

# SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

## DRAFT STAFF REPORT

### Amendments to Rule 4905 (Natural Gas-fired, Fan-Type Central Furnaces)

March 8, 2018

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#### I. SUMMARY

In 2015, the District amended Rule 4905 to fulfill the commitments in the 2008 PM2.5 Plan, 2012 PM2.5 Plan, and 2013 Plan for the Revoked 1-Hour Ozone Standard to further reduce NOx emissions. The amendments included the following:

- Lower the NOx emission limit for residential units to 14 nanograms of NOx per joule of heat output (ng/J),
- Expand the applicability to include commercial units with a NOx emission limit of 14 ng/J,
- Expand the applicability to include units installed in manufactured homes with an initial NOx emission limit of 40 ng/J which would then be lowered to 14 ng/J in 2018, and
- Allow the sale of non-compliant units during the initial implementation period (36-months) in exchange for the payment of an emissions fee for each non-compliant unit sold

These lower NOx limits were guided by the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (District) co-funded technology assessment to evaluate the performance of ultra-low NOx furnace technologies.<sup>1</sup> The technology assessment resulted in the successful demonstration of several low-NOx furnace designs, which were expected to be commercially available by the compliance dates as established in the current Rule 4905. For those manufacturers that are not able to respond to increased demand for new compliant units by the

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<sup>1</sup> SCAQMD. (2014, September 5). *Governing Board Agenda Item, September 5, 2014: Amend Rule 1111 – Reduction of NOx Emissions from Natural-gas-fired, Fan-type Central Furnaces*. Retrieved 9/9/14 from <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-sep5-032.pdf?sfvrsn=2>.

compliance dates, the emissions fee option would allow them to continue selling units in the San Joaquin Valley (Valley).

The 36-month implementation period that allows the use of emission fees in lieu of complying with the lower NO<sub>x</sub> limit is now coming to an end in 2018. Although progress has been made with a few product lines that are now commercially available and certified at the lower NO<sub>x</sub> levels, the full product line availability is still limited, as manufacturers continue to develop, test, and certify additional product lines. Multiple manufactures and distributors have contacted both the District and SCAQMD to express concern regarding the commercial availability of compliant units by the given timeframe. Currently, manufacturers are still using the fee option for the majority of the condensing, non-condensing, and weatherized units in their product line.

Due to the limited number of certified compliant units that will be available by the deadline dates, the purpose of this rule amendment is to extend the implementation period to allow the use of emission fees in lieu of complying with the 14 ng/J limit. The proposed amendment would allow an additional period of time necessary to continue technology development and certification process while providing strong incentive for accelerated deployment of compliant units.

Due to the lack of certified compliant units, SCAQMD also amended their furnace rule (Rule 1111 - NO<sub>x</sub> Emissions from Natural Gas-fired, Fan type Central Furnaces) on March 2, 2018 to extend the fee option period and increase the emission fee along with the addition of rebates. The proposed amendments are analogous SCAQMD's Rule 1111 and provide for regulatory consistency in California.

## **II. BACKGROUND**

### **A. Source Category**

Rule 4905 is a point-of-sale rule that applies to any person who supplies, sells, offers for sale, installs, or solicits the installation of natural-gas-fired, fan-type central furnaces in the San Joaquin Valley (Valley). Affected parties include furnace manufacturers, residential heating wholesalers, supply stores, contractors and end-users (consumers). The point-of-sale approach has allowed the District to achieve NO<sub>x</sub> reductions without placing an undue financial burden on the residents, operators and businesses that sell these units in the Valley.

Central furnaces are controlled by a thermostat, which sends signals to turn the device on or off when the building temperature does not match a chosen set point. A valve then opens to send natural gas to the burners, which combust the gas directly into the heat exchangers. A blower pulls air from outside the building through a filter, across the heat exchanger, and through a series of ducts and vents to different areas of the building. Exhaust from the combustion exits the building through a separate duct.

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Condensing units use an additional heat exchanger to extract the latent heat in the flue (exhaust) gas by cooling the combustion gasses to near ambient temperature and thereby increase the heating efficiency by up to 10%. The water vapor in the flue gas is condensed, collected, and drained.

## **B. Current Rule 4905**

Rule 4905 was most recently amended in 2015 to satisfy commitments included in the multiple District attainment plans and reduced NO<sub>x</sub> emission rates by 65% for new units sold in the Valley. Current District Rule 4905 limits NO<sub>x</sub> emissions from natural gas-fired, fan-type central furnaces with rated heat inputs less than 175,000 Btu/hr and for combination heating and cooling units rated at a cooling capacity less than 65,000 Btu/hr. Unit types include condensing furnaces, non-condensing furnaces, weatherized furnaces, and furnaces installed in manufactured homes.

The rule requires units comply with a 14 ng/J NO<sub>x</sub> emission limit, and requires units be certified through either the District's certification program, the SCAQMD certification process for SCAQMD Rule 1111, or another emission certification program approved by the United States Environmental Protection Agency (EPA) and District's Air Pollution Control Officer (APCO). Manufacturers are also required to display the model number of the unit on the shipping container and rating plate. If requested by the APCO, each manufacturer must submit a statement confirming the unit is in compliance, including a source test report verifying compliance with the emission limit.

