

**TITLE 252. DEPARTMENT OF ENVIRONMENTAL QUALITY  
CHAPTER 100. AIR POLLUTION CONTROL**

**SUBCHAPTER 31. CONTROL OF EMISSION OF SULFUR COMPOUNDS**

**PART 1. GENERAL PROVISIONS**

**252:100-31-1. Purpose**

The purpose of this ~~Subchapter~~ subchapter is to control emissions of sulfur compounds from stationary sources ~~in order to prevent the Oklahoma Air Quality Standard from being exceeded and insure that degradation of the present level of air quality in Oklahoma does not occur.~~

**252:100-31-2. Definitions**

The following words or terms, when used in this ~~Subchapter~~ subchapter, shall have the following meaning, unless the context clearly indicates otherwise:

"Alternative fuel" means fuel derived from any source other than petroleum, natural gas, or coal. Alternative fuel includes, but is not limited to, biogas, waste-derived fuel, recycled tires, tire-derived fuel, and wood-fuel as defined in OAC 252:100-19-1.

~~"Black liquor solids" means the dry weight of the solids, which that enter the recovery furnace in the black liquor.~~

~~"Digester system" means each continuous digester or each batch digester used for the cooking of wood in white liquor, and associated flash tank(s), below tank(s), chip steamer(s), and condenser(s).~~

~~"Existing facility," "existing source," or "existing equipment" means any facility, source, or equipment that emits sulfur compounds and which is in being prior to July 1, 1972, except that for facilities, sources, or equipment subject to:~~

~~(A) OAC 252:100-31-7(b) and/or OAC 252:100-31-26(a)(1), the date is prior to December 31, 1974, and~~

~~(B) OAC 252:100-31-13, the date is on or before August 17, 1971.~~

~~"Lime kiln" means a unit used to calcine lime mud, which consists primarily of calcium carbonate, into quicklime, which is calcium oxide.~~

~~"Multiple-effect evaporator system" means the multiple-effect evaporators and associated condenser(s) and hotwell(s) used to concentrate the spent cooking liquid that is separated from the pulp (black liquor).~~

~~"New facility," "new installation," "new source," or "new equipment" means any facility, installation, source, or equipment that emits sulfur compounds and which is not in being on, or which is modified after, July 1, 1972, except that for:~~

~~(A) facilities, installations, sources, or equipment subject to OAC 252:100-31-7(b) and/or OAC 252:100-31-26(a)(1) the date is December 31, 1974;~~

~~(B) petroleum refining facilities, sources, or equipment subject to OAC 252:100-31-26(a)(2), the date is December 31, 1974; and~~

~~(C) facilities, sources or equipment subject to OAC 252:100-31-13, the date is August 17, 1971.~~

"Kraft pulp mill" means any pulp mill process facility that produces pulp from wood by cooking (digesting) wood chips in a water solution of sodium hydroxide and sodium sulfide (white liquor) at high temperature and pressure. Regeneration of the cooking chemicals through a recovery process is also considered part of the kraft pulp mill.

"Petroleum and natural gas process equipment" means ~~processes~~ the process equipment used in the processing of to convert crude petroleum and/or natural gas into refined products ~~including~~. Petroleum and natural gas process equipment includes, but is not limited to, distillation columns, treating columns, catalytic cracking units, catalytic reforming units, sulfur removal equipment, petroleum coke units, flares, heat exchangers, reboilers, jet ejectors, compressors, recompressors, and any other auxiliary equipment pertinent to the process.

"Petroleum and natural gas process facility" means a facility that is engaged in converting crude petroleum and/or natural gas into refined products. Petroleum and natural gas process facilities include petroleum refineries and natural gas processing plants, but do not include petroleum and natural gas production and transportation facilities.

"Pulp mill process" means any mechanical, chemical, or combination mechanical/chemical pulping process.

"Pulp mill process equipment" means the process equipment used in production of pulp from wood chips or bolts. Pulp mill process equipment ~~which~~ may include, but ~~are~~ is not limited to, ~~debarker, chipper, digester~~ debarkers, chippers, digesters, blow ~~tank~~ tanks, washers, condensers, evaporators, recovery ~~furnace~~ furnaces, lime ~~kiln~~ kilns, smelt-dissolving ~~tank~~ tanks, mixers, heat exchangers, gas scrubbers, and any other auxiliaries ~~auxiliary equipment~~ pertinent to the process.

