air (	conditioner	$\checkmark$		
Filter pack I	MFC power supply								
Does the	e site have the require	d and	l most recer	t QC documen	ts and	<u>report forms?</u>			
	P	resen	t				Curre	nt	
Station Log		✓	Dataviev	v					
SSRF		$\checkmark$					$\checkmark$		
Site Ops Ma	nual	$\checkmark$							
HASP		$\checkmark$							
Field Ops M	lanual	$\checkmark$							
Calibration	Reports	$\checkmark$	9/16/20 ⁻	5			$\checkmark$		
Ozone z/s/p	Control Charts								
Preventive r	naintenance schedul								
1 Is the s	tation log properly co	mplet	ted during e	very site visit?	✓ Da	ataview			
2 Are the current	e Site Status Report Fo t?	orms	being comp	leted and	✓ Flo	ow section only			
3 Are the sample	e chain-of-custody form transfer to and from [	ns pr lab?	operly used	to document					
4 Are ozo current	one z/s/p control chart t?	s pro	perly comp	eted and	✓ Date	ataview			
Provide any natural or n	additional explanatio nan-made, that may af	n (ph ffect (	otograph o the monitor	r sketch if nece ing parameters	ssary) r	egarding condition	ns listed a	above, o	or any other features,

#### SHN418 Technician Eric Hebert Site Visit Date 11/29/2017 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? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

#### Frequency

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

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

OC	Check	Perform	ned
VV.	Chicch	I CITOI II	icu

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

Provide any additional 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.

#### **Compliant**

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

✓ Dataview **Compliant** 

Fi	eld Sy	stems Data Fo	orm				<b>F-02058-1500-S9-re</b>					
Sit	Site ID SHN418 Tec		Techni	hnician Eric Hebert			Site Visit Date	11/29/2017				
	<u>Site ope</u>	eration procedures										
1	Is the filter pack being changed every Tuesday as scheduled						Filter changed morir	nings 90%				
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						
5	Are site supplies on-hand and replenished in a timely fashion?											
6	Are sample flow rates recorded? How?				✓	SSRF						
7	Are samples sent to the lab on a regular schedule in a timely fashion?				✓							
8	Are filte and shij	ers protected from cont pping? How?	tamination	n du	ring handling	✓	Clean gloves on and	d off				
9	Are the operation	site conditions reporte ons manager or staff?	d regular	ly to	the field							
QC	Check P	erformed		Fre	quency			Compliant				
I	Multi-poi	nt MFC Calibrations	$\checkmark$	Sen	niannually							
1	Flow Syst	em Leak Checks	$\checkmark$	Wee	ekly							
1	Filter Pac	k Inspection										
1	Flow Rate Setting Checks											
	Visual Check of Flow Rate Rotometer					$\checkmark$						
1	n-line Fil	ter Inspection/Replace	ment 🗹	As r	needed			$\checkmark$				
5	Sample Li	ine Check for Dirt/Wat	ter 🗸	Wee	əkly							
Deser		d different semilemetion (	(		n alaatah if maaaa	~~~~	) manual in a sour dist		n ann ath an faatanaa			

SHN418

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

Site ID	
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Technician Eric Hebert

Site Visit Date 11/29/2017

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU13607B3	none
DAS	Environmental Sys Corp	8816	2643	90658
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0288714888	00443
flow rate	Tylan	FC280	AW9605202	03942
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9404009	03485
Ozone	ThermoElectron Inc	49i A3NAA	0903334535	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460009	none
Sample Tower	Aluma Tower	В	none	923307
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	14265	none
Zero air pump	Werther International	C 70/4	000855578	none

### **APPENDIX B**

**CASTNET Site Spot Report Forms** 

## **EEMS Spot Report**

**Data Compiled:** 1/23/2018 5:23:03 PM

### SiteVisitDate Site Technician

ACA416 Eric Hebert

#### Records with valid pass/fail criteria

10/10/2017

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.20	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.25	с	Р
3	Wind Speed average error below 5m/s in m/s	Р	3	0.5	4	0.18	m/s	Р
4	Wind Speed max error below 5m/s in m/s	Р	3	0.5	4	0.20	m/s	Р
5	Wind Speed average % difference above 5 m/s $$	Р	3	5	4	1.1	%	Р
6	Wind Speed max % difference above 5 m/s	Р	3	5	4	2.6	%	Р
7	Wind Speed Torque average error	Р	3	0.5	1	0.40	g-cm	Р
8	Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
9	Wind Direction Input Deg True average error (de	Р	2	5	4	3.5	degrees	Р
10	Wind Direction Input Deg True max error (deg)	Р	2	5	4	4	degrees	Р
11	Wind Direction Linearity average error (deg)	Р	2	5	8	1.8	degrees	Р
12	Wind Direction Linearity max error (deg)	Р	2	5	8	5	degrees	Р
13	Wind Direction Torque average error	Р	2	30	1	9	g-cm	Р
14	Wind Direction Torque max error	Р	2	30	1	10	g-cm	Р
15	Relative Humidity average below 85%	Р	6	10	8	2.6	%	Р
16	Relative Humidity max below 85%	Р	6	10	8	6.2	%	Р
17	Solar Radiation % diff of avg	Р	9	10	18	4.77	%	Р
18	Solar Radiation % diff of max STD value	Р	9	10	18	2.9	%	Р
19	Precipitation average % difference	Р	1	10	2	5.0	%	Р
20	Precipitation max % difference	Р	1	10	2	6.0	%	Р
21	Ozone Slope	Р	0	1.1	4	1.02812	unitless	Р
22	Ozone Intercept	Р	0	5	4	-0.51449	ppb	Р
23	Ozone correlation	Р	0	0.995	4	0.99981	unitless	Р
24	Ozone % difference avg	Р	7	10	4	2.0	%	Р
25	Ozone % difference max	Р	7	10	4	4.2	%	Р
26	Flow Rate average % difference	Р	10	5	4	0.91	%	Р
27	Flow Rate max % difference	Р	10	5	4	1.13	%	Р
28	DAS Voltage average error	Р	1	0.003	6	0.0000	V	Р
29	Surface Wetness Response	Р	12	100	1	100.4		Р
30	Shelter Temperature average error	Р	5	2	2	0.74	c	Р
31	Shelter Temperature max error	Р	5	2	2	1.05	с	Р

SiteVisitDateSiteTechnician10/10/2017ACA416Eric Hebert

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

#### 2 Parameter: DasComments

The accuracy of the DAS was not tested due to poor wiring conditions at the logger and lack of wiring documentation. It was decided that it was safer not to disturb the signal connections. The sensors will be moved to the new logger in the near future.

#### 3 Parameter: SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

#### 4 Parameter: ShelterCleanNotes

The shelter is new, clean and well organized. Equipment is still being moved from the old shelter.

#### 5 Parameter: PollAnalyzerCom

New sample lines have been installed in the new shelter. The ozone inlet was not approved material but was replaced shortly after the audit.

#### 6 Parameter: MetOpMaintCom

The sensor signal cables are beginning to show signs of wear. Some are being replaced as instruments are installed in the new shelter.

## **EEMS Spot Report**

**Data Compiled:** 1/28/2018 2:45:33 PM

### SiteVisitDate Site Technician

10/27/2017 ALH157 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	0.12	c	Р
2	Temperature max error	Р	4	0.5	6	0.16	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99956	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.04828	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р
7	Ozone % difference max	Р	7	10	4	2.1	%	Р
8	Flow Rate average % difference	Р	10	5	6	1.01	%	Р
9	Flow Rate max % difference	Р	10	5	6	1.32	%	Р
10	DAS Voltage average error	Р	7	0.003	21	0.0001	V	Р
11	Shelter Temperature average error	Р	5	2	15	0.44	с	Р
12	Shelter Temperature max error	Р	5	2	15	0.67	c	Р

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

The backup site operator is not always consistently using gloves to handle the filter pack.

#### 2 Parameter: SitingCriteriaCom

The site is located on a privately operated farm which rotates corn and soy bean crops.

#### 3 Parameter: ShelterCleanNotes

The shelter floor is soft and deteriorating and many tiles are loose. Walls have signs of leaks.

#### 4 Parameter: MetSensorComme

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

## **EEMS Spot Report**

Data Compiled: 1/24/2018 1:17:07 PM

# SiteVisitDateSiteTechnician10/19/2017ANA115Sandy 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	1.00596	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.81566	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.1	%	Р
5	Ozone % difference max	Р	7	10	4	5.0	%	Р

## **EEMS Spot Report**

**Data Compiled:** 1/26/2018 11:56:26 AM

# SiteVisitDateSiteTechnician10/08/2017ARE128Sandy 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	0.99071	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.45652	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.6	%	Р
5	Ozone % difference max	Р	7	10	4	1.4	%	Р
**Data Compiled:** 1/26/2018 2:16:18 PM

# SiteVisitDateSiteTechnician10/13/2017ASH135Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00608	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.12752	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.2	%	Р
5	Ozone % difference max	Р	7	10	4	2.8	%	Р

**Data Compiled:** 1/24/2018 12:31:00 PM

# SiteVisitDate Site Technician 11/20/2017 BEL116 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01315	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.98232	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.1	%	Р
5	Ozone % difference max	Р	7	10	4	5.3	%	Р

Data Compiled: 1/28/2018 8:28:05 PM

### SiteVisitDate Site Technician

11/27/2017 BFT142 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.18	c	Р
2	Temperature max error	Р	4	0.5	9	0.30	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98365	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.45817	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.8	%	Р
7	Ozone % difference max	Р	7	10	4	1.2	%	Р
8	Flow Rate average % difference	Р	10	5	6	0.89	%	Р
9	Flow Rate max % difference	Р	10	5	6	1.34	%	Р
10	DAS Voltage average error	Р	7	0.003	56	0.0000	v	Р
11	Shelter Temperature average error	Р	5	2	15	0.22	с	Р
12	Shelter Temperature max error	Р	5	2	15	0.32	с	Р

## **Field Systems Comments**

### 1 Parameter: DasComments

The sample tower is attached to the shelter. The sample tower is not grounded.

### 2 Parameter: SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

### 3 Parameter: ShelterCleanNotes

The shelter roof is leaking. There are buckets on the counter to catch the rain water.

