SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

FINAL DRAFT STAFF REPORT

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

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I. SUMMARY

In 2015, the San Joaquin Valley Air Pollution Control District (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 from this source category. The amendments included lowering the NOx emission limit from 40 nanograms of NOx per joule of heat output (ng/J) to 14 ng/J and allowing 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, distributed, or installed in or into the San Joaquin Valley Air Basin (Valley).

These lower NOx limits were guided by the technology assessment funded by the District, the South Coast Air Quality Management District (SCAQMD), and others to evaluate the performance of ultra-low NOx furnace technologies.[1] 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 compliance dates, the emissions fee option allowed them to continue selling units in the Valley.

The 36-month implementation periods allowing the use of emission fees in lieu of complying with the lower NOx limit are now coming to an end, with the first category expiring in April 2018. Only three manufacturers have stated that they have some

[1] 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.

commercially available products ready to meet the lower NOx levels. However, the full product line availability is still limited, and manufacturers are still in the process of developing and testing the lower NOx units for certification. Multiple manufacturers and distributors have contacted both the District and SCAQMD to express concern regarding the commercial availability of compliant units by the given timeframes. 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 emissions 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.

For the same reasons, SCAQMD also amended their furnace rule (Rule 1111 - NOx Emissions from Natural Gas-fired, Fan type Central Furnaces) on March 2, 2018, to extend the fee option period and provide an exemption for natural gas units to be converted to propane firing with propane conversion kits. The proposed amendments are analogous to SCAQMD's Rule 1111 and will 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 with a rated heat input capacity of less than 175,000 Btu/hr and a rated cooling capacity of less than 65,000 Btu/hr for combination heating and cooling units. Affected parties include furnace manufacturers, residential heating wholesalers, supply stores, contractors and end-users. The point-of-sale approach has allowed the District to achieve NOx reductions without placing an undue financial burden on residents, operators and businesses that sell these units in the Valley.

The most common residential and commercial heat sources are boilers and furnaces. Other heating options include heat pumps, active solar heating, electric heating, wood or pellet stoves, portable and direct vent wall heaters, and fireplaces.[2] Heat distribution systems are either central heating, meaning heat is generated in a central location and distributed throughout the building, or point-of-use or space heating, meaning supplemental heat is provided to a specific room. Types of central heating systems

[2] Department of Energy. (2013, December 16). *Energy Saver 101: Everything You Need to Know About Home Heating*. Retrieved 12/17/13 from http://energy.gov/articles/energy-saver-101-infographic-home-heating.

include forced air, steam radiant, radiant, hot water baseboards, and electric baseboards. Types of space heaters include wood or pellet stoves, portable and direct vent wall heaters, and fireplaces. Fuel types include natural gas, propane, heating oil, electricity, and solid fuels such as wood or pellets.

All heating systems have three basic components: a heat source, a heat distribution system, and a control system. The control system is usually a programmable thermostat. The heat source, which generally determines the type of distribution system used, is selected based on many factors. The most important factor is geographical location, which determines the climate and types of available fuel. Most commercial and residential buildings in the Valley have access to natural gas, which is typically the cheapest and most convenient fuel source in areas where it is available.

Rule 4905 applies to furnaces fueled by natural gas that use forced air distribution, the most common type of heating system for residential and commercial buildings. 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. 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.

Units installed in manufactured homes utilize the same types of materials and operating principles as commercial and residential units; however, significant differences exist. Furnaces installed in manufactured homes use sealed combustion, meaning all of the combustion air is taken from outside the building. These units also pre-heat the air, typically to 50-60°F, using a concentric vent where the combustion air is drawn in through the outer ring, while exhaust gases are vented through the inside core of the vent pipe. The air is pre-heated because the cold outside air does not mix well with the fuel, while pre-heated air blends well and allows for quieter ignition and combustion.

B. Current Rule 4905

Rule 4905 was most recently amended in 2015 to satisfy commitments in District attainment plans and reduce NOx emission rates for new units sold in the Valley. Current District Rule 4905 limits NOx 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 to comply with a 14 ng/J NOx emission limit, and requires units be certified through 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 carton 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.

To help minimize unfair competitive disadvantage for manufacturers that will provide compliant units to the San Joaquin Valley, this rule allows 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. This allowance is necessary to ensure adequate supply for the expected demand for new units in the San Joaquin Valley. The emissions fee is set at a level to provide a financial disincentive for continued sale of non-compliant units, which is set to $225 for each non-condensing, weatherized, and manufactured home units and $290 for each condensing unit.

