BAY AREA AIR QUALITY MANAGEMENT DISTRICT

RESOLUTION NO. 2021-

A Resolution of the Board of Directors of the Bay Area Air Quality Management District Amending District Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units

WHEREAS, public hearings have been properly noticed in accordance with the provisions of Health & Safety Code § 40725;

WHEREAS, the Board of Directors of the Bay Area Air Quality Management District ("Air District" or "District") has determined that a need exists to amend District rules and regulations by adopting amendments to Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units, as set forth in Attachment A hereto ("Proposed Amendments");

WHEREAS, the Board of Directors of the Air District obtains its authority to adopt, amend or repeal rules and regulations from Sections 40000, 40001, 40702, and 40725 through 40728.5, of the California Health & Safety Code;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are written and displayed so that their meaning can be easily understood by the persons directly affected by the rule;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are in harmony with and not in conflict with or contradictory to existing statutes, court decisions, and state and federal regulations;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments do not impose the same requirements as any existing state or federal regulation, and are necessary and proper to execute the power and duties granted to, and imposed upon, the Air District;

WHEREAS, the Board of Directors of the Air District, by adopting the Proposed Amendments, is implementing, interpreting or making specific the provisions of Health & Safety Code § 40001 (rules to achieve ambient air quality standards), and § 40702 (rulemaking actions that are necessary and proper to execute the powers and duties granted to it);

WHEREAS, pursuant to California State Law AB 617, the Air District on December 19, 2018 adopted an Expedited Schedule for Best Available Retrofit Control Technology Implementation Schedule ("Expedited BARCT Schedule") describing and setting a schedule for adoption of certain rules;

WHEREAS, among the rules scheduled for adoption in the Expedited BARCT Schedule was amendments to Regulation 6, Rule 5 intended to reduce particulate matter from Fluidized Catalytic Cracking Units at Bay Area refineries;

WHEREAS, adoption of the Expedited BARCT Schedule was deemed a CEQA "project" and was evaluated in an Environmental Impact Report certified by the Board of Directors on December 19, 2018;

WHEREAS, the Air District prepared initial draft amendments, published them for comment, and held an online workshop on February 4, 2021, to discuss the draft amendments with interested parties and the public;

WHEREAS, Air District staff discussed concepts for possible amendments to Regulation 6, Rule 5 with the Stationary Source Committee of the Board of Directors on June 17, 2020, July 29, 2020, October 1, 2020, December 17, 2020, and March 15, 2021;

WHEREAS, on March 30, 2021, Air District staff revised the draft amendments based on comments received during and after the February 4, 2021 workshop and published the revised draft amendments for comment in advance of the public hearing to consider adoption of amendments to Regulation 6, Rule 5;

WHEREAS, on March 30, 2021, the Air District transmitted the text of the draft amendments to California Air Resources Board;

WHEREAS, on or before March 30, 2021, Air District staff published in newspapers and distributed and published on the District's website notice of a public hearing to be held on June 2, 2021 to consider adoption of the draft amendments, and the notice included a request for public comments and input on the draft amendments;

WHEREAS, the Board of Directors of the Air District held a public hearing on June, 2 2021, to consider the Proposed Amendments in accordance with all provisions of law ("Public Hearing");

WHEREAS, at the Public Hearing, the subject matter of the Proposed Amendments was discussed with interested persons in accordance with all provisions of law;

WHEREAS, Air District staff has prepared and presented to the Board of Directors a detailed Staff Report and a Response to Comments document regarding the Proposed Amendments, which have been considered by this Board and is incorporated herein by reference;

WHEREAS, the Board of Directors finds and determines that the Proposed Amendments are considered a "project" pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 *et seq*.);

WHEREAS, the Air District is the CEQA lead agency for this project pursuant to CEQA Guidelines § 15050 (14 California Code of Regulations ("CCR") § 15050);

WHEREAS, the 2018 BARCT Schedule EIR addressed in detail the impacts of two approaches for controlling particulate matter emissions at Fluidized Catalytic Cracking Units at petroleum oil refineries, including the approach codified in the Proposed Amendments;

