



Sand Mountain, AL (SND152)

2013 CASTNET Part 58 Compliance Overview

June 5, 2013

1. Network Overview

The Environmental Protection Agency (EPA), the National Park Service (NPS), and Wyoming's Bureau of Land Management (BLM) manage the Clean Air Status and Trends Network (CASTNET). In addition to EPA, NPS, and BLM, there are numerous other participants including tribes, federal agencies, states, and universities that provide network support. The EPA, NPS, and BLM have their own contractors that operate their sites within the network. AMEC, Inc. operates the EPA-sponsored sites and ARS operates the NPS- and BLM-sponsored CASTNET sites.

As of May 2013, there are 90 CASTNET sites that measure weekly concentrations of sulfur and nitrogen species and base cations using a 3-stage filter pack. Eighty of the CASTNET sites collect ambient ozone concentrations and 29 measure hourly meteorological parameters. EPA and NPS operate collocated sites (ROM206/ROM406), respectively, at Rocky Mountain National Park, Colorado to ensure consistency across the network. Ozone data from ROM206 are not submitted to EPA's Air Quality System (AQS) database as part of the CASTNET regulatory ozone monitoring network. An overview of the CASTNET monitoring program can be found here:

<http://epa.gov/castnet/javaweb/docs/CASTNET_Factsheet_2013.pdf>. In addition to the regulatory ozone monitors, EPA operates a non-regulatory ozone analyzer above canopy (23.5 m) at the Howland AmeriFlux site as part of a direct deposition study. The analyzer at HOW191 does not meet the siting criteria for a regulatory ozone monitor so these data are not submitted to AQS. Independent audits, including Performance Evaluations (PE) and Field Technical Systems Audits (TSA) are performed by Environmental, Engineering & Measurement Services, Inc (EEMS) unless a state or region has agreed to perform the audit. RTI International performs the facility TSA at both the EPA and NPS/BLM contractor field laboratories.

EPA upgraded the CASTNET ozone analyzers to Thermo 49is, installed on-site transfer standards, and updated the QA/QC procedures at all EPA-sponsored sites to comply with the requirements in 40 Code of Federal Regulations (CFR) Part 58 in FY 2011. This upgrade has improved the overall quality of data, reliability of the analyzers and comparability of the data with other regulatory monitoring networks (i.e., State and Local Air Monitoring Sites (SLAMS)). CASTNET data will be used to calculate design values for the 2011-2013 ozone seasons for all sites where data completeness requirements are met. EPA regional contacts and states were notified of this change during NACAA monitoring meetings, monthly phone calls and a notice in the Federal Register. This document summarizes the QA/QC procedures and schedules that the CASTNET program follows to meet the regulatory requirements.

The procedures in this document were adapted from the requirements placed on the states to meet the needs of a federally-operated national monitoring network.

2. Ozone Data

a) All CASTNET sites measure ambient ozone concentrations at 10 m. Ambient ozone concentrations are submitted near real time to AIRNow <www.airnow.gov> and posted to the CASTNET website daily < http://epa.gov/castnet/javaweb/index.html>. AMEC and ARS submit the hourly ozone concentrations and bi-weekly 1-point QC results to AQS monthly. As required by the CFR, annual data certification is completed by the sponsoring agency by May 1st of each year for all of the CASTNET sites. Previously, a letter was submitted to OAQPS stating that the monitoring agency was certifying that their data was valid and complete. EPA, NPS and BLM will rely on states to determine if CASTNET ozone data should be flagged as an exceptional event. States should contact Tim Sharac (sharac.timothy@epa.gov) or Jessica Ward (jward@air-resource.com) if they need CASTNET ozone data flagged for an exceptional event. State agencies have the responsibility, according to the Exceptional Events Rule, to demonstrate to their EPA region that an exceptional event occurred. When a state would like CASTNET data flagged, the following information needs to be provided to the sponsoring agency: date/time range of incident, type of exceptional event, and which CASTNET sites are being impacted.

b) Data Quality Indicators (DQI)

CASTNET uses the monitoring quality objectives shown in Table 1 to ensure that the highest quality data are being submitted to AQS. The AQS QA qualifier table which includes qualifier codes, descriptions, and valid/invalid status codes is available in Appendix C.

Table 1 originated from the Quality Assurance Handbook for Air Pollution Measurement Systems QA Handbook Volume II, Appendix D Revision 1, December 2008. EPA, NPS, and the CASTNET contractors added comments to this table to further explain actions to be taken regarding data validation.

Table 1 Monitoring Quality Objectives

Ozone Validation Template – CASTNET				
Requirement	Minimum Frequency	Acceptance Criteria	Information/Action	Comments
CRITICAL CRITERIA				
One Point QC Check Single analyzer	1/ 2 weeks	≤ ±7% (percent difference)	0.01 - 0.10 ppm Relative to routine concentrations 40 CFR Part 58 App A Sec 3.2	A failure of this one-point QC check may indicate a problem with the transfer standard

Ozone Validation Template – CASTNET				
Requirement	Minimum Frequency	Acceptance Criteria	Information/Action	Comments
Zero/span check	1/2 weeks	Zero drift $\leq \pm 2\%$ of full scale* Span drift $\leq \pm 7\%$		<p>These checks are typically performed daily. If the check does not meet the criteria, data are invalidated from the last check that met the criteria to the next meeting the criteria. If the problem can be verifiably traced to a system or subsystem that does not affect reported data, the associated data are valid. Missing checks only result in data invalidation if the frequency of checks is less than required frequency of once every 2 weeks.</p> <p>Drift in ozonator concentrations is treated as an operational criterion. If reference concentrations (those generated by the transfer standard) are not within 2% of full scale, investigate the problem. When evaluating zero drift, apply the criterion to direct readings and to comparisons with the onsite transfer standard. Take action if either fails to meet the criterion.</p>
OPERATIONAL CRITERIA				
Shelter Temperature				
Temperature Range	Daily (hourly values)	20 to 30° C. (Hourly average) or per manufacturer's specifications if designated to a wider temperature range	Generally the 20-30° C range will apply, but the most restrictive operable range of the instruments in the shelter may also be used as guidance.	<p>Investigate data associated with temperatures outside of 18 to 32° C window: Review data for reasonableness†. If temperature is outside of this window for 3 or more consecutive hours or outside of a 15 to 35° C window for any recorded hour, verify that the analyzer internal temperature is between 25 and 40° C during the excursion. Invalidate data deemed unreasonable† for ambient conditions or per site history and any data collected while analyzer internal temperatures were not between 25 and 40° C.</p>
Temperature Control	Daily (hourly values)	$\leq \pm 2^\circ$ C SD over 24 hours		If a 24 hr period is outside of the criterion, review associated data for reasonableness†. Treat hourly temperature readings that are out of range as described above.