"Recovery furnace" means either a straight ~~kraft recovery~~ kraft-recovery furnace or a ~~cross recovery~~ cross-recovery furnace, and includes the direct-contact evaporator for a ~~direct contact~~ direct-contact furnace.

"Smelt-dissolving Smelt-dissolving tank" means a vessel used for dissolving the smelt collected from the recovery furnace.

"Steam-generator unit" means a boiler or other closed vessel in which water is heated to produce vaporized water for use in various processes or heating applications.

"Sulfur recovery plant unit" means a process device that recovers elemental sulfur from acid gas.

"Sweetening plant unit" means a ~~process~~ natural gas processing device that ~~separates the~~ removes hydrogen sulfide H<sub>2</sub>S and carbon dioxide CO<sub>2</sub> ~~contents~~ from the gas stream.

~~"Three-hour average" or "3-hour average"~~ means ~~the arithmetic average of sampling results or continuous emission monitoring data from three contiguous one hour periods.~~

"Total reduced sulfur" or "TRS" ~~is~~ means the sum of the compounds hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide.

#### **252:100-31-4. Excess emission reporting and alternative reporting schedule**

Any excess emission resulting from a violation of any emission limit contained in this subchapter shall be reported in accordance with the requirements of OAC 252:100-9. In the event that the excess emission is also a violation of an applicable 40 CFR Part 60 emission limit, the owner or operator may report the excess emission as part of an alternative reporting schedule applied for or obtained under OAC 252:100-9-7(d), if the following requirements are met.

(1) The excess emission occurs at the same emission unit at the same time.

(2) The emission limit is for the same regulated air pollutant, and has the same averaging time and units of measure as the applicable 40 CFR Part 60 emission limit.

## **PART 2. AMBIENT AIR CONCENTRATION LIMITS OR IMPACTS FOR NEW AND EXISTING EQUIPMENT, SOURCES, OR FACILITIES**

### **252:100-31-7. ~~Ambient air concentration limits or impacts~~Allowable hydrogen sulfide (H<sub>2</sub>S) ambient air concentrations for new and existing sources**

(a) ~~[Reserved] Sulfur oxides.~~ Emissions of sulfur dioxide from any existing facility or any new petroleum and natural gas process facility with equipment subject to OAC 252:100-31-26(a)(1) shall not impact existing ambient air concentrations of sulfur dioxide by more than:

- (1) 1300 µg/m<sup>3</sup> (0.50 ppm) in a five (5) minute period of any hour;
- (2) 1200 µg/m<sup>3</sup> (0.46 ppm), one hour average;
- (3) 650 µg/m<sup>3</sup> (0.25 ppm), 3 hour average;
- (4) 130 µg/m<sup>3</sup> (0.05 ppm), 24 hour average; or,
- (5) 80 µg/m<sup>3</sup> (0.03 ppm), annual arithmetic mean.

(b) ~~Hydrogen sulfide.~~ Emissions of hydrogen sulfide H<sub>2</sub>S from any new or existing source facility shall not result in a 24-hour average cause or contribute to an ambient air concentration of hydrogen sulfide at any given point of H<sub>2</sub>S greater than 0.2 ppm or greater at standard conditions, 24-hour average.

(c) ~~Exceptions.~~ The standards set in subsections (a) and (b) of this Section shall not apply to ambient air concentrations or impacts occurring on the property from which such emission occurs, providing such property, from the emission point to the point of any such concentration, is controlled by the person responsible for such emission.

(d) ~~Compliance assurance.~~ Upon approval of the Director, facility operators may use appropriate material balances, performance test data, and/or emission factors to determine stack emissions combined, when necessary, with the appropriate EPA approved atmospheric dispersion models to determine ambient air concentration or impact in lieu of ambient air monitoring as proof of compliance with limits set in OAC 252:100-31-7(a) and (b).

## **PART 3. EXISTING EQUIPMENT STANDARDS**

### **252:100-31-13. Requirements for existing Sulfuric-sulfuric acid plants**

Any sulfuric acid plant that was in being on or before August 17, 1971 shall comply with the following requirements.

