

Anti-Backsliding Demonstration for the consolidation of
10 CSR 10-6.260 Restriction of Emission of Sulfur Compounds
with new rule
10 CSR 10-6.261 Control of Sulfur Dioxide Emissions

I. Purpose

To streamline requirements and reduce confusion for Missouri's sulfur dioxide (SO₂) emission sources, the Missouri Department of Natural Resources' Air Pollution Control Program (Air Program) is creating a new rule 10 CSR 10-6.261 *Control of Sulfur Dioxide Emissions* that includes all necessary SO₂ requirements, both existing and new. 10 CSR 10-6.261 sets enforceable environmental conditions and limits necessary to comply with the EPA's new 1-hour SO₂ National Ambient Air Quality Standard (NAAQS) and retains necessary emission conditions and limits from 10 CSR 10-6.260 *Restriction of Emission of Sulfur Compounds*. In this document, 10 CSR 10-6.261 is referred to as 10 CSR 10-6.261, and 10 CSR 10-6.260 is referred to as 10 CSR 10-6.260.

This document demonstrates that the consolidation of existing rule 10 CSR 10-6.260 with new rule 10 CSR 10-6.261 will not negatively impact the state's ambient air quality. 10 CSR 10-6.260, which is a rule that consolidated earlier air regulations and has limits that have been in place prior to any sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS), contains requirements for limiting emissions of sulfur compounds. In this consolidation effort, obsolete requirements currently found in 10 CSR 10-6.260 are being eliminated and requirements that cannot be replaced with equivalent or more stringent requirements are being carried forward into the new rule, 10 CSR 10-6.261. In addition, 10 CSR 10-6.261 adds requirements for SO₂ sources impacted by the initial round of nonattainment designations for the 1-hour SO₂ NAAQS. The Air Program intends to rescind 10 CSR 10-6.260 once the new rule is in effect. While the requirements being carried forward from 10 CSR 10-6.260 are not necessarily protective of the 1-hour SO₂ NAAQS, these requirements are necessary to maintain the existing level of SO₂ emissions control in portions of the state outside the SO₂ NAAQS nonattainment areas. The new rule 10 CSR 10-6.261 will then serve as the state's sulfur dioxide rule that can be amended as needed to comply with future phases of implementation of the 1-hour SO₂ NAAQS.

The purpose of this document is to 1) specify which 10 CSR 10-6.260 provisions are being eliminated and which ones are being carried forward as is into 10 CSR 10-6.261 and 2) address the department's obligation under Clean Air Act (CAA) Section 110(l) by demonstrating that 10 CSR 10-6.260 provisions being eliminated would not have an adverse impact on air quality. The State Implementation Plans for the Jackson and Jefferson County nonattainment areas being submitted in conjunction with this

rulemaking demonstrate that the new requirements added to 10 CSR 10-6.261 ensure compliance with the 1-hour SO₂ NAAQS in the nonattainment areas; these 1-hour SO₂ NAAQS requirements are not addressed in this document.

II. Background

In June 2010, the U.S. Environmental Protection Agency (EPA) established a new 1-hour primary sulfur dioxide standard of seventy-five (75) parts-per-billion (ppb). SO₂ is one of EPA's six criteria air pollutants. Criteria pollutants are commonly found air pollutants that, at high enough levels, can harm human health and the environment.

On August 5, 2013, EPA finalized the first round of nonattainment areas per the 2010 1-hour SO₂ NAAQS. In accordance with department's Air Pollution Control Program's final recommendation, portions of Jackson and Jefferson Counties in Missouri are now designated as SO₂ nonattainment areas based on monitored violations of the SO₂ NAAQS during 2007-2009.

The effective date of the August 5, 2013 rule finalizing SO₂ nonattainment area designations is October 4, 2013, a date which triggers the clock for future State Implementation Plan (SIP) submittals. Specifically, the department is required to submit attainment SIPs for the initial SO₂ nonattainment areas by April 6, 2015. These attainment SIPs must demonstrate the nonattainment areas will be in compliance with the 2010 1-hour SO₂ NAAQS no later than the October 4, 2018 attainment deadline. 10 CSR 10-6.261 *Control of Sulfur Dioxide Emissions* sets enforceable environmental conditions and limits for the 1-hour SO₂ standard and will be part of the SIPs for the nonattainment areas.

