2014 – 2nd Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

EPA Contract No. EPW12019

Prepared for:

U. S. Environmental Protection Agency

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Table of Contents

List of Appendices

List of Tables

List of Acronyms and Abbreviations

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

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

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

As of May 2016, the network is comprised of 94 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

1.2 Project Objectives

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

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

and PAL190. Five new sites sponsored by EPA and operated by the BLM in WY also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, ROM206, and BEL116. None of those sites were audited in second quarter 2014.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point	0.9000 ≤ m ≤ 1.1000

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Ozone	Intercept	test gas concentration as measured with a certified transfer standard	-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

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

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

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

1.3 CASTNET Sites Visited Second Quarter 2014

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

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
CAN407	With met	NPS	5/6/2014	Canyonlands NP
CHA467	With met	NPS	4/23/2014	Chiricahua NM
DEN417	Without met	NPS	6/24/2014	Denali NP
GRB411	With met	NPS	5/27/2014	Great Basin NP
GRC474	With met	NPS	4/8/2014	Grand Canyon NP
JOT403	With met	NPS	4/28/2014	Joshua Tree NP
MEV405	With met	NPS	5/5/2014	Mesa Verde NP
PET427	With met	NPS	4/7/2014	Petrified Forest NP

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

Table 3. Site Ozone PE Visits

Site ID	Sponsor Agency	Site Location	Visit dates
DCP114	EPA	Deer Creek St. Park	4/9/2014
LAV410	NPS	Lassen Volcanic NP	5/31/2014
OXF122	EPA	Oxford	4/10/2014
PIN414	NPS	Pinnacles NM	5/1/2014
QAK172	EPA	Quaker City	4/8/2014
SAN189	NPS	Santee Sioux	6/2/2014
SEK430	NPS	Sequoia NP - Ash Mountain	5/30/2014
YOS404	NPS	Yosemite NP	5/29/2014

1.4 Audit Results

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

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

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

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

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 200 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 100 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

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

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

2.2 Project Objectives

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

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

2.3 Sites Visited Second Quarter 2014

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

Table 4. Sites Surveyed – Second Quarter 2014

Side ID	Network	Visit Date	Station Name
AZ06	NTN	4/22/2014	Organ Pipe Cactus NP
AZ97	NTN	4/7/2014	Petrified Forest National Park-Rainbow Forest
AZ98	AMoN/NTN	4/23/2014	Chiricahua NM
AZ99	NTN	4/25/2014	Oliver Knoll
NM07	NTN	4/15/2014	Bandelier National Monument
NM08	NTN	4/14/2014	Mayhill
OH09	NTN	4/10/2014	Oxford
OH49	NTN	4/8/2014	Caldwell
OH54	AMoN/NTN	4/9/2014	Deer Creek State Park
OH71	NTN	4/9/2014	Wooster
KS04	MDN	5/29/2014	West Mineral
KS07	NTN	5/31/2014	Farlington Fish Hatchery
KS24	MDN	5/30/2014	Glen Elder State Park
KS31	AMoN/NTN	5/31/2014	Konza Prarie
KS99	MDN	5/30/2014	Cimarron National Grassland
CO93	NTN	6/2/2014	Dry Lake
KS03	AMoN/MDN	6/1/2014	Reserve
KS05	MDN	6/3/2014	Coffey County Lake

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*
PET427-Eric Hebert-04/07/2014						
1	4/7/2014	Computer	Hewlett Packard	none	6560 b	5CB22906TB
2	4/7/2014	DAS	Environmental Sys Corp	90641	8816	2526
3	4/7/2014	Elevation	Elevation	None	1	None
4	4/7/2014	Filter pack flow pump	Thomas	none	107CAB18B	109500000032
5	4/7/2014	Flow Rate	Mykrolis	none	FC280SAV-4S	AW9510056
6	4/7/2014	Infrastructure	Infrastructure	none	none	none
7	4/7/2014	Met tower	Universal Tower	none	unknown	none
8	4/7/2014	MFC power supply	Mykrolis	none	RO-32	FP9510004
9	4/7/2014	Modem	US Robotics	none	56k	unknown
10	4/7/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460048
11	4/7/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1015543061
12	4/7/2014	Precipitation	Climatronics	none	100097-1-G0	646
13	4/7/2014	Relative Humidity	Rotronic	none	MP 601A	59217
14	4/7/2014	Sample Tower	Aluma Tower	none	B	none
15	4/7/2014	Shelter Temperature	ARS	none	none	none
16	4/7/2014	Siting Criteria	Siting Criteria	None	1	None
17	4/7/2014	Solar Radiation	Licor	none	LI-200	PY46776
18	4/7/2014	Temperature	RM Young	none	41342	7036
19	4/7/2014	Temperature Translator	RM Young	none	PT05592	PT05572
20	4/7/2014	Wind Direction	RM Young	90879	AQ05103-5	55389wdr
21	4/7/2014	Wind Speed	RM Young	90879	AQ05103-5	55389wsp
22	4/7/2014	Zero air pump	Werther International	none	PC 70/4	531382

DAS Data Form

DAS Time Max Error: 1.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2526	PET427	Eric Hebert	04/07/2014	DAS	Primary

Das Date: 4 /7 /2014
Das Time: 9:28:40
Das Day: 97

Audit Date 4 /7 /2014
Audit Time 9:30:00
Audit Day 97

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0004	0.0006

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	0.0000	-0.0002	0.0000	V	V	0.0002
3	0.1000	0.0998	0.0999	V	V	0.0001
3	0.3000	0.2998	0.2999	V	V	0.0001
3	0.5000	0.4999	0.5000	V	V	0.0001
3	0.7000	0.6999	0.7001	V	V	0.0002
3	0.9000	0.8999	0.9001	V	V	0.0002
3	1.0000	0.9999	1.0002	V	V	0.0003
9	0.0000	-0.0002	0.0000	V	V	0.0002
9	0.1000	0.0998	0.1000	V	V	0.0002
9	0.3000	0.2998	0.3001	V	V	0.0003
9	0.5000	0.4999	0.5002	V	V	0.0003
9	0.7000	0.6998	0.7003	V	V	0.0005
9	0.9000	0.8998	0.9004	V	V	0.0006
9	1.0000	0.9999	1.0005	V	V	0.0006

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9510056	PET427	Eric Hebert	04/07/2014	Flow Rate	none

Mfg	Mykrolis	
SN/Owner ID	FP9510004	none
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
0.67%	1.35%			

Cal Factor Zero	-0.11
Cal Factor Full Scale	5.08
Rotometer Reading:	3.3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.08	0.0830	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.09	0.0886	-0.02	l/m	l/m	
primary	test pt 1	2.974	2.970	3.02	3.0038	3.01	l/m	l/m	1.35%
primary	test pt 2	2.993	2.990	3.02	3.0038	3.01	l/m	l/m	0.67%
primary	test pt 3	3.012	3.010	3.02	3.0038	3.01	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.0 cm	**Status**	fail
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460048	PET427	Eric Hebert	04/07/2014	Ozone	none

Slope:	1.01633	**Slope:**	0.00000
Intercept	1.89013	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
5.0%	7.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.43	0.63	2.50	ppb	
primary	2	33.29	33.26	35.64	ppb	7.16%
primary	3	51.25	51.09	53.90	ppb	5.50%
primary	4	77.95	77.61	80.83	ppb	4.15%
primary	5	116.00	115.39	119.10	ppb	3.22%

Sensor Component	Condition	Status
Cell B Noise	1.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0021	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-1.0	pass
Span	1.004	pass
Cell B Freq.	81.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.66 lpm	pass
Cell A Tmp.	37.1 C	pass
Cell A Pressure	613 mmHg	pass
Cell A Noise	1.8 ppb	pass
Cell A Freq.	79.7 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0024	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	55389wsp	PET427	Eric Hebert	04/07/2014	Wind Speed	90879

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/16/2014	**CorrCoff**	1.00000

Prop or Cups SN 83718
Prop or Cups Torque 0.3 **to** 0.4
Prop Correction Fact 0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.00%		
Abs Max Er	0.20	0.00%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01253	200	1.02	0.0	1.0		0.00	
primary	01253	400	2.05	0.0	2.1		0.00	
primary	01253	800	4.10	0.0	4.1		0.00	
primary	01253	1200	6.14	0.0	6.1	0.00%		
primary	01253	2400	12.29	0.0	12.3	0.00%		
primary	01253	4000	20.48	0.0	20.5	0.00%		
primary	01253	9400	48.13	0.0	48.1	0.00%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	55389wdr	PET427	Eric Hebert	04/07/2014	Wind Direction	90879

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01264		

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

VaneTorque 18 **to** 18 180

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	192034	**Tfer Desc.**	transit
Tfer ID	01270		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/30/2014	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.8	2.3		
Abs Max Er	3	5		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	359	1	43	-2
primary	01264	45	☑	0.0000	43	2	44	-1
primary	01264	90	☑	0.0000	87	3	44	-1
primary	01264	135	☑	0.0000	134	1	47	2
primary	01264	180	☑	0.0000	180	0	46	1
primary	01264	225	☑	0.0000	227	2	47	2
primary	01264	270	☑	0.0000	267	3	40	-5
primary	01264	315	☑	0.0000	316	1	49	4
primary	01270	90	☐	0.0000	87	3		3
primary	01270	180	☐	0.0000	180	0		0
primary	01270	270	☐	0.0000	267	3		3
primary	01270	360	☐	0.0000	359	1		1

Sensor Component	Torque	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Mast	**Condition**	Poor	**Status**	Fail
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	7036	PET427	Eric Hebert	04/07/2014	Temperature	none

Mfg	RM Young	
SN/Owner ID	PT05572	none
Parameter	Temperature Translator	

Mfg	Eutechnics	**Parameter**	Temperature	
Serial Number	01D102193	**Tfer Desc.**	RTD translator	
Tfer ID	01231			
Slope	1.00133	**Intercept**	-0.05731	
Cert Date	12/27/2013	**CorrCoff**	1.00000	
Mfg	Eutechnics	**Parameter**	Temperature	
Serial Number	01H0060	**Tfer Desc.**	RTD probe	
Tfer ID	01230			
Slope	1.00133	**Intercept**	-0.05731	
Cert Date	12/27/2013	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.24	0.27		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.01	0.07	0.0000	-0.2	C	-0.27
primary	Temp Mid Range	25.44	25.46	0.0000	25.2	C	-0.24
primary	Temp High Range	45.40	45.40	0.0000	45.2	C	-0.21

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	59217	PET427	Eric Hebert	04/07/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	1.6	0.8		
Abs Max Er	1.8	0.8		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	34.2	1.4
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	54.7	1.8
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	92.8	-0.8

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY46776	PET427	Eric Hebert	04/07/2014	Solar Radiation	none

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
8.4%	8.9%	0.0%	0.0%

Mfg	RM Young	Parameter	solar radiation
Serial Number		Tfer Desc.	SR transfer translat
Tfer ID	01240		
Slope	1.02678	Intercept	-16.91000
Cert Date	6/14/2014	CorrCoff	0.99800

Mfg	Licor	Parameter	solar radiation
Serial Number		Tfer Desc.	SR transfer sensor
Tfer ID	01241		
Slope	1.02678	Intercept	-16.91000
Cert Date	6/14/2014	CorrCoff	0.99800

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	4/7/2014	9:00	704	702	754	7.4%
primary	4/7/2014	10:00	842	836	900	7.7%
primary	4/7/2014	11:00	923	915	983	7.4%
primary	4/7/2014	12:00	934	926	1008	8.9%
primary	4/7/2014	13:00	879	873	962	10.2%

Sensor Component	Sensor Clean	Condition	Clean	Status	pass
Sensor Component	Sensor Level	Condition	Level	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	646	PET427	Eric Hebert	04/07/2014	Precipitation	none

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.8%	3.2%		

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	12 sec	7.14	7.11	mm	mm	ml	-0.4%
primary	test 2	231.5	2	12 sec	7.14	7.37	mm	mm	ml	3.2%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Fair	Status	pass
Sensor Component	Gauge Screen	Condition	Not installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Not functioning	Status	Fail
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PET427	Eric Hebert	04/07/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.89	1.60		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.98	24.01	0.000	25.6	C	1.6
primary	Temp Mid Range	27.41	27.43	0.000	26.8	C	-0.63
primary	Temp Mid Range	26.81	26.83	0.000	26.4	C	-0.43

Infrastructure Data For

Site ID	Technician	Site Visit Date
PET427	Eric Hebert	04/07/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	PET427	Eric Hebert	04/07/2014	Filter Position	Mykrolis	3559	☐	☑
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.								
Wind Direction	PET427	Eric Hebert	04/07/2014	Mast	RM Young	3916	☐	☑
The wind direction sensor mast is loose on the tower causing inaccurate wind direction measurement.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available for the site audit. Reported information is from the previous site audit.

2 **Parameter:** DasComments

The heating and air conditioning systems run simultaneously.

3 **Parameter:** ShelterCleanNotes

The shelter is dusty, but in good condition, well organized and maintained.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PET427	**Technician**	Eric Hebert	**Site Visit Date**	04/07/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Padilla Tank
Operating Group	NPS	**Map Scale**	
AQS #	04-017-0119	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	desert	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(928) 524-6668	**Audit Latitude**	34.822508
Site Address 1		**Audit Longitude**	-109.892485
Site Address 2		**Audit Elevation**	1712
County	Navajo	**Audit Declination**	10.5
City, State	Petrified Forest, AZ		**Present**
Zip Code	85942	**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	**Model**	8814	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is dusty, but in good condition, well organized and maintained.				
Site OK	☑	**Notes**					

Driving Directions

From I-40 take exit 311 to the Petrified Forest . The site operator's office is located in the visitors center. The site is another 25 miles further south on the park road near the Rainbow Forest at the south end of the park, 1.5 miles west of the main road on a closed side road. The gate at the side road is usually open. The park ranger horse stable is located past the site on the side road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PET427 **Technician** Eric Hebert **Site Visit Date** 04/07/2014

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PET427	Technician	Eric Hebert	Site Visit Date	04/07/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	PET427	Technician	Eric Hebert	Site Visit Date	04/07/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PET427	Technician	Eric Hebert	Site Visit Date	04/07/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PET427 **Technician** Eric Hebert **Site Visit Date** 04/07/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The heating and air conditioning systems run simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID PET427 **Technician** Eric Hebert **Site Visit Date** 04/07/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID PET427 **Technician** Eric Hebert **Site Visit Date** 04/07/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID PET427 **Technician** Eric Hebert **Site Visit Date** 04/07/2014

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings.
2	Are the Site Status Report Forms being completed and filed correctly?	☑	No observations
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☐	
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?	☑	second day
8	Are filters protected from contamination during handling and shipping? How?	☑	Bag is used as glove
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

The site operator was not available for the site audit. Reported information is from the previous site audit.

