

CASTNET 2020 Annual Network Plan Response to Comments

**Clean Air Markets Division
Office of Atmospheric Programs
US Environmental Protection Agency**

June 30, 2020

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1. Comment received in regard to the level of the 1-point QC checks for CASTNET ozone analyzers.

Commenter: Robert Judge, EPA Region 1.

Date received: April 30, 2020

Comment 1.

Tim- I'm not going to give this as detailed review as I would for a State ANP, which we in the Regions actually "approve." But as a Region who reviews your CASTNET data quarterly, you guys do a good job. I will observe, just like we do with our States that are collecting data for regulatory purposes- and in compliance with 40 CFR Part 58, Appendix A, I would consider all CASTNET ozone monitors to be more analogous to research based sites/ NCore, and would therefore be asking the State to run p-checks at values close to the mean/ median. These CASTNET sites are not primarily NAAQS compliance monitors. (I know I've said this before) Be safe...

Table 1 Quality

Table 1 Quality	O3 (ppb)	SO2 (ppb)	CO (ppm)
Control			
Checks Frequency			
Zero	Daily	0	0
Precision	Daily	60	25
Span	Daily	225*	90
Additional point #1	Weekly	30**	5**
Additional point #2	Weekly	90**	40**
Additional point #3	Weekly	150**	60**

3. Measurement Quality Check Requirements

3.1. Gaseous Monitors of SO2, NO2, O3, and CO.

3.1.1 *One-Point Quality Control (QC) Check for SO2, NO2, O3, and CO.* (a) A one-point QC check must be performed at least once every 2 weeks on each automated monitor used to measure SO2, NO2, O3 and CO. With the advent of automated calibration systems, more frequent checking is strongly encouraged. See Reference 10 of this appendix for guidance on the review procedure. The QC check is made by challenging the monitor with a QC check gas of known concentration (effective concentration for open path monitors) between the prescribed range of 0.005 and 0.08 parts per million (ppm) for SO2, NO2, and O3, and between the prescribed range of 0.5 and 5 ppm for CO monitors. The QC check gas concentration selected within the prescribed range should be related to the monitoring objectives for the monitor. **If monitoring at an NCore site or for trace level monitoring, the QC check concentration should be selected to represent the mean or median concentrations at the site.** If the mean or median concentrations at trace gas sites are below the MDL of the instrument the agency can select the lowest concentration in the prescribed range that can be practically achieved. If the mean or median concentrations at trace gas sites are above the prescribed range the agency can select the highest concentration in the prescribed range. An additional QC check point is encouraged for those

organizations that may have occasional high values or would like to confirm the monitors' linearity at the higher end of the operational range or around NAAQS concentrations. If monitoring for NAAQS decisions, the QC concentration can be selected at a higher concentration within the prescribed range but should also consider precision points around mean or median monitor concentrations.

(b) Point analyzers must operate in their normal sampling mode during the QC check and the test atmosphere must pass through all filters, scrubbers, conditioners and other components used during normal ambient sampling and as much of the ambient air inlet system as is practicable. The QC check must be conducted before any calibration or adjustment to the monitor.

Response 1.

The CASTNET ozone monitoring program is designed to provide ozone monitoring data that fulfill the requirements for ozone NAAQS attainment designations. CASTNET site locations span the continental U.S. and Alaska. As a national program, CASTNET utilizes the same quality assurance and quality control (QA/QC) protocols across very different geographic regions. A review of the 2019 ozone design value report¹ shows that seven CASTNET ozone analyzers reported ozone design values above the 2015 NAAQS. Over the last five years, CASTNET sites averaged 199 ozone exceedances (i.e., eight hour daily maximum ozone concentrations above 70 ppb) per year.

The 2019 ozone design value report also illustrates the unique role that CASTNET ozone analyzers fulfill where they are oftentimes the only regulatory ozone analyzer within a county or community based statistical area (CBSA). For example, out of 80 valid CASTNET ozone design values, 79 sites were in the top five of their respective county and 45 were in the top five of their respective CBSA. Sixty-three CASTNET sites had the leading design value for their respective county and 32 CASTNET sites had the leading ozone design value for their respective CBSA. Lastly, in 49 counties and 17 CBSAs CASTNET sites provided the only regulatory ozone concentrations for citizens of those communities.

Appendix A to 40 CFR Part 58 states, "If monitoring for NAAQS decisions, the QC concentration can be selected at a higher concentration within the prescribed range but should also consider precision points around mean or median monitor concentrations." Given the importance of national consistency across the CASTNET monitoring program, paucity of ozone monitoring where CASTNET sites are located, and the episodic ozone exceedances, our program finds that setting the daily 1-point QC check level at 60 ppb meets both the requirements spelled out in Appendix A to 40 CFR Part 58 and the objectives of the CASTNET program. To evaluate ozone measurements near the mean or median (approximately 35 ppb for the CASTNET network) a precision check is also performed weekly at 30 ppb and results for EPA-sponsored sites are reported on the CASTNET website.

