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# **PROPOSED AMENDMENTS TO RULE 2.37, NATURAL GAS-FIRED WATER HEATERS AND SMALL BOILERS**

## **FINAL STAFF REPORT**

March 27, 2009

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## I. EXECUTIVE SUMMARY

On April 8, 2009, the Yolo-Solano Air Quality Management District (District) Board of Directors will consider the proposed amendments to Rule 2.37.

The District is proposing to revise the rule to fulfill a previous District commitment made pursuant to Senate Bill (SB) 656. SB 656 focuses on reducing both directly emitted particulate matter (PM) and secondary PM by implementing a list of control measures adopted by our Board in 2005. SB 656 required the District to assess and prioritize the measures based on the nature and severity of the PM problem in the District. The amendment of this rule focuses on reducing oxides of nitrogen (NOx) emissions that in turn form secondary PM.

The main revisions for Rule 2.37 will be to expand the scope and lower the applicable emission concentration limits in units of nanograms per joule (ng/j) or parts per million (ppm) @ 3% O<sub>2</sub>, as follows:

Category Name	Rated Heat Input Capacity (Btu/hr)	NOx Emission Limit
Small water heater	< 75,000	as of 1/2010: 10 ng/j or 15 ppm @ 3% O <sub>2</sub>
Large water heater	75,000 - 400,000	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or (20 ppm @ 3% O <sub>2</sub>
Small boilers	> 400,000 - < 1,000,000	as of 1/2010: 20 ng/j or 30 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>
Mobile home water heaters	All	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>
Pool/spa heaters	> 400,000 - < 1,000,000	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>

The current Rule 2.37 requires the following:

Name	Rated Heat Input Capacity (Btu/hr)	NOx Emission limit
Residential hot water heaters	< 75,000 Btu/hr	40 ng/j (93 lbs/billion Btu)

For reference, the District has separate existing requirements which apply to combustion equipment (boilers, process heater, etc...) rated at 1,000,000 Btu/hr and above. Any unit rated over 1,000,000 Btu/hr requires a District Authority to Construct (ATC) and Permit to Operate (PTO) and would be subject to New Source Review (NSR), including Best Available Control Technology (BACT) and/or offsets. In addition, units rated greater than 5,000,000 Btu/hr are subject to Rule 2.27 which was a retrofit rule requiring units to meet 30 ppm NOx. The District is currently planning on amending Rule 2.27 in the near future (as a State Implementation Plan (SIP) control measure) to require the larger units to retrofit to meet lower emission standards.

Since the District does not require permits for installation of natural gas fired water heaters with rated heat input capacities less than 1 MMBtu/hr, enforcement of the existing Rule 2.37 as well as the proposed amended Rule 2.37 will be done more as a "point of sale" regulation with requirements on manufacturers, retailers, and installers. The District will also request help from local city and county building departments which require building permits for these type of units.

The proposed amendments will neither have a significant nor detrimental effect on the environment. Therefore, staff has prepared a Notice of Exemption to satisfy the requirements of the California Environmental Quality Act (CEQA). The notice states that the revisions to the Rules are exempt from the requirements of CEQA pursuant to Section 15308, *Actions by Regulatory Agencies for Protection of the Environment*.

## A. BACKGROUND

In an effort to reduce public exposure to Particulate Matter less than 10 microns (PM10) and Particulate Matter less than 2.5 microns (PM2.5), Senate Bill 656 was proposed and passed by the state legislature in 2003. Later codified as California Health and Safety Code (CH&SC) Section 39614, SB 656 required the California Air Resources Board (CARB) to compile a list of the most readily available, feasible, and cost effective PM control measures. As part of SB 656, Districts were then required to evaluate the CARB list and determine which measures were appropriate to implement in their District and propose a schedule for the implementation. Our Board considered and adopted our SB 656 plan on July 13, 2005. One category on our commitment list to evaluate was combustion, and specifically residential water heaters.

### Overview of source category

The types of equipment included in the 75,000 Btu/hr or less range (classified as small water heater units in this proposed rule and staff report) include various types of natural gas fired small water heaters. Natural draft residential water heaters are designed to allow air to enter at the bottom of the unit and vent exhaust gas byproducts through an exhaust duct to the outside of the dwelling. A variety of units fall under the category of "power assisted water heaters". Direct vent water heaters, are equipped with air intake and exhaust ducts to handle air intake and gas byproduct exhaust expulsion to the outside of a building. Power direct vent water heaters, use a blower apparatus to assist in combustion exhaust expulsion, but also utilize air intake ducts to transport air to the system. Power vent water heaters, use a blower apparatus to assist in exhaust expulsion, but differ from the power direct vent units in that they do not use air intake ducts.

Tankless water heaters have also been in recent circulation in the industry. These units are energy efficient units where water is heated "on-demand" or as needed, hence saving energy by omitting the requirement for storage tanks to be heated multiple times throughout the day to maintain desired water temperatures.

Water heater units used in mobile homes are designed differently than the conventional water heaters. The burners used in the design of mobile home water heaters must accommodate various fuel types such as natural gas or propane depending on the fuel type used by the mobile home. Additionally, the technology for these units is not advanced enough to achieve the low NOx emission limits designated for mobile home dwelling units (SCAQMD Rule 1121, Staff Report 1999).

Regulations to cover the above discussed units have already been approved and implemented in the South Coast Air Quality Management District (SCAQMD) and the Bay Area Air Quality Management District (BAAQMD) for units with a rated heat input capacity of 75,000 Btu/hr and less.

Additionally, the District is establishing NOx emissions limits on units currently exempt from District regulation in order to obtain additional NOx emissions reductions. To accomplish this, the District has proposed to expand the capacity range described in the rule to apply to units with rated heat input capacities less than 1,000,000 Btu/hr (or 1 MM Btu/hr). These units are commonly referred to as large water heaters or small boilers.

Large water heaters and small boilers are used to provide hot water and steam to a variety of residential, industrial, and commercial applications. Such applications consist of supplying hot water and steam for space heating, food processing, garment laundering, or equipment sterilization. The units are primarily fired on gaseous fuels (e.g. natural gas, propane) and have burner ratings of less than 1MM Btu/hr. Typically, units with burner ratings under 300,000 Btu/hr use the draft created during the combustion process to transfer the combustion heat to the water. Units with burner ratings greater than or equal to 300,000 Btu/hr may use either fans or the natural combustion drafts to transfer the combustion heat into a heat exchange system.

The classification of units ranging in size from 75,000 - 400,000 Btu/hr will be designated as large water heaters for clarification purposes. Typically used in small hotels, commercial buildings and industrial uses, large water heaters are similar in appearance to a small water heater.

Small boilers, or units with a rated heat input capacity greater than 400,000 Btu/hr but less than 1 MM Btu/hr, are more commonly found in industrial facilities, schools, and large buildings, where they are used to provide steam or hot water. Pool and spa heaters in this range are also proposed to be subject to the rule amendments. Pool and spa heaters in this range are generally consistent to those used for large residential pools (approximately 44,000 gallons in size) and commercial uses such as multi-family residential housing and hotels.