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

Site ID PET427 **Technician** Eric Hebert **Site Visit Date** 04/07/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906TB	none
DAS	Environmental Sys Corp	8816	2526	90641
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	109500000032	none
Flow Rate	Mykrolis	FC280SAV-4S	AW9510056	none
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	none
MFC power supply	Mykrolis	RO-32	FP9510004	none
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460048	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1015543061	none
Precipitation	Climatronics	100097-1-G0	646	none
Relative Humidity	Rotronic	MP 601A	59217	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY46776	none
Temperature	RM Young	41342	7036	none
Temperature Translator	RM Young	PT05592	PT05572	none
Wind Direction	RM Young	AQ05103-5	55389wdr	90879
Wind Speed	RM Young	AQ05103-5	55389wsp	90879
Zero air pump	Werther International	PC 70/4	531382	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRC474-Eric Hebert-04/08/2014						
1	4/8/2014	Computer	Hewlett Packard	none	6560 b	5CB22906T9
2	4/8/2014	DAS	Environmental Sys Corp	90602	8816	2270
3	4/8/2014	Elevation	Elevation	None	1	None
4	4/8/2014	Filter pack flow pump	Thomas	none	107CAB18	120000014367
5	4/8/2014	flow rate	Tylan	none	FC280SAV	AW9805027
6	4/8/2014	Infrastructure	Infrastructure	none	none	none
7	4/8/2014	MFC power supply	Tylan	none	RO-32	illegible
8	4/8/2014	Modem	US Robotics	none	33.6 sportster	unknown
9	4/8/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
10	4/8/2014	Ozone Standard	ThermoElectron Inc	none	49C	49C-66830-354
11	4/8/2014	Precipitation	Climatronics	illegible	100508-2	illegible
12	4/8/2014	Printer	Hewlett Packard	none	842C	unknown
13	4/8/2014	Relative Humidity	Rotronic	none	MP 601A	52069
14	4/8/2014	Sample Tower	Aluma Tower	03570	B	none
15	4/8/2014	Shelter Temperature	ARS	none	none	none
16	4/8/2014	Siting Criteria	Siting Criteria	None	1	None
17	4/8/2014	Solar Radiation	Licor	none	LI-200	PY8975
18	4/8/2014	Solar Radiation Translator	RM Young	91044	70101-X	none
19	4/8/2014	Temperature	RM Young	none	41342VC	17626
20	4/8/2014	Wind Direction	RM Young	91054	AQ05103-5	24819wdr
21	4/8/2014	Wind Speed	RM Young	91054	AQ05103-5	24819wsp
22	4/8/2014	Wind Translator	RM Young	01175	05603BP	none
23	4/8/2014	Zero air pump	Werther International	none	PC70/4	531380

DAS Data Form

DAS Time Max Error: 1.83

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2270	GRC474	Eric Hebert	04/08/2014	DAS	Primary

Das Date: 4 /8 /2014
Das Time: 12:31:00
Das Day: 98

Audit Date 4 /8 /2014
Audit Time 12:32:50
Audit Day 98

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0005	0.0001	0.0002

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
6	0.0000	-0.0001	0.0000	V	V	0.0001
6	0.1000	0.0999	0.1000	V	V	0.0001
6	0.3000	0.3000	0.3002	V	V	0.0002
6	0.5000	0.4999	0.5002	V	V	0.0003
6	0.7000	0.7000	0.7003	V	V	0.0003
6	0.9000	0.9000	0.9004	V	V	0.0004
6	1.0000	1.0000	1.0005	V	V	0.0005
9	0.0000	-0.0001	-0.0002	V	V	-0.0001
9	0.1000	0.0999	0.1000	V	V	0.0001
9	0.3000	0.2999	0.3000	V	V	0.0001
9	0.5000	0.4999	0.5001	V	V	0.0002
9	0.7000	0.6999	0.7000	V	V	0.0001
9	0.9000	0.8999	0.9001	V	V	0.0002
9	1.0000	1.0000	1.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9805027	GRC474	Eric Hebert	04/08/2014	flow rate	none

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

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.95
1.21%	1.32%			**Cal Factor Full Scale**	5.426
				Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.15	-0.1040	-0.16	l/m	l/m	
primary	leak check	0.000	0.000	-0.15	-0.1028	-0.16	l/m	l/m	
primary	test pt 1	3.040	3.040	2.71	2.7232	3.00	l/m	l/m	-1.32%
primary	test pt 2	3.043	3.040	2.71	2.7235	3.00	l/m	l/m	-1.32%
primary	test pt 3	3.031	3.030	2.71	2.7236	3.00	l/m	l/m	-0.99%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Eric Hebert	04/08/2014	Ozone	none

Slope:	1.02910	**Slope:**	0.00000
Intercept	-1.89689	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	3.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.42	0.62	-1.27	ppb	
primary	2	33.07	33.04	31.98	ppb	-3.21%
primary	3	51.08	50.93	50.54	ppb	-0.77%
primary	4	76.90	76.56	77.15	ppb	0.77%
primary	5	115.51	114.90	116.20	ppb	1.13%

Sensor Component	Condition	Status
Cell B Noise	0.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	0.9997	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	1.6	pass
Span	1.040	pass
Cell B Freq.	87.6 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.63 lpm	pass
Cell A Tmp.	37.5 C	pass
Cell A Pressure	598 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	96.2 kHz	pass
Cell A Flow	0.63 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0001	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	24819wsp	GRC474	Eric Hebert	04/08/2014	Wind Speed	91054

Mfg	RM Young		
SN/Owner ID	none	01175	
Parameter	Wind Translator		

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/16/2014	**CorrCoff**	1.00000

Prop or Cups SN	68490		
Prop or Cups Torque	0.4	**to**	0.4
Prop Correction Fact	0.0512		

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.13	1.44%		
Abs Max Er	0.30	1.95%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	-0.1		-0.30	
primary	01253	200	1.02	0.0	1.0		-0.01	
primary	01253	400	2.05	0.0	1.9		-0.12	
primary	01253	800	4.10	0.0	4.0		-0.10	
primary	01253	1200	6.14	0.0	6.0	-1.95%		
primary	01253	2400	12.29	0.0	12.1	-1.46%		
primary	01253	4000	20.48	0.0	20.2	-1.27%		
primary	01253	9400	48.13	0.0	47.6	-1.08%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	24819wdr	GRC474	Eric Hebert	04/08/2014	Wind Direction	91054

Mfg	RM Young	
SN/Owner ID	none	01175
Parameter	Wind Translator	

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

VaneTorque 12 **to** 12 180

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01264		

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	192034	**Tfer Desc.**	transit
Tfer ID	01270		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/30/2014	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	2.8	2.0		
Abs Max Er	4	4		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	2	2	46	1
primary	01264	45	☑	0.0000	45	0	43	-2
primary	01264	90	☑	0.0000	92	2	47	2
primary	01264	135	☑	0.0000	141	6	49	4
primary	01264	180	☑	0.0000	187	7	46	1
primary	01264	225	☑	0.0000	231	6	44	-1
primary	01264	270	☑	0.0000	274	4	43	-2
primary	01264	315	☑	0.0000	316	1	42	-3
primary	01270	90	☐	0.0000	87	3		3
primary	01270	180	☐	0.0000	182	2		2
primary	01270	270	☐	0.0000	268	2		2
primary	01270	360	☐	0.0000	356	4		4

Sensor Component	Torque	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17626	GRC474	Eric Hebert	04/08/2014	Temperature	none

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.24	0.58		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.08	0.14	0.0000	0.7	C	0.58
primary	Temp Mid Range	24.35	24.37	0.0000	24.4	C	0.07
primary	Temp High Range	45.95	45.95	0.0000	46.0	C	0.07

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	52069	GRC474	Eric Hebert	04/08/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.5	2.6		
Abs Max Er	0.6	2.6		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	32.4	-0.4
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	53.5	0.6
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	91.0	-2.6

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY8975	GRC474	Eric Hebert	04/08/2014	Solar Radiation	none

Mfg	RM Young	
SN/Owner ID	none	91044
Parameter	Solar Radiation Translator	

Mfg	RM Young	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer translat	
Tfer ID	01240			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	
Mfg	Licor	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer sensor	
Tfer ID	01241			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
0.3%	3.6%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	4/8/2014	12:00	949	941	907	-3.6%
primary	4/8/2014	13:00	908	901	936	3.9%
primary	4/8/2014	14:00	802	798	801	0.4%
primary	4/8/2014	15:00	638	638	641	0.5%
primary	4/8/2014	16:00	449	454	458	0.9%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	GRC474	Eric Hebert	04/08/2014	Precipitation	illegible

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
4.0%	4.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	5.00	4.80	mm	mm	ml	-4.0%
primary	test 2	231.5	2	10 sec	5.00	4.80	mm	mm	ml	-4.0%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Not installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Not installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRC474	Eric Hebert	04/08/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.35	0.51		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.10	27.12	0.000	27.3	C	0.16
primary	Temp Mid Range	26.55	26.57	0.000	26.9	C	0.37
primary	Temp Mid Range	26.59	26.61	0.000	27.1	C	0.51

Infrastructure Data For

Site ID	GRC474	Technician	Eric Hebert	Site Visit Date	04/08/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRC474	**Technician**	Eric Hebert	**Site Visit Date**	04/08/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Grand Canyon
Operating Group	NPS	**Map Scale**	
AQS #	04-005-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, UV-B	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(928) 638-2031	**Audit Latitude**	36.058642
Site Address 1	2D Albright Ave	**Audit Longitude**	-112.183575
Site Address 2	PO Box 129	**Audit Elevation**	2070
County	Coconino	**Audit Declination**	11.5
City, State	Grand Canyon, AZ		
Zip Code	86023	**Fire Extinguisher** ☑	No inspection date
Time Zone	Arizona	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

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

Driving Directions From Flagstaff, AZ take route 180 north to the Grand Canyon National Park. The site operator's office is in the Mckee building on Albright Ave. Obtain a pass to travel the West Rim Road. The gate code is #1965. The site is a few miles along the rim road on the left just past the Abyss.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GRC474 **Technician** Eric Hebert **Site Visit Date** 04/08/2014

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GRC474	Technician	Eric Hebert	Site Visit Date	04/08/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GRC474	Technician	Eric Hebert	Site Visit Date	04/08/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	GRC474	Technician	Eric Hebert	Site Visit Date	04/08/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GRC474 **Technician** Eric Hebert **Site Visit Date** 04/08/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID GRC474 **Technician** Eric Hebert **Site Visit Date** 04/08/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	GRC474	Technician	Eric Hebert	Site Visit Date	04/08/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID GRC474 **Technician** Eric Hebert **Site Visit Date** 04/08/2014

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 95% of the time
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

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

Site ID GRC474 **Technician** Eric Hebert **Site Visit Date** 04/08/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906T9	none
DAS	Environmental Sys Corp	8816	2270	90602
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	120000014367	none
flow rate	Tylan	FC280SAV	AW9805027	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	illegible	none
Modem	US Robotics	33.6 sportster	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943902	none
Ozone Standard	ThermoElectron Inc	49C	49C-66830-354	none
Precipitation	Climatronics	100508-2	illegible	illegible
Printer	Hewlett Packard	842C	unknown	none
Relative Humidity	Rotronic	MP 601A	52069	none
Sample Tower	Aluma Tower	B	none	03570
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY8975	none
Solar Radiation Translator	RM Young	70101-X	none	91044
Temperature	RM Young	41342VC	17626	none
Wind Direction	RM Young	AQ05103-5	24819wdr	91054
Wind Speed	RM Young	AQ05103-5	24819wsp	91054
Wind Translator	RM Young	05603BP	none	01175
Zero air pump	Werther International	PC70/4	531380	none

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHA467-Eric Hebert-04/23/2014					
4/23/2014	Computer	Gateway	none	Solo	B2509462726
4/23/2014	DAS	Environmental Sys Corp	90611	8816	2613
4/23/2014	Elevation	Elevation	None	1	None
4/23/2014	Filter pack flow pump	Thomas	none	107CAB11A	109500000036
4/23/2014	flow rate	Tylan	none	FC280SAV	AW9706014
4/23/2014	Infrastructure	Infrastructure	none	none	none
4/23/2014	MFC power supply	Tylan	none	RO-32	FP99706005
4/23/2014	Modem	US Robotics	09615	56k	unknown
4/23/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
4/23/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
4/23/2014	Precipitation	Climatronics	none	100508-2	21258-598
4/23/2014	Printer	Hewlett Packard	none	5610	Unknown
4/23/2014	Relative Humidity	Rotronic	none	MP 601A	56083
4/23/2014	Sample Tower	Aluma Tower	03566	A	none
4/23/2014	Shelter Temperature	ARS	none	none	none
4/23/2014	Siting Criteria	Siting Criteria	None	1	None
4/23/2014	Solar Radiation	Licor	none	LI-200	PY6249
4/23/2014	Solar Radiation Translator	RM Young	01913	70101-X	none
4/23/2014	Temperature	RM Young	none	41342	018535
4/23/2014	Wind Direction	RM Young	none	AQ05103-5	110900wdr
4/23/2014	Wind Speed	RM Young	none	AQ05103-5	110900wsp
4/23/2014	Zero air pump	Werther International	none	PC70/4	000665785

DAS Data Form

DAS Time Max Error: 1.23

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2613	CHA467	Eric Hebert	04/23/2014	DAS	Primary

Das Date: 4 /23/2014
Das Time: 15:58:00
Das Day: 113

Audit Date 4 /23/2014
Audit Time 15:56:46
Audit Day 113

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0020	0.0021	0.0001	0.0002

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0019	V	V	0.0019
2	0.1000	0.1000	0.1019	V	V	0.0019
2	0.3000	0.3000	0.3020	V	V	0.0020
2	0.5000	0.5000	0.5020	V	V	0.0020
2	0.7000	0.7001	0.7021	V	V	0.0020
2	0.9000	0.9001	0.9021	V	V	0.0020
2	1.0000	1.0001	1.0022	V	V	0.0021
14	0.0000	0.0000	0.0000	V	V	0.0000
14	0.1000	0.1000	0.1000	V	V	0.0000
14	0.3000	0.3000	0.3001	V	V	0.0001
14	0.5000	0.5001	0.5002	V	V	0.0001
14	0.7000	0.7001	0.7003	V	V	0.0002
14	0.9000	0.9001	0.9003	V	V	0.0002
14	1.0000	1.0001	1.0003	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706014	CHA467	Eric Hebert	04/23/2014	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP99706005	none
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.42
0.15%	0.20%			**Cal Factor Full Scale**	5.86
				Rotometer Reading:	3.35

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.39	-0.3816	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.39	-0.3560	0.03	l/m	l/m	
primary	test pt 1	2.993	2.990	2.36	2.3654	3.00	l/m	l/m	0.20%
primary	test pt 2	3.004	3.000	2.36	2.3654	3.00	l/m	l/m	-0.13%
primary	test pt 3	3.002	3.000	2.36	2.3654	3.00	l/m	l/m	-0.13%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Eric Hebert	04/23/2014	Ozone	none

Slope:	1.02891	**Slope:**	0.00000
Intercept	2.25151	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
6.9%	10.0%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	0.25	2.49	ppb	
primary	2	33.88	33.85	37.25	ppb	10.04%
primary	3	52.43	52.27	55.98	ppb	7.10%
primary	4	78.27	77.92	82.20	ppb	5.49%
primary	5	115.51	114.90	120.60	ppb	4.96%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0035	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.1	pass
Span	1.046	pass
Cell B Freq.	75.2 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.66 lpm	pass
Cell A Tmp.	36.1 C	pass
Cell A Pressure	623 mmHg	pass
Cell A Noise	0.4 ppb	pass
Cell A Freq.	82.6 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0036	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	110900wsp	CHA467	Eric Hebert	04/23/2014	Wind Speed	none

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/16/2014	**CorrCoff**	1.00000

Prop or Cups SN 64415
Prop or Cups Torque 0.3 **to** 0.4
Prop Correction Fact 0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.11	1.09%		
Abs Max Er	0.15	2.12%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.2		-0.05	
primary	01253	200	1.02	0.0	1.1		0.08	
primary	01253	400	2.05	0.0	2.2		0.15	
primary	01253	800	4.10	0.0	4.3		0.15	
primary	01253	1200	6.14	0.0	6.3	2.12%		
primary	01253	2400	12.29	0.0	12.4	0.90%		
primary	01253	4000	20.48	0.0	20.7	0.93%		
primary	01253	9400	48.13	0.0	48.3	0.42%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	110900wdr	CHA467	Eric Hebert	04/23/2014	Wind Direction	none

