

Sulfur Dioxide Data Requirements Rule

2025 Annual Review



IOWA DEPARTMENT OF NATURAL RESOURCES

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Environmental Services Division
Air Quality Bureau
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June 2025

Executive Summary

The Iowa Department of Natural Resources (DNR) prepared this stand-alone report to satisfy the annual reporting obligations of the *Data Requirements Rule [DRR] for the 2010 1-Hour Sulfur Dioxide (SO₂) Primary National Ambient Air Quality Standard (NAAQS)*. The DRR, promulgated by the U.S. Environmental Protection Agency (EPA) on August 21, 2015 ([80 FR 51052](#)), mandates that air agencies document in a report due July 1 each year the recent annual SO₂ emissions of sources in each area where modeling of actual emissions served as the basis for designating that area attainment. The air agency must also provide a recommendation regarding whether additional modeling is needed to determine if each such area continues to meet the 2010 1-hour SO₂ NAAQS.

This is the ninth annual report for the DRR prepared by the DNR. The areas in Iowa that must be evaluated are Louisa County and Pottawattamie County. The DRR-listed source in Louisa County is MidAmerican Energy Company's (MidAmerican) Louisa Generating Station (LGS). The DRR-listed source in Pottawattamie County is MidAmerican's Walter Scott Jr. Energy Center (WSEC).

Based on documented reductions in annual SO₂ emissions, the DNR concludes that additional modeling is not needed to determine that Louisa County and Pottawattamie County both continue to attain the 2010 1-hour SO₂ NAAQS.

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1. Introduction

On August 21, 2015 ([80 FR 51052](#)), the U.S. Environmental Protection Agency (EPA) published the *Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO₂) Primary National Ambient Air Quality Standard (NAAQS)*. This rule, referred to as the Data Requirements Rule (DRR), includes provisions in [40 CFR 51.1205\(b\)](#) that require the air agency to submit a report to EPA documenting recent SO₂ emissions in areas where modeling of actual SO₂ emissions served as the basis for designating the area attainment for the 75 part per billion (ppb) 2010 1-hour SO₂ NAAQS ([75 FR 35519](#), June, 22, 2010). The report must include an assessment of the cause of any emissions increases from the previous year and a recommendation regarding whether additional modeling is needed to characterize air quality to determine whether an area meets or does not meet the 2010 1-hour SO₂ NAAQS. The first such report is due by July 1 of the calendar year after the effective date of an area's initial designation. Thereafter, the report must be submitted annually, by July 1 of each year. The ongoing requirements do not sunset, but an area becomes exempt if the state submits, and EPA approves, a new dispersion modeling analysis that meets the conditions of either 40 CFR [51.1205\(b\)\(2\)](#) or [51.1205\(c\)](#).

1.1. Affected Areas

This stand-alone report is the ninth report prepared by the Iowa Department of Natural Resources (DNR) pursuant to the ongoing data review provisions of the DRR. There are two areas in Iowa that must be addressed at this time, Louisa County and Pottawattamie County, whose locations are indicated in Figure 1-1. These two counties were among those designated during the third round of SO₂ designations ([83 FR 1098](#), January 9, 2018), and they each contain one facility that was identified by the DNR pursuant to [40 CFR 51.1203\(a\)](#) as a source that was not located in a nonattainment area and had actual annual SO₂ emissions of 2,000 tons or more. The applicable source in Louisa County is MidAmerican Energy Company's (MidAmerican) Louisa Generating Station (LGS). In Pottawattamie County, the applicable source is MidAmerican's Walter Scott Jr. Energy Center (WSEC). The dispersion modeling conducted by the DNR that supported the attainment designations for these two areas was based, in part, on the use of actual emissions.