Ozone Validation Template – CASTNET				
Requirement	Minimum Frequency	Acceptance Criteria	Information/Action	Comments
Temperature Device Check	2/year	± 2° C of standard		CASTNET requirement for device field calibration is ± 0.5° C of standard. Data associated with a failure of ± 2° C or greater must be reviewed as described above. If the failure is linear 2° C may be added or subtracted as appropriate to determine which periods require further investigation. If the failure is non-linear or the temperature device is otherwise non-functional, the temperature probe is replaced and the entire period must be reviewed for reasonableness† and to verify internal analyzer temperatures. [Applies to routine calibration visits]
Precision (using 1-point QC checks)	Calculated annually and as appropriate for design value estimates	90% CL CV ≤ 7% (monitor level)	90% of Confidence Limit of coefficient of variation. 40 CFR Part 58 App A sec 4.1.2	This metric is reviewed as part of the annual review screening procedure. Exceeding the criterion will trigger additional review including data from nearby sites (including SLAMS), site narrative logs, and the analyzer’s internal systems monitoring (a.k.a “housekeeping”) data.
Bias (using 1-point QC checks)	Calculated annually and as appropriate for design value estimates	95% CL CV ≤ ± 7% (monitor level)	95% of Confidence Limit of coefficient of variation. 40 CFR Part 58 App A sec 4.1.3	[Calculation performed by Data Manager and results reviewed by Data and QA Managers]
Annual Performance Evaluation				
Single Analyzer	Every site 1/year or 25 % of sites quarterly	Percent difference of audit levels 3-10 ≤ ±15% [Audit levels 1&2 ± 1.5 ppb difference or ±15%]	3 consecutive audit concentration not including zero. 40 CFR Part 58 App A sec 3.2.2	Reviewed as part of the annual review screening procedure. Exceeding the criterion will trigger additional review as noted above. [EPA Responsibility]
Primary QA Organization (PQAO)	Annually	95% of audit percent differences fall within the one point QC check 95% probability intervals at PQAO level of aggregation	Same as above. 40 CFR Part 58 App A sec 4.1.4	
Federal Audits (NPAP)	1/year at selected sites 20% of sites audited	Mean absolute difference ≤ 10%	40 CFR Part 58 App A sec 2.4	
State audits	1/year	State requirements		

Ozone Validation Template – CASTNET				
Requirement	Minimum Frequency	Acceptance Criteria	Information/Action	Comments
Verification/Calibration	Upon receipt/adjustment/repair/ installation/moving -1/6 months if manual zero/span performed biweekly -1/year if continuous zero/span performed daily	All points within $\pm 2\%$ of full scale of best fit straight line Linearity error < 5%	Multi-point calibration (0-4 upscale points) 40 CFR Part 58 App D sec 5.2.3	If verification results are outside of the listed criteria, review the calibration forms, problem tickets and repair logs to confirm proper operation of the analyzer and onsite transfer standard. If a starting point for the problem can be determined and documented, use this period as that to be invalidated. If the problem can be verifiably traced to a system or subsystem that does not affect reported data, the associated data may be treated as valid. Otherwise, invalidate all associated data. Ensure confirmation of the onsite transfer standard and the "calibration standard." [Applies to routine calibration visits]
Zero Air		Concentration below LDL		If the criterion is exceeded (± 0.003 ppm), correlate with any zero/span results that exceed critical criteria. If the zero air system is implicated, report this finding immediately to the project manager, field operations manager, and QA manager. [Applies to routine calibration visits] Replacing traps would seem to make for sense than reporting it to somebody far far away. Applies to 6-month duration; 6-month calibration will not invalidate all 6-months of data.
Gaseous Standards		NIST Traceable (e.g., EPA Protocol Gas)	40 CFR Part 58 App A sec 2.6.1	
Zero Air Check	1/year	Concentrations below LDL		
Ozone Level 2 Standard				
Certification/recertification to Standard Reference Photometer	1/year	single point difference $\leq \pm 3\%$	Primary Standards usually transported to EPA Regions SRP for comparison	If the standard exceeds the criterion and its authority has been used at any sites for re-verification or calibration the associated site analyzers must be re-verified with a properly certified standard.
(if recertified via a transfer standard)	1/year	Regression slopes = 1.00 ± 0.03 and two intercepts are 0 and ± 3 ppb		See above. Additionally, the travelling transfers are audited with a stationary standard 2x/calendar quarter to verify proper calibration w/o applying the certification calculation. The audit results must meet the criteria listed below: <ul style="list-style-type: none"> New slope=± 0.05 of previous and RSD of six slopes $\leq 3.7\%$ Std. Dev. of 6 intercepts ≤ 1.5 Failure to meet these criteria will require servicing and/or recertification as appropriate.

