

GENERAL AIR CONTAMINANT DISCHARGE PERMIT

Department of Environmental Quality
Air Quality Division
811 SW Sixth Avenue
Portland, OR 97204-1390
Telephone: (503) 229-5359

This permit is issued in accordance with the provisions of ORS 468A.040 and incorporated into OAR 340-216-0060 by the Environmental Quality Commission on October 17, 2007 for the following source category:

Oil-fired boilers greater than 10 million Btu/hour heat input and natural gas, propane, or butane-fired boilers (with or without distillate oil backup) 30 million Btu/hour or more heat input. SIC 4961

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1.0 PERMIT ASSIGNMENT

1.1 Qualifications

All of the following conditions must be met in order to qualify for assignment to this General Air Contaminant Discharge Permit (ACDP):

- a. The permittee is operating oil, natural gas, propane, and/or butane-fired boiler(s) as listed on the cover of this permit, including supporting activities. This permit is not applicable to fuel burning equipment used to support other activities or sources required to have a permit under OAR 340-216-0090, Table 1.
- b. Notwithstanding condition 1.1.a., this permit is applicable to space heating and process boilers described in the table below:

Size	Heat energy input capacity
single boiler	oil-fired boiler, greater than 10 MM Btu/hour;
	natural gas, propane, or butane-fired boiler, 30 MM Btu/hr or more
aggregate on site	between 10 and 250 MM BTU/hour

- c. More than one boiler on site may be permitted with this General Permit provided that aggregate emissions from all boilers do not exceed the generic PSEL.
- d. A Simple or Standard ACDP is not required for the source.
- e. The source is not having ongoing, recurring or serious compliance problems.

1.2 Assignment

The Department will assign qualifying permittees to this permit that have and maintain a good record of compliance with the Department's Air Quality regulations and that the Department determines would be appropriately regulated by a General ACDP. The Department may rescind assignment if the permittee no longer meets the requirements of OAR 340-216-0060 and the conditions of this permit.

1.3 Permitted Activities

This permit allows the permittee to discharge air contaminants from processes and activities related to the air contaminant source(s) listed on the first page of this permit until this permit expires, is modified, revoked or rescinded. If there are other emissions activities occurring at the site besides those listed on the cover page of this permit, the permittee may be required to obtain a Standard Permit or additional General ACDPs, if applicable.

2.0 GENERAL EMISSION STANDARDS AND LIMITS**2.1 Visible Emissions**

The permittee must comply with the following visible emission limits, as applicable:

- a. Emissions from any air contaminant source must not equal or exceed 20% opacity for a period aggregating more than 3 minutes in any one hour.
- b. In Clackamas, Columbia, Multnomah, or Washington Counties, emissions from any air contaminant source other than fuel burning equipment must not equal or exceed 20% opacity for a period aggregating more than 30 seconds in any one hour.

2.2 Particulate Matter Emissions

The permittee must comply with the following particulate matter emission limits, as applicable:

- a. Particulate matter emissions from any fuel burning equipment installed on or before June 1, 1970 must not exceed 0.2 grains per dry standard cubic foot, corrected to 12% CO₂ or 50% excess air.
- b. Particulate matter emissions from any fuel burning equipment installed, constructed, or modified after June 1, 1970 must not exceed 0.1 grains per dry standard cubic foot, corrected to 12% CO₂ or 50% excess air.
- c. In Clackamas, Columbia, Multnomah, or Washington Counties, particulate matter emissions from fuel burning equipment must not exceed the emission rate shown in Figure 1 of OAR 340-208-0610 as a function of the maximum heat input when using all other fuels, except natural gas and LPG.