WHEREAS, the 2018 BARCT Schedule EIR found that the approach to controlling particulate matter emissions at Fluidized Catalytic Cracking Units in the Proposed Amendments would result in air quality impacts associated with the construction of air pollution control equipment would be potentially significant after mitigation and cumulatively considerable, and that water demand impacts from the operation of air pollution control equipment were found to be potentially significant after mitigation and cumulatively considerable;

WHEREAS, the Board of Directors finds that the 2018 BARCT Schedule EIR continues to be an adequate analysis of impacts as required under CEQA, including the assessment that adoption of the Proposed Amendments will result in significant environmental impacts after mitigation and be cumulatively considerable;

WHEREAS, the Board of Directors, in adopting the 2018 BARCT Schedule EIR, also adopted a Statement of Overriding Considerations explaining why the significant and unavoidable impacts to air quality during construction and from increases in water demand are acceptable because the public health and air quality benefits from the Expedited BARCT Schedule outweigh these significant unavoidable impacts;

WHEREAS, the Board of Directors continues to rely on both the 2018 BARCT Schedule EIR and the December 19, 2018, Statement of Overriding Considerations in support of adoption of the Proposed Amendments;

WHEREAS, the Board of Directors, pursuant to the requirements of Health & Safety Code § 40728.5, has actively considered the socioeconomic impacts of the Proposed Amendments and has reviewed and considered the "Socioeconomic Impact Analysis: Proposed Amendments to Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units," prepared for the Air District by Applied Development Economics of Walnut Creek, California, which concludes that the Proposed Amendments will potentially have a significant economic impact on affected facilities, but that economic impacts could likely be mitigated to less than significant levels;

WHEREAS, the Board of Directors, pursuant to the requirements of Health & Safety Code § 40728.5, has made a good faith effort to minimize adverse socioeconomic impacts of the Proposed Amendments;

WHEREAS, the Board of Directors, pursuant to the requirements of Health & Safety Code § 40920.6, has actively considered the incremental cost-effectiveness of the Proposed Amendments in meeting emission reduction goals under the California Clean Air Act as set forth in the Staff Report, and finds and determines that there are no incrementally more cost-effective potential control options that would achieve the emission reduction objectives of the Proposed Amendments;

WHEREAS, the Air District has prepared, pursuant to the requirements of Health & Safety Code § 40727.2, a written analysis of federal, state, and District requirements applicable to this source category and has found that the Proposed Amendments would not be conflict with any federal, state, or other Air District rules, and the Board of Directors has agreed with these findings;

WHEREAS, the documents and other materials that constitute the record of proceedings on which this rulemaking project is based are located at the Bay Area Air Quality Management District, 375 Beale Street, San Francisco, 94105, and the custodian for these documents is Marcy Hiratza, Clerk of the Boards;

WHEREAS, Air District staff recommends adoption of the Proposed Amendments;

WHEREAS, the Board of Directors concurs with Air District staff's recommendations and desires to adopt the Proposed Amendments;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Proposed Amendments, pursuant to the authority granted by law, as set forth in Attachment A hereto, and discussed in the Staff Report (including Appendices) with instructions to Air District staff to correct any typographical or formatting errors before final publication of the Proposed Amendments.

The foregoing Resolution was duly and regularly introduced, passed and adopted at a regular meeting of the Board of Directors of the Bay Area Air Quality Management District on the Motion of Director _____, seconded by Director _____, on the 2nd day of June, 2021 by the following vote of the Board:

AYES:

NOES:

ABSENT:

_____
Cindy Chavez
Chairperson of the Board of Directors

ATTEST:

_____
John J. Bauters
Secretary of the Board of Directors

ATTACHMENT A

[PROPOSED AMENDMENTS]

Amended Regulation 6, Rule 5: Particulate Emissions from Petroleum Refinery Fluidized Catalytic Cracking Units