Ozone Validation Template – CASTNET				
Requirement	Minimum Frequency	Acceptance Criteria	Information/Action	Comments
Ozone Transfer Standard				
Qualification	Upon receipt of transfer standard	±4% or ±4 ppb (whichever greater)	Transfer Standard Doc EPA 600/4-79-056 Section 6.4	All analyzers are on the list of USEPA Designated Equivalent Methods and are therefore qualified by their manufacturer. To maintain designation, they must not be modified or operated contrary to manufacturer's instructions or QA requirements.
Certification	After qualification and upon receipt/adjustment/repair	RSD of six slopes ≤ 3.7% Std. Dev. Of 6 intercepts ≤ 1.5	Transfer Standard Doc EPA 600/4-79-056 Section 6.6	If the analyzer has been used at any sites for re-verification or calibration, the associated site analyzers must be re-verified with a properly certified analyzer.
Recertification to local primary standard	Beginning and end of O ₃ season or 1/6 months whichever less	New slope = ± 0.05 of previous and RSD of six slopes ≤ 3.7% Std. Dev. Of 6 intercepts ≤ 1.5	1 recertification test that then gets added to most recent 5 tests. If this does not meet acceptability certification fails	Recertification to Level 2 standard. See above. This applies to onsite stationary Level 3 transfer standards.
Lower Detectable Level (LDL)	1/year	0.003 ppm	If the standard exceeds the criterion and its authority has been used at any sites for re-verification or calibration the associated site analyzers must be re-verified with a properly certified standard.	(3 ppb) Ref. 40 CFR Part 136 App B. If the standard exceeds the criterion and its authority has been used at any sites for re-verification or calibration, the associated site analyzers must be re-verified with a properly certified standard.
SYSTEMATIC CRITERIA				
Standard Reporting Units	All data	ppm (final units in AQS)		Data must be converted to correct units.
Completeness (seasonal)	Daily	75% of hourly averages for the 8-hour period	8-hour average	If the criterion is not met, data may not be used for reporting 8-hour averages.
Sample Residence Times		≤ 20 seconds		Report any sites found to exceed this criterion to the project manager, field operations manager, and QA manager. Indicates a problem that should be checked at site.
Sample Probe, Inlet, Sampling train		Borosilicate glass (e.g., Pyrex [®]) or Teflon [®]	40 CFR Part 58 App E	See above.
Siting		Un-obstructed probe inlet	40 CFR Part 58 App E	See above.
EPA Standard Ozone Reference Photometer (SRP) Recertification	1/year	Regression slope = 1.00 ± 0.01 and intercept < 3 ppb	This is usually at an EPA Regional Office and is compared against the traveling SRP	Standard Reference Level 2. There is a traveling standard (Level 2) which is deployed to the field and 2 standard reference level 2 devices that stay in the lab to verify the traveling standards to eliminate the need for sending traveling standards back to NIST after field deployment. Both lab and field SRPs are level 2. If the standard exceeds the criterion and its authority has been used at any sites for re-verification or calibration the associated site analyzers must be re-verified with a properly certified standard.

†Review for reasonableness may include:

CL = Confidence

RSD = Relative

Ozone Validation Template – CASTNET				
Requirement	Minimum Frequency	Acceptance Criteria	Information/Action	Comments
<ul style="list-style-type: none"> Synoptic meteorological conditions (where available) Calibration schedule Site Visit Log Data from nearby sites (including SLAMS sites, where applicable) 		Limit	CV = Coefficient of Variation LDL = Lower Detectable Level	Standard Deviation SD = Standard Deviation

In addition to the daily zero/precision/span (z/p/s) QC checks described in the table above, the CASTNET contractors perform semi-annual audits at each CASTNET site. During the audit, the on-site analyzer is audited and calibrated to the traveling transfer standard (Level 2), and the data logger and the shelter temperature probe are verified using NIST traceable standards. Nearly all on-site ozone transfer standards at CASTNET sites are NIST traceable at Level 3, the two exceptions are the BLM CASTNET sites, Basin, WY (BAS601) and New Castle, WY (NEC602), which are currently at Level 4. Audit results are used to perform the final validation on the hourly ozone data. Results from the semi-annual audits are routinely submitted by the contractor to the sponsoring agency.

3. Network audit requirements.

The network audit requirements for 40 CFR Part 58 compliance are summarized in Table 2 below. EPA will provide Regions with the facility and field Technical Systems Audit (TSA) schedules at least 6 months in advance to ensure Regions have sufficient time to arrange for travel if they choose to attend the audit.

Table 2 Summary of 40 CFR Part 58 audit requirements.

Required Audits	Audits Performed By	Site Selection	Audit Frequency	Audit Results Submitted	Funding Organization
Ozone Performance Audit (PE)	Independent auditor	EPA/NPS/BLM	Annually (All CASTNET sites)	AQS EPA/NPS/BLM	EPA → independent auditor
National Performance Audit Program (NPAP)	OAQPS will coordinate with the regional offices	OAQPS	20% of the sites each year	AQS	EPA → OAQPS → Regional Office → ESAT
Technical System Audits (TSA) Field Audit	Independent auditor + EPA/NPS/BLM + Regions/States Regions may visit site along with auditor	EPA/NPS/BLM	10% of the network each year	EPA/NPS/BLM OAQPS	EPA → independent auditor
Technical System	3 rd party auditor	EPA/NPS/BLM	Each facility every 3 years	EPA/NPS/BLM contractor	EPA (Base Funding)

Audits (TSA) Facilities Audit				AQS	NPS/BLM (same facility)
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4. Daily Quality Control Checks.

Nightly zero/precision/span (z/p/s) scans are performed, but can also be run manually and/or remotely through the data logger if necessary. A summary of the daily verification calibrations is included in Table 1. If the automated span and precision differ by more than 7 % of the target value, it is considered a failure. If the zero reading is outside of ± 10 ppb, this is considered a failure. The site operator is instructed to call the Field Operations Manager to troubleshoot the problem if a failure occurs, although with remote data polling, the CASTNET contractors generally know about failures before the normally scheduled Tuesday call-in with the site operator.

5. Performance Evaluations (PE)

Annual ozone PE will be conducted in accordance with EPA’s *Quality Assurance Handbook for Air Pollution Measurement Systems: Volume II - Ambient Air Specific Methods, 40 CFR Parts 53 and Parts 58 Revisions to Ambient Air Monitoring Regulations: Final Rule*. Results from the ozone PE will be submitted to AQS quarterly by the auditor.

The verification of the ozone analyzer during the PE audit requires that the zero/span be within 2% of the full scale of the best fit linear line. Per the memorandum sent by OAQPS in February 2011, the auditor may choose target concentration values from ten audit levels. A minimum of three audit levels that represent routine concentrations at the monitoring site are required. See Table 3 for acceptable audit ranges. The lowest two audit levels must be within ± 1.5 ppb or a 15% difference, whichever is greater, to meet the acceptance criteria. Levels 3-10 must be within 15% to meet the acceptance criteria. The target values must bracket 85% of a site’s concentration levels.

