

**REGULATION 9
INORGANIC GASEOUS POLLUTANTS
RULE 7
NITROGEN OXIDES AND CARBON MONOXIDE FROM INDUSTRIAL,
INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS,
AND PROCESS HEATERS**

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**REGULATION 9
INORGANIC GASEOUS POLLUTANTS
RULE 7
NITROGEN OXIDES AND CARBON MONOXIDE FROM INDUSTRIAL,
INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS,
AND PROCESS HEATERS**

(Adopted September 16, 1992)

9-7-100 GENERAL

9-7-101 Description: This rule limits the emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) from industrial, institutional, and commercial boilers, steam generators, and process heaters.

9-7-110 Exemptions: The requirements of this rule shall not apply to the following:

110.1 Boilers, steam generators, and process heaters with a rated heat input ~~less than 10 of 2~~ million BTU/hour or less, if fired exclusively with natural gas, liquefied petroleum gas, or any combination thereof;

110.2 Boilers, steam generators and process heaters with a rated heat input less than 1 million BTU/hour fired with any fuel;

110.3 Boilers, steam generators, and process heaters that are used in petroleum refineries;

110.4 Boilers used by public electric utilities or qualifying small power production facilities, as defined in Section 228.5 of the Public Utilities Code, to generate electricity;

110.5 Waste heat recovery boilers that are used to recover sensible heat from the exhaust of combustion turbines or reciprocating internal combustion engines;

110.6 Kilns, ovens, and furnaces used for drying, baking, heat treating, cooking, calcining, or vitrifying.

9-7-111 Limited Exemption, Low Fuel Usage - Section 9-7-301: The requirements of Section 9-7-301 shall not apply to the use of any boiler, steam generator, or process heater with an annual heat input less than 90,000 therms during each consecutive 12-month period after July 1, 1993, or that accepts a limiting condition in their operating permit to limit the annual heat input to less than 90,000 therms, provided the requirements of Sections 9-7-304 and 504 are satisfied.

9-7-112 Limited Exemption, Low Fuel Usage - Boiler, Steam Generator or Process Heater Rated Less Than 10 Million BTU/hr Input: The requirements of Sections 9-7-307.1 and 307.2 shall not apply to the use of any boiler, steam generator, or process heater provided that all the following conditions are met:

112.1 The device uses less than 10% of its annual maximum heat capacity in each consecutive 12-month period beginning January 1, 2011, and

112.2 The requirements of Sections 9-7-308 and 504 are satisfied.

9-7-113 Limited Exemption, Low Fuel Usage - Boiler, Steam Generator or Process Heater Rated 10 Million BTU/hr Input or More: The requirements of Section 9-7-307.3 through 307.6 shall not apply to the use of any boiler, steam generator, or process heater provided that all the following conditions are met:

113.1 The device uses less than 10% of its annual maximum heat capacity in each consecutive 12-month period beginning January 1, 2011, and

113.2 The requirements of Sections 9-7-307.10 and 504 are satisfied.

9-7-114 Limited Exemption, Use of Non-Gaseous Fuel During Natural Gas Curtailment or Testing: The NO_x emission limits of Sections 9-7-301.8 and 307.9 shall not apply during the use of non-gaseous fuel in any boiler, steam generator, or process heater during a natural gas curtailment provided that all of the following conditions are met:

114.1 The device does not burn non-gaseous fuel for more than 168 total hours in each consecutive 12-month period, plus 48 hours in each consecutive 12-month period for oil-burn readiness testing or state, federal, or local agency-required performance testing, and

114.2 The device does not exceed a NO_x exhaust concentration of 150 ppmv, and
 114.3 The records specified in Section 9-7-503.3 are maintained.

9-7-115 Limited Exemption, Tune-up: The emission limits of Section 9-7-307 shall not apply during the tune-up of a boiler, steam generator or process heater required by Section 9-7-312. Emissions shall be minimized to the extent possible during the exemption period and the tune-up shall be completed in as little time as necessary.