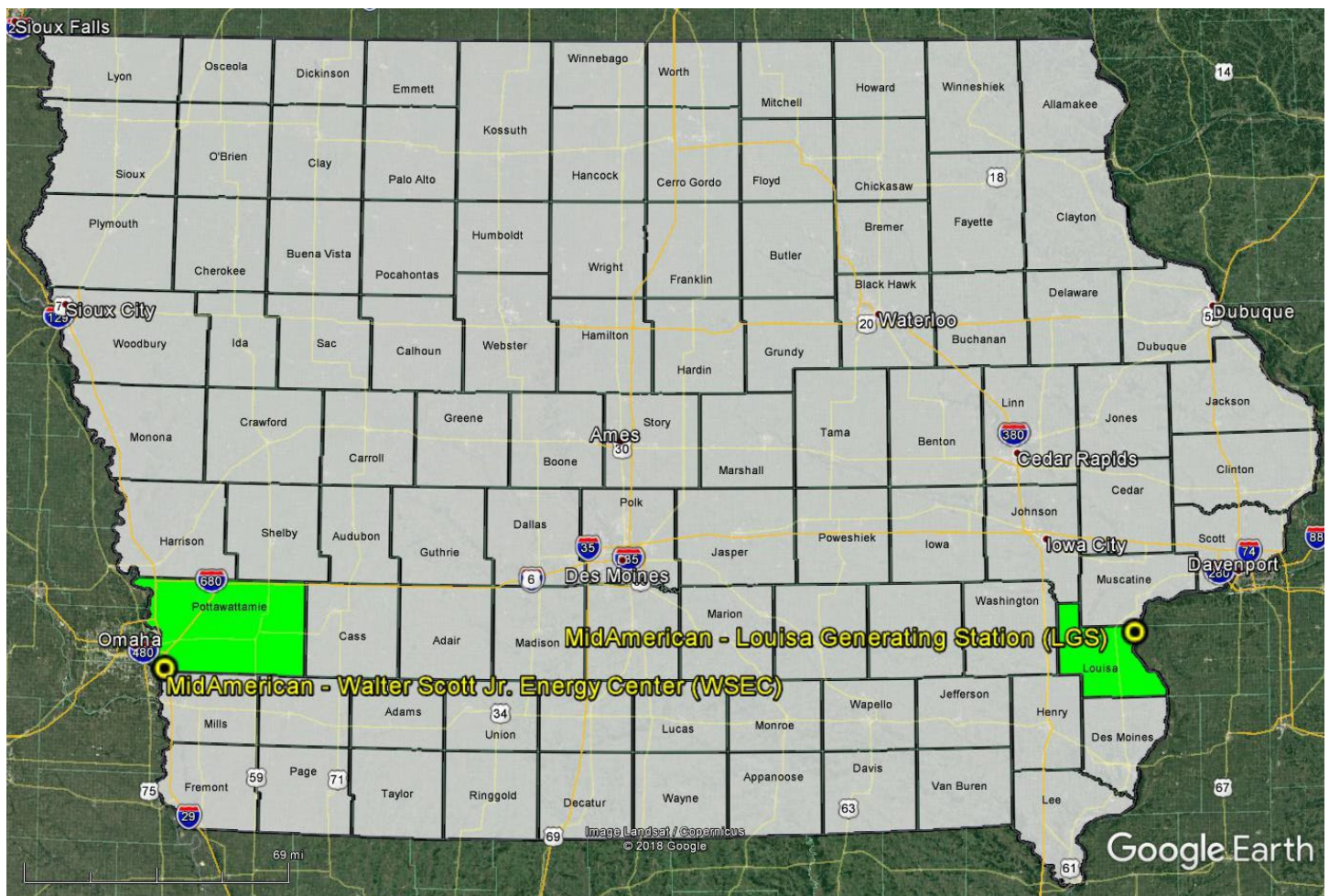


Figure 1-1. Locations of Louisa and Pottawattamie Counties and their DRR-listed source.

1.2. Unclassifiable Areas

The DNR also relied on dispersion modeling that used actual emissions to recommend an attainment designation for Linn County during the third round of designations for the 2010 1-hour SO₂ NAAQS. However, EPA finalized a designation of unclassifiable for Linn County, and thus the DRR's ongoing data review provisions do not apply to this area. Although Woodbury County is also currently designated unclassifiable for the 1-hour SO₂ NAAQS, the ongoing data review provisions of the DRR will not apply should EPA act on the Governor's January 5, 2017, request to redesignate Woodbury County to attainment. This is because the modeling supporting that request is based on federally enforceable maximum permitted allowable emission limits, in accordance with [40 CFR 51.1205\(c\)](#).

1.3. Report History and Exemptions

The sources in Iowa requiring review pursuant to the DRR have remained the same since 2019, but the DNR's first DRR report was completed in 2017. The sources subject to evaluation at that time were Interstate Power and Light's (IPL) Burlington Generating Station (BGS) in Des Moines County and IPL's Ottumwa Generating Station (OGS) in Wapello County. They remained the only sources/areas subject to review for the second DRR report, submitted in 2018.

The 2018 report, however, differed significantly from the 2017 review because it contained new dispersion modeling results for both BGS/Des Moines County and OGS/Wapello County that exempted those sources/areas from future DRR reports. The 2018 report describes the exemption criteria and associated modeling in detail, includes a historical review of the DRR, identifies all the DRR-listed sources in Iowa, and summarizes the first three¹ rounds of designations for the 2010 1-hour SO₂ NAAQS. All previous DRR reports are available on the DNR's [Air Quality Implementation Plans](#) website.²

¹ A fourth, and final, round of initial designations for the 2010 1-hour SO₂ NAAQS was published by EPA in the Federal Register on March 26, 2021 ([86 FR 16055](#); supplemented April 14, 2021, [86 FR 19576](#)). The fourth round involved areas using new ambient air monitoring to characterize SO₂ concentrations around DRR sources, and any other remaining undesignated areas. There were no such areas in Iowa. EPA completed the initial designations process for Iowa during the third round of 1-hour SO₂ designations.

² On the [Air Quality Implementation Plans](#) page, the DRR annual reports are located within the "Designation Recommendations" section, under (and near the bottom of) the "2010 SO₂ (Includes Muscatine 1-hour SO₂ Nonattainment Area)" subsection.

2. Louisa County Review

MidAmerican's LGS (facility ID 58-07-001) is the only source in Louisa County meeting the applicability requirements of the DRR. It was identified by the DNR, in a letter to EPA dated December 15, 2015, as a source that was not located in a nonattainment area and whose most recent actual annual SO₂ emissions were 2,000 tons or more. At that time, the 2014 annual emissions data were the most recent available, and LGS's reported annual SO₂ emissions for 2014 were 8,783 tons.

LGS is an electric generating facility (power plant) with one coal-fired boiler with a maximum rated capacity of 8,000 MMBtu/hr. According to the Energy Information Agency's (EIA) 2018 Form EIA-860 data, LGS serves a generator with a nameplate capacity of 811.9 megawatts (MW) that began operating in 1983. The location of LGS is indicated in Figure 2-1.

