# 2015 – 4th 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**

**Prepared by:**

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## List of Acronyms and Abbreviations

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

# 1.0 CASTNET Quarterly Report

## 1.1 Introduction

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

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

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

As of January 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. Those variables were audited at the PNF126, HWF187, and BEL116 stations during fourth quarter 2015. All of the $SO_2$ and NOy results for those audits were found to be within acceptance criteria. The preliminary reports of those results were delivered following the audits and are not included in this report.

**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<br>(~ 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;<br>< 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;<br>≤ ±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 |

| Sensor | Parameter | Audit Challenge | Acceptance Criteria |
|---|---|---|---|
| Ozone | Slope | Linear regression of multi-point test gas concentration as measured with a certified transfer standard | 0.9000 ≤ m ≤ 1.1000 |
| Ozone | Intercept | | -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 Fourth Quarter 2015

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the fourth quarter (October through December) of 2015. The locations and dates of the site visits for complete audits are presented in Table 2.

**Table 2. Site Audit Visits**

| **Side ID** | **Audit Type** | **Sponsor** | **Site Visit Date** | **Station Name** |
|---|---|---|---|---|
| WFM105 | Flow Only | EPA | 10/1/2015 | Whiteface Mountain |
| NIC001 | Flow Only | EPA | 10/2/2015 | Nicks Lake |
| UND002 | Flow Only | EPA | 10/5/2015 | Underhill |
| GRS420 | without met | NPS | 10/26/2015 | Great Smoky NP - Look Rock |
| LRL117 | without met | EPA | 11/1/2015 | Laurel Hill |
| SHN418 | without met | NPS | 11/6/2015 | Shenandoah NP - Big Meadows |
| WSP144 | without met | EPA | 11/9/2015 | Washington Crossing State Park |
| VPI120 | without met | EPA | 11/19/2015 | Horton Station |
| PAR107 | without met | EPA | 11/21/2015 | Parsons |
| CDR119 | without met | EPA | 11/22/2015 | Cedar Creek |
| BWR139 | without met | EPA | 11/24/2015 | Blackwater NWR |
| CND125 | without met | EPA | 12/01/2015 | Candor |
| PED108 | without met | EPA | 12/3/2015 | Prince Edward |
| BFT142 | without met | EPA | 12/4/2015 | Beaufort |

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

**Table 3. TTP Pollutant PE Visits**

| Side ID | Audit Type | Sponsor | Site Visit Date | Station Name |
|---|---|---|---|---|
| HWF187 | NOy | EPA | 10/3/2015 | Huntington Wildlife Forest |
| HWF187 | Ozone PE | EPA | 10/3/2015 | Huntington Wildlife Forest |
| HOW191 | Ozone PE | EPA | 10/6/2015 | Howland Ameriflux |
| ASH135 | Ozone PE | EPA | 10/7/2015 | Ashland |
| CTH110 | Ozone PE | EPA | 10/23/2015 | Connecticut Hill |
| KEF112 | Ozone PE | EPA | 10/24/2015 | Kane Experimental Forest |
| MKG113 | Ozone PE | EPA | 10/25/2015 | M.K. Goddard State Park |
| PSU106 | Ozone PE | EPA | 10/27/2015 | Penn State University |
| ABT147 | Ozone PE | EPA | 10/28/2015 | Abington |
| WST109 | Ozone PE | EPA | 10/29/2015 | Woodstock |
| ARE128 | Ozone PE | EPA | 11/2/2015 | Arendtsville |
| PNF126 | NOy | EPA | 11/4/2015 | Cranberry |
| PNF126 | Ozone PE | EPA | 11/4/2015 | Cranberry |
| BEL116 | $SO_2$ | EPA | 11/19/2015 | Beltsville |
| BEL116 | Nitrotrain | EPA | 11/25/2015 | Beltsville |
| BEL116 | Ozone PE | EPA | 11/19/2015 | Beltsville |

## 1.4 Audit Results

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

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

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

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

# 2.0 NADP Quarterly Report

## 2.1 Introduction

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

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

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

## 2.2 Project Objectives

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

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

## 2.3 Sites Visited Fourth Quarter 2015

This report covers the results from the NADP sites surveyed during the fourth quarter (October through December) of 2015. The station names and dates of the audits are presented in Table 4.

**Table 4. Sites Surveyed – Fourth Quarter 2015**

| Side ID | Network | Visit Date | Station Name |
|---|---|---|---|
| ME02 | MDN/NTN | 10/15/2015 | Bridgton |
| ME08 | NTN | 10/16/2015 | Gilead |
| ME09 | MDN/NTN | 10/14/2015 | Greenville Station |
| ME96 | MDN/NTN | 10/13/2015 | Casco Bay-Wolfe’s Neck Farm |
| NY22 | NTN | 10/19/2015 | Akwesasne Mohawk-Fort Covington |
| NY28 | NTN | 10/21/2015 | Piseco Lake |
| NY59 | NTN | 10/20/2015 | Wanakena |
| NY93 | NTN | 10/19/2015 | Paul Smith's |
| PA02 | NTN | 10/25/2015 | Crooked Creek Lake |
| PA18 | MDN | 10/27/2015 | Young Woman's Creek |
| PA21 | MDN/NTN | 10/25/2015 | Goddard State Park |
| PA52 | MDN/NTN | 10/30/2015 | Little Pine State Park |
| PA71 | NTN | 10/26/2015 | Little Buffalo State Park |
| PA72 | MDN/NTN | 10/29/2015 | Milford |
| PA98 | NTN | 10/30/2015 | Frances Slocum State Park |
| DE02 | AIRMoN | 11/23/2015 | Lewes |
| MD08 | MDN/NTN/AMoN | 11/23/2015 | Piney Reservoir |
| MD13 | NTN | 11/16/2015 | UM WYE Center |
| MD15 | NTN | 11/17/2015 | Smith Island |
| MD18 | NTN | 11/23/2015 | Assateague Island National Seashore-Woodcock |
| NJ00 | NTN | 11/12/2015 | Edwin B. Forsythe National Wildlife Refuge |
| NJ30 | MDN | 11/9/2015 | New Brunswick |
| NJ39 | NTN | 11/10/2015 | Cattus Island County Park |

| **Side ID** | **Network** | **Visit Date** | **Station Name** |
|---|---|---|---|
| NJ99 | NTN | 11/18/2015 | Washington Crossing |
| PA00 | AMoN | 11/2/2015 | Arendtsville |
| PA37 | MDN | 11/20/2015 | Waynesburg |
| PA83 | NTN | 11/24/2015 | Laurel Hill State Park |
| TN11 | MDN/NTN | 11/3/2015 | Great Smoky Mountains National Park-Elkmont |
| VA13 | AMoN | 11/19/2015 | Horton Station |
| WV05 | AMoN/NTN | 11/22/2015 | Cedar Creek State Park |
| WV18 | NTN | 11/23/2015 | Parsons |
| NC17 | MDN/NTN | 12/1/2015 | University Research Farm |
| NC26 | AMoN/MDN | 12/1/2015 | Candor |

## 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*

*WFM105-Eric Hebert-10/01/2015*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 10/1/2015 | DAS | Campbell | none | CR850 | 23270 |
| 2 | 10/1/2015 | elevation | Elevation | none | none | none |
| 3 | 10/1/2015 | Filter pack flow pump | Permotec | none | BL30EB | Illegible |
| 4 | 10/1/2015 | Flow Rate | Apex | 000668 | AXMC105LPMDPCV | illegible |
| 5 | 10/1/2015 | Infrastructure | Infrastructure | none | none | none |
| 6 | 10/1/2015 | Modem | Sierra wireless | 06983 | unknown | unknown |
| 7 | 10/1/2015 | Sample Tower | Aluma Tower | 000748 | B | AT-212125X75 |
| 8 | 10/1/2015 | siting criteria | Siting Criteria | none | none | None |
| 9 | 10/1/2015 | Temperature | RM Young | 04683 | 41342VC | 6697 |

# Flow Data Form

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | illegible | WFM105 | Eric Hebert | 10/01/2015 | Flow Rate | 000668 |

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

**DAS 1:**

| A Avg % Diff: | A Max % Di |
|---|---|
| 0.44% | 0.67% |

**DAS 2:**

| A Avg %Dif | A Max % Di |
|---|---|
| | |

**Cal Factor Zero** -0.136

**Cal Factor Full Scale** 0.919

**Rotometer Reading:** 3

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.14 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | -0.13 | l/m | l/m | |
| primary | test pt 1 | 3.018 | 3.010 | 3.00 | 0.000 | 3.02 | l/m | l/m | 0.33% |
| primary | test pt 2 | 3.031 | 3.030 | 3.00 | 0.000 | 3.02 | l/m | l/m | -0.33% |
| primary | test pt 3 | 3.007 | 3.000 | 3.00 | 0.000 | 3.02 | l/m | l/m | 0.67% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | -1.0 cm | **Status** | Fail |
| **Sensor Component** | Filter Azimuth | **Condition** | 270 deg | **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 | 6697 | WFM105 | Eric Hebert | 10/01/2015 | Temperature | 04683 |

**Mfg** Extech
**Parameter** Temperature
**Serial Number** H232679
**Tfer Desc.** RTD
**Tfer ID** 01228
**Slope** 1.00564
**Intercept** -0.21981
**Cert Date** 1/30/2015
**CorrCoff** 1.00000

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **Abs Avg Err** | **Abs Max Er** | **Abs Avg Err** | **Abs Max Er** |
| 0.35 | 0.44 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 17.13 | 17.25 | 0.000 | 17.0 | C | -0.26 |
| primary | Temp High Range | 39.70 | 39.70 | 0.000 | 39.3 | C | -0.44 |

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

## Infrastructure Data For

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

| Shelter Make | Shelter Model | Shelter Size |
|---|---|---|
| | | |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Tower Type | **Condition** | Type B | **Status** | pass |
| **Sensor Component** | Conduit | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Met Tower | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Moisture Trap | **Condition** | Not installed | **Status** | pass |
| **Sensor Component** | Power Cables | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Temp Control | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Rotometer | **Condition** | Installed | **Status** | pass |
| **Sensor Component** | Sample Tower | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Condition | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Shelter Door | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Shelter Roof | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Shelter Floor | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Signal Cable | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Tubing Type | **Condition** | 3/8 Bevline | **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 | WFM105 | Eric Hebert | 10/01/2015 | Filter Position | Apex | 4110 | ☐ | ☑ |

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:** DasComments

Single tower, with filter pack at 10 meters and temperature at 9 meters.

2 **Parameter:** DocumentationCo

There is no logbook present to record the status of the site equipment or filter information.

3 **Parameter:** SitingCriteriaCom

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

4 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.  Equipment housed in enclosure on sample tower.

# Field Systems Data Form

# F-02058-1500-S1-rev002

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | | |
| **Operating Group** | SUNY | **Map Scale** | | |
| **AQS #** | | **Map Date** | | |
| **Meteorological Type** | | | | |
| **Air Pollutant Analyzer** | | **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** | | **Audit Latitude** | | 44.39322 |
| **Site Address 1** | | **Audit Longitude** | | -73.85874 |
| **Site Address 2** | | **Audit Elevation** | | 608 |
| **County** | | **Audit Declination** | | |
| **City, State** | Wilmington, NY | | **Present** | |
| **Zip Code** | 12997 | **Fire Extinguisher** | ☐ | |
| **Time Zone** | Eastern | **First Aid Kit** | ☐ | |
| **Primary Operator** | | **Safety Glasses** | ☐ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☐ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☐ | |
| **Backup Operator** | | **Security Fence** | ☐ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☐ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☐ | |

**Shelter Working Room** ☐ **Make** **Model** **Shelter Size**

**Shelter Clean** ☐ **Notes** Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

**Site OK** ☑ **Notes**

**Driving Directions**

# Field Systems Data Form

F-02058-1500-S2-rev002

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | | ☑ |
| Limited agricultural operations | 200 m | | ☑ |
| Large parking lot | 200 m | | ☑ |
| Small parking lot | 100 m | 75 m | ☐ |
| Tree line | 50 m | 25 m | ☐ |
| Obstacles to wind | 10 times obstacle height | | ☑ |

**Siting Distances OK** ☑

**Siting Criteria Comment**

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

# Field Systems Data Form

**F-02058-1500-S3-rev002**

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | N/A |
| 5 | Is the solar radiation sensor's lens clean and free of scratches? | ☑ | N/A |
| 6 | Is the surface wetness sensor grid clean and undamaged? | ☑ | N/A |
| 7 | Are the sensor signal and power cables intact, in good condition, and well maintained? | ☑ | |
| 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** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the analyzers and equipment appear to be in good condition and well maintained? | ☑ | |
| 2 | Are the analyzers and monitors operational, on-line, and reporting data? | ☑ | |
| 3 | Describe ozone sample tube. | | N/A |
| 4 | Describe dry dep sample tube. | | 3/8 Bevline by 10 meters |
| 5 | Are in-line filters used in the ozone sample line? (if yes indicate location) | ☑ | N/A |
| 6 | Are sample lines clean, free of kinks, moisture, and obstructions? | ☑ | |
| 7 | Is the zero air supply desiccant unsaturated? | ☑ | N/A |
| 8 | Are there moisture traps in the sample lines? | ☐ | Not present |
| 9 | Is there a rotometer in the dry deposition filter line, and is it clean? | ☑ | |

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** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the DAS instruments appear to be in good condition and well maintained? | ☑ | |
| 2 | Are all the components of the DAS operational? (printers, modem, backup, etc) | ☑ | |
| 3 | Do the analyzer and sensor signal leads pass through lightning protection circuitry? | ☑ | |
| 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? | ☐ | No |

| | | 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:**

Single tower, with filter pack at 10 meters and temperature at 9 meters.

# Field Systems Data Form

F-02058-1500-S7-rev002

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

| | Yes | No | N/A |
|---|---|---|---|
| Wind speed sensor | ☐ | ☐ | ☑ |
| Wind direction sensor | ☐ | ☐ | ☑ |
| Temperature sensor | ☐ | ☑ | ☐ |
| Relative humidity sensor | ☐ | ☐ | ☑ |
| Solar radiation sensor | ☐ | ☐ | ☑ |
| Surface wetness sensor | ☐ | ☐ | ☑ |
| Wind sensor translator | ☐ | ☐ | ☑ |
| Temperature translator | ☐ | ☐ | ☑ |
| Humidity sensor translator | ☐ | ☐ | ☑ |
| Solar radiation translator | ☐ | ☐ | ☑ |
| Tipping bucket rain gauge | ☐ | ☐ | ☑ |
| Ozone analyzer | ☐ | ☐ | ☑ |
| Filter pack flow controller | ☐ | ☑ | ☐ |
| Filter pack MFC power supply | ☐ | ☐ | ☑ |

| | Yes | No | N/A |
|---|---|---|---|
| Data logger | ☐ | ☑ | ☐ |
| Data logger | ☐ | ☐ | ☑ |
| Strip chart recorder | ☐ | ☐ | ☑ |
| Computer | ☐ | ☐ | ☑ |
| Modem | ☐ | ☑ | ☐ |
| Printer | ☐ | ☐ | ☑ |
| Zero air pump | ☐ | ☐ | ☑ |
| Filter flow pump | ☐ | ☑ | ☐ |
| Surge protector | ☐ | ☐ | ☑ |
| UPS | ☐ | ☐ | ☑ |
| Lightning protection device | ☐ | ☐ | ☑ |
| Shelter heater | ☐ | ☐ | ☑ |
| Shelter air conditioner | ☐ | ☐ | ☑ |

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☐ | No logbook | ☐ |
| 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? | ☐ | No logbook |
| 2 | Are the Site Status Report Forms being completed and current? | ☑ | |
| 3 | Are the chain-of-custody forms properly used to document sample transfer to and from lab? | ☑ | |
| 4 | Are ozone z/s/p control charts properly completed and current? | ☑ | N/A |

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

There is no logbook present to record the status of the site equipment or filter information.

# Field Systems Data Form

**F-02058-1500-S8-rev002**

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

## Site operation procedures

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

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

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

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

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

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

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

## Site operation procedures

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Filter changed mornings |
| 2 | Are the Site Status Report Forms being completed and filed correctly? | ☑ | |
| 3 | Are data downloads and backups being performed as scheduled? | ☑ | No longer required |
| 4 | Are general observations being made and recorded? How? | ☑ | SSRF |
| 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 | ☑ | 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 | ☑ | 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** WFM105 **Technician** Eric Hebert **Site Visit Date** 10/01/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| DAS | Campbell | CR850 | 23270 | none |
| elevation | Elevation | none | none | none |
| Filter pack flow pump | Permotec | BL30EB | Illegible | none |
| Flow Rate | Apex | AXMC105LPMDPC | illegible | 000668 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Sierra wireless | unknown | unknown | 06983 |
| Sample Tower | Aluma Tower | B | AT-212125X75 | 000748 |
| siting criteria | Siting Criteria | none | None | none |
| Temperature | RM Young | 41342VC | 6697 | 04683 |

# Site Inventory by Site Visit

*NIC001-Eric Hebert-10/02/2015*

| Site Visit | Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 10/2/2015 | DAS | Campbell | 000801 | CR850 | 23268 |
| 2 | 10/2/2015 | elevation | Elevation | none | none | none |
| 3 | 10/2/2015 | Filter pack flow pump | Permotec | none | BL30EB | Illegible |
| 4 | 10/2/2015 | Flow Rate | Apex | 000594 | AXMC105LPMDPCV | unknown |
| 5 | 10/2/2015 | Infrastructure | Infrastructure | none | none | none |
| 6 | 10/2/2015 | Sample Tower | Aluma Tower | 000785 | B | AT-212125X73 |
| 7 | 10/2/2015 | siting criteria | Siting Criteria | none | none | None |
| 8 | 10/2/2015 | Temperature | RM Young | 04943 | 41342 | none |

# Flow Data Form

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | unknown | NIC001 | Eric Hebert | 10/02/2015 | Flow Rate | 000594 |

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

**DAS 1:**

**DAS 2:**

| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
|---|---|---|---|
| 0.99% | 1.32% | | |

**Cal Factor Zero** -0.055
**Cal Factor Full Scale** 0.964
**Rotometer Reading:** 2.95

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignal | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.06 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | -0.06 | l/m | l/m | |
| primary | test pt 1 | 3.039 | 3.040 | 3.00 | 0.000 | 3.00 | l/m | l/m | -1.32% |
| primary | test pt 2 | 3.032 | 3.030 | 3.00 | 0.000 | 3.00 | l/m | l/m | -0.99% |
| primary | test pt 3 | 3.021 | 3.020 | 3.00 | 0.000 | 3.00 | l/m | l/m | -0.66% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 3.5 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | -1.0 cm | **Status** | Fail |
| **Sensor Component** | Filter Azimuth | **Condition** | 235 deg | **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 | none | NIC001 | Eric Hebert | 10/02/2015 | Temperature | 04943 |

**Mfg** Extech **Parameter** Temperature

**Serial Number** H232679 **Tfer Desc.** RTD

**Tfer ID** 01228

**Slope** 1.00564 **Intercept** -0.21981

**Cert Date** 1/30/2015 **CorrCoff** 1.00000

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| 0.18 | 0.26 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | -0.09 | 0.13 | 0.000 | 0.1 | C | -0.08 |
| primary | Temp Mid Range | 22.01 | 22.11 | 0.000 | 21.9 | C | -0.26 |
| primary | Temp High Range | 42.17 | 42.15 | 0.000 | 42.0 | C | -0.2 |

**Sensor Component** Shield **Condition** Moderately clean **Status** pass

**Sensor Component** Blower **Condition** N/A **Status** pass

**Sensor Component** Blower Status Switch **Condition** N/A **Status** pass

**Sensor Component** System Memo **Condition** **Status** pass

## Infrastructure Data For

| | | | | | |
|---|---|---|---|---|---|
| **Site ID** | NIC001 | **Technician** | Eric Hebert | **Site Visit Date** | 10/02/2015 |

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| | | |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Tower Type | **Condition** | Type B | **Status** | pass |
| **Sensor Component** | Conduit | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Met Tower | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Moisture Trap | **Condition** | Not installed | **Status** | pass |
| **Sensor Component** | Power Cables | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Temp Control | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Rotometer | **Condition** | Installed | **Status** | pass |
| **Sensor Component** | Sample Tower | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Condition | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Shelter Door | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Shelter Roof | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Shelter Floor | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Signal Cable | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Tubing Type | **Condition** | 3/8 Bevline | **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 | NIC001 | Eric Hebert | 10/02/2015 | Filter Position | Apex | 3963 | ☐ | ☑ |

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:** DasComments

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters.

2 **Parameter:** DocumentationCo

There is no logbook onsite to record information regarding site status or filter information.

3 **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.  Equipment housed in enclosure on sample tower.

# Field Systems Data Form

F-02058-1500-S1-rev002

| | | | | | |
|---|---|---|---|---|---|
| **Site ID** | NIC001 | **Technician** | Eric Hebert | **Site Visit Date** | 10/02/2015 |

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | | |
| **Operating Group** | NY DEC | **Map Scale** | | |
| **AQS #** | | **Map Date** | | |
| **Meteorological Type** | | | | |
| **Air Pollutant Analyzer** | | **QAPP Latitude** | | |
| **Deposition Measurement** | dry | **QAPP Longitude** | | |
| **Land Use** | Woodland - mixed | **QAPP Elevation Meters** | | |
| **Terrain** | Complex | **QAPP Declination** | | |
| **Conforms to MLM** | No | **QAPP Declination Date** | | |
| **Site Telephone** | | **Audit Latitude** | | 43.68596 |
| **Site Address 1** | | **Audit Longitude** | | -74.9857 |
| **Site Address 2** | | **Audit Elevation** | | 526 |
| **County** | Herkimer | **Audit Declination** | | |
| **City, State** | Old Forge, NY | | **Present** | |
| **Zip Code** | 13420 | **Fire Extinguisher** | ☐ | |
| **Time Zone** | Eastern | **First Aid Kit** | ☐ | |
| **Primary Operator** | | **Safety Glasses** | ☐ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☐ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☐ | |
| **Backup Operator** | | **Security Fence** | ☐ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☐ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☐ | |

**Shelter Working Room** ☐ **Make** **Model** **Shelter Size**

**Shelter Clean** ☐ **Notes** Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

**Site OK** ☐ **Notes**

**Driving Directions**

# Field Systems Data Form

F-02058-1500-S2-rev002

**Site ID** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | | ☑ |
| Limited agricultural operations | 200 m | | ☑ |
| Large parking lot | 200 m | | ☑ |
| Small parking lot | 100 m | 20 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** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

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

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

# Field Systems Data Form

# F-02058-1500-S4-rev002

**Site ID** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | N/A |
| 5 | Is the solar radiation sensor's lens clean and free of scratches? | ☑ | N/A |
| 6 | Is the surface wetness sensor grid clean and undamaged? | ☑ | N/A |
| 7 | Are the sensor signal and power cables intact, in good condition, and well maintained? | ☑ | |
| 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** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the analyzers and equipment appear to be in good condition and well maintained? | ☑ | |
| 2 | Are the analyzers and monitors operational, on-line, and reporting data? | ☑ | |
| 3 | Describe ozone sample tube. | | N/A |
| 4 | Describe dry dep sample tube. | | 3/8 Bevline by 10 meters |
| 5 | Are in-line filters used in the ozone sample line? (if yes indicate location) | ☑ | N/A |
| 6 | Are sample lines clean, free of kinks, moisture, and obstructions? | ☑ | |
| 7 | Is the zero air supply desiccant unsaturated? | ☑ | N/A |
| 8 | Are there moisture traps in the sample lines? | ☐ | Not present |
| 9 | Is there a rotometer in the dry deposition filter line, and is it clean? | ☑ | |

**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** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the DAS instruments appear to be in good condition and well maintained? | ☑ | |
| 2 | Are all the components of the DAS operational? (printers, modem, backup, etc) | ☑ | |
| 3 | Do the analyzer and sensor signal leads pass through lightning protection circuitry? | ☑ | |
| 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? | ☑ | N/A |

| | | 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:**

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters.

# Field Systems Data Form

**F-02058-1500-S7-rev002**

**Site ID** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

## Documentation

**Does the site have the required instrument and equipment manuals?**

| | Yes | No | N/A |
|---|---|---|---|
| Wind speed sensor | ☐ | ☐ | ☑ |
| Wind direction sensor | ☐ | ☐ | ☑ |
| Temperature sensor | ☐ | ☑ | ☐ |
| Relative humidity sensor | ☐ | ☐ | ☑ |
| Solar radiation sensor | ☐ | ☐ | ☑ |
| Surface wetness sensor | ☐ | ☐ | ☑ |
| Wind sensor translator | ☐ | ☐ | ☑ |
| Temperature translator | ☐ | ☐ | ☑ |
| Humidity sensor translator | ☐ | ☐ | ☑ |
| Solar radiation translator | ☐ | ☐ | ☑ |
| Tipping bucket rain gauge | ☐ | ☐ | ☑ |
| Ozone analyzer | ☐ | ☐ | ☑ |
| Filter pack flow controller | ☐ | ☑ | ☐ |
| Filter pack MFC power supply | ☐ | ☐ | ☑ |

| | Yes | No | N/A |
|---|---|---|---|
| Data logger | ☐ | ☑ | ☐ |
| Data logger | ☐ | ☐ | ☑ |
| Strip chart recorder | ☐ | ☐ | ☑ |
| Computer | ☐ | ☐ | ☑ |
| Modem | ☐ | ☑ | ☐ |
| Printer | ☐ | ☐ | ☑ |
| Zero air pump | ☐ | ☐ | ☑ |
| Filter flow pump | ☐ | ☑ | ☐ |
| Surge protector | ☐ | ☐ | ☑ |
| UPS | ☐ | ☐ | ☑ |
| Lightning protection device | ☐ | ☐ | ☑ |
| Shelter heater | ☐ | ☐ | ☑ |
| Shelter air conditioner | ☐ | ☐ | ☑ |

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☐ | No logbook | ☐ |
| 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? | ☐ | No logbook |
| 2 | Are the Site Status Report Forms being completed and current? | ☑ | |
| 3 | Are the chain-of-custody forms properly used to document sample transfer to and from lab? | ☑ | |
| 4 | Are ozone z/s/p control charts properly completed and current? | ☑ | N/A |

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

There is no logbook onsite to record information regarding site status or filter information.