¹ 2019 Design Value Reports. Accessed on June 10, 2020. <https://www.epa.gov/air-trends/air-quality-design-values>

2. Comment received in regard to missing URL website links and grammar suggestions.

Commenter: James W. Boylan, Ph.D., Georgia Department of Natural Resources
GA EPD - Air Protection Branch

Date received: May 7, 2020

Comment 2.

Submitted by electronic email to: Sharac.Timothy@epa.gov

Mr. Timothy Sharac
Office of Air & Radiation - Clean Air Markets Division
U. S. EPA Headquarters
1200 Pennsylvania Avenue, N.W.
MC-6204M
Washington, DC 20460

Dear Mr. Timothy Sharac:

The Georgia Environmental Protection Division (Georgia EPD) appreciates the opportunity to provide the following comments on the draft "2020 CASTNET Annual Network Plan" document (hereafter "Draft CASTNET Plan") dated April 30, 2020.

Overall, EPA's Draft CASTNET Plan document provides a clear and comprehensive plan for the CASTNET network. Below, we provide some general and specific comments for EPA to consider as they finalize the planning document.

General Comments

Georgia EPD recommends that EPA use "a" before words that start with a consonant sound and "an" before words that start with a vowel sound. When an acronym starts with a consonant that when pronounced sound like a vowel (e.g., the letters "F" pronounced "eff" or "S" pronounced "ess"), then the acronym should be preceded by "an" not "a" (e.g., "an FSA" instead of "a FSA" or "an S/L/T" instead of "a S/L/T").

Specific Comments

The attached Table 1 contains Georgia EPD's comments on specific items in EPA's Draft CASTNET Plan. We attempted to include the original text of the Draft CASTNET Plan in Table 1 so that EPA staff can easily locate our discussion items. For editorial changes, we used red font.

If you have any questions about our comments, please contact Gil Grodzinsky at Gil.Grodzinsky@dnr.ga.gov.

Table 1. Georgia EPD’s specific comments on EPA’s draft 2020 CASTNET Annual Network Plan.

Page	Original Text	Comment
3 (top)	“A summary of the entire CASTNET monitoring program is available online. ¹ ”	The link associated with footnote 1 at the bottom of page 3, which is https://www3.epa.gov/castnet/docs/CASNET-Factsheet-2019.pdf , does not exist or isn’t at this location.
3 (under Figure 1)	“Ninety-three CASTNET sites measure weekly concentrations of sulfur dioxide (SO ₂), sulfate (SO ₄ ²⁻), nitrate (NO ₃), nitric acid (HNO ₃), ammonium (NH ₄ ⁺), chloride (Cl ⁻) and base cations using a 3-stage filter pack (see Figure 2).”	Nitrate is an anion with a charge of -1, so should read NO ₃ ⁻ . Change to “Ninety-three CASTNET sites measure weekly concentrations of sulfur dioxide (SO ₂), sulfate (SO ₄ ²⁻), nitrate (NO ₃ ⁻), nitric acid (HNO ₃), ammonium (NH ₄ ⁺), chloride (Cl ⁻) and base cations using a 3-stage filter pack (see Figure 2).”
4	“The QA program routinely assesses compliance with the CASTNET Quality Assurance Project Plan (QAPP) ² through internal monitoring, including audits and on-site system checks.”	The link associated with footnote 2 at the bottom of page 4, which is https://www3.epa.gov/castnet/docs/CASNET_QAPP_v9-3_Main_body.pdf , does not exist or isn’t at this location.
8 (Table 2 caption)	“Table 2 Note: 40 CFR Part 58 Appendix A – Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards. ¹¹ ”	The link associated with footnote 11 at the bottom of page 8, which is https://www.ecfr.gov/cgi-bin/text-idx?SID=43a82c5c9a954280524a1abf6a3328ca&mc=true&node=ap40.6.58_161.a&rgn=div9 , does not exist or isn’t at this location.

Sincerely,

James W. Boylan, Ph.D.
 Manager, Planning and Support Program
 Georgia Department of Natural Resources
 GA EPD - Air Protection Branch

Response 2.

The erroneous URLs have been updated and the suggested grammar corrections have been applied.

3. Comment received in regard to 1-point QC checks and NPAP audit levels for CASTNET trace-level gas analyzers.

Commenter: Mustafa Mustafa, EPA Region 2.