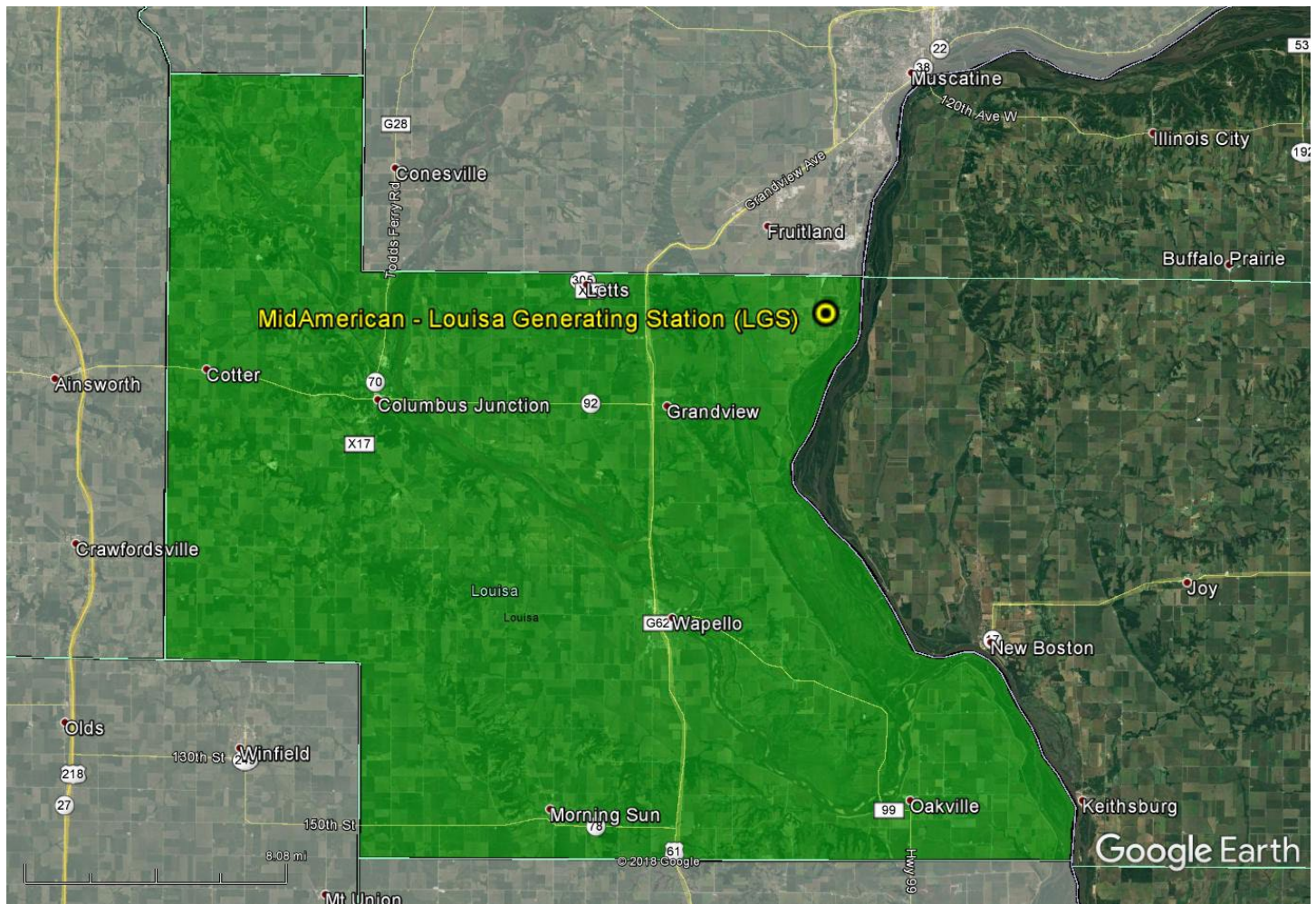


Figure 2-1. Location of MidAmerican's LGS.

The largest SO₂ source at LGS is the coal-fired boiler. Two auxiliary boilers are also potential SO₂ sources, but under normal operation they are fired by natural gas and emit relatively little SO₂. The facility's emergency generator is an intermittent source that was excluded from the modeling analysis that supported the attainment designation. Its exclusion was justified pursuant to Section 5.5 of EPA's draft "*SO₂ NAAQS Designations Modeling Technical Assistance Document*" (referred to as the "Modeling TAD," most recently updated August 2016). A detailed description of the modeling analysis that supported the attainment designation for Louisa County is available in the DNR's [revised technical support document](#) (TSD)³ for the third round of 1-hour SO₂ designations.

³2010 1-Hour Sulfur Dioxide (SO₂) Standard, Round 3 Designations Recommendations and Data Requirements Rule, Technical Support Document, Iowa DNR, dated December 19, 2016 (revised 4/3/2017).

As described in more detail in that TSD, the SO₂ emissions from facilities within 10 km of LGS were evaluated to identify additional sources to model. Three facilities within the Muscatine 1-hour SO₂ nonattainment area were included in the modeling analysis as a result. Those facilities are located in Muscatine County and include Grain Processing Corporation (GPC, facility ID 70-01-004), Muscatine Power and Water (MPW, facility ID 70-01-011), and Bayer CropScience LP⁴ (Bayer, facility ID 70-01-008), as shown in Figure 2-2. No additional relevant SO₂ sources were found by extending the search to areas within 10-20 km of LGS.