- 2.3 Fugitive Emissions** The permittee must take reasonable precautions for preventing fugitive dust emissions from becoming a nuisance, such as but not limited to:
- a. Treating vehicular traffic areas of the plant site under the control of the permittee.
 - b. Operating all air contaminant-generating processes so that fugitive type dust associated with the operation will be adequately controlled at all times.
 - c. Storing collected materials from air pollution control equipment in a covered container or other method equally effective in preventing the material from becoming airborne during storage and transfer.
- 2.4 Particulate Matter Fallout** The permittee must not cause or permit the emission of any particulate matter larger than 250 microns in size at sufficient duration or quantity, as to create an observable deposition upon the real property of another person. The Department will verify that the deposition exists and will notify the permittee that the deposition must be controlled.
- 2.5 Nuisance and Odors** The permittee must not cause or allow air contaminants from any source to cause a nuisance. Nuisance conditions will be verified by Department personnel.
- 2.6 Fuels and Fuel Sulfur Content** The permittee must not use any fuel other than natural gas, propane, butane, ASTM grade fuel oils, or on-specification used oil.
- a. Fuel oils must not contain more than:
 - i. 0.3% sulfur by weight for ASTM Grade 1 distillate oil;
 - ii. 0.5% sulfur by weight for ASTM Grade 2 distillate oil;
 - iii. 1.75% sulfur by weight for residual oil;
 - b. The permittee is allowed to use on-specification used oil that contains no more than 0.5% sulfur by weight. The permittee must obtain analyses from the marketer or, if generated on site, have the used oil analyzed, so that it can be demonstrated that the used oil does not exceed the used oil specifications contained in 40 CFR Part 279.11, Table 1.

3.0 NEW SOURCE PERFORMANCE STANDARDS

- 3.1 Applicability** Federal requirements apply to boilers for which construction, modification, or reconstruction is commenced after June 9, 1989 and that have a maximum design heat input capacity of 100 million Btu per hour (Btu/hr) or less, but greater than or equal to 10 million Btu/hr. These requirements are in addition to requirements listed elsewhere in the permit. The full text of the federal standards are found in 40 CFR 60, Subpart Dc.
- 3.2 Definitions**
- a. **Construction** means fabrication, erection, or installation of an affected facility.
 - b. **Modification** means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.
- 3.3 Visible Emissions Limit** If oil is burned in the boiler and the heat input is greater than 30 million Btu/hr, visible emissions must not exceed 20% opacity as a 6-minute average, except for one 6-minute period per hour of not more than 27% opacity.
- 3.4 Particulate Matter Emission Limits** The following particulate matter emission standards apply to each boiler that commences construction, reconstruction, or modification after February 28, 2005, and that has a heat input capacity greater than or equal to 30 million Btu/hr.
- a. If oil, gas, or a mixture of these fuels is burned in the boiler, particulate matter emissions must not exceed 0.030 lbs/MMBtu heat input, except as provided in condition 3.4.b.
 - b. As an alternative to meeting the requirements of condition 3.4.a for a boiler that commenced modification after February 28, 2005, particulate matter emissions must not exceed 0.051 lbs/MMBtu heat input and particulate matter emissions must be reduced by 99.8 percent from uncontrolled.
- 3.5 Visible Emissions Monitoring**
- a. If residual oil is burned in the boiler and the heat input is greater than 30 million Btu/hr, visible emissions must be monitored with a continuous opacity monitoring system (COMS) installed, operated, and maintained in accordance with 40 CFR 60.13.