9-7-116 Limited Exemption, Startup and Shutdown: The emission limits of Section 9-7-307 shall not apply during startup and shutdown periods provided that all of the following conditions are met:

116.1 Each startup and shutdown period shall not exceed two hours, unless otherwise allowed in a District Permit to Operate. In no case shall the startup period exceed 12 hours, or the shutdown period exceed 9 hours.

116.2 All emission control systems shall be in operation and emissions shall be minimized, to the extent possible, during startup and shutdown periods.

9-7-200 DEFINITIONS

9-7-201 Annual Heat Input: The total heat input of fuels burned by a combustion source during any consecutive 12-month period, as determined from the higher heating value and cumulative annual usage of each fuel.

9-7-202 Annual Maximum Heat Capacity: The amount of heat input that a device would have if it operated at its rated heat input continuously for 365 consecutive days.

9-7-203 Boiler or Steam Generator: Any combustion equipment used to produce steam or to heat water.

9-7-204 British Thermal Unit (BTU): The amount of heat required to raise the temperature of one pound of water from 59° to 60°F at one atmosphere.

9-7-205 Digester Gas: Gas derived from the decomposition of organic matter in a digester.

9-7-206 Gaseous Fuel: Any fuel that is a gas at 68°F and one atmosphere.

9-7-207 Heat Input: The heat of combustion released due to burning a fuel in a source, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.

9-7-208 Heat-Input Weighted Average: The heat input of the gaseous fuel per unit time divided by the total heat input per unit time and the heat input per unit time of the non-gaseous fuel divided by the total heat input per unit time. The calculated fractions are used to calculate the applicable weighted average ppmv emission limit of Section 9-7-301.3303.

9-7-209 Higher Heating Value (HHV): The total heat liberated per mass of fuel burned (BTU per pound), when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to their standard states at standard conditions. The HHV is determined as specified in Section 9-7-605.

9-7-210 Landfill Gas: Gas derived from the decomposition of waste in a landfill.

9-7-211 Load-Following Unit: A unit with normal operational load fluctuations and requirements, imposed by fluctuations in the process(es) served by the unit, that exceed the operational response range of a Ultra-Low NO_x burner system operating at 9 ppmv NO_x, as determined by the District and indicated on the device's permit to operate.

9-7-212 Natural Gas: Any mixture of gaseous hydrocarbons containing at least 80 percent methane by volume, as determined according to Standard Method ASTM D1945-64.

9-7-213 Natural Gas Curtailment: A shortage in the supply of pipeline natural gas, due solely to supply limitations or restrictions in distribution pipelines by the utility supplying the gas, and not due to the cost of natural gas.

9-7-214 Nitrogen Oxide (NO_x) Emissions: The sum of nitric oxide (NO) and nitrogen dioxide (NO₂) in the flue gas, collectively expressed as nitrogen dioxide.

9-7-209 Non-Gaseous Fuel: Any fuel which is not a gas at 68°F and one atmosphere.

9-7-215 Process Heater: Any combustion equipment that which transfers heat from combustion gases to water or process streams. A process heater does not include any kiln, furnace, or oven, which is used for drying, baking, heat treating, cooking,

calcining, or vitrifying. A process heater also does not include a space heating device that is primarily intended to only heat ambient air.

9-7-216244 Rated Heat Input: The heat input capacity specified on the nameplate of the boiler, steam generator or process heater, or the sum of the capacities on the nameplates of the burners in the boiler, steam generator or process heater, whichever is greater combustion source. If the combustion source has been physically modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the modified maximum heat input, per Section 9-7-502, shall be considered as the rated heat input.

9-7-217 Shutdown Period: The period of time during which a unit is taken from an operational to a non-operational status.

9-7-218 Startup Period: The period of time during which a unit is brought from a non-operational status to operating temperature, including the time required for the unit's emission control system to reach full operation.