## II. DISCUSSION OF PROPOSED RULE 2.37 REQUIREMENTS

Listed below are descriptions of the proposed revisions and the intended purposes of the revisions:

### Title: Natural Gas-Fired Water Heaters and Small Boilers

Staff is proposing to revise the applicability of the rule to include all units with a rated heat capacity less than 1MMBtu/hr, including those used for commercial, business, and residential purposes.

### Section 100. General

Staff is proposing to amend Section 101-Purpose, Section 102-Applicability, and Section 110-Exemptions, to update terminology for rule consistency and to expand the applicability.

The term "residential" is proposed to be removed from the rule's purpose statement in order to expand the rule's applicability to all units within a particular heat capacity range, independent of land use type.

Section 102-Applicability, will be revised in order to expand the rule to include all natural gas fired water heaters with a rated heat input capacity less than 1MM Btu/hr.

Section 103-Severability was added to the rule for administrative purposes.

Exemption 110.1 will be amended so that larger units with a 1MM Btu/hr or greater rated heat input limit will not be affected by this rule.

Existing exemption 110.3 has been proposed to be removed to allow provisions of the rule to apply to swimming pool and hot tub water heaters with rated heat input capacities greater than 400,000 Btu/hr, but less than 1MM Btu/hr.

Section 200 Definitions

Rule 2.37 will amend some existing definitions to provide updated test methods per the Code of Federal Regulations (CFR), American Society for Testing and Materials (ASTM), and/or the United States Environmental Protection Agency (EPA), in addition to including definitions of new terms applicable to the proposed rule changes.

Section 300 Standards

Staff proposes the following NOx emission limits and applicable units:

Category Name	Rated heat input capacity (Btu/hr)	NOx Emission Limit
Small water heater	< 75,000	as of 1/2010: 10 ng/j or 15 ppm @ 3% O <sub>2</sub>
Large water heater	75,000 - 400,000	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>
Small boilers	> 400,000 - < 1,000,000	as of 1/2010: 20 ng/j or 30 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>
Mobile home water heaters	All	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>
Pool/spa heaters	> 400,000 - < 1,000,000	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>

Staff is proposing the above limits based on a review of products currently available in the market place. Staff believes that adoption of the new NOx limits will not adversely affect the industry through the implementation of technology forcing regulations. Other air districts have adopted rules with the proposed NOx emission limits. As of September 2007, 20% and 45% of large water heaters and small boilers respectively, were able to achieve the 14ng/j lower standard (BAAQMD Reg 9, Rule 6, Staff Report, November 2007). Rules passed in other districts regulating NOx emissions for small water heaters, mobile water heaters, and pool/spa heaters are consistent with the proposed limits included above and

the industry has readily available units capable of achieving the 10ng/j (small water heaters) and 40ng/j (mobile home water heaters and pool/spa heaters) emission limits.

Section 500 Monitoring and Records

Staff proposes a change to Section 501.1 to update the referenced American National Standards Institute (ANSI) method.

Staff proposes a change in the calculation methodology used in Section 501.3 to maintain consistency with other air districts in the state that have previously adopted similar regulation for this source category.

Staff proposes to remove the reference to the SCAQMD definition and measurement procedure due to amendments adopted in the SCAQMD rule that no longer include this information. Additionally, the record retention requirement was modified to require the manufacturer to maintain compliance reports, test reports, and compliance statements for as long as the unit is sold, offered for sale, or installed in the District, or for five years, whichever is longer, pursuant to an EPA Technical Support Document that was issued to Santa Barbara County Air Pollution Control District (SBCAPCD) in August 2000.

### **III. COMPARISON WITH OTHER APPLICABLE REGULATIONS AND REQUIREMENTS**

CH&SC Section 40727.2 requires districts to perform a comparative alternative analysis of any new control standard. Specifically, the District is required to prepare a written analysis (usually in the form of a matrix) that identifies all existing federal air pollution control requirements, including, but not limited to emission control standards constituting best available control technology (BACT) that applies to the same equipment or source type as the rule or regulation proposed for adoption or modification by the District. In addition, the analysis shall identify any other District rule or regulation that applies to the same equipment or source type.

There are no federal regulations, such as National Emission Standards for Hazardous Air Pollutants (NESHAPs) or New Source Pollution Standards (NSPSs), that apply to this source category. In addition, by definition and applicability thresholds, units which are subject to this rule will never be subject to BACT. Therefore, the 40727.2 analysis can not be performed.

However, for reference, the several other air districts that have rules that apply to similar sources were compared:

Category	Our NOx limit	South Coast NOx limit (Rule 1121 & 1146.2)	Bay Area NOx limit (Reg 9 Rule 6)
Small water heater	as of 1/2010: 10 ng/j or 15 ppm @ 3% O <sub>2</sub>	10 ng/j (23 lb per billion Btu) (15 ppmv at 3% O <sub>2</sub> )	as of 2010: 10ng/j for storage tank units less than or greater than 50 gallons  as of 1/2011: 10 ng/j for all storage tank water heaters
Large water heater	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>	40 ng/j NOx or 55 ppm @ 3% O <sub>2</sub>  effective 1/2012: 14 ng/j or 20 ppm @ 3% O <sub>2</sub>	40 ng/j NOx  effective 1/2013: 14 ng/j
Small boilers	as of 1/2010: 20 ng/j or 30 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14ng/j or 20 ppm @ 3% O <sub>2</sub>	30 ppm NOx @ 3% O <sub>2</sub>  as of 1/2010: 14 ng/j or 20 ppm @ 3% O <sub>2</sub>	20 ng/j NOx or 30 ppm @ 3% O <sub>2</sub>  effective 1/2013: 14 ng/j or 20 ppm @ 3% O <sub>2</sub>
Mobile home water heaters	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>	40 ng/j (93 lb per billion Btu) (55 ppmv at 3% O <sub>2</sub> )	40 ng/j
Pool/spa heaters	as of 1/2010: 40 ng/j or 55 ppm @ 3% O <sub>2</sub>  as of 1/2014: 14 ng/j or 20/ ppm @ 3% O <sub>2</sub>	30 ppm @ 3% O <sub>2</sub>  effective 1/2012: 14 ng/j or 20 ppm @ 3% O <sub>2</sub>	40 ng/j or 55 ppm @ 3% O <sub>2</sub>  effective 1/2013: 14 ng/j or 20 ppm @ 3% O <sub>2</sub>

#### IV. IMPACTS OF THE PROPOSED RULE

##### Emissions Impacts

Staff used the CARB Emissions Inventory to obtain NOx emissions inventory information for natural gas consumption by various unit types. The unit types included boilers, process heaters, space heating, water heating, cooking, and "other" in the following processes: manufacturing and industrial, food and agricultural processing, service and commercial, and residential fuel combustion.

Inventory data was obtained for the selected baseline year 2005 and was found to be 2.229 tons per day (tpd) of NOx. The proposed implementation year of 2010 was also researched and the inventory was found to be 2.250 tpd NOx. Future inventory emissions were projected for the years 2015 and 2020 using the CARB Emissions Inventory Database and found to be 2.357 and 2.419 tpd of NOx respectively.