- 3.6 Particulate Matter Emission Testing** For each boiler subject to the PM and/or opacity standards under Conditions 3.3 and/or 3.4 must conduct an initial performance test in accordance with 40 CFR 60.45c(a), and must conduct subsequent performance tests as requested by the Department, to determine compliance with the standards, except as specified in Condition 3.7
- 3.7 Emissions testing and monitoring exemption** Boilers that burn only oil that contains no more than 0.5 weight percent sulfur or gaseous fuels with potential sulfur emission rates of 0.54 lbs/MMBtu heat input or less are not required to conduct emissions testing or monitoring if they maintain fuel supply certifications of the sulfur content of the fuels burned.
- 3.8 Sulfur Limits** The sulfur content of fuel oil burned in the boiler must not exceed 0.5% by weight.
- 3.9 Fuel Sulfur Monitoring** Unless an approved alternate monitoring frequency is obtained from the EPA Administrator, the permittee must record and maintain records of the amounts of each fuel combusted during each day in each subject boiler.
- a. If oil is burned, the permittee must maintain records of the sulfur content of the fuel oil by either obtaining fuel supplier certifications or sampling and analyzing the fuel oil in accordance with ASTM procedures.
 - b. If relying on fuel samples for demonstrating compliance with the fuel sulfur content limits, a sample must be collected and analyzed after each shipment of fuel is added to the storage tank.
- 3.10 NSPS Boiler Reporting Requirement** Unless an approved alternate monitoring frequency is obtained from the EPA Administrator, the permittee must submit semi-annual reports for periods during which oil was burned that include the following information:
- a. The calendar dates covered in the reporting period;
 - b. Each 30-day average sulfur content (weight percent), calculated during the reporting period, ending with the last 30-day period in the quarter; including:
 - i. reasons for any noncompliance with the emission standards; and
 - ii. a description of corrective actions taken.
 - c. Each 30-day average percent of potential SO₂ emission rate calculated during the reporting period in accordance with Condition 3.7, ending with the last 30-day period, including:
 - i. reasons for any noncompliance with the emission

- standards; and
- ii. a description of corrective actions taken.
- d. If fuel supplier certifications are used to demonstrate compliance, records of fuel supplier certifications that include:
- i. For distillate oil:
 - The name of the oil supplier; and
 - A statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in 40 CFR 61.41c.
 - ii. For residual oil:
 - The name of the oil supplier;
 - The location of the oil when the sample was drawn for analysis to determine the sulfur content of the oil, specifically including whether the oil was sampled as delivered to the facility, or whether the sample was drawn from oil in storage at the oil supplier's or oil refiner's facility, or other location;
 - The sulfur content of the oil from which the shipment came (or of the shipment itself); and
 - The method used to determine the sulfur content of the oil.

Note: If using ASTM grade 3, include the most relevant information depending on whether the blend exhibits the characteristics of a distillate or residual oil

- e. If residual oil is burned in the boiler and the heat input is greater than 30 million Btu/hr, the semi-annual report must include a summary of any excess visible emissions recorded by the COMS.
- f. The initial semi-annual report must be postmarked by the 30th day of the third month following the actual date of startup. Each subsequent semi-annual report must be postmarked by the 30th day following the end of the reporting period.
- g. If fuel supplier certification is used to demonstrate compliance, records of fuel supplier certification as described under section d of this condition, as applicable. In addition to records of fuel supplier certifications, the report shall include a certified statement signed by the owner or operator of the affected facility that the records

of fuel supplier certifications submitted represent all of the fuel combusted during the reporting period.

3.11 Performance testing and reporting The permittee must submit to the Department the performance test data from the initial and any subsequent performance tests.

3.12 Recordkeeping The permittee must maintain on-site for a period of at least two (2) years, records of the amount and type of fuels burned each day and calendar month, unless an alternate frequency is obtained from EPA, and the information in Conditions 3.9 through 3.11.

3.13 Construction or Modification In addition to the Notice of Intent to Construct (NC) requirement in Condition 8.58.5a., the permittee must notify the Department and the EPA when equipment becomes subject to NSPS as summarized below:

If	Notification of	Due Date
Constructing or installing a new affected NSPS boiler	The date construction began	Within 30 days of commencing construction
	Actual start-up date	Within 15 days after start-up
Modifying existing equipment	The nature of the change, present and future emissions, productive capacity differences, expected completion date of change	60 days prior to expected completion date

3.14 EPA Submittal Address All submittals to the EPA must be sent to the following address:

Director
 Air and Waste Management Division
 EPA Region X
 Mail Stop OAQ-107
 1200 Sixth Avenue, Suite 900
 Seattle, WA 98101-3123