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01264		

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

VaneTorque 10 **to** 12 178

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	192034	**Tfer Desc.**	transit
Tfer ID	01270		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/30/2014	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	4.8	2.5		
Abs Max Er	6	7		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	0	0	43	-2
primary	01264	45	☑	0.0000	48	3	48	3
primary	01264	90	☑	0.0000	94	4	46	1
primary	01264	135	☑	0.0000	140	5	46	1
primary	01264	180	☑	0.0000	190	10	50	5
primary	01264	225	☑	0.0000	228	3	38	-7
primary	01264	270	☑	0.0000	273	3	45	0
primary	01264	315	☑	0.0000	317	2	44	-1
primary	01270	88	☐	0.0000	94	6		6
primary	01270	178	☐	0.0000	180	2		2
primary	01270	268	☐	0.0000	273	5		5
primary	01270	358	☐	0.0000	4	6		6

Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018535	CHA467	Eric Hebert	04/23/2014	Temperature	none

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.51	0.61		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.23	0.0000	0.8	C	0.61
primary	Temp Mid Range	25.95	25.97	0.0000	26.5	C	0.56
primary	Temp High Range	48.21	48.20	0.0000	48.6	C	0.37

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	56083	CHA467	Eric Hebert	04/23/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	3.3	0.1		
Abs Max Er	3.5	0.1		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	35.9	3.1
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	56.4	3.5
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	93.5	-0.1

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY6249	CHA467	Eric Hebert	04/23/2014	Solar Radiation	none

Mfg	RM Young	
SN/Owner ID	none	01913
Parameter	Solar Radiation Translator	

Mfg	RM Young	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer translat	
Tfer ID	01240			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	
Mfg	Licor	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer sensor	
Tfer ID	01241			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
11.4%	9.5%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	4/23/2014	10:00	892	885	967	9.2%
primary	4/23/2014	11:00	975	966	1058	9.5%
primary	4/23/2014	12:00	973	964	1079	11.9%
primary	4/23/2014	13:00	947	938	1032	10.0%
primary	4/23/2014	14:00	786	782	917	17.3%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	21258-598	CHA467	Eric Hebert	04/23/2014	Precipitation	none

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

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	8 sec	5.00	4.90	mm	mm	ml	-2.0%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Not installed	Status	Fail
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Fair	Status	pass
Sensor Component	Gauge Screen	Condition	Not installed	Status	Fail
Sensor Component	Gauge Clean	Condition	Moderately clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHA467	Eric Hebert	04/23/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.30	0.53		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.39	25.41	0.000	25.2	C	-0.2
primary	Temp Mid Range	25.15	25.17	0.000	25.0	C	-0.17
primary	Temp Mid Range	25.18	25.20	0.000	24.7	C	-0.53

Infrastructure Data For

Site ID	CHA467	Technician	Eric Hebert	Site Visit Date	04/23/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator routinely reviews the previous week's data.

2 **Parameter:** SitingCriteriaCom

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

3 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHA467	**Technician**	Eric Hebert	**Site Visit Date**	04/23/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Bowie Mountain South
Operating Group	NPS	**Map Scale**	
AQS #	04-003-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	desert range, woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(520) 824-4182	**Audit Latitude**	32.009405
Site Address 1	13063 East Bontia Canyon Road	**Audit Longitude**	-109.389058
Site Address 2		**Audit Elevation**	1569
County	Cochise	**Audit Declination**	9.6
City, State	Wilcox, AZ		**Present**
Zip Code	85632	**Fire Extinguisher**	☑ March 2014
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 **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in good condition, clean, well organized, and well maintained.

Site OK ☑ **Notes**

Driving Directions From I-10 take exit 344 (Wilcox AZ). Continue south on route 186 from Wilcox to Chiricahua National Monument, approximately 30 miles and turn left at route 181 (follow sign for Chiricahua National Monument). Continue another few miles to park entrance. The site is just before the fee both on the north side of the road about 150 meters.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

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

Siting Distances OK ☑

Siting Criteria Comment

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHA467	Technician	Eric Hebert	Site Visit Date	04/23/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CHA467	Technician	Eric Hebert	Site Visit Date	04/23/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☐
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	towers bolted to shelter	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

Site operation procedures

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

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

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

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

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

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

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

The site operator routinely reviews the previous week's data.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

Site operation procedures

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

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

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

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

Site ID CHA467 **Technician** Eric Hebert **Site Visit Date** 04/23/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	B2509462726	none
DAS	Environmental Sys Corp	8816	2613	90611
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11A	109500000036	none
flow rate	Tylan	FC280SAV	AW9706014	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP99706005	none
Modem	US Robotics	56k	unknown	09615
Ozone	ThermoElectron Inc	49i A3NAA	CM08460007	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450193	none
Precipitation	Climatronics	100508-2	21258-598	none
Printer	Hewlett Packard	5610	Unknown	none
Relative Humidity	Rotronic	MP 601A	56083	none
Sample Tower	Aluma Tower	A	none	03566
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY6249	none
Solar Radiation Translator	RM Young	70101-X	none	01913
Temperature	RM Young	41342	018535	none
Wind Direction	RM Young	AQ05103-5	110900wdr	none
Wind Speed	RM Young	AQ05103-5	110900wsp	none
Zero air pump	Werther International	PC70/4	000665785	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
JOT403-Eric Hebert-04/28/2014						
1	4/28/2014	Computer	Hewlett Packard	none	8460p	CNU1360668
2	4/28/2014	DAS	Environmental Sys Corp	90599	8816	2271
3	4/28/2014	Elevation	Elevation	None	1	None
4	4/28/2014	Filter pack flow pump	Thomas	none	107CAB11A	109500000033
5	4/28/2014	flow rate	Tylan	03378	FC280AV	AW9403016
6	4/28/2014	Infrastructure	Infrastructure	none	none	none
7	4/28/2014	MFC power supply	Tylan	03683	RO-32	FP9403017
8	4/28/2014	Modem	US Robotics	none	56k	unknown
9	4/28/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460006
10	4/28/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
11	4/28/2014	Precipitation	Climatronics	01498	100508-2	illegible
12	4/28/2014	Relative Humidity	Rotronic	none	MP601	52061
13	4/28/2014	Sample Tower	Aluma Tower	923310	B	none
14	4/28/2014	Shelter Temperature	ARS	none	none	none
15	4/28/2014	Siting Criteria	Siting Criteria	None	1	None
16	4/28/2014	Solar Radiation	Licor	02221	LI-200	PY59533
17	4/28/2014	Solar Radiation Translator	RM Young	none	70101-X	none
18	4/28/2014	Temperature	RM Young	none	41342	14960
19	4/28/2014	Wind Direction	RM Young	90893	AQ05103-5	47104wdr
20	4/28/2014	Wind Speed	RM Young	90893	AQ05103-5	47104wsp
21	4/28/2014	Zero air pump	Werther International	none	PC70/4	606491

DAS Data Form

DAS Time Max Error: 1.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2271	JOT403	Eric Hebert	04/28/2014	DAS	Primary

Das Date: 4 /28/2014
Das Time: 8:58:00
Das Day: 118

Audit Date 4 /28/2014
Audit Time 8:56:20
Audit Day 118

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0004	0.0002	0.0004

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.1000	0.1000	V	V	0.0000
2	0.3000	0.3000	0.3001	V	V	0.0001
2	0.5000	0.5000	0.5002	V	V	0.0002
2	0.7000	0.7001	0.7003	V	V	0.0002
2	0.9000	0.9001	0.9004	V	V	0.0003
2	1.0000	1.0001	1.0005	V	V	0.0004
9	0.0000	0.0000	0.0000	V	V	0.0000
9	0.1000	0.1000	0.1000	V	V	0.0000
9	0.3000	0.3000	0.3001	V	V	0.0001
9	0.5000	0.5000	0.5002	V	V	0.0002
9	0.7000	0.7001	0.7004	V	V	0.0003
9	0.9000	0.9001	0.9004	V	V	0.0003
9	1.0000	1.0001	1.0005	V	V	0.0004

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403016	JOT403	Eric Hebert	04/28/2014	flow rate	03378

Mfg	Tylan	
SN/Owner ID	FP9403017	03683
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.05
1.96%	1.96%			**Cal Factor Full Scale**	5.38
				Rotometer Reading:	3.1

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.06	-0.0245	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.06	-0.0251	0.02	l/m	l/m	
primary	test pt 1	3.060	3.060	3.03	2.7681	3.00	l/m	l/m	-1.96%
primary	test pt 2	3.063	3.060	3.03	2.7681	3.00	l/m	l/m	-1.96%
primary	test pt 3	3.059	3.060	3.03	2.7681	3.00	l/m	l/m	-1.96%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460006	JOT403	Eric Hebert	04/28/2014	Ozone	none

Slope:	0.98081	**Slope:**	0.00000
Intercept	1.06586	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.08	0.28	1.26	ppb	
primary	2	35.38	35.34	35.79	ppb	1.27%
primary	3	54.57	54.39	54.43	ppb	0.07%
primary	4	82.45	82.08	81.66	ppb	-0.51%
primary	5	118.21	117.58	116.30	ppb	-1.09%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	10.0014	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.8	pass
Span	1.001	pass
Cell B Freq.	86.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	32.1 C	pass
Cell A Pressure	654 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	90.1 kHz	pass
Cell A Flow	0.72 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	-0.0003	pass

Wind Speed Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	47104wsp	JOT403	Eric Hebert	04/28/2014	Wind Speed	90893

Mfg	RM Young	Parameter	wind speed
Serial Number	CA04013	Tfer Desc.	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	Intercept	0.00000
Cert Date	1/16/2014	CorrCoff	1.00000

Prop or Cups SN	63812
Prop or Cups Torque	0.5 to 0.5
Prop Correction Facto	0.512

	DAS 1: Low Range	DAS 1: High Range	DAS 2: Low Range	DAS 2: High Range
Abs Avg Err	0.05	0.00%		
Abs Max Er	0.20	0.00%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.20	
primary	01253	200	1.02	0.0	1.0		0.00	
primary	01253	400	2.05	0.0	2.1		0.00	
primary	01253	800	4.10	0.0	4.1		0.00	
primary	01253	1200	6.14	0.0	6.1	0.00%		
primary	01253	2400	12.29	0.0	12.3	0.00%		
primary	01253	4000	20.48	0.0	20.5	0.00%		
primary	01253	9400	48.13	0.0	48.1	0.00%		

Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Prop or Cups Condition	Condition	Good	Status	pass
Sensor Component	Sensor Heater	Condition	N/A	Status	pass
Sensor Component	Torque	Condition	Fair	Status	pass
Sensor Component	Sensor Plumb	Condition	Plumb	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Wind Direction Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	47104wdr	JOT403	Eric Hebert	04/28/2014	Wind Direction	90893

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01264		

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

VaneTorque 15 **to** 18 360

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	192034	**Tfer Desc.**	transit
Tfer ID	01270		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/30/2014	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.0	1.5		
Abs Max Er	2	5		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	0	0	41	-4
primary	01264	45	☑	0.0000	44	1	44	-1
primary	01264	90	☑	0.0000	88	2	44	-1
primary	01264	135	☑	0.0000	134	1	46	1
primary	01264	180	☑	0.0000	179	1	45	0
primary	01264	225	☑	0.0000	229	4	50	5
primary	01264	270	☑	0.0000	274	4	45	0
primary	01264	315	☑	0.0000	319	4	45	0
primary	01270	71	☐	0.0000	73	2		2
primary	01270	169	☐	0.0000	170	1		1
primary	01270	180	☐	0.0000	179	1		1
primary	01270	360	☐	0.0000	0	0		0

Sensor Component	Torque	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14960	JOT403	Eric Hebert	04/28/2014	Temperature	none

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.12	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.03	0.09	0.0000	0.2	C	0.13
primary	Temp Mid Range	26.20	26.22	0.0000	26.1	C	-0.1
primary	Temp High Range	47.17	47.16	0.0000	47.0	C	-0.14

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

Humidity Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	52061	JOT403	Eric Hebert	04/28/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1: Low Range:	DAS 1: High Range	DAS 2: Low Range:	DAS 2: High Range
Abs Avg Err	1.8	5.0		
Abs Max Er	2.5	5.0		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	35.3	2.5
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	53.9	1.0
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	88.6	-5.0

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

Solar Radiation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY59533	JOT403	Eric Hebert	04/28/2014	Solar Radiation	02221

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

Mfg	RM Young	Parameter	solar radiation	
Serial Number		Tfer Desc.	SR transfer translat	
Tfer ID	01240			
Slope	1.02678	Intercept	-16.91000	
Cert Date	6/14/2014	CorrCoff	0.99800	
Mfg	Licor	Parameter	solar radiation	
Serial Number		Tfer Desc.	SR transfer sensor	
Tfer ID	01241			
Slope	1.02678	Intercept	-16.91000	
Cert Date	6/14/2014	CorrCoff	0.99800	

DAS 1:		DAS 2:	
% Diff of Avg	%Diff of Max	%Diff of Avg	%Diff of Max
6.7%	7.1%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	4/28/2014	10:00	911	904	968	7.0%
primary	4/28/2014	11:00	959	950	1017	7.1%
primary	4/28/2014	12:00	942	934	1000	7.1%
primary	4/28/2014	13:00	861	855	904	5.7%

Sensor Component	Sensor Clean	Condition	Clean	Status	pass
Sensor Component	Sensor Level	Condition	1/2 bubble off level	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Precipitation Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	JOT403	Eric Hebert	04/28/2014	Precipitation	01498

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
8.0%	8.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	8 -10 sec	5.00	4.60	mm	mm	ml	-8.0%
primary	test 2	231.5	2	8 - 10 sec	5.00	4.60	mm	mm	ml	-8.0%

Sensor Component	Properly Sited	Condition	45 degree rule	Status	Fail
Sensor Component	Gauge Drain Screen	Condition	Not installed	Status	Fail
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	JOT403	Eric Hebert	04/28/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.35	0.49		

Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000
Mfg	Eutechnics	**Parameter**	Shelter Temperatur
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.77	22.80	0.000	23.0	C	0.19
primary	Temp Mid Range	22.54	22.57	0.000	23.1	C	0.49
primary	Temp Mid Range	23.19	23.22	0.000	23.6	C	0.37

Infrastructure Data For

Site ID	JOT403	Technicia	Eric Hebert	Site Visit Date	04/28/2014

Shelter Make	Shelter Model	Shelter Size
ShelterOne	E8129-28036	768 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is only a few years old and is in good condition, clean and well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	JOT403	**Technician**	Eric Hebert	**Site Visit Date**	04/28/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Yucca Valley South
Operating Group	NPS	**Map Scale**	
AQS #	06-071-9002	**Map Date**	
Meteorological Type	RM Young		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	34.0714
Deposition Measurement	dry, wet	**QAPP Longitude**	-116.3906
Land Use	desert	**QAPP Elevation Meters**	1244
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(760) 228-1927	**Audit Latitude**	34.069569
Site Address 1		**Audit Longitude**	-116.388933
Site Address 2		**Audit Elevation**	1243
County	San Bernardino	**Audit Declination**	12
City, State	Yacca Valley, CA		
Zip Code	92284	**Fire Extinguisher** ☑	Inspected March 2014
Time Zone	Pacific	**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**	ShelterOne	**Model**	E8129-28036	**Shelter Size**	768 cuft
Shelter Clean	☑	**Notes**	The shelter is only a few years old and is in good condition, clean and well organized.				
Site OK	☑	**Notes**					

