

RULE 239 - NATURAL GAS-FIRED ~~RESIDENTIAL~~ WATER HEATERS LESS THAN 1,000,000 BTU PER HOUR

(Adopted: March 24, 1998, amended October 21, 2025)

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B.

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RULE 239 – NATURAL GAS FIRED RESIDENTIAL WATER HEATERS
ADOPTED: MARCH 24, 1998

239.1 GENERAL

RULE 239 - NATURAL GAS-FIRED WATER HEATERS LESS THAN 1,000,000 BTU PER HOUR

239.1 GENERAL

A. **PURPOSE:** To limit the emission of nitrogen oxides (NO_x) from the use of natural gas-fired ~~residential~~ water heaters.

~~A.~~

~~B.~~ **APPLICABILITY:** ~~÷~~

~~1. **GEOGRAPHIC:** The provisions of this rule apply to all of El Dorado County.~~

B. **GENERAL:** The provisions of this is-rrule shall apply to any person who manufactures, distributes, offers for sale, sells, or installs any natural gas-fired ~~residential~~ water heater with a rated heat input capacity less than 751,000,000 British thermal units per hour (Btu/hr), for use in this District.

C. **SEVERABILITY:** Each provision of this rule shall be deemed severable. In the event that any provisions of this rule is deemed to be invalid, the remainder of this rule shall continue in full force and effect.

~~2.~~

D. **EXEMPTIONS:** The provisions of this rule shall not apply to:

1. ~~**LARGE NATURAL GAS-FIRED WATER HEATERS:** Water heaters with a rated heat input of 751,000,000 Btu/hr or greater are exempt from all provisions of this rule.~~

~~C.~~

1. ~~**EXEMPTION, RECREATIONAL VEHICLES:** Natural gas-fired Wwater heaters used exclusively in recreational vehicles are exempt from all provisions of this rule.~~

2.

D. ~~**EXEMPTION, SWIMMING POOLS AND HOT TUBS:** Natural gas-fired wwater heaters used exclusively to heat swimming pools and hot tubs are exempt from all provisions of this rule.~~

E. ~~**EXEMPTION, OTHER FUELS:** Water heaters using any fuel other than natural gas are exempt from all provisions of this rule.~~

239.2 DEFINITIONS

A. **BRITISH THERMAL UNIT (Btu):** The amount of heat energy required to raise the temperature of one pound of water from 59-°F to 60-°F at one atmosphere pressure.

~~A.~~

B. **HEAT INPUT:** The actual amount of heat energy released by natural gas burned in a natural gas-fired water heater. It is calculated during certification testing in accordance with the test method referenced in Section 239.5 A.

~~B.~~

C. **HEAT OUTPUT:** The amount of heat energy, H_o, in British thermal units (Btu), absorbed by the water being heated during the process of natural gas-fired water heater testing in accordance with the protocol referenced in Section 239.5 A.

~~C.~~

D. **MOBILE HOME:** A residential dwelling, designed and manufactured to be movable from site to site as desired by the owner/occupant, and that is not a Recreational Vehicle as defined in Section 239.2 H.

~~D.~~

E. **MOBILE HOME WATER HEATER:** A natural gas-fired water heater manufactured exclusively for mobile home use.

~~E.~~

F. **NATURAL GAS:** A mixture of gaseous hydrocarbons containing at least 80 percent methane by volume as determined according to American Standard Test Method (ASTM) D1945-64.

~~F.~~

G. **NATURAL GAS-FIRED WATER HEATER:** A closed vessel in which water is heated by the combustion of natural gas and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210°F (99°C).

H. **PARTS PER MILLION BY VOLUME (ppmv):** The ratio of the number of gas molecules of a given species, or group of species, to the number of millions of total gas molecules.

~~G.~~

I. **RATED HEAT INPUT CAPACITY:** The heat input capacity specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the actual heat input capacity as certified by the mManufacturer or cCertified technician, shall be considered as the rated heat input capacity.

RECREATIONAL VEHICLE: A motor home, travel trailer, truck camper, or camping trailer, with or without motive power, designed for human habitation for recreational, emergency, or other occupancy, as defined pursuant to Section 18010 of the California Health and Safety Code.