9-7-219242 Therm: One hundred thousand (100,000) BTU's.

9-7-300 STANDARDS

9-7-301 Interim Emission Limits—Gaseous Fuel: ~~Effective January 1, 1996, No~~ a person shall ~~not~~ operate a boiler, steam generator, or process heater with a rated heat input greater than or equal to 10 million BTU per hour, ~~fired on gaseous fuel~~, unless the following emission limits are met:

301.1 Nitrogen oxides (NOx) emissions shall not exceed 30 ppmv, dry at 3 percent oxygen when gaseous fuel is used;

301.2 Nitrogen oxides (NOx) emissions shall not exceed 40 ppmv, dry at 3 percent oxygen when non-gaseous fuel is used;

301.3 Nitrogen oxides (NOx) emissions shall not exceed the heat-input weighted average of the limits in Sections 9-7-301.1 and 301.2 when a combination of gaseous and non-gaseous fuel is used;

301.4~~2~~ Carbon monoxide (CO) emissions shall not exceed 400 ppmv, dry at 3 percent oxygen.

This section shall not apply to any boiler, steam generator, or process heater subject to a NOx or CO emission limit in Section 9-7-307.

~~**9-7-302 Emission Limits - Non-Gaseous Fuel:** Effective January 1, 1996, a person shall not operate a boiler, steam generator, or process heater, with a rated heat input greater than or equal to 10 million BTU per hour, fired on non-gaseous fuel, unless the following emission limits are met:~~

~~302.1 Nitrogen oxides (NOx) shall not exceed 40 ppmv, dry at 3 percent oxygen;~~

~~302.2 Carbon monoxide (CO) shall not exceed 400 ppmv, dry at 3 percent oxygen.~~

~~**9-7-303 Emission Limits - Gaseous and Non-Gaseous Fuel:** Effective January 1, 1996, a person shall not operate a boiler, steam generator, or process heater, with a rated heat input greater than or equal to 10 million BTU per hour, fired simultaneously on combinations of gaseous and non-gaseous fuels, unless the heat input weighted average of the emission limits specified in subsections 9-7-301.1, 301.2, 302.1, and 302.2 are not exceeded.~~

9-7-304 Interim Low Fuel Usage Requirements: ~~Effective January 1, 1996, a~~ No person shall ~~who~~ operates any boiler, steam generator, or process heater ~~under with~~ rated heat input greater than or equal to 10 million BTU per hour and qualifying for the limited exemption in Section 9-7-111, or with rated heat input less than 10 million BTU per hour with the capability of firing any non-gaseous fuel other than natural gas or liquefied petroleum gas, without doing at least shall meet one of the following conditions:

304.1 Operate in a manner that maintains stack-gas oxygen concentrations at less than or equal to 3 percent by volume on a dry basis; or

304.2 Perform an inspection and tune-up ~~Tune~~ at least once every ~~12~~ twelve months by a technician in accordance with the procedure specified in Section 9-7-604; or

304.3 Meet the emission limits specified in Sections 9-7-301, ~~302,~~ or 303.

~~9-7-305 **Natural Gas Curtailment – Non-Gaseous Fuel:** Effective January 1, 1996, if natural gas is unavailable to use, a person shall not operate a boiler, steam generator, or process heater, fired on non-gaseous fuel, unless the following emission limits are met:~~

~~305.1 Nitrogen oxides (NOx) shall not exceed 150 ppmv, dry at 3 percent oxygen;~~

~~305.2 Carbon monoxide (CO) shall not exceed 400 ppmv, dry at 3 percent oxygen.~~

~~9-7-306 **Equipment Testing – Non-Gaseous Fuel:** Effective January 1, a person shall not operate a boiler, steam generator, or process heater, fired on non-gaseous fuel for equipment testing, unless the following limits are met:~~