Driving Directions At the intersection of route 62 and route 247 in Yucca Valley, take Joshua Lane south (route 247). Follow the signs for Joshua Tree National Monument. The site is up the dirt road through the locked gate (cable) toward the water tower. (gate lock = 1123 shelter lock = 5570)

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID JOT403 **Technician** Eric Hebert **Site Visit Date** 04/28/2014

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	JOT403	Technician	Eric Hebert	Site Visit Date	04/28/2014

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	1/2 bubble off level
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	45 degree rule violation
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	JOT403	Technician	Eric Hebert	Site Visit Date	04/28/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	JOT403	Technician	Eric Hebert	Site Visit Date	04/28/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	JOT403	Technician	Eric Hebert	Site Visit Date	04/28/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	The sample tower is bolted to the shelter	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID JOT403 **Technician** Eric Hebert **Site Visit Date** 04/28/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	June 2000	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	JOT403	Technician	Eric Hebert	Site Visit Date	04/28/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	JOT403	Technician	Eric Hebert	Site Visit Date	04/28/2014

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings (50%)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

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

Site ID JOT403 **Technician** Eric Hebert **Site Visit Date** 04/28/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU1360668	none
DAS	Environmental Sys Cor	8816	2271	90599
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB11A	109500000033	none
flow rate	Tylan	FC280AV	AW9403016	03378
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9403017	03683
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460006	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450191	none
Precipitation	Climatronics	100508-2	illegible	01498
Relative Humidity	Rotronic	MP601	52061	none
Sample Tower	Aluma Tower	B	none	923310
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY59533	02221
Solar Radiation Translator	RM Young	70101-X	none	none
Temperature	RM Young	41342	14960	none
Wind Direction	RM Young	AQ05103-5	47104wdr	90893
Wind Speed	RM Young	AQ05103-5	47104wsp	90893
Zero air pump	Werther International	PC70/4	606491	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MEV405-Eric Hebert-05/05/2014						
1	5/5/2014	Computer	Gateway	none	450SX4	unknown
2	5/5/2014	DAS	Environmental Sys Corp	90613	8816	2616
3	5/5/2014	Elevation	Elevation	None	1	None
4	5/5/2014	Filter pack flow pump	Thomas	01564	107CA18	0688001769
5	5/5/2014	flow rate	Tylan	none	FC280AV-4S	AW9403013
6	5/5/2014	Infrastructure	Infrastructure	none	none	none
7	5/5/2014	Met tower	Universal Tower	none	unknown	none
8	5/5/2014	MFC power supply	Tylan	none	RO-32	FP9710002
9	5/5/2014	Modem	US Robotics	none	56k fax modem	unknown
10	5/5/2014	Ozone	ThermoElectron Inc	none	49C	0425208058
11	5/5/2014	Ozone Standard	ThermoElectron Inc	none	49C	0425208055
12	5/5/2014	Precipitation	Climatronics	none	100508-2	illegible
13	5/5/2014	Printer	Hewlett Packard	none	842C	unknown
14	5/5/2014	Relative Humidity	Rotronic	none	MP 601A	59017
15	5/5/2014	Sample Tower	Aluma Tower	illegible	B	none
16	5/5/2014	Shelter Temperature	ARS	none	none	none
17	5/5/2014	Shield (10 meter)	RM Young	none	43532	none
18	5/5/2014	Siting Criteria	Siting Criteria	None	1	None
19	5/5/2014	Solar Radiation	Licor	none	LI-200	PY8978
20	5/5/2014	Solar Radiation Translator	Climatronics	none	100144	392
21	5/5/2014	Temperature	RM Young	none	41432VC	15106
22	5/5/2014	Wind Direction	Climatronics	91024	100076	2228
23	5/5/2014	Wind Speed	Climatronics	90924	100075	1515
24	5/5/2014	Zero air pump	Werther International	none	PC40/4	526289

DAS Data Form

DAS Time Max Error: 1.1

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2616	MEV405	Eric Hebert	05/05/2014	DAS	Primary

Das Date: 5 /5 /2014
Das Time: 10:30:46
Das Day: 125

Audit Date 5 /5 /2014
Audit Time 10:29:40
Audit Day 125

Low Channel:

Avg Diff:	Max Diff:
0.0002	0.0003

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
5	0.0000	0.0002	0.0002	V	V	0.0000
5	0.1000	0.1000	0.1002	V	V	0.0002
5	0.3000	0.3000	0.3002	V	V	0.0002
5	0.5000	0.5001	0.5003	V	V	0.0002
5	0.7000	0.7001	0.7003	V	V	0.0002
5	0.9000	0.9001	0.9003	V	V	0.0002
5	1.0000	1.0001	1.0004	V	V	0.0003
10	0.0000	0.0000	0.0000	V	V	0.0000
10	0.1000	0.1000	0.1000	V	V	0.0000
10	0.3000	0.3000	0.3001	V	V	0.0001
10	0.5000	0.5001	0.5001	V	V	0.0000
10	0.7000	0.7001	0.7002	V	V	0.0001
10	0.9000	0.9001	0.9003	V	V	0.0002
10	1.0000	1.0002	1.0003	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403013	MEV405	Eric Hebert	05/05/2014	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP9710002	none
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.047
0.33%	0.66%			**Cal Factor Full Scale**	5.574
				Rotometer Reading:	3.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.09	-0.0435	-0.10	l/m	l/m	
primary	leak check	0.000	0.000	-0.06	-0.0140	-0.05	l/m	l/m	
primary	test pt 1	3.004	3.000	2.71	2.7178	3.00	l/m	l/m	0.00%
primary	test pt 2	3.024	3.020	2.71	2.7178	3.00	l/m	l/m	-0.66%
primary	test pt 3	3.011	3.010	2.71	2.7178	3.00	l/m	l/m	-0.33%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0425208058	MEV405	Eric Hebert	05/05/2014	Ozone	none

Slope:	0.99710	**Slope:**	0.00000
Intercept	-2.66354	**Intercept**	0.00000
CorrCoff	0.99983	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
5.9%	10.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.40	0.60	-1.13	ppb	
primary	2	32.64	32.61	29.21	ppb	-10.43%
primary	3	50.49	50.34	46.80	ppb	-7.03%
primary	4	76.47	76.14	72.98	ppb	-4.15%
primary	5	110.24	109.67	107.40	ppb	-2.07%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0002	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	1.0	pass
Span	1.030	pass
Cell B Freq.	81.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.58 lpm	pass
Cell A Tmp.	35.8 C	pass
Cell A Pressure	571 mmHg	pass
Cell A Noise	1.6 ppb	pass
Cell A Freq.	57.8 kHz	Fail
Cell A Flow	0.68 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0004	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1515	MEV405	Eric Hebert	05/05/2014	Wind Speed	90924

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/16/2014	**CorrCoff**	1.00000

Prop or Cups SN 198
Prop or Cups Torque 0.3 **to** 0.4
Prop Correction Fact

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.31%		
Abs Max Er	0.12	0.75%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.2		0.03	
primary	01253	50	1.40	0.0	1.4		0.01	
primary	01253	100	2.57	0.0	2.5		-0.12	
primary	01253	170	4.22	0.0	4.2		-0.02	
primary	01253	250	6.10	0.0	6.1	-0.16%		
primary	01253	500	11.97	0.0	11.9	-0.75%		
primary	01253	800	19.02	0.0	19.0	-0.21%		
primary	01253	2000	47.22	0.0	47.2	-0.11%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	2228	MEV405	Eric Hebert	05/05/2014	Wind Direction	91024

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01264		

Vane SN: 38 **C. A. Align. deg. true:**

VaneTorque 8 **to** 10 180

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	192034	**Tfer Desc.**	transit
Tfer ID	01270		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/30/2014	**CorrCoff**	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	2.8	2.0		
Abs Max Er	5	5		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	359	1	47	2
primary	01264	45	☑	0.0000	41	4	42	-3
primary	01264	90	☑	0.0000	85	5	44	-1
primary	01264	135	☑	0.0000	129	6	44	-1
primary	01264	180	☑	0.0000	179	1	50	5
primary	01264	225	☑	0.0000	222	3	43	-2
primary	01264	270	☑	0.0000	266	4	44	-1
primary	01264	315	☑	0.0000	312	3	46	1
primary	01270	90	☐	0.0000	85	5		5
primary	01270	180	☐	0.0000	179	1		1
primary	01270	270	☐	0.0000	266	4		4
primary	01270	360	☐	0.0000	359	1		1

Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15106	MEV405	Eric Hebert	05/05/2014	Temperature	none

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.37	0.64		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.10	0.16	0.0000	0.8	C	0.64
primary	Temp Mid Range	27.95	27.97	0.0000	28.2	C	0.25
primary	Temp High Range	45.16	45.16	0.0000	45.0	C	-0.21

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	59017	MEV405	Eric Hebert	05/05/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.1	0.1		
Abs Max Er	2.2	0.1		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	35.0	2.2
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	54.9	2.0
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	93.5	-0.1

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY8978	MEV405	Eric Hebert	05/05/2014	Solar Radiation	none

Mfg	Climatronics	
SN/Owner ID	392	none
Parameter	Solar Radiation Translator	

Mfg	RM Young	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer translat	
Tfer ID	01240			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	
Mfg	Licor	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer sensor	
Tfer ID	01241			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
7.6%	6.1%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	5/5/2014	8:00	536	538	580	7.8%
primary	5/5/2014	9:00	769	765	835	9.1%
primary	5/5/2014	10:00	928	920	999	8.6%
primary	5/5/2014	11:00	1000	991	1069	7.9%
primary	5/5/2014	12:00	1012	1002	1063	6.1%
primary	5/5/2014	13:00	960	952	1014	6.5%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	1/2 bubble off level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	MEV405	Eric Hebert	05/05/2014	Precipitation	none

DAS 1:

A Avg % Diff:	A Max % Di
1.0%	2.0%

DAS 2:

A Avg %Dif	A Max % Di

Mfg	PMP	**Parameter**	Precipitation
Serial Number	EW-06134-50	**Tfer Desc.**	250ml graduate
Tfer ID	01250		
Slope	1.00000	**Intercept**	0.00000
Cert Date	9/5/2005	**CorrCoff**	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	8 sce	5.00	5.10	mm	mm	ml	2.0%
primary	test 2	231.5	2	8 sec	5.00	5.00	mm	mm	ml	0.0%

Sensor Component	Condition	Status
Properly Sited	45 degree rule	pass
Gauge Drain Screen	Not installed	Fail
Funnel Clean	Clean	pass
Condition	Good	pass
Gauge Screen	Installed	pass
Gauge Clean	Clean	pass
Level	Level	pass
Sensor Heater	Functioning	pass
System Memo		pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MEV405	Eric Hebert	05/05/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.76	2.20		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.46	23.49	0.000	25.2	C	1.73
primary	Temp Mid Range	23.86	23.89	0.000	25.3	C	1.36
primary	Temp Mid Range	23.01	23.04	0.000	25.2	C	2.2

Infrastructure Data For

Site ID	MEV405	Technician	Eric Hebert	Site Visit Date	05/05/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	888	512 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	MEV405	Eric Hebert	05/05/2014	Cell A Freq.	ThermoElectron	418	☐	☑

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

A large parking lot for park service employees is located aproximately 30 meters north of the site.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MEV405	**Technician**	Eric Hebert	**Site Visit Date**	05/05/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Moccasin Mesa
Operating Group	NPS	**Map Scale**	
AQS #	08-083-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	37.198398
Site Address 1	Natural Resources	**Audit Longitude**	-108.490462
Site Address 2	Mesa Verde National Park	**Audit Elevation**	2170
County	Montezuma	**Audit Declination**	10.3
City, State	Cortez, CO		**Present**
Zip Code	81330	**Fire Extinguisher**	☑ No inspection date
Time Zone	Mountain	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	888	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, and well organized.				
Site OK	☑	**Notes**					

Driving Directions From the main entrance on highway 160, go through the park gate and drive about 35 minutes to mile marker 19. Just after mile marker 19 turn right on the paved service road. The air quality office is the stone building about 200 yards down the road. Continue on the same road to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

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

Siting Distances OK ☐

Siting Criteria Comment

A large parking lot for park service employees is located aproximately 30 meters north of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	45 degree rule violation
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	MEV405	Technician	Eric Hebert	Site Visit Date	05/05/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

Site operation procedures

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

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

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

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

Site ID MEV405 **Technician** Eric Hebert **Site Visit Date** 05/05/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	450SX4	unknown	none
DAS	Environmental Sys Corp	8816	2616	90613
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0688001769	01564
flow rate	Tylan	FC280AV-4S	AW9403013	none
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	none
MFC power supply	Tylan	RO-32	FP9710002	none
Modem	US Robotics	56k fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	0425208058	none
Ozone Standard	ThermoElectron Inc	49C	0425208055	none
Precipitation	Climatronics	100508-2	illegible	none
Printer	Hewlett Packard	842C	unknown	none
Relative Humidity	Rotronic	MP 601A	59017	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Shield (10 meter)	RM Young	43532	none	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY8978	none
Solar Radiation Translator	Climatronics	100144	392	none
Temperature	RM Young	41432VC	15106	none
Wind Direction	Climatronics	100076	2228	91024
Wind Speed	Climatronics	100075	1515	90924
Zero air pump	Werther International	PC40/4	526289	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Eric Hebert-05/06/2014						
1	5/6/2014	Computer	Hewlett Packard	none	6560 b	5CB1520H70
2	5/6/2014	DAS	Environmental Sys Corp	09638	8816	2523
3	5/6/2014	Elevation	Elevation	None	1	None
4	5/6/2014	F460 translator	Climatronics	none	100163	892
5	5/6/2014	Filter pack flow pump	Thomas	none	107CAB18A	07960000521
6	5/6/2014	flow rate	Mykrolis	03388	FC280SAV-4S	AW9403022
7	5/6/2014	Infrastructure	Infrastructure	none	none	none
8	5/6/2014	Mainframe	Climatronics	01340	100081	1291
9	5/6/2014	Met tower	Universal Tower	01357	unknown	none
10	5/6/2014	MFC power supply	Tylan	03678	RO-32	none
11	5/6/2014	Modem	US Robotics	none	56.6k	unknown
12	5/6/2014	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745085
13	5/6/2014	Ozone Standard	ThermoElectron Inc	90606	49C	49C-61991-333
14	5/6/2014	Precipitation	Climatronics	90870	100508-2	illegible
15	5/6/2014	Printer	Hewlett Packard	none	842C	unknown
16	5/6/2014	Relative Humidity	Rotronic	none	MP 601	52065
17	5/6/2014	Sample Tower	Aluma Tower	illegible	B	none
18	5/6/2014	Shelter Temperature	ARS	none	none	none
19	5/6/2014	Shield (10 meter)	Climatronics	01197	100325	1225
20	5/6/2014	Siting Criteria	Siting Criteria	None	1	None
21	5/6/2014	Solar Radiation	Licor	none	LI-200	PY46778
22	5/6/2014	Solar Radiation Translator	Climatronics	none	100144	650
23	5/6/2014	Temperature	Climatronics	ARS110	100093	missing
24	5/6/2014	Temperature Translator	Climatronics	03628	100088-2	395
25	5/6/2014	Wind Direction	Climatronics	90900	100076	ARS1
26	5/6/2014	Wind Speed	Climatronics	90872	100075	1784
27	5/6/2014	Zero air pump	Twin Tower Engineering	none	TT70/4E	526292