In order to determine the NOx emission reductions from the proposed rule for small water heater units, an approximate life cycle of 15 years was selected to allow achievement of the full emission reduction benefit. The 15 year life span was chosen because it is similar to the typical 12 year life span for the small water heater units (BAAQMD Reg 9, Rule 6, Staff Report, November 2007). A 12 year life span cannot be specified for this analysis because NOx emissions for future years are calculated from the CARB emissions inventory which only forecasts in 5 year increments. Using the inventory data, expected changeover rate as older units are decommissioned and new small water heater units are cycled into service, staff was able to estimate the expected emission reductions for the incremental years of 2010, 2015, 2020, and full implementation in 2025.

The District committed to implementing a Large Water Heater and Small Boiler control measure in the Sacramento Regional 8-hour Ozone Attainment and Reasonable Further Progress Plan to receive NOx reductions by the 2018 attainment deadline. Using the reduction estimates calculated for the years 2015 and 2020, the estimated 2018 emission reduction benefits were extrapolated. Considering implementation of the rule for all categories (small water heaters, large water heaters, small boilers, etc.) as of 2015, a total of 0.2634 tpd NOx were estimated to be reduced and as of 2020, 0.6563 tpd NOx were estimated to be reduced. Extrapolating this data to determine 2018 reductions for comparison to the District commitment in the 8-hour ozone plan, approximately 0.4976 tpd NOx are expected through implementation of this rule which is greater than the initial 0.2403 estimate submitted in the 8-hour ozone plan.

The small water heater category at the proposed new NOx limit of 10ng/j, was found to have an estimated 0.4718 tpd NOx reduction at its 2025 full implementation year. Since large water heaters and small boilers have a longer life expectancy, estimated at 25 years, the changeover frequency and emissions inventory forecasting was extended to allow time for full implementation of the new NOx limits for these units. Additionally, calculations were conducted to determine the estimated reductions that would be observed based on the

limits that become effective in 2010 and 2014. Since units subject to this rule (with the exception of the residential water heaters) have been unregulated by the District with regards to their allowed NOx emission limits, it was necessary to establish a baseline to calculate future emission reductions as a result of the proposed rule adoption. The limit of 40ng/j was established as the baseline for all of the categories included in the proposed rule. Using an assumed 25 year life span, all large water heaters and small boilers will be replaced by 2039. Once all units meet the lower emission limits, emissions for large water heaters are estimated to be reduced by 0.4703 tpd and emissions for small boilers will be 1.010 tpd.

Full implementation of the proposed rule will account for an estimated 1.952 tpd of NOx emission reductions. This amount is larger than the previously calculated emissions benefits from the control measure analyses because of the lower NOx limits that are proposed by this rule amendment. Previous analyses assumed that both large water heaters and small boilers would be regulated to a 40ng/j NOx limit. Instead, this rule proposes a 20ng/j limit for small boilers which are estimated to be 50% of the total inventory with a latter 14ng/j limit effective 2014, as is similar for large water heaters in 2014 which are required to meet the lower NOx limit of 14ng/j. Moreover, additional emission benefits will be realized due to the lower NOx limit proposed for the small water heater units that will be regulated from 40ng/j to 10ng/j. The emission reduction calculations are included with this report as Attachment B.

Cost Effectiveness

CH&SC Section 40703 requires the District, in the process of the adoption of any regulation, to consider and make public its findings related to the cost effectiveness of a control measure. Cost effectiveness for rule-making purposes is calculated by dividing the cost of air pollution controls required by the rule by the amount of air pollution reduced.

Industry feedback indicated that the incremental cost difference between purchasing a standard water heater compared to a low-NOx water heater with emission limits proposed in the report were as follows:

Unit Size	Additional Cost for Low NOx Unit
Small water heater (10ng/j)	\$95 - \$170
Large water heater (40ng/j)	\$20 - \$1,600
Small boiler (20ng/j)	\$500 - \$650
Pool/spa heater (40ng/j)	\$0 - \$5,000

Consistently, the varying price ranges were attributed to the various unit sizes, as well as the higher energy efficient units. For the water heating units used in various building types, the increased cost of purchasing the high energy efficiency units was reported to be offset

within 2 years of purchase due to the gas energy use savings and utility company rebates. Industry response varied depending on the manufacturer or retailer regarding the cost impact for the pool/spa heater units. In some cases, no cost difference was observed for purchasing a standard emission pool/spa heater compared to a low NOx unit, whereas one response indicated a \$5,000 increase in the unit cost for purchasing a low NOx unit. Typically, pool/spa heaters in the range of 400,000 - 1MM Btu/hr are used for large residential pools (44,000 gallons), as well as commercial uses such as apartment complexes and hotels.

When the BAAQMD last amended their rule in 2007, they calculated the cost effectiveness for the same category of equipment. Staff expects the factors involved in this calculation to be comparable for our District as the Bay Area. The cost effectiveness for this source category is estimated as:

Small water heaters	\$17,300 per ton of NOx reduced
Large water heaters	\$7,500 - \$15,000 per ton of NOx reduced
Small boilers	\$3,000 - \$6,000 per ton of NOx reduced (includes costs for units up to 2 MMBtu/hr)

According to SCAQMD rule development documents for Rule 1146.2 (Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers (400,000 to 1,000,000 Btu/hr)) the rule incorporated provisions for retrofit kits to obtain low NOx levels in an effort to extend the useful life of existing equipment. However, despite the rule being adopted in 1998, as of 2004's Rule 1146.2 Implementation Study, only one manufacturer had received retrofit certification for their own product line. Based on this information, it is staff's recommendation that retrofits not be required as part of this proposed rule implementation.

#### Socioeconomic Impacts

CH&SC Section 40728.5 (a) requires the District, in the process of the adoption of any rule or regulation, to consider the socioeconomic impact if air quality or emission limits may be significantly affected. However, districts with a population of less than 500,000 persons are exempt from the provisions of Section 40728.5 (a). The District's population is estimated to be approximately 310,000 and well below the 500,000 person threshold. Therefore, a socioeconomic analysis for this rule-making is not required.

#### Incremental Cost Effectiveness

CH&SC Section 40920.6 requires an assessment of the incremental cost-effectiveness for proposed regulations relative to ozone, Carbon Monoxide (CO), Sulfur Oxides (SOx), Nitrogen Oxides (NOx), and their precursors. Incremental cost-effectiveness is defined as the difference in control costs divided by the difference in emission reductions between two potential control options that can achieve the same emission reduction goal of a regulation.

In order to determine the incremental cost, the annualized incremental capital cost is divided by NOx tons of reduced emissions. Cost effectiveness for low NOx small water

heaters were estimated at \$17,300 per ton. For large water heaters, the estimate was found to be \$7,500 per ton and for small boilers, \$3,000 - \$6,000 per ton (BAAQMD Reg 9, Rule 6, Staff Report, November 2007). When comparing alternative technologies available for achieving NOx reductions for small boilers, the most cost effective means of achievement is implementing low NOx burners. Flue gas recirculation and catalytic reduction are alternatives to the low NOx burners, however, the costs involved with these alternatives are 3-5 times higher than compared to low NOx burners (BAAQMD Reg 9, Rule 6, Staff Report, November 2007).