### 4 Parameter: MetOpMaintCom

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

**Data Compiled:** 1/28/2018 5:30:08 PM

### SiteVisitDate Site Technician

BVL130 Eric Hebert

### Records with valid pass/fail criteria

11/09/2017

Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
Temperature2meter average error	Р	5	0.5	3	0.20	c	Р
Temperature2meter max error	Р	5	0.5	3	0.28	с	Р
Wind Speed average error below 5m/s in m/s	Р	3	0.5	8	0.05	m/s	Р
Wind Speed max error below 5m/s in m/s	Р	3	0.5	8	0.20	m/s	Р
Wind Speed average % difference above 5 m/s	Р	3	5	8	0.0	%	Р
Wind Speed max % difference above 5 m/s	Р	3	5	8	0.0	%	Р
Wind Speed Torque average error	Р	3	0.5	1	0.35	g-cm	Р
Wind Speed Torque max error	Р	3	0.5	1	0.4	g-cm	Р
Wind Direction Input Deg True average error (de	Р	2	5	8	2.0	degrees	Р
Wind Direction Input Deg True max error (deg)	Р	2	5	8	3	degrees	Р
Wind Direction Linearity average error (deg)	Р	2	5	16	0.9	degrees	Р
Wind Direction Linearity max error (deg)	Р	2	5	16	2	degrees	Р
Wind Direction Torque average error	Р	2	30	1	11	g-cm	Р
Wind Direction Torque max error	Р	2	30	1	12	g-cm	Р
Temperature average error	Р	4	0.5	6	0.13	с	Р
Temperature max error	Р	4	0.5	6	0.16	с	Р
Relative Humidity average below 85%	Р	6	10	4	15.1	%	Fail
Relative Humidity max below 85%	Р	6	10	4	24.9	%	Fail
Solar Radiation % diff of avg	Р	9	10	35	8.47	%	Р
Solar Radiation % diff of max STD value	Р	9	10	35	10.1	%	Fail
Precipitation average % difference	Р	1	10	2	1.0	%	Р
Precipitation max % difference	Р	1	10	2	2.0	%	Р
Ozone Slope	Р	0	1.1	4	0.99042	unitless	Р
Ozone Intercept	Р	0	5	4	-0.2865	ppb	Р
Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
Ozone % difference avg	Р	7	10	4	1.3	%	Р
Ozone % difference max	Р	7	10	4	1.4	%	Р
Flow Rate average % difference	Р	10	5	3	2.6	%	Р
Flow Rate max % difference	Р	10	5	3	2.6	%	Р
DAS Voltage average error	Р	7	0.003	56	0.0000	V	Р
Surface Wetness Response	Р	12	0.5	1	1.01		Р
Shelter Temperature average error	Р	5	2	15	0.27	с	Р
Shelter Temperature max error	Р	5	2	15	0.54	с	Р
	Audited ParameterI-emperature2meter average errorWind Speed average error below 5m/s in m/sWind Speed nax error below 5m/s in m/sWind Speed average % difference above 5 m/sWind Speed Torque average errorWind Speed Torque average errorWind Speed Torque average errorWind Direction Input Deg True average error (deg)Wind Direction Linearity average error (deg)Wind Direction Torque average errorWind Direction Torque average errorWind Direction Torque average errorPamperature average errorSolar Radiation % diff of avgSolar Radiation % differencePrecipitation average % differenceOzone SlopeOzone SlopeOzone Mifference avgGroure wifference avgFlow Rate average % differenceFlow Rate average % differenceDas SlopeOzone SlopeDas Radiation % diff of max STD valuePrecipitation average % differenceDas Radiation % differenceDas	Audited ParameterDASTemperature2meter average errorPTemperature2meter max errorPWind Speed average error below 5m/s in m/sPWind Speed nax error below 5m/s in m/sPWind Speed 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m/sP33Wind Speed max % difference above 5 m/sP33Wind Speed Torque average errorP33Wind Speed Torque max errorP33Wind Direction Input Deg True average error (deg)P22Wind Direction Linearity average error (deg)P22Wind Direction Torque average errorP32Wind Direction Torque average errorP34Temperature average errorP34Relative Humidity average below 85%P66Relative Humidity max below 85%P34Solar Radiation % differenceP34Precipitation average % differenceP34Ozone SlopeP35Ozone % difference avgP35Flow Rate average % differenceP35Flow Rate average % differenceP35</td> <td>Audited ParameterDASCh.#Critteria -/-Temperature2meter average errorP50.5Temperature2meter max errorP30.5Wind Speed average more below 5m/s in m/sP30.5Wind Speed average % difference above 5 m/sP30.5Wind Speed max % difference above 5 m/sP30.5Wind Speed Torque average errorP30.5Wind Speed Torque average errorP30.5Wind Speed Torque max errorP255Wind Direction Input Deg True average error (deg)P255Wind Direction Input Deg True 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Site	VisitDate	Site

11/09/2017 BVL130

Technician Eric Hebert

## **Field Systems Comments**

### **1 Parameter:** SiteOpsProcedures

Ozone and NCORE sample line filters are replaced, and the sample lines are leaked tested, every 2 weeks.

### 2 Parameter: SitingCriteriaCom

The site is located in an agricultural and atmospheric research center. There are crops within 50 meters.

### 3 Parameter: ShelterCleanNotes

The shelter is somewhat cluttered but is improved since the previous audit visit.

### 4 Parameter: MetSensorComme

The tipping bucket rain gage is mounted near the meteorological tower and in violation of the 45 degree rule.

Data Compiled: 1/28/2018 8:45:08 PM

### SiteVisitDate Site Technician

11/27/2017 BWR139 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.11	с	Р
2	Temperature max error	Р	4	0.5	12	0.25	с	Р
3	Ozone Slope	Р	0	1.1	4	1.02079	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.55573	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99995	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.8	%	Р
7	Ozone % difference max	Р	7	10	4	2.0	%	Р
8	Flow Rate average % difference	Р	10	5	4	2.6	%	Р
9	Flow Rate max % difference	Р	10	5	4	2.6	%	Р
10	DAS Voltage average error	Р	7	0.003	56	0.0000	V	Р
11	Shelter Temperature average error	Р	5	2	15	1.43	с	Р
12	Shelter Temperature max error	Р	5	2	15	1.96	с	Р

Technician

11/27/2017 BWR139

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

## **Field Systems Comments**

1 Parameter: SiteOpsProcedures

The ozone sample train is leak checked every two weeks following the inlet filter change.

2 Parameter: SitingCriteriaCom

Very light agriculture activities near site, not harvested, just to provide food for wildlife.

3 Parameter: ShelterCleanNotes

The shelter is showing signs of deterioration with leaks and rot at bottom of walls.

**Data Compiled:** 1/28/2018 6:41:25 PM

### SiteVisitDate Site Technician

11/19/2017 CND125 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.06	с	Р
2	Temperature max error	Р	4	0.5	9	0.14	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99229	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.44188	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
б	Ozone % difference avg	Р	7	10	4	1.3	%	Р
7	Ozone % difference max	Р	7	10	4	4.6	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.96	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.96	%	Р
10	DAS Voltage average error	Р	7	0.003	7	0.0000	V	Р
11	Shelter Temperature average error	Р	5	2	15	0.72	c	Р
12	Shelter Temperature max error	Р	5	2	15	1.16	с	Р

## **Field Systems Comments**

#### 1 Parameter: SitingCriteriaCom

The land owner maintains a pine tree forest on the property within 50 meters of the site. The trees were planted just before the site was installed in 1990 and will be harvested in the near future.

#### 2 Parameter: ShelterCleanNotes

The shelter is well maintained, clean and well organized.

#### 3 Parameter: MetOpMaintCom

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

Data Compiled: 1/26/2018 12:25:57 PM

SiteVisitDate	Site	Technician
10/11/2017	CTH110	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	0.98668	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.04910	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.3	%	Р
5	Ozone % difference max	Р	7	10	4	2.1	%	Р

## **Field Performance Comments**

1 Parameter: Ozone

SensorComponent: Cell B Flow

CommentCode 99

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

**Data Compiled:** 1/26/2018 3:47:45 PM

# SiteVisitDateSiteTechnician10/24/2017DEN417Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.08821	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.05394	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	8.6	%	Р
5	Ozone % difference max	Р	7	10	4	8.9	%	Р

**Data Compiled:** 1/26/2018 5:27:49 PM

# SiteVisitDateSiteTechnician10/04/2017DIN431Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99511	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.47792	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.1	%	Р
5	Ozone % difference max	Р	7	10	4	3.8	%	Р

**Data Compiled:** 1/28/2018 6:18:59 PM

### SiteVisitDate Site Technician

11/15/2017 GRS420 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.22	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.30	с	Р
3	Ozone Slope	Р	0	1.1	4	1.00748	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.18955	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	6	0.24	%	Р
9	Flow Rate max % difference	Р	10	5	6	0.46	%	Р
10	DAS Voltage average error	Р	2	0.003	35	0.0000	V	Р
11	Shelter Temperature average error	Р	5	2	18	1.05	с	Р
12	Shelter Temperature max error	Р	5	2	18	1.65	с	Р

11/15/2017 GRS420

Technician Eric Hebert

## **Field Performance Comments**

1Parameter:Temperature2meteSensorComponent:Properly SitedCommentCode142

The lower (two meter temperature sensor) shield is not mounted at 2 meters above the ground as stated in the QAPP.

## **Field Systems Comments**

### 1 Parameter: SiteOpsProcedures

The ozone sample train is leak-tested each week after the inlet filter is changed.

### 2 Parameter: SitingCriteriaCom

The site is located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.

### 3 Parameter: ShelterCleanNotes

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

### 4 Parameter: MetSensorComme

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground.

Data Compiled: 1/28/2018 11:33:51 AM

### SiteVisitDate Site Technician

10/03/2017 GTH161 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	15	0.06	c	Р
2	Temperature max error	Р	4	0.5	15	0.07	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98580	unitless	Р
4	Ozone Intercept	Р	0	5	4	2.61367	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99987	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.5	%	Р
7	Ozone % difference max	Р	7	10	4	7.3	%	Р
8	Flow Rate average % difference	Р	10	5	3	0.33	%	Р
9	Flow Rate max % difference	Р	10	5	3	0.33	%	Р
10	DAS Voltage average error	Р	7	0.003	49	0.0004	v	Р
11	Shelter Temperature average error	Р	5	2	15	0.69	с	Р
12	Shelter Temperature max error	Р	5	2	15	1.55	с	Р

## **Field Systems Comments**

### 1 Parameter: SiteOpsProcComm

Due to the remote location of the site, it can take up to a week to return the filter sample to the lab after it is removed from the tower in the winter.

#### 2 Parameter: ShelterCleanNotes

Some floor tiles are damaged.

#### 3 Parameter: MetSensorComme

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

### 4 Parameter: MetOpMaintCom

The temperature signal cable is showing signs of wear.

**Data Compiled:** 1/26/2018 1:58:47 PM

# SiteVisitDateSiteTechnician10/12/2017HOW191Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99829	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.15345	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.7	%	Р
5	Ozone % difference max	Р	7	10	4	1.4	%	Р

**Data Compiled:** 1/24/2018 2:10:39 PM

# SiteVisitDateSiteTechnician10/20/2017HOX148Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01745	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.13909	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	1.9	%	Р

**Data Compiled:** 1/26/2018 2:28:12 PM

# SiteVisitDateSiteTechnician10/17/2017HWF187Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98417	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.06763	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.9	%	Р
5	Ozone % difference max	Р	7	10	4	2.3	%	Р

**Data Compiled:** 1/28/2018 5:57:06 PM

### SiteVisitDate Site Technician

11/13/2017 MAC426 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.20	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.25	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98285	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.16574	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.8	%	Р
7	Ozone % difference max	Р	7	10	4	2.4	%	Р
8	Flow Rate average % difference	Р	10	5	2	6.61	%	Fail
9	Flow Rate max % difference	Р	10	5	2	6.61	%	Fail
10	DAS Voltage average error	Р	16	0.003	49	0.0001	V	Р
11	Shelter Temperature average error	Р	5	2	12	0.29	с	Р
12	Shelter Temperature max error	Р	5	2	12	0.51	с	Р

11/13/2017 MAC426

Technician

### Eric Hebert

## **Field Performance Comments**

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

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

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

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

#### 2 Parameter: SitingCriteriaCom

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

#### 3 Parameter: ShelterCleanNotes

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

**Data Compiled:** 1/26/2018 3:37:50 PM

# SiteVisitDate Site Technician 11/16/2017 PNF126 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99614	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.53512	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.3	%	Р
5	Ozone % difference max	Р	7	10	4	6.4	%	Р

**Data Compiled:** 1/28/2018 12:42:54 PM

### SiteVisitDate Site Technician

10/22/2017 PRK134 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	9	0.13	c	Р
2	Temperature max error	Р	4	0.5	9	0.26	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98190	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.28944	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.1	%	Р
7	Ozone % difference max	Р	7	10	4	1.6	%	Р
8	Flow Rate average % difference	Р	10	5	3	1.32	%	Р
9	Flow Rate max % difference	Р	10	5	3	1.32	%	Р
10	DAS Voltage average error	Р	7	0.003	56	0.0000	V	Р
11	Shelter Temperature average error	Р	5	2	15	0.19	с	Р
12	Shelter Temperature max error	Р	5	2	15	0.31	с	Р

## **Field Systems Comments**

1 Parameter: DasComments

The sample tower and guy wires have been replaced.

2 Parameter: SitingCriteriaCom

Clover and Barley have been planted for hay within 20m of the site starting in 2008.

3 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized.