While Missouri has no history of SO₂ nonattainment areas under any previous SO₂ NAAQS, the Air Pollution Control Program does have an existing rule 10 CSR 10-6.260 *Restriction of Emission of Sulfur Compounds*, most of which is incorporated into the Missouri SIP. 10 CSR 10-6.260 contains requirements for limiting emissions of sulfur compounds, including SO₂, sulfur trioxide, and sulfuric acid. The rule has limits and conditions whose origins date back to the 1960s, prior to the federal CAA, and some of its provisions are outdated. 10 CSR 10-6.260 is not being relied on in the attainment demonstration for the 2010 1-hour SO₂ nonattainment areas.

III. Demonstration

The following is a list of requirements currently found in 10 CSR 10-6.260 that are: A) Not being moved into 10 CSR 10-6.261 since they are no longer necessary or applicable. These include obsolete provisions and those for which equivalent or more stringent SO₂ requirements have been identified, or B) Retained in the new rule since they cannot be replaced with an equivalent or more restrictive requirement. These provisions are not

necessarily protective of the 1-hour SO₂ NAAQS but ensure the existing level of SO₂ control in portions of the state outside SO₂ nonattainment areas.

A) Not being moved into 10 CSR 10-6.261 since they are no longer necessary or applicable. These include obsolete provisions and those for which equivalent or more stringent SO₂ requirements have been identified.

1) Removal of distinction between indirect and direct heating sources. 10 CSR 10-6.260 sets separate sulfur dioxide limits based on the source's classification as either a direct or indirect heating source. Per 10 CSR 10-6.020 *Definitions and Common Reference Tables*, an indirect heating source is defined as "A source operation in which fuel is burned for the primary purpose of producing steam, hot water, or hot air, or other indirect heating of liquids, gases, or solids where, in the course of doing so, the products of combustion do not come into direct contact with process materials." Though there is no explicit definition of direct heating source in 6.020, the converse dictates that a direct heating source is implicitly defined as a heating source that does not satisfy the definition of an indirect heating source or a heating source where the products of combustion do come into direct contact with process materials. These definitions are complicated by operations that involve both direct and indirect components/processes during the facility operating/manufacturing process or by operations that do not clearly/fully satisfy the definition of either a direct or indirect heating source. As a result, any uncertainty in assessing the direct/indirect status of a facility or operation could introduce unintended inconsistencies when such assessments are subject to interpretation or other evaluation factors that may not be clearly defined to determine applicability of specific regulatory requirements.

Per existing language in 10 CSR 10-6.260, direct heating sources are primarily subject only to the provisions of subsection (3)(A) and indirect heating sources are primarily subject only to the provisions of subsection (3)(B). Subsection (3)(A) of 10 CSR 10-6.260 limits the emission into the atmosphere gases containing no more than 2,000 ppmv of SO₂ for existing direct heating sources and no more than 500 ppmv of SO₂ for new direct heating sources. Indirect heating sources are currently exempt from Subsection (3)(A) of 10 CSR 10-6.260. Rather than a ppmv concentration limit that applies only to direct heating sources, the Air Program maintains that limit(s) on the sulfur content of fuels is appropriate to restrict SO₂ emissions from both direct and indirect sources (see discussion *Removal of 2,000 and 500 ppmv sulfur dioxide concentration limits* in this demonstration). Subsection (3)(B) limits the emissions of SO₂ from indirect heating sources in pounds of SO₂ per million BTUs. Indirect heating sources are subject to a 2.3 and 8.0 lbs/MMBtu limits in subparagraph (3)(B)2.A., part (3)(B)3.A.(I), and part (3)(B)3.B.(II), depending on the sources location in the state. Named sources found in Table I are subject to specific lbs/MMBtu limits. Direct heating sources are currently exempt from Subsection (3)(B) of 10 CSR 10-6.260. The Air Program maintains that there is no known scientific basis for moving forward with a regulation that exempts entire groups (direct and indirect heating sources) from specific requirements intended to limit emissions of sulfur dioxide, particularly when the impacts of such wide-reaching

exemptions inhibit an area's ability to attain and maintain compliance with SO₂ NAAQS requirements. The 10 CSR 10-6.260 limits of 2.3 and 8.0 lbs/MMBtu are being retained in 10 CSR 10-6.261 since an equivalent or more stringent federal or state standard to replace these limits could not be identified. (see discussion *St. Louis and Outstate 2.3 lbs/MMBtu and 8.0 lbs/MMBtu sulfur dioxide emission limits* in this demonstration).