4.0 OPERATION AND MAINTENANCE REQUIREMENTS

- 4.1 Work practices** The permittee must perform a maintenance service on each boiler at least once in every 2-year period. As a minimum, the service must include an inspection of the burners and refractory chamber; cleaning, adjustment, and repair as necessary. For water tube boilers, the service must include flushing the tubes.
- 4.2 Fugitive Emissions Control Plan** While operating in the Medford-Ashland AQMA, the permittee must prepare and implement site-specific plans for the control of fugitive emissions in accordance with OAR 340-240-0180. While operating in the Lakeview Urban Growth Area (UGA), the permittee must prepare and implement site-specific plans for the control of fugitive emissions in accordance with OAR 340-240-0410.
- 4.3 O&M plan** While operating in the Medford-Ashland AQMA, the permittee must prepare and implement an operation and maintenance (O&M) plan in accordance with OAR 340-240-0190. While operating in the Lakeview UGA, the permittee must prepare and implement an O&M plan in accordance with OAR 340-240-0420.

5.0 PLANT SITE EMISSION LIMITS

- 5.1 Plant Site Emission Limits (PSEL)** Plant site emissions must not exceed the following:

Pollutant	Limit	Units
PM	24	tons per year
PM ₁₀	14	tons per year
SO ₂	39	tons per year
NO _x	39	tons per year
CO	99	tons per year
VOC	39	tons per year

- 5.2 PM₁₀ PSEL for Medford-Ashland AQMA** For sources operating in the Medford-Ashland AQMA, plant site emissions of PM₁₀ must not exceed the following:

Pollutant	Limit	Units
PM ₁₀	4.5	tons per year
	49	pounds per day

- 5.3 Annual Period** The annual plant site emissions limits apply to any 12-consecutive calendar month period.

6.0 COMPLIANCE DEMONSTRATION

- 6.1 PSEL Compliance Monitoring** Compliance with the PSEL is determined for each 12-consecutive calendar month period based on the following calculation for each pollutant:

$$E = \Sigma(EF \times F)/2000 \text{ lbs}$$

where,

E = pollutant emissions (ton/yr);

EF = pollutant emission factor (see Condition 6.2);

F = quantity of fuel burned (million cubic feet of natural gas or 1000 gallons of oil, propane, or butane)

- 6.2 Emission Factors** The permittee must use the default emission factors provided in Appendix A of this permit for calculating pollutant emissions, unless alternative emission factors are approved by the Department. The permittee may request or the Department may require using alternative emission factors provided they are based on actual test data or other documentation (e.g., AP-42 compilation of emission factors) that has been reviewed and approved by the Department.

7.0 RECORDKEEPING REQUIREMENTS

- 7.1 Operation and Maintenance** The permittee must maintain the following records related to the operation and maintenance of the plant and associated air contaminant control devices:
- Maintenance log and operation and maintenance plan as required in Section 4.0; and
 - Sulfur content of fuel oil used at the plant.
 - Sulfur content and analysis of used oil, as required by condition 2.6b; and
 - Daily (Medford/Ashland AQMA only), monthly and annual usage of fuels by type and quantity.
- 7.2 Excess Emissions** The permittee must maintain records of excess emissions as defined in OAR 340-214-0300 through 340-214-0340 (recorded on occurrence). Typically, excess emissions are caused by process upsets, startups, shutdowns, or scheduled maintenance. In many cases, excess emissions are evident when visible emissions are greater than 20% opacity for 3 minutes or more in any 60-

minute period.

- 7.3 Complaint Log** The permittee must maintain a log of all written complaints and complaints received via telephone that specifically refer to air pollution concerns associated to the permitted facility. The log must include a record of the permittee's actions to investigate the validity of each complaint and a record of actions taken for complaint resolution.
- 7.4 Retention of Records** Unless otherwise specified, all records must be maintained on site for a period of two (2) years and made available to the Department upon request.