Table 3 Audit Levels for Performance Evaluations (PE)

Audit Level	Concentration Range, ppm	Acceptance Criteria
1	0.004 – 0.0059	± 1.5 ppb or $\pm 15\%$, whichever is greater
2	0.006 – 0.019	± 1.5 ppb or $\pm 15\%$, whichever is greater
3	0.020 – 0.039	$\pm 15\%$
4	0.040 – 0.069	$\pm 15\%$
5	0.070 – 0.089	$\pm 15\%$
6	0.090 – 0.119	$\pm 15\%$
7	0.120 – 0.139	$\pm 15\%$
8	0.140 – 0.169	$\pm 15\%$
9	0.170 – 0.189	$\pm 15\%$
10	0.190 - 0.259	$\pm 15\%$

Table from US EPA OAQPS dated Feb 17, 2011; “Guidance on Statistics for Use at Audit Levels 1 and 2 of the Expanded List of Audit Levels for Annual Performance Evaluation for SO₂, NO₂, O₃, and CO as Described in 40 CFR Part 58 Appendix A Section 3.2.2”

The proposed PE audit schedule for CASTNET sites is shown in Table 4 below. Auditing equipment used by the independent auditor will be NIST certified at least twice per year.

Note: PE and field Technical System Audits (TSA) (described below) are not differentiated within this table. An ozone PE audit is performed at each site annually, while a field TSA which includes flow, meteorological sensors, etc. is performed every other year. States may perform a PE audit if they are coordinated with the sponsoring agency, site supervisor, and independent auditor.

Table 4 PE and Field TSA Schedule*

Odd years:

1 st Quarter			2 nd Quarter			3 rd Quarter			4 th Quarter		
Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	ALC188 BBE401 CAD150 CHE185 GAS153 IRL141 PAL190 SND152 SUM156	CDZ171 COW137 CVL151 ESP127 MAC426 MCK131 MCK231 PNF126 SPD111	CKT136 DCP114 OXF122 QAK172	CAN407 CHA467 GRC474 JOT403 LAV410 PET427 PIN414 SEK430 YOS404	BAS601 CNT169 GRB411 GTH161 NEC602 PND165 ROM406 YEL408	DEN417 GLR468 MOR409 SAN189 THR422 WNC429	ALH157 ANA115 BVL130 HOX148 PRK134 SAL133 STK138 UVL124 VIN140 VOY413	ABT147 ACA416 ASH135 GRS420 HWF187 PED108 VPI120 WST109	ARE128 BEL116 BFT142 BWR139 CND125 PSU106 WSP144	CDR119 CTH110 KEF112 LRL117 MKG113 PAR107 SHN418	

Even years:

1 st Quarter			2 nd Quarter			3 rd Quarter			4 th Quarter		
Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	CAD150 CHE185 EVE419 GAS153 IRL141 SND152 SUM156	ALC188 BBE401 CDZ171 CVL151? COW137 ESP127 MAC426 MCK131 MCK231 PAL190 PNF126 SPD111	CAN407 CHA467 CKT136 DCP114 GRC474 MEV405 OXF122 PET427 QAK172	GRB411 JOT403 LAV410 PIN414 SEK430 YOS404	BAS601 CNT169 GTH161 DEN417 GLR468 MOR409 NEC602 PND165 ROM406 SAN189 YEL408	ALH157 ANA115 BVL130 HOX148 PRK134 SAL133 STK138 UVL124 VIN140	ABT147 ACA416 ASH135 PED108 VPI120	CAT175 HWF187 THR422 VOY413 WNC429 WST109	CDR119 CTH110 EGB181 GRS420 KEF112 LRL117 MKG113 PAR107 SHN418	ARE128 BEL116 BFT142 BWR139 CND125 PSU106 WSP144	

*See Appendix D for Region and State of each Part 58 compliant CASTNET site

6. Field Technical Systems Audit (TSA)

Field TSAs are performed every other year at each CASTNET site (with or without ozone) by an independent contractor. The purpose of these audits is to provide an independent assessment of the site, the equipment performance, and the proficiency of the site operator. The auditor will verify that flow, ozone, and the meteorological sensors meet the criteria listed in Table 1. The auditor will also complete a performance evaluation (PE) for ozone (see below). These ozone audits will be performed through the probe (TTP) to verify there are no line losses within the system. In addition, the auditor will acknowledge if any objects or pollutant sources are violating the CASTNET siting criteria; see the

QAPP for siting criteria at <<http://java.epa.gov/castnet/documents.do>>. During the field TSA, the auditor will discuss any issues related to equipment, siting criteria, or operator handling with the operator and/or site supervisor. Results from the site audit are submitted to the site supervisor, site operator, site funding agency, and CASTNET contractor following the audit. Audit results are summarized in a quarterly report and posted to the CASTNET website under “Quality Assurance” at <<http://java.epa.gov/castnet/documents.do>>.

Field TSAs are scheduled with the CASTNET independent auditor, unless a state monitoring agency requests to perform the audit at a site within their state. TSA announcement letters containing a list of auditors and purpose of site visit are sent to site operators and National Park Service personnel 2-4 weeks prior to field TSAs to ensure all parties involved are prepared. If, and when, travel funds permit, an EPA, NPS or BLM representative will be present at the field TSA. States and Regions will have 6 months notice prior to the field TSA and their participation in the field TSAs will be encouraged. It is required that at least ten percent of all CASTNET sites have a field TSA completed each year. A proposed schedule for 2013 is shown in Table 5. CASTNET has required field TSAs every other year to ensure network-wide consistency in the data. CASTNET will continue to perform field TSAs at 50% of the network each year, exceeding the 10% requirement for regulatory monitors.