**Data Compiled:** 1/26/2018 12:05:52 PM

# SiteVisitDateSiteTechnician10/09/2017PSU106Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.99541	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.54301	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.8	%	Р
5	Ozone % difference max	Р	7	10	4	1.2	%	Р

**Data Compiled:** 1/26/2018 2:37:28 PM

# SiteVisitDateSiteTechnician10/19/2017SAL133Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.01563	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.44556	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
4	Ozone % difference avg	Р	7	10	4	1.6	%	Р
5	Ozone % difference max	Р	7	10	4	3.3	%	Р

**Data Compiled:** 1/28/2018 9:18:18 PM

### SiteVisitDate Site Technician

11/29/2017 SHN418 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.18	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.27	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97938	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.18335	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	2.1	%	Р
7	Ozone % difference max	Р	7	10	4	4.0	%	Р
8	Flow Rate average % difference	Р	10	5	10	1.53	%	Р
9	Flow Rate max % difference	Р	10	5	10	1.57	%	Р
10	DAS Voltage average error	Р	2	0.003	7	0.0003	V	Р
11	Shelter Temperature average error	Р	5	2	12	0.92	с	Р
12	Shelter Temperature max error	Р	5	2	12	0.95	c	Р

11/29/2017 SHN418

Technician Eric Hebert

### Life II

## **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: SiteOpsProcedures

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

### 2 Parameter: ShelterCleanNotes

The shelter is in good condition, clean and well organized

**Data Compiled:** 1/28/2018 2:03:06 PM

### SiteVisitDate Site Technician

10/25/2017 STK138 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.03	с	Р
2	Temperature max error	Р	4	0.5	12	0.04	с	Р
3	Ozone Slope	Р	0	1.1	4	1.01407	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.0614	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
б	Ozone % difference avg	Р	7	10	4	1.3	%	Р
7	Ozone % difference max	Р	7	10	4	2.4	%	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 Voltage average error	Р	7	0.003	56	0.0001	V	Р
11	Shelter Temperature average error	Р	5	2	15	1.11	с	Р
12	Shelter Temperature max error	Р	5	2	15	1.28	с	Р

## **Field Systems Comments**

### 1 Parameter: SiteOpsProcedures

The ozone sample train is leak tested every 2 weeks.

### 2 Parameter: SitingCriteriaCom

The site is located in a corn field on a cattle farm. Corn is planted within 10 meters.

### 3 Parameter: ShelterCleanNotes

The shelter is somewhat dirty and cluttered. There are signs of leaks on the walls and floor rot.

**Data Compiled:** 1/24/2018 2:21:08 PM

# SiteVisitDateSiteTechnician10/20/2017UVL124Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98024	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.26213	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	1.9	%	Р

**Data Compiled:** 1/28/2018 4:22:15 PM

### SiteVisitDate Site Technician

10/30/2017 VIN140 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.08	c	Р
2	Temperature max error	Р	4	0.5	3	0.10	c	Р
3	Ozone Slope	Р	0	1.1	4	0.99697	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.04294	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.7	%	Р
7	Ozone % difference max	Р	7	10	4	2.2	%	Р
8	Flow Rate average % difference	Р	10	5	6	0.49	%	Р
9	Flow Rate max % difference	Р	10	5	6	0.66	%	Р
10	DAS Voltage average error	Р	7	0.003	56	0.0001	V	Р
11	Shelter Temperature average error	Р	5	2	15	0.55	c	Р
12	Shelter Temperature max error	Р	5	2	15	1.1	с	Р

## **Field Systems Comments**

### 1 Parameter: DasComments

The sample tower ground wire is broken.

#### 2 Parameter: SitingCriteriaCom

The site is in an agricultural research center with farm activities adjacent to the site. A train track is approximately 200 meters to the north.

#### 3 Parameter: ShelterCleanNotes

The shelter is in good condition and well maintained, however rot is beginning to form at the bottom of the walls.

#### 4 Parameter: MetSensorComme

The temperature sensor is mounted on the sample tower.

**Data Compiled:** 1/28/2018 11:32:22 AM

SiteVisitDate	Site	Technician
10/02/2017	WFM007	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.02	с	Р
2	Temperature max error	Р	4	0.5	3	0.04	с	Р
3	Flow Rate average % difference	Р	10	5	2	0.77	%	Р
4	Flow Rate max % difference	Р	10	5	2	0.99	%	Р
# **Field Systems Comments**

#### 1 Parameter: DasComments

The sample tower is approximately one meter in height mounted to and accessed directly from the roof of the facility.

#### 2 Parameter: DocumentationCo

There is no logbook onsite to record site visit information.

#### 3 Parameter: SitingCriteriaCom

The site is located at the summit of Whiteface Mountain on the roof of the ASRC facility with other monitoring instrumentation.

#### 4 Parameter: MetSensorComme

The temperature sensor is mounted approximately one meter above a black roof.

# **EEMS Spot Report**

**Data Compiled:** 1/28/2018 12:01:37 PM

### SiteVisitDate Site Technician

10/12/2017 WNC429 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	0.15	c	Р
2	Temperature2meter max error	Р	5	0.5	3	0.31	с	Р
3	Ozone Slope	Р	0	1.1	4	0.96148	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.00563	ppb	Р
5	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
б	Ozone % difference avg	Р	7	10	4	3.7	%	Р
7	Ozone % difference max	Р	7	10	4	3.9	%	Р
8	Flow Rate average % difference	Р	10	5	9	1.01	%	Р
9	Flow Rate max % difference	Р	10	5	9	1.11	%	Р
10	DAS Voltage average error	Р	1	0.003	7	0.0003	V	Р
11	Shelter Temperature average error	Р	5	2	6	0.95	с	Р
12	Shelter Temperature max error	Р	5	2	6	1.74	с	Р

10/12/2017 WNC429

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 general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack.

#### 2 Parameter: SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota. There is no means for introducing routine test gas at the sample inlet and all routine checks are performed at the back of the analyzer. Audit test gas was introduced through the sample inlet flooding the glass manifold.

#### 3 Parameter: DocumentationCo

Records of the routine checks performed by the state personnel are kept onsite in a logbook.

#### 4 Parameter: ShelterCleanNotes

One shelter houses the gas analyzers and is in good condition and clean. The analyzer sample train is a glass manifold with an exhaust fan. The second shelter houses the flow system, met translator, and IMPROVE. It is older and not climate controlled.

#### 5 Parameter: PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter. The ozone sample train is a 3 meter glass manifold with a 1/4 inch Teflon tubing connection to the analyzer.

#### 6 Parameter: MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear.

# **EEMS Spot Report**

**Data Compiled:** 1/28/2018 9:03:08 PM

#### SiteVisitDate Site Technician

11/28/2017 WSP144 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	0.22	с	Р
2	Temperature max error	Р	4	0.5	9	0.33	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97433	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.75095	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	5.3	%	Р
7	Ozone % difference max	Р	7	10	4	8.9	%	Р
8	Flow Rate average % difference	Р	10	5	4	1.54	%	Р
9	Flow Rate max % difference	Р	10	5	4	1.97	%	Р
10	DAS Voltage average error	Р	7	0.003	56	0.0000	V	Р
11	Shelter Temperature average error	Р	5	2	15	1.1	с	Р
12	Shelter Temperature max error	Р	5	2	15	1.99	с	Р

11/28/2017 WSP144

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: SiteOpsProcedures

Ozone sample line leak-checks are conducted every two weeks.

2 Parameter: SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

3 Parameter: ShelterCleanNotes

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

### **APPENDIX C**

**CASTNET Ozone Performance Evaluation Forms** 

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
DIN4	431-Martin	Valvur-10/04/2017				
1	10/4/2017	DAS	Environmental Sys Corp	90652	8816	2565
2	10/4/2017	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
3	10/4/2017	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
4	10/4/2017	Zero air pump	Werther International	none	PC70/4	531395

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visit	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	121105	2490	DIN431	М	artin Valv	ur	10/04/20	17	Ozone		none	
Slope: Intercept CorrCoff	( -( (	).99511 ).47792 ).99999	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7 01110	lectron 0008-3	Inc Pa	rameter ozc er Desc. Ozc	one one primary	/ stan
DAS 1: A Avg % D 2.1	<b>)iff: A N</b> 1%	<b>lax % D</b> 3.8'	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9/	1.0080 /11/201	1 Inter 7 Corr	·cept ·Coff	-0.05	5199 0000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		Display="block-color: block-color:	Tfer Raw 0.31 15.31 35.92 65.27 111 83	Tfer 0 15 35 64	Corr 35 .23 .68 .80	Si 0. 14 34 64	ite 03 j .65 j .77 j .10 j	Site ppb ppb ppb ppb	e Unit	PctDiff	-3.81% -2.55% -1.08% -0.89%	
Sensor Co	ompone	nt Samp	le Train	111.05	Conditi	on Good	110	<u>,,,,,</u>		Status	pass	0.0970	
Sensor Co	omponei	nt 22.5 c	legree rule		Conditi	on				Status	pass		
Sensor Co	omponei	nt Inlet F	- Filter Conditio	n	Conditi	on Clean				Status	pass		
Sensor Co	- omponei	nt Batter	y Backup		Conditi	on N/A				Status	pass		
Sensor Co	omponei	nt Offset	t .		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Span	-		Conditi	on Not te	sted			Status	nass		
Sensor C	ompone	at Zero \			Conditi	on $N/A$				Status	nass		
Sensor C	ompone				Conditi					Status	nase		
Sensor Co	omponei				Conditio		- 41			Status	pass		
Sensor Co	ompone	nt Cell A	Freq.		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell A	Noise		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditi	on 0.68 l	pm			Status	Pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditi	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell B	5 Flow		Conditi	on 0.67 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditi	on Not te	sted			Status	pass		
Sensor Co	omnone	nt Cell B	STmp.		Conditi	on				Status	pass		
Sensor Co	ompone	nt Line L	.0SS		Conditi	on Not te	sted			Status	pass		
Sensor C	omnone	nt Svste	m Memo		Conditi	on				Statue	pass		
	Pone				Condition					Status	• • • • • • • • • • • • • • • • • • •		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
ARE	128-Sandy	Grenville-10/08/2017				
1	10/8/2017	DAS	Campbell	000400	CR3000	2524
2	10/8/2017	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
3	10/8/2017	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
4	10/8/2017	Zero air pump	Werther International	06866	PC70/4	000815262

Mfg	5	Serial Number Ta Site			Technician			Site Visit Date Paran		Parame	neter Owner II		D
ThermoElec	ctron Inc	100924	1798	ARE128	Sa	andy Grei	nville	10/08/20	017	Ozone		000621	
Slope: Intercept CorrCoff	0.	99071 45652 99998	Slope: Intercept CorrCoff	0.00000	00 Mfg 100 Serial Number 100 Tfer ID			ThermoE 5171121 01111	Electron 75	Inc Pa	rameter ozone er Desc. Ozone primary star		y stan
DAS 1: A Avg % D 0.6	<b>)iff: A M</b> 6%	<b>ax % D</b> 1.49	DAS 2: i A Avg %	bDif A Max	% Di	Slope Cert Da	ıte	3	1.0025 3/21/201	0 Inter 7 Corr	·cept ·Coff	0.45	5870 0000
UseDes prin prin prin prin	acription nary nary nary nary		ncGroup 1 2 3 4	Tfer Raw 0.01 15.02 35.04 68.05	Tfer -0. 14. 34. 67.	Corr 44 .52 .49 .42	Si 0. 14 34 66	ite 38 .72 .41 .97	Sit ppb ppb ppb ppb	e Unit	PetD	ifference 1.38% -0.23% -0.67%	
prin Sonsor Co	nary	t Samn	ן און ופ Train	110.04	Conditi	0.30	109	9.00	ррь	Status	nass	-0.27%	
Sensor Co	omponen	t 22.5 d			Conditi					Status	nass		
Sensor Co	omponen		ilter Conditio	n	Conditi					Status	pass		
Sensor Co	omponen				Conditio					Status	pass		
Sensor Co	omponen	t Batter	у васкир		Conditio	on IN/A				Status	pass		
Sensor Co	omponen	t Offset			Condition	on 0.10				Status	pass		
Sensor Co	omponen	t Span			Condition	<b>on</b> 1.011				Status	pass		
Sensor Co	omponen	t Zero \	/oltage		Conditio	on N/A				Status	pass		
Sensor Co	omponen	t Fullsc	ale Voltage		Conditi	on N/A				Status	pass		
Sensor Co	omponen	t Cell A	Freq.		Condition	on 98.4 k	Hz			Status	pass		
Sensor Co	omponen	t Cell A	Noise		Conditi	on 1.1 pp	b			Status	pass		
Sensor Co	- omponen	t Cell A	Flow		Conditi	on 0.69 l	om			Status	pass		
Sensor Co	omponen	t Cell A	Pressure		Conditi	on 711 1	mmHa			Status	nass		
Sensor Co	omponen		Tmp		Conditi	36.6.0				Status	nass		
Sensor Co	omponen		Thip.		Conditio		, 			Status	pass		
Sensor Co	omponen		Freq.		Conditio	on 82.9 k	.HZ			Status	pass		
Sensor Co	omponen	t Cell B	Noise		Condition	on 0.6 pp	b			Status	pass		
Sensor Co	omponen	t Cell B	Flow		Condition	<b>on</b> 0.69 l	om			Status	pass		
Sensor Co	omponen	t Cell B	Pressure		Conditio	<b>on</b> 710.8	mmHg			Status	pass		
Sensor Co	omponen	t Cell B	Tmp.		Conditio	on				Status	pass		
Sensor Co	omponen	t Line L	.OSS		Conditio	on Not te	sted			Status	pass		
Sensor Co	omponen	t Syster	m Memo		Conditio	on				Status	pass		