# Field Systems Data Form

**F-02058-1500-S8-rev002**

**Site ID** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

## Site operation procedures

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

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

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

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

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

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

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

## Site operation procedures

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Filter changed mornings |
| 2 | Are the Site Status Report Forms being completed and filed correctly? | ☑ | |
| 3 | Are data downloads and backups being performed as scheduled? | ☑ | No longer required |
| 4 | Are general observations being made and recorded? How? | ☑ | SSRF |
| 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 | ☑ | 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 | ☑ | 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** NIC001 **Technician** Eric Hebert **Site Visit Date** 10/02/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| DAS | Campbell | CR850 | 23268 | 000801 |
| elevation | Elevation | none | none | none |
| Filter pack flow pump | Permotec | BL30EB | Illegible | none |
| Flow Rate | Apex | AXMC105LPMDPC | unknown | 000594 |
| Infrastructure | Infrastructure | none | none | none |
| Sample Tower | Aluma Tower | B | AT-212125X73 | 000785 |
| siting criteria | Siting Criteria | none | None | none |
| Temperature | RM Young | 41342 | none | 04943 |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *UND002-Eric Hebert-10/05/2015* | | | | | | |
| 1 | 10/5/2015 | DAS | Campbell | none | CR850 | 23269 |
| 2 | 10/5/2015 | elevation | Elevation | none | none | none |
| 3 | 10/5/2015 | Filter pack flow pump | Permotec | none | BL30EB | Illegible |
| 4 | 10/5/2015 | Flow Rate | Apex | 000658 | AXMC105LPMDPCV | unknown |
| 5 | 10/5/2015 | Infrastructure | Infrastructure | none | none | none |
| 6 | 10/5/2015 | Modem | Sierra wireless | 06982 | unknown | unknown |
| 7 | 10/5/2015 | Sample Tower | Aluma Tower | 000778 | B | AT-212125X77 |
| 8 | 10/5/2015 | siting criteria | Siting Criteria | none | none | None |
| 9 | 10/5/2015 | Temperature | RM Young | 04688 | 41342 | none |

# Flow Data Form

| Mfg | Serial Number Ta | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | unknown | UND002 | Eric Hebert | 10/05/2015 | Flow Rate | 000658 |

**Mfg** BIOS

**Parameter** Flow Rate

**Serial Number** 131818

**Tfer Desc.** BIOS 220-H

**Tfer ID** 01417

**Slope** 1.00316

**Intercept** -0.00540

**Cert Date** 1/7/2015

**CorrCoff** 1.00000

**DAS 1:**

| A Avg % Diff: | A Max % Di |
|---|---|
| 0.09% | 0.23% |

**DAS 2:**

| A Avg %Dif | A Max % Di |
|---|---|
|  |  |

**Cal Factor Zero** -0.024

**Cal Factor Full Scale** 0.991

**Rotometer Reading:** 3

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignal | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.02 | l/m | l/m |  |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | -0.02 | l/m | l/m |  |
| primary | test pt 1 | 3.025 | 3.020 | 2.99 | 0.000 | 3.02 | l/m | l/m | -0.03% |
| primary | test pt 2 | 3.024 | 3.020 | 3.00 | 0.000 | 3.02 | l/m | l/m | 0.00% |
| primary | test pt 3 | 3.017 | 3.010 | 3.00 | 0.000 | 3.02 | l/m | l/m | 0.23% |

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| **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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 0.5 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 180 deg | **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 | none | UND002 | Eric Hebert | 10/05/2015 | Temperature | 04688 |

**Mfg** Extech

**Parameter** Temperature

**Serial Number** H232679

**Tfer Desc.** RTD

**Tfer ID** 01228

**Slope** 1.00564

**Intercept** -0.21981

**Cert Date** 1/30/2015

**CorrCoff** 1.00000

| DAS 1: |  | DAS 2: |  |
|---|---|---|---|
| Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| 0.35 | 0.44 |  |  |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | -0.17 | 0.05 | 0.000 | -0.3 | C | -0.34 |
| primary | Temp Mid Range | 23.89 | 23.97 | 0.000 | 23.7 | C | -0.27 |
| primary | Temp High Range | 43.70 | 43.67 | 0.000 | 43.2 | C | -0.44 |

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

## Infrastructure Data For

**Site ID** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

| Shelter Make | Shelter Model | Shelter Size |
|---|---|---|
| | | |

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

# Field Systems Comments

**1** **Parameter:** DasComments

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

**2** **Parameter:** DocumentationCo

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

**3** **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.  Equipment housed in enclosure on sample tower.

# Field Systems Data Form

**F-02058-1500-S1-rev002**

**Site ID** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | | |
| **Operating Group** | VT Monitoring Coop | **Map Scale** | | |
| **AQS #** | | **Map Date** | | |
| **Meteorological Type** | | | | |
| **Air Pollutant Analyzer** | | **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** | | **Audit Latitude** | | 44.52843 |
| **Site Address 1** | | **Audit Longitude** | | -72.86804 |
| **Site Address 2** | | **Audit Elevation** | | 402 |
| **County** | Chittenden | **Audit Declination** | | |
| **City, State** | Underhill Center, VT | | **Present** | |
| **Zip Code** | 05489 | **Fire Extinguisher** | ☐ | |
| **Time Zone** | Eastern | **First Aid Kit** | ☐ | |
| **Primary Operator** | | **Safety Glasses** | ☐ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☐ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☐ | |
| **Backup Operator** | | **Security Fence** | ☐ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☐ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☐ | |

**Shelter Working Room** ☐ **Make** **Model** **Shelter Size**

**Shelter Clean** ☐ **Notes** Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

**Site OK** ☑ **Notes**

**Driving Directions**

# Field Systems Data Form

# F-02058-1500-S2-rev002

**Site ID** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | | ☑ |
| Limited agricultural operations | 200 m | | ☑ |
| Large parking lot | 200 m | | ☑ |
| Small parking lot | 100 m | | ☑ |
| Tree line | 50 m | 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** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** UND002

**Technician** Eric Hebert

**Site Visit Date** 10/05/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | N/A |
| 5 | Is the solar radiation sensor's lens clean and free of scratches? | ☑ | N/A |
| 6 | Is the surface wetness sensor grid clean and undamaged? | ☑ | N/A |
| 7 | Are the sensor signal and power cables intact, in good condition, and well maintained? | ☑ | |
| 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** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the analyzers and equipment appear to be in good condition and well maintained? | ☑ | |
| 2 | Are the analyzers and monitors operational, on-line, and reporting data? | ☑ | |
| 3 | Describe ozone sample tube. | | N/A |
| 4 | Describe dry dep sample tube. | | 3/8 Bevline by 10 meters |
| 5 | Are in-line filters used in the ozone sample line? (if yes indicate location) | ☑ | N/A |
| 6 | Are sample lines clean, free of kinks, moisture, and obstructions? | ☑ | |
| 7 | Is the zero air supply desiccant unsaturated? | ☑ | N/A |
| 8 | Are there moisture traps in the sample lines? | ☐ | Not present |
| 9 | Is there a rotometer in the dry deposition filter line, and is it clean? | ☑ | |

**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** UND002

**Technician** Eric Hebert

**Site Visit Date** 10/05/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the DAS instruments appear to be in good condition and well maintained? | ☑ | |
| 2 | Are all the components of the DAS operational? (printers, modem, backup, etc) | ☑ | |
| 3 | Do the analyzer and sensor signal leads pass through lightning protection circuitry? | ☑ | |
| 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? | ☑ | N/A |

| | | 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:**

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

# Field Systems Data Form

**F-02058-1500-S7-rev002**

**Site ID** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

| | Yes | No | N/A |
|---|---|---|---|
| Wind speed sensor | ☐ | ☐ | ☑ |
| Wind direction sensor | ☐ | ☐ | ☑ |
| Temperature sensor | ☐ | ☑ | ☐ |
| Relative humidity sensor | ☐ | ☐ | ☑ |
| Solar radiation sensor | ☐ | ☐ | ☑ |
| Surface wetness sensor | ☐ | ☐ | ☑ |
| Wind sensor translator | ☐ | ☐ | ☑ |
| Temperature translator | ☐ | ☐ | ☑ |
| Humidity sensor translator | ☐ | ☐ | ☑ |
| Solar radiation translator | ☐ | ☐ | ☑ |
| Tipping bucket rain gauge | ☐ | ☐ | ☑ |
| Ozone analyzer | ☐ | ☐ | ☑ |
| Filter pack flow controller | ☐ | ☑ | ☐ |
| Filter pack MFC power supply | ☐ | ☐ | ☑ |

| | Yes | No | N/A |
|---|---|---|---|
| Data logger | ☐ | ☑ | ☐ |
| Data logger | ☐ | ☐ | ☑ |
| Strip chart recorder | ☐ | ☐ | ☑ |
| Computer | ☐ | ☐ | ☑ |
| Modem | ☐ | ☑ | ☐ |
| Printer | ☐ | ☐ | ☑ |
| Zero air pump | ☐ | ☐ | ☑ |
| Filter flow pump | ☐ | ☑ | ☐ |
| Surge protector | ☐ | ☐ | ☑ |
| UPS | ☐ | ☐ | ☑ |
| Lightning protection device | ☐ | ☐ | ☑ |
| Shelter heater | ☐ | ☐ | ☑ |
| Shelter air conditioner | ☐ | ☐ | ☑ |

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| 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? | ☑ | |
| 3 | Are the chain-of-custody forms properly used to document sample transfer to and from lab? | ☑ | |
| 4 | Are ozone z/s/p control charts properly completed and current? | ☑ | N/A |

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

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

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

**Site ID** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

## Site operation procedures

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

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

| QC Check Performed | | Frequency | Compliant |
|---|---|---|---|
| Multipoint Calibrations | ☑ | N/A | ☑ |
| Visual Inspections | ☑ | 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 | ☐ | N/A | ☑ |
| Automatic Zero/Span Tests | ☐ | N/A | ☑ |
| Manual Zero/Span Tests | ☐ | N/A | ☑ |
| Automatic Precision Level Tests | ☐ | N/A | ☑ |
| Manual Precision Level Test | ☐ | N/A | ☑ |
| Analyzer Diagnostics Tests | ☐ | N/A | ☑ |
| In-line Filter Replacement (at inlet) | ☐ | N/A | ☑ |
| In-line Filter Replacement (at analyze | ☐ | N/A | ☑ |
| Sample Line Check for Dirt/Water | ☐ | N/A | ☑ |
| Zero Air Desiccant Check | ☐ | N/A | ☑ |

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

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

## Site operation procedures

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Filter changed mornings |
| 2 | Are the Site Status Report Forms being completed and filed correctly? | ☑ | |
| 3 | Are data downloads and backups being performed as scheduled? | ☑ | No longer required |
| 4 | Are general observations being made and recorded? How? | ☑ | SSRF |
| 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 | ☑ | 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** UND002 **Technician** Eric Hebert **Site Visit Date** 10/05/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| DAS | Campbell | CR850 | 23269 | none |
| elevation | Elevation | none | none | none |
| Filter pack flow pump | Permotec | BL30EB | Illegible | none |
| Flow Rate | Apex | AXMC105LPMDPC | unknown | 000658 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Sierra wireless | unknown | unknown | 06982 |
| Sample Tower | Aluma Tower | B | AT-212125X77 | 000778 |
| siting criteria | Siting Criteria | none | None | none |
| Temperature | RM Young | 41342 | none | 04688 |

# Site Inventory by Site Visit

## GRS420-Eric Hebert-10/26/2015

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 10/26/2015 | Computer | Hewlett Packard | none | 6730b | USH01700BY |
| 2 | 10/26/2015 | DAS | Environmental Sys Corp | none | 8832 | A4115K |
| 3 | 10/26/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 10/26/2015 | Filter pack flow pump | Thomas | none | 107CA18 | 0191007233 |
| 5 | 10/26/2015 | flow rate | Tylan | none | FC280SAV | AW9706012 |
| 6 | 10/26/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 10/26/2015 | Met tower | Rohn | none | unknown | none |
| 8 | 10/26/2015 | MFC power supply | Tylan | 03944 | RO-32 | FP9605010 |
| 9 | 10/26/2015 | Modem | US Robotics | none | V.92 | unknown |
| 10 | 10/26/2015 | Ozone | ThermoElectron Inc | none | 49i A3NAA | 1023943903 |
| 11 | 10/26/2015 | Ozone Standard | ThermoElectron Inc | none | 49i A1NAA | 1130450193 |
| 12 | 10/26/2015 | Sample Tower | Aluma Tower | 90945 | B | none |
| 13 | 10/26/2015 | Shelter Temperature | ARS | none | none | none |
| 14 | 10/26/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 15 | 10/26/2015 | Temperature | RM Young | none | 41342 | 7297 |
| 16 | 10/26/2015 | Zero air pump | Werther International | none | PC70/4 | 531385 |

# DAS Data Form

**DAS Time Max Error:** 0.05

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Environmental Sys | A4115K | GRS420 | Eric Hebert | 10/26/2015 | DAS | Primary |

**Das Date:** 10/26/2015
**Das Time:** 9:53:00
**Das Day:** 299

**Audit Date** 10/26/2015
**Audit Time** 9:53:03
**Audit Day** 299

**Low Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0001

**High Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0001

**Mfg** Datel
**Parameter** DAS
**Serial Number** 4000392
**Tfer Desc.** Source generator (D
**Tfer ID** 01321
**Slope** 1.00000
**Intercept** 0.00000
**Cert Date** 1/22/2015
**CorrCoff** 1.00000

**Mfg** Fluke
**Parameter** DAS
**Serial Number** 86590148
**Tfer Desc.** DVM
**Tfer ID** 01310
**Slope** 1.00000
**Intercept** 0.00000
**Cert Date** 1/22/2015
**CorrCoff** 1.00000

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 2 | 0.0000 | 0.0000 | 0.0000 | V | V | 0.0000 |
| 2 | 0.1000 | 0.1000 | 0.1000 | V | V | 0.0000 |
| 2 | 0.3000 | 0.3000 | 0.3000 | V | V | 0.0000 |
| 2 | 0.5000 | 0.5000 | 0.5000 | V | V | 0.0000 |
| 2 | 0.7000 | 0.7000 | 0.7000 | V | V | 0.0000 |
| 2 | 0.9000 | 0.9000 | 0.9001 | V | V | 0.0001 |
| 2 | 1.0000 | 1.0000 | 1.0001 | V | V | 0.0001 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Tylan | AW9706012 | GRS420 | Eric Hebert | 10/26/2015 | flow rate | none |

|  |  |  |
|---|---|---|
| **Mfg** | Tylan | |
| **SN/Owner ID** | FP9605010 | 03944 |
| **Parameter** | MFC power supply | |

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

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 1.04% | 1.48% | | |

|  |  |
|---|---|
| **Cal Factor Zero** | 0.458 |
| **Cal Factor Full Scale** | 5.381 |
| **Rotometer Reading:** | 3 |

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | -0.34 | -0.3060 | 0.16 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | -0.34 | -0.3060 | 0.16 | l/m | l/m | |
| primary | test pt 1 | 3.054 | 3.050 | 2.58 | 2.5870 | 3.01 | l/m | l/m | -1.48% |
| primary | test pt 2 | 3.039 | 3.030 | 2.58 | 2.5870 | 3.00 | l/m | l/m | -0.86% |
| primary | test pt 3 | 3.032 | 3.030 | 2.58 | 2.5870 | 3.01 | l/m | l/m | -0.79% |

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| **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** | See comments | **Status** | pass |
| **Sensor Component** | Filter Distance | **Condition** | 5.0 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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1023943903 | GRS420 | Eric Hebert | 10/26/2015 | Ozone | none |

| | | | |
|---|---|---|---|
| **Slope:** | 0.97926 | **Slope:** | 0.00000 |
| **Intercept** | -0.35728 | **Intercept** | 0.00000 |
| **CorrCoff** | 1.00000 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 2.8% | 3.6% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.41 | 0.61 | 0.27 | ppb | |
| primary | 2 | 27.41 | 27.31 | 26.34 | ppb | -3.55% |
| primary | 3 | 55.36 | 54.95 | 53.45 | ppb | -2.73% |
| primary | 4 | 78.56 | 77.89 | 75.94 | ppb | -2.50% |
| primary | 5 | 104.57 | 103.61 | 101.10 | ppb | -2.42% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.000 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.000 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | 0.0001 | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | 1.000 | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 86.4 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.69 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 689.1 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 31.9 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 85.7 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | 688.2 mmHg | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 7297 | GRS420 | Eric Hebert | 10/26/2015 | Temperature | none |

**Mfg** Fluke

**Parameter** Temperature

**Serial Number** 2085085

**Tfer Desc.** RTD

**Tfer ID** 01226

**Slope** 1.00105

**Intercept** -0.07989

**Cert Date** 1/30/2015

**CorrCoff** 1.00000

| **DAS 1:** |  | **DAS 2:** |  |
|---|---|---|---|
| **Abs Avg Err** | **Abs Max Er** | **Abs Avg Err** | **Abs Max Er** |
| 0.15 | 0.23 |  |  |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.04 | 0.12 | 0.0000 | 0.2 | C | 0.12 |
| primary | Temp Mid Range | 24.78 | 24.83 | 0.0000 | 24.7 | C | -0.09 |
| primary | Temp High Range | 47.31 | 47.34 | 0.0000 | 47.1 | C | -0.23 |

**Sensor Component** Shield **Condition** Moderately 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** See comments **Status** pass

# Shelter Temperature Data For

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ARS | none | GRS420 | Eric Hebert | 10/26/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.25 | 0.47 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

| | | | |
|---|---|---|---|
| **Mfg** | Fluke | **Parameter** | Shelter Temperatur |
| **Serial Number** | 2085085 | **Tfer Desc.** | RTD |
| **Tfer ID** | 01226 | | |
| **Slope** | 1.00105 | **Intercept** | -0.07989 |
| **Cert Date** | 1/30/2015 | **CorrCoff** | 1.00000 |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 22.71 | 22.77 | 0.000 | 22.3 | C | -0.47 |
| primary | Temp Mid Range | 21.96 | 22.02 | 0.000 | 22.1 | C | 0.03 |

## Infrastructure Data For

**Site ID** GRS420 **Technicia** Eric Hebert **Site Visit Date** 10/26/2015

| Shelter Make | Shelter Model | Shelter Size |
|---|---|---|
| Ekto | 8810 (s/n 2961-1) | 640 cuft |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Tower Type | **Condition** | Type B | **Status** | pass |
| **Sensor Component** | Conduit | **Condition** | Good | **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** | Good | **Status** | pass |
| **Sensor Component** | Shelter Condition | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Door | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Roof | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Floor | **Condition** | Fair | **Status** | pass |
| **Sensor Component** | Signal Cable | **Condition** | Fair | **Status** | pass |
| **Sensor Component** | Tubing Type | **Condition** | 3/8 teflon | **Status** | pass |
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |

# Site Visit Comments

| Parameter | Site | Technician | S.V. Date | Component | Mfg | Serial No. | Hazard | Problem |
|---|---|---|---|---|---|---|---|---|
| Flow Rate | GRS420 | Eric Hebert | 10/26/2015 | Moisture Present | Tylan | 648 | ☐ | ☐ |

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

# Field Systems Data Form F-02058-1500-S1-rev002

**Site ID** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | NPS | **USGS Map** | | Blockhouse |
| **Operating Group** | NPS | **Map Scale** | | |
| **AQS #** | 47-009-0101 | **Map Date** | | |
| **Meteorological Type** | R.M. Young | | | |
| **Air Pollutant Analyzer** | Ozone, Hg, SO2, NOx, PM2.5, PM10, | **QAPP Latitude** | | 35.6331 |
| **Deposition Measurement** | dry | **QAPP Longitude** | | -83.9422 |
| **Land Use** | woodland - mixed | **QAPP Elevation Meters** | | 793 |
| **Terrain** | complex (ridge-top) | **QAPP Declination** | | |
| **Conforms to MLM** | No | **QAPP Declination Date** | | |
| **Site Telephone** | | **Audit Latitude** | | 35.633482 |
| **Site Address 1** | Look Rock | **Audit Longitude** | | -83.941606 |
| **Site Address 2** | Foothills Parkway | **Audit Elevation** | | 801 |
| **County** | Blount | **Audit Declination** | | 5.5 |
| **City, State** | Maryville, TN | | **Present** | |
| **Zip Code** | 37803 | **Fire Extinguisher** | ☑ | inspected Sept 2015 |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☑ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☑ | |
| **Backup Operator** | | **Security Fence** | ☑ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☑ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8810 (s/n 2961-1) **Shelter Size** 640 cuft

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

**Site OK** ☑ **Notes**

**Driving Directions** From Maryville proceed east on 321 and turn right (south) onto the Foothills Parkway. Continue approximately 11 miles. Just before reaching the Look Rock parking area and trail, turn right on a gravel road through a locked NPS gate. The site is approximately 200 meters up the trail on the right.

# Field Systems Data Form

F-02058-1500-S2-rev002

**Site ID** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

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

**Siting Distances OK** ☐

**Siting Criteria Comment**

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

# Field Systems Data Form

**F-02058-1500-S3-rev002**

**Site ID** GRS420

**Technician** Eric Hebert

**Site Visit Date** 10/26/2015

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

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

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground. Previously recorded temperature data are not comparable to current data labeled as temperature.

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | |
| 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** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☑ | ☑ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☑ |

11 Tower comments? Sample tower grounded to shelter, and slightly bent at hinge.

**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** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | Dataview | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☑ | | ☑ |
| HASP | ☑ | | ☑ |
| Field Ops Manual | ☑ | | ☑ |
| Calibration Reports | ☑ | 4/30/2015 | ☑ |
| 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** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

## Site operation procedures

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

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

| QC Check Performed | | Frequency | Compliant |
|---|---|---|---|
| Multipoint Calibrations | ☑ | Semiannually | ☑ |
| Visual Inspections | ☑ | 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 | ☑ | Weekly | ☑ |
| Automatic Precision Level Tests | ☑ | Daily | ☑ |
| Manual Precision Level Test | ☐ | | ☑ |
| Analyzer Diagnostics Tests | ☑ | Alarm values only | ☑ |
| In-line Filter Replacement (at inlet) | ☑ | Weekly | ☑ |
| 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? | ☑ | |
| 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 ozone sample train is leak-tested each week after the inlet filter is changed.

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

## Site operation procedures

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Filter changed morinings in winter, changed in afternoon in summer |
| 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 | ☑ | Weekly | ☐ |

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

Site operation and filter handling has improved since the previous audit visit.