(a) ~~(1) Sulfuric acid mist standard.~~ After January 10, 1979, emissions Emissions of sulfuric acid mist from any existing sulfuric acid plant shall not exceed 0.5 lb/T pounds per ton of acid produced (250 g/MT grams per metric ton). The acid production shall be expressed as 100% sulfuric acid (H<sub>2</sub>SO<sub>4</sub>).

(b) ~~(2) Continuous emission Emission monitoring.~~ Continuous monitoring of sulfur dioxide is required for existing The owner or operator shall continuously monitor SO<sub>2</sub> emissions for any sulfuric acid plants where the plant with a production capacity is greater than 300 tons per day TPD expressed as 100% acid, except where the conversion of sulfuric acid is utilized to prevent emissions of sulfur dioxide or other sulfur compounds.

(c) ~~(3) Installation, calibration, and maintenance of emission monitoring systems.~~ Required emission monitoring systems shall be installed, calibrated, maintained, and operated in

accordance with 40 CFR Part 60, Appendix B and 40 CFR Part 51, Appendix P. ~~Appendix P is hereby incorporated by reference.~~

**252:100-31-15. Requirements for existing Kraft kraft pulp mills**

Any After May 8, 1989, all existing kraft pulp mills mill that was in being on or before July 1, 1972 shall comply with meet the following requirementsstandards.

~~(1) **TRS.** Emissions of TRS emissions from any recovery furnace shall not exceed:~~  
~~(A) 40 ppm TRS, measured a hydrogen sulfide as H<sub>2</sub>S on a dry basis and on a 12-hour average, converted to eight percent (8%) by volume oxygen, from any recovery furnace;~~

~~(2) (B) TRS emissions from any lime kiln shall not exceed 40 ppm TRS measured as hydrogen sulfide H<sub>2</sub>S on a dry basis and on a 12-hour average, corrected to ten percent (10%) by volume oxygen, from any lime kiln; and,~~

~~(3) (C) TRS emissions from any smelt-dissolving tank shall not exceed 0.033 lb pounds TRS per ton/T black liquor solids as hydrogen sulfide (0.016 g TRS/kg) of black liquor solids, measured as H<sub>2</sub>S on hydrogen sulfide) for a 12-hour average from any smelt dissolving tank.~~

~~(4)(2) **Non-condensable gases.** Non-condensable gases from all evaporators and digester systems shall be efficiently incinerated or otherwise treated to limit emissions of TRS measured as hydrogen sulfide to less than five (5) ppmv, measured as H<sub>2</sub>S at standard conditions ppm by volume on a dry basis.~~

**252:100-31-16. Requirements for existing Fossil-fuel-fired steam-generators generator units**

Any fuel-fired steam generator unit that was in being on or before July 1, 1972 shall comply with the following requirements.

(a) ~~(1) **Continuous emission Emission monitoring.** Continuous monitoring of sulfur dioxide~~ The owner or operator shall continuously monitor SO<sub>2</sub> emissions from any is required for existing fossil-fuel-fired steam generator unit that generators where the source utilizes an air pollution abatement operation to reduce the sulfur dioxide emissions of sulfur oxides. Continuous monitoring of oxygen or carbon dioxide is required where if it is necessary to convert sulfur dioxide SO<sub>2</sub> monitoring results.

(b) (2) **Installation, calibration, and maintenance of emission monitoring systems.** Required emission monitoring systems shall be installed, calibrated, maintained, and operated in accordance with 40 CFR Part 60, Appendix B and 40 CFR Part 51, Appendix P.

## PART 5. NEW EQUIPMENT STANDARDS

**252:100-31-25. Requirements for new Fuel-burning fuel-burning equipment**

Any fuel-burning equipment that was not in being on or before July 1, 1972 or that is modified after July 1, 1972 shall comply with the following requirements.

(a) ~~**Emission limits.**~~

(1) **Emissions attributable to the burning of fuel.** Emissions of SO<sub>x</sub> measured as SO<sub>2</sub> from fuel-burning equipment shall meet the following limits.