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number
PSU	106-Sandy	Grenville-10/09/2017				
1	10/9/2017	DAS	Campbell	000407	CR3000	2512
2	10/9/2017	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
3	10/9/2017	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
4	10/9/2017	Zero air pump	Werther International	06921	C 70/4	000836216

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visit	t Date	Parame	ter	Owner I	D
ThermoElec	tron Inc	103024	4791	PSU106	Sa	andy Grei	nville	10/09/20	17	Ozone		000678	
Slope: Intercept CorrCoff	(	).99541 ).54301 ).99998	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 51711217 01111	lectron 75	Inc Pa	rameter ozo er Desc. Ozo	one one primary	/ stan
DAS 1: A Avg % D 0.8	<b>Diff: A N</b> 3%	<mark>Iax % D</mark> 1.2	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	3,	1.0025 /21/201	0 Inter 7 Corr	ccept Coff	0.45	870 0000
UseDes prin prin prin prin prin	cription nary nary nary nary nary		DINCGROUP 1 2 3 4 5	Tfer Raw 0.05 15.02 35.05 68.06 110.34	Tfer -0. 14. 34. 67. 109	Corr 40 52 50 43 960	Si 0. 14 34 68 109	ite 33 1 .70 1 .80 1 .00 1	Site ppb ppb ppb ppb	e Unit	PctDiff	erence 1.24% 0.87% 0.85% -0.09%	
Sensor Co	ompone	nt Samp	le Train	110.01	Conditio	on Good	102			Status	pass	0.0770	
Sensor Co	omponei	nt 22.5 c	legree rule		Conditio	on				Status	pass		
Sensor Co	omponei	nt Inlet F	Filter Condition	n	Conditio	on Clean	1			Status	pass		
Sensor Co	omponei	nt Batter	y Backup		Conditio	on N/A				Status	pass		
Sensor Co	omponei	nt Offset	t		Conditio	<b>on</b> 0.40				Status	pass		
Sensor Co	omponei	nt Span			Conditio	<b>n</b> 1.006				Status	pass		
Sensor Co	ompone	nt Zero	Voltage		Conditio	n N/A				Status	pass		
Sensor Co	ompone	at Fullso	ale Voltage		Conditio	n N/A				Status	nass		
Sensor Co	ompone		Freq		Conditio	08.31	/Ц ₇			Status	naee		
Selisor Co	ompone		Noise		Conditio	0.0 m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Status	2000		
Sensor Co	omponei				Conditio	0 <b>n</b> 0.8 pt	מכ			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.681	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	on 696.8	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 34.5 (	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 99.8 k	κHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on 1.1 pp	b			Status	pass		
Sensor Co	ompone	nt Cell B	5 Flow		Conditio	on 0.67 l	pm			Status	pass		
Sensor Co	ompone	nt Cell B	Pressure		Conditio	on 696.5	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	ested			Status	pass		
Sensor Co	ompone	nt Syste	m Memo		Conditio	on				Status	pass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СТН	1110-Sandy	Grenville-10/11/2017				
1	10/11/2017	DAS	Campbell	000415	CR3000	2510
2	10/11/2017	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
3	10/11/2017	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
4	10/11/2017	Zero air pump	Werther International	06864	PC70/4	000815261

Mfg	S	erial N	umber Ta	Site	Те	chnician		Site Visi	it Date	Paramo	eter	Owner I	D
ThermoElec	ctron Inc 1	10534	7308	CTH110	Sa	andy Gre	nville	10/11/2	017	Ozone		000735	
Slope: Intercept CorrCoff	0.0 0.0 0.9	98668 04910 99999	Slope: Intercept CorrCoff	0.00000	00 Mfg 00 Serial Number 00 Tfer ID			ThermoE 5171121 01111	Electron 75	Inc Pa	er Desc.	zone Dzone primar	y stan
DAS 1: A Avg % D 1.3	Diff: A Ma	<b>x % D</b> 2.19	DAS 2: i A Avg %	bDif A Max	% Di	Slope Cert Da	nte	3	1.0025 3/21/201	0 Inter 7 Corr	rcept :Coff	0.45	5870 0000
UseDes prin prin prin prin prin prin	scription nary nary nary nary nary nary		nncGroup 1 2 3 4 5	Tfer Raw           0.29           15.13           35.12           68.02           110.01	Tfer -0. 14. 34. 67. 109	Corr 16 63 57 39 .27	Si -0. 14 33 66 108	ite .04 .69 .86 .43 3.00	Sit ppb ppb ppb ppb ppb	e Unit	PctDi	fference 0.41% -2.05% -1.42% -1.16%	
Sensor Co	omponent	Samp	le Train		Conditio	on Good				Status	pass		
Sensor Co	omponent	22.5 d	legree rule		Conditio	on				Status	pass		_
Sensor C	omponent	Inlet F	ilter Conditio	n	Conditio	n Clear	1			Status	pass		
Sensor C	omponent	Batter	v Backup		Conditio	n N/A				Status	pass		
Sensor C	omponent	Offset	, ,		Conditio	on 0.40				Status	pass		
Sonsor C	omponent	Span			Conditio	1 024				Status	nass		
Sensor C	omponent	Zero \	/oltage		Conditio	N/A				Status	nass		
Selisor C	omponent	Eulloo								Status	pass		
Sensor Co	omponent	Fullsca			Conditio	on IN/A				Status	pass		
Sensor C	omponent	Cell A	Freq.		Conditio	on 100.0	kHz			Status	pass		
Sensor C	omponent	Cell A	Noise		Conditio	<b>on</b> 1.0 pp	b			Status	pass		
Sensor C	omponent	Cell A	Flow		Conditio	<b>on</b> 0.54 l	pm			Status	Pass		
Sensor C	omponent	Cell A	Pressure		Conditio	on 688.7	mmHg			Status	pass		
Sensor C	omponent	Cell A	Tmp.		Conditio	on 32.6 (	C			Status	pass		
Sensor Co	omponent	Cell B	Freq.		Conditio	on 105.3	kHz			Status	pass		
Sensor C	omponent	Cell B	Noise		Conditio	<b>on</b> 1.3 pp	ob			Status	pass		
Sensor Co	omponent	Cell B	Flow		Conditio	on 0.00 l	pm			Status	Fail		
Sensor Co	omponent	Cell B	Pressure		Conditio	on 688.4	mmHg			Status	pass		
Sensor C	omponent	Cell B	Tmp.		Conditio	on				Status	pass		
Sensor C	omponent	Line L	OSS		Conditio	n Not te	ested			Status	pass		
Sensor C	omponent	Svster	m Memo		Conditio	on [				Status	pass		
		_ ,			Contaith					Status	• • • • • • • • • • • • • • • • • • •		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
HO	W191-Eric I	Hebert-10/12/2017				
1	10/12/2017	DAS	Campbell	000419	CR3000	2527
2	10/12/2017	Ozone	ThermoElectron Inc	000616	49i A1NAA	1009241781
3	10/12/2017	Ozone Standard	ThermoElectron Inc	000372	49i A3NAA	0726124684
4	10/12/2017	Zero air pump	Werther International	06908	C 70/4	000821900