Research into other states' (and federal) sulfur dioxide regulations verifies that contemporary SO₂ regulatory requirements are not typically predicated on "direct" versus "indirect" heating source status. Rather, the fact that a source emits SO₂ is the basis for determining whether regulatory requirements should apply that limit such emissions, particularly when necessary to demonstrate SO₂ NAAQS compliance as new regulatory requirements are introduced for current and future rounds of nonattainment per the 1-hour SO₂ NAAQS (as well as future SO₂ NAAQS).

2) Removal of sulfuric acid/sulfur trioxide concentration limits. 10 CSR 10-6.260 sets concentration limits of 70 mg/m³ of sulfuric acid and sulfur trioxide for existing sources and 35 mg/m³ for new sources in paragraphs (3)(A)1. and 2. The sulfuric acid and sulfur trioxide limits are attributed to regulations applicable to sulfuric acid plants and kraft pulp mills promulgated under section 111(d) of the CAA. A review of Missouri's inventory shows no existing sources in these categories. While Missouri may have had applicable sources in the past, those sources are no longer operating and Missouri has no record of submitting 111(d) plans for either source category. Title V permits that simply list 10 CSR 10-6.260 as being an applicable regulation since the source has sulfur emissions may, as a result, have set limits for these compounds. However, any reference to these limits in Title V permits is unnecessary. Any new sources in these source categories would be subject to the federal New Source Performance Standards (NSPS) requirements.

In addition to having no sources in Missouri and no 111(d) plan, the sulfuric acid and sulfur trioxide concentration limits are not relied upon in demonstrating compliance with the 1-hour SO₂ NAAQS. For these reasons the sulfuric acid and sulfur trioxide limits are not incorporated into the new rule and removing them will not have an adverse effect on air quality.

Since the sulfuric acid and sulfur trioxide limits fall under section 111(d) and are not approved in the Missouri SIP, the anti-backsliding provisions of CAA section 110(l) do not apply. This discussion is included in this demonstration for completeness.

3) Removal of 2,000 and 500 ppmv sulfur dioxide concentration limits. 10 CSR 10-6.260 sets concentration limits of 2,000 and 500 ppmv of sulfur dioxide for existing and new sources at paragraphs (3)(A)1. and 2. These sulfur dioxide limits are attributed to regulations applicable to sulfuric acid plants and kraft pulp mills promulgated under section 111(d) of the CAA. Since these sulfur dioxide limits fall under section 111(d) and are not approved in the Missouri SIP, the anti-backsliding provisions of CAA section 110(l) do not apply. This discussion is included in this demonstration for completeness.

Title V permits that simply list 10 CSR 10-6.260 as being an applicable regulation since the source has sulfur dioxide emissions may, as a result, have set limits for these compounds. However, any reference to these limits in Title V permits is unnecessary. In addition, the Air Program feels that the more stringent fuel sulfur limit for fuels found in federal regulations have made the 2,000 and 500 ppmv concentration limits unnecessary. Per the federal Low Sulfur Diesel (LSD) [500 ppm] and Ultra Low Sulfur Diesel (ULSD) [15 ppm] regulations [40 CFR 80 Subpart I], Diesel Fuel Grades 1-D & 2-D are required to be 100% ULSD for both highway diesel fuel and Non-road diesel fuel by 2014 (or earlier). Also, the provisions allowing qualifying small refiners and credit options to produce higher sulfur fuels all expire in 2014 (or earlier) for both highway diesel fuel and Non-road diesel. As a result, ULSD requirements dictate 100% of Non-road Diesel Fuel Grades 1-D & 2-D, shall satisfy ULSD requirements in 2014 as follows – June 1 (all refiners), August 1 (terminals), October 1 (retailers), and December 1 (in-use). Refiners are not making any higher sulfur content fuels. We are not aware of any diesel or fuel oil with a fuel sulfur content greater than 15 ppm currently available in the state.

The following emission standards reference guide provides a summary of the federal fuel sulfur limits found in 40 CFR 80, Subpart I.