DAS Data Form

DAS Time Max Error: 0.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2523	CAN407	Eric Hebert	05/06/2014	DAS	Primary

Das Date: 5 /6 /2014
Das Time: 11:49:00
Das Day: 126

Audit Date 5 /6 /2014
Audit Time 11:48:20
Audit Day 126

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0002	0.0009	0.0022

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
5	0.0000	0.0000	0.0000	V	V	0.0000
5	0.1000	0.1000	0.1000	V	V	0.0000
5	0.3000	0.3000	0.3000	V	V	0.0000
5	0.5000	0.5000	0.5001	V	V	0.0001
5	0.7000	0.7001	0.7002	V	V	0.0001
5	0.9000	0.9001	0.9002	V	V	0.0001
5	1.0000	1.0001	1.0003	V	V	0.0002
13	0.0000	0.0005	0.0027	V	V	0.0022
13	0.1000	0.1005	0.1026	V	V	0.0021
13	0.3000	0.2999	0.2995	V	V	-0.0004
13	0.5000	0.4999	0.4995	V	V	-0.0004
13	0.7000	0.6999	0.6995	V	V	-0.0004
13	0.9000	0.8999	0.8995	V	V	-0.0004
13	1.0000	0.9999	0.9995	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9403022	CAN407	Eric Hebert	05/06/2014	flow rate	03388

Mfg	Tylan	
SN/Owner ID	none	03678
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
2.48%	2.58%			

Cal Factor Zero	-0.01
Cal Factor Full Scale	5.29
Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.02	0.0065	0.00	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.0065	0.00	l/m	l/m	
primary	test pt 1	3.101	3.100	2.85	2.8560	3.02	l/m	l/m	-2.58%
primary	test pt 2	3.102	3.100	2.85	2.8560	3.02	l/m	l/m	-2.58%
primary	test pt 3	3.090	3.090	2.85	2.8560	3.02	l/m	l/m	-2.27%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745085	CAN407	Eric Hebert	05/06/2014	Ozone	none

Slope:	0.99581	**Slope:**	0.00000
Intercept	-0.67417	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.0%	3.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.32	0.52	0.34	ppb	
primary	2	34.50	34.46	33.15	ppb	-3.80%
primary	3	52.85	52.68	51.48	ppb	-2.28%
primary	4	79.88	79.52	78.56	ppb	-1.21%
primary	5	115.10	114.50	113.60	ppb	-0.79%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0028	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.1	pass
Span	1.047	pass
Cell B Freq.	76.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.64 lpm	pass
Cell A Tmp.	34.3 C	pass
Cell A Pressure	605 mmHg	pass
Cell A Noise	1.2 ppb	pass
Cell A Freq.	84.6 kHz	pass
Cell A Flow	0.66 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	-0.0007	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1784	CAN407	Eric Hebert	05/06/2014	Wind Speed	90872

Mfg	Climatronics		
SN/Owner ID	892	none	
Parameter	F460 translator		

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/16/2014	**CorrCoff**	1.00000

Prop or Cups SN	1144		
Prop or Cups Torque	0.3	**to**	0.3
Prop Correction Fact	N/A		

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.51%		
Abs Max Er	0.14	0.84%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.3		0.14	
primary	01253	50	1.40	0.0	1.4		0.02	
primary	01253	100	2.57	0.0	2.6		0.02	
primary	01253	170	4.22	0.0	4.2		0.02	
primary	01253	250	6.10	0.0	6.1	0.49%		
primary	01253	500	11.97	0.0	12.1	0.84%		
primary	01253	800	19.02	0.0	19.1	0.37%		
primary	01253	2000	47.22	0.0	47.4	0.34%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	ARS1	CAN407	Eric Hebert	05/06/2014	Wind Direction	90900

Mfg	Climatronics	
SN/Owner ID	892	none
Parameter	F460 translator	

Vane SN: 3501 **C. A. Align. deg. true:**

VaneTorque 8 **to** 10 358

Mfg	RM Young	**Parameter**	wind direction	
Serial Number		**Tfer Desc.**	wind direction wheel	
Tfer ID	01264			
Mfg	Ushikata	**Parameter**	wind direction	
Serial Number	192034	**Tfer Desc.**	transit	
Tfer ID	01270			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	1/30/2014	**CorrCoff**	1.00000	

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	1.8	1.8		
Abs Max Er	3	4		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	359	1	45	0
primary	01264	45	☑	0.0000	43	2	44	-1
primary	01264	90	☑	0.0000	90	0	47	2
primary	01264	135	☑	0.0000	132	3	42	-3
primary	01264	180	☑	0.0000	181	1	49	4
primary	01264	225	☑	0.0000	223	2	42	-3
primary	01264	270	☑	0.0000	269	1	46	1
primary	01264	315	☑	0.0000	314	1	45	0
primary	01270	88	☐	0.0000	90	2		2
primary	01270	178	☐	0.0000	181	3		3
primary	01270	268	☐	0.0000	269	1		1
primary	01270	358	☐	0.0000	359	1		1

Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Functioning	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	CAN407	Eric Hebert	05/06/2014	Temperature	ARS110

Mfg	Climatronics
SN/Owner ID	395 / 03628
Parameter	Temperature Translator

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01D102193	**Tfer Desc.**	RTD translator
Tfer ID	01231		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

Mfg	Eutechnics	**Parameter**	Temperature
Serial Number	01H0060	**Tfer Desc.**	RTD probe
Tfer ID	01230		
Slope	1.00133	**Intercept**	-0.05731
Cert Date	12/27/2013	**CorrCoff**	1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.09	0.15		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.05	0.11	0.0000	0.1	C	-0.01
primary	Temp Mid Range	26.08	26.10	0.0000	26.0	C	-0.12
primary	Temp High Range	44.52	44.52	0.0000	44.7	C	0.15

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	52065	CAN407	Eric Hebert	05/06/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	1.7	1.0		
Abs Max Er	3.1	1.0		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	32.5	-0.3
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	56.0	3.1
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	92.6	-1.0

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY46778	CAN407	Eric Hebert	05/06/2014	Solar Radiation	none

Mfg	Climatronics	
SN/Owner ID	650	none
Parameter	Solar Radiation Translator	

Mfg	RM Young	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer translat	
Tfer ID	01240			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	
Mfg	Licor	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer sensor	
Tfer ID	01241			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
7.8%	8.4%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	5/6/2014	12:28	1027	1017	1101	8.3%
primary	5/6/2014	12:29	1032	1022	1107	8.3%
primary	5/6/2014	12:30	1039	1028	1114	8.4%
primary	5/6/2014	12:40	545	547	579	5.8%
primary	5/6/2014	12:45	889	882	948	7.5%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	CAN407	Eric Hebert	05/06/2014	Precipitation	90870

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
6.0%	8.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	8 sec	5.00	4.60	mm	mm	ml	-8.0%
primary	test 2	231.5	2	10 sec	5.00	4.80	mm	mm	ml	-4.0%

Sensor Component	Properly Sited	Condition	45 degree rule	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Not installed	Status	Fail
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CAN407	Eric Hebert	05/06/2014	Shelter Temperature	none

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

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.02	22.05	0.000	21.7	C	-0.33
primary	Temp Mid Range	20.84	20.87	0.000	20.8	C	-0.07
primary	Temp Mid Range	21.38	21.41	0.000	21.3	C	-0.15

Infrastructure Data For

Site ID	CAN407	Technician	Eric Hebert	Site Visit Date	05/06/2014

Shelter Make	Shelter Model	Shelter Size
NPS	R46453	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	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	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 100m to the northeast.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAN407	**Technician**	Eric Hebert	**Site Visit Date**	05/06/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Musselman Arch
Operating Group	NPS	**Map Scale**	
AQS #	49-037-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed, desert range	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(435) 259-4141	**Audit Latitude**	38.458323
Site Address 1	Visitors Center	**Audit Longitude**	-109.82126
Site Address 2	route 313	**Audit Elevation**	1794
County	San Juan	**Audit Declination**	11.6
City, State	Moab, UT		**Present**
Zip Code	84532	**Fire Extinguisher**	☑ Inspected April 2014
Time Zone	Mountain	**First Aid Kit**	☑ in vehicle
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**	NPS	**Model**	R46453	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, well organized and well maintained.				
Site OK	☑	**Notes**					

Driving Directions

From I-70, take exit 180 south on route 191. Approximately 9 miles north of Moab, turn right (west) on route 313 at the sign for Canyonlands National Park. Follow 313 west for 25 miles passing the state park and continuing straight to Canyonlands. The site is at the end of the dirt road behind the visitors center, in the maintenance area.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CAN407 **Technician** Eric Hebert **Site Visit Date** 05/06/2014

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

Siting Distances OK ☑

Siting Criteria Comment

The small parking lot at the visitors center is approximately 100m to the northeast.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CAN407	Technician	Eric Hebert	Site Visit Date	05/06/2014

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	45 degree rule violation
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CAN407 **Technician** Eric Hebert **Site Visit Date** 05/06/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CAN407	Technician	Eric Hebert	Site Visit Date	05/06/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAN407 **Technician** Eric Hebert **Site Visit Date** 05/06/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CAN407 **Technician** Eric Hebert **Site Visit Date** 05/06/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CAN407	Technician	Eric Hebert	Site Visit Date	05/06/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CAN407 **Technician** Eric Hebert **Site Visit Date** 05/06/2014

Site operation procedures

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

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

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

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

Site ID CAN407 **Technician** Eric Hebert **Site Visit Date** 05/06/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H70	none
DAS	Environmental Sys Corp	8816	2523	09638
Elevation	Elevation	1	None	None
F460 translator	Climatronics	100163	892	none
Filter pack flow pump	Thomas	107CAB18A	07960000521	none
flow rate	Mykrolis	FC280SAV-4S	AW9403022	03388
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1291	01340
Met tower	Universal Tower	unknown	none	01357
MFC power supply	Tylan	RO-32	none	03678
Modem	US Robotics	56.6k	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1030745085	none
Ozone Standard	ThermoElectron Inc	49C	49C-61991-333	90606
Precipitation	Climatronics	100508-2	illegible	90870
Printer	Hewlett Packard	842C	unknown	none
Relative Humidity	Rotronic	MP 601	52065	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Shield (10 meter)	Climatronics	100325	1225	01197
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY46778	none
Solar Radiation Translator	Climatronics	100144	650	none
Temperature	Climatronics	100093	missing	ARS110
Temperature Translator	Climatronics	100088-2	395	03628
Wind Direction	Climatronics	100076	ARS1	90900
Wind Speed	Climatronics	100075	1784	90872
Zero air pump	Twin Tower Engineering	TT70/4E	526292	none

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRB411-Alison Ray-05/27/2014					
1 5/27/2014	Computer	Hewlett Packard	none	6560 b	5CB22906V0
2 5/27/2014	DAS	Environmental Sys Corp	90635	8816	2507
3 5/27/2014	Elevation	Elevation	None	1	None
4 5/27/2014	F460 translator	Climatronics	none	100163	823
5 5/27/2014	Filter pack flow pump	Thomas	none	107CA14	0000109-84D
6 5/27/2014	flow rate	Tylan	03387	FC280AV	AW9403026
7 5/27/2014	Infrastructure	Infrastructure	none	none	none
8 5/27/2014	Mainframe	Climatronics	none	100081	1378
9 5/27/2014	Mainframe power supply	Climatronics	none	101074	unknown
10 5/27/2014	Met tower	Climatronics	01358	18 inch taper	none
11 5/27/2014	MFC power supply	Tylan	03681	RO-32	FP9404004
12 5/27/2014	Modem	US Robotics	none	0701	Z4L0057C027R
13 5/27/2014	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
14 5/27/2014	Ozone Standard	ThermoElectron Inc	90570	49C	49C-59301-322
15 5/27/2014	Precipitation	Texas Electronics	none	TR-525i-HT	45484-910
16 5/27/2014	Relative Humidity	Rotronic	none	MP 601A	56082
17 5/27/2014	Sample Tower	Aluma Tower	none	B	AT-5381-F9-2
18 5/27/2014	Shelter Temperature	ARS	none	none	80
19 5/27/2014	Shield (10 meter)	Climatronics	00608	100325	illegible
20 5/27/2014	Siting Criteria	Siting Criteria	None	1	None
21 5/27/2014	Solar Radiation	Licor	none	LI-200	PY12084
22 5/27/2014	Solar Radiation Translator	RM Young	103144	70101-X	none
23 5/27/2014	Temperature	Climatronics	none	100093	illegible
24 5/27/2014	Temperature Translator	Climatronics	none	100088-2	441
25 5/27/2014	Wind Direction	Climatronics	91052	100076	4231
26 5/27/2014	Wind Speed	Climatronics	90923	100075	1489
27 5/27/2014	Zero air pump	Werther International	90722	TT70/4E	507782

DAS Data Form

DAS Time Max Error: 2.38

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2507	GRB411	Alison Ray	05/27/2014	DAS	Primary

Das Date: 5 /27/2014
Das Time: 16:50:37
Das Day: 147

Audit Date 5 /27/2014
Audit Time 16:53:00
Audit Day 147

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	0.0000	0.0001	0.0000	V	V	-0.0001
3	0.1000	0.1001	0.1000	V	V	-0.0001
3	0.3000	0.3001	0.3001	V	V	0.0000
3	0.5000	0.5002	0.5000	V	V	-0.0002
3	0.7000	0.7002	0.7000	V	V	-0.0002
3	0.9000	0.9002	0.9000	V	V	-0.0002
3	1.0000	1.0002	1.0000	V	V	-0.0002
9	0.0000	0.0001	0.0000	V	V	-0.0001
9	0.1000	0.1001	0.1000	V	V	-0.0001
9	0.3000	0.3001	0.3000	V	V	-0.0001
9	0.5000	0.5001	0.5000	V	V	-0.0001
9	0.7000	0.7002	0.7000	V	V	-0.0002
9	0.9000	0.9002	0.8999	V	V	-0.0003
9	1.0000	1.0002	1.0000	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403026	GRB411	Alison Ray	05/27/2014	flow rate	03387

Mfg	Tylan
SN/Owner ID	FP9404004 03681
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
2.40%	2.61%			

Cal Factor Zero	0.32
Cal Factor Full Scale	5.76
Rotometer Reading:	2.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.26	-0.2380	0.06	l/m	l/m	
primary	leak check	0.000	0.000	-0.26	-0.2380	0.06	l/m	l/m	
primary	test pt 1	3.057	3.060	2.44	2.4470	2.98	l/m	l/m	-2.61%
primary	test pt 2	3.046	3.050	2.44	2.4470	2.98	l/m	l/m	-2.30%
primary	test pt 3	3.052	3.050	2.44	2.4470	2.98	l/m	l/m	-2.30%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	335 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59285-322	GRB411	Alison Ray	05/27/2014	Ozone	90565

Slope:	0.98260	**Slope:**	0.00000
Intercept	-3.54543	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
7.8%	11.8%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.03	0.23	-3.69	ppb	
primary	2	33.65	33.62	29.65	ppb	-11.81%
primary	3	51.80	51.64	47.37	ppb	-8.27%
primary	4	77.74	77.40	73.03	ppb	-5.65%
primary	5	113.08	112.49	106.50	ppb	-5.32%

Sensor Component	Condition	Status
Cell B Noise	2.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	0.9924	pass
Inlet Filter Condition	Moderately clean	pass
Line Loss	Not tested	pass
Offset	0.5	pass
Span	0.991	pass
Cell B Freq.	78.5 kHz	pass
System Memo		pass
Sample Train	Fair	pass
Cell B Pressure		pass
Cell B Flow	0.65 lpm	pass
Cell A Tmp.	34.3 C	pass
Cell A Pressure	577 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	85.5 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	-0.0058	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	1489	GRB411	Alison Ray	05/27/2014	Wind Speed	90923

