SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report
Proposed Amended Rule 218.2 – Continuous Emission Monitoring System: General Provisions
Proposed Amended Rule 218.3 – Continuous Emission Monitoring System: Performance Specifications

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BACKGROUND

Adopted in March 2021, South Coast Air Quality Management District (South Coast AQMD) Rules 218.2 and 218.3 provide specifications for continuous emission monitoring system (CEMS). A CEMS is the combination of equipment necessary for the determination of pollutant concentrations or emission rate on a continuous basis using analyzer measurements and a conversion equation, graph, or computer program to produce results in units of the applicable emission limitation or standard. Rules 218.2 and 218.3 provide specifications for CEMS operated at former Regional Clean Air Incentives Market (RECLAIM) facilities that were previously certified according to the RECLAIM program but have exited RECLAIM, as well as specifications for CEMS operated at non-RECLAIM facilities that were previously certified or would have been certified according to Rules 218 and 218.1. An implementation schedule is specified under Rules 218.2 and 218.3 to define the compliance date of each system. Prior to the compliance date, CEMS at RECLAIM facilities would continue to be subject to their current monitoring provisions under RECLAIM (i.e., Rule 2012 for NOx CEMS), and non-RECLAIM CEMS would continue to be subject to Rules 218 and 218.1.

Since the adoption of Rules 218.2 and 218.3, staff has been monitoring the implementation through discussions with facilities applying for CEMS certification, meetings with CEMS vendors regarding their progress on software adjustment and customer feedback, and monitoring landing rule amendments and proposals related to CEMS. As a result, certain concerns were identified.

First, both rules were developed to address compliance with command-and-control concentration-based emission limits; however, since their adoption, several command-and-control rules with CEMS requirements have been adopted or amended to include mass emission limits. Due to those recent rule changes, staff recognizes guidance and specifications, including calculations and a data substitution procedure, are needed for owners or operators of CEMS complying with mass emission limits. Next, the U.S. Environmental Protection Agency (U.S. EPA) recommended that staff include more specific requirements related to Executive Officer discretion in CEMS monitoring rules. Stakeholders subject to the rules also asked staff to address potential emission overestimation from dual range analyzers. Resolution of these concerns requires rule amendments.

REGULATORY HISTORY FOR RULES 218.2 and 218.3

The South Coast AQMD has various rules, regulations and permit conditions that require the installation and operation of CEMS to determine compliance with an emission limitation or standard. Since January 1976, the South Coast AQMD has established CEMS monitoring rules to provide guidance and specifications for the CEMS installation and operation to ensure accuracy and precision of the CEMS. For facilities that are under a command-and-control regulatory structure and are not in the RECLAIM, CEMS provisions are specified in Rule 218 – Continuous Emissions Monitoring and Rule 218.1 – Continuous Emissions Monitoring Performance Specifications. For RECLAIM facilities, CEMS provisions are specified in Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions and Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions.

Rule 218.2 – Continuous Emission Monitoring System: General Provision and Rule 218.3 – Continuous Emission Monitoring System: Performance Specification will eventually replace Rules 218, 218.1, and 2012. It should be noted that at this time, SOx RECLAIM is not transitioning to a command-and-control regulatory structure. Consequently, CEMS in SOx RECLAIM will continue to be subject to the requirements in Rule 2011.

Rules 218.2 and 218.3 were developed to include the requirements contained in Rules 218 and 218.1 as well as some of the requirements contained in Rule 2012. Rules 218.2 and 218.3 were adopted on March 5, 2021. The primary objectives of these rules are to:

- Develop one set of requirements that will apply to both non-RECLAIM and former RECLAIM facilities;
- Align CEMS requirements for RECLAIM facilities as they transition to command and control rules;
- Streamline requirements and provide more clarity to existing CEMS provisions; and
- Codify existing practices to provide more transparency.

PUBLIC PROCESS

The development of Proposed Amended Rules 218.2 and 218.3 (PAR 218.2 and PAR 218.3) has been conducted through a public process. Two Working Group meetings were held on January 27, 2022, and February 24, 2022. The Working Groups included a wide variety of stakeholders such as affected facilities, consultants, environmental and community groups, and other agencies. The objective of the Working Group Meetings is to build consensus and resolve key issues with the stakeholders.

Staff also has had individual meetings with stakeholders and the U.S. EPA for issues related to the PAR 218.2 and PAR 218.3.