Highway, Nonroad, Locomotive, and Marine Diesel Fuel Sulfur Standards

	Regulated Entity	Covered Fuel	Per-gallon Maximum Sulfur Level by Year (ppm)								
			2006 ^a	2007 ^b	2008	2009	2010 ^{c,d}	2011	2012	2013	2014
Federal	Large Refiners & Importers	Highway	80% 15 20% 500				15				
	Small Refiners	Highway	500								
	Large Refiners & Importers	NR	-	500	500	500	15	15	15	15	15
		LM	-	500	500	500	500	500	15	15	15
		NRLM with Credits ^e	-	HS	HS	HS	500	500	500	500	15
	Small Refiners	NRLM ^f	-	HS	HS	HS	500	500	500	500	15
	Transmix Processor & In-use	NR ^e	-	HS	HS	HS	500	500	500	500	15
LM ^e		-	HS	HS	HS	500	500	500	500	500	

Notes:

- a** For highway diesel fuel, standards are effective June 1 for refiners/importers, September 1 for pipelines and terminals, and October 15 for retailers and wholesale purchaser-consumers. Anti-downgrading provisions effective October 16, 2006.
- b** For Nonroad, Locomotive, and Marine (NRLM) diesel fuel, standards are effective June 1 for refiners; downstream requirements apply for Northeast/Mid-Atlantic area only

(August 1 for terminals, October 1 for retailers and wholesale purchaser-consumers, and December 1 for in-use).

c For highway diesel fuel, standards are effective June 1 for refiners/importers, October 1 for pipelines and terminals, and December 1 for retailers and wholesale purchaser-consumers.

d For NRLM diesel fuel, standards are effective June 1 for refiners, August 1 for terminals, October 1 for retailers and wholesale purchaser-consumers, and December 1 for in-use.

e Excluding the Northeast and Alaska.

f Excluding the Northeast, with approval in Alaska.

Calculations below show that sources burning 500 ppm sulfur level fuels will have sulfur concentration levels below the 500 ppmv found in 10 CSR 10-6.260. Removing the 2,000/500 ppmv SO₂ concentration limits will not result in any unintended effects on state permits. While these fuel sulfur limits are not necessarily protective of the 1-hour SO₂ NAAQS, the sulfur content limits do provide an upper limit on sulfur dioxide emissions.

The following engineering calculations demonstrate that the combustion of #2 diesel fuel containing up to 0.5% sulfur will always comply with the 500 ppmv SO₂ limit regardless of the engine involved. The engineering calculations examined the stoichiometric combustion of #2 diesel fuel and calculated the maximum SO₂ content of the flue gases. Though this figure varies proportionally with the carbon content of the diesel fuel, the figure will never exceed the 500 ppmv limit.

Using 100 pounds of fuel as a basis, the following three (3) cases were examined.

Case*	Pounds in Fuel		
	Carbon	Hydrogen	Sulfur
1	87	12.5	0.5
2	96	3.5	0.5
3	78	21.5	0.5

*Case 1 is the normal case, Case 2 increases carbon by 10 percent, and Case 3 decreases carbon by 10 percent

	Case 1	Case 2	Case 3
moles CO ₂	7.24	7.99	6.49
moles N ₂	38.94	33.36	44.51
moles SO ₂	0.0156	0.0156	0.0156
Total Dry Moles	46.196	41.366	51.016
ppmv SO ₂	338	377	306

The calculations show the #2 diesel fuel combusted with air will always comply with the 500 ppmv SO₂ limit. The calculations use the conservative assumptions of complete

combustion and no excess air. The real world includes partial combustion and excess air, both of which would tend to dilute the SO₂ concentration in the exhaust effluent.

Assumptions for the table calculations above:

All constituents of the fuel are burned proportionally.

Any excess air typical of combustion would tend to dilute the SO₂ concentration in the flue gas, therefore only theoretical air is considered.

#2 diesel fuel is composed of carbon, hydrogen, sulfur, and negligible amount of water and ash.

Ignore the water because the standard is a dry standard and the water will drop out of any calculations.

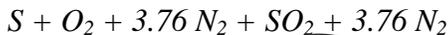
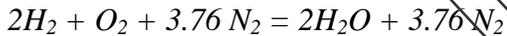
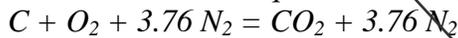
Ignore the ash as negligible unless the study predicts an SO₂ concentration greater than 450 ppm.

Typical #2 diesel fuel is composed of 87% carbon, 12.5% hydrogen, and 0.5% sulfur for calculations.