Manufacturers are allowed to sell non-compliant units during the initial implementation period of 36-months after the compliance date specified in the rule, in exchange for the payment of an emissions fee for each non-compliant unit sold.

## **C. South Coast AQMD Rule 1111**

SCAQMD amended Rule 1111 (Reduction of NO<sub>x</sub> Emissions from Natural-Gas-Fired, Fan-type Central Furnaces) in November 2009 to lower the NO<sub>x</sub> emission limit for applicable units from 40 ng/J to 14 ng/J.<sup>2</sup>

In 2009, because no compliant units for the new lower NO<sub>x</sub> limit were commercially available, SCAQMD and the District co-funded a technology assessment to evaluate the performance of ultra-low NO<sub>x</sub> furnace technologies.<sup>3</sup> The technology assessment resulted in the successful demonstration of several low-NO<sub>x</sub> furnace designs, which were expected to be commercially available by the compliance dates. For those manufacturers that were not able to respond to increased demand for new units by the

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<sup>2</sup> SCAQMD. (2009, November 6). *Final Staff Report with Socioeconomic Impact Assessment*. Retrieved 9/16/14 from <http://www3.aqmd.gov/hb/2009/November/091130a.htm>.

<sup>3</sup> SCAQMD. (2014, September 5). *Governing Board Agenda Item, September 5, 2014: Amend Rule 1111 – Reduction of NO<sub>x</sub> Emissions from Natural-gas-fired, Fan-type Central Furnaces*. Retrieved 9/9/14 from <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-sep5-032.pdf?sfvrsn=2>.

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compliance dates, the emissions fee option allowed them the option to continue selling units in the San Joaquin Valley (Valley).

SCAQMD amended Rule 1111 again in September 2014 to extend the compliance date for condensing furnaces and add an emissions fee option due to lack of commercially available compliant units.<sup>4</sup> The alternate compliance option allowed manufacturers to pay a per unit fee in lieu of meeting the 14 ng/J NOx limit.

Based on considerations of technology development and implementation status, stakeholders' input, and the need to encourage development and sale of compliant products, on March 2, 2018, SCAQMD amended Rule 1111 to extend the fee period by up to 1.5 years, increase the fee amounts, and provide additional financial incentives for the installation of compliant units in the SCAQMD.

## D. Control Technology

At this time, the District has confirmed at least three furnace manufacturers who sell units in the Valley will have compliant units by the end of the current fee period. Lennox/Allied air, Goodman, and Rheem have developed and certified compliant SKUs satisfying the 14 ng/J NOx emission limit.

- On September 19, 2017, Lennox's four base Models SL280UH060NV36A-, SL280UH080NV48B-, SL280UH080NV60C-, and SL280UH100NV60C- were certified by SCAQMD. These are certified non-condensing furnaces with maximum input rates of 60,000, 80,000, and 100,000 btu/hr. According to SCAQMD on December 4, 2017, Lennox launched their line of certified compliant products and made them commercially available for sale.
- On August 15, 2017, Goodman's natural gas fired furnace base Models GMES960403BU\*\*, GMES960603BU\*\*, and GMES960805CU\*\* were issued NOx certifications by SCAQMD. The certified furnace models cover condensing furnaces with maximum input rates of 40,000, 60,000, and 80,000 btu/hr.
- On September 20, 2016, Rheem's natural gas fired furnace Model \*801TA070317UUA was certified by the SCAQMD. This unit is a non-condensing furnace with a maximum input rate about 70,000 btu/hr.

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<sup>4</sup> SCAQMD. (2014, September 5). *Governing Board Agenda Item, September 5, 2014: Amend Rule 1111 – Reduction of NOx Emissions from Natural-gas-fired, Fan-type Central Furnaces*. Retrieved 9/9/14 from <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-sep5-032.pdf?sfvrsn=2>.

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## III. DRAFT AMENDMENTS TO RULE 4905

### **Requirements (Section 5.0)**

Section 5.0 would be amended to remove redundant and expired language to improve clarity of rule requirements.

#### *Section 5.4 – Emissions Fee Option*

As discussed above, manufacturers have yet to develop, certify, and mass produce sufficient numbers of compliant units to meet Valley consumer demands. In response to the lack of compliant units available, the District recommends amending Rule 4905 to expand the emissions fee option period with an increased fee to allow an additional period of time necessary to continue technology development and certification while providing strong incentive for accelerated deployment of compliant units.

| Unit Type          | Phase 1            |             | Phase 2           |              |
|--------------------|--------------------|-------------|-------------------|--------------|
|                    | Current Fee Period | Current Fee | Draft Period      | Draft Fee    |
| Condensing         | 4/1/15 – 4/30/18   | \$290       | 5/01/18 – 9/30/19 | <b>\$950</b> |
| Non-Condensing     | 10/1/15 – 9/30/18  | \$225       | 10/1/18 – 9/30/19 | <b>\$900</b> |
| Weatherized        | 10/1/16 – 9/30/18  | \$225       | 10/1/18 – 9/30/20 | <b>\$900</b> |
| Manufactured homes | 10/1/18 – 9/30/19  | \$225       | N/A               | N/A          |

The District recommends a less complex fee structure (see table above) compared to the financial incentives offered by SCAQMD.