~~306.1 Nitrogen oxides (NOx) shall not exceed 150 ppmv, dry at 3 percent oxygen.~~

~~306.2 Carbon monoxide (CO) shall not exceed 400 ppmv, dry at 3 percent oxygen.~~

~~306.3 Equipment testing shall not exceed a combined total of 48 hours during any calendar year.~~

9-7-307 Final Emission Limits: No person shall operate a boiler, steam generator, or process heater with a rated heat input listed in the table below that exceeds the corresponding NOx and CO emission limits on or after the corresponding effective date. Where more than one NOx limit applies to a device, the device will be subject only to the higher (less restrictive) NOx limit.

<u>Section</u>	<u>Rated Heat Input (million BTU/hr)</u>	<u>NOx Limit (ppmv)</u>	<u>CO Limit (ppmv)</u>	<u>Effective Date</u>
<u>307.1</u>	<u>>2 to 5</u>	<u>30</u>	<u>400</u>	<u>Later of: January 1, 2011 OR 10 years after original manufacture date if manufactured prior to January 1, 2011</u>
<u>307.2</u>	<u>>5 to <10</u>	<u>15</u>	<u>400</u>	
<u>307.3</u>	<u>10 to <20</u>	<u>15</u>	<u>400</u>	<u>Later of: January 1, 2011 OR 5 years after original manufacture date if manufactured prior to January 1, 2011</u>
<u>307.4</u>	<u>20 to <75</u>	<u>9</u>	<u>400</u>	
<u>307.5</u>	<u>20 or more, load-following unit</u>	<u>15</u>	<u>400</u>	
<u>307.6</u>	<u>75 or more</u>	<u>5</u>	<u>400</u>	
<u>307.7</u>	<u>10 or more while firing or co-firing landfill or digester gas</u>	<u>30</u>	<u>400</u>	<u>upon adoption</u>
<u>307.8</u>	<u>1 or more while firing only non-gaseous fuel</u>	<u>40</u>	<u>400</u>	<u>upon adoption</u>
<u>307.9</u>	<u>1 or more while firing a combination of gaseous and non-gaseous fuel</u>	<u>heat-input weighted average of gaseous & non-gaseous limit</u>	<u>400</u>	<u>upon adoption</u>
<u>307.10</u>	<u>10 or more, while operated under exemption 9-7-113</u>	<u>30</u>	<u>400</u>	<u>upon adoption</u>

9-7-308 Final Low Fuel Usage Requirements: No person shall operate any boiler, steam generator, or process heater under the limited exemption in Section 9-7-112 without doing at least one of the following:

308.1 Operate in a manner that maintains stack-gas oxygen concentrations at less than or equal to 3 percent by volume on a dry basis; or

308.2 Perform an inspection and tune-up at least once per calendar year by a technician in accordance with the procedure specified in Section 9-7-604; or

308.3 Meet the applicable emission limits in Section 9-7-307.

9-7-309 Prohibition of Commerce in Uncertified Devices: No person shall sell, offer for sale, or install of any boiler, steam generator or process heater subject to Section 9-7-307.1 or 307.2 unless the device is certified in accordance with Sections 9-7-405 and 406.

9-7-310 Insulation Requirements: Effective January 1, 2009, no person shall operate a boiler, steam generator, or process heater that is subject to the requirements of this rule unless the exposed external surface of the device, including all exposed pipes and ducts heated by the device, but excluding the device exhaust stack downstream of any economizer, does not exceed a temperature of 120°F.