Using normal air for combustion (79% N₂ and 21% O₂)

For each lb-mole of oxygen in air, there is 3.76 lb-mole nitrogen. (1 lb-mole O₂) = (0.79/0.21) = 3.76 lb-mole N₂

The stoichiometric equations are:



To calculate the dry exhaust gases (CO₂, N₂, SO₂) the following equations are used:

Moles CO₂ = (lb C) x (1 lb-mole C/12.01 lb C) x (1 lb-mole CO₂/1 lb-mole C) + (lb H₂) x (1 lb-mole H₂/2.016 lb H₂) x (3.76 lb-mole N₂/2 lb-mole H₂)

Moles N₂ = (lb C) x (1 lb-mole C/12.01 lb C) x (3.76 lb-mole N₂/lb-mole C) = (lb S) x (1 lb-mole S/32.06 lb S) x (3.76 lb-mole N₂/lb-mole S)

Condensing these equations leaves:

$$\text{moles } CO_2 = \text{lb C}/12.01$$

$$\text{moles } N_2 = 3.76 \times [(\text{lb C}/12.01) + (\text{lb H}_2/4.032) + (\text{lb S}/32.06)]$$

$$\text{moles } SO_2 = \text{lb S}/32.06$$

Then, by Avogadro's Law and the definition of mole:

$$\text{ppmv } SO_2 = 1,000,000 \times [\text{moles } SO_2 / (\text{moles } CO_2 + \text{moles } N_2 + \text{moles } SO_2)]$$

The table calculations above show that the use of LSD at 500 ppm results in a sulfur dioxide ppmv values less than the 500 ppmv limit currently found in 10 CSR 10-6.260. Therefore, all sources using LSD and ULSD as their fuel source will have sulfur dioxide

ppmv values less than the current limit in 10 CSR 10-6.260. Therefore, sources using fuel regulated under federal rules results in less sulfur dioxide emissions than maintaining the 2,000 and 500 ppmv concentration limits found in 10 CSR 10-6.260. The federal fuel requirement is stricter than the requirement found in 10 CSR 10-6.260. In addition, if sources use another fuel source with higher sulfur content, they are still subject to the 2.3 lbs/MMBtu and 8.0 lbs/MMBtu for the St. Louis area and outstate area, respectively.

Since the concentration limits of 2,000 and 500 ppmv are not approved in the Missouri SIP, the anti-backsliding provisions of CAA section 110(l) do not apply. This discussion is included in this demonstration for completeness.

4) Removal of sources that no longer operate or are covered by another enforceable mechanism. The following is a list of named sources found in Table I or Table II of 10 CSR 10-6.260 that are not being carried over to the new rule. They are removed since they no longer operate or are subject to a state and/or federal SIP enforceable agreement. Should any of these sources that ceased operation choose to restart, they would have to go through the New Source Review process. A copy of, or link to, the consent agreement, consent decree, and related closure documents are included in the Appendix.

Doe Run Company's Glover smelter shut down in 2003. The last actual production occurred in November 2003 and was marked as out of business in January 2009, just over five (5) years after the date of last actual production. Their last EIQ was for 2008. Since it has been in excess of five (5) years since any production occurred at this installation, Doe Run Company would be required to obtain a construction permit prior to resumption of production.

Source	Reason for removal
City Utilities – James River Plant	SO ₂ Consent Agreement – 67 FR 13570
Aquila (St. Joseph Light & Power) – Lake Road Plant	SO ₂ Consent Decree – 66 FR 57389
Doe Run Company, Lead Smelter and Refinery - Glover, Missouri	Ceased secondary smelting operation in late 2003
Doe Run Company, Smelter – Herculanum, Missouri	Ceased operation in December 2013 as described in federal consent decree

5) Compliance, monitoring, reporting, and recordkeeping requirements. 10 CSR 10-6.260 has monitoring, reporting, recordkeeping, and compliance scattered among the various subsections of the rule. The new rule simplifies the requirements for Continuous Emission Monitoring (CEM), reporting, recordkeeping, and expands the list of test methods. The new rule simplifies the requirements in all these areas by placing them into appropriate areas in the rule.

Compliance

Compliance with 10 CSR 10-6.260 is determined in three (3) ways: by source testing, by providing the director such data as s/he may reasonably require, or by other methods

approved by the staff director in advance. Source testing to determine compliance with sulfur dioxide emission limits is further directed to 10 CSR 10-6.030(6) *Sampling Methods for Air Pollution Sources*. Section 10 CSR 10-6.030(6) is a reference to 40 CFR part 60, Appendix A Test Methods, Method 6-*Determination of Sulfur Dioxide Emissions from Stationary Sources*.