For example, the SCAQMD Phase 2 fee amount for >90,000 Btu/hr condensing unit is \$450 per unit, and the initial SCAQMD rebate is \$500. Therefore the total fee is \$950 (\$450 emissions fee + \$500 rebate = \$950).

### **Administrative Requirements (Section 6.0)**

A new section (Section 6.3.2) would be added to rule language to require any person who supplies, distributes, sells, offers for sale, or installs a natural gas-fired, fan-type central furnaces to maintain the records of the model number, serial number, purchaser, and zip code of installation for a period of five years and make it available to the APCO upon request.

**IV. ANALYSES**

**A. Emission Reduction Analysis**

2015 amendments to Rule 4905 lowered the NOx emission limit for residential units and added NOx emission limits for units installed in commercial buildings (commercial units) and units installed in manufactured homes. Because Rule 4905 is a point-of-sale rule, the emissions reduced from the 2015 amendments of 2.10 tons per day are achieved gradually as older units are replaced over the 20 year turnover period. Annual NOx emission reductions were determined to be 0.105 tpd.

The draft 2018 amendments would extend the emissions fee period for up to 1.5 years, and as such could delay the NOx emission reductions from furnaces by up to 1.5 years. As such, the amendments will not cause any measurable overall change in future year emission reductions.

**B. Cost Effectiveness Analysis**

The proposed amendments do not impose additional requirements on manufacturers of compliant furnaces. While a fee increase is recommended, it is only for manufacturers of non-compliant units through the emission fee option. Therefore, a cost effectiveness analysis is not required.

**C. Socioeconomic Analysis**

Pursuant to California Health and Safety Code (CH&SC) Section 40728.5, the District conducts a socioeconomic analysis of a proposed rule or rule amendment that will significantly affect air quality or emission limitations prior to rule adoption. A socioeconomic analysis examines how a rule project may impact industries, businesses, employment rates, and the economy in the Valley. Draft amendments would extend the emission fee option by up to 1.5 years, with no significant impact on air quality or emissions limits. In addition, the higher initial capital cost of compliant units are offset by the energy cost savings these newer and more efficient units will provide throughout the life of the unit. A socioeconomic analysis is not required for this rule amendment project.

**D. Rule Consistency Analysis**

Pursuant to CH&SC §40727.2, prior to adopting, amending, or repealing a rule or regulation, the District is required to perform a written analysis that identifies and compares the air pollution control elements of the rule or regulation with corresponding elements of existing or proposed District and EPA rules, regulations, and guidelines that apply to the same source category. The elements analyzed are emission standards, monitoring and testing requirements, and recordkeeping and reporting requirements.

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Based on the following analysis, District staff found that the draft amendments to Rule 4905 would not conflict with any District or federal rules, regulations, or policies covering similar stationary sources.

## *District Rules*

There is no other District prohibitory rule or regulation tailored specifically for natural gas-fired, fan-type central furnaces. Sources could be subject to other District rules including:

- Rule 1020 Definitions
- Rule 1140 Applicability of Emissions Limits
- Rule 4301 Fuel Burning Equipment
- Rule 6150 Enforcement

The requirements of the rules listed above are not in conflict with, nor are they inconsistent with the requirements of Draft Rule 4905.

## *Federal Rules, Regulations, and Policies*

There are no applicable Control Technique Guidelines (CTG), Alternative Control Techniques (ACT), New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), Best Available Control Technology (BACT), or Maximum Achievable Control Technology (MACT) guidelines for natural gas-fired, fan-type central furnaces with a rated heat input capacity less than 175,000 Btu/hr or, for combination heating and cooling units, a rated cooling capacity less than 65,000 Btu/hr.

EPA Policy on Recordkeeping: EPA has a policy that mandates stationary sources keep and maintain records for at least five years; however, as a point-of-sale rule, natural gas-fired, fan-type commercial and residential central furnaces of this size are not permitted sources and are thus not required to follow specific recordkeeping guidelines. Therefore, units subject to Rule 4905 are not subject to EPA's Policy on Recordkeeping.

## **V. RULE DEVELOPMENT PROCESS**

### **A. Public Workshop for Rule 4905**

The District will host a public workshop to present draft amendments and receive public comments on March 8, 2018, followed by a public comment period ending at 5:00 PM on March 18, 2018. All significant comments received before the comment period deadline will be reviewed and incorporated into the proposed rule, staff report, and appendices as appropriate.

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## **B. Public Hearing for Rule 4905**

In accordance with CH&SC Section (§) 40725, the proposed amendments to Rule 4905 and the final draft staff report will be publicly notice and made available prior to the April 19, 2018 Governing Board public hearing to consider adoption of the proposed rule amendments. The public is invited to provide comments to District Governing Board members during the public hearing.