(A) ~~Gas-fired fuel-burning equipment~~ **Gas fuel.** Emissions of SO<sub>x</sub> Sulfur oxide emissions (measured as sulfur dioxide) from any new gas-fired fuel-burning equipment using gas fuel shall not exceed 0.2 lb/MMBtu MMBTU heat input (86 ng/J).

~~(2) (B) **Liquid-fired fuel-burning equipment**~~**Liquid fuel.** Emissions of SO<sub>x</sub> Sulfur-oxide emissions (measured as sulfur dioxide) from any new liquid-fired fuel-burning equipment using liquid fuel shall not exceed 0.8 lb/MMBtuMMBTU heat input (340 ng/J).

~~(3) (C) **Solid fuel-burning equipment fuel.**~~ Emissions of SO<sub>x</sub> Sulfur-oxide emissions (measured as sulfur dioxide) from any new equipment using solid fuel fuel-burning equipment shall not exceed 1.2 lb/MMBtuMMBTU heat input (520 ng/J).

~~(4) (D) **Combination of fuels burned.**~~ When different types of fuels are burned simultaneously in any combination, emissions of SO<sub>x</sub> shall not exceed the applicable standard (in lb/MMBtu) shall be limit determined by proration unless a secondary fuel is used in de minimis quantities (less than five percent (5%) of total Btu-BTU heat input annually). ~~Compliance~~ The applicable limit, in lb/MMBTU heat input, shall be determined using the following formula, where X is the percent of total heat input derived from gas fuel, Y is the percent of total heat input derived from liquid fuel, and Z is the percent of total heat input derived from solid fuel:-

$$\text{SO}_2 \text{ limit} = [X(0.2) + Y(0.8) + Z(1.2)] / (X + Y + Z)$$

$$\text{SO}_x \text{ limit} = (0.2X + 0.8Y + 1.2Z) / (X + Y + Z).$$

~~(b) (2) **Averaging time.**~~ The averaging time for the emission limits set in OAC 252:100-31-25(1)(a) is ~~three (3) hours~~ (3) hours unless a solid fuel sampling and analysis method is used to determine emission compliance. In that case the averaging time is 24 hours.

~~(c) (3) **Emission monitoring, fuel monitoring, and recordkeeping**~~ **Additional requirements for sources with heat input of 250 MMBtuMMBTU/hr or more.** The requirements contained in this subsection apply to any new Any fuel-burning equipment with a rated design heat input values of 250 MMBtuMMBTU/hr or greatermore shall comply with the following requirements.

~~(1)(A) **Emission monitoring.**~~ The instruments in OAC 252:100-31-25(e)(1)(A) and (B)(i) shall be installed, calibrated, maintained, and operated in any new fuel-burning equipment with a rated heat input of 250 MMBtu/hr or greater. These instruments shall be calibrated following performance specifications 2 and 3 of 40 CFR Part 60, Appendix B.

~~(A)(i) **Opacity.**~~ A photoelectric or other type smoke detector and recorder The owner or operator shall be used to continuously monitor opacity, except where gaseous fuel is the only fuel burned.

~~(B)(ii) **Sulfur dioxide.**~~

~~(i) An instrument for~~ The owner or operator shall continuously monitoring and recording sulfur dioxide monitor SO<sub>2</sub> emissions shall be used, except where:

~~(I) -gaseous fuel containing less than 160 ppmv at standard conditions on a dry basis (0.1% by weight) sulfur is the only fuel burned; or~~

~~(ii)(II) -Aa solid or liquid fuel sampling and analysis method may be is used to determine SO<sub>x</sub> emission compliance.~~

~~(iii) **Installation, calibration, and maintenance of emission monitoring systems.**~~ Required emission monitoring systems shall be installed, calibrated, maintained, and operated in accordance with 40 CFR Part 60, Appendix B and 40 CFR Part 51, Appendix P.

~~(2)(B) **Fuel monitoring.**~~ The sulfur content of solid or liquid fuels as burned shall be determined in accordance with previous methods as previously approved by the Director or in accordance with Method 19 of 40 CFR Part 60, Appendix A.