In 10 CSR 10-6.261, the compliance test methods are expanded to include additional methods beyond just Method 6. The additional test methods allow sources to more accurately determine their sulfur dioxide emissions, especially the inclusion of Methods 6A, 6B, and 6C. The following are the test methods found in the new rule.

- Method 1: Sample and velocity traverses for stationary sources;
- Method 2: Determination of stack gas velocity and volumetric flow rate (Type S pitot tube);
- Method 3: Gas analysis for the determination of dry molecular weight;
- Method 4: Determination of moisture content in stack gases;
- Method 6: Determination of Sulfur Dioxide Emissions from Stationary Sources;
- Method 6A: Determination of Sulfur Dioxide, Moisture, and Carbon Dioxide from Fuel Combustion Sources;
- Method 6B: Determination of Sulfur Dioxide and Carbon Dioxide Daily Average Emissions from Fossil Fuel Combustion Sources;
- Method 6C: Determination of Sulfur Dioxide Emissions from Stationary Sources (Instrumental Analyzer Procedure); and/or
- Method 8: Determination of sulfuric acid mist and sulfur dioxide emissions from stationary sources

In 10 CSR 10-6.260 the director may request sources to furnish data to determine whether compliance is being met. This requirement is carried forward into 10 CSR 10-6.261.

10 CSR 10-6.261 clarifies that the director and U.S. Environmental Protection Agency must approve the method and the method must be incorporated in the SIP.

10 CSR 10-6.260 also requires continuous emission monitoring systems (CEMS) for Ameren's Labadie and Sioux plants and for the lead smelters and refiners. The use of CEMS does not change with the new rule. Those sources will continue to use CEMS for compliance purposes in 10 CSR 10-6.261.

10 CSR 10-6.261 allows the use of fuel delivery records to demonstrate compliance with the rule.

The compliance requirements are equivalent to or stricter than that found in 10 CSR 10-6.260.

Monitoring

10 CSR 10-6.260 requires the use of CEMS for Ameren's Labadie and Sioux plants and for the lead smelters and refiners. The CEMS for Ameren shall be certified in accordance with Performance Specifications 2 and 3, 40 CFR part 60, Appendix B. They shall also be operated and maintained in accordance with 40 CFR 60.13(d) and (e)(2).

In 10 CSR 10-6.261, all CEMS shall follow all the requirements in 40 CFR 75 and/or 40 CFR 60, Appendices B and F. The only exception to this is that CEMS for lead smelters and refiners is copied verbatim from 10 CSR 10-6.260 into the new rule. This monitoring requirement is equivalent to or stricter than that found in 10 CSR 10-6.260.

Reporting

10 CSR 10-6.260 outlines the reporting requirements in section (4). As described in the rule text, only sources subject to subparagraph (3)(B)3.A. and paragraph (3)(C)3. are required to submit written reports of excess emissions. The sources covered are indirect heating sources located in Franklin, Jefferson, St. Louis, St. Charles Counties, or City of St. Louis for installations with a capacity of two thousand (2,000) million or more Btus per hour and the lead smelters. They are only required to report those excess emissions on a quarterly basis. No other sources are required to report, even if they do have excess emissions.

In 10 CSR 10-6.261 all sources subject to the rule are required to report any excess emissions other than startup, shutdown, and malfunction (SSM) emissions already required to be reported under 10 CSR 10-6.050 *Start-Up, Shutdown, and Malfunction Conditions*. Excess emissions not covered under 10 CSR 10-6.050 are to be reported within thirty (30) days following the end of the quarter. This reporting requirement is more strict than found in 10 CSR 10-6.260.

Recordkeeping

10 CSR 10-6.260 does not require any source to keep records to document changes in a source's operating procedures, performance test results, monitoring results, etc.

In 10 CSR 10-6.261 sources are required in section (4) to keep appropriate records on source activities. This includes maintaining records on: modifications to the sources operating procedures to prevent or minimize excess emissions; records of performance tests, CEM information, and fuel sampling tests; and monitoring data, calibration checks, and adjustments and maintenance to systems. In addition, records are to be maintained on fuel supplier certification information to certify the fuel sulfur content on deliveries. These recordkeeping requirements are more strict than found in 10 CSR 10-6.260.