#### Impacts to the District

The proposed amendments are not expected to result in any significant increased workload for District staff since the proposed regulation is at the "point of sale" level and will be implemented by manufacturers, retailers, and city/county building permit processors. Occasional compliance checks at local distributors and retailers by District staff to enforce that the equipment available to the public is in compliance with the proposed rule are expected. Staff believes this will not create an undue burden on District resources and that this increase in work load can be absorbed.

### **V. ENVIRONMENTAL IMPACTS OF METHODS OF COMPLIANCE**

California Public Resource Code Section 21159 requires the District to perform an environmental analysis of the reasonably foreseeable methods of compliance. The analysis must include the following information for the proposed adoption of/amendments to Rule 2.37:

- a. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
- b. An analysis of the reasonably foreseeable mitigation measures.
- c. An analysis of the reasonably foreseeable alternative means of compliance with the rule or regulation.

The following table lists all reasonably foreseeable compliance methods, the environmental impacts of those methods, and measures that could be used to mitigate the environmental impacts.

Compliance Methods	Reasonable Foreseeable Environmental Impacts	Reasonably Foreseeable Mitigation Measures
Lower NOx emission limits	Air Quality Impacts: All compliance methods are aimed at lowering NOx emission levels from a point of sale regulation.	No mitigation necessary
	Water Impacts: Compliance methods will not contribute to potential water impacts.	
	Human Health Impacts: Compliance methods will not contribute to potential human health impacts.	
	Solid Waste Disposal: Compliance methods will not contribute to potential solid waste impacts. Product turnover is estimated at 15-25 years and the compliance methods proposed do not require retrofitting equipment to meet new NOx emission standards. Life span of units are not affected by requiring low NOx technology.	

This analysis demonstrates the adoption of amendments to Rule 2.37 will not have a significant effect on the environment or humans due to unusual circumstances. In addition, the amendments to proposed Rule 2.37 are an action taken to protect the environment. Therefore, staff have determined that the project is categorically exempt from the requirements of CEQA pursuant to Section 15308, Actions by Regulatory Agencies for Protection of the Environment. Staff prepared a Notice of Exemption (NOE) to meet the CEQA Guidelines (Attachment C).

**VI. REGULATORY FINDINGS**

Section 40727(a) of the CH&SC requires that prior to adopting or amending a rule or regulation, an air district's board make findings of necessity, authority, clarity, consistency, non-duplication, and reference. The findings must be based on the following:

1. Information presented in the District's written analysis, prepared pursuant to CH&SC Section 40727.2;
2. Information contained in the rulemaking records pursuant to CH&SC Section 40728; and
3. Relevant information presented at the Board's hearing for adoption of the rule.

The required findings are:

Necessity: The rule amendment is required in order to meet our commitment to SB656 and "every feasible measures" requirement (Section 40914 of the CH&SC) for reducing NOx emissions from natural gas-fired water heaters. (CH&SC Section 40727 (b)(1)).

Authority: The District is authorized to adopt rules and regulations by CH&SC, Sections 40001, 40702, 40716, 41010 and 41013. (CH&SC Section 40727 (b)(2)).

Clarity: District staff have reviewed the proposed rule amendment and determined that it can be easily understood by the affected industry. In addition, the record contains no evidence that the persons directly affected by the rule cannot understand the rule. (CH&SC Section 40727(b)(3)).

Consistency: The proposed rule amendment does not conflict with and is not contradictory to, existing statutes, court decisions, or state or federal regulations. (CH&SC Section 40727(b)(4)).

Non-Duplication: The proposed rule amendment does not duplicate any state laws or regulations, regarding the attainment and maintenance of state and federal air quality limits. (CH&SC Section 40727(b)(5)).

Reference: The District must refer to any statute, court decision, or other provision of law that the District implements, interprets, or makes specific by adopting, amending or repealing the rule.

## **VII. PUBLIC COMMENTS AND STAFF RESPONSES**

Staff held a public workshop on February 10, 2009, to discuss the proposed amendments to Rule 2.37. Notification was sent to surrounding Air Districts, City Managers within the District, building/planning/community development departments within the District, all city and county libraries within the District, all Board members, and all water heater/boiler retailers and manufacturers in the District. The workshop notice was published in the Vacaville Reporter, Daily Democrat, West Sacramento Press, Dixon Tribune, and the Davis Enterprise.

A copy of the public workshop notice, the draft staff report, draft rule language, final staff report, and final rule language was posted on the District's web page. Additionally, Attachment E includes written comments the District received during the rule development process.

#### **A. Public Workshop:**

The February 10, 2009, public workshop was attended by 4 people. Questions were asked for clarification purposes and rule enforcement. No formal comments were submitted.

#### **B. Written comments:**

Tom Pomalef of ARB offered verbal comments on telephone on January 13<sup>th</sup> and 14<sup>th</sup>, 2009, and issued written comments via email on February 2<sup>nd</sup>, 2009. The comments and district responses are listed below:

Comment 1: Section 110.3: This section makes reference to "swimming pools and hot tubs". We suggest that reference to "swimming pools and hot tubs" be changed to "pools/spas" for consistency with the rest of the rule.

Response 1: Comment noted and incorporated into rule language.

Comment 2: Section 200: ARB staff recommends that a new subsection be added to include a definition for pool/spa heaters.

Response 2: Comment noted and incorporated into rule language.

Comment 3: Section 301: In the last two lines of this section, it is stated that "...40 nanograms calculated as weight equivalent NO<sub>2</sub> per joule (ng/j) [93 pounds per billion BTU] (93 lb/10<sup>9</sup> BTU) of heat output." For consistency with the rest of the sections, ARB staff recommends that this sentence be revised to read as follows:

"...40 nanograms per Joule calculated as weight equivalent NO<sub>2</sub> (ng/J) (93 pounds per billion BTU) of heat output"

Response 3: Comment noted and incorporated into rule language.

Comment 4: Section 401.2: This section states that "The manufacturer may submit to the District an approved Bay Area AQMD or South Coast AQMD certification in lieu of conducting duplicative compliance tests." We recommend that the District specify which Bay Area AQMD and South Coast AQMD rules describe the certification process for natural gas-fired water heaters and small boilers.

Response 4: Comment noted and incorporated into rule language.

Comment 5: Section 501.3: This section makes reference to the number "5211" in the equation to calculate the NO<sub>x</sub> emissions rate in ng/j (lb/BTU) of heat output, but does not state what this number represents. We recommend that an explanation for the number "5211" in the equation be included in this section.

Response 5: The equation used in the rule language to calculate the NO<sub>x</sub> emission rate in nanograms of NO<sub>x</sub> per joule of heat output was amended to maintain consistency with other air district rules who have previously adopted similar regulation for this source category.

Andrew Steckel of EPA offered comments via email on February 10<sup>th</sup>, 2009. The comments and district responses are listed below:

Comment 1: Section 302.5 refers to pool/spa heaters without previously defining the term. We recommend a definition of this term be added to Section 200.