~~(3)(C) — **Recordkeeping.** The owner or operator of any fuel-burning equipment with a rated heat input of 250 MMBtu/hr or greater shall maintain a file records of all measurements required in paragraphs (1)(A) and (2)(B) of this subsection in accordance with the applicable requirements of OAC 252:100-43-7, including compliance status records and excess emissions measurements. These records and measurements shall be retained for at least two (2) years following the date of such measurements, and made available for inspection by the Division or its representatives during normal business hours.~~

~~(4) **Alternative fuel.** An alternative fuel may be used in fuel-burning equipment, provided the following criteria are met.~~

~~(A) The use of an alternative fuel does not cause:~~

~~(i) the SO<sub>x</sub> emission limits in (a) of this section to be exceeded, or~~

~~(ii) the ambient air concentration limit for H<sub>2</sub>S contained in OAC 252:100-31-7 to be exceeded.~~

~~(B) The use of an alternative fuel does not create a condition for violation of any TAC MAAC listed in Appendix O to this chapter. (See OAC 252:100-42)~~

~~(C) The use of an alternative fuel is not disallowed under any applicable 40 CFR Part 60, 61, or 63 rule, or results in a violation of any applicable emission standard therein.~~

~~(D) The use of an alternative fuel does not create or contribute to a violation of any NAAQS or PSD increment.~~

~~(E) The use of an alternative fuel is allowed under an enforceable permit.~~

**252:100-31-26. Requirements for new ~~Petroleum-petroleum~~ and natural gas processes**

~~Any petroleum and natural gas process that was not in being on or before December 31, 1974 or that is modified after December 31, 1974 shall comply with the following requirements.~~

~~(a) — (1) **Standards Emissions.**~~

~~(1)(A) **Hydrogen sulfide standards.** Hydrogen sulfide-H<sub>2</sub>S contained in the waste gas stream from any new petroleum or natural gas process equipment shall be removed from the exhaust gas stream or it shall be oxidized to sulfur dioxide. Hydrogen sulfide emissions shall be reduced by 95% of the hydrogen sulfide in the exhaust gas by removal or by being oxidized to SO<sub>2</sub> prior to being emitted to the ambient air. This requirement shall not apply if a facility's emissions of H<sub>2</sub>S do not exceed 0.3 lb/hr, two-hour average.~~

~~(2)(B) **Sulfur dioxide standards. Oxides of sulfur.** The following requirements apply to any gas sweetening unit or petroleum refinery process equipment with a sulfur content of greater than 0.54 LT/D in the acid gas stream. Alternatively, any gas sweetening unit or petroleum refinery process equipment with an emission rate of 100 lb/hr or less of SO<sub>x</sub> expressed as SO<sub>2</sub>, two-hour average, shall be considered to be below this threshold.~~

~~——(A)(i) **Natural gas processing sweetening units.** Sulfur oxide emissions, calculated as sulfur dioxide, The sulfur content of any acid gas stream from any new gas sweetening plant unit shall be reduced by use of a sulfur recovery plant unit prior to release of the exhaust gas to the atmosphere ambient air. The sulfur recovery plant unit shall have the sulfur reduction-recovery efficiencies required in subparagraphs (C) through (F) of OAC 252:100-31-26(a)(2)(iii) through (vi) of this subparagraph.~~

~~——(B)(ii) **Petroleum refinery processing.** Sulfur recovery plants units operating in conjunction with any refinery process shall have the sulfur reduction-recovery efficiencies required in paragraphs (C) through (F) of OAC 252:100-31-26(a)(2) (iii) through (vi) of this subparagraph.~~

~~\_\_\_\_\_ (C)(iii) Greater Sulfur content greater than 0.54 LT/D but less than or equal to 5.0 LT/D.~~ When the sulfur content of the acid gas stream from a ~~new~~ gas sweetening unit or refinery process is greater than 0.54 LT/D but less than or equal to 5.0 LT/D, the ~~sulfur dioxide emission reduction recovery~~ efficiency of the sulfur recovery ~~plant unit~~ shall be at least 75.0%.