B) Retained in the new rule since they cannot be replaced with an equivalent or more restrictive requirement. These provisions are not necessarily protective of the 1-hour SO₂ NAAQS but ensure the existing level of SO₂ control in portions of the state outside SO₂ nonattainment areas.

- 1) Exemption for small sources. 10 CSR 10-6.260 exempts indirect heating sources with a total rated capacity less than or equal to three hundred fifty thousand British thermal units (350,000 Btus) per hour actual heat input. With the removal of the indirect and direct heating sources categories, the exemption is changed so that the exemption applies to all small sources, direct or indirect. Small direct heating sources that now are exempt in 10 CSR 10-6.261 due to their size, would have been subject to the 2,000/500 ppmv concentration limit in 10 CSR 10-6.260. However, as described previously in this demonstration, the Air Program has shown that these small sources are using fuels that result in concentration limits well below 500 ppmv. This exemption in 10 CSR 10-6.261 is equivalent to 10 CSR 10-6.260
- 2) Exemption for source units subject to an applicable sulfur dioxide emission limit under 10 CSR 10-6.070 *New Source Performance Regulations*. 10 CSR 10-6.260 exempts from the rule in paragraph (1)(A)1. emission sources subject to an applicable sulfur compound emission limit under 10 CSR 10-6.070 *New Source Performance Regulations*. This exemption is being retained in 10 CSR 10-6.261, but modified to require that the sulfur dioxide be more restrictive to be an exemption and clarified that the exemption is only applicable on a unit by unit basis and does not exempt the entire source. A sulfur-in-fuel limit is also being added to account for an NSPS that contain such provisions. This exemption in 10 CSR 10-6.261 is equivalent to or stricter than 10 CSR 10-6.260 because sources are subject to the more restrictive sulfur dioxide or sulfur-in-fuel limit.
- 3) Exemption for sources using natural gas and LPG from emission limits. 10 CSR 10-6.260 exempts combustion equipment in paragraph (1)(A)2. that uses exclusively pipeline grade natural gas as defined in 40 CFR 72.2 or liquefied petroleum gas (LPG) as defined by ASTM or any combination of these fuels. This exemption is retained in 10 CSR 10-6.261 for emission sources with units fueled exclusively with natural gas or LPG. These sources will however be subject to reporting and recordkeeping, and test method requirements. This exemption in 10 CSR 10-6.261 is equivalent to or stricter than 10 CSR 10-6.260 because sources must now maintain fuel delivery and certification records to demonstrate compliance.
- 4) St. Louis and Outstate 2.3 lbs/MMBtu and 8.0 lbs/MMBtu sulfur dioxide emission limits. 10 CSR 10-6.260 sets sulfur dioxide emission limits for indirect heating sources at 2.3 lbs/MMBtu and 8.0 lbs/MMBtu in subparagraph (3)(B)2.A., part (3)(B)3.A.(I), and part (3)(B)3.B.(II), for the St. Louis area and outstate area, respectively. These limits have origins dating back to the 1960s, prior to the federal CAA. While these emission limits are not protective of the 1-hour SO₂ NAAQS, the emission limits need to be retained since they are part of the SIP and do provide an upper limit on sulfur dioxide emissions and an equivalent or more stringent federal or state standard to replace these limits could not be identified. The new rule retains the use of those sulfur dioxide emission limits. These limits are applicable to all sources, not just indirect heating sources, as described in the new rule. This requirement in 10 CSR 10-6.261 is stricter than that found in 10 CSR 10-6.260 because it applies to more sources.

5) Two percent (2%) and four percent (4%) sulfur coal and fuel oil limits. 10 CSR 10-6.260 has a 2% and 4% sulfur limit in part (3)(B)3.B.(I) for indirect heating sources located in Franklin, Jefferson, St. Louis, St. Charles Counties, or City of St. Louis with a capacity of less than two thousand (2,000) million Btus per hour. While these limits are not protective of the 1-hour SO₂ NAAQS, these limits are retained in 10 CSR 10-6.261 since an equivalent or more stringent federal or state standard to replace these limits could not be identified. This requirement in 10 CSR 10-6.261 is equivalent to 10 CSR 10-6.260.