Mfg	Climatronics		
SN/Owner ID	823	none	
Parameter	F460 translator		

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/16/2014	**CorrCoff**	1.00000

Prop or Cups SN	2334		
Prop or Cups Torque	0.3	**to**	0.3
Prop Correction Fact	N/A		

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.07	0.35%		
Abs Max Er	0.10	1.15%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.1		-0.06	
primary	01253	50	1.40	0.0	1.3		-0.10	
primary	01253	100	2.57	0.0	2.5		-0.03	
primary	01253	170	4.22	0.0	4.1		-0.09	
primary	01253	250	6.10	0.0	6.0	-1.15%		
primary	01253	500	11.97	0.0	12.0	0.00%		
primary	01253	800	19.02	0.0	19.0	0.05%		
primary	01253	2000	47.22	0.0	47.3	0.21%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Not tested	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	4231	GRB411	Alison Ray	05/27/2014	Wind Direction	91052

Mfg	Climatronics	
SN/Owner ID	823	none
Parameter	F460 translator	

Vane SN: 4491 C. A. Align. deg. true:

VaneTorque 7 to 7 360

Mfg	RM Young	Parameter	wind direction
Serial Number		Tfer Desc.	wind direction wheel
Tfer ID	01264		

Mfg	Ushikata	Parameter	wind direction
Serial Number	192034	Tfer Desc.	transit
Tfer ID	01270		
Slope	1.00000	Intercept	0.00000
Cert Date	1/30/2014	CorrCoff	1.00000

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	3.5	0.9		
Abs Max Er	6	3		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01264	0	☑	0.0000	351	9	46	1
primary	01264	45	☑	0.0000	35	10	44	-1
primary	01264	90	☑	0.0000	78	12	42.5	-2.5
primary	01264	135	☑	0.0000	124	11	46.5	1.5
primary	01264	180	☑	0.0000	169	11	45	0
primary	01264	225	☑	0.0000	215	10	46	1
primary	01264	270	☑	0.0000	260	10	45	0
primary	01264	315	☑	0.0000	305	10	45	0
primary	01270	180	☐	0.0000	179	1		1
primary	01270	360	☐	0.0000	354	6		6

Sensor Component		Condition		Status	
Sensor Component	Torque	Condition		Status	pass
Sensor Component	Sensor Plumb	Condition	Plumb	Status	pass
Sensor Component	Sensor Heater	Condition	Not tested	Status	pass
Sensor Component	Mast	Condition	Good	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Vane Condition	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	GRB411	Alison Ray	05/27/2014	Temperature	none

Mfg	Climatronics	
SN/Owner ID	441	none
Parameter	Temperature Translator	

Mfg	Eutechnics	**Parameter**	Temperature	
Serial Number	01D102193	**Tfer Desc.**	RTD translator	
Tfer ID	01231			
Slope	1.00133	**Intercept**	-0.05731	
Cert Date	12/27/2013	**CorrCoff**	1.00000	
Mfg	Eutechnics	**Parameter**	Temperature	
Serial Number	01H0060	**Tfer Desc.**	RTD probe	
Tfer ID	01230			
Slope	1.00133	**Intercept**	-0.05731	
Cert Date	12/27/2013	**CorrCoff**	1.00000	

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.07	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.57	0.63	0.0000	0.6	C	-0.04
primary	Temp Mid Range	23.89	23.92	0.0000	23.9	C	0.01
primary	Temp High Range	46.18	46.18	0.0000	46.3	C	0.16

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	56082	GRB411	Alison Ray	05/27/2014	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/5/2010	**CorrCoff**	1.00000

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	3.2	4.0		
Abs Max Er	4.7	4.0		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	0.0	32.8	0.0000	34.5	1.7
primary	RH Low Range	GTL	52.9	0.0	52.9	0.0000	57.6	4.7
primary	RH High Range	GTL	93.6	0.0	93.6	0.0000	89.6	-4.0

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY12084	GRB411	Alison Ray	05/27/2014	Solar Radiation	none

Mfg	RM Young	
SN/Owner ID	none	103144
Parameter	Solar Radiation Translator	

Mfg	RM Young	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer translat	
Tfer ID	01240			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	
Mfg	Licor	**Parameter**	solar radiation	
Serial Number		**Tfer Desc.**	SR transfer sensor	
Tfer ID	01241			
Slope	1.02678	**Intercept**	-16.91000	
Cert Date	6/14/2014	**CorrCoff**	0.99800	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
0.4%	0.5%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	5/27/2014	10:00	995	985	986	0.1%
primary	5/27/2014	11:00	1045	1034	1039	0.5%
primary	5/27/2014	12:00	957	948	920	-3.0%
primary	5/27/2014	13:00	842	836	842	0.7%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	45484-910	GRB411	Alison Ray	05/27/2014	Precipitation	none

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
6.0%	6.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	EW-06134-50	Tfer Desc.	250ml graduate
Tfer ID	01250		
Slope	1.00000	Intercept	0.00000
Cert Date	9/5/2005	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	5.00	4.70	mm	mm	ml	-6.0%
primary	test 2	231.5	2	10 sec	5.00	4.70	mm	mm	ml	-6.0%

Sensor Component	Properly Sited	Condition	45 degree rule	Status	Fail
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Not tested	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	80	GRB411	Alison Ray	05/27/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.36	3.28		

Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01D102193	Tfer Desc.	RTD translator
Tfer ID	01231		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000
Mfg	Eutechnics	Parameter	Shelter Temperatur
Serial Number	01H0060	Tfer Desc.	RTD probe
Tfer ID	01230		
Slope	1.00133	Intercept	-0.05731
Cert Date	12/27/2013	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.44	24.46	0.000	25.0	C	0.53
primary	Temp Mid Range	25.25	25.27	0.000	25.6	C	0.28
primary	Temp Mid Range	21.35	21.38	0.000	24.7	C	3.28

Infrastructure Data For

Site ID	GRB411	Technician	Alison Ray	Site Visit Date	05/27/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2652-1)	640 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature	GRB411	Alison Ray	05/27/2014	Blower	Climatronics	3947	☐	☐

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, The shelter floor has missing and crumbled tiles.

2 **Parameter:** MetOpMaintCom

The forced air aspirator for the temperature sensor shield is not functioning, resulting in inaccurate temperature measurements.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRB411	**Technician**	Alison Ray	**Site Visit Date**	05/27/2014

Site Sponsor (agency)	NPS	**USGS Map**	Lehman Caves
Operating Group	NPS	**Map Scale**	
AQS #	32-033-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	39.0053
Deposition Measurement	dry, wet	**QAPP Longitude**	-114.2158
Land Use	woodland - evergreen	**QAPP Elevation Meters**	2060
Terrain	complex (dessert basin and mountain)	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(775) 234-7104	**Audit Latitude**	39.005121
Site Address 1	Great Basin Nat. Park	**Audit Longitude**	-114.215932
Site Address 2	Hwy 488	**Audit Elevation**	2058
County	White Pine	**Audit Declination**	12.5
City, State	Baker, NV		
Zip Code	89311	**Fire Extinguisher**	☑
Time Zone	Pacific	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2652-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, The shelter floor has missing and crumbled tiles.				
Site OK	☑	**Notes**					

Driving Directions

From Las Vegas travel north on Interstate 15 to exit 109 in Beaver, Utah. Travel west on 21 to Garrison, Nevada and turn left on route 487 and continue to Baker. Turn left on 488 in Baker and follow the signs to Great Basin National Park. The site is on the left of the road to the residential and office area.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GRB411 **Technician** Alison Ray **Site Visit Date** 05/27/2014

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GRB411	Technician	Alison Ray	Site Visit Date	05/27/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GRB411	Technician	Alison Ray	Site Visit Date	05/27/2014

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☐	Temperature blower not functioning
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

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

The forced air aspirator for the temperature sensor shield is not functioning, resulting in inaccurate temperature measurements.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	GRB411	Technician	Alison Ray	Site Visit Date	05/27/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GRB411 **Technician** Alison Ray **Site Visit Date** 05/27/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID GRB411 **Technician** Alison Ray **Site Visit Date** 05/27/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	June 2000	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	GRB411	Technician	Alison Ray	Site Visit Date	05/27/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID GRB411 **Technician** Alison Ray **Site Visit Date** 05/27/2014

Site operation procedures

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

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

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

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

Site ID GRB411 **Technician** Alison Ray **Site Visit Date** 05/27/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906V0	none
DAS	Environmental Sys Corp	8816	2507	90635
Elevation	Elevation	1	None	None
F460 translator	Climatronics	100163	823	none
Filter pack flow pump	Thomas	107CA14	0000109-84D	none
flow rate	Tylan	FC280AV	AW9403026	03387
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1378	none
Mainframe power supply	Climatronics	101074	unknown	none
Met tower	Climatronics	18 inch taper	none	01358
MFC power supply	Tylan	RO-32	FP9404004	03681
Modem	US Robotics	0701	Z4L0057C027R	none
Ozone	ThermoElectron Inc	49C	49C-59285-322	90565
Ozone Standard	ThermoElectron Inc	49C	49C-59301-322	90570
Precipitation	Texas Electronics	TR-525i-HT	45484-910	none
Relative Humidity	Rotronic	MP 601A	56082	none
Sample Tower	Aluma Tower	B	AT-5381-F9-2	none
Shelter Temperature	ARS	none	80	none
Shield (10 meter)	Climatronics	100325	illegible	00608
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY12084	none
Solar Radiation Translator	RM Young	70101-X	none	103144
Temperature	Climatronics	100093	illegible	none
Temperature Translator	Climatronics	100088-2	441	none
Wind Direction	Climatronics	100076	4231	91052
Wind Speed	Climatronics	100075	1489	90923
Zero air pump	Werther International	TT70/4E	507782	90722

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DEN417-Eric Hebert-06/24/2014						
1	6/24/2014	Computer	Gateway	none	Solo	2500251309
2	6/24/2014	DAS	Environmental Sys Corp	90600	8816	2274
3	6/24/2014	Elevation	Elevation	None	1	None
4	6/24/2014	Filter pack flow pump	Thomas	none	107CAB18B	099800009754
5	6/24/2014	Flow Rate	Tylan	90966	FC280SAV	AW9706011
6	6/24/2014	Infrastructure	Infrastructure	none	none	none
7	6/24/2014	Mainframe	Climatronics	none	100081	1293
8	6/24/2014	Mainframe power supply	Climatronics	none	101074	685
9	6/24/2014	Met tower	Climatronics	none	unknown	none
10	6/24/2014	MFC power supply	Tylan	90967	RO-32	FP9706004
11	6/24/2014	Modem	US Robotics	none	33.6 fax modem	unknown
12	6/24/2014	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384
13	6/24/2014	Ozone Standard	ThermoElectron Inc	90831	49C	0520012325
14	6/24/2014	Printer	Hewlett Packard	none	840C	unknown
15	6/24/2014	Sample Tower	Aluma Tower	none	B	AT-71102-7I-5
16	6/24/2014	Shelter Temperature	ARS	none	none	006
17	6/24/2014	Shield (10 meter)	Climatronics	none	100325	2530
18	6/24/2014	Siting Criteria	Siting Criteria	None	1	None
19	6/24/2014	Temperature	Climatronics	none	100093	236
20	6/24/2014	Temperature Translator	Climatronics	none	100088-2	806
21	6/24/2014	Zero air pump	Werther International	none	PC70/4	526281

DAS Data Form

DAS Time Max Error: 1.17

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2274	DEN417	Eric Hebert	06/24/2014	DAS	Primary

Das Date: 6 /24/2014 **Audit Date** 6 /24/2014
Das Time: 11:37:50 **Audit Time** 11:39:00
Das Day: 175 **Audit Day** 175

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

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/28/2013	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
6	0.0000	0.0000	0.0001	V	V	0.0001
6	0.1000	0.1007	0.1006	V	V	-0.0001
6	0.3000	0.3003	0.3004	V	V	0.0001
6	0.5000	0.5004	0.5005	V	V	0.0001
6	0.7000	0.7003	0.7004	V	V	0.0001
6	0.9000	0.9005	0.9007	V	V	0.0002
6	1.0000	0.9993	0.9995	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706011	DEN417	Eric Hebert	06/24/2014	Flow Rate	90966

Mfg	Tylan
SN/Owner ID	FP9706004 90967
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.01%	1.01%			

Cal Factor Zero	0.206
Cal Factor Full Scale	5.667
Rotometer Reading:	3.15

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.21	-0.1620	0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.20	-0.1618	0.03	l/m	l/m	
primary	test pt 1	2.972	2.970	2.55	2.5580	3.00	l/m	l/m	1.01%
primary	test pt 2	2.971	2.970	2.55	2.5580	3.00	l/m	l/m	1.01%
primary	test pt 3	2.968	2.970	2.55	2.5580	3.00	l/m	l/m	1.01%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-1.5 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-77033-384	DEN417	Eric Hebert	06/24/2014	Ozone	90778

Slope:	0.98709	**Slope:**	0.00000
Intercept	0.09300	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	1.00928	**Intercept**	0.11780
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	1.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.22	0.10	0.18	ppb	
primary	2	26.58	26.21	25.91	ppb	-1.14%
primary	3	49.46	48.88	48.39	ppb	-1.00%
primary	4	79.12	78.27	77.45	ppb	-1.05%
primary	5	109.10	107.98	106.60	ppb	-1.28%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0001	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.3	pass
Span	1.008	pass
Cell B Freq.	76.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.68 lpm	pass
Cell A Tmp.	36.5 C	pass
Cell A Pressure	675 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	92.1 kHz	pass
Cell A Flow	0.65 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	-0.0001	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	236	DEN417	Eric Hebert	06/24/2014	Temperature	none

Mfg	Climatronics	
SN/Owner ID	806	none
Parameter	Temperature Translator	

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00496	**Intercept**	-0.23009
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.05	0.13		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.07	0.16	0.0000	0.1	C	-0.03
primary	Temp Mid Range	23.12	23.23	0.0000	23.2	C	0
primary	Temp High Range	46.37	46.37	0.0000	46.5	C	0.13

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	006	DEN417	Eric Hebert	06/24/2014	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.45	0.62		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00496	Intercept	-0.23009
Cert Date	1/8/2014	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.90	24.01	0.000	23.4	C	-0.62
primary	Temp Mid Range	23.64	23.75	0.000	23.4	C	-0.33
primary	Temp Mid Range	23.70	23.81	0.000	23.4	C	-0.39

Infrastructure Data For

Site ID	Technician	Site Visit Date
DEN417	Eric Hebert	06/24/2014

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	DEN417	Eric Hebert	06/24/2014	Filter Position	Tylan	3168	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are not performed due to the extreme cold and added stress on the quick-connect fitting.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DEN417	**Technician**	Eric Hebert	**Site Visit Date**	06/24/2014

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Healy C-4
Operating Group	NPS	**Map Scale**	
AQS #	02-068-0003	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(907) 683-9638	**Audit Latitude**	63.7232
Site Address 1	mile 238 Parks Highway	**Audit Longitude**	-148.9676
Site Address 2		**Audit Elevation**	663
County	Denali Borough	**Audit Declination**	19.3
City, State	Denali Park, AK		**Present**
Zip Code	99755	**Fire Extinguisher**	☐
Time Zone	Alaska Time Zone	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

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

Driving Directions

From either Anchorage or Fairbanks, take the Parks Highway (route 3) north or south respectively. Just south of the town of Healy turn west into Denali National Park. The road is well marked. Continue on the park road a few miles to the Park Headquarters. The site is approximately 100 yards up a residential road on the opposite side of the street from the headquarters parking lot.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID DEN417 **Technician** Eric Hebert **Site Visit Date** 06/24/2014

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	DEN417	Technician	Eric Hebert	Site Visit Date	06/24/2014

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	DEN417	Technician	Eric Hebert	Site Visit Date	06/24/2014

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID DEN417 **Technician** Eric Hebert **Site Visit Date** 06/24/2014

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID DEN417 **Technician** Eric Hebert **Site Visit Date** 06/24/2014

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID DEN417 **Technician** Eric Hebert **Site Visit Date** 06/24/2014

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☑	Dataview

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	DEN417	Technician	Eric Hebert	Site Visit Date	06/24/2014

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID DEN417 **Technician** Eric Hebert **Site Visit Date** 06/24/2014

Site operation procedures

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

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

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

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are not performed due to the extreme cold and added stress on the quick-connect fitting.