9-7-311 Stack Gas Temperature Limits: Effective January 1, 2011, no person shall operate a boiler or steam generator with a stack gas temperature (upstream of any economizer), that exceeds the indicated maximum temperature:

<u>Heater Design</u>	<u>Maximum Temperature (°F)</u>	
	<u>Gaseous Fuel</u>	<u>Non-Gaseous Fuel</u>
<u>firetube</u>	100°F over saturated steam temperature for steam boiler, 100°F over hot water temperature for hot water boiler OR 250 °F, whichever is higher	100°F over saturated steam temperature for steam boiler, 100°F over hot water temperature for hot water boiler OR 300 °F, whichever is higher
<u>watertube</u>	150°F over saturated steam temperature for steam boiler, 150°F over hot water temperature for hot water boiler OR 250 °F, whichever is higher	150°F over saturated steam temperature for steam boiler, 150°F over hot water temperature for hot water boiler OR 300 °F, whichever is higher

9-7-312 Tune-up Requirements: Effective January 1, 2009, no person shall operate a boiler, steam generator, or process heater unless they do at least one of the following each calendar year:

- 312.1 Operate in accordance with the limited exemption in Section 9-7-111, 112 or 113 for the entire calendar year; or
- 312.2 Perform an inspection and tune-up at least once per calendar year by a technician in accordance with the procedure specified in Section 9-7-604.

9-7-400 ADMINISTRATIVE REQUIREMENTS

~~**9-7-401 Compliance Schedule – Emissions and Usage Limits:** A person who must modify existing sources or equipment to comply with the requirements of Sections 9-7-301, 302, 303, 305, or 306 shall comply with the following increments of progress:~~

- ~~401.1 By January 1, 1994: Submit an application for any required Authority to Construct to achieve compliance with such requirements.~~
- ~~401.2 By January 1, 1995: Submit a status report to the APCO stating the progress of the modification or installation.~~
- ~~401.3 By January 1, 1996: Be in compliance with all the requirements of this rule.~~

~~**9-7-402 Compliance Schedule - Low Fuel Usage Requirements:** A person who must comply with the requirements of Section 9-7-304 shall comply with the following increments of progress:~~

- ~~402.1 By January 1, 1995: Submit a plan for approval by the APCO containing the following items:

 - ~~1.1 A list of all sources with the rated heat input capacities and anticipated annual heat inputs; and~~
 - ~~1.2 A selection of one of the three options specified in subsections 9-7-304.1, 304.2, and 304.3.~~~~
- ~~402.2 By January 1, 1996: Be in compliance with all the requirements of this rule.~~

9-7-403 Initial Demonstration of Compliance: By July 1, 1996, any person subject to this rule shall conduct source tests, as specified in Sections 9-7-601 or 602, for the purpose of demonstrating compliance with Sections 9-7-301, 302, 303, or subsection 9-7-304.1. No person shall operate a boiler, steam generator or process heater that is subject to the requirements of Sections 9-7-307.2, 307.3, 307.4, 307.5, 307.6 or 308.1 unless an initial source test to verify compliance with these requirements is conducted in accordance with Sections 9-7-601 or 602 within 1 year of the date these requirements are effective. Alternatively, devices subject to Sections 9-7-307.2, 307.3 or 308.1 may be tested using a portable analyzer that meets the

specification standards and using the testing protocol in Attachment 1. This section does not apply to any device required to perform verification testing to establish compliance with applicable requirements of Sections 9-7-307.2, 307.3, 307.4, 307.5, 307.6 or 308.1 in accordance with a District Authority to Construct issued on or after January 1, 2011.

9-7-404 Registration: Effective January 1, 2011, no person shall operate any boiler, steam generator or process heater subject to Section 9-7-307.1 or 307.2 unless the device is registered in accordance with Regulation 1, Section 410. Any person registering a device shall pay the fees specified in Regulation 3. This registration requirement shall not apply to any device for which the operator holds a District Permit to Operate.

9-7-405 Compliance with Emissions Standards – Devices Rated Less Than 10 Million BTU/hr Input: The manufacturer shall obtain confirmation from an independent testing laboratory that each boiler, steam generator or process heater model it sells or distributes for sale into the District that is subject to the requirements of Sections 9-7-307.1 or -307.2 has been tested in accordance with the procedures in 9-7-601 and -602. This requirement shall not apply to burner assemblies sold as retrofit packages.