C. South Coast AQMD Rule 1111

SCAQMD amended Rule 1111 (Reduction of NOx Emissions from Natural-Gas-Fired, Fan-type Central Furnaces) in November 2009 to lower the NOx emission limit for applicable units from 40 ng/J to 14 ng/J.[3]

In 2009, because no compliant units for the new lower NOx limit were commercially available, the District, SCAQMD, and others funded a technology assessment to evaluate the performance of ultra-low NOx furnace technologies.[4] 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.

SCAQMD amended Rule 1111 again in September 2014 to extend the compliance date and add an emissions fee option due to lack of commercially available compliant units.[5] The alternate compliance option allowed manufacturers to pay a per unit fee in lieu of meeting the 14 ng/J NOx limit.

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[3] 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.

[4] 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.

[5] 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.

At the request of furnace manufacturers, on March 2, 2018, SCAQMD amended Rule 1111 to extend the fee period by up to 1.5 years and increase the fee amounts.

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. Based on input received from furnace manufacturers, additional models that will comply with Rule 4905 are currently under development and commercialization, with certification forthcoming in the near future.

- 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. Lennox clarified at the March 8, 2018 public workshop that they now have SCAQMD certifications for 14 ng/J compliant furnaces for 8 SKUs in the noncondensing furnace category and 16 SKUs in the condensing furnace category.

- 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.

III. PROPOSED AMENDMENTS TO RULE 4905

Exemptions (Section 4.0)

Section 4.1 – Propane

Any natural gas fired fan type central furnace that is not certified to meet 14 ng/J of NOx emissions and is to be installed with a propane conversion kit for propane firing only, in the Valley, is exempt from section 5.0 provided the unit is certified to have NOx emissions of no more than 40 ng/J and meets labeling requirements pursuant to Section 4.1.2.

Some manufacturers and distributers sell 40 ng/J natural gas-fired fan-type central furnaces with propane conversion kits into the Valley to Valley residents who do not have access to natural gas. The manufacturers currently comply with Rule 4905 requirements by paying the current applicable fee for a 40 ng/J limit. However, this fee option will end pursuant to schedules in Rule 4905.

Consistent with amendments adopted by SCAQMD to address potential feasibility and cost issues associated with propane fired units, the District is adding an exemption allowing the sale or installation of a natural gas-fired furnace certified to meet a 40 ng/J NOx emission with a propane conversion kit provided the shipping carton or the furnace clearly displays the following, or an alternate APCO-approved language: “This furnace is to be installed for propane firing only. Operating in natural gas mode is in violation of District Rule 4905.”

Requirements (Section 5.0)

Section 5.1 would be deleted in order to remove redundant and expired language and to improve clarity of rule requirements.

Section 5.3 – 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 is proposing to amend Rule 4905 to extend the emissions fee option period with changes in fee structure to allow an additional period of time necessary to continue technology development and certification while providing strong incentive for accelerated deployment of compliant units. To ensure regulatory consistency in California and ensure continued incentive for the deployment of compliant units, the fees and timelines for each furnace category below are similar to SCAQMD’s latest rule, adopted March 2, 2018. Furthermore, manufacturers have expressed the need to provide a sell-through transition period from non-compliant units to compliant units in order to alleviate inventory uncertainty and allow for the sale of remaining non-compliant units in

inventory that were manufactured prior to the applicable fee end date. As such, the amended rule provides a six month sell-through period after the Phase Two fee end date for all units manufactured prior to that end date.

Rule 4905 Table 3 Emissions Fee Option						
		Phase One		Phase Two		
Size Range (Btu/hr)	Furnace Category	Fee Start Date	Fee Amount ($/unit)	Fee Start Date	Fee Amount ($/unit)	Fee End Date
≤ 60,000	All non-weatherized condensing units except those installed in manufactured homes	August 1, 2018	$275	October 1, 2018	$350	September 30, 2019
	All non-weatherized, non-condensing units except those installed in manufactured homes	October 1, 2018	$225	April 1, 2019	$300	September 30, 2019
	Weatherized units	October 1, 2018	$225	April 1, 2019	$300	September 30, 2020
	Units installed in manufactured homes (for certified 40 ng/J units)	October 1, 2018	$150	April 1, 2019	$150	September 30, 2021
>60,000 and ≤90,000	All non-weatherized condensing units except those installed in manufactured homes	August 1, 2018	$300	October 1, 2018	$400	September 30, 2019
	All non-weatherized, non-condensing units except those installed in manufactured homes	October 1, 2018	$250	April 1, 2019	$350	September 30, 2019
	Weatherized units	October 1, 2018	$250	April 1, 2019	$350	September 30, 2020
	Units installed in manufactured homes (for certified 40 ng/J units)	October 1, 2018	$150	April 1, 2019	$150	September 30, 2021
>90,000	All non-weatherized condensing units except those installed in manufactured homes	August 1, 2018	$325	October 1, 2018	$450	September 30, 2019
	All non-weatherized, non-condensing units except those installed in manufactured homes	October 1, 2018	$275	April 1, 2019	$400	September 30, 2019
	Weatherized units	October 1, 2018	$275	April 1, 2019	$400	September 30, 2020