SUMMARY OF PROPOSAL

PAR 218.2 proposes a minor revision to include more specificity to the rule language on recertification requirements related to Executive Officer discretion.

PAR 218.3 proposes an option to validate and accept data that would fall in a monitoring gap for a dual range analyzer, adds specifications for mass emission calculations and a data substitution procedure, and provides clarity on linearity error check.

PROPOSED AMENDMENT TO RULE 218.2

CEMS certification/recertification requires case-by-case evaluations. Executive Officer's discretion may be required for some unique cases. EPA advised staff to include more specificity to provisions that allow for Executive Officer's discretion.

Revise Certification Requirement Related to Executive Officer discretion – Subparagraph (f)(1)(B)

While paragraph (f)(1) defines situations when a CEMS shall be certified or recertified, subparagraph (f)(1)(B) allows an opportunity for Executive Officer to identify unique modifications that would not require a recertification. Staff is proposing the following revision, specifying the basis of the determination on impact of data accuracy.

(f) Certification Requirements

(1) The owner or operator of a CEMS shall certify or recertify any CEMS that is:

(A) Installed after [Date of Adoption];

(B) Modified for any component that is either listed on the certification letter, Technical Guidance Document R-002, or Quality Assurance/Quality Control Plan, unless the Executive Officer determines that such modification would not impact data accuracy and certification or recertification is not necessary; or

(C) Determined by the Executive Officer that a CEMS recertification is required because the QA/QC or performance requirements for the CEMS cannot be achieved in accordance with Rule 218.3 subdivision (g).

PROPOSED AMENDMENTS TO RULE 218.3

The proposed amendments to Rule 218.3 will address a concern raised for current requirements on dual range analyzers and include specifications for mass emission calculations and a missing data procedure. Those proposed amendments are all under subdivision (i) for data handling. In addition, staff recognizes the need to revise subparagraph (f)(4)(F) to clarify the linearity error check method.

Clarify the Linearity Error Check Method – Subparagraph (f)(4)(F)

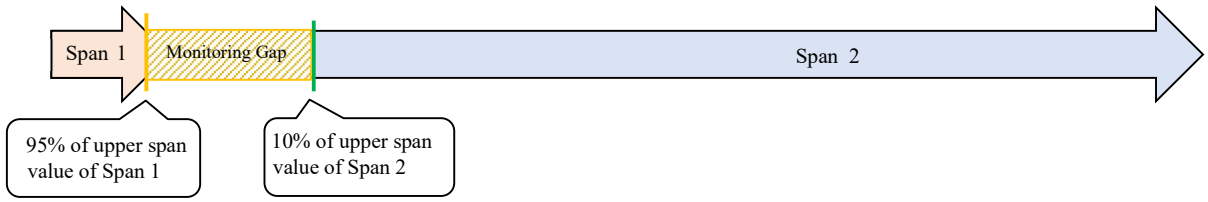
The method for linearity error check under this subparagraph remains the same. The revision is intended to provide more detailed instruction on the test sequence and the number of data points required when conducting the linearity error check procedure.

Revise Data Handling for Data Below 10 Percent of the Upper Span Value – Subparagraph (i)(1)(C)

For a dual range span analyzer, when 95 percent of the upper span value of the lower span range does not overlap with 10 percent of the upper span value of the higher span range, there is an unintended monitoring gap results. (See Figure 1 below.) Rule 218.3 paragraph (i)(1) requires data

measured in monitoring gap to be reported as 10 percent of the upper span value of the higher span, which may overestimate the emissions. Stakeholders raised a concern that this could place the equipment out of compliance.

Figure 1: Dual Range Analyzer Monitoring Gap



Subparagraph (i)(1)(C) provides an option to validate data points that fall below 10 percent of the upper span value of the span range and report the data point at the actual measured value, but that is only applicable to the lowest vendor guaranteed span range for that CEMS analyzer. To utilize this option the owner or operator for the CEMS are required to conduct the validation tests specified in Rule 218.3 Attachment A: Supplemental and Alternative Performance Requirements.

To address the dual range analyzer monitoring gap concern, staff is proposing to extend a low level data validation option to any span range, provided the owner or operator conducts an additional procedure included in Attachment A to ensure data linearity. The additional procedure includes a three-point calibration at the lower level, in lieu of the current spike recovery procedure. The low-level calibration procedure provides a data validation procedure to ensure the accuracy of any data collected in the monitoring gap.