Mfg Serial Number Ta Site		Site	Technician		Site Visit Date		Parameter		Owner II	D		
ctron Inc	100924	1781	HOW191	Er	ic Hebert		10/12/20	17	Ozone		000616	
	).99829 ).15345 ).99999	Slope: Intercept CorrCoff	0.00000	) ) )	Mfg Serial N Tfer ID	umber	ThermoEl 05171121 01113	lectron 67	Inc Pa	rameter ozo er Desc. Ozo	ne ne primary	stan
<b>)iff: A N</b> 7%	<mark>fax % D</mark> 1.4	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	te	9/	1.0050/ 12/201	4 Inter 7 Corr	ccept Coff	0.32	915 000
scription nary nary nary nary nary		Display="block-color: block-color:	Tfer Raw           0.03           13.60           34.71           68.23           113.13	Tfer -0. 13. 34. 67. 112	Corr 29 20 20 56 23	Si -0. 13. 34. 67. 112	ite .09 F .05 F .67 F .45 F 2.20 F	Site opb opb opb opb opb	e Unit	PctDiffe	-1.14% 1.37% -0.16% -0.03%	
ompone	nt Samp	le Train		Conditio	Good				Status	pass		
ompone	nt 22.5 c	degree rule		Conditio	on				Status	pass		
ompone	nt Inlet F	Filter Conditio	n	Conditio	on Clean				Status	pass		
ompone	nt Batter	y Backup		Conditio	n N/A				Status	pass		
ompone	nt Offset	t		Conditio	<b>on</b> 0.20				Status	pass		
ompone	nt Span			Conditio	<b>n</b> 1.007				Status	pass		]
ompone	nt Zero	Voltage		Conditio	n N/A				Status	pass		]
ompone	nt Fullsc	ale Voltage		Conditio	n N/A				Status	pass		
ompone	nt Cell A	Freq.		Conditio	on 97.2 k	Hz			Status	pass		]
ompone	nt Cell A	Noise		Conditio	n Not te	sted			Status	pass		]
ompone		Flow		Conditio		om of the second			Status	nass		
ompone		Drosouro		Conditio		mmHa			Status	2000		
ompone		Tres		Conditio		,			Status	pass		
ompone				Conditio	on 34.8 (	, 			Status	pass		
ompone	nt Cell B	s ⊢req.		Conditio	on 96.7 k	Hz			Status	pass		
ompone	nt Cell B	Noise		Conditio	Not te	sted			Status	pass		
ompone	nt Cell B	Flow		Conditio	<b>on</b> 0.70 l	om			Status	pass		
ompone	nt Cell B	Pressure		Conditio	<b>on</b> 707.4	mmHg			Status	pass		]
ompone	nt Cell B	S Tmp.		Conditio	on				Status	pass		
ompone	nt Line L	OSS		Conditio	Not te	sted			Status	pass		
ompone	nt Syste	m Memo		Conditio	on				Status	pass		
	etron Inc () () () () () () () () () ()	tron Inc 100924 0.99829 0.15345 0.99999 0.15345 0.99999 0.16 0.99999 0.17 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.99999 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14	Serial Number Ta0.092417810.15345Slope:0.15345Intercept0.15345DAS 2:0.15345Aavg %0.15345Aavg %0.15345Aavg %0.15345Aavg %0.15345Aavg %0.15345Aavg %0.15345Concorrent0.15345Concorrent0.1541Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent0.1141Concorrent <td< td=""><td>Serial Number TaSiteatron Inc1009241781HOW191a.099829Slope:0.000000.15345Intercept0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoffA Max %biff: A Max % D A Avg % DiffA Max %criptionConcGroupTfer Rawnary10.03nary334.71nary468.23nary5113.13omponentSample TrainomponentSample TrainomponentSpanomponentSpanomponentSpanomponentCell A Freq.omponentCell A Freq.omponentCell A Freq.omponentCell A Freq.omponentCell A Freq.omponentCell B Freq.omponentCell B Freq.omponentCell B Freq.omponentCell B Freq.omponentCell B Tmp.omponentCell B Tmp.omponentSystem Memo</td><td>Serial Number Ta       Site       Te         tron Inc       1009241781       HOW191       End         0.99829       Slope:       0.00000         0.15345       Intercept       0.00000         0.99999       CorrCoff       0.00000         0.99999       CorrCoff       0.00000         0.99999       CorrCoff       0.00000         0.99999       CorrCoff       AMax % Di         riff: A Max % Di       A Avg % Di       A Max % Di         ring:       1.4%       Ter         cription       ConcGroup       Tfer Raw       Tfer         nary       1       0.03       -0.         nary       3       34.71       34.         nary       5       113.13       112         omponent       Sample Train       Condition         omponent       Battery Backup       Condition         omponent       Battery Backup       Condition         omponent       Span       Condition         omponent       Cell A Freq.       Condition         omponent       Cell A Noise       Condition         omponent       Cell A Freq.       Condition         omponent       Cell B</td><td>Serial Number TaSiteTechnican1009241781HOW191Eric Helsen0.9829Slope: 0.000000.000000.15345Intercept 0.000000.000000.15345Intercept 0.000000.000000.9999DAS 2: 0.00000Mfg 0.000000.9999DAS 2: 0.00000Serial N 0.000000.9999DAS 2: 0.00000Serial N 0.000000.9999DAS 2: 0.0000Mfg 0.000000.9999DAS 2: 0.0000Mfg 0.000000.9999ConcGroupTfer RawMfgr C C 0.00000.9090ConcGroupTfer RawMfgr C 0.00000.90912013.6013.20nary10.03-0.29nary213.6013.20nary334.7134.20nary334.7134.20nary5113.13112.23omponetSampe TrainCondition0mponetGrifsetCondition0mponetSpanCondition0mponetSpanCondition0mponetGrifsetCondition0mponetCell A Freq.Condition0mponetCell A Freq.Condition0mponetCell A Freq.Condition0mponetCell A Tmp.Condition0mponetCell B Freq.Condition0mponetCell B Freq.Condition0mponetCell B Freq.Condition0mponetCell B Freq.<!--</td--><td>Serial Number Ta       Site       Technician         itron Inc       1009241781       HOW191       Eric Hebert         0.99829       Slope:       0.00000       Mfg         0.15345       Intercept       0.00000       Serial Number         0.99999       CorrCoff       0.00000       Tfer ID         Slope:       1.4%       A Avg %Dif       A Max % Di       Slope         cription       ConcGroup       Tfer Raw       Tfer Corr       Si         nary       1       0.03       0.29       -0.0         nary       2       13.60       13.20       13         nary       3       34.71       34.20       34         nary       5       113.13       112.23       112         omponent       Sample Train       Condition       Good       Good         omponent       Sample Train       Condition       I.007       Gond         omponent       Sample Train       Condition       I.007       Gond       I.007         omponent       Battery Backup       Condition       I.007       Gond       I.007         omponent       Gifset       Condition       I.007       Gond       I.007</td><td>Serial Number Ta       Site       Technican       Site Visit         itron Inc       1009241781       HOW191       Eric Hebert       10/12/20         0.99829       Slope:       0.00000       O       Serial Number       05171121         0.15345       Intercept       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       Avg %Dif       A Max %Di       Serial Number       05171121         011133       Slope       Cord       Serial Number       05171121       011133         stray       DA Say %Dif       A Max %Di       A Max %Di       A Max %Di       Slope       Cert Dut       90         arry       1.4%       0.03       -0.29       -0.09       1       31.30       13.20       13.05       1         arry       3       34.71       34.20       34.67       34.67       31.31       112.20       10       10         omponent       Sample Train       Condition       N/A       Condition       0.20       10</td><td>Serial Number Ta         Site         Technician         Site Visit Date           tron Inc         1009241781         HOW191         Eric Hebert         10/12/2017           0.99829         Slope:         0.00000         Serial Number         0517112167           0.153345         Intercept         0.00000         Serial Number         0517112167           0.0153345         Intercept         0.00000         Corr Coff         0.00000           0.153345         Intercept         0.00000         Corr Coff         0.00000           0.153345         Intercept         0.00000         Corr Coff         10.0000           0.153345         Intercept         0.00000         Corr Coff         10.0000         Corr Coff         10.0000           01ff: A Max % Di         A Arg % Di         A Max % Di         A Max % Di         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ary         2         13.60</td><td>Serial Number Ta         Site         Technican         Site Visit Date         Parameter           tron Inc         1009241781         HOW191         Eric Hebert         10/12/2017         Ozone           0.99829         Stope:         0.00000         0.50345         Intercept         0.00000         0.01113         ThermoElectron Inc         Pa           0.99829         Stope:         0.00000         0.01112         0.01112         ThermoElectron Inc         Pa           0.99829         Data         A.Yag %Dif         A.Max %Di         Stope         0.01112         ThermoElectron Inc         Pa           0.01113         T.4%         O.0000         Order Train         Stope         0.01112         Cord         Order Train         ThermoElectron Inc         Pa           aray         1         0.03         -0.29         -0.09         ppt         Intercept         Order Train         Status           aray         1         0.03         -0.29         -0.09         ppt         Intercept         Status           aray         2         13.60         13.20         13.05         Status         Status           aray         2.5         Gegree rule         Condition         God         Status<td>Serial Number 1a         Site         Technician         Site Visit Date         Parameter           tron Inc         1009241781          HOW191         Enc Hebert         101/12/2017         Ogoo           0.99829         Sige:         0.00000         0.00000         Scrial Number         Darameter 0200           0.15345         Intercept         0.00000         0.00000         Scrial Number         Darameter 0200           0.99999         Corr Corr         0.00000         0.00000         Scrial Number         Dif1112167         ThermoElectron Inc         Parameter 0200           0.99999         Corr Corr         Size Visit Data         Mfg         Intercept         Darameter 0200           0.99999         Corr Corr         Size Visit Data         Mitry         Dif1112167         ThermoElectron Inc         Parameter 0200           1.4%         1.4%         On         Corr Corr         Size         Size Visit Data         Mitry         Dif1113           1.14%         1.4%         Mitry         Size Visit Data         Mitry         Polific         Po</td><td>Serial Number TaSiteTechnicianSite Visit DateParameterOwner IItron in1009241781HOW191Enc Hebert10/12/2017Ozon0000160.9829Stope:0.00000OconantParameter ozone0000160.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.00000Conc GroupTfer RawMrer CrSiteNitercept0.020.15345Intercept0.033-0.29-0.009Ppb-0.16%arry10.03-0.29-0.09Ppb-1.14%arry213.6013.2013.05Ppb-1.14%arry334.7134.2034.67Ppb-0.16%arry334.7134.2034.67ppb-0.16%arry5113.13112.23112.20Ppb-0.06%arry513.60FizzPizzPizz-0.06%arry5ConditionConditionConditionSitusPaszomponentParameter ozoneSitusPasz-0.16%arry1ConditionN/ASitusPaszomponentPizzCondition</td></td></td></td<>	Serial Number TaSiteatron Inc1009241781HOW191a.099829Slope:0.000000.15345Intercept0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoff0.000000.99999CorrCoffA Max %biff: A Max % D A Avg % DiffA Max %criptionConcGroupTfer Rawnary10.03nary334.71nary468.23nary5113.13omponentSample TrainomponentSample TrainomponentSpanomponentSpanomponentSpanomponentCell A Freq.omponentCell A Freq.omponentCell A Freq.omponentCell A Freq.omponentCell A Freq.omponentCell B Freq.omponentCell B Freq.omponentCell B Freq.omponentCell B Freq.omponentCell B Tmp.omponentCell B Tmp.omponentSystem Memo	Serial Number Ta       Site       Te         tron Inc       1009241781       HOW191       End         0.99829       Slope:       0.00000         0.15345       Intercept       0.00000         0.99999       CorrCoff       0.00000         0.99999       CorrCoff       0.00000         0.99999       CorrCoff       0.00000         0.99999       CorrCoff       AMax % Di         riff: A Max % Di       A Avg % Di       A Max % Di         ring:       1.4%       Ter         cription       ConcGroup       Tfer Raw       Tfer         nary       1       0.03       -0.         nary       3       34.71       34.         nary       5       113.13       112         omponent       Sample Train       Condition         omponent       Battery Backup       Condition         omponent       Battery Backup       Condition         omponent       Span       Condition         omponent       Cell A Freq.       Condition         omponent       Cell A Noise       Condition         omponent       Cell A Freq.       Condition         omponent       Cell B	Serial Number TaSiteTechnican1009241781HOW191Eric Helsen0.9829Slope: 0.000000.000000.15345Intercept 0.000000.000000.15345Intercept 0.000000.000000.9999DAS 2: 0.00000Mfg 0.000000.9999DAS 2: 0.00000Serial N 0.000000.9999DAS 2: 0.00000Serial N 0.000000.9999DAS 2: 0.0000Mfg 0.000000.9999DAS 2: 0.0000Mfg 0.000000.9999ConcGroupTfer RawMfgr C C 0.00000.9090ConcGroupTfer RawMfgr C 0.00000.90912013.6013.20nary10.03-0.29nary213.6013.20nary334.7134.20nary334.7134.20nary5113.13112.23omponetSampe TrainCondition0mponetGrifsetCondition0mponetSpanCondition0mponetSpanCondition0mponetGrifsetCondition0mponetCell A Freq.Condition0mponetCell A Freq.Condition0mponetCell A Freq.Condition0mponetCell A Tmp.Condition0mponetCell B Freq.Condition0mponetCell B Freq.Condition0mponetCell B Freq.Condition0mponetCell B Freq. </td <td>Serial Number Ta       Site       Technician         itron Inc       1009241781       HOW191       Eric Hebert         0.99829       Slope:       0.00000       Mfg         0.15345       Intercept       0.00000       Serial Number         0.99999       CorrCoff       0.00000       Tfer ID         Slope:       1.4%       A Avg %Dif       A Max % Di       Slope         cription       ConcGroup       Tfer Raw       Tfer Corr       Si         nary       1       0.03       0.29       -0.0         nary       2       13.60       13.20       13         nary       3       34.71       34.20       34         nary       5       113.13       112.23       112         omponent       Sample Train       Condition       Good       Good         omponent       Sample Train       Condition       I.007       Gond         omponent       Sample Train       Condition       I.007       Gond       I.007         omponent       Battery Backup       Condition       I.007       Gond       I.007         omponent       Gifset       Condition       I.007       Gond       I.007</td> <td>Serial Number Ta       Site       Technican       Site Visit         itron Inc       1009241781       HOW191       Eric Hebert       10/12/20         0.99829       Slope:       0.00000       O       Serial Number       05171121         0.15345       Intercept       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       Avg %Dif       A Max %Di       Serial Number       05171121         011133       Slope       Cord       Serial Number       05171121       011133         stray       DA Say %Dif       A Max %Di       A Max %Di       A Max %Di       Slope       Cert Dut       90         arry       1.4%       0.03       -0.29       -0.09       1       31.30       13.20       13.05       1         arry       3       34.71       34.20       34.67       34.67       31.31       112.20       10       10         omponent       Sample Train       Condition       N/A       Condition       0.20       10</td> <td>Serial Number Ta         Site         Technician         Site Visit Date           tron Inc         1009241781         HOW191         Eric Hebert         10/12/2017           0.99829         Slope:         0.00000         Serial Number         0517112167           0.153345         Intercept         0.00000         Serial Number         0517112167           0.0153345         Intercept         0.00000         Corr Coff         0.00000           0.153345         Intercept         0.00000         Corr Coff         0.00000           0.153345         Intercept         0.00000         Corr Coff         10.0000           0.153345         Intercept         0.00000         Corr Coff         10.0000         Corr Coff         10.0000           01ff: A Max % Di         A Arg % Di         A Max % Di         A Max % Di         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ary         2         13.60</td> <td>Serial Number Ta         Site         Technican         Site Visit Date         Parameter           tron Inc         1009241781         HOW191         Eric Hebert         10/12/2017         Ozone           0.99829         Stope:         0.00000         0.50345         Intercept         0.00000         0.01113         ThermoElectron Inc         Pa           0.99829         Stope:         0.00000         0.01112         0.01112         ThermoElectron Inc         Pa           0.99829         Data         A.Yag %Dif         A.Max %Di         Stope         0.01112         ThermoElectron Inc         Pa           0.01113         T.4%         O.0000         Order Train         Stope         0.01112         Cord         Order Train         ThermoElectron Inc         Pa           aray         1         0.03         -0.29         -0.09         ppt         Intercept         Order Train         Status           aray         1         0.03         -0.29         -0.09         ppt         Intercept         Status           aray         2         13.60         13.20         13.05         Status         Status           aray         2.5         Gegree rule         Condition         God         Status<td>Serial Number 1a         Site         Technician         Site Visit Date         Parameter           tron Inc         1009241781          HOW191         Enc Hebert         101/12/2017         Ogoo           0.99829         Sige:         0.00000         0.00000         Scrial Number         Darameter 0200           0.15345         Intercept         0.00000         0.00000         Scrial Number         Darameter 0200           0.99999         Corr Corr         0.00000         0.00000         Scrial Number         Dif1112167         ThermoElectron Inc         Parameter 0200           0.99999         Corr Corr         Size Visit Data         Mfg         Intercept         Darameter 0200           0.99999         Corr Corr         Size Visit Data         Mitry         Dif1112167         ThermoElectron Inc         Parameter 0200           1.4%         1.4%         On         Corr Corr         Size         Size Visit Data         Mitry         Dif1113           1.14%         1.4%         Mitry         Size Visit Data         Mitry         Polific         Po</td><td>Serial Number TaSiteTechnicianSite Visit DateParameterOwner IItron in1009241781HOW191Enc Hebert10/12/2017Ozon0000160.9829Stope:0.00000OconantParameter ozone0000160.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.00000Conc GroupTfer RawMrer CrSiteNitercept0.020.15345Intercept0.033-0.29-0.009Ppb-0.16%arry10.03-0.29-0.09Ppb-1.14%arry213.6013.2013.05Ppb-1.14%arry334.7134.2034.67Ppb-0.16%arry334.7134.2034.67ppb-0.16%arry5113.13112.23112.20Ppb-0.06%arry513.60FizzPizzPizz-0.06%arry5ConditionConditionConditionSitusPaszomponentParameter ozoneSitusPasz-0.16%arry1ConditionN/ASitusPaszomponentPizzCondition</td></td>	Serial Number Ta       Site       Technician         itron Inc       1009241781       HOW191       Eric Hebert         0.99829       Slope:       0.00000       Mfg         0.15345       Intercept       0.00000       Serial Number         0.99999       CorrCoff       0.00000       Tfer ID         Slope:       1.4%       A Avg %Dif       A Max % Di       Slope         cription       ConcGroup       Tfer Raw       Tfer Corr       Si         nary       1       0.03       0.29       -0.0         nary       2       13.60       13.20       13         nary       3       34.71       34.20       34         nary       5       113.13       112.23       112         omponent       Sample Train       Condition       Good       Good         omponent       Sample Train       Condition       I.007       Gond         omponent       Sample Train       Condition       I.007       Gond       I.007         omponent       Battery Backup       Condition       I.007       Gond       I.007         omponent       Gifset       Condition       I.007       Gond       I.007	Serial Number Ta       Site       Technican       Site Visit         itron Inc       1009241781       HOW191       Eric Hebert       10/12/20         0.99829       Slope:       0.00000       O       Serial Number       05171121         0.15345       Intercept       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       0.00000       O       Serial Number       05171121         0.99999       CorrCoff       Avg %Dif       A Max %Di       Serial Number       05171121         011133       Slope       Cord       Serial Number       05171121       011133         stray       DA Say %Dif       A Max %Di       A Max %Di       A Max %Di       Slope       Cert Dut       90         arry       1.4%       0.03       -0.29       -0.09       1       31.30       13.20       13.05       1         arry       3       34.71       34.20       34.67       34.67       31.31       112.20       10       10         omponent       Sample Train       Condition       N/A       Condition       0.20       10	Serial Number Ta         Site         Technician         Site Visit Date           tron Inc         1009241781         HOW191         Eric Hebert         10/12/2017           0.99829         Slope:         0.00000         Serial Number         0517112167           0.153345         Intercept         0.00000         Serial Number         0517112167           0.0153345         Intercept         0.00000         Corr Coff         0.00000           0.153345         Intercept         0.00000         Corr Coff         0.00000           0.153345         Intercept         0.00000         Corr Coff         10.0000           0.153345         Intercept         0.00000         Corr Coff         10.0000         Corr Coff         10.0000           01ff: A Max % Di         A Arg % Di         A Max % Di         A Max % Di         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ff: A Max % Di         A Arg % Di         Ther Raw         Ther Corr         Size         Size           01ary         2         13.60	Serial Number Ta         Site         Technican         Site Visit Date         Parameter           tron Inc         1009241781         HOW191         Eric Hebert         10/12/2017         Ozone           0.99829         Stope:         0.00000         0.50345         Intercept         0.00000         0.01113         ThermoElectron Inc         Pa           0.99829         Stope:         0.00000         0.01112         0.01112         ThermoElectron Inc         Pa           0.99829         Data         A.Yag %Dif         A.Max %Di         Stope         0.01112         ThermoElectron Inc         Pa           0.01113         T.4%         O.0000         Order Train         Stope         0.01112         Cord         Order Train         ThermoElectron Inc         Pa           aray         1         0.03         -0.29         -0.09         ppt         Intercept         Order Train         Status           aray         1         0.03         -0.29         -0.09         ppt         Intercept         Status           aray         2         13.60         13.20         13.05         Status         Status           aray         2.5         Gegree rule         Condition         God         Status <td>Serial Number 1a         Site         Technician         Site Visit Date         Parameter           tron Inc         1009241781          HOW191         Enc Hebert         101/12/2017         Ogoo           0.99829         Sige:         0.00000         0.00000         Scrial Number         Darameter 0200           0.15345         Intercept         0.00000         0.00000         Scrial Number         Darameter 0200           0.99999         Corr Corr         0.00000         0.00000         Scrial Number         Dif1112167         ThermoElectron Inc         Parameter 0200           0.99999         Corr Corr         Size Visit Data         Mfg         Intercept         Darameter 0200           0.99999         Corr Corr         Size Visit Data         Mitry         Dif1112167         ThermoElectron Inc         Parameter 0200           1.4%         1.4%         On         Corr Corr         Size         Size Visit Data         Mitry         Dif1113           1.14%         1.4%         Mitry         Size Visit Data         Mitry         Polific         Po</td> <td>Serial Number TaSiteTechnicianSite Visit DateParameterOwner IItron in1009241781HOW191Enc Hebert10/12/2017Ozon0000160.9829Stope:0.00000OconantParameter ozone0000160.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.00000Conc GroupTfer RawMrer CrSiteNitercept0.020.15345Intercept0.033-0.29-0.009Ppb-0.16%arry10.03-0.29-0.09Ppb-1.14%arry213.6013.2013.05Ppb-1.14%arry334.7134.2034.67Ppb-0.16%arry334.7134.2034.67ppb-0.16%arry5113.13112.23112.20Ppb-0.06%arry513.60FizzPizzPizz-0.06%arry5ConditionConditionConditionSitusPaszomponentParameter ozoneSitusPasz-0.16%arry1ConditionN/ASitusPaszomponentPizzCondition</td>	Serial Number 1a         Site         Technician         Site Visit Date         Parameter           tron Inc         1009241781          HOW191         Enc Hebert         101/12/2017         Ogoo           0.99829         Sige:         0.00000         0.00000         Scrial Number         Darameter 0200           0.15345         Intercept         0.00000         0.00000         Scrial Number         Darameter 0200           0.99999         Corr Corr         0.00000         0.00000         Scrial Number         Dif1112167         ThermoElectron Inc         Parameter 0200           0.99999         Corr Corr         Size Visit Data         Mfg         Intercept         Darameter 0200           0.99999         Corr Corr         Size Visit Data         Mitry         Dif1112167         ThermoElectron Inc         Parameter 0200           1.4%         1.4%         On         Corr Corr         Size         Size Visit Data         Mitry         Dif1113           1.14%         1.4%         Mitry         Size Visit Data         Mitry         Polific         Po	Serial Number TaSiteTechnicianSite Visit DateParameterOwner IItron in1009241781HOW191Enc Hebert10/12/2017Ozon0000160.9829Stope:0.00000OconantParameter ozone0000160.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.15345Intercept0.00000OconantParameter ozoneParameter ozone0.00000Conc GroupTfer RawMrer CrSiteNitercept0.020.15345Intercept0.033-0.29-0.009Ppb-0.16%arry10.03-0.29-0.09Ppb-1.14%arry213.6013.2013.05Ppb-1.14%arry334.7134.2034.67Ppb-0.16%arry334.7134.2034.67ppb-0.16%arry5113.13112.23112.20Ppb-0.06%arry513.60FizzPizzPizz-0.06%arry5ConditionConditionConditionSitusPaszomponentParameter ozoneSitusPasz-0.16%arry1ConditionN/ASitusPaszomponentPizzCondition