9-7-406 Application for Certification:

406.1 Each manufacturer shall submit an application to the APCO for certification of their compliant boiler, steam generator or process heater model. The application must:

406.1.1 Provide the following general information: name and address of manufacturer, brand name, trade name, model number and heat input rating as it appears on the water heater rating plate.

406.1.2 Provide a description of the model being certified

406.1.3 Include a complete certification source test report demonstrating that the boiler or water heater model was tested in accordance with procedures in Sections 9-7-601 and -602 and a written statement that the model complies with Section 9-7-307.1 or -307.2 and is tested in accordance with procedures in Section 9-7-601 and -602.

406.1.4 Be submitted to the District no more than 90 days after the date of the emissions compliance test conducted in accordance with Section 9-7-405.

406.1.5 Be submitted to the District no less than 90 days before the first sale or distribution within the District that occurs on or after January 1, 2011, of a boiler, steam generator or process heater model.

406.2 After completing review of the application for certification and source test report, the APCO will approve, or will deny approval of, the device.

406.3 Certification status shall be valid for three years from the date of approval by the APCO. After the third year, recertification shall be required according to the requirements in 9-7-406.

9-6-407 Identification: The boiler, steam generator or process heater manufacturer shall display the model number and the certification status of the boiler, steam generator or process heater on the shipping carton and on the rating plate of each unit.

9-7-500 MONITORING AND RECORDS

9-7-501 Combinations of Different Fuels: ~~No person shall~~Any person who simultaneously fires combinations of different fuels in a device source with a rated heat input greater than or equal to 10 million BTU per hour and is subject to the requirements of Sections 9-7-301.3 or 307.9303 without first shall installing a non-resettable totalizing fuel meter in each fuel line for each source.

~~**9-7-502 Modified Maximum Heat Input:** Any person who operates a boiler, steam generator, or process heater that has been physically modified such that its maximum heat input is different than the heat input specified on the nameplate shall demonstrate to the APCO the maximum heat input by a fuel meter, while operating the source at maximum capacity.~~

9-7-503 Records: Any person subject to the requirements of this rule shall keep records of the following:

- 503.1 Documentation verifying ~~annual~~ tune-ups performed in accordance with ~~Sections~~subsection 9-7-304.2, 308.2 or 312.2.
- 503.2 In the event that ~~the limited exemption in Section 9-7-114 is invoked~~natural gas is unavailable for use, documentation from the natural gas supplier verifying that natural gas was unavailable due to a natural gas curtailment.
- 503.3 Documentation verifying the hours of equipment testing using non-gaseous fuel, and of total operating hours using non-gaseous fuel during each calendar month to demonstrate compliance with subsection 9-7-306.3.
- 503.4 The results of any ~~source~~ testing required by Sections 9-7-403 or 506.

Such records shall be retained for a minimum of 24 months from date of entry and be made available to District staff upon request.

9-7-504 Low Fuel Usage - Monitoring and Records: Any person who operates boilers, steam generators, or process heaters ~~with rated heat inputs greater than or equal to 40 million BTU per hour and qualifying for~~ under the limited exemption of Section 9-7-111, 112 or 113 shall comply with the following requirements:

- 504.1 ~~Operate~~Install by July 1, 1993, a non-resettable totalizing meter for each fuel that demonstrates that the source operated at or below the applicable heat input level, or receive APCO approval for using utility service meters, purchase or tank fill records, or any other acceptable methods for measuring the cumulative annual usage of each fuel; and
- 504.2 Have available for inspection by the APCO ~~by July 1, 1994, and each year thereafter,~~ annual fuel use data and the Higher Heating Value of each fuel used, for the ~~prior~~preceding consecutive 12-month period. Records shall be maintained and made accessible to the APCO for a period of 24 months from the date the record is made.