Response 1: Comment noted and incorporated into rule language.

Comment 2: Section 401.2c indicates that Bay Area AQMD and South Coast AQMD certification can be submitted in lieu of conducting duplicative testing. We suggest the rule specify with SCAQMD and BAAQMD rules describe the certification process for water heaters.

Response 2: Comment noted and incorporated into rule language.

Comment 3: We also recommend the District reconsider setting stricter NO<sub>x</sub> emission limits such as those set by South Coast AQMD in Rule 1146.2 adopted May 5<sup>th</sup>, 2006, which regulates units larger than 0.75 MM Btu/hr.

Response 3: The District decided to propose implementing the lower NO<sub>x</sub> limits as suggested in the above comment in efforts of maintaining consistency with other air districts in the state (BAAQMD and SCAQMD) who have previously adopted the lower NO<sub>x</sub> limit into their rules.

## VIII. REFERENCES

1. Bay Area Air Quality Management District, Bay Area Ozone Strategy Control Measure SS 13, Regulation 9, Rule 6, Nitrogen Oxides from Natural Gas-Fired Water Heaters and Small Boilers (September 2007).
2. Bay Area Air Quality Management District, Staff Report, Regulation 9 Inorganic Gaseous Pollutants, Rule 6 Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters (November 2007).
3. South Coast Air Quality Management District, Rule 1121, Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters, September 2004.
4. South Coast Air Quality Management District, Staff Report, Proposed Amended Rule 1121, Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters, November 1999.
5. South Coast Air Quality Management District, Implementation Study for Rule 1146.2, Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers (400,000 to 1,000,000 Btu/hr), June 2004.
6. State of California. California Air Resources Board, 2006 Emission Inventory
7. Yolo-Solano Air Quality Management District Final Staff Report, Proposed Implementation of Senate Bill 656, Sher 2003 (June 2005).
8. Yolo-Solano Air Quality Management District, Rule 2.37, Natural Gas-Fired Residential Water Heaters, November 1994.

**ATTACHMENT A**

**PROPOSED RULE 2.37, NATURAL GAS-FIRED WATER HEATERS AND SMALL BOILERS  
STRIKE-OUT UNDERLINE VERSION**

**RULE 2.37**  
**NATURAL GAS-FIRED RESIDENTIAL WATER HEATERS AND SMALL BOILERS**

**ADOPTED** November 9, 1994  
**REVISED** April 8, 2009

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100 GENERAL

- 101 **PURPOSE:** The purpose of this Rule is to limit the emissions of oxides of nitrogen (NOx) from the use of natural gas-fired residential hot water heaters.
- 102 **APPLICABILITY:** The provisions of this Rule shall apply to any person that manufactures, offers for sale, sells, or installs any natural gas-fired water heater with a rated heat input capacity of less than ~~75,000~~ 1,000,000 British Thermal Units per hour (Btu/hr).
- 103 **SEVERABILITY:** If any provision, clause, sentence, paragraph, section or part of this rule for any reason is judged to be unconstitutional or invalid, such judgement shall not affect or invalidate the remainder of the rule.
- 110 **EXEMPTIONS:** The provisions of this Rule shall not apply to:
- 110.1 Water heaters with a rated heat input of ~~75,000~~ 1,000,000 Btu/hr or greater.
- 110.2 Water heaters used in recreational vehicles.
- 110.3 Water heaters used exclusively to heat swimming pools and hot tubs/spas with a rated heat input capacity less than or equal to 400,000 Btu/hr.

200 DEFINITIONS

- 201 **BRITISH THERMAL UNIT (BTU):** The amount of heat required to raise the temperature of one pound of water from 59° F to 60° F at one atmosphere.
- 202 **HEAT INPUT:** The actual amount of heat released by natural gas burned in the water heater.
- 203 **HEAT OUTPUT:** The product obtained by multiplying the recovery efficiency, as defined by Title 20 10, California Administrative Code of the Code of Federal Regulation, Chapter 2 Section 6.1.3, Subchapter 4, Part 430, Subpart B, Appendix E, Sections 1603 and 1607, by the heating value input rating of the natural gas furnished to the water heater.
- 204 **LARGE WATER HEATER:** A natural gas-fired water heater with a rated heat input capacity ranging from 75,000 - 400,000 Btu/hour.
- 205 **MOBILE HOME WATER HEATER:** A natural gas-fired water heater manufactured exclusively for use in a mobile home.
- 2046 **NATURAL GAS:** A mixture of gaseous hydrocarbons containing at least 80 percent methane by volume as determined according to ASTM Test Method D1945-6403.
- 207 **POOL / SPA HEATER:** A device through which water is heated when pool or spa water circulates through a heat exchanger.
- 2058 **RATED HEAT INPUT CAPACITY:** The heat input capacity specified on the nameplate of the combustion unit. If the combustion unit has been physically altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.
- 209 **SMALL BOILER:** A natural gas-fired water heater with a rated heat input capacity greater than 400,000 but less than 1,000,000 Btu/hour (1 MM Btu/hr).

210 **SMALL WATER HEATER:** A natural gas-fired water heater with a rated heat input capacity less than 75,000 BTU/hour.

211 **TANKLESS WATER HEATER:** A water heating device that does not use a storage tank to hold heated water. An electric ignition source is used to initiate water heating and then natural gas is introduced to fuel further combustion using multiple modulating burners to heat water on demand.

20612 **WATER HEATER:** A device that heats water at a thermostatically-controlled temperature for delivery on demand including storage tank and tankless units.

**300 STANDARDS**

301 **PROHIBITIONS:** Effective May 31, 1995, No person shall manufacture, offer for sale, sell, or install any natural gas-fired water heater with oxides of nitrogen (NOx) emissions in excess of 40 nanograms per joule Joule calculated as weight equivalent NO<sub>2</sub> per joule (ng/J) [93 pounds per billion BTU] (93 lb/10<sup>9</sup> BTU) of heat output.

**PROHIBITIONS:** No person shall manufacture, offer for sale, sell, or install any natural gas fired water heater with oxides of nitrogen (NOx) emissions in excess of the limits set forth in the compliance schedule indicated below:

Category	Rated Heat Input Capacity (Btu/hour)	NOx Emission Limit Effective 5/31/1995 - 12/31/2009	NOx Emission Limit Effective 1/1/2010 - 12/31/2013	NOx Emission Limit Effective 1/1/2014
Small water heater	< 75,000	40ng/J	10ng/J or 15 ppm NOx @ 3% O <sub>2</sub> dry	10ng/J or 15 ppm NOx @ 3% O <sub>2</sub> dry
Large water heater	75,000 - 400,000	No present standard	40ng/J or 55 ppm NOx @ 3% O <sub>2</sub> dry	14ng/J or 20 ppm NOx @ 3% O <sub>2</sub> dry
Small boiler	> 400,000 - < 1,000,000	No present standard	20ng/J or 30 ppm NOx @ 3% O <sub>2</sub> dry	14ng/J or 20 ppm NOx @ 3% O <sub>2</sub> dry
Mobile home water heater	All	No present standard	40ng/J or 55 ppm NOx @ 3% O <sub>2</sub> dry	40ng/J or 55 ppm NOx @ 3% O <sub>2</sub> dry
Pool/spa heater	> 400,000 - < 1,000,000	No present standard	40ng/J or 55 ppm NOx @ 3% O <sub>2</sub> dry	14ng/J or 20 ppm NOx @ 3% O <sub>2</sub> dry

400 ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE REPORT: A manufacturer shall submit to the Air Pollution Control Officer a Compliance Report that demonstrates compliance with Section 301 of this Rule for each water heater model subject to the provisions of this Rule. A manufacturer shall submit a new compliance report for any water heater model whose design is changed in any manner which may alter NOx emissions. These Compliance Reports, for either new or altered models, shall be submitted to the District at least 30 days before the water heater model is offered for sale, sold, or installed within the District. The compliance Report shall contain all the following information:

401.1 General Information:

- a. Name and address of manufacturer;
- b. Brand name and model;
- c. Model number as it appears on the rating plate of each water heater;
- d. Description of each water heater model being certified; and
- e. Heat input rating.