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ASH	135-Eric H	ebert-10/13/2017				
1	10/13/2017	DAS	Campbell	000634	CR3000	4933
2	10/13/2017	Ozone	ThermoElectron Inc	000730	49i A1NAA	1105347325
3	10/13/2017	Ozone Standard	ThermoElectron Inc	000442	49i A3NAA	CM08200018
4	10/13/2017	Zero air pump	Werther International	06923	C 70/4	000836208

Mfg	S	erial N	umber Ta	Site	Te	chnician		Site Visi	it Date	Paramo	eter	Owner I	D
ThermoElec	ctron Inc	110534	7325	ASH135	Er	ic Heber	t	10/13/2	017	Ozone		000730	
Slope: Intercept CorrCoff	1.0 0.1 0.9	00608 12752 99995	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	Thermole 0517112 01113	Electron	Inc Pa	er Desc.	zone Dzone primar	y stan
DAS 1: A Avg % D 1.2	Diff: A Ma	<b>x % D</b> 2.8°	DAS 2: i A Avg %	bDif A Max	% Di	Slope Cert Da	nte		1.0050 9/12/201	14 Inter	rcept :Coff	0.32	2915 )000
UseDes prin prin prin prin prin	scription nary nary nary nary nary nary		nncGroup 1 2 3 4 5	Tfer Raw           0.48           13.48           35.01           65.81           110.44	Tfer 0.1 13. 34. 65. 109	Corr 15 08 50 15 0.55	Si -0. 13 35 65 110	ite 06 .05 .46 .97 0.00	Sit ppb ppb ppb ppb	e Unit	PctDi	fference -0.23% 2.78% 1.26% 0.41%	
Sensor Co	omponent	Samp	le Train		Conditio	on Good	1			Status	pass	1	
Sensor Co	omponent	22.5 d	legree rule		Conditio	on				Status	pass		_
Sensor Co	omponent	Inlet F	ilter Conditio	n	Conditio	on Clear	1			Status	pass		
Sensor C	- omponent	Batter	y Backup		Conditio	n N/A				Status	pass		
Sensor C	omponent	Offset			Conditio	<b>n</b> -0.10				Status	pass		
Sensor C	omponent	Span			Conditio	n 1 019				Status	pass		
Sonsor C	omponent	Zero \	/oltage		Conditio					Status	nass		
Sensor C	omponent	Eullee			Conditio					Status	pass		
Selisor Co	omponent				Conditio					Status	pass		
Sensor C	omponent	Cell A	Freq.		Conditio	on 111.8	кнz			Status	pass		
Sensor Co	omponent	Cell A	Noise		Conditio	on 1.3 pr	b			Status	pass		
Sensor Co	omponent	Cell A	Flow		Conditio	<b>0.90</b> l	pm			Status	pass		
Sensor Co	omponent	Cell A	Pressure		Conditio	<b>n</b> 729.4	mmHg			Status	pass		
Sensor C	omponent	Cell A	Tmp.		Conditio	on 35.9 (	C			Status	pass		
Sensor C	omponent	Cell B	Freq.		Conditio	on 98.7 k	κHz			Status	pass		
Sensor Co	omponent	Cell B	Noise		Conditio	on 0.9 pp	ob			Status	pass		
Sensor C	omponent	Cell B	Flow		Conditio	on 0.73 l	pm			Status	pass		
Sensor Co	omponent	Cell B	Pressure		Conditio	on 728.8	mmHg			Status	pass		_
Sensor C	- omponent	Cell B	Tmp.		Conditio	on	-			Status	pass		
Sensor C	omponent	Line L	OSS		Conditio	n Not te	ested			Status	pass		
Sensor C	omnonent	Syster	m Memo		Conditio	on [				Status	pass		
	Ponent				Contraction					Status	• · · · · ·		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
HW	F187-Eric H	lebert-10/17/2017				
1	10/17/2017	DAS	Campbell	000356	CR3000	2134
2	10/17/2017	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	10/17/2017	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
4	10/17/2017	Zero air pump	Werther International	06931	C 70/4	000836212
5	10/17/2017	Zero air pump	Teledyne	000772	701H	608