REGULATION 6
PARTICULATE MATTER
RULE 5
PARTICULATE EMISSIONS FROM PETROLEUM REFINERY FLUIDIZED CATALYTIC CRACKING UNITS

INDEX

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PARTICULATE EMISSIONS FROM PETROLEUM REFINERY FLUIDIZED CATALYTIC CRACKING UNITS

(Adopted December 16, 2015)

6-5-100 GENERAL

6-5-101 **Description:** This rule limits the emissions of particulate matter, including filterable and condensable particulate matter ~~emissions~~ from petroleum refinery fluidized catalytic cracking units (FCCUs) as well as emissions of precursors of secondary particulate matter. Regulation 6, Rule 1 addresses filterable particulate emissions from FCCUs. For the purposes of this rule, commingled ~~ammonia, condensable particulate and sulfur dioxide~~ emissions from an FCCU and one or more other sources from a single exhaust point shall all be considered to be FCCU emissions as described in District Regulation 1, Section 107.

6-5-110 EXEMPTIONS

6-5-111 **Limited Exemption, Emissions Abated by Wet Scrubber:** The emission limit for ammonia in Section 6-5-301.1 ~~requirements of this rule~~ shall not apply to sources that are abated by a wet scrubber that is required to be operated by a District permit and that constitutes best available control technology (BACT) for any pollutant when permitted or constructed.

Amended December 19, 2018

6-5-112 **Limited Exemption, Emissions during Startup or Shutdown Periods:** The emission limit for ammonia in Section 6-5-301.1 and short-term seven-day rolling average emission limit for sulfur dioxide in ~~requirements of~~ Section 6-5-301.2.2 shall not apply to emissions during an FCCU startup or shutdown period. FCCU startup and shutdown periods shall be as defined in this rule, unless a different period is specified in a District Permit to Operate for an FCCU, in which case the Permit to Operate shall take precedence. This exemption is also applicable to a non-FCCU source with startup or shutdown provisions specified in a Permit to Operate, if that source is subject to the requirements of Section 6-5-301 because the source emissions are commingled with those of an FCCU at a single exhaust point; the startup or shutdown provisions specified in the Permit to Operate shall be the basis for this exemption. Whenever this exemption applies to any source, it shall apply to all sources with commingled emissions.

6-5-113 **Deleted [date of adoption]** ~~**Limited Exemption, Installation of Wet Scrubber:** The emission limit effective date for ammonia in Section 6-5-301 may be extended to a later date specified in a District Authority to Construct for an existing FCCU to be controlled with a new wet scrubber, but may not be extended by more than 36 months.~~

6-5-114 **Limited Exemption, FCCU without Nitrogen-Based Additives:** The emission limit for ammonia in Section 6-5-301.1 shall not apply to an FCCU where ammonia, urea or any other nitrogen-based additive is not used in a way that contributes to ammonia or condensable particulate FCCU emissions.

6-5-115 **Limited Exemption, Ammonia Optimization:**

115.1 Before [5 years after date of adoption], ~~T~~the ammonia emission limit in Section 6-5-301.1 shall not apply to the owner/operator of a petroleum refinery that implements an optimization of ammonia and/or urea injection in accordance with Section 6-5-403.

115.2 Effective [5 years after date of adoption], the ammonia emission limit in Section 6-5-301.1 shall apply to all owner/operators previously exempt under Section 6-5-115.1.

6-5-200 **DEFINITIONS**

6-5-201 **Ammonia Slip:** Ammonia slip is the amount of unreacted ammonia emitted to the atmosphere from the FCCU, regardless of the source of the ammonia.

6-5-202 **Catalyst Regeneration Unit (CRU):** A catalyst regeneration unit regenerates spent FCCU catalyst by burning off the coke that has deposited on the catalyst surface. The resulting CRU flue gas is the primary emission source addressed by this rule.

6-5-203 **Condensable Particulate Matter:** Liquid droplets that coalesce, or gaseous emissions that condense to form liquid or solid particles. These liquid and/or solid particles are identified as condensable organic or condensable inorganic particulate matter using EPA Test Method 202.