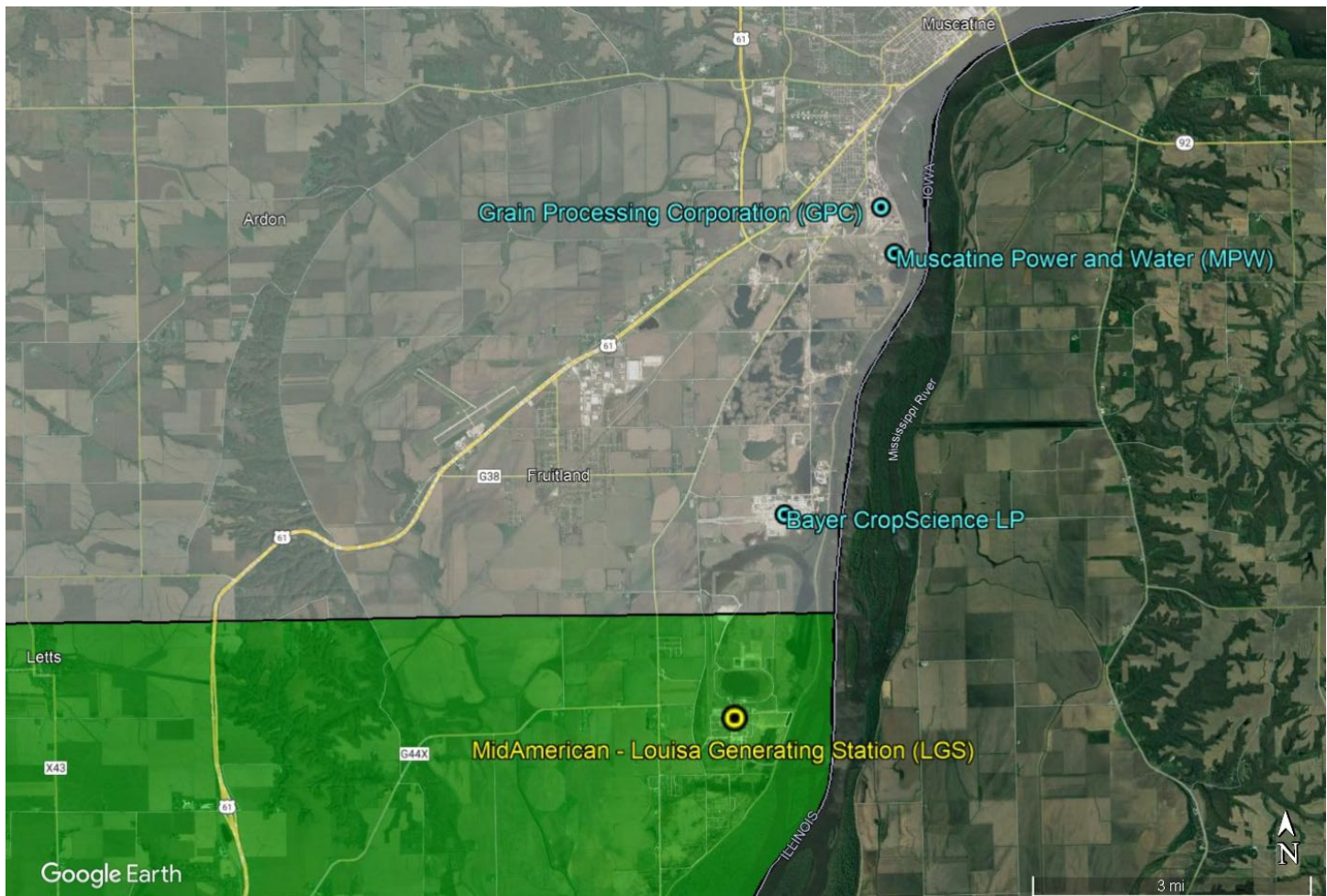


Figure 2-2. Location of GPC, MPW, and Bayer in relation to LGS.

The facilities and their sources included in the modeling analysis that supported the attainment designation for Louisa County were the same as those included in the modeled attainment demonstration for the Muscatine 1-hour SO₂ nonattainment SIP.⁵ Additionally, the modeling for Louisa County utilized the same stack parameters and, with the exception of one emission point, the same federally enforceable maximum permitted allowable emission limits used in the Muscatine 1-hour SO₂ attainment demonstration. The one exception was Boiler #8 (EP-195) at Bayer, whose modeled emission rate of 159.1 lb/hr was determined using the results of a September 2, 2015, stack test.

The coal-fired boiler at LGS was modeled using its 1-hour critical emission value of 4,270.89 lb/hr. This value was derived from its 3,449.6 lb/hr 30-day rolling-average federally enforceable maximum permitted allowable SO₂ emission limit,⁶ using methods consistent with Section V.D.2 of EPA's April 23, 2014, *Guidance for 1-Hour SO₂ Nonattainment Area SIP Submissions* memorandum. The two auxiliary boilers at LGS were modeled using their federally enforceable maximum

⁴ Bayer was previously named Monsanto - Muscatine.

⁵ A copy of the May 17, 2016, [Muscatine 1-hour SO₂ Nonattainment SIP](#), and its appendices, can be found on the DNR's [Air Quality Implementation Plans](#) website, within the "Implementation Plans for Nonattainment and Maintenance Areas" section, under the "Muscatine 2010 1-hour SO₂ Nonattainment Area" subsection.

⁶ In 2023, DNR added an 800 lb/hr (30-day rolling average) SO₂ limit to LGS's main boiler permit (for purposes of the regional haze rule's second planning period). No physical stack parameters changed. New modeling wasn't needed given the more stringent limit.

permitted allowable emission limits of 0.06 lb/hr. The emission rates for LGS, and the associated results of the modeling analysis that supported the attainment designation for Louisa County, are summarized in Table 2-1 and Table 2-2, respectively, and described in more detail in the TSD referenced in footnote 3.

Table 2-1. Louisa Generating Station modeled SO₂ emission rates.

Model ID	Unit Description	Modeled Emission Rate in lb/hr
EP01	Main Boiler (coal-fired)	4,270.89 (critical emission value)
EP02	Auxiliary Boiler 1 (natural gas)	0.06 (permit limit)
EP03	Auxiliary Boiler 2 (natural gas)	0.06 (permit limit)

Table 2-2. Summary of the model predicted concentration (µg/m³) for the LGS analysis.⁷

Maximum Model Design Value	Background Concentration	Total Concentration	2010 1-Hour SO ₂ NAAQS	Meets NAAQS
186.86	7	194	196	Yes

2.1. Emissions Assessment

When modeling of actual SO₂ emissions serves as the basis for designating an area attainment, the provisions of the DRR in [40 CFR 51.1205\(b\)](#) require that the state document the annual SO₂ emissions of each applicable source in each such area and provide an assessment of the cause of any emissions increase from the previous year. Only emissions from Bayer Boiler #8 need to be evaluated pursuant to this review. All other SO₂ sources at Bayer, and all the SO₂ sources at LGS, MPW, and GPC were modeled based on their federally enforceable maximum permitted allowable emission limits. Reviewing the actual emissions from these sources is uninformative and unwarranted pursuant to the DRR because their actual emissions must be less than their maximum permitted allowable emission limits and dispersion modeling has established that the permitted limits are protective of the 1-hour SO₂ NAAQS.

For the affected source, the DRR requires a review of its most recent two years of annual SO₂ emissions, which currently would be 2023 and 2024. However, the DNR has found that evaluating only this data does not provide sufficient information to determine if additional modeling is needed, because it excludes the actual emissions data that was modeled to support the attainment designation. A more informative review that complies with the requirement of the DRR can be conducted for Bayer Boiler #8 by also including emissions data going back through the 2012-2014 modeled timeframe.

The modeled SO₂ emission rate of 159.1 lb/hr for Boiler #8 was obtained from a 2015 stack test, as it represented the best source of actual emissions information available at that time for that source and was suitably representative of the 2012-2014 years modeled. To facilitate the necessary annual emissions review, the 159.1 lb/hr modeled emission rate is easily expressed as an annualized (ton per year) value because this source was modeled as operating continuously. Assuming a nominal 8760 hours of operation produces annualized SO₂ emissions of 696.9 tons. As shown in Figure 2-3, that value exceeds all the reported annual SO₂ emissions for this source from any year within the 2012-2024 timeframe.