9-7-505 Original Manufacture Date: Any person who operates a boiler, steam generator or process heater that subject to a standard in Sections 9-7-301.1 through 301.4 and that elects to use an effective date for this standard that is based on the original manufacture date of the device shall make available the original manufacture date of the device on the original manufacturer's identification or rating plate permanently fixed to the device, or else on a copy of the manufacturer's invoice.

9-7-506 Periodic Testing: No person shall operate a boiler, steam generator, or process heater subject to an emission limit specified in the table below unless they verify compliance with the limit at the specified intervals. Testing shall be performed in accordance with Sections 9-7-601 and 602. Alternatively, devices may be tested using a portable analyzer that meets the specification standards and using the testing protocol in Attachment 1. No person shall operate a device that use non-gaseous fuel unless they perform testing using non-gaseous fuel to verify compliance with Section 9-7-307.8 or 307.9, in addition to testing to verify compliance with any other applicable standard in Section 9-7-307. This section does not apply to any device required to perform periodic testing in accordance with a District Permit to Operate.

<u>Emission Limit</u>	<u>Testing Interval</u>
<u>9-7-307.3</u>	<u>Every two years (no less than 18 months and no more than 24 months), beginning with the effective date in Section 9-7-307.</u>
<u>9-7-307.4, 9-7-307.5, 9-7-307.6, 9-7-307.7, or 9-7-308</u>	<u>Every year (no less than 10 months and no more than 12 months), beginning with the effective date in Section 9-7-307.</u>
<u>9-7-307.8 or 9-7-307.9</u>	<u>Within 60 days of the first use of non-gaseous fuel in any calendar year in which non-gaseous fuel is used. Use of non-gaseous fuel for oil-burn readiness testing or state, federal, or local agency-required performance testing, not exceeding a total of 48 hours in a calendar year, will not trigger periodic testing.</u>

9-7-600 MANUAL OF PROCEDURES

9-7-601 **Determination of Nitrogen Oxides:** The methods by which samples of exhaust gases are collected and analyzed to determine concentrations of nitrogen oxides are set forth in the District Manual of Procedures, Volume IV, ST-13 A or B.

9-7-602 **Determination of Carbon Monoxide and Stack-Gas Oxygen:** Compliance with the carbon monoxide emission requirements of Sections 9-7-301 and 307 and the stack-gas oxygen concentration requirement of ~~Sections~~subsection 9-7-304.1 and 308.1302.4 shall be determined as set forth in the District Manual of Procedures, Volume IV, ST-6 (carbon monoxide) and ST-14 (oxygen).

9-7-603 **Compliance Determination:** All emission determinations shall be made in the as-found operating condition, except that emission determinations shall include at least one source test conducted at the rated heat input of the source, and no compliance determination shall be established within two hours after a continuous period in which fuel flow to the unit is zero or is shut off for 30 minutes or longer.

9-7-604 **Tune-Up Procedures:** The tune-up procedure required by Section 9-7-304.2, 308.2 and 312.2 shall be performed in accordance with the procedure set forth in the District Manual of Procedures, Volume I, Chapter 5.

(Adopted September 15, 1993)

9-7-605 **Determination of Higher Heating Value:** If certification of the Higher Heating Value is not provided by the third-party fuel supplier, it shall be determined by one of the following test methods: (1) ASTM D2015-85 for solid fuels; (2) ASTM D240-87 or ASTM D2382-88 for liquid hydrocarbon fuels; or (3) ASTM D1826-88, or ASTM D1945-81 in conjunction with ASTM D3588-89, for gaseous fuels.

Attachment 1Portable Analyzer Protocol

Emission readings using a portable analyzer shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15-consecutive-minute sample reading or by taking at least five (5) readings evenly spaced over the 15-consecutive-minute period. If the results of the portable analyzer show that the NO_x or CO emissions from the unit exceed the applicable limits, then the unit shall be source tested no later than 60 days from the date of discovering such exceedance.