# Field Systems Data Form

# F-02058-1500-S10-rev002

**Site ID** GRS420 **Technician** Eric Hebert **Site Visit Date** 10/26/2015

## Site Visit Sensors

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Hewlett Packard | 6730b | USH01700BY | none |
| DAS | Environmental Sys Cor | 8832 | A4115K | none |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA18 | 0191007233 | none |
| flow rate | Tylan | FC280SAV | AW9706012 | none |
| Infrastructure | Infrastructure | none | none | none |
| Met tower | Rohn | unknown | none | none |
| MFC power supply | Tylan | RO-32 | FP9605010 | 03944 |
| Modem | US Robotics | V.92 | unknown | none |
| Ozone | ThermoElectron Inc | 49i A3NAA | 1023943903 | none |
| Ozone Standard | ThermoElectron Inc | 49i A1NAA | 1130450193 | none |
| Sample Tower | Aluma Tower | B | none | 90945 |
| Shelter Temperature | ARS | none | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342 | 7297 | none |
| Zero air pump | Werther International | PC70/4 | 531385 | none |

# *Site Inventory by Site Visit*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *LRL117-Sandy Grenville-11/01/2015* | | | | | | |
| 1 | 11/1/2015 | Computer | Dell | 07010 | D520 | unknown |
| 2 | 11/1/2015 | DAS | Campbell | 000344 | CR300 | 2123 |
| 3 | 11/1/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/1/2015 | Filter pack flow pump | Thomas | 01133 | 107CA18 | 1088003123 |
| 5 | 11/1/2015 | Flow Rate | Apex | 000460 | AXMC105LPMDPCV | 42229 |
| 6 | 11/1/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/1/2015 | Modem | Raven | 06383 | V4221-V | 0802325832 |
| 8 | 11/1/2015 | Ozone | ThermoElectron Inc | 000701 | 49i A1NAA | 1030244808 |
| 9 | 11/1/2015 | Ozone Standard | ThermoElectron Inc | 000444 | 49i A3NAA | CM08200020 |
| 10 | 11/1/2015 | Sample Tower | Aluma Tower | 03446 | A | none |
| 11 | 11/1/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 11/1/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/1/2015 | Temperature | RM Young | 06245 | 41342VC | 12792 |
| 14 | 11/1/2015 | Zero air pump | Werther International | 06904 | C 70/4 | 000821901 |

# DAS Data Form

**DAS Time Max Error:** 0.02

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 2123 | LRL117 | Sandy Grenville | 11/01/2015 | DAS | Primary |

**Das Date:** 11/1 /2015
**Das Time:** 10:51:00
**Das Day:** 305

**Audit Date** 11/1 /2015
**Audit Time** 10:51:01
**Audit Day** 305

**Low Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0000

**High Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0000

**Mfg** Datel
**Parameter** DAS
**Serial Number** 15510194
**Tfer Desc.** Source generator (D
**Tfer ID** 01320

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

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

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 42229 | LRL117 | Sandy Grenville | 11/01/2015 | Flow Rate | 000460 |

| | | | |
|---|---|---|---|
| **Mfg** | BIOS | **Parameter** | Flow Rate |
| **Serial Number** | 103471 | **Tfer Desc.** | nexus |
| **Tfer ID** | 01420 | | |
| **Slope** | 0.96664 | **Intercept** | 0.03078 |
| **Cert Date** | 2/5/2015 | **CorrCoff** | 0.99996 |
| **Mfg** | BIOS | **Parameter** | Flow Rate |
| **Serial Number** | 103424 | **Tfer Desc.** | BIOS cell |
| **Tfer ID** | 01410 | | |
| **Slope** | 0.96664 | **Intercept** | 0.03078 |
| **Cert Date** | 2/5/2015 | **CorrCoff** | 0.99996 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 6.05% | 6.25% | | |

| | |
|---|---|
| **Cal Factor Zero** | 0 |
| **Cal Factor Full Scale** | 0.98 |
| **Rotometer Reading:** | 1.5 |

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | 0.00 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | 0.00 | l/m | l/m | |
| primary | test pt 1 | 1.574 | 1.600 | 1.52 | 1.520 | 1.50 | l/m | l/m | -6.25% |
| primary | test pt 2 | 1.575 | 1.600 | 1.52 | 1.520 | 1.50 | l/m | l/m | -6.25% |
| primary | test pt 3 | 1.572 | 1.590 | 1.52 | 1.520 | 1.50 | l/m | l/m | -5.66% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 2.0 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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244808 | LRL117 | Sandy Grenville | 11/01/2015 | Ozone | 000701 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.99066 | **Slope:** | 0.00000 |
| **Intercept** | -1.30958 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99994 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 3.5% | 4.9% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.01 | 0.40 | -0.67 | ppb | |
| primary | 2 | 29.90 | 30.49 | 29.01 | ppb | -4.85% |
| primary | 3 | 49.94 | 50.66 | 48.58 | ppb | -4.11% |
| primary | 4 | 80.20 | 81.10 | 78.42 | ppb | -3.30% |
| primary | 5 | 109.60 | 110.69 | 108.90 | ppb | -1.62% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.10 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.011 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 108.5 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.2 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.67 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 693.7 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 32.3 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 94.3 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.2 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.72 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 12792 | LRL117 | Sandy Grenville | 11/01/2015 | Temperature | 06245 |

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

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **Abs Avg Err** | **Abs Max Er** | **Abs Avg Err** | **Abs Max Er** |
| 0.21 | 0.30 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.04 | 0.10 | 0.000 | 0.1 | C | 0.02 |
| primary | Temp Mid Range | 25.38 | 25.36 | 0.000 | 25.1 | C | -0.3 |
| primary | Temp High Range | 48.47 | 48.37 | 0.000 | 48.1 | C | -0.3 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Moderately clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | LRL117 | Sandy Grenville | 11/01/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.47 | 0.68 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 21.50 | 21.49 | 0.000 | 21.7 | C | 0.18 |
| primary | Temp Mid Range | 21.66 | 21.65 | 0.000 | 22.3 | C | 0.68 |
| primary | Temp Mid Range | 21.42 | 21.41 | 0.000 | 22.0 | C | 0.56 |

## Infrastructure Data For

**Site ID** LRL117 **Technicia** Sandy Grenville **Site Visit Date** 11/01/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 | 640 cuft |

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

# Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

3 **Parameter:** ShelterCleanNotes

The shelter has been repaired and is in very good condition. A new peaked roof has been installed.

# Field Systems Data Form

# F-02058-1500-S1-rev002

**Site ID** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

| | | | |
|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | |
| **Operating Group** | private/PADNR | **Map Scale** | |
| **AQS #** | 42-111-9991 | **Map Date** | |
| **Meteorological Type** | Climatronics | | |
| **Air Pollutant Analyzer** | Ozone | **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** | | **Audit Latitude** | 39.988309 |
| **Site Address 1** | Laurel Hill State Park | **Audit Longitude** | -79.251573 |
| **Site Address 2** | 1447 Laurel Hill State Park Rd. | **Audit Elevation** | 609 |
| **County** | | **Audit Declination** | -9 |

| | | | **Present** | |
|---|---|---|---|---|
| **City, State** | Somerset, PA | | | |
| **Zip Code** | 15501 | **Fire Extinguisher** | ☑ | No inspection date |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☑ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☐ | |
| **Backup Operator** | | **Security Fence** | ☐ | Locked gate |
| **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 has been repaired and is in very good condition. A new peaked roof has been installed.

**Site OK** ☑ **Notes**

**Driving Directions** From Somerset take 30 west

# Field Systems Data Form

**F-02058-1500-S2-rev002**

**Site ID** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | | ☑ |
| Limited agricultural operations | 200 m | | ☑ |
| Large parking lot | 200 m | | ☑ |
| Small parking lot | 100 m | | ☑ |
| Tree line | 50 m | 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** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

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

**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** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | **Is the met tower stable and grounded?** | ☐ | ☐ |
| 10 | **Is the sample tower stable and grounded?** | ☑ | ☐ |

11 **Tower comments?** Sample tower not grounded

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

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

# Field Systems Data Form

F-02058-1500-S7-rev002

**Site ID** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☐ | Not present | ☐ |
| HASP | ☐ | Not present | ☐ |
| 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? | ☑ | |
| 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** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

## Site operation procedures

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

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

| QC Check Performed |  | Frequency | Compliant |
|---|---|---|---|
| Multipoint Calibrations | ☑ | Semiannually | ☑ |
| Visual Inspections | ☑ | N/A | ☑ |
| Translator Zero/Span Tests (climatronics) | ☐ | N/A | ☑ |
| Manual Rain Gauge Test | ☑ | N/A | ☑ |
| Confirm Reasonableness of Current Values | ☑ | 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 | ☑ | Semiannually | ☑ |
| Automatic Zero/Span Tests | ☑ | Daily | ☑ |
| Manual Zero/Span Tests | ☐ |  | ☑ |
| Automatic Precision Level Tests | ☑ | Daily | ☑ |
| Manual Precision Level Test | ☐ |  | ☑ |
| Analyzer Diagnostics Tests | ☐ |  | ☐ |
| In-line Filter Replacement (at inlet) | ☑ | Every 2 weeks | ☑ |
| In-line Filter Replacement (at analyze | ☑ | N/A | ☑ |
| Sample Line Check for Dirt/Water | ☑ | Weekly | ☑ |
| Zero Air Desiccant Check | ☑ | Weekly | ☑ |

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

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

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** LRL117

**Technician** Sandy Grenville

**Site Visit Date** 11/01/2015

**Site operation procedures**

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

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

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

# Field Systems Data Form

F-02058-1500-S10-rev002

**Site ID** LRL117 **Technician** Sandy Grenville **Site Visit Date** 11/01/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | D520 | unknown | 07010 |
| DAS | Campbell | CR300 | 2123 | 000344 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA18 | 1088003123 | 01133 |
| Flow Rate | Apex | AXMC105LPMDPC | 42229 | 000460 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0802325832 | 06383 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1030244808 | 000701 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | CM08200020 | 000444 |
| Sample Tower | Aluma Tower | A | none | 03446 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342VC | 12792 | 06245 |
| Zero air pump | Werther International | C 70/4 | 000821901 | 06904 |

# Site Inventory by Site Visit

## SHN418-Eric Hebert-11/06/2015

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 11/6/2015 | Computer | Hewlett Packard | none | 8460p | CNU13607B3 |
| 2 | 11/6/2015 | DAS | Environmental Sys Corp | 90603 | 8816 | 2272 |
| 3 | 11/6/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/6/2015 | Filter pack flow pump | Thomas | 00443 | 107CA110 | 0288714888 |
| 5 | 11/6/2015 | flow rate | Tylan | 03942 | FC280 | AW9605202 |
| 6 | 11/6/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/6/2015 | MFC power supply | Tylan | 03485 | RO-32 | FP9404009 |
| 8 | 11/6/2015 | Ozone | ThermoElectron Inc | none | 49i A3NAA | 0903334535 |
| 9 | 11/6/2015 | Ozone Standard | ThermoElectron Inc | none | 49i A1NAA | CM08460009 |
| 10 | 11/6/2015 | Sample Tower | Aluma Tower | 923307 | B | none |
| 11 | 11/6/2015 | Shelter Temperature | ARS | none | none | none |
| 12 | 11/6/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/6/2015 | Temperature | RM Young | none | 41342VC | 14265 |
| 14 | 11/6/2015 | Zero air pump | Werther International | none | C 70/4 | 000855578 |

# DAS Data Form

**DAS Time Max Error:** 0.57

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Environmental Sys | 2272 | SHN418 | Eric Hebert | 11/06/2015 | DAS | Primary |

**Das Date:** 11/6 /2015
**Das Time:** 11:25:26
**Das Day:** 310

**Audit Date** 11/6 /2015
**Audit Time** 11:26:00
**Audit Day** 310

| Low Channel: | | High Channel: | |
|---|---|---|---|
| **Avg Diff:** | **Max Diff:** | **Avg Diff:** | **Max Diff:** |
| 0.0001 | 0.0003 | 0.0001 | 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** 1/22/2015
**CorrCoff** 1.00000

**Mfg** Fluke
**Parameter** DAS
**Serial Number** 86590148
**Tfer Desc.** DVM
**Tfer ID** 01310
**Slope** 1.00000
**Intercept** 0.00000
**Cert Date** 1/22/2015
**CorrCoff** 1.00000

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 2 | 0.0000 | 0.0000 | 0.0000 | V | V | 0.0000 |
| 2 | 0.1000 | 0.1000 | 0.1000 | V | V | 0.0000 |
| 2 | 0.3000 | 0.2999 | 0.3000 | V | V | 0.0001 |
| 2 | 0.5000 | 0.4999 | 0.5001 | V | V | 0.0002 |
| 2 | 0.7000 | 0.6999 | 0.7001 | V | V | 0.0002 |
| 2 | 0.9000 | 0.8999 | 0.9001 | V | V | 0.0002 |
| 2 | 1.0000 | 0.9999 | 1.0002 | V | V | 0.0003 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Tylan | AW9605202 | SHN418 | Eric Hebert | 11/06/2015 | flow rate | 03942 |

**Mfg** Tylan

**SN/Owner ID** FP9404009 03485

**Parameter** MFC power supply

**Mfg** BIOS

**Parameter** Flow Rate

**Serial Number** 131818

**Tfer Desc.** BIOS 220-H

**Tfer ID** 01417

**Slope** 1.00316

**Intercept** -0.00540

**Cert Date** 1/7/2015

**CorrCoff** 1.00000

| DAS 1: A Avg % Diff: | DAS 1: A Max % Di | DAS 2: A Avg %Dif | DAS 2: A Max % Di |
|---|---|---|---|
| 1.81% | 2.04% | | |

**Cal Factor Zero** -0.187

**Cal Factor Full Scale** 4.859

**Rotometer Reading:** 1.6

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.21 | 0.231 | 0.05 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.22 | 0.245 | 0.05 | l/m | l/m | |
| primary | test pt 1 | 1.473 | 1.470 | 1.66 | 1.673 | 1.50 | l/m | l/m | 2.04% |
| primary | test pt 2 | 1.477 | 1.480 | 1.66 | 1.673 | 1.50 | l/m | l/m | 1.35% |
| primary | test pt 3 | 1.472 | 1.470 | 1.66 | 1.673 | 1.50 | l/m | l/m | 2.04% |

| Sensor Component | | Condition | | Status | |
|---|---|---|---|---|---|
| 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 | See comments | Status | pass |
| Sensor Component | Filter Distance | Condition | 5.5 cm | Status | pass |
| Sensor Component | Filter Depth | Condition | -0.2 cm | Status | pass |
| Sensor Component | Filter Azimuth | Condition | 270 deg | Status | pass |
| Sensor Component | System Memo | Condition | See comments | Status | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 0903334535 | SHN418 | Eric Hebert | 11/06/2015 | Ozone | none |

| | | | |
|---|---|---|---|
| **Slope:** | 0.96564 | **Slope:** | 0.00000 |
| **Intercept** | -0.36003 | **Intercept** | 0.00000 |
| **CorrCoff** | 1.00000 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 4.1% | 4.6% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.46 | 0.66 | 0.28 | ppb | |
| primary | 2 | 26.77 | 26.68 | 25.46 | ppb | -4.57% |
| primary | 3 | 55.12 | 54.71 | 52.35 | ppb | -4.31% |
| primary | 4 | 82.08 | 81.37 | 78.27 | ppb | -3.81% |
| primary | 5 | 105.31 | 104.34 | 100.40 | ppb | -3.78% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.40 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.993 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | 0.0013 | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | 1.0010 | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 80.7 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.6 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.65 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 659.9 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 33.9 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 85.4 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.4 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.66 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 14265 | SHN418 | Eric Hebert | 11/06/2015 | Temperature | none |

| | | | |
|---|---|---|---|
| **Mfg** | Fluke | **Parameter** | Temperature |
| **Serial Number** | 2085085 | **Tfer Desc.** | RTD |
| **Tfer ID** | 01226 | | |
| **Slope** | 1.00105 | **Intercept** | -0.07989 |
| **Cert Date** | 1/30/2015 | **CorrCoff** | 1.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **Abs Avg Err** | **Abs Max Er** | **Abs Avg Err** | **Abs Max Er** |
| 0.14 | 0.22 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.13 | 0.21 | 0.000 | 0.2 | C | 0 |
| primary | Temp Mid Range | 29.95 | 30.00 | 0.000 | 29.8 | C | -0.22 |
| primary | Temp High Range | 43.75 | 43.78 | 0.000 | 43.6 | C | -0.2 |

| | | | | | |
|---|---|---|---|---|---|
| **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** | See comments | **Status** | pass |

# Shelter Temperature Data For

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ARS | none | SHN418 | Eric Hebert | 11/06/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.59 | 0.76 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

| | | | |
|---|---|---|---|
| **Mfg** | Fluke | **Parameter** | Shelter Temperatur |
| **Serial Number** | 2085085 | **Tfer Desc.** | RTD |
| **Tfer ID** | 01226 | | |
| **Slope** | 1.00105 | **Intercept** | -0.07989 |
| **Cert Date** | 1/30/2015 | **CorrCoff** | 1.00000 |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 25.04 | 25.09 | 0.000 | 24.7 | C | -0.42 |
| primary | Temp Mid Range | 25.38 | 25.43 | 0.000 | 24.9 | C | -0.58 |
| primary | Temp Mid Range | 23.45 | 23.51 | 0.000 | 24.3 | C | 0.76 |

## Infrastructure Data For

**Site ID** SHN418 **Technicia** Eric Hebert **Site Visit Date** 11/06/2015

| Shelter Make | Shelter Model | Shelter Size |
|---|---|---|
| Ekto | 8814 | 896 cuft |

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

# Site Visit Comments

<table>
<tr><th>Parameter</th><th>Site</th><th>Technician</th><th>S.V. Date</th><th>Component</th><th>Mfg</th><th>Serial No.</th><th>Hazard</th><th>Problem</th></tr>
<tr><td>Flow Rate</td><td>SHN418</td><td>Eric Hebert</td><td>11/06/2015</td><td>Moisture Present</td><td>Tylan</td><td>56</td><td>☐</td><td>☐</td></tr>
<tr><td colspan="9">The filter sample tubing has drops of moisture in low sections outside the shelter.</td></tr>
<tr><td>Flow Rate</td><td>SHN418</td><td>Eric Hebert</td><td>11/06/2015</td><td>Filter Depth</td><td>Tylan</td><td>56</td><td>☐</td><td>☑</td></tr>
<tr><td colspan="9">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.</td></tr>
</table>

# Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean and well organized

3 **Parameter:** MetSensorComme

The temperature sensor has been moved from 10 meters to approximately 2 meters above ground. Currently recorded temperature data are not comparable to previously measured temperature data.

# Field Systems Data Form

**F-02058-1500-S1-rev002**

**Site ID** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | NPS/EPA | **USGS Map** | | Big Meadows |
| **Operating Group** | NPS | **Map Scale** | | |
| **AQS #** | 51-113-003 | **Map Date** | | |
| **Meteorological Type** | Climatronics | | | |
| **Air Pollutant Analyzer** | Ozone, PM2.5 | **QAPP Latitude** | | |
| **Deposition Measurement** | dry, wet, Hg, IMPROVE | **QAPP Longitude** | | |
| **Land Use** | woodland - mixed | **QAPP Elevation Meters** | | |
| **Terrain** | complex | **QAPP Declination** | | |
| **Conforms to MLM** | No | **QAPP Declination Date** | | |
| **Site Telephone** | | **Audit Latitude** | | 38.5231 |
| **Site Address 1** | Shenandoah National Park | **Audit Longitude** | | -78.43471 |
| **Site Address 2** | 3655 US Hwy 211 East | **Audit Elevation** | | 1068 |
| **County** | Madison | **Audit Declination** | | -9.9 |
| **City, State** | Luray, VA | | **Present** | |
| **Zip Code** | 22835 | **Fire Extinguisher** | ☑ | Inspected Oct 2013 |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☐ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☐ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☑ | |
| **Backup Operator** | | **Security Fence** | ☑ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☑ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8814 **Shelter Size** 896 cuft

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

**Site OK** ☑ **Notes**

**Driving Directions** Note: arrange for a "EB submaster" key 4 days in advance to be left at Big Meadows Visitor Center. From DC take 460 west to 29N to 33W to Skyline Drive North. Exit into Big Meadows Visitors Center. Go toward lodge and take the first right. Take the gravel road from the parking lot on the left to the site.

# Field Systems Data Form

# F-02058-1500-S2-rev002

**Site ID** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | | ☑ |
| Limited agricultural operations | 200 m | | ☑ |
| Large parking lot | 200 m | | ☑ |
| Small parking lot | 100 m | | ☑ |
| Tree line | 50 m | 10 - 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** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

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

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

The temperature sensor has been moved from 10 meters to approximately 2 meters above ground.  Currently recorded temperature data are not comparable to previously measured temperature data.

# Field Systems Data Form

**F-02058-1500-S4-rev002**

**Site ID** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

| | | | |
|---|---|---|---|
| 1 | **Do all the meterological sensors appear to be intact, in good condition, and well maintained?** | ☑ | |
| 2 | **Are all the meteorological sensors operational online, and reporting data?** | ☑ | |
| 3 | **Are the shields for the temperature and RH sensors clean?** | ☑ | |
| 4 | **Are the aspirated motors working?** | ☑ | |
| 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** SHN418

**Technician** Eric Hebert

**Site Visit Date** 11/06/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☑ | ☑ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☑ |

11 Tower comments?

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** SHN418

**Technician** Eric Hebert

**Site Visit Date** 11/06/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

| | Yes | No | N/A |
|---|---|---|---|
| Wind speed sensor | ☑ | ☐ | ☐ |
| Wind direction sensor | ☑ | ☐ | ☐ |
| Temperature sensor | ☑ | ☐ | ☐ |
| Relative humidity sensor | ☐ | ☑ | ☐ |
| Solar radiation sensor | ☑ | ☐ | ☐ |
| Surface wetness sensor | ☐ | ☐ | ☑ |
| Wind sensor translator | ☐ | ☐ | ☑ |
| Temperature translator | ☐ | ☐ | ☑ |
| Humidity sensor translator | ☐ | ☐ | ☑ |
| Solar radiation translator | ☐ | ☐ | ☑ |
| Tipping bucket rain gauge | ☑ | ☐ | ☐ |
| Ozone analyzer | ☑ | ☐ | ☐ |
| Filter pack flow controller | ☐ | ☑ | ☐ |
| Filter pack MFC power supply | ☐ | ☑ | ☐ |

| | Yes | No | N/A |
|---|---|---|---|
| Data logger | ☑ | ☐ | ☐ |
| Data logger | ☐ | ☐ | ☑ |
| Strip chart recorder | ☐ | ☐ | ☑ |
| Computer | ☐ | ☑ | ☐ |
| Modem | ☑ | ☐ | ☐ |
| Printer | ☐ | ☐ | ☑ |
| Zero air pump | ☐ | ☑ | ☐ |
| Filter flow pump | ☐ | ☑ | ☐ |
| Surge protector | ☐ | ☑ | ☐ |
| UPS | ☑ | ☐ | ☐ |
| Lightning protection device | ☐ | ☑ | ☐ |
| Shelter heater | ☐ | ☑ | ☐ |
| Shelter air conditioner | ☑ | ☐ | ☐ |

### 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 | ☑ | 9/16/2015 | ☑ |
| 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 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? | ☑ | 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** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

## Site operation procedures

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

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

| QC Check Performed |  | Frequency | Compliant |
|---|---|---|---|
| Multipoint Calibrations | ☑ | Semiannually | ☑ |
| Visual Inspections | ☑ | 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 | ☑ | Semiannually | ☑ |
| Automatic Zero/Span Tests | ☑ | Daily | ☑ |
| Manual Zero/Span Tests | ☑ | Every 2 weeks | ☑ |
| Automatic Precision Level Tests | ☑ | Daily | ☑ |
| Manual Precision Level Test | ☑ | Every 2 weeks | ☑ |
| 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? | ☑ |  |
| 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 ozone inlet filter is replaced and the sample train is leak-tested every two weeks.