Comparing the most recent two years, as required by the DRR, reveals that the SO₂ emissions from Bayer Boiler #8 decreased by 0.02 tons between 2023 and 2024 from 0.13 to 0.11 tons per year, as shown in Figure 2-3.⁸ However, this fact is largely unimportant compared to the 99.9% reduction in SO₂ emissions that occurred between 2017 and 2018 due to a fuel switch from coal to natural gas. Natural gas combustion began on November 3, 2017, and thereafter, the use of coal in Boiler #8 is prohibited by air construction permit number 82-A-092-P12.

⁷ This modeling analysis, like the modeled attainment demonstration described in the Muscatine 1-hour SO₂ nonattainment SIP, included seven scenarios, depending upon which boilers (Units 7, 8, and 9) are operating at MPW. The results shown here reflect the scenario which produced the highest modeled impact (only Unit 7 operating).

⁸ Actual emissions data obtained from the DNR's State and Local Emissions Inventory System (SLEIS).

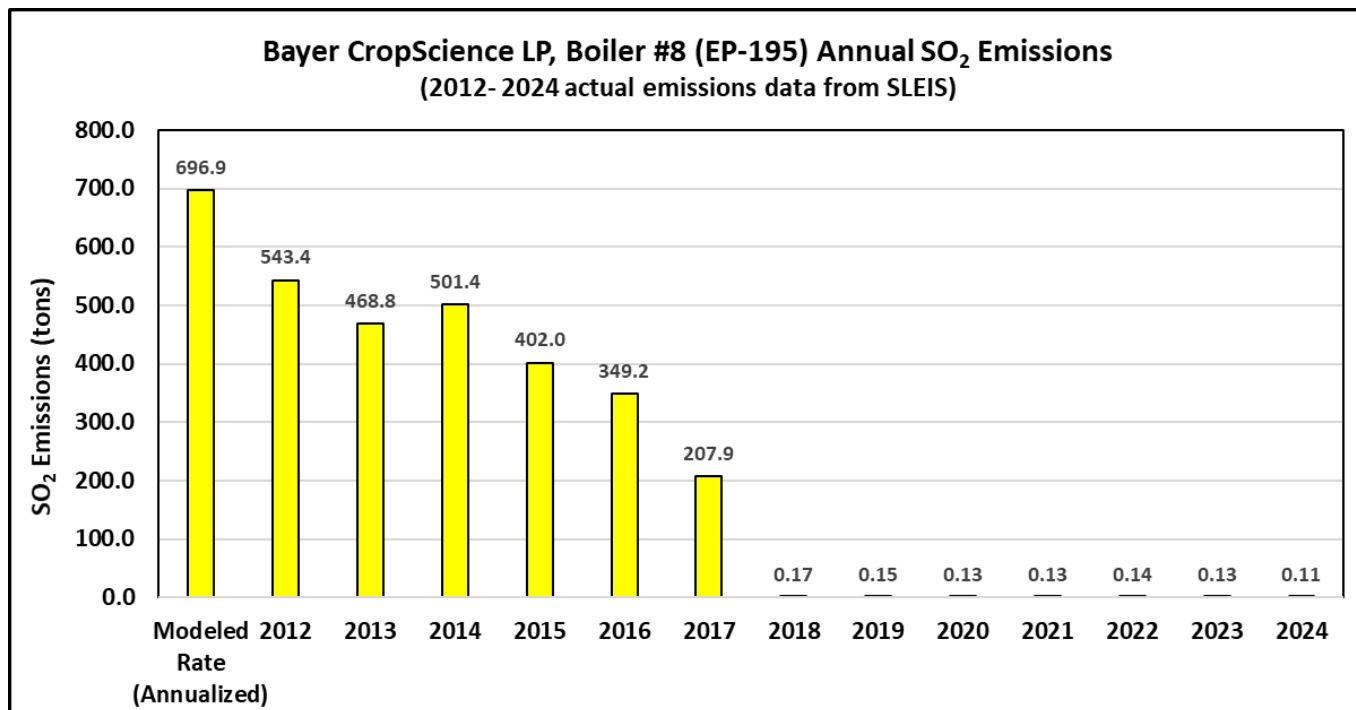


Figure 2-3. Annualized modeled and 2012-2024 actual SO₂ emissions (tons per year) from Boiler #8 at Bayer.

2.2. Recommendation

The state must provide a recommendation, pursuant to [40 CFR 51.1205\(b\)\(1\)](#), regarding whether additional modeling is needed to characterize air quality in the area to determine whether the area meets or does not meet the 2010 1-hour SO₂ NAAQS. The modeling analysis that supported the attainment designation for Louisa County yielded a total maximum concentration of 194 µg/m³ (see Table 2-2), meeting the 2010 1-hour SO₂ NAAQS. That analysis was based on Bayer's Boiler #8 combusting coal. Starting November 3, 2017, that unit is limited to burning only natural gas, and therefore, it emits little SO₂ after that date. Given this, and that all other sources in that analysis were modeled based on their federally enforceable maximum permitted allowable emission limits, additional modeling is not needed to determine that Louisa County still meets the 2010 1-hour SO₂ NAAQS.⁹

⁹ To the extent necessary, this conclusion is also applicable to that portion of Muscatine County designated attainment in the third round of the 2010 1-hour SO₂ NAAQS designations. While the modeling analysis for Louisa Generating Station was focused on Louisa County, the receptor grid did extend slightly into portions of south-central Muscatine County, in a region just west of the western edge of the nonattainment boundary. The receptors in this region were generally no closer than 8 -10 km from an SO₂ source in the modeling analysis, and all yielded predicted concentrations that met the 2010 1-hour SO₂ NAAQS.

3. Pottawattamie County Review

MidAmerican's WSEC (facility ID 78-01-026) is the only source in Pottawattamie County meeting the applicability requirements of the DRR. It was identified by the DNR in a letter to EPA dated December 15, 2015, as a source that was not located in a nonattainment area and whose most recent actual annual SO₂ emissions were 2,000 tons or more. At that time the 2014 annual emissions data were the most recent available, and WSEC's reported annual SO₂ emissions for 2014 were 13,749 tons.