~~J.~~

~~**RECREATIONAL VEHICLE:** A motor home, travel trailer, truck camper, or camping trailer, with or without motive power, designed for human habitation for recreational, emergency, or other occupancy, which meets all of the following criteria:~~

- ~~1. contains less than 320 square feet of internal living room area, excluding built-in equipment, including, but not limited to wardrobe, closets, cabinets, kitchen units or fixtures, and bath or toilet rooms;~~
- ~~2. it contains 400 square feet or less of gross area measured at maximum horizontal projections;~~
- ~~3. it is built on a single chassis; and~~
- ~~4. it is either self-propelled, truck-mounted, or permanently towable on the highways without a permit.~~

K. **SWIMMING POOLS AND HOT TUBS:** A device in which water is heated when pool or spa water circulates through a heat exchanger. Residential-only, single-family dwellings, recreational and personal therapeutic equipment, including in-ground swimming pools, above-ground swimming pools, spas and hot tubs.

L. **WATER HEATER:** A closed vessel in which water is heated and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which is generated and all control and devices necessary to prevent water temperatures from exceeding 210°F (99°C)

~~H.~~

239.3 STANDARDS:

~~A. **NITROGEN OXIDES EMISSIONS**~~ **S LIMIT:** No person shall ~~distribute~~, offer for sale, sell, or

install any

A. natural gas-fired residential water heater subject to the provision of this rule within the District with NOx emissions in excess of the following limits: which does not comply with the following:

1. A natural gas-fired residential water heater that emits less than or equal to 40 nanograms of nitrogen oxides (calculated as NO2) per joule (93 pounds per billion Btu) of heat output; and is certified in —accordance with Section 239.4 B.
2. A mobile home natural gas-fired water heater that emits less than or equal to 50 nanograms of nitrogen oxides (calculated as NO2) per joules (116 pounds per billion Btu) of heat output; and is certified in
3. accordance with Section 239.4 B.

<u>Heat Input Range and Type</u>	<u>NOx Limit Nanograms per Joule of Heat Output (ppmv @ 3% O2)*</u>
<u>< 75,000 Btu/hr</u>	
<u>Mobile Home</u>	<u>50 (66)</u>
<u>All others</u>	<u>40 (55)</u>
<u>75,000 to < 400,000 Btu/hr</u>	
<u>Pool/Spa</u>	<u>40 (55)</u>
<u>All others</u>	<u>14 (20)</u>
<u>400,000 to < 1million Btu/hr</u>	
<u>All Types</u>	<u>14 (20)</u>

* Where limits are shown in units of both nanograms per joule of heat output and ppmv at 3% oxygen, compliance can be demonstrated using either limit.

239.4 ADMINISTRATIVE REQUIREMENTS:

239.4

A. COMPLIANCE SCHEDULE: Effective December 1, 19984, no person shall distribute, offer for sale, sell, or install any natural gas-fired residential water heater which does not comply with the requirements of Section 239.3 STANDARDS.

A. CERTIFICATION REQUIREMENT:

B.

1. COMPLIANCE REPORT: A manufacturer shall submit to the Air Pollution Control Officer a cCompliance Rreport that demonstrates compliance with Section 239.3 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 cCompliance rReports, 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 Ccompliance Rreport shall contain all the following information: manufacturer of any natural gas-fired residential water heater subject to Section 239.3 STANDARDS, shall submit to the Air Pollution Control Officer (APCO) at least 30 days prior to sale, a statement obtained from an independent testing laboratory, certifying that the laboratory tested the unit in accordance with the method in Section 239.5 MONITORING AND RECORDKEEPING of this rule, and that it is in compliance with the provisions of Section 239.3 STANDARDS. The statement shall be signed, dated, and shall attest to the accuracy of all information. The statement shall include the brand name, model number, the heat input capacity rating as it appears on the water heater rating plate, and test results in accordance with Section 239.5 MONITORING AND RECORDKEEPING; or

a. Name and address of the manufacturer;