Table 5 Proposed Field TSA schedule for 2013

Site ID	AQS ID	Site Name	State	Region	Audit Month	Federal Agency	Region Contact
WSP144	340219991	Wash. Crossing	NJ	2	October	EPA	Richard Ruvo
BWR139	240199991	Blackwater NWR	MD	3	October	EPA	Andrew Hass
LRL117	421119991	Laurel Hill	PA	3	November	EPA	Andrew Hass
VPI120	510719991	Horton Station	VA	3	September	EPA	Andrew Hass
SHN418	511130003	Shenandoah NP - Big Meadows	VA	3	November	NPS	Andrew Hass
PED108	511479991	Prince Edward	VA	3	September	EPA	Andrew Hass
CDR119	540219991	Cedar Creek	WV	3	November	EPA	Andrew Hass
PAR107	540939991	Parsons	WV	3	November	EPA	Andrew Hass
MAC426	210610501	Mammoth Cave NP	KY	4	March	NPS	Todd Rinck
CKT136	211759991	Crockett	KY	4	March	EPA	Todd Rinck
CDZ171	212219991	Cadiz	KY	4	March	EPA	Todd Rinck
MCK131	212299991	Mackville	KY	4	March	EPA	Todd Rinck
MCK231	212299991	Mackville Collocated	KY	4	March	EPA	Todd Rinck
CVL151	281619991	Coffeeville	MS	4	February	EPA	Todd Rinck
BFT142	370319991	Beaufort	NC	4	October	EPA	Todd Rinck
CND125	371239991	Candor	NC	4	October	EPA	Todd Rinck
GRS420	470090101	Great Smoky NP - Look Rock	TN	4	September	NPS	Todd Rinck
BVL130	170191001	Bondville	IL	5	August	EPA	Jesse McGrath
STK138	170859991	Stockton	IL	5	August	EPA	Jesse McGrath
ALH157	171199991	Alhambra	IL	5	August	EPA	Jesse McGrath
VIN140	180839991	Vincennes	IN	5	August	EPA	Jesse McGrath
VOY413	271370034	Voyageurs NP	MN	5	August	NPS	Jesse McGrath

OXF122	390179991	Oxford	OH	5 April	EPA	Jesse McGrath
DCP114	390479991	Deer Creek	OH	5 April	EPA	Jesse McGrath
QAK172	391219991	Quaker City	OH	5 April	EPA	Jesse McGrath
PRK134	551199991	Perkinstown	WI	5 August	EPA	Jesse McGrath
CAD150	050199991	Caddo Valley	AR	6 February	EPA	Mark Sather
CHE185	400019009	Cherokee Nation	OK	6 March	EPA	Mark Sather
BBE401	480430101	Big Bend NP	TX	6 March	NPS	Mark Sather
ALC188	483739991	Alabama-Coushatta	TX	6 February	EPA	Mark Sather
PAL190	483819991	Palo Duro	TX	6 March	EPA	Mark Sather
SAN189	311079991	Santee Sioux	NE	7 June	EPA	Robert Nichols
GTH161	080519991	Gothic	CO	8 June	EPA	Richard Payton
ROM406	080690007	Rocky Mtn NP	CO	8 June	NPS	Richard Payton
THR422	380070002	Theodore Roosevelt NP	ND	8 July	NPS	Richard Payton
WNC429	460330132	Wind Cave NP	SD	8 July	NPS	Richard Payton
CNT169	560019991	Centennial	WY	8 June	EPA	Richard Payton
BAS601	560030002	Basin	WY	8 June	BLM	Richard Payton
PND165	560359991	Pinedale	WY	8 June	EPA	Richard Payton
YEL408	560391011	Yellowstone NP	WY	8 May	NPS	Richard Payton
NEC602	560450003	New Castle	WY	8 June	BLM	Richard Payton
CHA467	040038001	Chiricahua NM	AZ	9 April	NPS	Fletcher Clover
YOS404	060430003	Yosemite NP - Turtleback Dome	CA	9 May	NPS	Fletcher Clover
PIN414	060690003	Pinnacles NM	CA	9 April	NPS	Fletcher Clover
LAV410	060893003	Lassen Volcanic NP	CA	9 May	NPS	Fletcher Clover
SEK430	061070009	Sequoia NP - Ash Mountain	CA	9 May	NPS	Fletcher Clover

7. National Performance Audit Program (NPAP)

The EPA coordinates with OAQPS, regional offices, and the Environmental Services Assistance Team (ESAT) to fulfill the requirements under the National Performance Audit Program (NPAP). The goal for the CASTNET program is to complete NPAP audits at 20% of the sites each year. OAQPS is responsible for selecting the sites that will be audited. Special priority is given to those sites documented or expected to have concentrations near the level of the ozone standard. The audit results are submitted to AQS by the NPAP auditor. EPA, NPS and BLM incur all costs/fees associated with the audits.

The purpose of the NPAP is to assess the proficiency of the monitoring organization. The ozone audits are performed through the probe using a NIST certified gas, which is validated at least quarterly. The auditor selects 3-4 known target concentrations to determine the accuracy of the on-site ozone analyzer. The acceptable ranges can be found in 40 CFR Part 58, Appendix A, Section 3.2.2.1.

8. Facilities Technical Systems Audit (TSA)

EPA uses a 3rd party auditor to conduct the facilities portion of the TSA at the contractor's facilities. Provided travel funds are available, EPA, NPS, or BLM staff are present at the facility audit. EPA

provides the date of the scheduled audit to the Regions at least 6 months prior to the visit. The facility TSA will be performed once every three years at each facility.

The purpose of the facility TSA is to provide a qualitative appraisal of the total measurement system. Site planning, organization, documentation and operation are evaluated to ensure that good Quality Assurance/Quality Control practices are being applied throughout the monitoring program.

RTI performed the facility TSA at AMEC, Inc. in Gainesville, FL in 2012. The facility TSA consisted of an assessment of the staff, facilities, data and document control, and the quality control programs. AMEC, Inc.'s project manager, database manager, laboratory manager, and QA manager were present during the audit. Results, findings, and the responses to the findings can be found on the CASTNET/Ozone webpage <<http://epa.gov/castnet/javaweb/ozone.html>>.

9. Annual Monitoring Network Plans and Network Assessment

EPA prepares an annual CASTNET (EPA, NPS and BLM-sponsored sites) monitoring network plan for public review. The network plan focuses on the ozone component of CASTNET and addresses the ozone monitoring requirements of 40 CFR 58.10(b), including any anticipated new CASTNET ozone sites or ozone sites that are in jeopardy of being discontinued. The NPS and BLM are responsible for determining whether ozone monitoring at their sites are discontinued. The annual monitoring network plan is posted for 30 days of public inspection on approximately May 15 on the CASTNET website. The plan and response to any comments received during the inspection period are distributed to OAQPS and all EPA Regional Office contacts, and submitted to the CAMD Division Director for approval no later than July 1. The schedule for these activities is outlined in Table 6. OAQPS provides comments within 120 days on any plans proposing changes to the ozone network, and the final plan is posted on the EPA and TTNS web sites.