WSEC is an electric generating facility with two coal-fired boilers, identified as Units 3 and 4.¹⁰ Unit 3 has a maximum rated capacity of 7,700 MMBtu/hr, and Unit 4 has a maximum rated capacity of 7,675 MMBtu/hr. According to the 2018 Form EIA-860 data, Unit 3 serves a generator with a nameplate capacity of 725.8 megawatts (MW) that began operating in 1978, and Unit 4 serves a generator with a nameplate capacity of 922.5 MW that began operating in 2007. The location of WSEC is indicated in Figure 3-1.

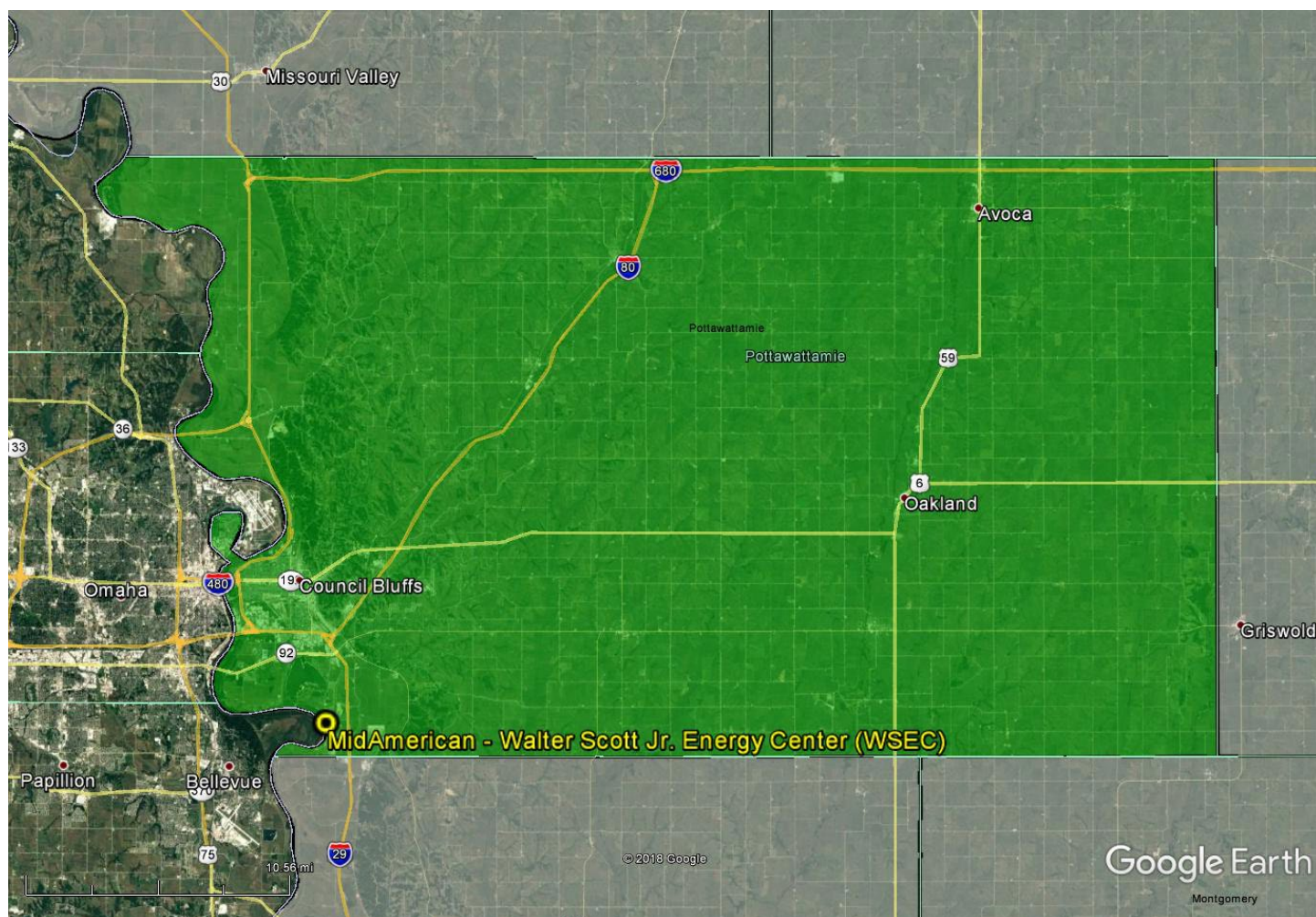


Figure 3-1. Location of MidAmerican's WSEC.

The largest SO₂ sources at WSEC are the two coal-fired boilers, Units 3 and 4. An auxiliary boiler is also a potential SO₂ source, but under normal operation it is fired by natural gas and emits relatively little SO₂. The facility's emergency generator is an intermittent source that was excluded from the modeling analysis that supported the attainment designation. Its exclusion was justified pursuant to Section 5.5 of EPA's draft "*SO₂ NAAQS Designations Modeling Technical Assistance Document*" (referred to as the "Modeling TAD," most recently updated August 2016). A detailed

¹⁰ Two other coal-fired boilers at WSEC, identified as Units 1 and 2, were permanently shut down in 2015 and thus excluded from the modeling analysis that supported the attainment designation for Pottawattamie County.

description of the modeling analysis that supported the attainment designation for Pottawattamie County is available in the DNR's revised [TSD](#)¹¹ for the third round of 1-hour SO₂ designations.

As described in more detail in that TSD, the SO₂ emissions from facilities within 10 km of WSEC were evaluated to identify additional sources to model. No relevant SO₂ sources were found. The search was then extended to areas within 10-20 km of WSEC, and the Nebraska Department of Environment and Energy (NDEE) identified two SO₂ sources. One source, Eppley Airfield, was excluded from the DNR's modeling analysis because its 2011 SO₂ emissions were only 36 tons, and it was 18 km from WSEC. The other source, the Omaha Public Power District (OPPD) North Omaha facility, had SO₂ emissions large enough to warrant its inclusion in the DNR's modeling analysis for WSEC.¹²

The larger (by electrical generating capacity) of the two coal-fired boilers at WSEC, Unit 4, was modeled using its 1-hour critical emission value of 909.8 lb/hr. This value was derived from its 0.1 lb/MMBtu 30-day rolling-average federally enforceable maximum permitted allowable SO₂ emission limit (in combination with the unit's maximum rated capacity of 7,675 MMBtu/hr), using methods consistent with Section V.D.2 of EPA's April 23, 2014, *Guidance for 1-Hour SO₂ Nonattainment Area SIP Submissions* memorandum. The other coal-fired boiler, Unit 3, was modeled using its 2012-2014 actual hourly emission rates as measured using continuous emission monitoring system (CEMS) data. The natural gas auxiliary boiler was modeled using its federally enforceable maximum permitted allowable emission limit of 0.21 lb/hr. The emission rates for WSEC, and the associated results of the modeling analysis that supported the attainment designation for Pottawattamie County, are summarized in Table 3-1 and Table 3-2, respectively, and described in more detail in the TSD referenced in footnote 11.