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

Site ID DEN417 **Technician** Eric Hebert **Site Visit Date** 06/24/2014

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Solo	2500251309	none
DAS	Environmental Sys Corp	8816	2274	90600
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	099800009754	none
Flow Rate	Tylan	FC280SAV	AW9706011	90966
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1293	none
Mainframe power supply	Climatronics	101074	685	none
Met tower	Climatronics	unknown	none	none
MFC power supply	Tylan	RO-32	FP9706004	90967
Modem	US Robotics	33.6 fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	49C-77033-384	90778
Ozone Standard	ThermoElectron Inc	49C	0520012325	90831
Printer	Hewlett Packard	840C	unknown	none
Sample Tower	Aluma Tower	B	AT-71102-7I-5	none
Shelter Temperature	ARS	none	006	none
Shield (10 meter)	Climatronics	100325	2530	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	Climatronics	100093	236	none
Temperature Translator	Climatronics	100088-2	806	none
Zero air pump	Werther International	PC70/4	526281	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 5/4/2016 2:07:48 PM

SiteVisitDate	Site	Technician
05/06/2014	CAN407	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	12	0.05	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	12	0.14	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	12	0.5	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	12	0.8	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	4	1.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	4	3	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	8	1.8	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	4	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	9	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	10	g-cm	**P**
13	Temperature average error	P	4	0.5	3	0.09	c	**P**
14	Temperature max error	P	4	0.5	3	0.15	c	**P**
15	Relative Humidity average above 85%	P	6	10	1	1.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	1	1.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	2	1.7	%	**P**
18	Relative Humidity max below 85%	P	6	10	2	3.1	%	**P**
19	Solar Radiation % diff of avg	P	9	10	15	7.84	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	15	8.4	%	**P**
21	Precipitation average % difference	P	1	10	2	6.0	%	**P**
22	Precipitation max % difference	P	1	10	2	8.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.99581	unitless	**P**
24	Ozone Intercept	P	0	5	4	-0.67417	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
26	Ozone % difference avg	P	1	10	4	2.0	%	**P**
27	Ozone % difference max	P	1	10	4	3.8	%	**P**
28	Flow Rate average % difference	P	10	5	8	2.48	%	**P**
29	Flow Rate max % difference	P	10	5	8	2.58	%	**P**
30	DAS Time maximum error	P	0	5	1	0.67	min	**P**
31	DAS Voltage average error	P	13	0.003	42	0.0009	V	**P**
32	DAS Voltage average error	P	5	0.003	42	0.0001	V	**P**

SiteVisitDate	Site	Technician
05/06/2014	CAN407	Eric Hebert

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 100m to the northeast.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 5/2/2016 4:57:06 PM

SiteVisitDate	Site	Technician
04/23/2014	CHA467	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.11	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.15	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	1.1	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	2.1	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.35	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	4	4.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	4	6	degrees	**Fail**
9	Wind Direction Linearity average error (deg)	P	2	5	8	2.5	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	7	degrees	**Fail**
11	Wind Direction Torque average error	P	2	20	1	11	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	12	g-cm	**P**
13	Temperature average error	P	4	0.5	6	0.51	c	**Fail**
14	Temperature max error	P	4	0.5	6	0.61	c	**Fail**
15	Relative Humidity average above 85%	P	6	10	3	0.1	%	**P**
16	Relative Humidity max above 85%	P	6	10	3	0.1	%	**P**
17	Relative Humidity average below 85%	P	6	10	6	3.3	%	**P**
18	Relative Humidity max below 85%	P	6	10	6	3.5	%	**P**
19	Solar Radiation % diff of avg	P	9	10	15	11.42	%	**Fail**
20	Solar Radiation % diff of max STD value	P	9	10	15	9.5	%	**P**
21	Precipitation average % difference	P	1	10	1	2.0	%	**P**
22	Precipitation max % difference	P	1	10	1	2.0	%	**P**
23	Ozone Slope	P	0	1.1	4	1.02891	unitless	**P**
24	Ozone Intercept	P	0	5	4	2.25151	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
26	Ozone % difference avg	P	1	10	4	6.9	%	**P**
27	Ozone % difference max	P	1	10	4	10.0	%	**Fail**
28	Flow Rate average % difference	P	10	5	9	0.16	%	**P**
29	Flow Rate max % difference	P	10	5	9	0.20	%	**P**
30	DAS Time maximum error	P	0	5	1	1.23	min	**P**
31	DAS Voltage average error	P	14	0.003	56	0.0001	V	**P**
32	DAS Voltage average error	P	2	0.003	56	0.0020	V	**P**

SiteVisitDate	Site	Technician
04/23/2014	CHA467	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator routinely reviews the previous week's data.

2 **Parameter:** SitingCriteriaCom

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

3 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 8/4/2014 5:50:23 PM

SiteVisitDate	Site	Technician
04/09/2014	DCP114	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01025	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.16701	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.9	%	**P**
5	Ozone % difference max	P	7	10	4	1.2	%	**P**

EEMS Spot Report

Data Compiled: 5/4/2016 4:23:14 PM

SiteVisitDate	Site	Technician
06/24/2014	DEN417	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.05	c	**P**
2	Temperature max error	P	4	0.5	6	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98709	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.09300	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	1	10	4	1.1	%	**P**
7	Ozone % difference max	P	1	10	4	1.3	%	**P**
8	Flow Rate average % difference	P	9	5	4	1.01	%	**P**
9	Flow Rate max % difference	P	9	5	4	1.01	%	**P**
10	DAS Time maximum error	P	0	5	1	1.17	min	**P**
11	DAS Voltage average error	P	6	0.003	49	0.0001	V	**P**

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are not performed due to the extreme cold and added stress on the quick-connect fitting.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 5/4/2016 3:54:42 PM

SiteVisitDate	Site	Technician
05/27/2014	GRB411	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.07	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.10	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.4	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	1.1	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	2	3.5	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	2	6	degrees	**Fail**
9	Wind Direction Linearity average error (deg)	P	2	5	8	0.9	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	2	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	7	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	7	g-cm	**P**
13	Temperature average error	P	4	0.5	3	0.07	c	**P**
14	Temperature max error	P	4	0.5	3	0.16	c	**P**
15	Relative Humidity average above 85%	P	6	10	3	4.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	3	4.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	6	3.2	%	**P**
18	Relative Humidity max below 85%	P	6	10	6	4.7	%	**P**
19	Solar Radiation % diff of avg	P	9	10	8	0.44	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	8	0.50	%	**P**
21	Precipitation average % difference	P	1	10	2	6.0	%	**P**
22	Precipitation max % difference	P	1	10	2	6.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.98260	unitless	**P**
24	Ozone Intercept	P	0	5	4	-3.54543	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
26	Ozone % difference avg	P	1	10	4	7.8	%	**P**
27	Ozone % difference max	P	1	10	4	11.8	%	**Fail**
28	Flow Rate average % difference	P	10	5	8	2.4	%	**P**
29	Flow Rate max % difference	P	10	5	8	2.61	%	**P**
30	DAS Time maximum error	P	0	5	1	2.38	min	**P**
31	DAS Voltage average error	P	9	0.003	42	0.0002	V	**P**
32	DAS Voltage average error	P	3	0.003	42	0.0001	V	**P**

SiteVisitDate	Site	Technician
05/27/2014	GRB411	Alison Ray

Field Performance Comments

1 **Parameter:** Temperature **SensorComponent:** Blower **CommentCode** 26

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, The shelter floor has missing and crumbled tiles.

2 **Parameter:** MetOpMaintCom

The forced air aspirator for the temperature sensor shield is not functioning, resulting in inaccurate temperature measurements.

EEMS Spot Report

Data Compiled: 4/17/2016 9:49:56 PM

SiteVisitDate	Site	Technician
04/08/2014	GRC474	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.13	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.30	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	1.4	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	2.0	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.40	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	4	2.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	4	4	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	8	2.0	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	4	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	12	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	12	g-cm	**P**
13	Temperature average error	P	5	0.5	6	0.24	c	**P**
14	Temperature max error	P	5	0.5	6	0.58	c	**Fail**
15	Relative Humidity average above 85%	P	6	10	4	2.6	%	**P**
16	Relative Humidity max above 85%	P	6	10	4	2.6	%	**P**
17	Relative Humidity average below 85%	P	6	10	8	0.5	%	**P**
18	Relative Humidity max below 85%	P	6	10	8	0.6	%	**P**
19	Solar Radiation % diff of avg	P	9	10	20	0.29	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	20	3.6	%	**P**
21	Precipitation average % difference	P	1	10	2	4.0	%	**P**
22	Precipitation max % difference	P	1	10	2	4.0	%	**P**
23	Ozone Slope	P	0	1.1	4	1.0291	unitless	**P**
24	Ozone Intercept	P	0	5	4	-1.89689	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
26	Ozone % difference avg	P	1	10	4	1.5	%	**P**
27	Ozone % difference max	P	1	10	4	3.2	%	**P**
28	Flow Rate average % difference	P	10	5	6	1.21	%	**P**
29	Flow Rate max % difference	P	10	5	6	1.32	%	**P**
30	DAS Time maximum error	P	0	5	1	1.83	min	**P**
31	DAS Voltage average error	P	9	0.003	49	0.0001	V	**P**
32	DAS Voltage average error	P	6	0.003	49	0.0003	V	**P**

SiteVisitDate	Site	Technician
04/08/2014	GRC474	Eric Hebert

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 4/10/2016 11:07:13 AM

SiteVisitDate	Site	Technician
04/28/2014	JOT403	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.05	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.20	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	8	0.0	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	8	0.0	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.50	g-cm	**Fail**
6	Wind Speed Torque max error	P	3	0.5	1	0.5	g-cm	**Fail**
7	Wind Direction Input Deg True average error (de	P	2	5	8	1.0	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	8	2	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	16	1.5	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	16	5	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	16	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	18	g-cm	**P**
13	Temperature average error	P	5	0.5	3	0.12	c	**P**
14	Temperature max error	P	5	0.5	3	0.14	c	**P**
15	Relative Humidity average above 85%	P	6	10	2	5.0	%	**P**
16	Relative Humidity max above 85%	P	6	10	2	5.0	%	**P**
17	Relative Humidity average below 85%	P	6	10	4	1.8	%	**P**
18	Relative Humidity max below 85%	P	6	10	4	2.5	%	**P**
19	Solar Radiation % diff of avg	P	9	10	4	6.74	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	4	7.1	%	**P**
21	Precipitation average % difference	P	1	10	2	8.0	%	**P**
22	Precipitation max % difference	P	1	10	2	8.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.98081	unitless	**P**
24	Ozone Intercept	P	0	5	4	1.06586	ppb	**P**
25	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
26	Ozone % difference avg	P	1	10	4	0.7	%	**P**
27	Ozone % difference max	P	1	10	4	1.3	%	**P**
28	Flow Rate average % difference	P	10	5	9	1.96	%	**P**
29	Flow Rate max % difference	P	10	5	9	1.96	%	**P**
30	DAS Time maximum error	P	0	5	1	1.67	min	**P**
31	DAS Voltage average error	P	9	0.003	49	0.0002	V	**P**
32	DAS Voltage average error	P	2	0.003	49	0.0002	V	**P**

SiteVisitDate	Site	Technician
04/28/2014	JOT403	Eric Hebert

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is only a few years old and is in good condition, clean and well organized.

EEMS Spot Report

Data Compiled: 8/5/2014 1:32:45 PM

SiteVisitDate	Site	Technician
05/31/2014	LAV410	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97835	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.93585	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	1	10	4	4.0	%	**P**
5	Ozone % difference max	P	1	10	4	5.4	%	**P**

EEMS Spot Report

Data Compiled: 5/4/2016 1:18:40 PM

SiteVisitDate	Site	Technician
05/05/2014	MEV405	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.04	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.12	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	8	0.3	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	8	0.8	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.35	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	8	2.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	8	5	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	16	2.0	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	16	5	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	9	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	10	g-cm	**P**
13	Temperature average error	P	4	0.5	6	0.37	c	**P**
14	Temperature max error	P	4	0.5	6	0.64	c	**Fail**
15	Relative Humidity average above 85%	P	6	10	1	0.1	%	**P**
16	Relative Humidity max above 85%	P	6	10	1	0.1	%	**P**
17	Relative Humidity average below 85%	P	6	10	2	2.1	%	**P**
18	Relative Humidity max below 85%	P	6	10	2	2.2	%	**P**
19	Solar Radiation % diff of avg	P	9	10	24	7.58	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	24	6.1	%	**P**
21	Precipitation average % difference	P	1	10	2	1.0	%	**P**
22	Precipitation max % difference	P	1	10	2	2.0	%	**P**
23	Ozone Slope	P	0	1.1	4	0.99710	unitless	**P**
24	Ozone Intercept	P	0	5	4	-2.66354	ppb	**P**
25	Ozone correlation	P	0	0.995	4	0.99983	unitless	**P**
26	Ozone % difference avg	P	1	10	4	5.9	%	**P**
27	Ozone % difference max	P	1	10	4	10.4	%	**Fail**
28	Flow Rate average % difference	P	10	5	8	0.33	%	**P**
29	Flow Rate max % difference	P	10	5	8	0.66	%	**P**
30	DAS Time maximum error	P	0	5	1	1.1	min	**P**
31	DAS Voltage average error	P	10	0.003	21	0.0001	V	**P**
32	DAS Voltage average error	P	5	0.003	21	0.0002	V	**P**

SiteVisitDate	Site	Technician
05/05/2014	MEV405	Eric Hebert

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Freq. **CommentCode** 99

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

A large parking lot for park service employees is located aproximately 30 meters north of the site.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 8/4/2014 6:03:16 PM

SiteVisitDate	Site	Technician
04/10/2014	OXF122	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02714	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.89517	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone % difference max	P	7	10	4	1.7	%	**P**

EEMS Spot Report

Data Compiled: 4/17/2016 8:47:01 PM

SiteVisitDate	Site	Technician
04/07/2014	PET427	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.05	m/s	**P**
2	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.20	m/s	**P**
3	Wind Speed average % difference above 5 m/s	P	3	5	4	0.0	%	**P**
4	Wind Speed max % difference above 5 m/s	P	3	5	4	0.0	%	**P**
5	Wind Speed Torque average error	P	3	0.5	1	0.35	g-cm	**P**
6	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
7	Wind Direction Input Deg True average error (de	P	2	5	4	1.8	degrees	**P**
8	Wind Direction Input Deg True max error (deg)	P	2	5	4	3	degrees	**P**
9	Wind Direction Linearity average error (deg)	P	2	5	8	2.2	degrees	**P**
10	Wind Direction Linearity max error (deg)	P	2	5	8	5	degrees	**P**
11	Wind Direction Torque average error	P	2	20	1	18	g-cm	**P**
12	Wind Direction Torque max error	P	2	20	1	18	g-cm	**P**
13	Temperature average error	P	5	0.5	12	0.24	c	**P**
14	Temperature max error	P	5	0.5	12	0.27	c	**P**
15	Relative Humidity average above 85%	P	8	10	1	0.8	%	**P**
16	Relative Humidity max above 85%	P	8	10	1	0.8	%	**P**
17	Relative Humidity average below 85%	P	8	10	2	1.6	%	**P**
18	Relative Humidity max below 85%	P	8	10	2	1.8	%	**P**
19	Solar Radiation % diff of avg	P	9	10	10	8.35	%	**P**
20	Solar Radiation % diff of max STD value	P	9	10	10	8.9	%	**P**
21	Precipitation average % difference	P	1	10	2	1.8	%	**P**
22	Precipitation max % difference	P	1	10	2	3.2	%	**P**
23	Ozone Slope	P	0	1.1	4	1.01633	unitless	**P**
24	Ozone Intercept	P	0	5	4	1.89013	ppb	**P**
25	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
26	Ozone % difference avg	P	1	10	4	5.0	%	**P**
27	Ozone % difference max	P	1	10	4	7.2	%	**P**
28	Flow Rate average % difference	P	10	5	3	0.67	%	**P**
29	Flow Rate max % difference	P	10	5	3	1.35	%	**P**
30	DAS Time maximum error	P	0	5	1	1.33	min	**P**
31	DAS Voltage average error	P	9	0.003	42	0.0004	V	**P**
32	DAS Voltage average error	P	3	0.003	42	0.0002	V	**P**

SiteVisitDate	Site	Technician
04/07/2014	PET427	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.