Table 6 Network Plan Schedule

Date	Network Plan Steps
March 30 th	Final data submitted to AQS
April 30 th	Submit network plan to NPS/BLM for review
May 15 st	Posted for public review – TTNS site, CASTNET site
June 15 st	EPA begins response to public comments
July 1 st	Submitted to EPA/CAMD division director for approval

EPA will complete a network assessment every 5 years in accordance with 40 CFR 58.10(d). The network assessment shall be submitted to the CAMD Division Director, OAQPS, and all EPA Regional Office contacts. The next assessment is due July 1, 2015, and every 5 years thereafter.

States may choose to include CASTNET sites in their network plan if the CASTNET site will fulfill their requirement for rural monitoring sites. The CASTNET agency sponsor should be notified that the state

will be using the CASTNET site in their plan so that the state and region can be included in any discussions related to changes that may be made to the site.

10. Ozone Network Modification

EPA, NPS and BLM will consult with OAQPS and applicable EPA Regional Offices before discontinuing any ozone monitor in accordance with the requirements of 40 CFR 58.14. The implications arising from a monitor discontinuation will be reviewed, involving affected state monitoring agencies. Formal approval of any network change is required. EPA, NPS, and BLM will consider pertinent comments on any network modification before making any change. It is necessary that network modifications be documented in the annual monitoring network plan process as described above.

As of April 2013, the following network modifications have occurred:

Ahead of the 2013 ozone season, CASTNET added two regulatory ozone monitoring sites, Basin, WY (BAS601 560030002) and New Castle, WY (NEC602 560450003). These two sites are operated by BLM.

Ozone monitoring at the Konza Prairie, KS site (KNZ184 560030002) was discontinued in April 2013 after the land owner (the Nature Conservancy) and operator (Kansas State University) made a request to EPA that the monitor be removed.

Lastly, the Howland, ME site (HOW132 230199991) was discontinued following the 2012 ozone season.

11. Data Reporting and Certification

CASTNET complies with the annual air monitoring certification requirements in accordance with 40 CFR 58.15. The certification process has been completed on May 1 for the prior calendar year's ambient and quality assurance data. The certification materials will be signed by designated ozone managers in EPA, NPS and BLM for their respective CASTNET sites and submitted to OAQPS for review. The Division Director at the EPA's Clean Air Markets Division will approve with input from states and Regions on July 1. After certification, this information will be public for 30 days. CASTNET will comply with the data submittal requirements in accordance with 40 CFR 58.16. Applicable ambient and quality assurance data will be submitted to AQS within 90 days after the end of each quarterly reporting period.

Outline for TSA Report

1. Executive Summary
2. Introduction
3. General Program and Quality Management (Audit of EPA contractor's office and NPS contractor's office)
 - a. Complete General/Quality Management Forms
 - b. Findings, Discussions, Recommendations
4. Network Management
 - a. Complete Network Management, Field Support, Instrument Certification/Testing, Standards and Calibrations, and Instrument Repair Forms
 - b. Table listing the site locations, number of monitors at each location, type of monitor (SLAMS, SPM, etc...), what is measured
 - c. Findings, Discussions, Recommendations
5. Field Operations
 - a. Complete Field Overview Forms
 - b. Table that list site name, AQS ID, and pollutants monitored
 - c. Findings, Discussions, Recommendations
6. Laboratory Operations
 - a. Complete Laboratory Operations Forms
 - b. Findings, Discussions, Recommendations
7. Data and Data Management
 - a. Complete Data and Data Management Forms
 - b. Findings, Discussions, Recommendations
8. Quality Control and Quality Assurance

Appendix B

Regional Contacts Information for TSA Report

Region	Name	Position	Phone	Email
Region 1	Judge, Bob		617-918-8387	judge.robert@epa.gov
Region 2	Ruvo, Richard A.; Mustafa, Mustafa	Mgr	212-637-4014; 732-906-6881	ruvo.richard@epa.gov ; mustafa.mustafa@epa.gov
Region 3	Hass, Drew		215-814-2049	hass.andrew@epa.gov
Region 4	Rinck, Todd; Garver, Daniel	Mgr	404-562-9062; 404-562-9839	rinck.todd@epa.gov ; garver.daniel@epa.gov
Region 5	McGrath, Jesse		312-886-1532	mcgrath.jesse@epa.gov
Region 6	Sather, Mark		214-665-8353	sather.mark@epa.gov
Region 7	Nichols, Robert; Grooms, Leland	Mgr	913-551-5266; 913-551-5010	nichols.robert@epa.gov ; grooms.leland@epa.gov
Region 8	Payton, Richard		303-312-6439	payton.richard@epa.gov
Region 9	Clover, Fletcher		415-972-3991	clover.fletcher@epa.gov
Region 10	Hall, Christopher		206-553-0521	hall.christopher@epa.gov

Appendix C

AQS Qualifier Codes and Descriptions

Codes with Status = I are not valid for reporting new data

18-AUG-10

Qt Qualifier Type	Qualifier Type Desc	Qualifier Code	Qualifier Desc
INFORM	Informational Only	A	High Winds
	Informational Only	B	Stratospheric Ozone Intrusion
	Informational Only	C	Volcanic Eruption
	Informational Only	D	Sandblasting
	Informational Only	F	Structural Fire
	Informational Only	G	High Pollen Count
	Informational Only	H	Chem. Spills & Indust. Accidents
	Informational Only	I	Unusual Traffic Congestion
	Informational Only	IA	African Dust
	Informational Only	IB	Asian Dust
	Informational Only	IC	Chem. Spills & Indust Accidents
	Informational Only	ID	Cleanup After a Major Disaster
	Informational Only	IE	Demolition
	Informational Only	IF	Fire - Canadian
	Informational Only	IG	Fire - Mexico/Central America
	Informational Only	IH	Fireworks
	Informational Only	II	High Pollen Count
	Informational Only	IJ	High Winds
	Informational Only	IK	Infrequent Large Gatherings
	Informational Only	IL	Other
	Informational Only	IM	Prescribed Fire
	Informational Only	IN	Seismic Activity
	Informational Only	IO	Stratospheric Ozone Intrusion
	Informational Only	IP	Structural Fire
	Informational Only	IQ	Terrorist Act
	Informational Only	IR	Unique Traffic Disruption
	Informational Only	IS	Volcanic Eruptions
	Informational Only	IT	Wildfire-U. S.
	Informational Only	IU	Wildland Fire Use Fire-U. S.
	Informational Only	J	Construction/Demolition
	Informational Only	K	Agricultural Tilling
	Informational Only	L	Highway Construction
	Informational Only	M	Rerouting of Traffic
	Informational Only	N	Sanding/Salting of Streets
Informational Only	O	Infrequent Large Gatherings	
Informational Only	P	Roofing Operations	
Informational Only	Q	Prescribed Burning	
Informational Only	R	Cleanup After a Major Disaster	