Table 3-1. Walter Scott Jr. Energy Center modeled SO₂ emission rates.

Model ID	Unit Description	Modeled Emission Rate in lb/hr
EP003	Unit 3 Boiler (coal-fired)	2012 – 2014 variable actual hourly (CEMS)
EP141	Unit 4 Boiler (coal-fired)	909.8 (critical emission value)
EP142	Auxiliary Boiler (natural gas)	0.21 (permit limit)

Table 3-2. Summary of the model predicted concentration (µg/m³) for the WSEC analysis.

Maximum Model Design Value	Background Concentration	Total Concentration	2010 1-Hour SO ₂ NAAQS	Meets NAAQS
127.0	7	134	196	Yes

3.1. Emissions Assessment

When modeling of actual SO₂ emissions serves as the basis for designating an area attainment, the provisions of the DRR in [40 CFR 51.1205\(b\)](#) require that the state document the annual SO₂ emissions of each applicable source in each such area and provide an assessment of the cause of any emissions increase from the previous year. Only emissions from WSEC Unit 3 need to be evaluated pursuant to this review. Unit 4 was modeled using its 1-hour critical emission value, which was derived from its federally enforceable maximum permitted allowable emission limit. The auxiliary boiler was also modeled using its federally enforceable maximum permitted allowable emission limit. Reviewing the actual emissions from these sources is uninformative and unwarranted pursuant to the DRR because their actual emissions must be less than their maximum permitted allowable emission limits and dispersion modeling has established that the permitted limits are protective of the 1-hour SO₂ NAAQS.

For the affected source, the DRR requires a review of its most recent two years of annual SO₂ emissions, which currently would be 2023 and 2024. However, the DNR has found that evaluating only this data does not provide sufficient information to determine if additional modeling is needed, because it excludes the 2012-2014 actual emissions data that

¹¹2010 1-Hour Sulfur Dioxide (SO₂) Standard, Round 3 Designations Recommendations and Data Requirements Rule, Technical Support Document, Iowa DNR, dated December 19, 2016 (revised 4/3/2017).

¹² The DNR modeled the OPPD North Omaha facility using actual emission rates (CEMS data) for its two coal-fired boilers. However, its emissions need not be evaluated pursuant to this review because: the North Omaha facility is 19 km from WSEC; it is located in Douglas County, Nebraska; the NDEE used ambient air quality monitoring to characterize peak 1-hour SO₂ concentrations in the area of that source; and EPA designated Douglas County as attainment/unclassifiable in round 4 ([86 FR 16055](#), March 26, 2021).

was modeled to support the attainment designation. A more informative review that complies with the requirement of the DRR can be conducted for WSEC Unit 3 by also including emissions data going back through the 2012-2014 modeled timeframe.

The actual annual SO₂ emissions from WSEC Unit 3 for the years 2012-2024 are shown in Figure 3-2. This information was obtained on April 11, 2025, using EPA’s Clean Air Markets Program Data (CAMPD) [Custom Data Download Tool](#). Between 2023 and 2024, the SO₂ emissions from WSEC Unit 3 decreased by 3,065 tons, a 65.1% reduction. The decrease is attributable to the implementation of scrubber improvements that occurred in late 2023. Earlier that same year, DNR established a new 770 lb/hr (30-day rolling average) SO₂ emission limit for WSEC Unit 3, pursuant to Iowa’s long-term strategy for the second planning period of the federal regional haze rule ([40 CFR 51.308](#)). While the unit’s heat input increased 33.9% between 2023 and 2024, the scrubber improvements decreased its annual SO₂ emission rate by 73.9%, from 0.363 lb/MMBtu in 2023 to 0.095 lb/MMBtu in 2024, as shown in Figure 3-3.

WSEC Unit 3’s 2024 actual annual SO₂ emissions are substantially lower than prior years, especially in comparison to the 2012-2014 modeled timeframe. Across the 2012-2014 modeled timeframe, the annual SO₂ emissions from WSEC Unit 3 averaged 9,166 tons per year, while the 2024 actual annual emissions from WSEC Unit 3 were 1,644 tons. This represents an emissions decrease of 7,522 tons, or 82.1%. The decrease is largely due to the required scrubber improvements.