Mfg	Serial Number Ta Site			Site	Technician			Site Visit Date Param			eter Owner ID		D
ThermoElec	ctron Inc	10302447	93	HWF187	Er	ic Hebert		10/17/20	17	Ozone		000700	
Slope: Intercept CorrCoff	0 -0 0	.98417 S .06763 I .99999 (	Slope: Intercept CorrCoff	0.0000	0 0 0	Mfg Serial N Tfer ID	umber	ThermoE 05171121 01113	lectron 67	Inc Pa	rameter oz er Desc. Oz	one zone primary	y stan
DAS 1: A Avg % E 1.9	<b>Diff: A M</b> 9%	ax % Di 2.3%	DAS 2: A Avg %	bDif A Max	% Di	Slope Cert Da	te	9/	1.00504 12/201	4 Inter 7 Corr	ccept Coff	0.32	2915 2000
UseDes prin prin prin prin prin prin	scription nary nary nary nary nary nary		cGroup 1 2 3 4 5	Tfer Raw           0.21           13.48           37.89           64.87           110.03	Tfer -0. 13. 37. 64. 109	Corr 11 08 37 21 0.15	Si -0. 12 36 63 107	ite 13 I .80 I .52 I .33 I 7.30 I	Site opb opb opb opb opb	e Unit	PctDif	ference -2.14% -2.27% -1.37% -1.69%	
Sensor C	omponer	t Sample	Train		Conditio	on Good				Status	pass		
Sensor C	omponer	t 22.5 deg	gree rule		Conditio	on				Status	pass		
Sensor C	omponer	t Inlet Filte	er Conditio	n	Conditio	on Clean				Status	pass		
Sensor C	omponer	t Battery E	Backup		Conditio	n N/A				Status	pass		
Sensor C	omponer	t Offset	bfset			on 0.10				Status	pass		
Sensor C	omponer	t Span			Conditio	<b>n</b> 1.011				Status	pass		
Sensor C	omponer	t Zero Vol	ltage		Conditio	n N/A				Status	pass		5
Sensor C	omponer	f Fullscale	e Voltage		Conditio	n N/A				Status	pass		
Sensor C	omponer		rea		Conditio	on 94.9 k	Hz			Status	pass		4
Sensor C	omponen		oise		Conditio					Status	pass		
Selisor C	omponer				Conditio					Status	2222		
Sensor C	omponer		IUW		Conditio	<b>n</b> 0.03 i				Status	pass		
Sensor C	omponer		ressure		Conditio	on 705.3	mm∺g			Status	pass		
Sensor C	omponer	t Cell A Ti	mp.		Conditio	on 36.9 (	;			Status	pass		
Sensor C	omponer	t Cell B Fi	req.		Conditio	on 92.5 k	Hz			Status	pass		
Sensor C	omponer	t Cell B N	oise		Conditio	<b>0.6</b> pp	b			Status	pass		
Sensor C	omponer	t Cell B Fl	low		Conditio	<b>on</b> 0.67 l	om			Status	pass		
Sensor C	omponer	t Cell B P	ressure		Conditio	<b>on</b> 704.8	mmHg			Status	pass		
Sensor C	omponer	t Cell B T	mp.		Conditio	on				Status	pass		
Sensor C	omponer	t Line Los	S		Conditio	on Not te	sted			Status	pass		
Sensor C	omponer	t System	Memo		Conditio	on				Status	pass		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ANA	115-Sandy	Grenville-10/19/2017				
1	10/19/2017	DAS	Campbell	000339	CR3000	2118
2	10/19/2017	Ozone	ThermoElectron Inc	000899	49i A1NAA	1030244804
3	10/19/2017	Ozone Standard	ThermoElectron Inc	000364	49i A3NAA	0726124687
4	10/19/2017	Zero air pump	Werther International	06933	C 70/4	000836202

Mfg		Serial N	umber Ta	Site	Те	chnician		Site Visit	Date	Parame	eter	Owner II	)
ThermoElec	tron Inc	103024	4804	ANA115	Sa	andy Grei	nville	10/19/201	17	Ozone		000899	
Slope: Intercept CorrCoff	· · · · · · · · · · · · · · · · · · ·	1.00596 ).81566 ).99995	Slope: Intercept CorrCoff	0.00000	) ) )	Mfg Serial N Tfer ID	lumber	ThermoEle 51711217 01111	ectron 5	Inc Pa	arameter ozone fer Desc. Ozone primary s		stan
DAS 1: A Avg % D 3.1	<b>Diff: A M</b> 1%	<b>fax % D</b> 5.0'	DAS 2: i A Avg %	6Dif A Max 9	% Di	Slope Cert Da	ıte	3/2	1.00250 21/201	0 Inter 7 Corr	·cept ·Coff	0.458	370 )00
UseDes prin prin prin prin prin	acription nary nary nary nary nary		I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Tfer Raw           0.14           15.09           35.10           68.10           111.10	Tfer -0. 14. 34. 67. 110	Corr 31 59 55 .47 0.36	Si 0. 15 35 69 111	ite p 19 p .32 p .93 p .25 p 1.40 p	Site pb pb pb pb pb	e Unit	PctDiff	5.00% 5.00% 3.99% 2.64% 0.94%	
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	omponei	nt Inlet F	ilter Conditio	'n	Condition	on Mode	rately cle	an		Status	pass		]
Sensor Co	omponei	nt Batter	y Backup		Conditi	on N/A				Status	pass		]
Sensor Co	ompone	nt Offset	t		Conditi	on 0.000				Status	pass		]
Sensor Co	omponei	nt Span			Conditio	on 1.043				Status	pass		]
Sensor Co	ompone	nt Zero \	/oltage		Conditi	on N/A				Status	pass		]
Sensor C	ompone		ale Voltage		Conditi	on N/A				Status	nass		]
Sensor C	omponer		Erog		Conditi		·U-7			Status	page		]
Sensor Co	omponei		Neise		Conditio		.1 1Z			Status	pass		]
Sensor Co	ompone	nt Cell A	NOISE		Conditio	on 1.6 pp	d			Status	pass		]
Sensor Co	ompone	nt Cell A	Flow		Condition	on 0.69 l	om			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Condition	on 703.5	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	. Tmp.		Conditio	on 33.5 (	)			Status	pass		]
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 91.7 k	Hz			Status	pass		]
Sensor Co	ompone	nt Cell B	Noise		Conditi	on 1.4 pp	b			Status	pass		]
Sensor Co	ompone	nt Cell B	Flow		Conditi	on 0.68 l	om			Status	pass		]
Sensor Co	omponei	nt Cell B	Pressure		Condition	on 702.9	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	sted			Status	pass		]
Sensor Co	ompone	nt Svste	m Memo		Conditi	on				Status	pass		]
	Ponel					[				2. Jee Jee J	·		1

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SAL	133-Eric He	ebert-10/19/2017				
1	10/19/2017	DAS	Campbell	000351	CR3000	2129
2	10/19/2017	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316
3	10/19/2017	Ozone Standard	ThermoElectron Inc	000370	49i A3NAA	0726124689
4	10/19/2017	Zero air pump	Werther International	06935	C 70/4	000829172

Mfg		Serial N	umber Ta	Site	Te	chnician		Site Visit	t Date	Parame	eter	Owner I	D
ThermoElec	tron Inc	110534	7316	SAL133	Er	ic Hebert		10/19/20	)17	Ozone		000741	
Slope: Intercept CorrCoff	-( (	1.01563 ).44556 ).99997	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 ⁻ 01113	lectron 167	Inc Pa	rameter ozo er Desc. Ozo	one one primary	/ stan
DAS 1: A Avg % D 1.6	<b>)iff: A M</b> 6%	<b>Iax % D</b> 3.3'	DAS 2: i A Avg %	6Dif A Max	% Di	Slope Cert Da	ıte	9,	1.0050 /12/201	4 Inter 7 Corr	cept Coff	0.32	2915 0000
UseDes prin prin prin prin prin	acription nary nary nary nary nary		DincGroup 1 2 3 4 5	Tfer Raw -0.14 15.41 35.88 71.20 114.48	Tfer -0. 15. 35. 70. 113	Corr 46 .00 .37 .51	Si -0. 14 35 70 115	ite 73 1 .50 1 .81 1 .74 1	Site ppb ppb ppb ppb	e Unit	PctDiff	erence -3.33% 1.24% 0.33% 1.35%	
Sensor Co	omponei	nt Samp	le Train	111.10	Conditio	on Good	110	,o		Status	pass	1.5570	
Sensor Co	omponei	1t 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	t Offset	t .		Conditio	<b>0.10</b>				Status	pass		
Sensor Co	ompone	t Span	-		Conditio	n 1 050				Status	nass		
Sensor C	ompone	t Zero \			Conditio					Status	nass		
Sensor C	ompone				Conditio					Status	pass		
Sensor Co	omponei				Conditio					Status	pass		
Sensor Co	ompone	t Cell A	Freq.		Conditio	on 103.2	KHZ			Status	pass		
Sensor Co	ompone	nt Cell A	Noise		Conditio	on Not te	sted			Status	pass		
Sensor Co	ompone	nt Cell A	Flow		Conditio	on 0.58 l	pm			Status	pass		
Sensor Co	ompone	nt Cell A	Pressure		Conditio	<b>on</b> 718.0	mmHg			Status	pass		
Sensor Co	ompone	nt Cell A	Tmp.		Conditio	on 35.4 0	2			Status	pass		
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 101.5	kHz			Status	pass		
Sensor Co	ompone	nt Cell B	Noise		Conditio	on Not te	sted			Status	pass		
Sensor Co	omponei	nt Cell B	6 Flow		Conditio	on 0.57 l	pm			Status	pass		
Sensor Co	omponei	nt Cell B	Pressure		Conditio	on 717.4	mmHg			Status	pass		
Sensor Co	ompone	t Cell B	S Tmp.		Conditio	on	-			Status	pass		
Sensor Co	ompone	nt Line L	.0SS		Conditio	on Not te	sted			Status	pass		
Sensor Co	omnone	nt Svste	m Memo		Conditi	on				Status	pass		
	Pone				Contaith					Status	• · · · · ·		

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
UVL	.124-Sandy	Grenville-10/20/2017				
1	10/20/2017	DAS	Campbell	000347	CR3000	2126
2	10/20/2017	Ozone	ThermoElectron Inc	000680	49i A1NAA	1030244792
3	10/20/2017	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
4	10/20/2017	Zero air pump	Werther International	06936	C 70/4	000829169

# **EEMS Spot Report**

**Data Compiled:** 1/24/2018 2:21:08 PM

# SiteVisitDateSiteTechnician10/20/2017UVL124Sandy 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	0.98024	unitless	Р
2	Ozone Intercept	Р	0	5	4	0.26213	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	1.9	%	Р

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
HO	X148-Sandy	Grenville-10/20/2017				
1	10/20/2017	DAS	Campbell	000426	CR3000	2533
2	10/20/2017	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
3	10/20/2017	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
4	10/20/2017	Zero air pump	Werther International	06938	C 70/4	000829164