401.2 Test Report:

- a. All compliance test procedures and results for each water heater model; and
- b. All calculations for determining compliance of each water heater model.
- c. The manufacturer may submit to the District an approved Bay Area AQMD Regulation 9 Rule 6 or South Coast AQMD Rule 1121 or 1146.2 certification in lieu of conducting duplicative compliance tests.

401.3 Compliance Statement: A signed and dated statement attesting to the accuracy of all statements and information in the Compliance Report.

402 LABELING: The manufacturer shall display the model number of the water heater complying with the requirements specified in Section 301 of this Rule on the water heater shipping carton and rating plate.

500 MONITORING AND RECORDS

501 TEST METHODS: The manufacturer shall have each water heater model tested in accordance with the following:

501.1 Each tested water heater shall be operated in accordance with Section 2.4 of the American National Standards Institute ANSI Z21.10.1-1975 1990 at normal test pressure, input rates, and with a five-foot exhaust stack installed during NOx emissions tests.

501.2 The measurement of NOx emissions shall be conducted in accordance with the EPA Reference Test Method 7E (40 CFR 60, Appendix A). The determination of CO2 shall be conducted in accordance with EPA Reference Test Method 3A (40 CFR 60, Appendix A). Other methods require approval by the Air Pollution Control Officer and the U.S. EPA.

501.3 The following procedure shall be used to calculate the NOx emissions rate in ng/J (lb/BTU) of heat output:

$$N = \frac{5211 \times C_f \times P \times F}{H_c \times C} \quad \frac{4.566 \times 10^4 \times P \times U}{H \times C \times E}$$

where:

N	=	<u>Nanograms of NO<sub>x</sub> expressed as weight equivalent NO<sub>2</sub> per joule of heat output, ng/J (lb/10<sup>9</sup> BTU).</u> <u>NOx emission rate in nanograms of NOx emitted per joule of heat output.</u>
$4.566 \times 10^4$	=	<u>unit conversion factor (ppm to nanograms and Btu to joules)</u>
$E_f$	=	<u>Carbon number of fuel, dimensionless</u>
P	=	<u>NO<sub>x</sub> concentration in flue gas, ppmv.</u> <u>Concentration of NOx in the flue gas in parts per million (volume)</u>
U	=	<u>Dry volume percent of CO<sub>2</sub> in flue gas necessary for stoichiometric combustion</u>
H	=	<u>Gross heating value of the gas, Btu/ft<sup>3</sup> (at 60°F and 30 in Hg)</u>
F	=	<u>Volume of fuel burned, cubic feet at 30 inches of Hg and 60°F.</u>
H <sub>c</sub>	=	<u>Heat output, BTU.</u>
C	=	<u>Concentration of CO<sub>2</sub> measured in flue gas, percent.</u> <u>Dry volume percent of CO, in flue gas</u>
E	=	<u>Recovery efficiency, percentage, as defined in Section 6.1.3 of the Code of Federal Regulation, Title 10, Part 430, Subpart B, Appendix E.</u>

The definitions of and the measurement procedure for the above listed parameters are described in South Coast AQMD's Rule 1121 Nitrogen Oxides Emissions Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers.

- 501.4 A manufacturer that has certified a water heater model to demonstrate compliance with a State or local agency rule that meets the requirements of this Rule may submit the test results to the District in lieu of conducting duplicative testing.
- 502 **RECORDS:** A manufacturer shall keep Compliance Reports, test reports, and compliance statements for as long as the water heater model is offered for sale, sold, or installed within the District, or for twofive years, whichever is longer.

**ATTACHMENT B**

**EMISSION REDUCTION CALCULATIONS**

# EMISSION REDUCTION CALCULATIONS FOR SMALL WATER HEATERS AT 2010 10NG/J LIMIT

USEFUL LIFE= 15 YEARS FOR < 75,000 Btu/hr

EXPECTED % CHANGE OVER= 6.67% PER YEAR FOR < 75,000 Btu/hr

% OF UNITS BETWEEN 400,000 - 1MMBTU/HR= 25%\*\*

\* 2010, 2015, 2020, 2025, 2030, 2035, 2040 data derived from CARB Emissions Inventory database; interim years derived from data extrapolation  
 \*\* REFER TO CONTROL MEASURE BACK UP DATA ASSUMPTION (YSAQMD-7)

YEAR	INCREMENT #	CHANGE OVER	EX. NOx LEVEL (40 NG/J)	< THAN 75,000 BTU/HR			CONTROL RATE	EMISSION REDUCTION
				EMISSIONS TPD	% OF INV. IN THIS RANGE	NEW NOx LEVEL (10 NG/J)		
2010	0	6.7%	1	2.250	0.25	0.25	0.75	0.0000
2015	5	33.5%	1	2.357	0.25	0.25	0.75	0.1480
2020	10	67.0%	1	2.419	0.25	0.25	0.75	0.3039
2025	15	100.5%	1	2.504	0.25	0.25	0.75	0.4718

## EMISSION REDUCTION CALCULATIONS FOR LARGE WATER HEATERS AT 2010 40NG/J LIMIT AND 2014 14NG/J LIMIT

USEFUL LIFE= 25 YEARS FOR 75,000 - <1MM Btu/hr

EXPECTED % CHANGE OVER= 4% PER YEAR FOR 75,000 - <1MM Btu/hr

% OF UNITS BETWEEN 75,000 - 400,000 Btu/hr= 25%\*\*

\* 2010, 2015, 2020, 2025, 2030, 2035, 2040 data derived from CARB Emissions Inventory database; interim years derived from data extrapolation

\*\* REFER TO CONTROL MEASURE BACK UP DATA ASSUMPTION (YSAQMD-7)