For a span range other than the lowest vendor guaranteed span range, the owner or operator for the CEMS are allowed to choose a lowest non-zero value to set the low end of the data range to be validated. The lowest non-zero value selected will depend on the analyzer's sensitivity. For example, for a dual range analyzer with a lower span range at 0-10 ppmv and a higher span range at 0-1000 ppmv, by current requirement the monitoring gap would be 9.5-100 ppmv. If a measurement fell within that monitoring gap, the owner or operator would have to replace the measured value with 10 percent of the upper span value, which is 100 ppmv in the above example. In the proposed amendment, the owner or operator may choose a lowest non-zero value in the monitoring gap to demonstration data linearity for data validation. If the owner or operator choose a low point at 20 ppmv, a three-point calibration would include a low-point of 20 ppmv, a mid-point of 20 and 100 ppmv (e.g., 40 ppmv), and a high-point of 100 ppmv to validate data in the range of 20-100 ppmv. Even with the new procedure, there may still be a small data gap if the lowest non-zero value selected is not low enough to bridge the gap. For the above example the data gap will be from 9.5 ppmv to 20 ppmv. If a value is measured in the data gap, the owner or operator would have to replace the measured value with the lowest non-zero value in the three-point calibration, which is 20 ppmv in the above example instead of 100 ppmv as would be required under the current data gap procedure.

Add Mass Emission Calculation Methodology – Paragraph (i)(10)

Rules 218.2 and 218.3 were developed for compliance with command-and-control rules, which typically establish concentration-based emission limits instead of a mass-based emission limits. As a result, the rules do not currently address a mass emission calculation. However, as some command-and-control rules are including mass emission limit compliance options, there is a need to specify data handling for mass emissions.

Staff is proposing to include three calculation methods under Rule 218.3 paragraph (i)(10) for determining hourly mass emission rates depending on the parameters being monitored. Those methods are consistent with the methodology used in Rule 2012 for RECLAIM facilities and are expressed in three equations listed in Table 5. The first equation is based on stack gas concentration and volumetric flow rate. The second equation is based on stack gas concentration, heat input rate, and oxygen concentration, referenced as oxygen F factor approach. The third equation is based on stack gas concentration, heat input rate, and carbon dioxide concentration, referenced as carbon dioxide F factor approach. The oxygen F factor approach may not be used in cases where enriched oxygen is used, non-fuel sources of carbon dioxide are present (e.g. lime kilns and calciners), or the oxygen content of the stack gas is 19 percent or greater. The carbon dioxide F factor approach may not be used in cases where enriched oxygen is used or non-fuel sources of carbon dioxide are present (e.g. lime kilns and calciners).

In regard to three equations, RECLAIM CEMS are allowed to conduct measurements at either 60°F or 68°F, and thus utilize NOx conversion factor of 1.214×10^{-7} or 1.195×10^{-7} lbs/ft^3 to determine mass emissions. Rule 218.3 will be consistent with Rule 102 – Definition of Terms for the definition of standard conditions which required measurements be conducted at 60°F; therefore, the NOx conversion factor of 1.214×10^{-7} lbs/ft^3 will be utilized in the Table 5 equations.

For the mass emission calculation when the higher heating value is required, Rule 218.3 will allow a default higher heating value listed in Table 6 or a measured heating value of the fuel determined by a method approved by the Executive Officer (see footnote of Table 5). A heating value determined by gas bills would be considered as a measured heating value.

Add Data Substitution Procedure – Subparagraph (i)(11)

Missing or invalid data periods may occur during CEMS maintenance, system malfunctioning, or failed QA/QC tests. Missing or invalid CEMS data would create data gaps for those time periods. When mass emission limits must be demonstrated for specific averaging periods (e.g., 24 hours or 365-day rolling average), data substitution would be required to fill the data gaps.