6-5-204 **Daily Average:** The arithmetic mean of the measured ammonia emissions subject to Section 6-5-301.1 on any calendar day that the FCCU operates.

6-5-205 **FCCU Shutdown:** Unless otherwise specified in a District Permit to Operate, FCCU shutdown is a period which begins when fresh feed flow to the FCCU reactor stops and ends when the main blower for catalyst recirculation is shutdown.

6-5-206 **FCCU Startup:** Unless otherwise specified in a District Permit to Operate, FCCU startup is a period not exceeding 120 hours which begins with the startup of the main blower for introduction of catalyst and ends after fresh feed is introduced to the FCCU reactor, when the process reaches steady state.

6-5-207 **Fluidized Catalytic Cracking Unit (FCCU):** A fluidized catalytic cracking unit (FCCU) is a processing unit that converts heavy petroleum fractions, typically from crude oil distillation units, into lighter fuel intermediates by using a fine, powdered catalyst to promote a chemical reaction in which the heavy petroleum molecules are broken into smaller molecules. In addition to the cracking reactor, an FCCU includes a catalyst regeneration unit (CRU), ancillary equipment including blowers, and all equipment for controlling air pollutant emissions and recovering heat.

6-5-208 **Petroleum Refinery:** An establishment that is located on one or more contiguous or adjacent properties that processes crude oil to produce more usable products such as gasoline, diesel fuel, aviation fuel, lubricating oils, asphalt or petrochemical feedstocks.

petroleum refinery processes include separation processes (e.g., atmospheric or vacuum distillation, and light ends recovery), petroleum conversion processes (e.g., cracking, reforming, alkylation, polymerization, isomerization, coking, and visbreaking) petroleum treating processes (e.g., hydrodesulfurization, hydrotreating, chemical sweetening, acid gas removal, and deasphalting), feedstock and product handling (e.g., storage, blending, loading, and unloading), auxiliary facilities (e.g., boilers, waste water treatment, hydrogen production, sulfur recovery plant, cooling towers, blowdown systems, compressor engines, and power plants).

6-5-209 **Primary Particulate Matter:** Material emitted to the atmosphere as filterable or condensable particulate matter.

6-5-210 **Secondary Particulate Matter:** Material emitted to the atmosphere in a gaseous form that will not coalesce or condense to a solid or liquid form at atmospheric temperature and pressure, but that may react in the atmosphere into a solid or liquid form. For the purposes of this rule, precursors of Secondary Particulate Matter shall include sulfur dioxide (SO_2) and ammonia.

6-5-211 **Wet Scrubber:** A device that removes air pollutants from gas streams by contacting the gas stream with a scrubbing liquid.

6-5-212 **Total Particulate Matter 10 Microns or Less in Diameter (Total PM_{10}):** Material emitted to the atmosphere as filterable particulate matter or condensable particulate matter less than 10 microns in diameter.

6-5-213 **Total Particulate Matter 2.5 Microns or Less in Diameter (Total $PM_{2.5}$):** Material emitted to the atmosphere as filterable particulate matter or condensable particulate matter less than 2.5 microns in diameter.

6-5-300 STANDARDS

6-5-301 **Fluidized Catalytic Cracking Unit (FCCU) Emission Limits:** The owner/operator of a petroleum refinery that includes an FCCU shall not cause emissions to the atmosphere from the FCCU that exceed the limits in Table 1 on or after the indicated effectiveness date:

Table 1 – FCCU Emission Limits

Section	Pollutant	Emission Limit	Effective Date
301.1	Ammonia	10 ppmvd at 3% O_2 as a daily average	January 1, 2018 or [5 years after date of adoption] for an owner/operator previously exempt under Section 6-5-115.1

301.2	Sulfur Dioxide	2.1	25 ppmvd at 0% O_2 on a 365-day rolling average basis; and	[5 years after date of adoption]
		2.2	50 ppmvd at 0% O_2 on a 7-day rolling average basis	[5 years after date of adoption]
301.3	Total PM_{10}	0.010 gr/dscf at 5% O_2 on a rolling four-quarter average basis		[5 years after date of adoption]