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** SHN418

**Technician** Eric Hebert

**Site Visit Date** 11/06/2015

## Site operation procedures

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

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

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

# Field Systems Data Form

F-02058-1500-S10-rev002

**Site ID** SHN418 **Technician** Eric Hebert **Site Visit Date** 11/06/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Hewlett Packard | 8460p | CNU13607B3 | none |
| DAS | Environmental Sys Cor | 8816 | 2272 | 90603 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA110 | 0288714888 | 00443 |
| flow rate | Tylan | FC280 | AW9605202 | 03942 |
| Infrastructure | Infrastructure | none | none | none |
| MFC power supply | Tylan | RO-32 | FP9404009 | 03485 |
| Ozone | ThermoElectron Inc | 49i A3NAA | 0903334535 | none |
| Ozone Standard | ThermoElectron Inc | 49i A1NAA | CM08460009 | none |
| Sample Tower | Aluma Tower | B | none | 923307 |
| Shelter Temperature | ARS | none | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342VC | 14265 | none |
| Zero air pump | Werther International | C 70/4 | 000855578 | none |

# *Site Inventory by Site Visit*

*WSP144-Eric Hebert-11/09/2015*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 11/9/2015 | Computer | Dell | 07037 | Inspiron 15 | Unknown |
| 2 | 11/9/2015 | DAS | Campbell | 000430 | CR3000 | 2525 |
| 3 | 11/9/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/9/2015 | Filter pack flow pump | Thomas | 00087 | 107CA110 | 83403-10 |
| 5 | 11/9/2015 | Flow Rate | Apex | 000639 | AXMC105LPMDPCV | 54780 |
| 6 | 11/9/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/9/2015 | Modem | Raven | 06454 | V4221-V | 0808338332 |
| 8 | 11/9/2015 | Ozone | ThermoElectron Inc | 000734 | 49i A1NAA | 1105347317 |
| 9 | 11/9/2015 | Ozone Standard | ThermoElectron Inc | 000543 | 49i A3NAA | 0929938240 |
| 10 | 11/9/2015 | Sample Tower | Aluma Tower | 000126 | B | none |
| 11 | 11/9/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 11/9/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/9/2015 | Temperature | RM Young | 06387 | 41342VC | 13960 |
| 14 | 11/9/2015 | Zero air pump | Werther International | 06880 | C 70/4 | 000814273 |

# DAS Data Form

**DAS Time Max Error:** 0.02

| **Mfg** | **Serial Number** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Use Desc.** |
|---|---|---|---|---|---|---|
| Campbell | 2525 | WSP144 | Eric Hebert | 11/09/2015 | DAS | Primary |

| | | | |
|---|---|---|---|
| **Das Date:** | 11/9 /2015 | **Audit Date** | 11/9 /2015 |
| **Das Time:** | 14:30:00 | **Audit Time** | 14:30:01 |
| **Das Day:** | 313 | **Audit Day** | 313 |

**Low Channel:**

**Avg Diff:** 0.0000

**Max Diff:** 0.0000

**High Channel:**

**Avg Diff:** 0.0000

**Max Diff:** 0.0000

| | | | |
|---|---|---|---|
| **Mfg** | Datel | **Parameter** | DAS |
| **Serial Number** | 4000392 | **Tfer Desc.** | Source generator (D |
| **Tfer ID** | 01321 | | |
| **Slope** | 1.00000 | **Intercept** | 0.00000 |
| **Cert Date** | 1/22/2015 | **CorrCoff** | 1.00000 |
| **Mfg** | Fluke | **Parameter** | DAS |
| **Serial Number** | 86590148 | **Tfer Desc.** | DVM |
| **Tfer ID** | 01310 | | |
| **Slope** | 1.00000 | **Intercept** | 0.00000 |
| **Cert Date** | 1/22/2015 | **CorrCoff** | 1.00000 |

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 7 | 0.0000 | 0.0000 | 0.0000 | V | V | 0.0000 |
| 7 | 0.1000 | 0.1000 | 0.1000 | V | V | 0.0000 |
| 7 | 0.3000 | 0.3000 | 0.3000 | V | V | 0.0000 |
| 7 | 0.5000 | 0.5000 | 0.5000 | V | V | 0.0000 |
| 7 | 0.7000 | 0.7000 | 0.7000 | V | V | 0.0000 |
| 7 | 0.9000 | 0.9000 | 0.9000 | V | V | 0.0000 |
| 7 | 1.0000 | 1.0000 | 1.0000 | V | V | 0.0000 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 54780 | WSP144 | Eric Hebert | 11/09/2015 | Flow Rate | 000639 |

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

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 2.17% | 2.60% | | |

**Cal Factor Zero** 0

**Cal Factor Full Scale** 1.01

**Rotometer Reading:** 1.3

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | 0.00 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.15 | 0.000 | 0.09 | l/m | l/m | |
| primary | test pt 1 | 1.535 | 1.540 | 1.48 | 0.000 | 1.50 | l/m | l/m | -2.60% |
| primary | test pt 2 | 1.530 | 1.530 | 1.48 | 0.000 | 1.50 | l/m | l/m | -1.96% |
| primary | test pt 3 | 1.526 | 1.530 | 1.48 | 0.000 | 1.50 | 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** | 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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 3.0 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 235 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1105347317 | WSP144 | Eric Hebert | 11/09/2015 | Ozone | 000734 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.98867 | **Slope:** | 0.00000 |
| **Intercept** | -0.62015 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99997 | **CorrCoff** | 0.00000 |

**DAS 1:**

**DAS 2:**

| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
|---|---|---|---|
| 2.2% | 3.4% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.28 | 0.48 | -0.28 | ppb | |
| primary | 2 | 28.54 | 28.43 | 27.46 | ppb | -3.41% |
| primary | 3 | 54.75 | 54.34 | 53.27 | ppb | -1.97% |
| primary | 4 | 80.88 | 80.18 | 79.02 | ppb | -1.45% |
| primary | 5 | 102.28 | 101.34 | 99.20 | ppb | -2.11% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.40 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.997 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 95.6 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.72 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 738.4 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 32.9 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 92.2 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.69 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 13960 | WSP144 | Eric Hebert | 11/09/2015 | Temperature | 06387 |

**Mfg** Fluke

**Parameter** Temperature

**Serial Number** 2085085

**Tfer Desc.** RTD

**Tfer ID** 01226

**Slope** 1.00105

**Intercept** -0.07989

**Cert Date** 1/30/2015

**CorrCoff** 1.00000

| DAS 1: Abs Avg Err | DAS 1: Abs Max Er | DAS 2: Abs Avg Err | DAS 2: Abs Max Er |
|---|---|---|---|
| 0.22 | 0.38 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.03 | 0.11 | 0.000 | 0.2 | C | 0.08 |
| primary | Temp Mid Range | 19.00 | 19.06 | 0.000 | 18.9 | C | -0.19 |
| primary | Temp High Range | 48.75 | 48.78 | 0.000 | 48.4 | C | -0.38 |

| Sensor Component | | Condition | | Status | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | WSP144 | Eric Hebert | 11/09/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.65 | 0.89 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

| | | | |
|---|---|---|---|
| **Mfg** | Fluke | **Parameter** | Shelter Temperatur |
| **Serial Number** | 2085085 | **Tfer Desc.** | RTD |
| **Tfer ID** | 01226 | | |
| **Slope** | 1.00105 | **Intercept** | -0.07989 |
| **Cert Date** | 1/30/2015 | **CorrCoff** | 1.00000 |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 20.72 | 20.78 | 0.000 | 21.1 | C | 0.31 |
| primary | Temp Mid Range | 22.00 | 22.06 | 0.000 | 23.0 | C | 0.89 |
| primary | Temp Mid Range | 22.66 | 22.72 | 0.000 | 23.5 | C | 0.75 |

## Infrastructure Data For

**Site ID** WSP144 **Technicia** Eric Hebert **Site Visit Date** 11/09/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 | 640 cuft |

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

# Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

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

# Field Systems Data Form

# F-02058-1500-S1-rev002

**Site ID** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

| | | | |
|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | Pennington |
| **Operating Group** | NJDEP / WCRC | **Map Scale** | |
| **AQS #** | 34-021-9991 | **Map Date** | |
| **Meteorological Type** | R.M. Young | | |
| **Air Pollutant Analyzer** | Ozone | **QAPP Latitude** | |
| **Deposition Measurement** | dry, PM2.5, PM10 | **QAPP Longitude** | |
| **Land Use** | woodland, urban agriculture | **QAPP Elevation Meters** | |
| **Terrain** | rolling | **QAPP Declination** | |
| **Conforms to MLM** | Marginally | **QAPP Declination Date** | |
| **Site Telephone** | | **Audit Latitude** | 40.312303 |
| **Site Address 1** | WCRC-FA | **Audit Longitude** | -74.872663 |
| **Site Address 2** | Church Rd. | **Audit Elevation** | 59 |
| **County** | Mercer | **Audit Declination** | -12.5 |
| **City, State** | Titusville, NJ | **Present** | |
| **Zip Code** | 08560 | **Fire Extinguisher** ☑ | dated 2015 |
| **Time Zone** | Eastern | **First Aid Kit** ☑ | |
| **Primary Operator** | | **Safety Glasses** ☑ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** ☐ | |
| **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, very neat, and well organized.

**Site OK** ☑ **Notes**

**Driving Directions** From Philadelphia take I-95 north. Cross the Delaware River into New Jersey and take the first exit, route 29 north, just over the bridge. Continue approximately 4 miles through the traffic light at the intersection of 546 and through the park. Turn right onto Church road at the traffic light. Continue approximately 0.5 miles to the gate for the WCRC-FA on the right. The combination to the lock is 1903. Continue through the gate up the gravel road to the top of the hill and turn right along the edge of the field. Follow the gravel road to the site in the chain-link fenced area.

# Field Systems Data Form

**F-02058-1500-S2-rev002**

**Site ID** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | 20 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 city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

# Field Systems Data Form

**F-02058-1500-S3-rev002**

**Site ID** WSP144

**Technician** Eric Hebert

**Site Visit Date** 11/09/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | |
| 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** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

**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** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☑ | Oct 2011 | ☑ |
| HASP | ☑ | Oct 2011 | ☑ |
| 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? | ☑ | |
| 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** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

## Site operation procedures

1 Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? ☑

2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? ☑

3 Is the site visited regularly on the required Tuesday schedule? ☑

4 Are the standard CASTNET operational procedures being flollowed by the site operator? ☑

5 Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation) ☑

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

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

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

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

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

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

3 Are the automatic and manual z/s/p checks monitored and reported? If yes, how? ☑ SSRF, logbook, call-in

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

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

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

## Site operation procedures

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

| QC Check Performed | | Frequency | Compliant |
|---|---|---|---|
| Multi-point MFC Calibrations | ☑ | Semiannually | ☑ |
| Flow System Leak Checks | ☑ | Weekly | ☑ |
| Filter Pack Inspection | ☑ | Weekly | ☑ |
| 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** WSP144 **Technician** Eric Hebert **Site Visit Date** 11/09/2015

**Site Visit Sensors**

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

# Site Inventory by Site Visit

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *VPI120-Sandy Grenville-11/19/2015* | | | | | | |
| 1 | 11/19/2015 | Computer | Dell | 07032 | Inspiron 15 | Unknown |
| 2 | 11/19/2015 | DAS | Campbell | 000402 | CR3000 | 2514 |
| 3 | 11/19/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/19/2015 | Filter pack flow pump | Thomas | 02751 | 107CAB18 | 1192001884 |
| 5 | 11/19/2015 | Flow Rate | Apex | 000591 | AXMC105LPMDPCV | illegible |
| 6 | 11/19/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/19/2015 | Modem | Raven | 06586 | V4221-V | 0844350237 |
| 8 | 11/19/2015 | Ozone | ThermoElectron Inc | 000628 | 49i A1NAA | 1009241786 |
| 9 | 11/19/2015 | Ozone Standard | ThermoElectron Inc | 000443 | 49i A3NAA | CM08200019 |
| 10 | 11/19/2015 | Sample Tower | Aluma Tower | 06641 | B | unknown |
| 11 | 11/19/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 11/19/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/19/2015 | Temperature | Climatronics | 06700 | 100093 | none |
| 14 | 11/19/2015 | Zero air pump | Werther International | 06907 | C 70/4 | 000829179 |

# DAS Data Form

**DAS Time Max Error:** 0

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 2514 | VPI120 | Sandy Grenville | 11/19/2015 | DAS | Primary |

**Das Date:** 11/19/2015
**Das Time:** 13:33:01
**Das Day:** 323

**Audit Date** 11/19/2015
**Audit Time** 13:33:01
**Audit Day** 323

**Low Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0001

**High Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0001

**Mfg** Datel
**Parameter** DAS
**Serial Number** 15510194
**Tfer Desc.** Source generator (D
**Tfer ID** 01320

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

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

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | illegible | VPI120 | Sandy Grenville | 11/19/2015 | Flow Rate | 000591 |

| | | | |
|---|---|---|---|
| **Mfg** | BIOS | **Parameter** | Flow Rate |
| **Serial Number** | 103471 | **Tfer Desc.** | nexus |
| **Tfer ID** | 01420 | | |
| **Slope** | 0.96664 | **Intercept** | 0.03078 |
| **Cert Date** | 2/5/2015 | **CorrCoff** | 0.99996 |
| **Mfg** | BIOS | **Parameter** | Flow Rate |
| **Serial Number** | 103424 | **Tfer Desc.** | BIOS cell |
| **Tfer ID** | 01410 | | |
| **Slope** | 0.96664 | **Intercept** | 0.03078 |
| **Cert Date** | 2/5/2015 | **CorrCoff** | 0.99996 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 3.02% | 3.23% | | |

| | |
|---|---|
| **Cal Factor Zero** | -0.05 |
| **Cal Factor Full Scale** | 0.95 |
| **Rotometer Reading:** | 1.45 |

| 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 | 0.020 | -0.03 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.01 | 0.020 | -0.04 | l/m | l/m | |
| primary | test pt 1 | 1.525 | 1.550 | 1.55 | 1.550 | 1.50 | l/m | l/m | -3.23% |
| primary | test pt 2 | 1.526 | 1.550 | 1.55 | 1.550 | 1.50 | l/m | l/m | -3.23% |
| primary | test pt 3 | 1.523 | 1.540 | 1.55 | 1.550 | 1.50 | l/m | l/m | -2.60% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 4.1 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 0 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 200 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241786 | VPI120 | Sandy Grenville | 11/19/2015 | Ozone | 000628 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.99265 | **Slope:** | 0.00000 |
| **Intercept** | -0.28599 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99998 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 1.1% | 1.5% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.01 | 0.40 | 0.01 | ppb | |
| primary | 2 | 30.00 | 30.59 | 30.42 | ppb | -0.56% |
| primary | 3 | 50.15 | 50.87 | 50.09 | ppb | -1.53% |
| primary | 4 | 79.52 | 80.42 | 79.25 | ppb | -1.45% |
| primary | 5 | 110.14 | 111.23 | 110.30 | ppb | -0.84% |

| Sensor Component | Condition | Status |
|---|---|---|
| Sample Train | Good | pass |
| Inlet Filter Condition | Clean | pass |
| Battery Backup | N/A | pass |
| Offset | 0.60 | pass |
| Span | 1.007 | pass |
| Zero Voltage | N/A | pass |
| Fullscale Voltage | N/A | pass |
| Cell A Freq. | 88.9 kHz | pass |
| Cell A Noise | 0.4 ppb | pass |
| Cell A Flow | 0.69 lpm | pass |
| Cell A Pressure | 662 mmHg | pass |
| Cell A Tmp. | 34.0 C | pass |
| Cell B Freq. | 92.2 kHz | pass |
| Cell B Noise | 0.4 ppb | pass |
| Cell B Flow | 0.80 lpm | pass |
| Cell B Pressure | | pass |
| Cell B Tmp. | | pass |
| Line Loss | Not tested | pass |
| System Memo | | pass |

# Temperature Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Climatronics | none | VPI120 | Sandy Grenville | 11/19/2015 | Temperature | 06700 |

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

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.05 | 0.11 | 0.000 | 0.2 | C | 0.05 |
| primary | Temp Mid Range | 25.35 | 25.33 | 0.000 | 25.3 | C | 0.01 |
| primary | Temp High Range | 49.17 | 49.07 | 0.000 | 49.1 | C | 0.03 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Moderately 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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | VPI120 | Sandy Grenville | 11/19/2015 | Shelter Temperature | none |

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| 0.26 | 0.40 | | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 22.72 | 22.71 | 0.000 | 23.0 | C | 0.26 |
| primary | Temp Mid Range | 22.57 | 22.56 | 0.000 | 22.7 | C | 0.13 |
| primary | Temp Mid Range | 21.96 | 21.95 | 0.000 | 22.4 | C | 0.4 |

## Infrastructure Data For

**Site ID** VPI120 **Technicia** Sandy Grenville **Site Visit Date** 11/19/2015

| Shelter Make | Shelter Model | Shelter Size |
|---|---|---|
| Ekto | 8810 (s/n 2107-3) | 640 cuft |

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

# Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is on a wooded hillside. The met gear and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 30 meters away.

2 **Parameter:** ShelterCleanNotes

The shelter roof has been recently repaired due to additional leaks. The shelter is clean, neat, and well organized.

# Field Systems Data Form

F-02058-1500-S1-rev002

| | | | | | |
|---|---|---|---|---|---|
| **Site ID** | VPI120 | **Technician** | Sandy Grenville | **Site Visit Date** | 11/19/2015 |

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | | Eggleston |
| **Operating Group** | VA Tech | **Map Scale** | | |
| **AQS #** | 51-071-9991 | **Map Date** | | |
| **Meteorological Type** | Climatronics | | | |
| **Air Pollutant Analyzer** | Ozone | **QAPP Latitude** | | 37.3300 |
| **Deposition Measurement** | dry, wet | **QAPP Longitude** | | -80.5573 |
| **Land Use** | woodland - mixed | **QAPP Elevation Meters** | | 920 |
| **Terrain** | complex | **QAPP Declination** | | 7.9 |
| **Conforms to MLM** | No | **QAPP Declination Date** | | 1/31/2007 |
| **Site Telephone** | | **Audit Latitude** | | 37.329832 |
| **Site Address 1** | Mountain Lake Rd. | **Audit Longitude** | | -80.55751 |
| **Site Address 2** | Jefferson National Forest | **Audit Elevation** | | 920 |
| **County** | Giles | **Audit Declination** | | -7.8 |
| **City, State** | Newport, VA | | **Present** | |
| **Zip Code** | 24128 | **Fire Extinguisher** | ☑ | Inspected March 2009 |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☑ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☑ | |
| **Backup Operator** | | **Security Fence** | ☐ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☑ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8810 (s/n 2107-3) **Shelter Size** 640 cuft

**Shelter Clean** ☑ **Notes** The shelter roof has been recently repaired due to additional leaks. The shelter is clean, neat, and well organized.

**Site OK** ☑ **Notes**

**Driving Directions** From Blacksburg go west on route 460 approximately 10 miles. Turn right (north) onto route 700, Mountain Lake Rd., toward Mountain Lake Resort. There is a sign for Virginia Tech and Horton Station. Continue on 700 up the mountain. Turn right at the sign for Horton Station on the gravel drive into the research center.

# Field Systems Data Form

# F-02058-1500-S2-rev002

**Site ID** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

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

**Siting Distances OK** ☑

**Siting Criteria Comment**

The site is on a wooded hillside. The met gear and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 30 meters away.

# Field Systems Data Form

**F-02058-1500-S3-rev002**

**Site ID** VPI120

**Technician** Sandy Grenville

**Site Visit Date** 11/19/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

| | | | |
|---|---|---|---|
| 1 | **Do all the meterological sensors appear to be intact, in good condition, and well maintained?** | ☑ | |
| 2 | **Are all the meteorological sensors operational online, and reporting data?** | ☑ | |
| 3 | **Are the shields for the temperature and RH sensors clean?** | ☑ | Moderately 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** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the analyzers and equipment appear to be in good condition and well maintained? | ☑ | |
| 2 | Are the analyzers and monitors operational, on-line, and reporting data? | ☑ | |
| 3 | Describe ozone sample tube. | | 1/4 teflon by 18 meters |
| 4 | Describe dry dep sample tube. | | 3/8 teflon by 18 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** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☑ | ☑ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☑ |

11 Tower comments?

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** VPI120

**Technician** Sandy Grenville

**Site Visit Date** 11/19/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☑ | Oct 2001 | ☐ |
| HASP | ☑ | Feb 2014 | ☑ |
| Field Ops Manual | ☑ | July 1990 | ☐ |
| Calibration Reports | ☑ | | ☑ |
| Ozone z/s/p Control Charts | ☐ | | ☐ |
| Preventive maintenance schedule | ☐ | | ☐ |

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

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

# Field Systems Data Form

F-02058-1500-S8-rev002

**Site ID** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

## Site operation procedures

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

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

| QC Check Performed | | Frequency | Compliant |
|---|---|---|---|
| Multipoint Calibrations | ☑ | Semiannually | ☑ |
| Visual Inspections | ☑ | N/A | ☑ |
| Translator Zero/Span Tests (climatronics) | ☐ | N/A | ☑ |
| Manual Rain Gauge Test | ☑ | N/A | ☑ |
| Confirm Reasonableness of Current Values | ☑ | 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 | ☑ | Semiannually | ☑ |
| Automatic Zero/Span Tests | ☑ | Daily | ☑ |
| Manual Zero/Span Tests | ☑ | As needed | ☑ |
| Automatic Precision Level Tests | ☑ | Daily | ☑ |
| Manual Precision Level Test | ☑ | As needed | ☑ |
| Analyzer Diagnostics Tests | ☑ | Weekly | ☑ |
| In-line Filter Replacement (at inlet) | ☑ | Every 2 weeks | ☑ |
| In-line Filter Replacement (at analyze | ☑ | N/A | ☑ |
| Sample Line Check for Dirt/Water | ☐ | | ☐ |
| Zero Air Desiccant Check | ☑ | Weekly | ☑ |

| | | | |
|---|---|---|---|
| 1 | Do multi-point calibration gases go through the complete sample train including all filters? | ☐ | 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? | ☑ | logbook, call-in |

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

**Site operation procedures**

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

| QC Check Performed | | Frequency | Compliant |
|---|---|---|---|
| Multi-point MFC Calibrations | ☑ | Semiannually | ☑ |
| Flow System Leak Checks | ☑ | Weekly | ☑ |
| Filter Pack Inspection | ☐ | | ☐ |
| Flow Rate Setting Checks | ☑ | Weekly | ☑ |
| Visual Check of Flow Rate Rotometer | ☑ | Weekly | ☑ |
| In-line Filter Inspection/Replacement | ☑ | 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** VPI120 **Technician** Sandy Grenville **Site Visit Date** 11/19/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | Inspiron 15 | Unknown | 07032 |
| DAS | Campbell | CR3000 | 2514 | 000402 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CAB18 | 1192001884 | 02751 |
| Flow Rate | Apex | AXMC105LPMDPC | illegible | 000591 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0844350237 | 06586 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1009241786 | 000628 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | CM08200019 | 000443 |
| Sample Tower | Aluma Tower | B | unknown | 06641 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | Climatronics | 100093 | none | 06700 |
| Zero air pump | Werther International | C 70/4 | 000829179 | 06907 |

# Site Inventory by Site Visit

*PAR107-Sandy Grenville-11/21/2015*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 11/21/2015 | Computer | Dell | 07072 | Inspiron 15 | Unknown |
| 2 | 11/21/2015 | DAS | Campbell | 000333 | CR3000 | 2112 |
| 3 | 11/21/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/21/2015 | Filter pack flow pump | Thomas | 00859 | 107CA18 | missing |
| 5 | 11/21/2015 | Flow Rate | Apex | 000803 | AXMC105LPMDPCV | 50752 |
| 6 | 11/21/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/21/2015 | Modem | Raven | 06607 | H4222-C | 0844356054 |
| 8 | 11/21/2015 | Ozone | ThermoElectron Inc | 000685 | 49i A1NAA | 1030244789 |
| 9 | 11/21/2015 | Ozone Standard | ThermoElectron Inc | 000436 | 49i A3NAA | CM08200012 |
| 10 | 11/21/2015 | Sample Tower | Aluma Tower | 000838 | B | unknown |
| 11 | 11/21/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 11/21/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/21/2015 | Temperature | RM Young | 04316 | 41342VO | 4013 |
| 14 | 11/21/2015 | Zero air pump | Werther International | 06932 | C 70/4 | 000829174 |

# DAS Data Form

**DAS Time Max Error:** 0

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 2112 | PAR107 | Sandy Grenville | 11/21/2015 | DAS | Primary |

**Das Date:** 11/21/2015
**Das Time:** 14:55:08
**Das Day:** 325

**Audit Date** 11/21/2015
**Audit Time** 14:55:08
**Audit Day** 325

**Low Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0001

**High Channel:**

**Avg Diff:** 0.0000
**Max Diff:** 0.0001

**Mfg** Datel
**Parameter** DAS
**Serial Number** 15510194
**Tfer Desc.** Source generator (D
**Tfer ID** 01320

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

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

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 50752 | PAR107 | Sandy Grenville | 11/21/2015 | Flow Rate | 000803 |

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

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

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 3.02% | 3.23% | | |

**Cal Factor Zero** -0.02

**Cal Factor Full Scale** 0.96

**Rotometer Reading:** 1.5

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.02 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | -0.030 | -0.03 | l/m | l/m | |
| primary | test pt 1 | 1.525 | 1.550 | 1.54 | 1.540 | 1.50 | l/m | l/m | -3.23% |
| primary | test pt 2 | 1.526 | 1.550 | 1.54 | 1.540 | 1.50 | l/m | l/m | -3.23% |
| primary | test pt 3 | 1.523 | 1.540 | 1.54 | 1.540 | 1.50 | l/m | l/m | -2.60% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 2.5 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 95 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244789 | PAR107 | Sandy Grenville | 11/21/2015 | Ozone | 000685 |

**Slope:** 1.00098
**Intercept** -0.89739
**CorrCoff** 0.99999

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

**DAS 1:**

| A Avg % Diff: | A Max % Di |
|---|---|
| 1.6% | 2.7% |

**DAS 2:**

| A Avg %Dif | A Max % Di |
|---|---|
|  |  |

**Mfg** ThermoElectron Inc
**Parameter** ozone
**Serial Number** 0419606966
**Tfer Desc.** Ozone primary stan
**Tfer ID** 01112
**Slope** 0.99384
**Intercept** -0.40946
**Cert Date** 6/25/2015
**CorrCoff** 1.00000

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.02 | 0.39 | -0.40 | ppb |  |
| primary | 2 | 29.94 | 30.53 | 29.72 | ppb | -2.65% |
| primary | 3 | 49.91 | 50.63 | 49.53 | ppb | -2.17% |
| primary | 4 | 79.57 | 80.47 | 79.61 | ppb | -1.07% |
| primary | 5 | 109.77 | 110.86 | 110.20 | ppb | -0.60% |

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Moderately clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.50 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.997 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 93.5 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.4 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.62 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 683.4 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 31.9 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 92.3 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.9 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.52 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** |  | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** |  | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 4013 | PAR107 | Sandy Grenville | 11/21/2015 | Temperature | 04316 |

**Mfg** Extech

**Parameter** Temperature

**Serial Number** H232734

**Tfer Desc.** RTD

**Tfer ID** 01227

**Slope** 1.00343

**Intercept** -0.06409

**Cert Date** 1/30/2015

**CorrCoff** 1.00000

| | DAS 1: | | DAS 2: | |
|---|---|---|---|---|
| | Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| | 0.05 | 0.10 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.01 | 0.07 | 0.000 | 0.1 | C | 0.02 |
| primary | Temp Mid Range | 25.14 | 25.12 | 0.000 | 25.0 | C | -0.1 |
| primary | Temp High Range | 47.54 | 47.44 | 0.000 | 47.5 | C | 0.02 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | PAR107 | Sandy Grenville | 11/21/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.20 | 0.29 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 22.39 | 22.38 | 0.000 | 22.3 | C | -0.09 |
| primary | Temp Mid Range | 20.88 | 20.87 | 0.000 | 21.2 | C | 0.29 |
| primary | Temp Mid Range | 21.69 | 21.68 | 0.000 | 21.9 | C | 0.22 |

## Infrastructure Data For

**Site ID** PAR107 **Technicia** Sandy Grenville **Site Visit Date** 11/21/2015

| Shelter Make | Shelter Model | Shelter Size |
|---|---|---|
| Ekto | 8810 | 640 cuft |

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

# Field Systems Comments

**1** **Parameter:** DasComments

The meteorological tower has been removed and the temperature sensor has been mounted on the sample tower.