75,000 - 400,000 BTU/HR				AS OF 1/2010		AS OF 1/2014							
YEAR	CHANGE OVER	EMISSIONS TPD	% OF INV. IN THIS RANGE	NEW NOx LEVEL (40 NG/J)	EMISSION REDUCTION	YEAR	CHANGE OVER	% OF INV. IN	EMISSIONS TPD	NEW NOx LEVEL (14 NG/J)	CONTROL RATE	EMISSION REDUCTION	
2010	0	0.0%	2.250	25%	1	0.0000							
2011	1	4.0%	2.271	25%	1	0.0000							
2012	2	8.0%	2.293	25%	1	0.0000							
2013	3	12.0%	2.314	25%	1	0.0000							
2014	4	16.0%					2014	0	0.0%	25%	2.336		
2015	5	20.0%					2015	1	4.0%	25%	2.357	0.35	0.0153
2016	6	24.0%					2016	2	8.0%	25%	2.369		
2017	7	28.0%					2017	3	12.0%	25%	2.382		
2018	8	32.0%					2018	4	16.0%	25%	2.394	0.65	0.0622
2019	9	36.0%					2019	5	20.0%	25%	2.407		
2020	10	40.0%					2020	6	24.0%	25%	2.419	0.35	0.0943
2021	11	44.0%					2021	7	28.0%	25%	2.431		
2022	12	48.0%					2022	8	32.0%	25%	2.444		
2023	13	52.0%					2023	9	36.0%	25%	2.456		
2024	14	56.0%					2024	10	40.0%	25%	2.469		
2025	15	60.0%					2025	11	44.0%	25%	2.504	0.35	0.1790
2026	16	64.0%					2026	12	48.0%	25%	2.521		
2027	17	68.0%					2027	13	52.0%	25%	2.538		
2028	18	72.0%					2028	14	56.0%	25%	2.554		
2029	19	76.0%					2029	15	60.0%	25%	2.571		
2030	20	80.0%					2030	16	64.0%	25%	2.588	0.35	0.2692
2031	21	84.0%					2031	17	68.0%	25%	2.605		
2032	22	88.0%					2032	18	72.0%	25%	2.622		
2033	23	92.0%					2033	19	76.0%	25%	2.639		
2034	24	96.0%					2034	20	80.0%	25%	2.656		
2035	25	100.0%					2035	21	84.0%	25%	2.673	0.35	0.3649
							2036	22	88.0%	25%	2.690		
							2037	23	92.0%	25%	2.707		
							2038	24	96.0%	25%	2.724		
							2039	25	100.0%	25%	2.894	0.35	0.4703

Total emission reduction = 0.4703

## EMISSION REDUCTION CALCULATIONS FOR SMALL BOILERS AT 2010 20NG/J LIMIT AND 2014 14NG/J LIMIT

USEFUL LIFE= 25 YEARS FOR 75,000 - < 1MM Btu/hr

EXPECTED % CHANGE/OVER= 4% PER YEAR FOR 75,000 - < 1MM Btu/hr

% OF UNITS BETWEEN 400,000 - 1MMBTU/HR= 50%\*\*

\* 2010, 2015, 2020, 2025, 2030, 2035, 2040 data derived from CARB Emissions Inventory database; interim years derived from data extrapolation

\*\* REFER TO CONTROL MEASURE BACK UP DATA ASSUMPTION (YSAQMD-7)

> 400,000 - < 1MMBTU/HR				AS OF 1/2010		AS OF 1/2014							
YEAR	CHANGE OVER	EMISSIONS TPD	% OF INV. IN THIS RANGE	NEW NOx LEVEL (20 NG/J)	EMISSION REDUCTION	YEAR	CHANGE OVER	% OF INV. IN	EMISSIONS TPD	NEW NOx LEVEL (14 NG/J)	CONTROL RATE	EMISSION REDUCTION	
2010	0	0.0%	2.250	50%	0.5	0.0000							
2011	1	4.0%	2.271	50%	0.5	0.0227							
2012	2	8.0%	2.293	50%	0.5	0.0459							
2013	3	12.0%	2.314	50%	0.5	0.0694							
2014	4	16.0%					2014	0	0.0%	50%	2.336	0.35	
2015	5	20.0%					2015	1	4.0%	50%	2.357	0.35	0.65
2016	6	24.0%					2016	2	8.0%	50%	2.369	0.35	
2017	7	28.0%					2017	3	12.0%	50%	2.382	0.35	
2018	8	32.0%					2018	4	16.0%	50%	2.394	0.35	0.1939
2019	9	36.0%					2019	5	20.0%	50%	2.407	0.35	
2020	10	40.0%					2020	6	24.0%	50%	2.419	0.35	0.65
2021	11	44.0%					2021	7	28.0%	50%	2.431	0.35	
2022	12	48.0%					2022	8	32.0%	50%	2.444	0.35	
2023	13	52.0%					2023	9	36.0%	50%	2.456	0.35	
2024	14	56.0%					2024	10	40.0%	50%	2.469	0.35	
2025	15	60.0%					2025	11	44.0%	50%	2.504	0.35	0.65
2026	16	64.0%					2026	12	48.0%	50%	2.521	0.35	
2027	17	68.0%					2027	13	52.0%	50%	2.538	0.35	
2028	18	72.0%					2028	14	56.0%	50%	2.554	0.35	
2029	19	76.0%					2029	15	60.0%	50%	2.571	0.35	
2030	20	80.0%					2030	16	64.0%	50%	2.588	0.35	0.65
2031	21	84.0%					2031	17	68.0%	50%	2.605	0.35	
2032	22	88.0%					2032	18	72.0%	50%	2.622	0.35	
2033	23	92.0%					2033	19	76.0%	50%	2.639	0.35	
2034	24	96.0%					2034	20	80.0%	50%	2.656	0.35	
2035	25	100.0%					2035	21	84.0%	50%	2.673	0.35	0.65
							2036	22	88.0%	50%	2.690	0.35	
							2037	23	92.0%	50%	2.707	0.35	
							2038	24	96.0%	50%	2.724	0.35	
							2039	25	100.0%	50%	2.894	0.35	0.65

Total emission reduction = 1.0100

**ATTACHMENT C**

**NOTICE OF EXEMPTION FROM CEQA GUIDELINES**

## Notice of Exemption

**To:**  Office of Planning and Research  
1400 Tenth Street., Room 121  
Sacramento, CA 95814

County Clerk  
County of Yolo  
625 Court Street Room 105  
Woodland, CA 95695

Clerk of the Board of Supervisors  
Solano County  
675 Texas Street, Suite 6500  
Fairfield, CA 94533

**From:** Yolo-Solano Air Quality Management District  
1947 Galileo Court, Suite 103, Davis, CA 95618

**Project Title:** Revision of Rule 2.37- Natural Gas Fired Water Heaters and Small Boilers

**Project Location:** Yolo-Solano Air Quality Management District

**Project description:** Rule 2.37 will be amended to include nitrous oxide (NOx) emission limits for water heaters/small boilers with rated heat input capacities less than 1,000,000 British Thermal Units per hour.

**Name of Public Agency Approving Project:** Yolo-Solano Air Quality Management District

**Name of Person or Agency Carrying Out Project:** Yolo-Solano Air Quality Management District

**Exempt Status:**

- Ministerial  
 Emergency Project  
 Categorical Exemption (CEQA Guidelines Section 15308, Action by Regulatory Agency for Protection of the Environment)  
 Statutory Exemption

**Reason why project is exempt:** The revision of Rule 2.37 is an action taken to protect the environment and is therefore exempt from CEQA because it constitutes a Class 8 categorical exemption pursuant to CEQA Guidelines 15308.