Date received: May 14, 2020

Comment 3.

Hi Tim,

I reviewed the 2020 CASTNE Annual Network Plan, and I have the following couple of QA comments:

1. Table 1 Quality Control Checks, page 8: the levels for CO need to be corrected, either by changing the CO units to (PPb) instead of (ppm), or the numbers into ppm to match. Also, the 1-Point Precision check range in the QA Handbook, Appendix D is .5 – 5.00 ppm. The point should be within the range, and CASTNET could do extra point at a lower level if they choose to.
2. Recommend that the additional check points level to be lowered. Attached is the levels and acceptance criteria we follow for the NPAP audits.
3. Table 2 Audit Levels for Performance Evaluations, pg 8: Just correct the absolute difference allowed for Levels 1&2 for CO to .031 ppm.
4. I understand that you don't have as many CO and SO2 monitors as O3 in the Network: are the NPAP audits are done just for O3?

Thank you,

Mustafa A. Mustafa
USEPA Region 2
(732) 906-6881

The NPAP Acceptance Criteria Excel attachment is shown below.

TTP NPAP Audits Acceptance Criteria							
Pollutant	Audit	Frequency	Acceptance Criteria		Citation		
O3	Federal Audits (NPAP)	20% of sites audited in calendar year	Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 10.1%		1 and 2) 40 CFR Part 58 App A Sec. 3.1.3 3) NPAP QAPP/SOP		
CO	Federal Audits (NPAP)	20% of sites audited in a calendar year	Audit levels 1&2 < ± 0.031 ppm difference all other levels percent difference < ± 15.1%		1 and 2) 40 CFR Part 58 App A Sec. 3.1.3 3) NPAP QAPP/SOP		
NO2	Federal Audits (NPAP)	20% of sites audited in calendar year	Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 15.1%		1 & 2) 40 CFR Part 58 App A Sec. 3.1.3 3) NPAP QAPP/SOP		
SO2	Federal Audits (NPAP)	20% of sites audited in calendar year	Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 15.1%		1&2) 40 CFR Part 58 App A Sec. 3.1.3 3) NPAP QAPP/SOP		
(NPAP) Levels & Acceptance Criteria							
Audit Level	O ₃ (ppm)	O ₃ Acceptance Criteria	SO ₂ (ppm)	NO ₂ (ppm)	NO ₂ & SO ₂ Acceptance Criteria	CO (ppm)	CO Acceptance Criteria
1	0.004-0.0059	< ±10.1% or < ±1.5 ppb	0.0003-0.0029	0.0003-0.0029	< ±15.1% or < ±1.5 ppb	0.020-0.059	< ±15.1% or < ±0.031 ppm
2	0.006-0.019		0.0030-0.0049	0.0030-0.0049		0.060-0.199	
3	0.020-0.039		0.0050-0.0079	0.0050-0.0079		0.200-0.899	
4	0.040-0.069		0.0080-0.0199	0.0080-0.0199		0.900-2.999	
5	0.070-0.089		0.0200-0.0499	0.0200-0.0499		3.000-7.999	
6	0.090-0.119	< ±10.1%	0.0500-0.0999	0.0500-0.0999	< ±15.1%	8.000-15.999	< ±15.1%
7	0.120-0.139		0.1000-0.1499	0.1000-0.2999		16.000-30.999	
8	0.140-0.169		0.1500-0.2599	0.3000-0.4999		31.000-39.999	
9	0.170-0.189		0.2600-0.7999	0.5000-0.7999		40.000-49.999	
10	0.190-0.259		0.8000-1.000	0.8000-1.000		50.000-60.000	

Response 3.

We reviewed Table 1 within the draft 2020 CASTNET Annual Network Plan and changed the units for CO levels to ppb instead of ppm. CASTNET performs 1-point QC checks for CO analyzers at 0.250 ppm which is outside the acceptable range of 0.5 – 5.00 ppm found in 40 CFR Part 58 App A Sec. 2.3.1. To fulfill the requirement of CO 1-point QC checks performed every two weeks, the results of the CO check at 1.80 ppm are submitted to AQS. The values for Levels 1 and 2 for CO were updated from 0.03 ppm to 0.031 ppm throughout the document.

NPAP audits are performed on all CO and SO₂ analyzers within CASTNET and audit results are submitted into AQS. There were NPAP audits on the CO and SO₂ analyzers at Great Smoky Mountains National Park (47-009-0101) on 11/7/2017 and at Mammoth Cave National Park (21-061-0501) on 9/10/2019. Bondville, IL (17-019-1001) is scheduled to have NPAP audits on the CO and SO₂ analyzers in 2020.