**2** **Parameter:** SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

**3** **Parameter:** ShelterCleanNotes

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

# Field Systems Data Form

F-02058-1500-S1-rev002

**Site ID** PAR107

**Technician** Sandy Grenville

**Site Visit Date** 11/21/2015

**Site Sponsor (agency)** EPA/USFS

**Operating Group** USFS

**AQS #** 54-093-9991

**Meteorological Type** Climatronics

**Air Pollutant Analyzer** Ozone

**Deposition Measurement** dry, wet

**Land Use** woodland - mixed

**Terrain** complex

**Conforms to MLM** No

**Site Telephone**

**Site Address 1** USFS Timber & Watershed Lab

**Site Address 2** Rt. 219, Nursery Bottom

**County** Parsons

**City, State** Parsons, WV

**Zip Code** 26287

**Time Zone** Eastern

**Primary Operator**

**Primary Op. Phone #**

**Primary Op. E-mail**

**Backup Operator**

**Backup Op. Phone #**

**Backup Op. E-mail**

**USGS Map** Parsons

**Map Scale**

**Map Date**

**QAPP Latitude**

**QAPP Longitude**

**QAPP Elevation Meters**

**QAPP Declination**

**QAPP Declination Date**

**Audit Latitude** 39.090434

**Audit Longitude** -79.661742

**Audit Elevation** 510

**Audit Declination** -9

| | Present | |
|---|---|---|
| **Fire Extinguisher** | ☑ | Inspected Nov 2015 |
| **First Aid Kit** | ☑ | |
| **Safety Glasses** | ☑ | |
| **Safety Hard Hat** | ☑ | |
| **Climbing Belt** | ☐ | |
| **Security Fence** | ☑ | |
| **Secure Shelter** | ☑ | |
| **Stable Entry Step** | ☑ | |

**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** Take highway 33W to Elkins WV. Turn onto 19N to Parsons. Continue through town to the Nursery Bottom Reservoir. The site entrance is on the right next to the visitors center.

# Field Systems Data Form

**F-02058-1500-S2-rev002**

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | 2.5 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 city of Parsons, estimated population 1500, is within 5 km of the site.

# Field Systems Data Form

**F-02058-1500-S3-rev002**

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

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

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

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

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | N/A |
| 5 | Is the solar radiation sensor's lens clean and free of scratches? | ☑ | N/A |
| 6 | Is the surface wetness sensor grid clean and undamaged? | ☑ | N/A |
| 7 | Are the sensor signal and power cables intact, in good condition, and well maintained? | ☑ | |
| 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** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☐ | ☐ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☐ |

11 Tower comments? Met tower removed

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

The meteorological tower has been removed and the temperature sensor has been mounted on the sample tower.

# Field Systems Data Form

F-02058-1500-S7-rev002

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☐ | | ☐ |
| HASP | ☑ | Feb 2014 | ☑ |
| 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? | ☑ | Minimal information |
| 2 | Are the Site Status Report Forms being completed and current? | ☑ | |
| 3 | Are the chain-of-custody forms properly used to document sample transfer to and from lab? | ☑ | |
| 4 | Are ozone z/s/p control charts properly completed and current? | ☐ | Control charts not used |

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

# Field Systems Data Form

# F-02058-1500-S8-rev002

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

## Site operation procedures

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

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

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

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

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

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

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

## Site operation procedures

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

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

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

# Field Systems Data Form

F-02058-1500-S10-rev002

**Site ID** PAR107 **Technician** Sandy Grenville **Site Visit Date** 11/21/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | Inspiron 15 | Unknown | 07072 |
| DAS | Campbell | CR3000 | 2112 | 000333 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA18 | missing | 00859 |
| Flow Rate | Apex | AXMC105LPMDPC | 50752 | 000803 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | H4222-C | 0844356054 | 06607 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1030244789 | 000685 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | CM08200012 | 000436 |
| Sample Tower | Aluma Tower | B | unknown | 000838 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342VO | 4013 | 04316 |
| Zero air pump | Werther International | C 70/4 | 000829174 | 06932 |

# *Site Inventory by Site Visit*

### *CDR119-Sandy Grenville-11/22/2015*

| | *Site Visit Date* | *Parameter* | *Mfg* | *Owner ID* | *Model Number* | *Serial Number* |
|---|---|---|---|---|---|---|
| 1 | 11/22/2015 | Computer | Dell | 07071 | Inspiron 15 | Unknown |
| 2 | 11/22/2015 | DAS | Campbell | 000339 | CR3000 | 2118 |
| 3 | 11/22/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/22/2015 | Filter pack flow pump | Thomas | 06027 | 107CAB18 | 060400022672 |
| 5 | 11/22/2015 | Flow Rate | Apex | 000660 | AXMC105LPMDPCV | 54747 |
| 6 | 11/22/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/22/2015 | Modem | Raven | 06592 | V4221-V | 0844350437 |
| 8 | 11/22/2015 | Ozone | ThermoElectron Inc | 000623 | 49i A1NAA | 1009241790 |
| 9 | 11/22/2015 | Ozone Standard | ThermoElectron Inc | 000365 | 49i A3NAA | 0726124688 |
| 10 | 11/22/2015 | Sample Tower | Aluma Tower | 928376 | B | AT-51060-56 |
| 11 | 11/22/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 11/22/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/22/2015 | Temperature | RM Young | 04448 | 41342 | 4546 |
| 14 | 11/22/2015 | Zero air pump | Werther International | 06903 | C 70/4 | 000899159 |

# DAS Data Form

**DAS Time Max Error:** 0.13

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 2118 | CDR119 | Sandy Grenville | 11/22/2015 | DAS | Primary |

**Das Date:** 11/22/2015
**Audit Date** 11/22/2015
**Das Time:** 14:51:00
**Audit Time** 14:50:52
**Das Day:** 326
**Audit Day** 326

| **Low Channel:** | | **High Channel:** | |
|---|---|---|---|
| **Avg Diff:** | **Max Diff:** | **Avg Diff:** | **Max Diff:** |
| 0.0002 | 0.0002 | 0.0002 | 0.0002 |

**Mfg** Datel
**Parameter** DAS
**Serial Number** 15510194
**Tfer Desc.** Source generator (D
**Tfer ID** 01320

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

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 7 | 0.0000 | -0.0001 | 0.0000 | V | V | 0.0001 |
| 7 | 0.1000 | 0.0998 | 0.1000 | V | V | 0.0002 |
| 7 | 0.3000 | 0.2997 | 0.2998 | V | V | 0.0001 |
| 7 | 0.5000 | 0.4996 | 0.4997 | V | V | 0.0001 |
| 7 | 0.7000 | 0.6995 | 0.6997 | V | V | 0.0002 |
| 7 | 0.9000 | 0.8994 | 0.8996 | V | V | 0.0002 |
| 7 | 1.0000 | 0.9993 | 0.9995 | V | V | 0.0002 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 54747 | CDR119 | Sandy Grenville | 11/22/2015 | Flow Rate | 000660 |

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

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

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 2.60% | 2.60% | | |

**Cal Factor Zero** 0.06

**Cal Factor Full Scale** 1.05

**Rotometer Reading:** 1.55

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | -0.38 | -0.040 | 0.02 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | 0.06 | l/m | l/m | |
| primary | test pt 1 | 1.516 | 1.540 | 1.44 | 1.450 | 1.50 | l/m | l/m | -2.60% |
| primary | test pt 2 | 1.517 | 1.540 | 1.45 | 1.450 | 1.50 | l/m | l/m | -2.60% |
| primary | test pt 3 | 1.518 | 1.540 | 1.45 | 1.450 | 1.50 | l/m | l/m | -2.60% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 0.2 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 95 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241790 | CDR119 | Sandy Grenville | 11/22/2015 | Ozone | 000623 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.98679 | **Slope:** | 0.00000 |
| **Intercept** | -0.73121 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99994 | **CorrCoff** | 0.00000 |

**DAS 1:** **DAS 2:**

| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
|---|---|---|---|
| 2.9% | 4.4% | | |

**Mfg** ThermoElectron Inc **Parameter** ozone

**Serial Number** 0419606966 **Tfer Desc.** Ozone primary stan

**Tfer ID** 01112

**Slope** 0.99384 **Intercept** -0.40946

**Cert Date** 6/25/2015 **CorrCoff** 1.00000

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.04 | 0.37 | -0.10 | ppb | |
| primary | 2 | 30.00 | 30.59 | 29.26 | ppb | -4.35% |
| primary | 3 | 49.88 | 50.60 | 49.31 | ppb | -2.55% |
| primary | 4 | 79.80 | 80.70 | 78.22 | ppb | -3.07% |
| primary | 5 | 109.40 | 110.49 | 108.80 | ppb | -1.53% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.3 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.993 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 89.4 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 719.2 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 27.4 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 88.9 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.72 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 4546 | CDR119 | Sandy Grenville | 11/22/2015 | Temperature | 04448 |

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

| DAS 1: Abs Avg Err | DAS 1: Abs Max Er | DAS 2: Abs Avg Err | DAS 2: Abs Max Er |
|---|---|---|---|
| 0.19 | 0.22 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.77 | 0.83 | 0.000 | 0.6 | C | -0.22 |
| primary | Temp Mid Range | 25.26 | 25.24 | 0.000 | 25.0 | C | -0.2 |
| primary | Temp High Range | 48.30 | 48.20 | 0.000 | 48.0 | C | -0.16 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | CDR119 | Sandy Grenville | 11/22/2015 | Shelter Temperature | none |

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| 0.26 | 0.41 | | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 13.60 | 13.62 | 0.000 | 13.8 | C | 0.18 |
| primary | Temp Mid Range | 18.89 | 18.89 | 0.000 | 19.3 | C | 0.41 |
| primary | Temp Mid Range | 20.89 | 20.88 | 0.000 | 21.1 | C | 0.18 |

## Infrastructure Data For

**Site ID** CDR119 **Technicia** Sandy Grenville **Site Visit Date** 11/22/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 | 640 cuft |

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

# Field Systems Comments

**1** **Parameter:** SiteOpsProcComm

The filter handling procedures have improved since the previous site audit visit.

**2** **Parameter:** SitingCriteriaCom

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road.

**3** **Parameter:** ShelterCleanNotes

The shelter has been refurbished since the previous site audit visit.

**4** **Parameter:** MetOpMaintCom

The temperature sensor has been moved to a naturally aspirated shield on the sample tower. The meteorological tower has been removed.

# Field Systems Data Form

F-02058-1500-S1-rev002

**Site ID** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

**Site Sponsor (agency)** EPA

**Operating Group** private, WV parks dept

**AQS #** 54-021-9991

**Meteorological Type** Climatronics

**Air Pollutant Analyzer** Ozone

**Deposition Measurement** dry, wet

**Land Use** woodland - mixed

**Terrain** complex

**Conforms to MLM** No

**Site Telephone**

**Site Address 1** Cedar Creek St. Park

**Site Address 2**

**County** Gilmer

**City, State** Glenville, WV

**Zip Code** 26351

**Time Zone** Eastern

**Primary Operator**

**Primary Op. Phone #**

**Primary Op. E-mail**

**Backup Operator**

**Backup Op. Phone #**

**Backup Op. E-mail**

**USGS Map** Glenville

**Map Scale**

**Map Date**

**QAPP Latitude**

**QAPP Longitude**

**QAPP Elevation Meters**

**QAPP Declination**

**QAPP Declination Date**

**Audit Latitude** 38.879503

**Audit Longitude** -80.847677

**Audit Elevation** 240

**Audit Declination** -8

| | Present | |
|---|---|---|
| **Fire Extinguisher** | ☑ | Inspected Oct 2015 |
| **First Aid Kit** | ☑ | |
| **Safety Glasses** | ☑ | |
| **Safety Hard Hat** | ☑ | |
| **Climbing Belt** | ☑ | |
| **Security Fence** | ☐ | |
| **Secure Shelter** | ☑ | |
| **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

**Shelter Clean** ☑ **Notes** The shelter has been refurbished since the previous site audit visit.

**Site OK** ☑ **Notes**

**Driving Directions**

# Field Systems Data Form

F-02058-1500-S2-rev002

**Site ID** CDR119

**Technician** Sandy Grenville

**Site Visit Date** 11/22/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | 30 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 | 25 m | ☐ |
| Obstacles to wind | 10 times obstacle height | | ☐ |

**Siting Distances OK** ☐

**Siting Criteria Comment**

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road.

# Field Systems Data Form F-02058-1500-S3-rev002

**Site ID** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

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

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

The temperature sensor has been moved to a naturally aspirated shield on the sample tower. The meteorological tower has been removed.

# Field Systems Data Form

# F-02058-1500-S5-rev002

**Site ID** CDR119

**Technician** Sandy Grenville

**Site Visit Date** 11/22/2015

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

| | | | |
|---|---|---|---|
| 1 | Do the sample inlets have at least a 270 degree arc of unrestricted airflow? | ☑ | |
| 2 | Are the sample inlets 3 - 15 meters above the ground? | ☑ | |
| 3 | Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees? | ☑ | 25 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** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☐ | ☐ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☑ |

11 Tower comments? Met tower removed

**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** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☑ | Jul 2006 | ☐ |
| HASP | ☑ | Nov 2009 | ☐ |
| Field Ops Manual | ☑ | 2001 | ☐ |
| Calibration Reports | ☑ | | ☐ |
| Ozone z/s/p Control Charts | ☐ | | ☐ |
| Preventive maintenance schedule | ☐ | | ☐ |

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

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

# Field Systems Data Form

**F-02058-1500-S8-rev002**

**Site ID** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

## Site operation procedures

1 Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? ☐

2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? ☐

3 Is the site visited regularly on the required Tuesday schedule? ☑

4 Are the standard CASTNET operational procedures being flollowed by the site operator? ☐

5 Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation) ☑

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

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

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

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

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

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

3 Are the automatic and manual z/s/p checks monitored and reported? If yes, how? ☑ SSRF, logbook, call-in

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

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

## Site operation procedures

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

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

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

The filter handling procedures have improved since the previous site audit visit.

# Field Systems Data Form

F-02058-1500-S10-rev002

**Site ID** CDR119 **Technician** Sandy Grenville **Site Visit Date** 11/22/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | Inspiron 15 | Unknown | 07071 |
| DAS | Campbell | CR3000 | 2118 | 000339 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CAB18 | 060400022672 | 06027 |
| Flow Rate | Apex | AXMC105LPMDPC | 54747 | 000660 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0844350437 | 06592 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1009241790 | 000623 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | 0726124688 | 000365 |
| Sample Tower | Aluma Tower | B | AT-51060-56 | 928376 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342 | 4546 | 04448 |
| Zero air pump | Werther International | C 70/4 | 000899159 | 06903 |

# *Site Inventory by Site Visit*

*BWR139-Eric Hebert-11/24/2015*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 11/24/2015 | Computer | Dell | 000321 | D520 | unknown |
| 2 | 11/24/2015 | DAS | Campbell | 000431 | CR3000 | 2536 |
| 3 | 11/24/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 11/24/2015 | Filter pack flow pump | Thomas | 06031 | 107CAB18 | 608102A |
| 5 | 11/24/2015 | Flow Rate | Apex | 000670 | AXMC105LPMDPCV | 54758 |
| 6 | 11/24/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 11/24/2015 | Modem | Raven | 06456 | V4221-V | 0808507415 |
| 8 | 11/24/2015 | Ozone | ThermoElectron Inc | 000731 | 49i A1NAA | 1105347309 |
| 9 | 11/24/2015 | Ozone Standard | ThermoElectron Inc | 000697 | 49i A3NAA | 1030244814 |
| 10 | 11/24/2015 | Sample Tower | Aluma Tower | missing | B | none |
| 11 | 11/24/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 11/24/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 11/24/2015 | Temperature | RM Young | 04315 | 41342 | 4012 |
| 14 | 11/24/2015 | Zero air pump | Werther International | 06877 | C 70/4 | 000815258 |

# DAS Data Form

**DAS Time Max Error:** 0.02

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 2536 | BWR139 | Eric Hebert | 11/24/2015 | DAS | Primary |

**Das Date:** 11/24/2015
**Audit Date** 11/24/2015
**Das Time:** 11:33:46
**Audit Time** 11:33:45
**Das Day:** 329
**Audit Day** 329

**Low Channel:**

**High Channel:**

| Low Channel Avg Diff: | Low Channel Max Diff: | High Channel Avg Diff: | High Channel Max Diff: |
|---|---|---|---|
| 0.0001 | 0.0002 | 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** 1/22/2015
**CorrCoff** 1.00000

**Mfg** Fluke
**Parameter** DAS
**Serial Number** 86590148
**Tfer Desc.** DVM
**Tfer ID** 01310
**Slope** 1.00000
**Intercept** 0.00000
**Cert Date** 1/22/2015
**CorrCoff** 1.00000

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 7 | 0.0000 | 0.0000 | 0.0000 | V | V | 0.0000 |
| 7 | 0.1000 | 0.1000 | 0.1000 | V | V | 0.0000 |
| 7 | 0.3000 | 0.3001 | 0.3001 | V | V | 0.0000 |
| 7 | 0.5000 | 0.5001 | 0.5001 | V | V | 0.0000 |
| 7 | 0.7000 | 0.7001 | 0.7002 | V | V | 0.0001 |
| 7 | 0.9000 | 0.9001 | 0.9002 | V | V | 0.0001 |
| 7 | 1.0000 | 1.0001 | 1.0003 | V | V | 0.0002 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 54758 | BWR139 | Eric Hebert | 11/24/2015 | Flow Rate | 000670 |

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

**DAS 1:**

| A Avg % Diff: | A Max % Di |
|---|---|
| 4.17% | 4.17% |

**DAS 2:**

| A Avg %Dif | A Max % Di |
|---|---|
| | |

**Cal Factor Zero** 0.1

**Cal Factor Full Scale** 1.11

**Rotometer Reading:** 1.45

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | 0.11 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.01 | 0.000 | 0.12 | l/m | l/m | |
| primary | test pt 1 | 1.441 | 1.440 | 1.38 | 0.000 | 1.50 | l/m | l/m | 4.17% |
| primary | test pt 2 | 1.443 | 1.440 | 1.38 | 0.000 | 1.50 | l/m | l/m | 4.17% |
| primary | test pt 3 | 1.442 | 1.440 | 1.38 | 0.000 | 1.50 | l/m | l/m | 4.17% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 45 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1105347309 | BWR139 | Eric Hebert | 11/24/2015 | Ozone | 000731 |

| | | | |
|---|---|---|---|
| **Slope:** | 1.01015 | **Slope:** | 0.00000 |
| **Intercept** | -0.50418 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99999 | **CorrCoff** | 0.00000 |

**DAS 1:** **DAS 2:**

| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
|---|---|---|---|
| 0.5% | 0.8% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.31 | 0.51 | -0.13 | ppb | |
| primary | 2 | 28.28 | 28.17 | 27.96 | ppb | -0.75% |
| primary | 3 | 50.86 | 50.50 | 50.70 | ppb | 0.40% |
| primary | 4 | 79.69 | 79.00 | 79.43 | ppb | 0.54% |
| primary | 5 | 107.01 | 106.02 | 106.40 | ppb | 0.36% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.000 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.043 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 103.1 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 747.8 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 32.3 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 81.4 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.9 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.73 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 4012 | BWR139 | Eric Hebert | 11/24/2015 | Temperature | 04315 |

| | | | |
|---|---|---|---|
| **Mfg** | Fluke | **Parameter** | Temperature |
| **Serial Number** | 2085085 | **Tfer Desc.** | RTD |
| **Tfer ID** | 01226 | | |
| **Slope** | 1.00105 | **Intercept** | -0.07989 |
| **Cert Date** | 1/30/2015 | **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 | 0.12 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.04 | 0.12 | 0.000 | 0.2 | C | 0.08 |
| primary | Temp Mid Range | 24.06 | 24.11 | 0.000 | 24.0 | C | -0.07 |
| primary | Temp High Range | 49.65 | 49.68 | 0.000 | 49.6 | C | -0.12 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Moderately clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | BWR139 | Eric Hebert | 11/24/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.11 | 0.31 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
|  |  |

| | | | |
|---|---|---|---|
| **Mfg** | Fluke | **Parameter** | Shelter Temperatur |
| **Serial Number** | 2085085 | **Tfer Desc.** | RTD |
| **Tfer ID** | 01226 | | |
| **Slope** | 1.00105 | **Intercept** | -0.07989 |
| **Cert Date** | 1/30/2015 | **CorrCoff** | 1.00000 |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 20.80 | 20.86 | 0.000 | 21.2 | C | 0.31 |
| primary | Temp Mid Range | 25.21 | 25.26 | 0.000 | 25.3 | C | 0.01 |
| primary | Temp Mid Range | 26.03 | 26.08 | 0.000 | 26.1 | C | -0.02 |

## Infrastructure Data For

**Site ID** BWR139 **Technicia** Eric Hebert **Site Visit Date** 11/24/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 | 640 cuft |

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

# Field Systems Comments

**1** **Parameter:** DasComments

The meteorological tower is no longer in service. The temperature sensor has been moved to the sample tower and is installed in a naturally aspirated shield.

**2** **Parameter:** SiteOpsProcedures

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

**3** **Parameter:** SitingCriteriaCom

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

**4** **Parameter:** ShelterCleanNotes

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

# Field Systems Data Form F-02058-1500-S1-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | | |
| **Operating Group** | BNWR/private | **Map Scale** | | |
| **AQS #** | 24-019-9991 | **Map Date** | | |
| **Meteorological Type** | R.M. Young | | | |
| **Air Pollutant Analyzer** | Ozone | **QAPP Latitude** | | |
| **Deposition Measurement** | dry | **QAPP Longitude** | | |
| **Land Use** | woodlands - mixed, wetlands | **QAPP Elevation Meters** | | |
| **Terrain** | flat | **QAPP Declination** | | |
| **Conforms to MLM** | Yes | **QAPP Declination Date** | | |
| **Site Telephone** | | **Audit Latitude** | | 38.444971 |
| **Site Address 1** | Blackwater Nat Wildlife Refuge | **Audit Longitude** | | -76.111274 |
| **Site Address 2** | 2145 Key Wallace Dr. | **Audit Elevation** | | 1 |
| **County** | Dorchester | **Audit Declination** | | -11.2 |
| **City, State** | Cambridge, MD | | **Present** | |
| **Zip Code** | 21613 | **Fire Extinguisher** | ☑ | dated 2015 |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☑ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☑ | |
| **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 showing signs of deterioration with leaks and rot at bottom of walls.

**Site OK** ☑ **Notes**

**Driving Directions** From I95 take route 50 east to Cambridge, MD. At mile marker 81 turn right on Woods Rd. Continue approximately 1 mile to the stop sign, turn right onto SR 16 west. Continue approximately 1.7 miles, past the school, and turn left onto Egypt Road. Continue approximately 7.1 miles to the stop sign. Turn right onto Key Wallace Drive towards the visitors center. Continue approximately 0.8 mile to the gate on the left. The site will be visible.

# Field Systems Data Form

F-02058-1500-S2-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

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

**Siting Distances OK** ☑

**Siting Criteria Comment**

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

# Field Systems Data Form

F-02058-1500-S3-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

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

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

# Field Systems Data Form

# F-02058-1500-S5-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☑ | ☑ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☑ |

11 Tower comments?

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

The meteorological tower is no longer in service. The temperature sensor has been moved to the sample tower and is installed in a naturally aspirated shield.