	Informational Only	S	Seismic Activity
	Informational Only	U	Sahara Dust
	Informational Only	Z	Other event
QA	Quality Assurance Qualifier	1	Deviation from a CFR/Critical Criteria Requirement
	Quality Assurance Qualifier	2	Operational Deviation
	Quality Assurance Qualifier	3	Field Issue
	Quality Assurance Qualifier	4	Lab Issue
	Quality Assurance Qualifier	5	Outlier
	Quality Assurance Qualifier	6	QAPP Issue
	Quality Assurance Qualifier	7	Below Lowest Calibration Level
	Quality Assurance Qualifier	8	QA/QC Unknown
	Quality Assurance Qualifier	9	Negative value detected - zero reported
	Quality Assurance Qualifier	CB	Values have been Blank Corrected
	Quality Assurance Qualifier	CC	Clean Canister Residue
	Quality Assurance Qualifier	CL	Surrogate Recoveries Outside Control Limits due to analytical interferences
	Quality Assurance Qualifier	EH	Estimated; Exceeds Upper Range
	Quality Assurance Qualifier	FB	Field Blank Value Above Acceptable Limit
	Quality Assurance Qualifier	HT	Sample pick-up hold time exceeded; data questionable
	Quality Assurance Qualifier	LB	Lab blank value above acceptable limit
	Quality Assurance Qualifier	LJ	Identification Of Analyte Is Acceptable; Reported Value Is An Estimate
	Quality Assurance Qualifier	LK	Analyte Identified; Reported Value May Be Biased High
	Quality Assurance Qualifier	LL	Analyte Identified; Reported Value May Be Biased Low
	Quality Assurance Qualifier	MD	Value less than MDL
	Quality Assurance Qualifier	MX	Matrix Effect
	Quality Assurance Qualifier	ND	No Value Detected
	Quality Assurance Qualifier	NS	Influenced by nearby source
	Quality Assurance Qualifier	PQ	Values Between PQL And MDL
	Quality Assurance Qualifier	SQ	Values Between SQL and MDL
	Quality Assurance Qualifier	SS	Value substituted from secondary monitor
	Quality Assurance Qualifier	SX	Does Not Meet Siting Criteria
	Quality Assurance Qualifier	T	Multiple PM2.5 Validity Flags
	Quality Assurance Qualifier	TB	Trip Blank Value Above Acceptable Limit
	Quality Assurance Qualifier	V	Validated Value
Quality Assurance Qualifier	VB	Value below normal; no reason to invalidate	
Quality Assurance Qualifier	W	Flow Rate Average out of Spec.	
Quality Assurance Qualifier	X	Filter Temperature Difference out of Spec.	
Quality Assurance Qualifier	Y	Elapsed Sample Time out of Spec.	
REQEXC	Request Exclusion	E	Forest Fire
	Request Exclusion	RA	African Dust
	Request Exclusion	RB	Asian Dust
	Request Exclusion	RC	Chem. Spills & Indust. Accidents
	Request Exclusion	RD	Cleanup After a Major Disaster

Request Exclusion	RE	Demolition
Request Exclusion	RF	Fire - Canadian
Request Exclusion	RG	Fire - Mexico/Central America
Request Exclusion	RH	Fireworks
Request Exclusion	RI	High Pollen Count
Request Exclusion	RJ	High Winds
Request Exclusion	RK	Infrequent Large Gatherings
Request Exclusion	RL	Other
Request Exclusion	RM	Prescribed Fire
Request Exclusion	RN	Seismic Activity
Request Exclusion	RO	Stratospheric Ozone Intrusion
Request Exclusion	RP	Structural Fire
Request Exclusion	RQ	Terrorist Act
Request Exclusion	RR	Unique Traffic Disruption
Request Exclusion	RS	Volcanic Eruptions
Request Exclusion	RT	Wildfire-U. S.
Request Exclusion	RU	Wildland Fire Use Fire-U. S.

URL for AQS Table: <http://www.epa.gov/ttn/airs/airsags/manuals/Qualifiers Code.xls>

AQS Exceptional Event Tutorial: <http://www.epa.gov/ttn/airs/airsags/manuals/ExceptionalEventTutorial.pdf>

Appendix D. Current list of 40 CFR Part 58 Compliant CASTNET Ozone Monitoring Sites - 2013