8.0 REPORTING REQUIREMENTS

- 8.1 Excess Emissions** The permittee must notify the Department by telephone or in person of any excess emissions which are of a nature that could endanger public health.
- a. Such notice must be provided as soon as possible, but never more than one hour after becoming aware of the problem. Notice must be made to the regional office identified in Condition 9.3.
 - b. If the excess emissions occur during non-business hours, the permittee must notify the Department by calling the Oregon Emergency Response System (OERS). The current number is 1-800-452-0311.
 - c. The permittee must also submit follow-up reports when required by the Department.
- 8.2 Annual Report** The permittee must submit to the Department by **February 15** of each year this permit is in effect, two (2) copies of the following information for the preceding calendar year:
- a. Operating parameters:
 - i. For sources operating in the Medford/Ashland AQMA, the maximum daily amount of each type of fuel burned;
 - ii. Type and quantity of fuels burned on an annual basis; and
 - iii. Annual emissions as calculated according to Condition 6.1.
 - b. Records of all planned and unplanned excess emissions

events.

- c. Summary of complaints relating to air quality received by permittee during the year.
- d. List permanent changes made in plant process, production levels, and pollution control equipment which affected air contaminant emissions.
- e. List major maintenance performed on pollution control equipment.

8.3 Initial Startup Notice The permittee must notify the Department in writing of the date a new facility is started up. The notification must be submitted no later than seven (7) days after startup.

8.4 Notice of Change of Ownership or Company Name The permittee must notify the Department in writing using a Departmental "Permit Application Form" within 60 days after the following:

- a. Legal change of the name of the company as registered with the Corporations Division of the State of Oregon; or
- b. Sale or exchange of the activity or facility.

8.5 Construction or Modification Notices The permittee must notify the Department in writing using a Departmental "Notice of Construction Form," or "Permit Application Form," and obtain approval in accordance with OAR 340-210-0205 through 340-210-0250 before:

- a. Constructing or installing any new source of air contaminant emissions, including air pollution control equipment;
- b. Modifying or altering an existing source that may significantly affect the emission of air contaminants;
- c. Making any physical change which increases emissions; or
- d. Changing the method of operation, the process, or the fuel use, or increasing the normal hours of operation that result in increased emissions.

8.6 Where to Send Reports and Notices The reports, with the permit number prominently displayed, must be sent to the Permit Coordinator for the region where the source is located as identified in Condition 9.2.

9.0 ADMINISTRATIVE REQUIREMENTS

- 9.1 Reassignment to the General ACDP** A complete application for reassignment to this permit is due within 60 days after the permit is reissued. The Department will notify the permittee when the permit is reissued. The application must be sent to the appropriate regional office.
- a. If the Department is delinquent in renewing the permit, the existing permit will remain in effect and the permittee must comply with the conditions of the permit until such time that the permit is reissued and the source is reassigned to the permit.
 - b. The permittee may submit an application for either a Simple or Standard ACDP at any time, but the permittee must continue to comply with the General ACDP until the Department takes final action on the Simple or Standard ACDP application.
 - c. If a complete application for reassignment to the General ACDP or Simple or Standard ACDP is filed with the Department in a timely manner, the permit will not be deemed to expire until final action has been taken on the application.
- 9.2 Permit Coordinator Addresses** All reports, notices, and applications should be directed to the Permit Coordinator for the area where the source is located. The Permit Coordinator addresses are as follows:

Counties	Permit Coordinator Address and Telephone
Clackamas, Clatsop, Columbia, Multnomah, Tillamook, and Washington	Department of Environmental Quality Northwest Region 2020 SW 4th Avenue, Suite 400 Portland, OR 97201-4987 Telephone: (503) 229-5582
Benton, Coos, Curry, Douglas, Jackson, Josephine, Lincoln, Linn, Marion, Polk, and Yamhill	Department of Environmental Quality Western Region 750 Front Street NE, Suite 120 Salem, OR 97301-1039 Telephone: (503) 378-8240
Baker, Crook, Deschutes, Gilliam, Grant, Harney, Hood River, Jefferson, Klamath, Lake, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa, Wasco, Wheeler	Department of Environmental Quality Eastern Region 475 NE Bellevue Dr., Suite 110 Bend, OR 97701 Telephone: (541) 633-2021

9.3 Department Contacts

Information about air quality permits and the Department's regulations may be obtained from the DEQ web page at www.deq.state.or.us. All inquiries about this permit should be directed to the regional office for the area where the source is located. The Department's regional offices are as follows:

Counties	Office Address and Telephone
Clackamas, Clatsop, Columbia, Multnomah, Tillamook, and Washington	Department of Environmental Quality Portland Office 2020 SW 4th Avenue, Suite 400 Portland, OR 97201-4987 Telephone: (503) 229-5582
Benton, Lincoln, Linn, Marion, Polk, and Yamhill	Department of Environmental Quality Salem Office 750 Front Street NE, Suite 120 Salem, OR 97301-1039 Telephone: (503) 378-5305
Coos, Curry, and Western Douglas	Department of Environmental Quality Coos Bay Office 340 N Front Street Coos Bay, OR 97420-2325 Telephone: (541) 269-2721
Eastern Douglas, Jackson, and Josephine	Department of Environmental Quality Medford Office 221 Stewart Ave, Suite 201 Medford, OR 97501 Telephone: (541) 776-6010
Crook, Deschutes, Harney, Hood River, Jefferson, Klamath, Lake, Sherman, Wasco, and Wheeler	Department of Environmental Quality Bend Office 475 NE Bellevue Dr., Suite 110 Bend, OR 97701 Telephone: (541) 388-6146
Baker, Gilliam, Grant, Malheur, Morrow, Umatilla, Union, and Wallowa	Department of Environmental Quality Pendleton Office 700 SE Emigrant Avenue, Suite 330 Pendleton, OR 97801-2597 Telephone: (541) 276-4063

10.0 FEES

- 10.1 Annual Compliance Fee** The Annual Compliance Determination Fee specified in OAR 340-216-0090, Table 2, Part 2(c) for a Class Two General ACDP is due on **December 1** of each year this permit is in effect. An invoice indicating the amount, as determined by Department regulations, will be mailed prior to the above date.
- 10.2 Change of Ownership or Company Name Fee** The non-technical permit modification fee specified in OAR 340-216-0090, Table 2, Part 3(a) is due with an application for changing the ownership or the name of the company of a source assigned to this permit.
- 10.3 Where to Submit Fees** Fees must be submitted to:
Department of Environmental Quality
Business Office
811 SW Sixth Avenue
Portland, Oregon 97204-1390

11.0 GENERAL CONDITIONS AND DISCLAIMERS

- 11.1 Other Regulations** In addition to the specific requirements listed in this permit, the permittee must comply with all other legal requirements enforceable by the Department.
- 11.2 Conflicting Conditions** In any instance in which there is an apparent conflict relative to conditions in this permit, the most stringent conditions apply.
- 11.3 Masking of Emissions** The permittee must not cause or permit the installation of any device or use any means designed to mask the emissions of an air contaminant that causes or is likely to cause detriment to health, safety, or welfare of any person or otherwise violate any other regulation or requirement.
- 11.4 Department Access** The permittee must allow the Department's representatives access to the plant site and pertinent records at all reasonable times for the purposes of performing inspections, surveys, collecting samples, obtaining data, reviewing and copying air contaminant emissions discharge records and conducting all necessary functions related to this permit in accordance with ORS 468-095.
- 11.5 Permit Availability** The permittee must have a copy of the permit available at the facility at all times.
- 11.6 Open Burning** The permittee may not conduct any open burning except as allowed by OAR 340 Division 264.