# Field Systems Data Form

F-02058-1500-S7-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

| | Yes | No | N/A |
|---|---|---|---|
| Wind speed sensor | ☐ | ☐ | ☑ |
| Wind direction sensor | ☐ | ☐ | ☑ |
| Temperature sensor | ☑ | ☐ | ☐ |
| Relative humidity sensor | ☐ | ☐ | ☑ |
| Solar radiation sensor | ☐ | ☐ | ☑ |
| Surface wetness sensor | ☐ | ☐ | ☑ |
| Wind sensor translator | ☐ | ☐ | ☑ |
| Temperature translator | ☐ | ☐ | ☑ |
| Humidity sensor translator | ☐ | ☐ | ☑ |
| Solar radiation translator | ☐ | ☐ | ☑ |
| Tipping bucket rain gauge | ☐ | ☐ | ☑ |
| Ozone analyzer | ☑ | ☐ | ☐ |
| Filter pack flow controller | ☑ | ☐ | ☐ |
| Filter pack MFC power supply | ☐ | ☐ | ☑ |

| | Yes | No | N/A |
|---|---|---|---|
| Data logger | ☐ | ☑ | ☐ |
| Data logger | ☐ | ☐ | ☑ |
| Strip chart recorder | ☐ | ☐ | ☑ |
| Computer | ☑ | ☐ | ☐ |
| Modem | ☐ | ☑ | ☐ |
| Printer | ☐ | ☐ | ☑ |
| Zero air pump | ☐ | ☑ | ☐ |
| Filter flow pump | ☐ | ☑ | ☐ |
| Surge protector | ☐ | ☑ | ☐ |
| UPS | ☐ | ☑ | ☐ |
| Lightning protection device | ☐ | ☐ | ☑ |
| Shelter heater | ☐ | ☑ | ☐ |
| Shelter air conditioner | ☑ | ☐ | ☐ |

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☑ | | ☑ |
| 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? | ☑ | |
| 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** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

## Site operation procedures

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

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

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

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

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

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

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

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

**Site operation procedures**

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Filter changed mornings 90% |
| 2 | Are the Site Status Report Forms being completed and filed correctly? | ☑ | |
| 3 | Are data downloads and backups being performed as scheduled? | ☐ | No longer required |
| 4 | Are general observations being made and recorded? How? | ☑ | SSRF, logbook |
| 5 | Are site supplies on-hand and replenished in a timely fashion? | ☑ | |
| 6 | Are sample flow rates recorded? How? | ☑ | SSRF, logbook, call-in |
| 7 | Are samples sent to the lab on a regular schedule in a timely fashion? | ☑ | |
| 8 | Are filters protected from contamination during handling and shipping? How? | ☑ | Clean gloves on and off |
| 9 | Are the site conditions reported regularly to the field operations manager or staff? | ☑ | |

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

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

# Field Systems Data Form

F-02058-1500-S10-rev002

**Site ID** BWR139 **Technician** Eric Hebert **Site Visit Date** 11/24/2015

## Site Visit Sensors

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | D520 | unknown | 000321 |
| DAS | Campbell | CR3000 | 2536 | 000431 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CAB18 | 608102A | 06031 |
| Flow Rate | Apex | AXMC105LPMDPC | 54758 | 000670 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0808507415 | 06456 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1105347309 | 000731 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | 1030244814 | 000697 |
| Sample Tower | Aluma Tower | B | none | missing |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342 | 4012 | 04315 |
| Zero air pump | Werther International | C 70/4 | 000815258 | 06877 |

# Site Inventory by Site Visit

*CND125-Sandy Grenville-12/01/2015*

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 12/1/2015 | Computer | Dell | 000254 | D520 | unknown |
| 2 | 12/1/2015 | DAS | Campbell | 000499 | CR3000 | 3816 |
| 3 | 12/1/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 12/1/2015 | Filter pack flow pump | Thomas | 01235 | 107CA18 | illegible |
| 5 | 12/1/2015 | Flow Rate | Apex | 000838 | AXMC105LPMDPCV | 54781 |
| 6 | 12/1/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 12/1/2015 | Modem | Raven | 06596 | V4221-V | 0844350327 |
| 8 | 12/1/2015 | Ozone | ThermoElectron Inc | 000692 | 49i A1NAA | 1030244803 |
| 9 | 12/1/2015 | Ozone Standard | ThermoElectron Inc | 000376 | 49i A3NAA | 0726124693 |
| 10 | 12/1/2015 | Sample Tower | Aluma Tower | 03495 | A | none |
| 11 | 12/1/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 12/1/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 12/1/2015 | Temperature | RM Young | 06402 | 41342VC | 14035 |
| 14 | 12/1/2015 | Zero air pump | Werther International | 06868 | C 70/4 | 000814284 |

# DAS Data Form

**DAS Time Max Error:** 0.28

| **Mfg** | **Serial Number** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Use Desc.** |
|---|---|---|---|---|---|---|
| Campbell | 3816 | CND125 | Sandy Grenville | 12/01/2015 | DAS | Primary |

**Das Date:** 12/1 /2015
**Das Time:** 15:21:46
**Das Day:** 335

**Audit Date** 12/1 /2015
**Audit Time** 15:21:29
**Audit Day** 335

**Low Channel:**

**Avg Diff:** 0.0001
**Max Diff:** 0.0001

**High Channel:**

**Avg Diff:** 0.0001
**Max Diff:** 0.0001

**Mfg** Datel
**Parameter** DAS
**Serial Number** 15510194
**Tfer Desc.** Source generator (D
**Tfer ID** 01320

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

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 7 | 0.0000 | -0.0001 | 0.0000 | V | V | 0.0001 |
| 7 | 0.1000 | 0.0998 | 0.0999 | V | V | 0.0001 |
| 7 | 0.3000 | 0.2997 | 0.2998 | V | V | 0.0001 |
| 7 | 0.5000 | 0.4995 | 0.4996 | V | V | 0.0001 |
| 7 | 0.7000 | 0.6995 | 0.6996 | V | V | 0.0001 |
| 7 | 0.9000 | 0.8993 | 0.8994 | V | V | 0.0001 |
| 7 | 1.0000 | 0.9992 | 0.9993 | V | V | 0.0001 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 54781 | CND125 | Sandy Grenville | 12/01/2015 | Flow Rate | 000838 |

**Mfg** BIOS

**Parameter** Flow Rate

**Serial Number** 103471

**Tfer Desc.** nexus

**Tfer ID** 01420

**Slope** 0.96664

**Intercept** 0.03078

**Cert Date** 2/5/2015

**CorrCoff** 0.99996

**Mfg** BIOS

**Parameter** Flow Rate

**Serial Number** 103424

**Tfer Desc.** BIOS cell

**Tfer ID** 01410

**Slope** 0.96664

**Intercept** 0.03078

**Cert Date** 2/5/2015

**CorrCoff** 0.99996

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
| 1.96% | 1.96% | | |

**Cal Factor Zero** -0.01

**Cal Factor Full Scale** 1.02

**Rotometer Reading:** 1.35

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.01 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | -0.02 | l/m | l/m | |
| primary | test pt 1 | 1.506 | 1.530 | 1.46 | 1.460 | 1.50 | l/m | l/m | -1.96% |
| primary | test pt 2 | 1.511 | 1.530 | 1.47 | 1.460 | 1.50 | l/m | l/m | -1.96% |
| primary | test pt 3 | 1.505 | 1.530 | 1.47 | 1.460 | 1.50 | 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** | 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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 0.7 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 230 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244803 | CND125 | Sandy Grenville | 12/01/2015 | Ozone | 000692 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.97118 | **Slope:** | 0.00000 |
| **Intercept** | -0.05317 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99999 | **CorrCoff** | 0.00000 |

**DAS 1:** **DAS 2:**

| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
|---|---|---|---|
| 2.9% | 3.4% | | |

**Mfg** ThermoElectron Inc **Parameter** ozone

**Serial Number** 0419606966 **Tfer Desc.** Ozone primary stan

**Tfer ID** 01112

**Slope** 0.99384 **Intercept** -0.40946

**Cert Date** 6/25/2015 **CorrCoff** 1.00000

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.12 | 0.29 | 0.21 | ppb | |
| primary | 2 | 30.04 | 30.63 | 29.84 | ppb | -2.58% |
| primary | 3 | 49.82 | 50.54 | 48.80 | ppb | -3.44% |
| primary | 4 | 79.41 | 80.31 | 78.08 | ppb | -2.78% |
| primary | 5 | 110.00 | 111.09 | 107.80 | ppb | -2.96% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.20 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.003 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 97.2 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.6 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 728.0 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 32.5 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 98.1 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.9 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.85 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 14035 | CND125 | Sandy Grenville | 12/01/2015 | Temperature | 06402 |

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

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| **Abs Avg Err** | **Abs Max Er** | **Abs Avg Err** | **Abs Max Er** |
| 0.16 | 0.30 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.11 | 0.17 | 0.000 | 0.2 | C | -0.01 |
| primary | Temp Mid Range | 26.60 | 26.57 | 0.000 | 26.4 | C | -0.17 |
| primary | Temp High Range | 48.80 | 48.70 | 0.000 | 49.0 | C | 0.3 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | CND125 | Sandy Grenville | 12/01/2015 | Shelter Temperature | none |

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| 0.04 | 0.05 | | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 22.89 | 22.88 | 0.000 | 22.8 | C | -0.05 |
| primary | Temp Mid Range | 23.33 | 23.31 | 0.000 | 23.3 | C | -0.04 |
| primary | Temp Mid Range | 23.70 | 23.68 | 0.000 | 23.7 | C | 0.02 |

## Infrastructure Data For

**Site ID** CND125 **Technicia** Sandy Grenville **Site Visit Date** 12/01/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 | 640 cuft |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Tower Type | **Condition** | Type A | **Status** | pass |
| **Sensor Component** | Conduit | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Met Tower | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Moisture Trap | **Condition** | 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** | Poor | **Status** | Fail |
| **Sensor Component** | Shelter Door | **Condition** | Fair | **Status** | pass |
| **Sensor Component** | Shelter Roof | **Condition** | Poor | **Status** | fail |
| **Sensor Component** | Shelter Floor | **Condition** | Fair | **Status** | pass |
| **Sensor Component** | Signal Cable | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Tubing Type | **Condition** | 3/8 teflon | **Status** | pass |
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |

# Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

The shelter is well maintained, clean and well organized. However the shelter roof is leaking and several wall panels and parts of the floor are showing signs of rot.

3 **Parameter:** MetOpMaintCom

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

# Field Systems Data Form

F-02058-1500-S1-rev002

**Site ID** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

**Site Sponsor (agency)** EPA
**Operating Group** private
**AQS #** 37-123-9991
**Meteorological Type** Climatronics
**Air Pollutant Analyzer** Ozone
**Deposition Measurement** dry, Hg, PM2.5, PM10
**Land Use** woodland
**Terrain** rolling
**Conforms to MLM** Marginally
**Site Telephone**
**Site Address 1** 136 Perry Drive
**Site Address 2**
**County** Montgomery
**City, State** Candor, NC
**Zip Code** 27229
**Time Zone** Eastern
**Primary Operator**
**Primary Op. Phone #**
**Primary Op. E-mail**
**Backup Operator**
**Backup Op. Phone #**
**Backup Op. E-mail**

**USGS Map**
**Map Scale**
**Map Date**
**QAPP Latitude**
**QAPP Longitude**
**QAPP Elevation Meters**
**QAPP Declination**
**QAPP Declination Date**
**Audit Latitude** 35.26333
**Audit Longitude** -79.83754
**Audit Elevation** 172
**Audit Declination** -8

| | **Present** | |
|---|---|---|
| **Fire Extinguisher** | ☑ | Inspected Oct 2001 |
| **First Aid Kit** | ☑ | |
| **Safety Glasses** | ☑ | |
| **Safety Hard Hat** | ☑ | |
| **Climbing Belt** | ☐ | |
| **Security Fence** | ☐ | |
| **Secure Shelter** | ☑ | |
| **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

**Shelter Clean** ☑ **Notes** The shelter is well maintained, clean and well organized. However the shelter roof is leaking and several wall panels and parts of the floor are showing signs of rot.

**Site OK** ☑ **Notes**

**Driving Directions** From Greensboro take Hwy 220 (future I-73) south to Candor. Exit at 211 west to Candor. At the traffic light turn left (south) onto 220 south and 731 west. Continue approximately 1.3 miles which will take you out of town. Bear right onto 731 west at the split. Take an immediate right onto McCallum Rd. (there is a sign for E-KU-SUMEE at the intersection). Continue approximately 5.4 miles to Perry Drive which is on the left. Turn left onto the gravel road and follow it to the end. The site is behind the house, drive around the grapevines on the left.

# Field Systems Data Form

**F-02058-1500-S2-rev002**

**Site ID** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

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

**Siting Distances OK** ☑

**Siting Criteria Comment**

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

# Field Systems Data Form

## F-02058-1500-S3-rev002

**Site ID** CND125

**Technician** Sandy Grenville

**Site Visit Date** 12/01/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

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

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

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

# Field Systems Data Form F-02058-1500-S5-rev002

**Site ID** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

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

**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** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the DAS instruments appear to be in good condition and well maintained? | ☑ | |
| 2 | Are all the components of the DAS operational? (printers, modem, backup, etc) | ☑ | |
| 3 | Do the analyzer and sensor signal leads pass through lightning protection circuitry? | ☑ | |
| 4 | Are the signal connections protected from the weather and well maintained? | ☑ | Met sensors only |
| 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** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

| | Yes | No | N/A |
|---|---|---|---|
| Wind speed sensor | ☐ | ☐ | ☑ |
| Wind direction sensor | ☐ | ☐ | ☑ |
| Temperature sensor | ☐ | ☑ | ☐ |
| Relative humidity sensor | ☐ | ☐ | ☑ |
| Solar radiation sensor | ☐ | ☐ | ☑ |
| Surface wetness sensor | ☐ | ☐ | ☑ |
| Wind sensor translator | ☐ | ☐ | ☑ |
| Temperature translator | ☐ | ☐ | ☑ |
| Humidity sensor translator | ☐ | ☐ | ☑ |
| Solar radiation translator | ☐ | ☐ | ☑ |
| Tipping bucket rain gauge | ☐ | ☐ | ☑ |
| Ozone analyzer | ☑ | ☐ | ☐ |
| Filter pack flow controller | ☐ | ☑ | ☐ |
| Filter pack MFC power supply | ☐ | ☐ | ☑ |

| | Yes | No | N/A |
|---|---|---|---|
| Data logger | ☐ | ☑ | ☐ |
| Data logger | ☐ | ☐ | ☑ |
| Strip chart recorder | ☐ | ☐ | ☑ |
| Computer | ☑ | ☐ | ☐ |
| Modem | ☐ | ☑ | ☐ |
| Printer | ☐ | ☐ | ☑ |
| Zero air pump | ☐ | ☑ | ☐ |
| Filter flow pump | ☐ | ☑ | ☐ |
| Surge protector | ☐ | ☐ | ☑ |
| UPS | ☐ | ☐ | ☑ |
| Lightning protection device | ☐ | ☐ | ☑ |
| Shelter heater | ☐ | ☑ | ☐ |
| Shelter air conditioner | ☐ | ☑ | ☐ |

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☐ | | ☐ |
| 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? | ☑ | |
| 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** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

**Site operation procedures**

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

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

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

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

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

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

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

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

## Site operation procedures

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

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

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

# Field Systems Data Form

F-02058-1500-S10-rev002

**Site ID** CND125 **Technician** Sandy Grenville **Site Visit Date** 12/01/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | D520 | unknown | 000254 |
| DAS | Campbell | CR3000 | 3816 | 000499 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA18 | illegible | 01235 |
| Flow Rate | Apex | AXMC105LPMDPC | 54781 | 000838 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0844350327 | 06596 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1030244803 | 000692 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | 0726124693 | 000376 |
| Sample Tower | Aluma Tower | A | none | 03495 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342VC | 14035 | 06402 |
| Zero air pump | Werther International | C 70/4 | 000814284 | 06868 |

# DAS Data Form

**DAS Time Max Error:** 0

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 2511 | PED108 | Sandy Grenville | 12/03/2015 | DAS | Primary |

**Das Date:** 12/3 /2015

**Das Time:** 10:29:33

**Das Day:** 337

**Audit Date** 12/3 /2015

**Audit Time** 10:29:33

**Audit Day** 337

| Low Channel: | | High Channel: | |
|---|---|---|---|
| **Avg Diff:** | **Max Diff:** | **Avg Diff:** | **Max Diff:** |
| 0.0001 | 0.0001 | 0.0001 | 0.0001 |

**Mfg** Datel

**Parameter** DAS

**Serial Number** 15510194

**Tfer Desc.** Source generator (D

**Tfer ID** 01320

**Mfg** Fluke

**Parameter** DAS

**Serial Number** 95740135

**Tfer Desc.** DVM

**Tfer ID** 01311

**Slope** 1.00000

**Intercept** 0.00000

**Cert Date** 1/22/2015

**CorrCoff** 1.00000

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 7 | 0.0000 | 0.0000 | 0.0001 | V | V | 0.0001 |
| 7 | 0.1000 | 0.0999 | 0.0999 | V | V | 0.0000 |
| 7 | 0.3000 | 0.2998 | 0.2997 | V | V | -0.0001 |
| 7 | 0.5000 | 0.4996 | 0.4996 | V | V | 0.0000 |
| 7 | 0.7000 | 0.6996 | 0.6995 | V | V | -0.0001 |
| 7 | 0.9000 | 0.8994 | 0.8993 | V | V | -0.0001 |
| 7 | 1.0000 | 0.9993 | 0.9992 | V | V | -0.0001 |

# Flow Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Apex | 54763 | PED108 | Sandy Grenville | 12/03/2015 | Flow Rate | 000666 |

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

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

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 4.65% | 5.06% | | |

| | |
|---|---|
| **Cal Factor Zero** | -0.02 |
| **Cal Factor Full Scale** | 0.96 |
| **Rotometer Reading:** | 1.55 |

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.00 | 0.000 | -0.02 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | 0.000 | -0.02 | l/m | l/m | |
| primary | test pt 1 | 1.560 | 1.580 | 1.56 | 1.560 | 1.50 | l/m | l/m | -5.06% |
| primary | test pt 2 | 1.553 | 1.570 | 1.56 | 1.560 | 1.50 | l/m | l/m | -4.46% |
| primary | test pt 3 | 1.554 | 1.580 | 1.56 | 1.560 | 1.51 | l/m | l/m | -4.43% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 1.0 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 160 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| **Mfg** | **Serial Number Tag** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Owner ID** |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1105347319 | PED108 | Sandy Grenville | 12/03/2015 | Ozone | 000732 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.98554 | **Slope:** | 0.00000 |
| **Intercept** | -0.67255 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99983 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 3.4% | 5.9% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.04 | 0.37 | 0.38 | ppb | |
| primary | 2 | 29.98 | 30.57 | 28.77 | ppb | -5.89% |
| primary | 3 | 50.00 | 50.72 | 48.52 | ppb | -4.34% |
| primary | 4 | 79.99 | 80.89 | 79.94 | ppb | -1.17% |
| primary | 5 | 109.99 | 111.08 | 108.70 | ppb | -2.14% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.1 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.995 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 94.1 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.2 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.64 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 728.3 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 31.0 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 107.5 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.63 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **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 | 14041 | PED108 | Sandy Grenville | 12/03/2015 | Temperature | 06408 |

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

| DAS 1: | | DAS 2: | |
|---|---|---|---|
| Abs Avg Err | Abs Max Er | Abs Avg Err | Abs Max Er |
| 0.10 | 0.18 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.19 | 0.25 | 0.000 | 0.2 | C | -0.07 |
| primary | Temp Mid Range | 24.91 | 24.89 | 0.000 | 24.7 | C | -0.18 |
| primary | Temp High Range | 47.66 | 47.56 | 0.000 | 47.5 | C | -0.06 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | PED108 | Sandy Grenville | 12/03/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.22 | 0.24 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 21.44 | 21.43 | 0.000 | 21.7 | C | 0.23 |
| primary | Temp Mid Range | 15.96 | 15.97 | 0.000 | 16.2 | C | 0.19 |
| primary | Temp Mid Range | 22.52 | 22.51 | 0.000 | 22.8 | C | 0.24 |

**Infrastructure Data For**

**Site ID** PED108 **Technicia** Sandy Grenville **Site Visit Date** 12/03/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 (s/n 2116-13) | 640 cuft |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Tower Type | **Condition** | Type B | **Status** | pass |
| **Sensor Component** | Conduit | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Met Tower | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Moisture Trap | **Condition** | Installed | **Status** | pass |
| **Sensor Component** | Power Cables | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Temp Control | **Condition** | Functioning | **Status** | pass |
| **Sensor Component** | Rotometer | **Condition** | Installed | **Status** | pass |
| **Sensor Component** | Sample Tower | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Condition | **Condition** | Fair | **Status** | pass |
| **Sensor Component** | Shelter Door | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Shelter Roof | **Condition** | 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 Data Form

**F-02058-1500-S1-rev002**

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

| | | | | |
|---|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | | Green Bay |
| **Operating Group** | Private | **Map Scale** | | |
| **AQS #** | 51-147-9991 | **Map Date** | | |
| **Meteorological Type** | Climatronics | | | |
| **Air Pollutant Analyzer** | Ozone | **QAPP Latitude** | | 37.1653 |
| **Deposition Measurement** | dry, wet | **QAPP Longitude** | | -78.3070 |
| **Land Use** | woodland - mixed | **QAPP Elevation Meters** | | 150 |
| **Terrain** | rolling | **QAPP Declination** | | -9.1 |
| **Conforms to MLM** | Yes | **QAPP Declination Date** | | 2/22/2006 |
| **Site Telephone** | | **Audit Latitude** | | 37.165222 |
| **Site Address 1** | SR 629 | **Audit Longitude** | | -78.307067 |
| **Site Address 2** | Prince Edward-Gallion State Forest | **Audit Elevation** | | 149 |
| **County** | Prince Edward | **Audit Declination** | | -9.4 |
| **City, State** | Burkesville, VA | | **Present** | |
| **Zip Code** | 23922 | **Fire Extinguisher** | ☑ | No inspection date |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☐ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☑ | |
| **Backup Operator** | | **Security Fence** | ☐ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☑ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8810 (s/n 2116-13) **Shelter Size** 640 cuft

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

**Site OK** ☑ **Notes**

**Driving Directions** From Farmville travel east on 460 approximately 1 mile. Turn right (south) onto route 696 toward Twin Lakes State Park. Continue approximately 8.5 miles on 696 (do not turn at the next sign for Twin Lakes State Park near the church) into the state forest. Turn left onto route 629 and continue approximately 1.3 miles. The site is not visible from the road, and is through a gate on a gravel road to the right.

# Field Systems Data Form

F-02058-1500-S2-rev002

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | | ☑ |
| Limited agricultural operations | 200 m | | ☑ |
| Large parking lot | 200 m | | ☑ |
| Small parking lot | 100 m | | ☑ |
| Tree line | 50 m | 25 - 35 m | ☐ |
| Obstacles to wind | 10 times obstacle height | | ☑ |

**Siting Distances OK** ☑

**Siting Criteria Comment**

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last nine years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

# Field Systems Data Form F-02058-1500-S3-rev002

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

| | | | |
|---|---|---|---|
| 1 | Do all the meterological sensors appear to be intact, in good condition, and well maintained? | ☑ | |
| 2 | Are all the meteorological sensors operational online, and reporting data? | ☑ | |
| 3 | Are the shields for the temperature and RH sensors clean? | ☑ | |
| 4 | Are the aspirated motors working? | ☑ | N/A |
| 5 | Is the solar radiation sensor's lens clean and free of scratches? | ☑ | N/A |
| 6 | Is the surface wetness sensor grid clean and undamaged? | ☑ | N/A |
| 7 | Are the sensor signal and power cables intact, in good condition, and well maintained? | ☑ | |
| 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** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the analyzers and equipment appear to be in good condition and well maintained? | ☑ | |
| 2 | Are the analyzers and monitors operational, on-line, and reporting data? | ☑ | |
| 3 | Describe ozone sample tube. | | 1/4 teflon by 18 meters |
| 4 | Describe dry dep sample tube. | | 3/8 teflon by 18 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** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☐ | ☐ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☑ |

11 Tower comments? Met tower removed

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

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

# Field Systems Data Form

F-02058-1500-S7-rev002

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

| | Present | | Current |
|---|---|---|---|
| Station Log | ☑ | | ☑ |
| SSRF | ☑ | | ☑ |
| Site Ops Manual | ☑ | Oct 2001 | ☐ |
| HASP | ☑ | Feb 2014 | ☑ |
| Field Ops Manual | ☑ | July 1999 | ☐ |
| Calibration Reports | ☑ | | ☑ |
| Ozone z/s/p Control Charts | ☐ | | ☐ |
| Preventive maintenance schedule | ☐ | | ☐ |

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

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

# Field Systems Data Form

F-02058-1500-S8-rev002

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

## Site operation procedures

| | | | |
|---|---|---|---|
| 1 | Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? | ☑ | Trained in FL in 1987 and refresher course in July 2006 |
| 2 | Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? | ☐ | |
| 3 | Is the site visited regularly on the required Tuesday schedule? | ☑ | |
| 4 | Are the standard CASTNET operational procedures being flollowed by the site operator? | ☑ | |
| 5 | Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation) | ☑ | |

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

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

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

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

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

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

# Field Systems Data Form

**F-02058-1500-S9-rev002**

**Site ID** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

**Site operation procedures**

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Flter 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, call-in |
| 7 | Are samples sent to the lab on a regular schedule in a timely fashion? | ☑ | |
| 8 | Are filters protected from contamination during handling and shipping? How? | ☑ | One set of gloves only |
| 9 | Are the site conditions reported regularly to the field operations manager or staff? | ☑ | |

| QC Check Performed | | Frequency | Compliant |
|---|---|---|---|
| Multi-point MFC Calibrations | ☑ | Semiannually | ☑ |
| Flow System Leak Checks | ☑ | Weekly | ☑ |
| Filter Pack Inspection | ☐ | | ☐ |
| Flow Rate Setting Checks | ☑ | Weekly | ☑ |
| Visual Check of Flow Rate Rotometer | ☑ | Weekly | ☑ |
| In-line Filter Inspection/Replacement | ☐ | Unknown | ☐ |
| 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** PED108 **Technician** Sandy Grenville **Site Visit Date** 12/03/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | D520 | unknown | 000291 |
| DAS | Campbell | CR3000 | 2511 | 000406 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA18 | 1088003022 | 00564 |
| Flow Rate | Apex | AXMC105LPMDPC | 54763 | 000666 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0844353122 | 06587 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1105347319 | 000732 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | 0622717855 | 000214 |
| Sample Tower | Aluma Tower | B | unknown | 000788 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342 | 14041 | 06408 |
| Zero air pump | Werther International | C 70/4 | 000815257 | 06883 |

# *Site Inventory by Site Visit*

## *BFT142-Sandy Grenville-12/04/2015*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 12/4/2015 | Computer | Dell | 07007 | Inspiron 15 | Unknown |
| 2 | 12/4/2015 | DAS | Campbell | 000498 | CR3000 | 3815 |
| 3 | 12/4/2015 | Elevation | Elevation | None | 1 | None |
| 4 | 12/4/2015 | Filter pack flow pump | Thomas | 00808 | 107CA18 | 00002460587 |
| 5 | 12/4/2015 | Flow Rate | Apex | 000463 | AXMC105LPMDPCV | 42230 |
| 6 | 12/4/2015 | Infrastructure | Infrastructure | none | none | none |
| 7 | 12/4/2015 | Modem | Raven | 06465 | V4221-V | 0808337771 |
| 8 | 12/4/2015 | Ozone | ThermoElectron Inc | 000738 | 49i A1NAA | 1045347307 |
| 9 | 12/4/2015 | Ozone Standard | ThermoElectron Inc | 000453 | 49i A3NAA | CM08200027 |
| 10 | 12/4/2015 | Sample Tower | Aluma Tower | 000632 | B | unknown |
| 11 | 12/4/2015 | Shelter Temperature | Campbell | none | 107-L | none |
| 12 | 12/4/2015 | Siting Criteria | Siting Criteria | None | 1 | None |
| 13 | 12/4/2015 | Temperature | RM Young | 04444 | 41342VO | 4542 |
| 14 | 12/4/2015 | Zero air pump | Werther International | 06897 | C 70/4 | 000821893 |