Staff is proposing to include data substitution procedure specifications in Rule 218.3 paragraph (i)(11). The procedure aligns with the data substitution procedure specified in Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations (Rule 1109.1), except that the rule requires the substituted data to be from a "unit operation hour" which is defined as "a clock hour during which a unit combusts any fuel either for part of the hour or for the entire hour." This is to avoid zero emission data being utilized for data substitution. According to the proposed procedure, when the missing data period is at or less than eight hours, the owner

or operator of the CEMS would substitute the data using the average of the recorded emission data for the unit operation hour immediately before the missing data period and the hour immediately after the missing data period. When the missing data period is more than eight hours, substitute the data using the maximum hourly emission data recorded for the previous 30 days with unit operation, commencing on the day immediately prior to the day the missing data occurred. Data substitution would be required for mass emissions calculations including the BARCT Equivalent Mass Cap Plan (B-Cap) and the interim facility-wide NOx emission limit of 0.03 pounds/MMBtu for process heaters and boilers less than or equal to 40 MMBtu/hr in Rule 1109.1.

For the purpose of filling the data gaps for mass emission calculations, the substituted data are only enforceable for compliance demonstration on mass emission limits, not concentration limits (e.g., ppmv).

AFFECTED FACILITIES

Based on the RECLAIM compliance year 2017 audit data, there are 83 RECLAIM facilities that in total operate 500 units with NOx emissions monitored by CEMS. It should be noted that one CEMS may monitor emissions for several units, which is common in petroleum refining facilities.

Based on the South Coast AQMD's database for non-RECLAIM CEMS applications, there are 126 non-RECLAIM facilities that previously installed one or more CEMS, estimating 250 units monitored by CEMS. Since records do not indicate the current status of the CEMS, some of non-RECLAIM CEMS may no longer be active. The CEMS universe may change when some landing rules are adopted or amended and become applicable to RECLAIM facilities.

EMISSION REDUCTIONS

PAR 218.2 and PAR 218.3 are administrative rules that provide technical guidelines for installation and operation of CEMS required by South Coast AQMD rules or permit conditions. PAR 218.2 and PAR 218.3 do not directly regulate sources for emissions control; therefore, there are no emission reductions will result from this rule development.

COST EFFECTIVENESS

While a source-specific rule determines when a CEMS would be required for emission monitoring, PAR 218.2 and PAR 218.3 provide administrative and technical guidelines on how to properly operate the CEMS. The cost-effectiveness of operating any CEMS is included in the related source-specific rule from which the CEMS is required.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) and South Coast AQMD's certified regulatory program (Public Resources Code Section 21080.5, CEQA Guidelines Section 15251(l) and South Coast AQMD Rule 110), the South Coast AQMD, as lead agency, is reviewing the proposed project to determine if it will result in any potential adverse environmental impacts. Appropriate CEQA documentation will be prepared based on the analysis.

SOCIOECONOMIC ANALYSIS

A socioeconomic impact assessment will be conducted and released for public review and comment at least 30 days prior to the South Coast AQMD Governing Board Hearing which is anticipated to be heard on June 3, 2022.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

California Health and Safety Code Section 40727 requires that prior to adopting, amending, or repealing a rule or regulation, the South Coast AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report. The following provides the draft findings.

Necessity: A need exists to propose Amended Rules 218.2 and 218.3 to provide administrative and technical specifications to continuous emission monitoring systems.

Authority: The South Coast AQMD obtains its authority to adopt, amend, or repeal rules and regulations from California Health and Safety Code Sections 39002, 39616, 40000, 40001, 40440, 40440.1, 40441, 40702, 40725 through 40728, and 41511.

Clarity: PAR 218.2 and PAR 218.3 have been written or displayed so that their meaning can be easily understood by the persons affected by the rule.

Consistency: PAR 218.2 and PAR 218.3 are in harmony with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or federal regulations.

Non-Duplication: PAR 218.2 and PAR 218.3 do not impose the same requirement as any existing state or federal regulation and is necessary and proper to execute the powers and duties granted to, and imposed upon, the South Coast AQMD.

Reference: In amending this rule, the South Coast AQMD hereby implements, interprets, or makes specific reference to the following statues: Health and Safety Code sections 39002, 40001, 40702, 40440(a), 41511, and 40725 through 40728.5.

COMPARATIVE ANALYSIS

Health & Safety Code section 40727.2(g) for comparative analysis is applicable when the proposed amended rules or regulations impose, or have the potential to impose, a new emissions limit or standard, or increased monitoring, recordkeeping, or reporting requirements. In this case, a comparative analysis is not required because the amendments do not impose such requirements.

INCREMENTAL COST EFFECTIVENESS

Health and Safety Code section 40920.6 requires an incremental cost-effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option that would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SOx, NOx, and their precursors. PAR 218.2 and PAR 218.3 are not Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies; therefore, this provision is applicable.