- 11.7 Asbestos** The permittee must comply with the asbestos abatement requirements in OAR 340, Division 248 for all activities involving asbestos-containing materials, including, but not limit to, demolition, renovation, repair, construction, and maintenance.
- 11.8 Property Rights** The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
- 11.9 Termination, Revocation, or Modification** The Commission may modify or revoke this permit pursuant to OAR 340-216-0060(3) and (4).

12.0 ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

ACDP	Air Contaminant Discharge Permit	O ₂	oxygen
ASTM	American Society for Testing and Materials	OAR	Oregon Administrative Rules
AQMA	Air Quality Maintenance Area	ORS	Oregon Revised Statutes
bbl	barrel (42 gal)	O&M	operation and maintenance
calendar year	The 12-month period beginning January 1st and ending December 31st	Pb	lead
CFR	Code of Federal Regulations	PCD	pollution control device
CO	carbon monoxide	PM	particulate matter
date	mm/dd/yy	PM ₁₀	particulate matter less than 10 microns in size
DEQ	Oregon Department of Environmental Quality	ppm	part per million
dscf	dry standard cubic foot	ppmv	part per million by volume
EPA	US Environmental Protection Agency	PSD	Prevention of Significant Deterioration
FCAA	Federal Clean Air Act	PSEL	Plant Site Emission Limit
gal	gallon(s)	PTE	Potential to Emit
gr/dscf	grains per dry standard cubic foot	RACT	Reasonably Available Control Technology
HAP	Hazardous Air Pollutant as defined by OAR 340-244-0040	scf	standard cubic foot
ID	identification number	SER	Significant Emission Rate
I&M	inspection and maintenance	SERP	Source Emission Reduction Plan
lb	pound(s)	SIC	Standard Industrial Code
MMBtu	million British thermal units	SIP	State Implementation Plan
NA	not applicable	SO ₂	sulfur dioxide
NESHAP	National Emissions Standards for Hazardous Air Pollutants	Special Control Area	as defined in OAR 340-204-0070
NO _x	nitrogen oxides	VE	visible emissions
NSPS	New Source Performance Standard	VOC	volatile organic compound
NSR	New Source Review	year	A period consisting of any 12-consecutive calendar months

APPENDIX A: EMISSION FACTORS

Emission Factors (EF) for Boilers

Fuel type	Boiler type or controls	EF units	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Natural Gas	Uncontrolled	lb/million cubic feet	2.5	2.5	1.7	100	84	5.5
	Low NO _x burners	lb/million cubic feet	2.5	2.5	1.7	50	84	5.5
	Flue gas recirculation	lb/million cubic feet	2.5	2.5	1.7	32	84	5.5
Propane	All	lb/1000 gallons	0.6	0.6	0.10S ¹	19	3.2	0.5
Butane	All	lb/1000 gallons	0.6	0.6	0.09S ¹	21	3.6	0.6
#1 distillate oil	All	lb/1000 gallons	3.3	1.7 ²	142S ¹	18	5	0.2 ³
#2 distillate oil	All	lb/1000 gallons	3.3	1.7 ²	142S ¹	20	5	0.2 ³
#4 residual oil	All	lb/1000 gallons	8.5	7.3 ⁴	150S ¹	20	5	0.2 ³
#5 & #6 residual oil	All	lb/1000 gallons	11.5	9.9 ⁴	157S ¹	55	5	0.28 ³

¹The sulfur dioxide emission factor is based on the sulfur content of the fuel expressed as a percent by weight. For example, if the sulfur content of #1 distillate oil is 0.3%, the emission factor is 142 x 0.3 = 42.6 lb/1000 gallons of oil burned.

²PM₁₀ is 50% of total PM. Total PM is the sum of filterable PM and condensible PM. [AP-42 tables 1.3-1, 1.3-2, and 1.3-6]

³VOC reported as non-methane total organic carbon (NMTOC).

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