- b. Brand name and model as it appears on the rating plate;
 - c. Fuel type unit is fired with;
 - d. Description of each water heater model being certified;
 - e. Heat input rating;
 - f. All compliance test procedures and results for each water heater model, as performed by an independent testing laboratory, in accordance with Section 239.5A;
 - g. All calculations for determining compliance of each water heater model; and
 - h. A signed and dated statement attesting to the accuracy of all statements and information in the compliance report.
2. In lieu of Section 239.4A.1(f) and 239.4A.1(g), a manufacturer may submit to the District, at least 30 days prior to a model being sold or distributed for sale with the District, an approved South Coast Air Quality Management District Rule 1121 or 1146.2 certification.
1. ~~er~~
2. ~~A manufacturer shall submit to this District an approved South Coast Air Quality Management District certification. Any model of natural gas-fired water heater certified as complying with the South Coast Air Quality Management District's Rule 1121 prior to July 1, 1995, need not be recertified to the test protocol specified in Section 239.5 MONITORING AND RECORDKEEPING until such time as required by the South Coast Air Quality Management District.~~

B. MANUFACTURER'S LABELING REQUIREMENT: A manufacturer shall display the model number of the water heater complying with Section 239.3 STANDARDS on the shipping carton and on the rating plate of each water heater unit. The manufacturer shall also display the certification status on the shipping carton and on the water heater.

239.5 MONITORING AND RECORDKEEPING

239.5

A. TESTING SCHEDULE: The manufacturer shall have each water heater, boiler, or process heater subject to this rule tested in accordance with one of the following:

~~A. CALCULATION FOR DETERMINATION OF HEAT OUTPUT: The amount of heat energy, H_o , in British thermal units (Btu), absorbed by the water being heated during the process of natural gas-fired water heater testing in accordance with the protocol referenced in Section 239.5 A.. It is calculated using the following equation:~~

$$H_o = MC_{pi}(T_{del} - T_{in}) + V_{st}D_nC_{p2}(T_{max} - T_o)$$

~~Where:~~

~~H_o = heat output, in Btu~~

~~M = mass of the water withdrawn, in pounds~~

~~C_{pi} = specific heat of water at the average temperature $[(T_{del} + T_{in}) / 2]$, Btu per pound per $^{\circ}F$ T_{del} = average delivery temperature, $^{\circ}F$~~

~~T_{in} = average inlet temperature, $^{\circ}F$~~

~~V_{st} = storage tank capacity, in gallons, as determined in Section 239.2~~

~~o~~

~~D_w = density of water at the average temperature $[(T_{max} + T_o) / 2]$, pounds per gallon~~

~~o~~

~~C_{p2} = specific heat of water at the average temperature, $[(T_{max} + T_o) / 2]$, Btu per pound per $^{\circ}F$ T_{max} =~~

~~maximum mean tank temperature recorded after cutout following the test draw, $^{\circ}F$~~

~~o~~

~~T_o = maximum mean tank temperature recorded prior to the test draw, $^{\circ}F$~~

~~**B. — CALCULATION FOR DETERMINATION OF STORAGE TANK CAPACITY: The capacity of the**~~

~~natural gas-fired water heater in gallons. It is calculated using the following equation:~~

$$V_{st} = (W_f - W_t) / D_s$$

~~Where:~~

~~V_{st} = storage capacity of the water heater, in gallons~~

~~W_f = weight of the water heater completely filled with water, in pounds W_t = weight of the empty water heater, in pounds~~

~~D_s = density of water at the test temperature, in pounds per gallon~~

~~239.6 MONITORING AND RECORDKEEPING~~

- ~~1. **TESTING PROCEDURE:** South Coast Air Quality Management District Protocol: "Nitrogen Oxides Emission Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers".~~
- ~~2. South Coast Air Quality Management District Test Method 100.1~~
- ~~3. EPA Reference Test Method 7E (40 CFR 60, Appendix A)~~
- ~~4. A manufacturer that has certified a unit 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. Any natural gas-fired water heater distributed, offered for sale, sold, or installed within the District shall be tested in accordance with the South Coast Air Quality Management District Protocol: Nitrogen Oxides Emission Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers, January 1995.~~

~~A.~~

- B. ~~**DURATION OF RECORDS**~~**RECORDKEEPING:** A manufacturer shall keep test reports and certification records for as long as the water heater model is offered for sale or sold in the District, or for three calendar years after manufacture, whichever is longer. These records shall be made available to the Air Pollution Control Officer upon request.