Amended December 19, 2018

6-5-400 ADMINISTRATIVE REQUIREMENTS

6-5-401 Ammonia Control Plan and Permit Applications: No later than January 1, 2017, the owner/operator of a petroleum refinery subject to the ammonia emission limit in Section 6-5-301.1 shall submit to the APCO a control plan detailing the measures, if any, to be taken in order to meet the requirements of Section 6-5-301.1, and also applications for all Authorities to Construct necessary for compliance with Section 6-5-301.1.

6-5-402 Ammonia Monitoring Plan: No later than January 1, 2017, the owner/operator of a petroleum refinery that includes an FCCU subject to the ammonia emission limit in Section 6-5-301 shall submit to the APCO a plan for the installation of an ammonia monitoring system to perform monitoring as required by Section 6-5-501. This plan shall identify the proposed monitoring technique, monitoring equipment, installation details and installation schedule.

6-5-403 Ammonia Optimization: Effective until [5 years after date of adoption], a~~A~~s an alternative to compliance with the ammonia emission limit of Section 6-5-301 per the limited exemption in Section 6-5-115.1, the owner/operator of a petroleum refinery may instead establish an enforceable ammonia emission limit for the FCCU that results in the minimization of total FCCU $PM_{2.5}$ emissions (including all condensable particulate matter), as follows:

403.1 No later than March 1, 2016, the petroleum refinery owner/operator shall submit to the APCO an Optimization and Demonstration Protocol for the purpose of establishing the minimum rate of ammonia and/or urea injection necessary to minimize total $PM_{2.5}$ FCCU emissions (including all condensable particulate matter) while complying with all existing permit requirements, excluding permit requirements that are not based on District BACT requirements, on District prohibitory rule limits or on federal consent decrees. The Optimization Protocol shall include the ammonia and/or urea injection rates to be evaluated and the criteria for selecting these rates, and also the criteria for determining the Optimized Ammonia Emissions Concentration that minimizes total FCCU $PM_{2.5}$ emissions.

403.2 Within 60 days, the APCO shall either approve or disapprove the Optimization and Demonstration Protocol.

403.3 The petroleum refinery owner/operator shall commence and complete the Optimization and Demonstration Protocol, approved by the APCO, no later than June 30, 2017.

403.4 The petroleum refinery owner/operator shall report to the APCO the results of the Optimization and Demonstration Protocol and the proposed Optimized Ammonia Emissions Concentration no later than August 31, 2017. No later than this same date, the petroleum refinery owner/operator shall submit a District permit application to 1) establish the Optimized Ammonia Emissions Concentration as an enforceable permit requirement, and to 2) relax any existing permit conditions that are not based on District BACT requirements, on District prohibitory rule limits or on federal consent decrees to the extent necessary to minimize total FCCU $PM_{2.5}$ emissions.

403.5 Disapproval of an Optimization and Demonstration Protocol, or a failure to meet any requirement or deadline in this section shall not constitute a violation of this rule, but shall preclude the applicability of the limited exemption in Section 6-5-115.1.

6-5-404 Reporting Requirements: The owner/operator of a petroleum refinery that includes an FCCU subject to the requirements in Section 6-5-301 shall submit a written report for each calendar month to the APCO. The report shall be due by the 30th day following the end of the calendar month. The report shall be submitted electronically in an APCO approved format and shall include a summary of the data obtained from the monitoring systems required or source testing conducted pursuant to Sections 6-5-501 and 6-5-503.

