December 12, 2023

Response to comment on Department's proposed guidance document, "Acceptable use of diluent cap in reducing gaseous and/or liquid fuel-fired combustion turbine and boiler CEMS data to demonstrate compliance with RACT emission limitations under RCSA § 22a-174-22e"

In May 2023, the Department released and sought public comment on the above-referenced proposed guidance document. The proposed guidance document was distributed via e-mail to interested stakeholders and the Department's SIPRAC membership; it was also posted to the Department's public notices webpage with instructions on how to comment. The Department requested that all comments be submitted no later than June 23, 2023.

Upon concluding a review of the comments received, the Department is finalizing the guidance document without any changes.

The Department received two comments, from (i) Debby Lemay of Berkshire Environmental ("Berkshire") and (ii) James Romanski of Yale University ("Yale"). The Department summarizes and responds to each comment below. Each comment is included in its entirety at the end of this document.

Comment no. 1

Berkshire: Does the Department believe that the proposed diluent cap will provide relief in instances where a short run or failed startup results in an exceedance of the applicable daily block average emission limit in the Department's NOx RACT rule?

Department: Diluent capping on an hourly average basis would likely have a limited impact on emission units that start up quickly and efficiently, e.g., natural gas-fired peaking units. In preparing the proposed guidance document, the Department's intent was to provide for the use of a diluent cap where there is state and/or federal precedent for doing so and where the use of a diluent cap does not alter the form or undermine the stringency of the promulgated NOx RACT limits. In some cases, diluent capping might have the effect of mitigating mathematical data inflation – specifically with respect to emissions in units of volumetric concentration or heat input-based mass rate – during short runs or failed startups. However, such determinations will always be fact-specific.

Comment no. 2

Yale: We appreciate the Department's guidance on diluent capping; however, we reviewed past CEMS data for our turbines and boiler and did not find any instances where the proposed guidance would be helpful. For the four CHP turbines, we found only 2 of 43,860 operating hours where the stack O_2 concentration was above the 19 percent cap; both of these hours occurred during 24-hour blocks when the NOx average was below the applicable phase 2 RACT limit. For the boiler, we found 39 operating hours where the measured O_2 concentration was above the 14 percent cap; all 39 hours were partial unit operating hours, and use of the 14 percent diluent cap was not necessary to demonstrate compliance with the applicable phase 2

RACT limit. For instances where an exceedance of the applicable daily block average RACT limit occurs by virtue of limited operating hours, we suggest that the Department consider one or more of the alternatives that we have raised: requiring a minimum number of valid operating hours to calculate a daily bock average; implementing a rolling, as opposed to block, averaging period; implementing an alternative mass-based NOx limit.

Department: The Department understands that the utility of a diluent cap is likely limited in the context of emission units that start up quickly and efficiently. The Department appreciates Yale's thoughts on alternative compliance options that could be implemented in cases where the calculated daily block average is influenced by an emission unit's limited runtime. These alternatives, however, would substantively alter the applicability and/or provisions of the Department's NOx RACT rule long after such rule was promulgated and took effect.

For the 39 partial boiler operating hours where Yale indicated that the stack O_2 concentration was above the proposed 14 percent diluent cap, it is unclear why the use of a diluent cap "was not necessary to demonstrate compliance with the daily block average Phase 2 NOx RACT limit." It is highly plausible, for example, that diluent capping was unnecessary because, after including the remaining operating hours in the emission average for the affected 24-hour block, the applicable NOx limit was not exceeded. The Department reiterates its expectation that partial operating hours be included in all[1] emission averages computed for NOx RACT compliance purposes; this expectation is based on the plain language of the rule:

- A "daily block average" – which is calculated to determine compliance with the "daily block average" emission standards in subsection (d) – is "the arithmetic mean of all hourly emission concentrations or rates recorded when an emission unit is operating measured over the 24-hour period from 12 a.m. (midnight) to 12 a.m. (midnight)" (emphasis added). RCSA § 22a-174-22e(a)(7).
- Pursuant to the emission averaging provisions of the rule, "[t]he following averaging times for emissions limitations shall be applicable to the owner or operator of an emission unit that has or is required to have a CEM system for NOx: (A) For a non-ozone season emissions limitation, the period from October 1 to April 30, inclusive, including all periods of operation, except as provided in subsection (m)(3) of this section; (B) For an ozone season emissions limitation, the period from May 1 to September 30, inclusive, including all periods of operation, except as provided in subsection (m)(3) of this section; (C) For any other emissions limitation, a daily block average, including all periods of operation, except as provided in subsection (m)(3) of this section" (emphasis added). RCSA § 22a-174-22e(d)(11).
- Pursuant to the monitoring provisions of the rule, "[i]f an owner or operator uses a CEM system to monitor NOx emissions, the owner or operator shall collect quality assured CEM data for all emission unit operating conditions. Data collection shall include periods of startup or shutdown … " (emphasis added). RCSA § 22a-174-22e(m)(2).

Furthermore, while 40 CFR 60.13(h)(2) only requires the validation of partial operating hours if the applicable subpart specifically provides for the inclusion of partial operating hours in emission calculations, there is no nexus from RCSA § 22a-174-22e to 40 CFR 60.13(h)(2); there

[1] Unless one or more conditions at RCSA § 22a-174-22e(m)(3) occurs for the entirety of such partial operating hour

is only a nexus from RCSA § 22a-174-22e to the performance and quality assurance specifications of the NSPS General Provisions and Acid Rain Program rule.

From: Debby Lemay
To: Felton, Jacob V.
Cc: Farrell, Paul; Sinclair, Jaimeson; Bouffard, Rickey; Gere, Merrily
Subject: Re: Draft guidance memorandum re CEMS data averaging under CT NOx RACT rule
Date: Monday, May 8, 2023 2:06:55 PM

Jake,
Is CTDEEP hoping that a diluent cap remedies the short run / failed startup issues that result in exceedances of the daily limits?
Best regards,
Debby Lemay
Senior Project Manager
Berkshire Environmental Consultants

Sent from my iPhone

From:	Romanski, James
To:	Felton, Jacob V.
Cc:	Farrell, Paul; Krochko, David; Kinsella, Iain
Subject:	RE: Subject Line Correction - Draft Guidance Memorandum Regarding CEMS Data Averaging Under CT NOx RACT Rule
Date:	Friday, June 23, 2023 4:59:00 PM

Jake

Yale offers the following comments on the Draft Guidance Memorandum Regarding CEMS Data Averaging Under CT NOx RACT Rule.

We reviewed the diluent cap guidance and analyzed our own actual past data applying the guidance to it. We didn't find any instance where it was helpful. We still suggest CT DEEP consider one or several of the alternatives that we have proposed to for situations where units operate for only part of an hour or part of a day.

Below is a summary of our analysis of our past year's CEMS data to illustrate its applicability (or lack thereof) to our situation and our emission units:

- Ability to use the diluent cap guidance is definitely appreciated – but cannot be a solution to the problems presented by calculating a daily block average with limited hours of operation during a calendar day.
- We reviewed CEMS data going back to the beginning of 2022 for our turbines and boilers and noted the following:
    - For the 4 combined heat and power turbines, only 2 out of the 43,680 hours reviewed had oxygen concentrations above the 19% diluent cap (19.1% and 19.2% respectively)
        - Both instances occurred on days with daily block average NOx concentrations below the applicable Phase 2 NOx RACT limits
        - Highest instances of instantaneous NOx concentrations were measured during non-steady state events with oxygen concentrations below the 19% diluent cap value.
    - For the CPP 100k boiler, a total of 39 hours were measured with oxygen concentrations above the applicable 14% diluent cap.
        - All 39 of these occurred during partial unit operating hours.
        - Use of the 14% diluent cap in these instances was not necessary to demonstrate compliance with the daily block average Phase 2 NOx RACT limit

It still appears that we would need to pursue one of the previously suggested strategies (requiring a minimum number of hours to calculate a daily block average; changing to a rolling 24-hr average; implementing a mass-based alternate NOx limit) would be the only way to achieve a complete solution to this problem.

Jim Romanski
SIPRAC CO-Chair

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