Rule 4905 Table 3 Emissions Fee Option						
		Phase One		Phase Two		
	Units installed in manufactured homes (for certified 40 ng/J units)	October 1, 2018	$150	April 1, 2019	$150	September 30, 2021

Section 5.4 – Emissions fee option for furnaces encumbered in a contractual agreement

A provision would be added to allow the sale of furnaces that have been encumbered in a contractual agreement, signed prior to January 1, 2018 by a furnace manufacturer or distributor for future or planned construction, in the Valley at the previous emission fee rate of $290 for each condensing furnace and $225 for each non-condensing furnace distributed or sold in the Valley. This will ensure that businesses that have already committed to specific pricing are not impacted by the emission fee changes.

Administrative Requirements (Section 6.0)

Section 6.3 would be amended to require additional recordkeeping to ensure enforcement of the rule as follows:

- *Any manufacturer, distributor, or contractor who supplies, distributes, sells, offers for sale or installs a furnace in or into the San Joaquin Valley Air Basin shall maintain such records as necessary to demonstrate compliance with this rule for a period of not less than five years and make such records available to the APCO upon request.*

Section 6.4 – Non-Compliant Unit Labeling

Labeling requirements have been added to ensure that non-compliant units are properly labeled and the public is well informed as follows:

- *Any furnace manufactured after October 1, 2018, using the emissions fee option shall have a label with APCO-approved language on the carton or furnace that clearly displays that the unit does not comply with the NOx limits in Table 1 of this rule.*

IV. ANALYSES

A. Emission Reduction Analysis

The 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 2018 amendments provides additional time necessary to continue technology development and the certification process while providing strong incentive for accelerated deployment of compliant units. As such, the amendment will not result in any change in emissions.

B. Cost Effectiveness Analysis

The proposed amendments do not impose additional requirements on manufacturers of compliant furnaces. While a fee increase is proposed, 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) §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. Proposed 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.

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.

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.

E. Environmental Impact Analysis

The amendments proposed to District Rule 4905 extends the existing emissions fee option to allow equipment manufacturers additional time to bring sufficient units to the marketplace and include additional administrative requirements to ensure enforcement of the regulation. There are no other actions or rule requirements associated with this project. Based on the District's investigation and lack of evidence to the contrary, the District has concluded that the project will not have any significant adverse effects on the environment.

The amendments to District Rule 4905 is an action taken by a regulatory agency, the San Joaquin Valley Air District, as authorized by state law to assure the maintenance, restoration, enhancement, or protection of air quality in the San Joaquin Valley where the regulatory process involves procedures for protection of air quality.

California Environmental Quality Act (CEQA) Guidelines §15308 (Actions by Regulatory Agencies for Protection of the Environment), provides a categorical exemption for "actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption." No construction activities or relaxation of standards are included in this project. Therefore, the rule amendment project is exempt from CEQA.

In addition, according to Section 15061-(b)(3) of the CEQA Guidelines, a project is exempt from CEQA if, "(t)he activity is covered by the general rule that CEQA applies

only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA." As such, the District finds that the rule amendment project is exempt from CEQA.

V. RULE DEVELOPMENT PROCESS

A. Public Workshop for Rule 4905

The District hosted 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 have been reviewed and incorporated into the proposed rule and staff report. A summary of significant comments and District responses will be available in Appendix A of the final staff report.

B. Public Hearing for Rule 4905

In accordance with CH&SC § 40725, the proposed amendments to Rule 4905 and the final draft staff report were publicly noticed prior to the Governing Board public hearing to consider adoption of the proposed amendments and made available on May 22, 2018. All significant comments received will be considered and incorporated into the proposed rule and staff report, as appropriate. A summary of significant comments and District responses will be available in Appendix A of the final staff report. The public is also invited to provide comments on the proposed amendments to Rule 4905 and staff report during the public hearing on June 21, 2018, for proposed adoption of this rule.

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