# DAS Data Form

**DAS Time Max Error:** 0

| Mfg | Serial Number | Site | Technician | Site Visit Date | Parameter | Use Desc. |
|---|---|---|---|---|---|---|
| Campbell | 3815 | BFT142 | Sandy Grenville | 12/04/2015 | DAS | Primary |

**Das Date:** 12/4 /2015
**Das Time:** 12:32:12
**Das Day:** 338

**Audit Date** 12/4 /2015
**Audit Time** 12:32:12
**Audit Day** 338

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

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

**Mfg** Datel
**Parameter** DAS
**Serial Number** 15510194
**Tfer Desc.** Source generator (D
**Tfer ID** 01320

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

| Channel | Input | DVM Output | DAS Output | InputUnit | OutputUnit | Difference |
|---|---|---|---|---|---|---|
| 7 | 0.0000 | -0.0001 | 0.0000 | V | V | 0.0001 |
| 7 | 0.1000 | 0.0998 | 0.0999 | V | V | 0.0001 |
| 7 | 0.3000 | 0.2996 | 0.2997 | V | V | 0.0001 |
| 7 | 0.5000 | 0.4995 | 0.4996 | V | V | 0.0001 |
| 7 | 0.7000 | 0.6994 | 0.6995 | V | V | 0.0001 |
| 7 | 0.9000 | 0.8993 | 0.8994 | V | V | 0.0001 |
| 7 | 1.0000 | 0.9992 | 0.9993 | V | V | 0.0001 |

# Flow Data Form

| **Mfg** | **Serial Number Tag** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Owner ID** |
|---|---|---|---|---|---|---|
| Apex | 42230 | BFT142 | Sandy Grenville | 12/04/2015 | Flow Rate | 000463 |

| | | | |
|---|---|---|---|
| **Mfg** | BIOS | **Parameter** | Flow Rate |
| **Serial Number** | 103471 | **Tfer Desc.** | nexus |
| **Tfer ID** | 01420 | | |
| **Slope** | 0.96664 | **Intercept** | 0.03078 |
| **Cert Date** | 2/5/2015 | **CorrCoff** | 0.99996 |
| **Mfg** | BIOS | **Parameter** | Flow Rate |
| **Serial Number** | 103424 | **Tfer Desc.** | BIOS cell |
| **Tfer ID** | 01410 | | |
| **Slope** | 0.96664 | **Intercept** | 0.03078 |
| **Cert Date** | 2/5/2015 | **CorrCoff** | 0.99996 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 1.53% | 1.96% | | |

**Cal Factor Zero** 0

**Cal Factor Full Scale** 1

**Rotometer Reading:** 1.5

| Desc. | Test type | Input l/m | Input Corr_ | MfcDisp. | OutputSignal | Output S E | InputUnit | OutputSignalI | PctDifference |
|---|---|---|---|---|---|---|---|---|---|
| primary | pump off | 0.000 | 0.000 | 0.01 | 0.010 | 0.01 | l/m | l/m | |
| primary | leak check | 0.000 | 0.000 | 0.00 | -0.010 | -0.01 | l/m | l/m | |
| primary | test pt 1 | 1.504 | 1.520 | 1.51 | 1.510 | 1.50 | l/m | l/m | -1.32% |
| primary | test pt 2 | 1.505 | 1.530 | 1.51 | 1.510 | 1.50 | l/m | l/m | -1.96% |
| primary | test pt 3 | 1.506 | 1.530 | 1.51 | 1.510 | 1.51 | l/m | l/m | -1.31% |

| | | | | | |
|---|---|---|---|---|---|
| **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** | 4.0 cm | **Status** | pass |
| **Sensor Component** | Filter Depth | **Condition** | 2.0 cm | **Status** | pass |
| **Sensor Component** | Filter Azimuth | **Condition** | 160 deg | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Ozone Data Form

| | | | | | | |
|---|---|---|---|---|---|---|
| **Mfg** | **Serial Number Tag** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Owner ID** |
| ThermoElectron Inc | 1045347307 | BFT142 | Sandy Grenville | 12/04/2015 | Ozone | 000738 |

| | | | |
|---|---|---|---|
| **Slope:** | 1.01401 | **Slope:** | 0.00000 |
| **Intercept** | -0.63216 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99998 | **CorrCoff** | 0.00000 |

**DAS 1:** **DAS 2:**

| | | | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 0.9% | 1.9% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.00 | 0.41 | 0.02 | ppb | |
| primary | 2 | 30.01 | 30.60 | 30.01 | ppb | -1.93% |
| primary | 3 | 50.24 | 50.96 | 50.96 | ppb | 0.00% |
| primary | 4 | 80.07 | 80.97 | 81.80 | ppb | 1.03% |
| primary | 5 | 110.08 | 111.17 | 112.00 | ppb | 0.75% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.000 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.039 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 101.4 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.7 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 756.1 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 29.8 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 96.5 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.5 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.08 lpm | **Status** | Fail |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | See comments | **Status** | pass |

# Temperature Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| RM Young | 4542 | BFT142 | Sandy Grenville | 12/04/2015 | Temperature | 04444 |

**Mfg** Extech **Parameter** Temperature

**Serial Number** H232734 **Tfer Desc.** RTD

**Tfer ID** 01227

**Slope** 1.00343 **Intercept** -0.06409

**Cert Date** 1/30/2015 **CorrCoff** 1.00000

| DAS 1: Abs Avg Err | DAS 1: Abs Max Er | DAS 2: Abs Avg Err | DAS 2: Abs Max Er |
|---|---|---|---|
| 0.16 | 0.21 | | |

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Low Range | 0.39 | 0.45 | 0.000 | 0.2 | C | -0.21 |
| primary | Temp Mid Range | 25.32 | 25.30 | 0.000 | 25.1 | C | -0.19 |
| primary | Temp High Range | 48.10 | 48.00 | 0.000 | 47.9 | C | -0.09 |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Shield | **Condition** | Moderately clean | **Status** | pass |
| **Sensor Component** | Blower | **Condition** | N/A | **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 Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| Campbell | none | BFT142 | Sandy Grenville | 12/04/2015 | Shelter Temperature | none |

**DAS 1:**

| Abs Avg Err | Abs Max Er |
|---|---|
| 0.32 | 0.47 |

**DAS 2:**

| Abs Avg Err | Abs Max Er |
|---|---|
| | |

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

| UseDesc. | Test type | InputTmpRaw | InputTmpCorr. | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference |
|---|---|---|---|---|---|---|---|
| primary | Temp Mid Range | 21.94 | 21.93 | 0.000 | 22.1 | C | 0.17 |
| primary | Temp Mid Range | 21.75 | 21.74 | 0.000 | 22.2 | C | 0.47 |
| primary | Temp Mid Range | 22.01 | 22.00 | 0.000 | 22.3 | C | 0.33 |

## Infrastructure Data For

**Site ID** BFT142 **Technicia** Sandy Grenville **Site Visit Date** 12/04/2015

| **Shelter Make** | **Shelter Model** | **Shelter Size** |
|---|---|---|
| Ekto | 8810 | 640 cuft |

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

# Site Visit Comments

| Parameter | Site | Technician | S.V. Date | Component | Mfg | Serial No. | Hazard | Problem |
|---|---|---|---|---|---|---|---|---|
| Ozone | BFT142 | Sandy Grenville | 12/04/2015 | Cell B Flow | ThermoElectron | 3889 | ☐ | ☐ |

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

# Field Systems Comments

**1** **Parameter:** DasComments

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

**2** **Parameter:** SitingCriteriaCom

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

**3** **Parameter:** ShelterCleanNotes

The shelter floor has been replaced since the previous audit.

**4** **Parameter:** MetOpMaintCom

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

# Field Systems Data Form

F-02058-1500-S1-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

| | | | |
|---|---|---|---|
| **Site Sponsor (agency)** | EPA | **USGS Map** | Williston |
| **Operating Group** | UNC-IMS | **Map Scale** | |
| **AQS #** | 37-031-9991 | **Map Date** | |
| **Meteorological Type** | R.M. Young | | |
| **Air Pollutant Analyzer** | Ozone | **QAPP Latitude** | |
| **Deposition Measurement** | dry, wet | **QAPP Longitude** | |
| **Land Use** | agriculture | **QAPP Elevation Meters** | |
| **Terrain** | flat | **QAPP Declination** | |
| **Conforms to MLM** | Yes | **QAPP Declination Date** | |
| **Site Telephone** | | **Audit Latitude** | 34.884668 |
| **Site Address 1** | Open Grounds Farm | **Audit Longitude** | -76.620666 |
| **Site Address 2** | 100 Nelson Bay Rd. | **Audit Elevation** | 5.3 |
| **County** | Carteret | **Audit Declination** | -9.9 |

| | | | **Present** | |
|---|---|---|---|---|
| **City, State** | Beaufort, NC | | | |
| **Zip Code** | 28516 | **Fire Extinguisher** | ☑ | Inspected July 2000 |
| **Time Zone** | Eastern | **First Aid Kit** | ☑ | |
| **Primary Operator** | | **Safety Glasses** | ☑ | |
| **Primary Op. Phone #** | | **Safety Hard Hat** | ☑ | |
| **Primary Op. E-mail** | | **Climbing Belt** | ☑ | |
| **Backup Operator** | | **Security Fence** | ☐ | |
| **Backup Op. Phone #** | | **Secure Shelter** | ☑ | |
| **Backup Op. E-mail** | | **Stable Entry Step** | ☑ | |

**Shelter Working Room** ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

**Shelter Clean** ☑ **Notes** The shelter floor has been replaced since the previous audit.

**Site OK** ☑ **Notes**

**Driving Directions** From I-95 take highway 70 east through Morehead City and over the bridge. Continue through Beaufort staying on route 70 east. At East Carteret High School, route 70 turns to the right at a traffic light. Continue straight through the light on Merrimon Rd. (SR 1300), do not follow 70 to the right. Open Grounds Farm will be on the right approximately 6 miles on Merrimon Rd. Sign in at the guard house. Continue on the dirt road into the farm. Turn left at the first dirt road. The site will be visible in the corner of the field. Follow the dirt road around the field to the site.

# Field Systems Data Form

# F-02058-1500-S2-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

| Potential Interferent | Minimum Distance From Measurement Apparatus | Distance | Pass = Checked |
|---|---|---|---|
| Large Point Source of SO2 or NOx | 20 to 40 km | | ☑ |
| Major industrial complex | 10 to 20 km | | ☑ |
| City > 50,000 population | 40 km | | ☑ |
| City 10,000 to 50,000 population | 10 km | | ☑ |
| City 1,000 to 10,000 population | 5 km | | ☑ |
| Major highway, airport or rail yard | 2 km | | ☑ |
| Secondary road, heavily traveled | 500 m | | ☑ |
| Secondary road, lightly traveled | 200 m | | ☑ |
| Feedlot operations | 500 m | | ☑ |
| Intensive agricultural ops (including aerial spraying) | 500 m | 20 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 site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

## Field Systems Data Form F-02058-1500-S3-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

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

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

# Field Systems Data Form

F-02058-1500-S4-rev002

**Site ID** BFT142

**Technician** Sandy Grenville

**Site Visit Date** 12/04/2015

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

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

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

# Field Systems Data Form

F-02058-1500-S5-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

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

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

## Pollutant analyzers and deposition equipment operations and maintenance

| | | | |
|---|---|---|---|
| 1 | Do the analyzers and equipment appear to be in good condition and well maintained? | ☑ | |
| 2 | Are the analyzers and monitors operational, on-line, and reporting data? | ☑ | |
| 3 | Describe ozone sample tube. | | 1/4 teflon by 10 meters |
| 4 | Describe dry dep sample tube. | | 3/8 teflon by 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** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

## DAS, sensor translators, and peripheral equipment operations and maintenance

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

| | | Stable | Grounded |
|---|---|---|---|
| 9 | Is the met tower stable and grounded? | ☐ | ☐ |
| 10 | Is the sample tower stable and grounded? | ☑ | ☐ |

11 Tower comments? Met tower removed.

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

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

# Field Systems Data Form F-02058-1500-S7-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

## Documentation

### Does the site have the required instrument and equipment manuals?

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

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

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

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

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

# Field Systems Data Form

## F-02058-1500-S8-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

### Site operation procedures

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

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

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

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

| QC Check Performed |  | Frequency | Compliant |
|---|---|---|---|
| Multi-point Calibrations | ☑ | Semiannually | ☑ |
| Automatic Zero/Span Tests | ☐ | Daily | ☑ |
| Manual Zero/Span Tests | ☑ | As needed | ☑ |
| Automatic Precision Level Tests | ☐ | Daily | ☑ |
| Manual Precision Level Test | ☑ | As needed | ☑ |
| 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 | ☑ | As needed | ☑ |

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

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

# Field Systems Data Form

F-02058-1500-S9-rev002

**Site ID** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

## Site operation procedures

| | | | |
|---|---|---|---|
| 1 | Is the filter pack being changed every Tuesday as scheduled? | ☑ | Filter changed morinings |
| 2 | Are the Site Status Report Forms being completed and filed correctly? | ☑ | |
| 3 | Are data downloads and backups being performed as scheduled? | ☐ | No longer required |
| 4 | Are general observations being made and recorded? How? | ☑ | SSRF |
| 5 | Are site supplies on-hand and replenished in a timely fashion? | ☑ | |
| 6 | Are sample flow rates recorded? How? | ☑ | SSRF, logbook, call-in |
| 7 | Are samples sent to the lab on a regular schedule in a timely fashion? | ☑ | |
| 8 | Are filters protected from contamination during handling and shipping? How? | ☑ | 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** BFT142 **Technician** Sandy Grenville **Site Visit Date** 12/04/2015

**Site Visit Sensors**

| Parameter | Manufacturer | Model | S/N | Client ID |
|---|---|---|---|---|
| Computer | Dell | Inspiron 15 | Unknown | 07007 |
| DAS | Campbell | CR3000 | 3815 | 000498 |
| Elevation | Elevation | 1 | None | None |
| Filter pack flow pump | Thomas | 107CA18 | 00002460587 | 00808 |
| Flow Rate | Apex | AXMC105LPMDPC | 42230 | 000463 |
| Infrastructure | Infrastructure | none | none | none |
| Modem | Raven | V4221-V | 0808337771 | 06465 |
| Ozone | ThermoElectron Inc | 49i A1NAA | 1045347307 | 000738 |
| Ozone Standard | ThermoElectron Inc | 49i A3NAA | CM08200027 | 000453 |
| Sample Tower | Aluma Tower | B | unknown | 000632 |
| Shelter Temperature | Campbell | 107-L | none | none |
| Siting Criteria | Siting Criteria | 1 | None | None |
| Temperature | RM Young | 41342VO | 4542 | 04444 |
| Zero air pump | Werther International | C 70/4 | 000821893 | 06897 |

# APPENDIX B

# CASTNET Site Spot Report Forms

# EEMS Spot Report

**Data Compiled:** 11/15/2015 2:18:18 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/28/2015 | ABT147 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.99294 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.37282 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99999 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 1.1 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 1.2 | % | **P** |

# Field Performance Comments

**1** **Parameter:** Ozone **SensorComponent:** Cell A Flow **CommentCode:** 99

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

# EEMS Spot Report

**Data Compiled:** 11/15/2015 2:39:15 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/02/2015 | ARE128 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 1.00896 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.80592 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99993 | 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:** 10/30/2015 1:24:34 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/07/2015 | ASH135 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.95816 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.31783 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 1.00000 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 4.7 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 5.1 | % | **P** |

# Field Performance Comments

**1** **Parameter:** Ozone **SensorComponent:** Cell A Pressure **CommentCode:** 99

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

**2** **Parameter:** Ozone **SensorComponent:** System Memo **CommentCode:** 93

The analyzer output is erratic and varying. The analyzer is in need of maintenance.

# EEMS Spot Report

**Data Compiled:** 12/5/2015 3:21:30 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/19/2015 | BEL116 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.98851 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.90721 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99998 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 3.2 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 4.9 | % | **P** |

# EEMS Spot Report

**Data Compiled:** 12/7/2015 9:56:14 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 12/04/2015 | BFT142 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.16 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 6 | 0.21 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 1.01401 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.63216 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99998 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 0.9 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 1.9 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 4 | 1.53 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 4 | 1.96 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.00 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0001 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.32 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.47 | c | **P** |

| SiteVisitDate | Site | Technician |
|---|---|---|
| 12/04/2015 | BFT142 | Sandy Grenville |

# Field Performance Comments

**1** **Parameter:** Ozone **SensorComponent:** Cell B Flow **CommentCode:** 99

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

# Field Systems Comments

**1** **Parameter:** DasComments

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

**2** **Parameter:** SitingCriteriaCom

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

**3** **Parameter:** ShelterCleanNotes

The shelter floor has been replaced since the previous audit.

**4** **Parameter:** MetOpMaintCom

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

# EEMS Spot Report

**Data Compiled:** 12/5/2015 3:54:17 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/24/2015 | BWR139 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 9 | 0.09 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 9 | 0.12 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 1.01015 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.50418 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99999 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 0.5 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 0.7 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 3 | 4.17 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 3 | 4.17 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.02 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0001 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.11 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.31 | c | **P** |

# Field Systems Comments

**1** **Parameter:** DasComments

The meteorological tower is no longer in service. The temperature sensor has been moved to the sample tower and is installed in a naturally aspirated shield.

**2** **Parameter:** SiteOpsProcedures

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

**3** **Parameter:** SitingCriteriaCom

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

**4** **Parameter:** ShelterCleanNotes

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

# EEMS Spot Report

**Data Compiled:** 12/29/2015 5:44:54 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/22/2015 | CDR119 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 15 | 0.19 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 15 | 0.22 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.98679 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.73121 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99994 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 2.9 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 4.3 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 3 | 2.6 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 3 | 2.6 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.13 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 28 | 0.0002 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.26 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.41 | c | **P** |

# Field Systems Comments

**1** **Parameter:** SiteOpsProcComm

The filter handling procedures have improved since the previous site audit visit.

**2** **Parameter:** SitingCriteriaCom

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road.

**3** **Parameter:** ShelterCleanNotes

The shelter has been refurbished since the previous site audit visit.

**4** **Parameter:** MetOpMaintCom

The temperature sensor has been moved to a naturally aspirated shield on the sample tower. The meteorological tower has been removed.

# EEMS Spot Report

**Data Compiled:** 12/7/2015 8:32:58 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 12/01/2015 | CND125 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.16 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 6 | 0.30 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.97118 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.05317 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99999 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 2.9 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 3.4 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 3 | 1.96 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 3 | 1.96 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.28 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0001 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.04 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.05 | c | **P** |

# Field Systems Comments

**1** **Parameter:** SitingCriteriaCom

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

**2** **Parameter:** ShelterCleanNotes

The shelter is well maintained, clean and well organized. However the shelter roof is leaking and several wall panels and parts of the floor are showing signs of rot.

**3** **Parameter:** MetOpMaintCom

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

# EEMS Spot Report

**Data Compiled:** 10/30/2015 1:42:21 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/23/2015 | CTH110 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.97207 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.54651 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99998 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 3.5 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 3.7 | % | **P** |

# EEMS Spot Report

**Data Compiled:** 11/2/2015 11:59:36 AM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/26/2015 | GRS420 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.15 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 6 | 0.23 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.97926 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.35728 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 1.00000 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 2.8 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 3.6 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 4 | 1.04 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 4 | 1.48 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.05 | min | **P** |
| 11 | DAS Voltage average error | P | 2 | 0.003 | 21 | 0.0000 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 10 | 0.25 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 10 | 0.47 | c | **P** |

| **SiteVisitDate** | **Site** | **Technician** |
|---|---|---|
| 10/26/2015 | GRS420 | Eric Hebert |

# Field Performance Comments

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

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

# Field Systems Comments

**1** **Parameter:** SiteOpsProcComm

Site operation and filter handling has improved since the previous audit visit.

**2** **Parameter:** SiteOpsProcedures

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

**3** **Parameter:** SitingCriteriaCom

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

**4** **Parameter:** ShelterCleanNotes

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

**5** **Parameter:** MetSensorComme

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground. Previously recorded temperature data are not comparable to current data labeled as temperature.

# EEMS Spot Report

**Data Compiled:** ####################

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/06/2015 | HOW191 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.96286 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.40667 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99998 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 4.2 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 4.3 | % | **P** |

# EEMS Spot Report

**Data Compiled:** ####################

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/03/2015 | HWF187 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.98118 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.16523 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 1.00000 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 2.2 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 2.5 | % | **P** |

# EEMS Spot Report

**Data Compiled:** 10/30/2015 1:53:35 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/24/2015 | KEF112 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.97256 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.13647 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99993 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 2.6 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 3.2 | % | **P** |

# EEMS Spot Report

**Data Compiled:** 11/15/2015 4:37:26 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/01/2015 | LRL117 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 9 | 0.21 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 9 | 0.30 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.99066 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -1.30958 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99994 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 3.5 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 4.9 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 4 | 6.05 | % | **Fail** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 4 | 6.25 | % | **Fail** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.02 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0000 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.47 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.68 | c | **P** |

# Field Systems Comments

**1** **Parameter:** DasComments

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

**2** **Parameter:** SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

**3** **Parameter:** ShelterCleanNotes

The shelter has been repaired and is in very good condition. A new peaked roof has been installed.

# EEMS Spot Report

**Data Compiled:** 11/15/2015 1:57:27 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/25/2015 | MKG113 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 1.00862 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.36949 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99994 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 0.9 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 1.7 | % | **P** |

# EEMS Spot Report

**Data Compiled:** 10/7/2015 9:55:53 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/02/2015 | NIC001 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.18 | c | **P** |
| 2 | Temperature max  error | P | 4 | 0.5 | 6 | 0.26 | c | **P** |
| 3 | Flow Rate average % difference | P | 10 | 5 | 3 | 0.99 | % | **P** |
| 4 | Flow Rate max  % difference | P | 10 | 5 | 3 | 1.32 | % | **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:** DasComments

Single tower with filter pack mounted at 10 meters and temperature mounted at 9 meters.

**2** **Parameter:** DocumentationCo

There is no logbook onsite to record information regarding site status or filter information.

**3** **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.  Equipment housed in enclosure on sample tower.

# EEMS Spot Report

**Data Compiled:** 12/29/2015 5:04:04 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/21/2015 | PAR107 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 12 | 0.05 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 12 | 0.10 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 1.00098 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.89739 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99999 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 1.6 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 2.7 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 3 | 3.02 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 3 | 3.23 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.00 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0000 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.20 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.29 | c | **P** |

# Field Systems Comments

**1** **Parameter:** DasComments

The meteorological tower has been removed and the temperature sensor has been mounted on the sample tower.

**2** **Parameter:** SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

**3** **Parameter:** ShelterCleanNotes

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

# EEMS Spot Report

**Data Compiled:** 12/7/2015 9:23:50 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 12/03/2015 | PED108 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 3 | 0.10 | c | **P** |
| 2 | Temperature max  error | P | 4 | 0.5 | 3 | 0.18 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.98554 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.67255 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99983 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 3.4 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 5.9 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 3 | 4.65 | % | **P** |
| 9 | Flow Rate max  % difference | P | 10 | 5 | 3 | 5.06 | % | **Fail** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.00 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0001 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.22 | c | **P** |
| 13 | Shelter Temperature max  error | P | 5 | 1 | 12 | 0.24 | c | **P** |

# Field Systems Comments

**1** **Parameter:** DasComments

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

**2** **Parameter:** SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest.  Trees were cut within the last nine years to increase the size of the clearing.  The tree line is encroaching again and is between 25 and 35 meters from the site.

**3** **Parameter:** ShelterCleanNotes

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

# EEMS Spot Report

**Data Compiled:** 11/15/2015 1:40:17 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/04/2015 | PNF126 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 1.00789 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | 0.19347 | 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:** 11/15/2015 2:08:23 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/27/2015 | PSU106 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 1.01677 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.47066 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99998 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 0.8 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 1.6 | % | **P** |

# Field Performance Comments

**1** **Parameter:** Ozone **SensorComponent:** Cell B Flow **CommentCode:** 99

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

# EEMS Spot Report

**Data Compiled:** 11/15/2015 3:49:17 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/06/2015 | SHN418 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 9 | 0.14 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 9 | 0.22 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.96564 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.36003 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 1.00000 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 4.1 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 4.6 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 9 | 1.81 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 9 | 2.04 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.57 | min | **P** |
| 11 | DAS Voltage average error | P | 2 | 0.003 | 21 | 0.0001 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 15 | 0.59 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 15 | 0.76 | c | **P** |

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/06/2015 | SHN418 | Eric Hebert |

# Field Performance Comments

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

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

2 **Parameter:** Flow Rate **SensorComponent:** Filter Depth **CommentCode:** 71

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

# Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean and well organized

3 **Parameter:** MetSensorComme

The temperature sensor has been moved from 10 meters to approximately 2 meters above ground. Currently recorded temperature data are not comparable to previously measured temperature data.