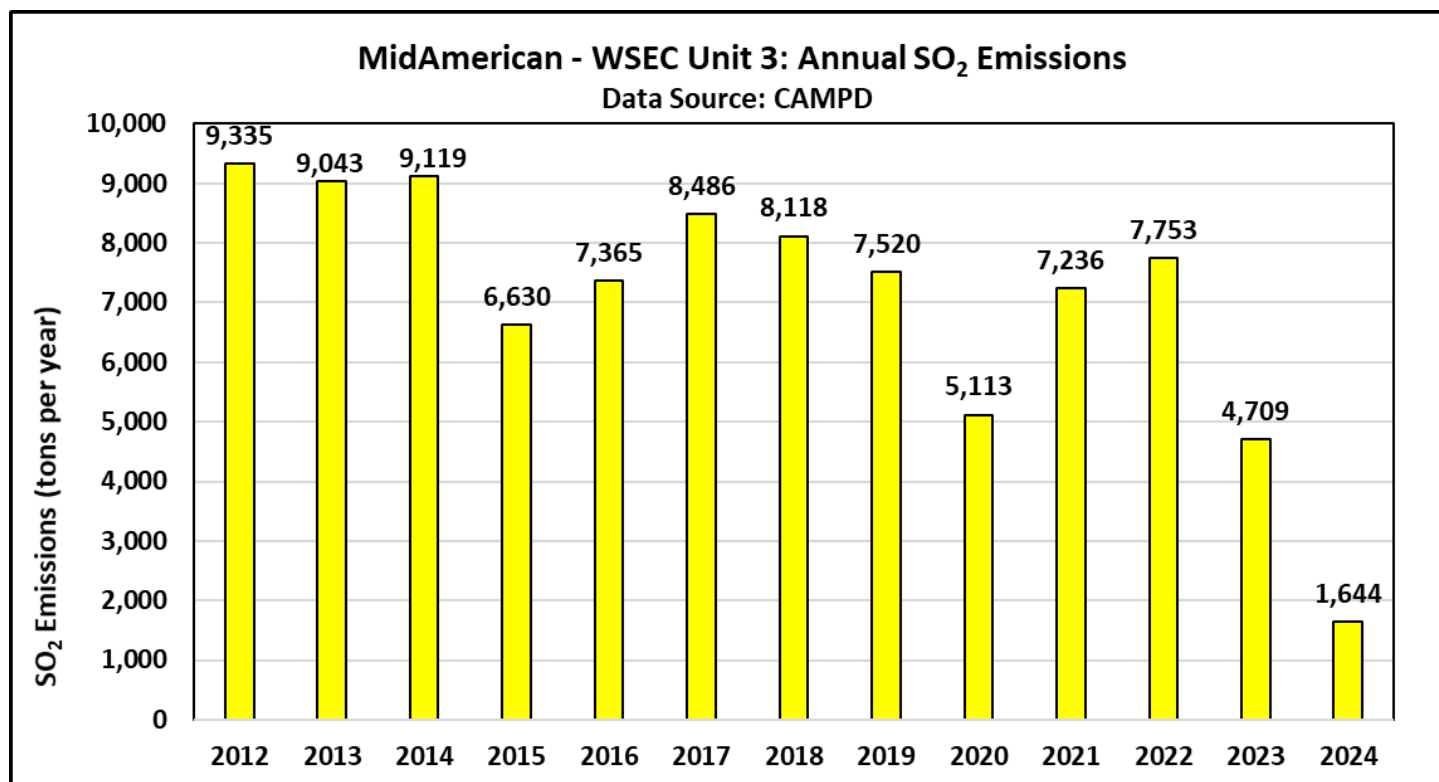


Figure 3-2. Annual 2012-2024 actual SO₂ emissions (tons per year) from Unit 3 at WSEC. Rounded to the nearest ton.

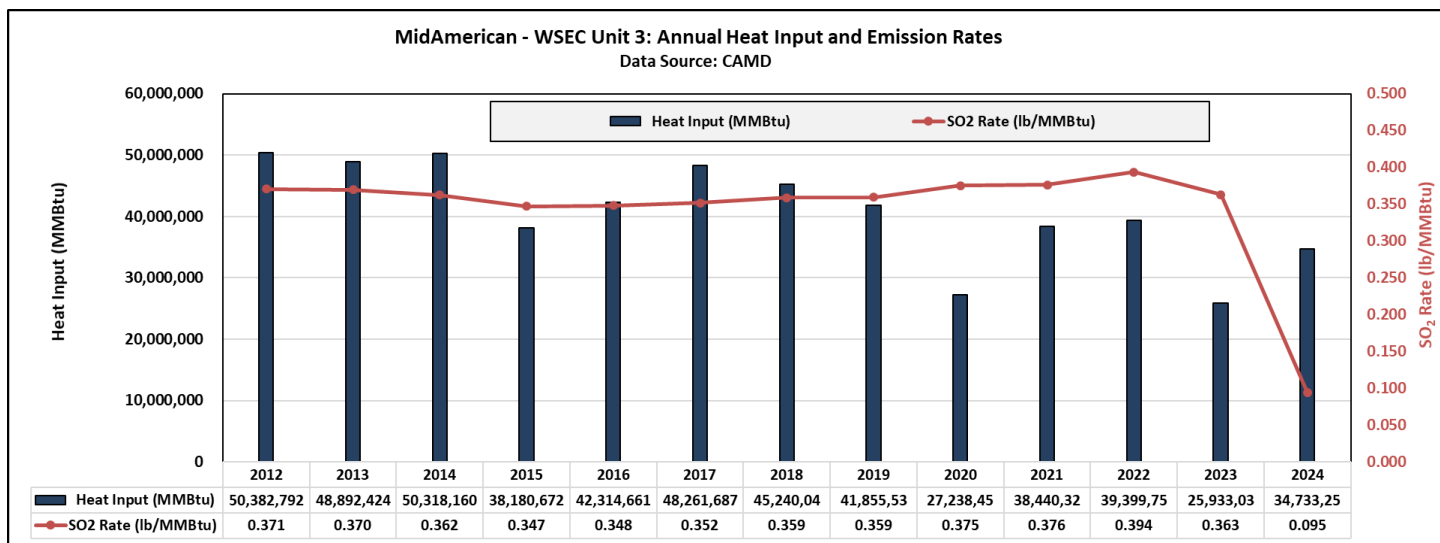


Figure 3-3. Annual 2012-2024 heat input (MMBtu) and SO₂ emission rates (lb/MMBtu) from Unit 3 at WSEC.

3.2. Recommendation

The state must provide a recommendation, pursuant to [40 CFR 51.1205\(b\)\(1\)](#), regarding whether additional modeling is needed to characterize air quality in the area to determine whether the area meets or does not meet the 2010 1-hour SO₂ NAAQS. The modeling analysis that supported the attainment designation for Pottawattamie County used actual hourly emission rates from 2012-2014 for WSEC Unit 3 and yielded a total maximum concentration of 134 µg/m³ (see Table 3-2), which is approximately 32% below the 2010 1-hour SO₂ NAAQS level of 75 ppb (~196 µg/m³). The 2024 annual SO₂ emissions from Unit 3 are 65.1% lower than they were in 2023 and are 82.1% lower than the average of the 2012-2014 annual emissions. Given this, and that all other sources at WSEC were modeled based on their federally enforceable maximum permitted allowable emission limits, additional modeling is not needed to determine that Pottawattamie County still meets the 2010 1-hour SO₂ NAAQS.