Portable Analyzer Specifications

A. **General:** A portable analyzer consists of a sample interface, a gas detector, and a data recorder, and is used to quantitatively analyze stack gas for one or more components. A portable analyzer for CO, O₂, or NO_x shall be considered approved by the District if it adheres to the standards that are set forth in this section, is used in accordance with the standards of this section, and is used in accordance with the manufacturer's specifications. Other portable analyzers and techniques are approvable on a case by case basis.

B. **Definitions:**

Sample interface: That portion of the portable analyzer used for one or more of the following: sample acquisition, sample transport, sample conditioning, or protection of the portable analyzer from the effects of the stack effluent.

Gas detector: That portion of the portable analyzer that senses the gas to be measured and generates an output proportional to the gas concentration.

Data recorder: A strip chart recorder, digital recorder, or any other device used for recording or displaying measurement data from the gas detector output.

Resolution: The smallest increment of output that the gas detector will provide. This value should be reported by the equipment manufacturer.

Error: The maximum standard measurement error over the measurement range. This value should be reported by the equipment manufacturer.

Detection Limit: The lowest concentration of gas that can be detected by the gas detector. This value should be reported by the equipment manufacturer.

Response Time: The amount of time required for the portable analyzer to display 95% of a step change in gas concentration on the data recorder.

C. **Equipment:** The portable analyzer shall adhere to the standards tabulated below for each of the pollutants that it is intended to measure. All values in the table refer to maximum values. In addition to the parameters contained in the table, the minimum upper limit of the measurement range shall be equal to 1.5 times the emission limit for the species being measured.

<u>Detector</u>	<u>Resolution</u>	<u>Error</u>	<u>Detection Limit</u>	<u>Response Time</u>
<u>CO</u>	<u>20 ppm</u>	<u>± 50 ppm</u>	<u>50 ppm</u>	<u>1 min</u>
<u>O₂</u>	<u>0.5%</u>	<u>± 1.0%</u>	<u>0%</u>	<u>1 min</u>
<u>NO_x</u>	<u>2 ppm</u>	<u>± 5 ppm</u>	<u>5 ppm</u>	<u>1 min</u>

D. **Calibration:** Each gas detector shall be calibrated a minimum of once every six months and all instrument calibration data shall be kept on file with the monthly analyses. If the manufacturer recommends calibration more than once every six months, then the instrument calibration shall follow the manufacturer's recommended interval. Two calibration gases are required, the upper limit calibration gas shall have a concentration of 60-100% of the upper limit of the measurement range and the lower limit calibration gas shall have a concentration from 0-10% of the upper limit of the measurement range. Ambient air may be used as the upper limit calibration gas for O₂ and may be used as the lower limit calibration gas for both

NOx and CO. The system response time shall be determined during the gas detector calibration. The portable analyzer shall first be purged with ambient air. Calibration gas is then provided to the portable analyzer through a tubing length typically used during analysis. The time necessary for the data recorder to display a concentration equal to 95% of the final steady state concentration shall be recorded as the response time.

E. Measurement:

1. Concentration measurements shall not be taken until the sample acquisition probe has been exposed to the stack gas for at least 150% of the response time. Measurements shall be taken in triplicate.
2. If water vapor is not removed prior to measurement, the absolute humidity in the gas stream must be determined so that the gas concentrations may be reported on a dry basis. If water vapor creates an interference with the measurement of any component, then the water vapor must be removed from the gas stream prior to concentration measurements.
3. The concentration of NOx is calculated as the sum of the volumetric concentrations of both NO and NO2. The portable analyzer used to detect NOx must either convert NO2 to NO and measure NO, convert NO to NO2 and measure NO2, or measure both NO and NO2. An NO2 to NO converter is not necessary if data are presented to demonstrate that the NO2 portion of the exhaust gas is less than 5 percent of the total NOx concentration.