# EEMS Spot Report

**Data Compiled:** 10/7/2015 10:16:10 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/05/2015 | UND002 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.35 | c | **P** |
| 2 | Temperature max  error | P | 4 | 0.5 | 6 | 0.44 | c | **P** |
| 3 | Flow Rate average % difference | P | 10 | 5 | 3 | 0.09 | % | **P** |
| 4 | Flow Rate max  % difference | P | 10 | 5 | 3 | 0.23 | % | **P** |

# Field Systems Comments

**1** **Parameter:** DasComments

Single tower with filer pack mounted at 10 meters and temperature mounted at 9 meters.

**2** **Parameter:** DocumentationCo

Although there is no CASTNET logbook present onsite, the site operator records CASTNET information in the VT Monitoring Coop logbook.

**3** **Parameter:** ShelterCleanNotes

Small footprint site with no shelter.  Equipment housed in enclosure on sample tower.

# EEMS Spot Report

**Data Compiled:** 12/29/2015 3:17:57 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/19/2015 | VPI120 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 3 | 0.03 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 3 | 0.05 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.99265 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.28599 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99998 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 1.1 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 1.5 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 2 | 3.02 | % | **P** |
| 9 | Flow Rate max % difference | P | 10 | 5 | 2 | 3.23 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.00 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0000 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.26 | c | **P** |
| 13 | Shelter Temperature max error | P | 5 | 1 | 12 | 0.40 | c | **P** |

# Field Systems Comments

**1** **Parameter:** SitingCriteriaCom

The site is on a wooded hillside. The met gear and sample inlet are at the tree tops of the downhill trees. The uphill tree line is 30 meters away.

**2** **Parameter:** ShelterCleanNotes

The shelter roof has been recently repaired due to additional leaks. The shelter is clean, neat, and well organized.

# EEMS Spot Report

**Data Compiled:** 10/7/2015 9:37:37 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/01/2015 | WFM105 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.35 | c | **P** |
| 2 | Temperature max error | P | 4 | 0.5 | 6 | 0.44 | c | **P** |
| 3 | Flow Rate average % difference | P | 10 | 5 | 2 | 0.44 | % | **P** |
| 4 | Flow Rate max % difference | P | 10 | 5 | 2 | 0.67 | % | **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:** DasComments

Single tower, with filter pack at 10 meters and temperature at 9 meters.

**2** **Parameter:** DocumentationCo

There is no logbook present to record the status of the site equipment or filter information.

**3** **Parameter:** SitingCriteriaCom

The site is located at the Atmospheric Science Research Center (ASRC) operated by the NY University (SUNY) system.

**4** **Parameter:** ShelterCleanNotes

Small footprint site with no shelter. Equipment housed in enclosure on sample tower.

# EEMS Spot Report

**Data Compiled:** 12/5/2015 3:08:35 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 11/09/2015 | WSP144 | Eric Hebert |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Temperature average error | P | 4 | 0.5 | 6 | 0.22 | c | **P** |
| 2 | Temperature max  error | P | 4 | 0.5 | 6 | 0.38 | c | **P** |
| 3 | Ozone Slope | P | 0 | 1.1 | 4 | 0.98867 | unitless | **P** |
| 4 | Ozone Intercept | P | 0 | 5 | 4 | -0.62015 | ppb | **P** |
| 5 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99997 | unitless | **P** |
| 6 | Ozone % difference avg | P | 7 | 10 | 4 | 2.2 | % | **P** |
| 7 | Ozone % difference max | P | 7 | 10 | 4 | 3.4 | % | **P** |
| 8 | Flow Rate average % difference | P | 10 | 5 | 3 | 2.17 | % | **P** |
| 9 | Flow Rate max  % difference | P | 10 | 5 | 3 | 2.6 | % | **P** |
| 10 | DAS Time maximum error | P | 0 | 5 | 1 | 0.02 | min | **P** |
| 11 | DAS Voltage average error | P | 7 | 0.003 | 42 | 0.0000 | V | **P** |
| 12 | Shelter Temperature average error | P | 5 | 1 | 12 | 0.65 | c | **P** |
| 13 | Shelter Temperature max  error | P | 5 | 1 | 12 | 0.89 | c | **P** |

# Field Systems Comments

**1** **Parameter:** SiteOpsProcedures

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

**2** **Parameter:** SitingCriteriaCom

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

**3** **Parameter:** ShelterCleanNotes

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

# EEMS Spot Report

**Data Compiled:** 11/15/2015 2:27:07 PM

| SiteVisitDate | Site | Technician |
|---|---|---|
| 10/29/2015 | WST109 | Sandy Grenville |

| Line | Audited Parameter | DAS | Ch. # | Criteria +/- | Counts | QaResult | Units | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 1 | Ozone Slope | P | 0 | 1.1 | 4 | 0.99514 | unitless | **P** |
| 2 | Ozone Intercept | P | 0 | 5 | 4 | -0.25764 | ppb | **P** |
| 3 | Ozone correlation | P | 0 | 0.995 | 4 | 0.99994 | unitless | **P** |
| 4 | Ozone % difference avg | P | 7 | 10 | 4 | 0.8 | % | **P** |
| 5 | Ozone % difference max | P | 7 | 10 | 4 | 1.8 | % | **P** |

# APPENDIX C

# CASTNET Ozone Performance Evaluation Forms

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *HWF187-Eric Hebert-10/03/2015* | | | | | | |
| 1 | 10/3/2015 | DAS | Campbell | 000356 | CR3000 | 2134 |
| 2 | 10/3/2015 | Ozone | ThermoElectron Inc | 000700 | 49i A1NAA | 1030244793 |
| 3 | 10/3/2015 | Ozone Standard | ThermoElectron Inc | 000445 | 49i A3NAA | CM08200021 |
| 4 | 10/3/2015 | Zero air pump | Werther International | 06916 | C 70/4 | 000829158 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244793 | HWF187 | Eric Hebert | 10/03/2015 | Ozone | 000700 |

**Slope:** 0.98118
**Intercept** -0.16523
**CorrCoff** 1.00000

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

**DAS 1:**

| A Avg % Diff: | A Max % Di |
|---|---|
| 2.2% | 2.5% |

**DAS 2:**

| A Avg %Dif | A Max % Di |
|---|---|
| | |

**Mfg** ThermoElectron Inc
**Parameter** ozone
**Serial Number** 49CPS-70008-364
**Tfer Desc.** Ozone primary stan
**Tfer ID** 01110
**Slope** 1.01130
**Intercept** -0.21263
**Cert Date** 9/21/2015
**CorrCoff** 1.00000

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.11 | 0.31 | 0.17 | ppb | |
| primary | 2 | 30.76 | 30.62 | 29.88 | ppb | -2.42% |
| primary | 3 | 47.57 | 47.24 | 46.08 | ppb | -2.46% |
| primary | 4 | 74.59 | 73.96 | 72.49 | ppb | -1.99% |
| primary | 5 | 108.92 | 107.91 | 105.70 | ppb | -2.05% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.10 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.011 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 93.6 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.6 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.50 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 713.6 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 32.0 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 90.8 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.72 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *HOW191-Eric Hebert-10/06/2015* | | | | | | |
| 1 | 10/6/2015 | DAS | Campbell | 000419 | CR3000 | 2527 |
| 2 | 10/6/2015 | Ozone | ThermoElectron Inc | 000616 | 49i A1NAA | 1009241781 |
| 3 | 10/6/2015 | Ozone Standard | ThermoElectron Inc | 000435 | 49i A3NAA | CM08200011 |
| 4 | 10/6/2015 | Zero air pump | Werther International | 06908 | C 70/4 | 000821900 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241781 | HOW191 | Eric Hebert | 10/06/2015 | Ozone | 000616 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.96286 | **Slope:** | 0.00000 |
| **Intercept** | -0.40667 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99998 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 4.2% | 4.4% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.30 | 0.50 | -0.23 | ppb | |
| primary | 2 | 32.83 | 32.67 | 31.25 | ppb | -4.35% |
| primary | 3 | 52.10 | 51.72 | 49.61 | ppb | -4.08% |
| primary | 4 | 75.20 | 74.56 | 71.53 | ppb | -4.06% |
| primary | 5 | 111.30 | 110.26 | 105.50 | ppb | -4.32% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.20 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.007 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 86.9 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.67 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 699.6 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 37.9 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 101.6 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.6 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.67 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *ASH135-Eric Hebert-10/07/2015* | | | | | | |
| 1 | 10/7/2015 | DAS | Campbell | 000634 | CR3000 | 4933 |
| 2 | 10/7/2015 | Ozone | ThermoElectron Inc | 000620 | 49i A1NAA | 1009241793 |
| 3 | 10/7/2015 | Ozone Standard | ThermoElectron Inc | 000442 | 49i A3NAA | CM08200018 |
| 4 | 10/7/2015 | UPS | APC | 06797 | RS900 | unknown |
| 5 | 10/7/2015 | Zero air pump | Werther International | 06923 | C 70/4 | 000836208 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241793 | ASH135 | Eric Hebert | 10/07/2015 | Ozone | 000620 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.95816 | **Slope:** | 0.00000 |
| **Intercept** | -0.31783 | **Intercept** | 0.00000 |
| **CorrCoff** | 1.00000 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 4.8% | 5.1% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.28 | 0.48 | 0.11 | ppb | |
| primary | 2 | 32.18 | 32.03 | 30.39 | ppb | -5.12% |
| primary | 3 | 50.62 | 50.26 | 47.81 | ppb | -4.87% |
| primary | 4 | 77.18 | 76.52 | 73.12 | ppb | -4.44% |
| primary | 5 | 109.45 | 108.43 | 103.50 | ppb | -4.55% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | Functioning | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.20 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.011 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 93.8 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.73 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 709.5 mmHg | **Status** | Fail |
| **Sensor Component** | Cell A Tmp. | **Condition** | 32.2 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 98.8 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.0 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.72 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | See comments | **Status** | pass |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *CTH110-Eric Hebert-10/23/2015* | | | | | | |
| 1 | 10/23/2015 | DAS | Campbell | 000415 | CR3000 | 2510 |
| 2 | 10/23/2015 | Ozone | ThermoElectron Inc | 000735 | 49i A1NAA | 1105347308 |
| 3 | 10/23/2015 | Ozone Standard | ThermoElectron Inc | 000447 | 49i A3NAA | CM08200023 |
| 4 | 10/23/2015 | Zero air pump | Werther International | 06864 | PC70/4 | 000815261 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1105347308 | CTH110 | Eric Hebert | 10/23/2015 | Ozone | 000735 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.97207 | **Slope:** | 0.00000 |
| **Intercept** | -0.54651 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99998 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 3.5% | 3.7% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.40 | 0.60 | -0.28 | ppb | |
| primary | 2 | 34.38 | 34.20 | 32.92 | ppb | -3.74% |
| primary | 3 | 52.52 | 52.14 | 50.39 | ppb | -3.36% |
| primary | 4 | 74.34 | 73.71 | 71.21 | ppb | -3.39% |
| primary | 5 | 108.83 | 107.82 | 104.00 | ppb | -3.54% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.40 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.014 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 81.8 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 2.1 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.74 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 702.5 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 31.6 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 92.8 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.5 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.73 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| ***KEF112-Eric Hebert-10/24/2015*** | | | | | | |
| 1 | 10/24/2015 | DAS | Campbell | 000414 | CR3000 | 2537 |
| 2 | 10/24/2015 | Ozone | ThermoElectron Inc | 000728 | 49i A1NAA | 1105347306 |
| 3 | 10/24/2015 | Ozone Standard | ThermoElectron Inc | 000545 | 49i A3NAA | 0929938241 |
| 4 | 10/24/2015 | Zero air pump | Werther International | 06922 | C 70/4 | 000836217 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1105347306 | KEF112 | Eric Hebert | 10/24/2015 | Ozone | 000728 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.97256 | **Slope:** | 0.00000 |
| **Intercept** | -0.13647 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99993 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 2.6% | 3.2% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.32 | 0.52 | -0.15 | ppb | |
| primary | 2 | 32.24 | 32.09 | 31.27 | ppb | -2.56% |
| primary | 3 | 55.25 | 54.84 | 53.89 | ppb | -1.73% |
| primary | 4 | 77.87 | 77.21 | 75.01 | ppb | -2.85% |
| primary | 5 | 114.76 | 113.68 | 110.00 | ppb | -3.24% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.000 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.011 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 87.6 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.73 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 685.7 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 30.8 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 89.9 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.74 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

## MKG113-Sandy Grenville-10/25/2015

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 10/25/2015 | DAS | Campbell | 000404 | CR3000 | 2521 |
| 2 | 10/25/2015 | Ozone | ThermoElectron Inc | 000703 | 49i A1NAA | 1030244805 |
| 3 | 10/25/2015 | Ozone Standard | ThermoElectron Inc | 000374 | 49i A3NAA | 0726124694 |
| 4 | 10/25/2015 | Zero air pump | Werther International | 06937 | C 70/4 | 000821896 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244805 | MKG113 | Sandy Grenville | 10/25/2015 | Ozone | 000703 |

| | | | |
|---|---|---|---|
| **Slope:** | 1.00862 | **Slope:** | 0.00000 |
| **Intercept** | -0.36949 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99994 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 0.9% | 1.7% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.11 | 0.52 | 0.14 | ppb | |
| primary | 2 | 29.99 | 30.58 | 30.07 | ppb | -1.67% |
| primary | 3 | 50.01 | 50.73 | 51.04 | ppb | 0.61% |
| primary | 4 | 79.83 | 80.73 | 81.70 | ppb | 1.20% |
| primary | 5 | 109.99 | 111.08 | 111.20 | ppb | 0.11% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.10 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.010 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 93.6 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.3 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.69 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 712.5 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 34.7 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 90.5 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.3 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.67 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# *Site Inventory by Site Visit*

## *PSU106-Sandy Grenville-10/27/2015*

|  | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 10/27/2015 | DAS | Campbell | 000407 | CR3000 | 2512 |
| 2 | 10/27/2015 | Ozone | ThermoElectron Inc | 000678 | 49i A1NAA | 1030244791 |
| 3 | 10/27/2015 | Ozone Standard | ThermoElectron Inc | 000434 | 49i A3NAA | CM08200010 |
| 4 | 10/27/2015 | Zero air pump | Werther International | 06921 | C 70/4 | 000836216 |

# Ozone Data Form

| **Mfg** | **Serial Number Tag** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Owner ID** |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244791 | PSU106 | Sandy Grenville | 10/27/2015 | Ozone | 000678 |

| | | | |
|---|---|---|---|
| **Slope:** | 1.01677 | **Slope:** | 0.00000 |
| **Intercept** | -0.47066 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99998 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 0.8% | 1.6% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.03 | 0.38 | -0.08 | ppb | |
| primary | 2 | 29.98 | 30.57 | 30.62 | ppb | 0.16% |
| primary | 3 | 51.00 | 51.72 | 51.87 | ppb | 0.29% |
| primary | 4 | 79.10 | 80.00 | 81.30 | ppb | 1.62% |
| primary | 5 | 110.80 | 111.89 | 113.10 | ppb | 1.08% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.10 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.029 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 91.3 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 714.4 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 29.7 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 90.6 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.0 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.000 | **Status** | Fail |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | See comments | **Status** | pass |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *ABT147-Sandy Grenville-10/28/2015* | | | | | | |
| 1 | 10/28/2015 | DAS | Campbell | 000413 | CR3000 | 2519 |
| 2 | 10/28/2015 | Ozone | ThermoElectron Inc | 000627 | 49i A1NAA | 1009241772 |
| 3 | 10/28/2015 | Ozone Standard | ThermoElectron Inc | 000440 | 49i A3NAA | CM08200025 |
| 4 | 10/28/2015 | Zero air pump | Werther International | 06930 | P 70/4 | 000829168 |

# Ozone Data Form

| **Mfg** | **Serial Number Tag** | **Site** | **Technician** | **Site Visit Date** | **Parameter** | **Owner ID** |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241772 | ABT147 | Sandy Grenville | 10/28/2015 | Ozone | 000627 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.99294 | **Slope:** | 0.00000 |
| **Intercept** | -0.37282 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99999 | **CorrCoff** | 0.00000 |

**DAS 1:** **DAS 2:**

| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
|---|---|---|---|
| 1.1% | 1.2% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.03 | 0.44 | -0.22 | ppb | |
| primary | 2 | 29.87 | 30.46 | 30.12 | ppb | -1.12% |
| primary | 3 | 50.03 | 50.75 | 50.19 | ppb | -1.10% |
| primary | 4 | 80.40 | 81.31 | 80.40 | ppb | -1.12% |
| primary | 5 | 110.24 | 111.33 | 110.00 | ppb | -1.19% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.20 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.997 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 89.8 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.0 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.00 lpm | **Status** | Fail |
| **Sensor Component** | Cell A Pressure | **Condition** | 720.4 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 36.5 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 94.7 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.67 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | See comments | **Status** | pass |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *WST109-Sandy Grenville-10/29/2015* | | | | | | |
| 1 | 10/29/2015 | DAS | Campbell | 000427 | CR3000 | 2526 |
| 2 | 10/29/2015 | Ozone | ThermoElectron Inc | 000611 | 49i A1NAA | 1009241795 |
| 3 | 10/29/2015 | Ozone Standard | ThermoElectron Inc | 000696 | 49i A3NAA | 1030244812 |
| 4 | 10/29/2015 | Zero air pump | Werther International | 06934 | P 70/4 | 000821881 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241795 | WST109 | Sandy Grenville | 10/29/2015 | Ozone | 000611 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.99514 | **Slope:** | 0.00000 |
| **Intercept** | -0.25764 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99994 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 0.8% | 1.8% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.00 | 0.41 | 0.05 | ppb | |
| primary | 2 | 29.95 | 30.54 | 30.43 | ppb | -0.36% |
| primary | 3 | 50.03 | 50.75 | 50.42 | ppb | -0.65% |
| primary | 4 | 80.28 | 81.18 | 79.75 | ppb | -1.76% |
| primary | 5 | 110.00 | 111.09 | 110.70 | ppb | -0.35% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.20 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.005 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 96.1 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 1.0 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 700.4 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 36.6 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 97.1 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 1.1 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.71 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

*ARE128-Sandy Grenville-11/02/2015*

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| 1 | 11/2/2015 | DAS | Campbell | 000400 | CR3000 | 2524 |
| 2 | 11/2/2015 | Ozone | ThermoElectron Inc | 000621 | 49i A1NAA | 1009241798 |
| 3 | 11/2/2015 | Ozone Standard | ThermoElectron Inc | 000199 | 49i A3NAA | 0607315737 |
| 4 | 11/2/2015 | Zero air pump | Werther International | 06866 | PC70/4 | 000815262 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1009241798 | ARE128 | Sandy Grenville | 11/02/2015 | Ozone | 000621 |

| | | | |
|---|---|---|---|
| **Slope:** | 1.00896 | **Slope:** | 0.00000 |
| **Intercept** | -0.80592 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99993 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 1.2% | 1.7% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 0419606966 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01112 | | |
| **Slope** | 0.99384 | **Intercept** | -0.40946 |
| **Cert Date** | 6/25/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | -0.02 | 0.39 | -0.04 | ppb | |
| primary | 2 | 30.00 | 30.59 | 30.11 | ppb | -1.57% |
| primary | 3 | 50.02 | 50.74 | 49.90 | ppb | -1.66% |
| primary | 4 | 80.22 | 81.12 | 80.50 | ppb | -0.76% |
| primary | 5 | 109.52 | 110.61 | 111.40 | ppb | 0.71% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | 0.10 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.011 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 97.7 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.6 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.72 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 716.1 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 31.0 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 89.6 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.9 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.71 lpm | **Status** | Pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

| Site Visit Date | | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *PNF126-Eric Hebert-11/04/2015* | | | | | | |
| 1 | 11/4/2015 | DAS | Campbell | 000346 | CR3000 | 2125 |
| 2 | 11/4/2015 | Ozone | ThermoElectron Inc | 000695 | 49i A1NAA | 1030244801 |
| 3 | 11/4/2015 | Ozone Standard | ThermoElectron Inc | 000437 | 49i A3NAA | CM08200013 |
| 4 | 11/4/2015 | Zero air pump | Werther International | 06885 | C 70/4 | 000814270 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244801 | PNF126 | Eric Hebert | 11/04/2015 | Ozone | 000695 |

| | | | |
|---|---|---|---|
| **Slope:** | 1.00789 | **Slope:** | 0.00000 |
| **Intercept** | 0.19347 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99999 | **CorrCoff** | 0.00000 |

**DAS 1:** | **DAS 2:**

| A Avg % Diff: | A Max % Di | A Avg %Dif | A Max % Di |
|---|---|---|---|
| 1.2% | 1.7% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.45 | 0.65 | 0.74 | ppb | |
| primary | 2 | 31.29 | 31.15 | 31.59 | ppb | 1.41% |
| primary | 3 | 52.62 | 52.24 | 53.14 | ppb | 1.72% |
| primary | 4 | 74.15 | 73.53 | 74.18 | ppb | 0.88% |
| primary | 5 | 99.80 | 98.89 | 99.80 | ppb | 0.92% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.10 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 1.029 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 98.5 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.9 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.63 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 619.7 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 35.9 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 82.6 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.7 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 0.82 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |

# Site Inventory by Site Visit

| | Site Visit Date | Parameter | Mfg | Owner ID | Model Number | Serial Number |
|---|---|---|---|---|---|---|
| *BEL116-Eric Hebert-11/19/2015* | | | | | | |
| 1 | 11/19/2015 | DAS | Campbell | 000341 | CR3000 | 2120 |
| 2 | 11/19/2015 | Ozone | ThermoElectron Inc | 000684 | 49i A1NAA | 1030244795 |
| 3 | 11/19/2015 | Ozone Standard | ThermoElectron Inc | 000373 | 49i A3NAA | 0726124685 |
| 4 | 11/19/2015 | Sample Tower | Aluma Tower | 000127 | B | none |
| 5 | 11/19/2015 | Zero air pump | Werther International | 06913 | C 70/4 | 000829178 |

# Ozone Data Form

| Mfg | Serial Number Tag | Site | Technician | Site Visit Date | Parameter | Owner ID |
|---|---|---|---|---|---|---|
| ThermoElectron Inc | 1030244795 | BEL116 | Eric Hebert | 11/19/2015 | Ozone | 000684 |

| | | | |
|---|---|---|---|
| **Slope:** | 0.98851 | **Slope:** | 0.00000 |
| **Intercept** | -0.90721 | **Intercept** | 0.00000 |
| **CorrCoff** | 0.99998 | **CorrCoff** | 0.00000 |

| **DAS 1:** | | **DAS 2:** | |
|---|---|---|---|
| **A Avg % Diff:** | **A Max % Di** | **A Avg %Dif** | **A Max % Di** |
| 3.2% | 4.9% | | |

| | | | |
|---|---|---|---|
| **Mfg** | ThermoElectron Inc | **Parameter** | ozone |
| **Serial Number** | 49CPS-70008-364 | **Tfer Desc.** | Ozone primary stan |
| **Tfer ID** | 01110 | | |
| **Slope** | 1.01130 | **Intercept** | -0.21263 |
| **Cert Date** | 9/21/2015 | **CorrCoff** | 1.00000 |

| UseDescription | ConcGroup | Tfer Raw | Tfer Corr | Site | Site Unit | PctDifference |
|---|---|---|---|---|---|---|
| primary | 1 | 0.38 | 0.58 | -0.08 | ppb | |
| primary | 2 | 27.88 | 27.77 | 26.41 | ppb | -4.90% |
| primary | 3 | 49.83 | 49.48 | 47.80 | ppb | -3.40% |
| primary | 4 | 77.89 | 77.22 | 75.25 | ppb | -2.55% |
| primary | 5 | 105.73 | 104.75 | 102.90 | ppb | -1.77% |

| | | | | | |
|---|---|---|---|---|---|
| **Sensor Component** | Sample Train | **Condition** | Good | **Status** | pass |
| **Sensor Component** | Inlet Filter Condition | **Condition** | Clean | **Status** | pass |
| **Sensor Component** | Battery Backup | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Offset | **Condition** | -0.1 | **Status** | pass |
| **Sensor Component** | Span | **Condition** | 0.997 | **Status** | pass |
| **Sensor Component** | Zero Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Fullscale Voltage | **Condition** | N/A | **Status** | pass |
| **Sensor Component** | Cell A Freq. | **Condition** | 94.5 kHz | **Status** | pass |
| **Sensor Component** | Cell A Noise | **Condition** | 0.8 ppb | **Status** | pass |
| **Sensor Component** | Cell A Flow | **Condition** | 0.67 lpm | **Status** | pass |
| **Sensor Component** | Cell A Pressure | **Condition** | 729.6 mmHg | **Status** | pass |
| **Sensor Component** | Cell A Tmp. | **Condition** | 33.1 C | **Status** | pass |
| **Sensor Component** | Cell B Freq. | **Condition** | 88.4 kHz | **Status** | pass |
| **Sensor Component** | Cell B Noise | **Condition** | 0.9 ppb | **Status** | pass |
| **Sensor Component** | Cell B Flow | **Condition** | 1.3 lpm | **Status** | pass |
| **Sensor Component** | Cell B Pressure | **Condition** | | **Status** | pass |
| **Sensor Component** | Cell B Tmp. | **Condition** | | **Status** | pass |
| **Sensor Component** | Line Loss | **Condition** | Not tested | **Status** | pass |
| **Sensor Component** | System Memo | **Condition** | | **Status** | pass |