Mfg	S	Serial Number Ta Site			Technician			Site Visit Date Parame			eter Owner ID		D
ThermoElec	ctron Inc	100924	1794	HOX148	Sa	andy Grer	nville	10/20/20	017	Ozone		000614	
Slope: Intercept CorrCoff	1. -0. 0.	01745 13909 99999	Slope: Intercept CorrCoff	0.00000	) ) )	Mfg Serial N Tfer ID	umber	ThermoE 5171121 01111	Electron 75	Inc Pa	rameter 02 er Desc. 0	zone zone primar	y stan
DAS 1: A Avg % D	<b>Diff: A M</b> 4%	<b>ax % D</b> 1.9°	DAS 2: i A Avg %	bDif A Max	% Di	Slope Cert Da	te	3	1.0025 3/21/201	0 Inter 7 Corr	cept Coff	0.45	5870 0000
UseDes prin prin prin prin	scription nary nary nary nary		ncGroup 1 2 3 4	Tfer Raw 0.29 15.67 35.39 68.18	Tfer -0. 15 34 67	Corr 16 .17 .84 .55	Si -0. 15 35 68	ite .41 .30 .31 .86	Sit ppb ppb ppb ppb	e Unit	PctDi	fference 0.86% 1.35% 1.94%	
prin Sensor C	nary	t Samp	ס le Train	110.53	Conditi	on Good	111	1.40	ррв	Statue	nass	1.47%	
Sensor C	omponen	22.5 d			Conditi					Status	pass		
Sensor Co	omponen			-	Conditio					Status	pass		
Sensor C	omponen			n	Conditi	on Clean				Status	pass		
Sensor Co	omponen	t Batter	y Backup		Conditi	on N/A				Status	pass		
Sensor C	omponen	t Offset			Conditi	on 0.50				Status	pass		
Sensor C	omponen	t Span			Conditi	on 1.049				Status	pass		
Sensor C	omponen	t Zero \	/oltage		Conditi	on N/A				Status	pass		
Sensor C	omponen	t Fullsc	ale Voltage		Conditi	on N/A				Status	pass		
Sensor Co	omponen	t Cell A	Freq.		Conditi	on 94.5 k	Hz			Status	pass		
Sensor C	omponen	t Cell A	Noise		Conditi	on 0.8 pp	b			Status	pass		
Sensor C	omponen		Flow		Conditi	0.83	n			Status	nass		
Selisor C	omponen		Dragouro		Conun	712.0	mmlla			Status	2222		
Sensor Co	omponen		Tiessule		Conditio	on 713.9	nining			Status	pass		
Sensor Co	omponen	t Cell A	Imp.		Conditi	on 35.5 (	;			Status	pass		
Sensor Co	omponen	t Cell B	Freq.		Conditi	<b>on</b> 91.4 k	Hz			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 0.71 l	om			Status	pass		
Sensor C	omponen	t Cell B	Pressure		Conditi	on 713.6	mmHg			Status	pass		
Sensor C	omponen	t Cell B	Tmp.		Conditi	on				Status	pass		
Sensor C	omponen	t Line L	.0SS		Conditi	on Not te	sted			Status	pass		
Sensor C	omponen	t Syster	m Memo		Conditi	on				Status	pass		

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number	
DEN	N417-Martir	1 Valvur-10/24/2017					
1	10/24/2017	DAS	Environmental Sys Corp	90600	8816	2274	
2	10/24/2017	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384	
3	10/24/2017	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368	
4	10/24/2017	Zero air pump	Werther International	none	PC70/4	526281	

Mfg S		Serial N	rial Number Ta Site		Technician		Site Visit Date Par		Parame	Parameter		D	
ThermoElec	tron Inc	49C-77	033-384	DEN417	M	artin Valv	ur	10/24/20	017	Ozone		90778	
Slope: Intercept CorrCoff	- -(	1.08821 0.05394 1.00000	Slope: Intercept CorrCoff	0.00000	) ) )	Mfg Serial N Tfer ID	lumber	ThermoE 49CPS-7 01110	Electron 70008-3	Inc Pa	rameter C	ozone Dzone primar	y stan
DAS 1: A Avg % Diff: A Ma 8.6%		<b>1ax % D</b> 8.99	DAS 2: i A Avg %	bDif A Max 9	if A Max % Di		Slope Cert Date		1.00801 Inter 9/11/2017 Corr		ccept Coff	-0.0	5199 0000
UseDes prin prin prin prin prin	cription nary nary nary nary nary		0ncGroup 1 2 3 4 5	Tfer Raw 0.10 15.05 35.14 68.80 110.70	Tfer 0. 14 34 68	Corr 15 .98 .91 .30 .87	Si 0. 16. 38. 74. 119	ite 18 .17 .03 .09 0.60	Sit ppb ppb ppb ppb	e Unit	PctD	ifference           7.94%           8.94%           8.48%           8.86%	
Sensor Co Sensor Co	omponer omponer	nt Samp	le Train legree rule	n	Condition Condition	on Good				Status Status	pass pass		
Sensor Co Sensor Co Sensor Co	ompone ompone ompone	nt Batter nt Offset	y Backup		Condition Condition	on N/A on 0.5				Status Status Status	pass pass		
Sensor Co Sensor Co	Sensor Component     Span       Sensor Component     Zero Voltage		/oltage	Condition         0.997           Condition         0.0004			4	Status Status			pass pass		
Sensor Co Sensor Co Sensor Co	omponei omponei omponei	nt Fullscant Cell A nt Cell A	Freq. Noise		Conditio	on 99.5 k on 0.5 pp	3 (Hz )b			Status Status Status	pass pass pass		
Sensor Co Sensor Co	ompone ompone	nt Cell A nt Cell A	Flow Pressure		Condition Condition	on 0.66 l on 687.1	om mmHg			Status Status	pass pass		
Sensor Co Sensor Co	ompone ompone	nt Cell A nt Cell B	Tmp. Freq.		Condition	on 32.1 ( on 74.7 k	C :Hz			Status Status	pass pass		
Sensor Co Sensor Co	ompone ompone	nt Cell B	Noise Flow Pressure		Condition Condition	on 0.5 pp on 0.68 l	om mmHa			Status Status	pass pass		
Sensor Co Sensor Co	omponer	nt Cell B	Tmp.		Conditio	on on on Not te	sted			Status Status Status	pass		
Sensor Co	ompone	nt Syster	m Memo		Conditio	on				Status	pass		

Site Visit Date Parameter		Parameter	Mfg	Owner ID	Model Number	Serial Number				
PNF	PNF126-Eric Hebert-11/16/2017									
1	11/16/2017	DAS	Campbell	000346	CR3000	2125				
2	11/16/2017	Ozone	ThermoElectron Inc	000746	49i A1NAA	1105347315				
3	11/16/2017	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691				
4	11/16/2017	Zero air pump	Werther International	06885	C 70/4	000814270				
5	11/16/2017	Zero air pump	Teledyne	000774	701H	610				

Mfg		Serial Number Ta		Site		Technician		Site Visit Date		Parame	eter	Owner I	Owner ID	
ThermoElec	tron Inc	110534	7315	PNF126	Er	ic Hebert		11/16/20	)17	Ozone		000746		
Slope: Intercept CorrCoff	( -( (	).99614 ).53512 ).99997	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	lectron 167	Inc Pa	rameter ozo er Desc. Oz	one cone primar	y stan	
DAS 1: A Avg % Diff: A Max % 2.3%			DAS 2: i A Avg %	6Dif A Max	% Di Cert Date		1.00504 Interce 9/12/2017 CorrC			ccept Coff	0.32	2915 0000		
UseDes prin prin prin prin prin	acription nary nary nary nary nary		DINCGROUP 1 2 3 4 5	Tfer Raw 0.53 15.49 35.41 69.93 110.56	Tfer 0. 15. 34. 69. 109	Corr 19 08 90 25 0.67	Si -0. 14 34 68 108	ite 27 .12 .76 .12 .3.80	Site ppb ppb ppb ppb ppb	e Unit	PctDif	ference -6.37% -0.40% -1.63% -0.79%		
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	ompone	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	Offset			Condition 0.10				Status	s pass			
Sensor Co	ompone	t Span				lition 1.064				Status	pass			
Sonsor C	ompone			Condition N/A				Status	nass					
Sensor C	ompone		Eullscale Voltage			Condition N/A				Status	pass			
Sensor Co	omponei				Conditio					Status	pass			
Sensor Co	ompone	t Cell A	Freq.		Conditio	on 92.7 k	HZ			Status	pass			
Sensor Co	ompone	nt Cell A	Noise		Conditio	on 0.8 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 686.2	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 105.1	kHz			Status	pass			
Sensor Component		nt Cell B	Noise		Conditio	Condition 0.9 ppb				Status	IS pass			
Sensor Co	omponei	nt Cell B	Flow		Conditio	on 0.64 l	pm			Status	pass			
Sensor Co	- omponei	nt Cell B	Pressure		Conditio	on 685.6	mmHg			Status	pass			
Sensor C	ompone	t Cell B	Tmp.		Conditio	on	0			Status	pass			
Sonsor C	ompone		055		Conditi	n Not te	sted			Status	pass			
Sensor Co	omponel		m Marra		Conditio					Status	2000			
Sensor Co	ompone	at Syste			Conditio	on				Status	pass			

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
BEL116-Eric Hebert-11/20/2017									
1	11/20/2017	DAS	Campbell	000341	CR3000	2120			
2	11/20/2017	Ozone	ThermoElectron Inc	000684	49i A1NAA	1030244795			
3	11/20/2017	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685			
4	11/20/2017	Zero air pump	Werther International	06913	C 70/4	000829178			

Mfg S		Serial Number Ta		Site 7		Technician		Site Visit Date		Parame	eter	Owner I	Owner ID	
ThermoElec	tron Inc	103024	4795	BEL116	Er	ic Hebert		11/20/20	)17	Ozone		000684		
Slope: Intercept CorrCoff	-( (	1.01315 ).98232 ).99998	Slope: Intercept CorrCoff	0.00000	0 0 0	Mfg Serial N Tfer ID	lumber	ThermoE 0517112 01113	lectron	Inc Pa	rameter ozo er Desc. Oz	one one primary	y stan	
DAS 1:         DAS 2:           A Avg % Diff: A Max % Di         A Avg %Dif           2.1%         5.3%			6Dif A Max	Slope Ax % Di Cert Date		1.00504         Intercent           9/12/2017         Correl			ccept Coff	0.32	2915 0000			
UseDes prin prin prin prin prin	cription nary nary nary nary nary		DncGroup 1 2 3 4 5	Tfer Raw           0.23           15.50           35.74           67.03           108.03	Tfer -0. 15. 35. 66. 107	Corr 09 09 23 36 7.16	Si -1. 14 34 66 107	ite 03 .29 .40 .72 7.40	Site ppb ppb ppb ppb	e Unit	PctDiff	-5.30% -2.36% 0.54% 0.22%		
Sensor Co	ompone	nt Samp	le Train		Conditio	on Good		<u> </u>		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 Co	ompone	nt Batter	y Backup		Conditio	on N/A				Status	pass			
Sensor Co	omponei	nt Offset	t		Conditio	on -0.10				Status	pass			
Sensor Co	omponei	nt Span		Conditio		on 1.017				Status	pass			
Sensor Co	omponei	nt Zero \	/oltage	Condition N/A			/A St			Status	pass			
Sensor Co	omponei	nt Fullsc	Fullscale Voltage			Condition N/A				Status	pass			
Sensor Co	ompone	nt Cell A	Freq		Conditio	n 103 7	kH7			Status	nass			
Sensor Co	ompone		Noise		Conditio		h. 12			Status	nass			
	ompone		Flow		Conditio					Status	2222			
Sensor Co	omponei				Conditio	0n 0.03 i				Status	pass			
Sensor Co	ompone		Pressure		Conditio	on 723.3	mmHg			Status	pass			
Sensor Co	ompone	nt Cell A	Imp.		Conditio	on 32.1 C	;			Status	pass			
Sensor Co	ompone	nt Cell B	Freq.		Conditio	on 97.3 k	κHz			Status	pass			
Sensor Co	ompone	nt Cell B	Noise		Conditio	<b>0.</b> 6 pp	b			Status	pass			
Sensor Co	ompone	nt Cell B	Flow		Conditio	on 0.51 l	pm			Status	pass			
Sensor Co	ompone	nt Cell B	Pressure		Conditio	on 722.7	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			