**Lead Agency Contact Person:** Mat Ehrhardt, P.E., Air Pollution Control Officer

**Telephone Number:** (530) 757-3650

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Title:** \_\_\_\_\_

## Notice of Exemption

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**Lead Agency Contact Person:** Mat Ehrhardt, P.E., Air Pollution Control Officer  
**Telephone Number:** (530) 757-3650

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**ATTACHMENT D**

**RESOLUTION NO. 09-04**

**RESOLUTION NO. 09-04**

**RESOLUTION ADOPTING YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT  
RULE 2.37, NATURAL GAS-FIRED WATER HEATERS AND SMALL BOILERS**

**WHEREAS**, California Health and Safety Code section 40702 provides that an air quality management district shall adopt rules and regulations, and do such acts as may be necessary or proper to execute the powers and duties granted to, and imposed upon, the district by Division 26 of the Health and Safety Code; and

**WHEREAS**, Health and Safety Code section 40727 provides that before adopting, amending, or repealing a rule or regulation, a district board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference, based upon information developed pursuant to section 40727.2, information in the rulemaking record maintained pursuant to section 40728, and relevant information presented at the public hearing required by section 40725; and

**WHEREAS**, section 15308 of the California Environmental Quality Act (CEQA) Guidelines provides that actions taken by regulatory agencies as authorized by state law to assure the maintenance, restoration, or enhancement of the environment where the regulatory process involves procedures for protection of the environment, are categorically exempt from CEQA review (Class 8 Categorical Exemption); and

**WHEREAS**, California Health and Safety Code sections 39002 and 40000 provides that an air quality management district shall have the responsibility to control air pollution from all sources other than vehicular sources; and

**WHEREAS**, the purpose of adopting District Rule 2.37 is to establish oxides of nitrogen (NOx) emission limits from natural gas-fired water heaters and small boilers with rated heat input capacities less than 1,000,000 British thermal units per hour.

**NOW, THEREFORE, BE IT RESOLVED** that the Board of Directors of the Yolo-Solano Air Quality Management District hereby finds, authorizes, directs and declares as follows:

1. The Board of Directors has considered and hereby adopts by reference the staff report prepared in this matter.
2. The Board of Directors makes the following findings pursuant to Health and Safety Code section 40727:

Attest:

Approved as to Form:

---

Kay Mahorney, Clerk  
Board of Directors

---

Hope Welton, District Counsel

**ATTACHMENT E**  
**WRITTEN COMMENTS RECEIVED**

**STATE OF CALIFORNIA  
ENVIRONMENTAL PROTECTION AGENCY  
AIR RESOURCES BOARD**



P. O. Box 2815  
Sacramento, California 95812

February 2, 2009

**Transmittal  
of  
ARB Staff Rule Review Comments**

**To:** Ms. Tiffany Lathrop  
Assistant Air Quality Planner  
Yolo Solano Air Quality Management District  
Telephone Number: (530) 757-3677  
e-mail: tlathrop@ysaqmd.gov

**From:** Alex Krichevsky, (916) 324-6222  
e-mail: akrichev@arb.ca.gov

The following draft rule, which is scheduled for a public workshop to be held by your District staff on February 10, 2009, was received by us on January 7, 2009, for our review:

**Rule 2.37      Natural Gas-Fired Water Heaters and Small Boilers**

We have reviewed the rule and have the comments on the following page.

On January 13th and 14th, 2009, Mr. Thomas Pomales of our Energy Section, Project Assessment Branch, Stationary Source Division, discussed the comments with you.

If you have any questions about our comments, please contact Mr. Dave Mehl, Manager of the Energy Section, at (916) 323-1491.

**Rule review comments are on the following page**

Date: February 2, 2009

Air Resources Board Staff Comments on  
Yolo Solano Air Quality Management District  
Draft Rule 2.37

Rule 2.37 Natural Gas-Fired Water Heaters and Small Boilers

1. Section 110.3: This section makes reference to "swimming pools and hot tubs..." We suggest that reference to "swimming pools and hot tubs" be changed to "pools/spas" for consistency with the rest of the rule.
2. Section 200: ARB staff recommends that a new subsection be added to include a definition for Pool/Spa Heaters.
3. Section 301: In the last two lines of this section it is stated that "...40 nanograms calculated as weight equivalent NO<sub>2</sub> per joule (ng/j) [93 pounds per billion BTU] (93 lb/10<sup>9</sup> BTU) of heat output." For consistency with the rest of the sections, ARB staff recommends that this sentence be revised to read as follows:  
  
    "...40 nanograms per Joule calculated as weight equivalent NO<sub>2</sub> (ng/J)  
    (93 pounds per billion BTU) of heat output"
4. Section 401.2: This section states that "The manufacturer may submit to the District an approved Bay Area AQMD or South Coast AQMD certification in lieu of conducting duplicative compliance tests." We recommend that the District specify which Bay Area AQMD and South Coast AQMD rules describe the certification process for natural gas-fired water heaters and small boilers.
5. Section 501.3: This section makes reference to the number "5211" in the equation to calculate the NO<sub>x</sub> emissions rate in ng/j (lb/BTU) of heat output, but does not state what this number represents. We recommend that an explanation for the number "5211" in the equation be included in this section.

**Tiffany Lathrop - EPA comments on Yolo-Solano 2.37**

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**From:** <Steckel.Andrew@epamail.epa.gov>  
**To:** Matt Jones <MJones@ysaqmd.org>, <mguzzett@arb.ca.gov>  
**Date:** 2/10/2009 11:10 AM  
**Subject:** EPA comments on Yolo-Solano 2.37  
**CC:** <Perez.Idalia@epamail.epa.gov>

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United States Environmental Protection Agency

**Region IX**  
75 Hawthorne Street  
San Francisco, CA 94105-3901

February 10, 2009

**Transmittal of EPA Rule Review Comments**

**To:** Matt Jones, Yolo-Solano Air Quality Management District  
mjones@ysaqmd.org

Mike Guzzetta, California Air Resources Board  
mguzzett@arb.ca.gov

**From:** Andrew Steckel, Rulemaking Office Chief  
steckel.andrew@epa.gov

**Re:** Rule 2.37, Natural Gas-Fired Water Heaters and Small Boilers, Revised 4/8/09

We are providing comments based on our preliminary review of the draft rule identified above. Please direct any questions about our comments to me at (415) 947-4115 or to Idalia Perez at (415) 972-3248.

Section 302.5 refers to pool/spa heaters without previously defining the term. We recommend a definition of this term be added to Section 200.

Section 401.2.c indicates that Bay Area AQMD and South Coast AQMD certification can be submitted in lieu of conducting duplicative testing. We suggest the Rule specify which SCAQMD and BAAQMD rules describe the certification process for water heaters.

We also recommend the District reconsider setting stricter NOx emission limits such as those set by South Coast AQMD in Rule 1146.2 adopted May 5, 2006 which regulates units larger than 0.75 MM btu/hour.