~~\_\_\_\_\_ (D)(iv) Greater Sulfur content greater than 5.0 LT/D but less than or equal to 150.0 LT/D.~~ When the sulfur content of the acid gas stream from a ~~new~~ gas sweetening unit or refinery process is greater than 5.0 LT/D but less than or equal to 150.0 LT/D, the required ~~sulfur dioxide emission reduction recovery~~ efficiency of the sulfur recovery ~~plant unit~~ shall be calculated using the following formula, where Z is the minimum ~~emission reduction sulfur recovery~~ efficiency required at all times and X is the sulfur feed rate expressed in LT/D of sulfur, rounded to one decimal place:  $Z = 92.34(X^{0.00774})$

~~\_\_\_\_\_ (E)(v) Greater Sulfur content greater than 150.0 LT/D but less than or equal to 1500.0 LT/D.~~ When the sulfur content of the acid gas stream from a ~~new~~ gas sweetening unit or refinery process is greater than 150.0 LT/D but less than or equal to 1500.0 LT/D, the required ~~sulfur dioxide emission reduction recovery~~ efficiency of the sulfur recovery ~~plant unit~~ shall be calculated using the following formula, where Z is the ~~minimum emission reduction sulfur recovery~~ efficiency required at all times and X is the sulfur feed rate expressed in LT/D of sulfur rounded to one decimal place:  $Z = 88.78(X^{0.0156})$

~~\_\_\_\_\_ (F)(vi) Greater Sulfur content greater than 1500.0 LT/D.~~ When the sulfur content of the acid gas stream from a ~~new~~ gas sweetening unit or refinery process is greater than 1500.0 LT/D, ~~a minimum the sulfur dioxide reduction recovery~~ efficiency of the sulfur recovery unit shall be at least 99.5% ~~shall be met.~~

~~(b) Exceptions.~~

~~(1) Hydrogen sulfide.~~ The requirements of OAC 252:100-31-26(a)(1) shall not apply if ~~hydrogen sulfide emissions do not exceed 0.3 lb/hr, two hour average.~~

~~(2) Sulfur dioxide.~~ The requirements of OAC 252:100-31-26(a)(2) shall not apply to any ~~new petroleum or natural gas process which would emit 100 lb/hr or less of sulfur oxides expressed as sulfur dioxide, two hour average. The requirements of paragraph (2) of subsection (a) of this Section can be met alternatively by establishing that the sulfur content of the acid gas stream from any gas sweetening plant or refinery process is 0.54 LT/D or less.~~

~~(2)(e) Emission monitoring for hydrogen sulfide H<sub>2</sub>S alarm systems.~~ All ~~new~~ thermal devices ~~for~~ used to control H<sub>2</sub>S emissions from petroleum and natural gas processing facilities regulated under OAC 252:100-31-26(a)(1)(A) of this section shall ~~have installed, calibrated, maintained, and operated~~ install, calibrate, maintain, and operate an alarm system that will signal ~~noncombustion of the gas~~ malfunction.

**252:100-31-27. Requirements for new Pulp mill pulp mill process equipment**

Any pulp mill process equipment that was not in being on or before December 31, 1974 or that is modified after December 31, 1974 shall comply with the following requirements.

(a) ~~(1) Emission limit.~~ The emission of ~~sulfur oxides~~SO<sub>x</sub>, calculated as ~~sulfur dioxide~~SO<sub>2</sub>, from the blow pits, washer vents, storage tanks, digester relief, and recovery furnace of any new pulp mill process equipment shall not exceed 18 ~~lb/T~~pounds per ton (air dried) of pulp produced, two-hour average.

~~(b) — (2) **Emission monitoring.** All new pulp mills. The owner or operator shall install, calibrate, maintain and operate instruments for continuously monitoring and recording monitor SO<sub>2</sub> emissions of sulfur dioxide from the recovery system gas-cleaning equipment and other locations as required by the Director.~~

~~(3) **Installation, calibration, and maintenance of emission monitoring systems.** Required emission monitoring systems. The instruments installed and used pursuant to this Section shall have a confidence level of at least 95% and be accurate within ~~±~~plus or minus 20% and shall be calibrated following performance specifications Performance Specification 2 and 3 of 40 CFR Part 60, Appendix B, and following the quality assurance procedures in 40 CFR Part 60, Appendix F.~~

~~(c) — (4) **Recordkeeping.** The owner or operator of any new pulp mill subject to provisions of this Section shall maintain files records of all measurements required under this section in accordance with the requirements of OAC 252:100-43-7, including compliance status records and excess emissions measurements. These records and measurements shall be retained for at least two years following the date of such measurements and made available for inspection by the Division during normal business hours.~~