SITE_ID	AQS_ID	AGY	AQS	ST	COUNTY	REG	NOTES	2011	2012	2013
ABT147	090159991	EPA	EPA	CT	Windham	1		Y	Y	Y
ASH135	230039991	EPA	EPA	ME	Aroostook	1		Y	Y	Y
ACA416	230090103	NPS	ME	ME	Hancock	1		Y	Y	Y
HOW132	230199991	EPA	EPA	ME	Penobscot	1	Inactive 10/2012	Y	Y	
WST109	330099991	EPA	EPA	NH	Grafton	1		Y	Y	Y
WSP144	340219991	EPA	EPA	NJ	Mercer	2		Y	Y	Y
HWF187	360319991	EPA	EPA	NY	Essex	2		Y	Y	Y
CTH110	361099991	EPA	EPA	NY	Tompkins	2		Y	Y	Y
BWR139	240199991	EPA	EPA	MD	Dorchester	3		Y	Y	Y
BEL116	240339991	EPA	EPA	MD	Prince George's	3		Y	Y	Y
ARE128	420019991	EPA	EPA	PA	Adams	3		Y	Y	Y
PSU106	420279991	EPA	EPA	PA	Centre	3		Y	Y	Y
KEF112	420479991	EPA	EPA	PA	Elk	3		Y	Y	Y
MKG113	420859991	EPA	EPA	PA	Mercer	3		Y	Y	Y
LRL117	421119991	EPA	EPA	PA	Somerset	3		Y	Y	Y
VPI120	510719991	EPA	EPA	VA	Giles	3		Y	Y	Y
SHN418	511130003	NPS	NPS	VA	Madison	3		Y	Y	Y
PED108	511479991	EPA	EPA	VA	Prince Edward	3		Y	Y	Y
CDR119	540219991	EPA	EPA	WV	Gilmer	3		Y	Y	Y
PAR107	540939991	EPA	EPA	WV	Tucker	3		Y	Y	Y
SND152	010499991	EPA	EPA	AL	DeKalb	4		Y	Y	Y
IRL141	120619991	EPA	EPA	FL	Indian River	4		Y	Y	Y
SUM156	120779991	EPA	EPA	FL	Liberty	4		Y	Y	Y
GAS153	132319991	EPA	EPA	GA	Pike	4		Y	Y	Y
MAC426	210610501	NPS	NPS	KY	Edmonson	4		Y	Y	Y
CKT136	211759991	EPA	EPA	KY	Morgan	4		Y	Y	Y
CDZ171	212219991	EPA	EPA	KY	Trigg	4		Y	Y	Y
MCK131	212299991	EPA	EPA	KY	Washington	4		Y	Y	Y
MCK231	212299991	EPA	EPA	KY	Washington	4		Y	Y	Y
CVL151	281619991	EPA	EPA	MS	Yalobusha	4		Y	Y	Y
PNF126	370119991	EPA	EPA	NC	Avery	4		Y	Y	Y
BFT142	370319991	EPA	EPA	NC	Carteret	4		Y	Y	Y
COW137	371139991	EPA	EPA	NC	Macon	4		Y	Y	Y
CND125	371239991	EPA	EPA	NC	Montgomery	4		Y	Y	Y
GRS420	470090101	NPS	NPS	TN	Blount	4		Y	Y	Y
SPD111	470259991	EPA	EPA	TN	Claiborne	4		Y	Y	Y
ESP127	470419991	EPA	EPA	TN	DeKalb	4		Y	Y	Y
BVL130	170191001	EPA	EPA	IL	Champaign	5		Y	Y	Y
STK138	170859991	EPA	EPA	IL	Jo Daviess	5		Y	Y	Y
ALH157	171199991	EPA	EPA	IL	Madison	5		Y	Y	Y
VIN140	180839991	EPA	EPA	IN	Knox	5		Y	Y	Y
SAL133	181699991	EPA	EPA	IN	Wabash	5		Y	Y	Y
UVL124	261579991	EPA	EPA	MI	Tuscola	5		Y	Y	Y
ANA115	261619991	EPA	EPA	MI	Washtenaw	5		Y	Y	Y
HOX148	261659991	EPA	EPA	MI	Wexford	5		Y	Y	Y

VOY413	271370034	NPS	NPS	MN	St. Louis	5		Y	Y	Y
OXF122	390179991	EPA	EPA	OH	Butler	5		Y	Y	Y
DCP114	390479991	EPA	EPA	OH	Fayette	5		Y	Y	Y
QAK172	391219991	EPA	EPA	OH	Noble	5		Y	Y	Y
PRK134	551199991	EPA	EPA	WI	Taylor	5		Y	Y	Y
CAD150	050199991	EPA	EPA	AR	Clark	6		Y	Y	Y
CHE185	400019009	EPA	CN	OK	Adair	6		Y	Y	Y
BBE401	480430101	NPS	NPS	TX	Brewster	6		Y	Y	Y
ALC188	483739991	EPA	EPA	TX	Polk	6	Part 58 upgrade too late into 2011 O3 season		Y	Y
PAL190	483819991	EPA	EPA	TX	Randall	6	Part 58 upgrade too late into 2011 O3 season		Y	Y
KNZ184	201619991	EPA	EPA	KS	Riley	7		Y	Y	
SAN189	311079991	EPA	EPA	NE	Knox	7		Y	Y	Y
GTH161	080519991	EPA	EPA	CO	Gunnison	8		Y	Y	Y
ROM206	080699991	EPA	EPA	CO	Larimer	8	Site used for QA purposes in 2012 and beyond	Y		
ROM406	080690007	NPS	NPS	CO	Larimer	8		Y	Y	Y
MEV405	080830101	NPS	NPS	CO	Montezuma	8		Y	Y	Y
GLR468	300298001	NPS	NPS	MT	Flathead	8		Y	Y	Y
THR422	380070002	NPS	ND	ND	Billings	8		Y	Y	Y
WNC429	460330132	NPS	SD	SD	Custer	8		Y	Y	Y
CAN407	490370101	NPS	NPS	UT	San Juan	8		Y	Y	Y
CNT169	560019991	EPA	EPA	WY	Albany	8		Y	Y	Y
BAS601	560030002	BLM	BLM	WY	Big Horn	8				Y
PND165	560359991	EPA	EPA	WY	Sublette	8		Y	Y	Y
YEL408	560391011	NPS	NPS	WY	Teton	8		Y	Y	Y
NEC602	560450003	BLM	BLM	WY	Weston	8				Y
CHA467	040038001	NPS	NPS	AZ	Cochise	9		Y	Y	Y
GRC474	040058001	NPS	NPS	AZ	Coconino	9		Y	Y	Y
PET427	040170119	NPS	NPS	AZ	Navajo	9		Y	Y	Y
YOS404	060430003	NPS	NPS	CA	Mariposa	9		Y	Y	Y
PIN414	060690003	NPS	NPS	CA	San Benito	9		Y	Y	Y
JOT403	060719002	NPS	NPS	CA	San Bernardino	9		Y	Y	Y
LAV410	060893003	NPS	NPS	CA	Shasta	9		Y	Y	Y
SEK430	061070009	NPS	NPS	CA	Tulare	9		Y	Y	Y
GRB411	320330101	NPS	NPS	NV	White Pine	9		Y	Y	Y
DEN417	020680003	NPS	NPS	AK	Denali	10		Y	Y	Y
MOR409	530531010	NPS	NPS	WA	Pierce	10		Y	Y	Y
Part 58 Sites								77	78	78

2013 SUMMARY

2013 Sites CASTNET ozone sites	2013 Part 58 Compliant sites
80	78
EPA ozone sites	NPS ozone sites
52	22
BLM ozone sites	Cherokee Nation SLAMS sites
2	1
SD SLAMS Sites	ND SLAMS Sites
1	1
ME SLAMS Sites	
1	