2 **Parameter:** Wind Direction **SensorComponent:** Mast **CommentCode** 155

The wind direction sensor mast is loose on the tower causing inaccurate wind direction measurement.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available for the site audit. Reported information is from the previous site audit.

2 **Parameter:** DasComments

The heating and air conditioning systems run simultaneously.

3 **Parameter:** ShelterCleanNotes

The shelter is dusty, but in good condition, well organized and maintained.

EEMS Spot Report

Data Compiled: 8/4/2014 10:08:16 PM

SiteVisitDate	Site	Technician
05/01/2014	PIN414	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.0099	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.21975	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	1	10	4	0.7	%	**P**
5	Ozone % difference max	P	1	10	4	0.9	%	**P**

EEMS Spot Report

Data Compiled: 8/4/2014 5:38:33 PM

SiteVisitDate	Site	Technician
04/08/2014	QAK172	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99571	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.51311	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	1.5	%	**P**

EEMS Spot Report

Data Compiled: 8/5/2014 2:12:03 PM

SiteVisitDate	Site	Technician
06/02/2014	SAN189	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01684	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.10424	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone % difference max	P	7	10	4	1.9	%	**P**

EEMS Spot Report

Data Compiled: 8/5/2014 1:21:11 PM

SiteVisitDate	Site	Technician
05/30/2014	SEK430	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99535	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.73418	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	1	10	4	2.2	%	**P**
5	Ozone % difference max	P	1	10	4	3.9	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode** 99

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

EEMS Spot Report

Data Compiled: 8/5/2014 1:08:15 PM

SiteVisitDate	Site	Technician
05/29/2014	YOS404	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.03866	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.0319	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	1	10	4	1.8	%	**P**
5	Ozone % difference max	P	1	10	4	3.1	%	**P**

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

EEMS Spot Report

Data Compiled: 8/4/2014 5:38:33 PM

SiteVisitDate	Site	Technician
04/08/2014	QAK172	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99571	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.51311	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	1.5	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241783	QAK172	Sandy Grenville	04/08/2014	Ozone	000613

Slope:	0.99571	**Slope:**	0.00000
Intercept	-0.51311	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	1.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.14	0.25	-0.51	ppb	
primary	2	30.67	30.64	30.29	ppb	-1.14%
primary	3	50.29	50.17	49.65	ppb	-1.04%
primary	4	81.29	81.03	79.84	ppb	-1.47%
primary	5	100.62	100.27	99.40	ppb	-0.87%

Sensor Component	Condition	Status
Cell B Noise	1.0 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.10	pass
Span	1.001	pass
Cell B Freq.	89.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	33.0 C	pass
Cell A Pressure	696 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	93.4 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
QAK172-Sandy Grenville-04/08/2014						
1	4/8/2014	DAS	Campbell	000418	CR3000	2518
2	4/8/2014	Ozone	ThermoElectron Inc	000613	49i A1NAA	1009241783
3	4/8/2014	Ozone Standard	ThermoElectron Inc	000511	49i A3NAA	0922236888
4	4/8/2014	Sample Tower	Aluma Tower	666368	B	AT-5107-E-4-8
5	4/8/2014	UPS	APC	06798	RS900	unknown
6	4/8/2014	Zero air pump	Werther International	06870	PC70/4	000814278

EEMS Spot Report

Data Compiled: 8/4/2014 5:50:23 PM

SiteVisitDate	Site	Technician
04/09/2014	DCP114	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01025	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.16701	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.9	%	**P**
5	Ozone % difference max	P	7	10	4	1.2	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	DCP114	Sandy Grenville	04/09/2014	Ozone	000615

Slope:	1.01025	**Slope:**	0.00000
Intercept	-0.16701	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.9%	1.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	0.16	-0.24	ppb	
primary	2	31.35	31.32	31.71	ppb	1.25%
primary	3	50.73	50.61	51.02	ppb	0.81%
primary	4	80.59	80.33	81.20	ppb	1.08%
primary	5	100.86	100.51	101.10	ppb	0.59%

Sensor Component	Condition	Status
Cell B Noise	0.5 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	0.999	pass
Cell B Freq.	95.6 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	34.4 C	pass
Cell A Pressure	712 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	97.8 kHz	pass
Cell A Flow	0.76 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DCP114-Sandy Grenville-04/09/2014						
1	4/9/2014	DAS	Campbell	000345	CR3000	2124
2	4/9/2014	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	4/9/2014	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
4	4/9/2014	Sample Tower	Aluma Tower	000030	B	AT-81056-J-4
5	4/9/2014	Zero air pump	Werther International	06939	PC70/4	000829175

EEMS Spot Report

Data Compiled: 8/4/2014 6:03:16 PM

SiteVisitDate	Site	Technician
04/10/2014	OXF122	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02714	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.89517	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone % difference max	P	7	10	4	1.7	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347312	OXF122	Sandy Grenville	04/10/2014	Ozone	000737

Slope:	1.02714	**Slope:**	0.00000
Intercept	-0.89517	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	1.7%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.04	0.15	-0.87	ppb	
primary	2	30.49	30.46	30.39	ppb	-0.23%
primary	3	50.58	50.46	51.18	ppb	1.43%
primary	4	82.49	82.22	83.60	ppb	1.68%
primary	5	100.39	100.04	101.70	ppb	1.66%

Sensor Component	Condition	Status
Cell B Noise	0.9 kHz	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.50	pass
Span	1.023	pass
Cell B Freq.	103.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.76 lpm	pass
Cell A Tmp.	35.3 C	pass
Cell A Pressure	701 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	104.5 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
OXF122-Sandy Grenville-04/10/2014						
1	4/10/2014	DAS	Campbell	000425	CR3000	2528
2	4/10/2014	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312
3	4/10/2014	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
4	4/10/2014	Sample Tower	Aluma Tower	000018	B	AT-61152-A-H8-E
5	4/10/2014	UPS	APC	05072	RS800	unknown
6	4/10/2014	Zero air pump	Werther International	06911	PC70/4	000829167

EEMS Spot Report

Data Compiled: 8/4/2014 10:08:16 PM

SiteVisitDate	Site	Technician
05/01/2014	PIN414	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.0099	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.21975	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	1	10	4	0.7	%	**P**
5	Ozone % difference max	P	1	10	4	0.9	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49c-74530376	PIN414	Eric Hebert	05/01/2014	Ozone	90765

Slope:	1.00990	**Slope:**	0.00000
Intercept	-0.21975	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

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

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	0.20	-0.07	ppb	
primary	2	29.51	29.51	29.79	ppb	0.95%
primary	3	49.14	49.00	49.17	ppb	0.35%
primary	4	78.69	78.34	78.72	ppb	0.49%
primary	5	107.00	106.45	107.40	ppb	0.89%

Sensor Component	Condition	Status
Cell B Noise	0.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0010	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	1.0	pass
Span	1.005	pass
Cell B Freq.	87.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.76 lpm	pass
Cell A Tmp.	40.0 C	pass
Cell A Pressure	716 mmHg	pass
Cell A Noise	0.6 ppb	pass
Cell A Freq.	100.0 kHz	pass
Cell A Flow	0.78 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	0.0002	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PIN414-Eric Hebert-05/01/2014						
1	5/1/2014	DAS	Environmental Sys Corp	90612	8816	2615
2	5/1/2014	Ozone	ThermoElectron Inc	90765	49C	49c-74530376
3	5/1/2014	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376
4	5/1/2014	Sample Tower	Aluma Tower	928348	B	AT-5381-F9-3
5	5/1/2014	UPS	APC	none	1400RMXL	WS9848027653
6	5/1/2014	Zero air pump	Werther International	none	PC 70/4	000706555

EEMS Spot Report

Data Compiled: 8/5/2014 1:08:15 PM

SiteVisitDate	Site	Technician
05/29/2014	YOS404	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.03866	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.0319	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	1	10	4	1.8	%	**P**
5	Ozone % difference max	P	1	10	4	3.1	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-74534-376	YOS404	Alison Ray	05/29/2014	Ozone	90763

Slope:	1.03866	**Slope:**	0.00000
Intercept	-1.03190	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.8%	3.1%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.00	0.20	-0.66	ppb	
primary	2	29.70	29.70	29.86	ppb	0.54%
primary	3	49.65	49.51	50.07	ppb	1.13%
primary	4	79.60	79.25	81.21	ppb	2.47%
primary	5	109.60	109.03	112.40	ppb	3.09%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	1.0036	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.038	pass
Cell B Freq.	104.3 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.61 lpm	pass
Cell A Tmp.	35.7 C	pass
Cell A Pressure	615 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	97.8 kHz	pass
Cell A Flow	0.61 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.0047	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
YOS404-Alison Ray-05/29/2014						
1	5/29/2014	DAS	Environmental Sys Corp	90645	8816	2558
2	5/29/2014	Ozone	ThermoElectron Inc	90763	49C	49C-74534-376
3	5/29/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450190
4	5/29/2014	Sample Tower	Aluma Tower	none	B	none
5	5/29/2014	Zero air pump	Werther International	none	PC70/4	531397

EEMS Spot Report

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SiteVisitDate	Site	Technician
05/30/2014	SEK430	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99535	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.73418	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	1	10	4	2.2	%	**P**
5	Ozone % difference max	P	1	10	4	3.9	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode** 99

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

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0520012327	SEK430	Alison Ray	05/30/2014	Ozone	90835

Slope:	0.99535	**Slope:**	0.00000
Intercept	-0.73418	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.2%	3.9%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.30	0.50	0.17	ppb	
primary	2	30.17	30.16	28.98	ppb	-3.91%
primary	3	49.59	49.45	48.24	ppb	-2.45%
primary	4	80.88	80.52	79.24	ppb	-1.59%
primary	5	111.01	110.43	109.50	ppb	-0.84%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	Not tested	pass
Inlet Filter Condition	Moderately clean	pass
Line Loss	Not tested	pass
Offset	0.2	pass
Span	1.028	pass
Cell B Freq.	87.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.66 lpm	pass
Cell A Tmp.	41.0 C	Fail
Cell A Pressure	700 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	103.2 kHz	pass
Cell A Flow	0.66 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	Not tested	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SEK430-Alison Ray-05/30/2014						
1	5/30/2014	DAS	Environmental Sys Corp	90649	8816	2562
2	5/30/2014	Met tower	Aluma Tower	none	B	none
3	5/30/2014	Ozone	ThermoElectron Inc	90835	49C	0520012327
4	5/30/2014	Ozone Standard	ThermoElectron Inc	90729	49C	49C-90523-366
5	5/30/2014	Zero air pump	Werther International	none	C 70/4	000838301

EEMS Spot Report

Data Compiled: 8/5/2014 1:32:45 PM

SiteVisitDate	Site	Technician
05/31/2014	LAV410	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97835	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.93585	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	1	10	4	4.0	%	**P**
5	Ozone % difference max	P	1	10	4	5.4	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-520012-328	LAV410	Alison Ray	05/31/2014	Ozone	90834

Slope:	0.97835	**Slope:**	0.00000
Intercept	-0.93585	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00707	**Intercept**	-0.21032
Cert Date	1/8/2014	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.0%	5.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.25	0.45	-0.36	ppb	
primary	2	31.89	31.87	30.16	ppb	-5.37%
primary	3	50.32	50.17	47.92	ppb	-4.48%
primary	4	79.81	79.45	76.97	ppb	-3.12%
primary	5	110.28	109.71	106.40	ppb	-3.02%

Sensor Component	Condition	Status
Cell B Noise	0.7 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	0.9974	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	0.992	pass
Cell B Freq.	81.0 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.64 lpm	pass
Cell A Tmp.	36.1 C	pass
Cell A Pressure	607 mmHg	pass
Cell A Noise	0.7 ppb	pass
Cell A Freq.	81.9 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	0.000	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LAV410-Alison Ray-05/31/2014					
1 5/31/2014	DAS	Environmental Sys Corp	90535	8816	2026
2 5/31/2014	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328
3 5/31/2014	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745083
4 5/31/2014	Sample Tower	Aluma Tower	923314	B	AT-5324-F6-O
5 5/31/2014	Zero air pump	Werther International	none	C 70/4	000847660

EEMS Spot Report

Data Compiled: 8/5/2014 2:12:03 PM

SiteVisitDate	Site	Technician
06/02/2014	SAN189	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01684	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.10424	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone % difference max	P	7	10	4	1.9	%	**P**

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347311	SAN189	Sandy Grenville	06/02/2014	Ozone	000740

Slope:	1.01684	**Slope:**	0.00000
Intercept	0.10424	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49C-73104-373	**Tfer Desc.**	Ozone transfer
Tfer ID	01100		
Slope	1.00458	**Intercept**	-0.11484
Cert Date	12/10/2013	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.8%	2.0%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.09	0.20	0.45	ppb	
primary	2	30.25	30.22	30.80	ppb	1.92%
primary	3	51.37	51.25	52.00	ppb	1.46%
primary	4	79.82	79.57	80.96	ppb	1.75%
primary	5	101.47	101.12	103.09	ppb	1.95%

Sensor Component	Condition	Status
Cell B Noise	0.3 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.005	pass
Cell B Freq.	90.9 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.63 lpm	pass
Cell A Tmp.	34.4 C	pass
Cell A Pressure	692 mmHg	pass
Cell A Noise	0.5 ppb	pass
Cell A Freq.	106.9 kHz	pass
Cell A Flow	0.65 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAN189-Sandy Grenville-06/02/2014						
1	6/2/2014	DAS	Campbell	000360	CR3000	2138
2	6/2/2014	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311
3	6/2/2014	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683
4	6/2/2014	Sample Tower	Aluma Tower	000207	B	none
5	6/2/2014	Zero air pump	Werther International	06875	C 70/4	000814272