6-5-500 MONITORING AND RECORDS

6-5-501 Ammonia Monitoring: The owner/operator of a petroleum refinery that includes an FCCU subject to the ammonia emission limit in Section 6-5-301.1 shall, no later than January 1, 2018, operate one of the following:

501.1 A mass-balance monitoring system that includes all of the following:

1.1 Parametric monitors that comply with District Regulation 1, Section 523 to continuously measure the injection or addition rate (pounds per hour) of ammonia, urea or any other nitrogen-based additive into the emission stream, and;

1.2 Continuous emission monitors that comply with District Regulation 1, Section 522 to continuously measure NOx and oxygen concentrations at appropriate locations to allow a calculation of the amount of ammonia and/or urea consumed in NOx-reduction reactions, and therefore the remaining, emitted amount of non-consumed ammonia.

501.2 Any other ammonia emission monitoring system approved in writing by the APCO.

6-5-502 Sulfur Dioxide Monitoring: No later than [5 years after the date of adoption], the owner/operator of a petroleum refinery that includes an FCCU subject to the sulfur dioxide limits in Section 6-5-301.2 shall comply with the monitoring requirements of District Regulation 1: General Provisions and Definitions, Sections 1-520 and 522.

6-5-503 Total PM_{10} and Total $PM_{2.5}$ Monitoring: No later than [5 years after the date of adoption], the owner/operator of a petroleum refinery that includes an FCCU subject

to the Total PM_{10} emission limit in Section 6-5-301.3 shall implement one of the following:

503.1 A source testing protocol that includes, at a minimum, one source test each calendar quarter for Total PM_{10} and Total $PM_{2.5}$ emissions in accordance with the test methods listed in Sections 6-5-604 and 605. During each source test, the owner/operator shall monitor and record, at a minimum, all operating data for the selected operating parameters of the FCCU control equipment, fresh feed rate, and flue gas flow rate.

503.2 Any other Total PM_{10} and Total $PM_{2.5}$ emission monitoring system approved in writing by the APCO.

6-5-~~502~~504 ~~Ammonia~~ Records: The owner/operator of a petroleum refinery subject to the ~~ammonia emission limit~~ requirements in Section 6-5-301 shall maintain records of the data required to be measured in Sections 6-5-501, 502, and 503. These records shall be kept for a period of at least five years and shall be made available to the APCO on request.

6-5-600 MANUAL OF PROCEDURES

6-5-601 Compliance Determination: All compliance determinations shall be made in the as-found operating condition. Source tests shall meet the requirements set forth in District Manual of Procedures, Volume IV, Source Test Policy and Procedures. No compliance determinations shall be made for the emission limit for ammonia in Section 6-5-301.1 and short-term seven-day rolling average emission limit for sulfur dioxide in Section 6-5-301.2.2 during periods subject to the exemption in Section 6-5-112.

6-5-602 Determination of Ammonia and Oxygen: Determination of ammonia shall be by Regulation 1, Section 522 NOx monitors or other APCO approved ammonia monitoring systems that have been installed pursuant to Section 6-5-501 and that meet the applicable requirements for ammonia monitoring set forth in the District Manual of Procedures. Determination of oxygen shall be by Regulation 1, Section 522 oxygen monitor. Compliance with the ammonia limits in Section 6-5-301.1 shall be determined by the monitoring systems that have been installed pursuant to Section 6-5-501.

6-5-603 Determination of Sulfur Dioxide: Compliance with the sulfur dioxide limits in Section 6-5-301.2 shall be determined by a monitoring system that meets the requirements of District Regulation 1, Section 522.

6-5-604 Determination of Total Particulate Matter 10 Microns or Less in Diameter (Total PM_{10}): Determination of Total PM_{10} shall be by the summation of filterable PM_{10} as measured by EPA Test Method 201A and condensable PM as measured by EPA Test Method 202. Compliance with the Total PM_{10} limit in Section 6-5-301.3 shall be determined by the time-weighted average of all source tests conducted in accordance with the District Manual of Procedures during the previous four calendar quarters.

6-5-605 Determination of Total Particulate Matter 2.5 Microns or Less in Diameter (Total $PM_{2.5}$): Determination of Total $PM_{2.5}$ shall be by the summation of filterable $PM_{2.5}$ as measured by EPA Test Method 201A and condensable PM as measured by EPA Test Method 202.