6) Named sources retained in 10 CSR 10-6.261. 10 CSR 10-6.260 has named sources with specific SO₂ emission limits found in (3)(B)2.B., (3)(B)3.A.(II), and (3)(C)1. While those emission limits are not necessarily protective of the 1-hour SO₂ NAAQS, the emission limits need to be retained since they are part of the SIP and maintain the existing level of sulfur dioxide emissions control. These sources are listed in Table II of 10 CSR 10-6.261. These sources may be subject to new limits as future rounds of nonattainment designations for the 1-hour SO₂ NAAQS are implemented. If that is the case, then these older emission limits would be replaced with newer, more stringent sulfur dioxide emission limits (i.e., these sources would be removed from Table II and inserted into Table I with a limit necessary to comply with the 1-hour SO₂ NAAQS). This requirement in 10 CSR 10-6.261 is equivalent to 10 CSR 10-6.260.

Source	Averaging Time	Emission Limit per Unit (Pounds Sulfur Dioxide Per Million Btus Actual Heat Input)
Ameren Missouri – Sioux Plant	Daily average	4.8
Doe Run Company – Buick Resource Recycling Facility	1 hour test repeated 3 times	8,650 pounds SO ₂ /hr
Empire District Electric Company – Asbury Plant	3 hours	12.0
Kansas City Power and Light Co. – Montrose Generating Station	24 hours	3.9
New Madrid Power Plant – Marston (formerly Associated Electric Cooperative)	3 hours	10.0
Thomas Hill Energy Center Power Division – Thomas Hill (formerly Associated Electric Cooperative)	3 hours	8.0
University of Missouri (MU) – Columbia Power Plant	3 hours	8.0
Associated Electric Cooperative, Inc. – Chamois	3 hours	6.7

(formerly Central Electric Power Cooperative)		
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IV. New 1-hour SO₂ NAAQS limits

New, lower limits to address the 1-hour SO₂ NAAQS for named sources located in the nonattainment areas are found in Table I of the new rule. These limits are expected to be either unit specific and/or specific to the entire source and are based upon modeling results. The following existing sources found in 10 CSR 10-6.260 have new 1-hour limits in 10 CSR 10-6.261. The Jackson and Jefferson County nonattainment area SIPs will address the adequacy of the new 1-hour limits.

Source	New 1-hour SO ₂ limit (Pounds SO ₂ per Hour)	Previous SO ₂ limit
Ameren Missouri – Labadie Plant	40,837	4.8 lbs/MMBtu (daily average)
Independence Power and Light Blue Valley Station Unit 1 Unit 2 Unit 3	Natural gas Natural gas Natural gas	6.3lbs/MMBtu (3-hour average)
Kansas City Power and Light Co. – Hawthorn Station Boiler #5 Combustion Turbine 7 Combustion Turbine 8 Combustion Turbine 9	785 ULSD* ULSD* ULSD*	0.12 lbs/MMBtu (30 day rolling average)
Kansas City Power and Light Co. – Sibley Generating Station Boiler #1 Boiler #2 Boiler #3	1,468.17 1,447.01 10,632.02	9.0 lbs/MMBtu (3-hour average)
Veolia Energy Kansas City Inc. – Grand Ave. Station Boiler 1A Boiler 6 & 8 Boiler 7	0.5 351.8 0.5	7.1 lbs/MMBtu (3-hour average)

*Ultra Low Sulfur Diesel (maximum 15 parts per million sulfur content) required for all fuel deliveries (for Table 1 sources/units using diesel fuel or fuel oil) after January 1, 2014.

V. Conclusion

This document demonstrates that the consolidated new rule 10 CSR 10-6.261 maintains existing rule requirements from 10 CSR 10-6.260 that are not being replaced with equivalent or more restrictive requirements. It also justifies removing 10 CSR 10-6.260 rule requirements that are no longer deemed necessary or applicable (e.g. facility shutdowns, requirements superseded by more stringent requirements, etc.). The obsolete provisions from 10 CSR 10-6.260 that are not being carried forward to 10 CSR 10-6.261 will be removed from the Missouri SIP with no adverse impact on air quality.

The new rule 10 CSR 10-6.261 will then serve as the state's sulfur dioxide rule that can be amended as needed to comply with any future SO₂ actions.

Appendix

City Utilities – James River Plant

Springfield

[SO₂ Consent Agreement](#)

St. Joseph Light & Power – Lake Road Plant

St. Joseph

[SO₂ Consent Decree](#)

Doe Run Company, Lead Smelter And Refinery

Herculaneum

[Consent Decree](#)