



REDESIGNATION REQUEST AND
MAINTENANCE PLAN FOR
THE LAKE COUNTY, OH 1-HOUR SO₂
NONATTAINMENT AREA

Lake County, Ohio

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REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE LAKE COUNTY, OH 1-HOUR SO₂ NONATTAINMENT AREA

Lake County, Ohio

CHAPTER ONE: Introduction

History

The Clean Air Act (CAA), as amended, requires each state with areas failing to meet the 1-hour sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS) to develop State Implementation Plans (SIPs) to expeditiously attain and maintain the standard. The United States Environmental Protection Agency (U.S. EPA) promulgated the revised NAAQS for SO₂ on June 2, 2010. U.S. EPA replaced the 24-hour and annual standards with a new short-term 1-hour standard of 75 parts per billion (ppb). The new 1-hour SO₂ standard was published on June 22, 2010 (75 FR 35520) and became effective on August 23, 2010. The standard is based on the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

On August 15, 2013, U.S. EPA published (78 FR 47191) the initial SO₂ nonattainment area designations for the 1-hour SO₂ standard across the country (effective October 4, 2013). Unlike Subpart 2 of the CAA Amendments of 1990 which defined five ozone nonattainment classifications for the areas that exceed the NAAQS based on the severity of the ozone levels, SO₂ nonattainment designations are simply labeled “nonattainment.” The CAA Amendments require states with SO₂ nonattainment areas to submit a plan within eighteen months of the effective date of the designations (April 4, 2015) detailing how the SO₂ standard will be attained by October 4, 2018 (referred to as an “attainment demonstration”). However, areas that attain before the required date for submitting a plan may be exempt from certain otherwise applicable requirements.

Section 107(d)(3)(E) of the CAA allows states to request nonattainment areas to be redesignated to attainment provided certain criteria are met. The following are the criteria that must be met in order for an area to be redesignated from nonattainment to attainment:

1. A determination that the area has attained the SO₂ standard. (CAA Section 107(d)(3)(E)(i))
2. An approved SIP for the area under Section 110(k). (CAA Section 107(d)(3)(E)(ii))
3. A determination that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, federal requirements, and other permanent and enforceable reductions. (CAA Section 107(d)(3)(E)(iii))
4. A fully approved maintenance plan, including a contingency plan, under Section 175A. (CAA Section 107(d)(3)(E)(iv))

5. A determination that all Section 110 and Part D requirements have been met. (CAA Section 107(d)(3)(E)(v))

Each of these criteria is discussed in more detail under Chapter Two with a detailed analysis in subsequent chapters. This document is intended to support Ohio's request that the Lake County, OH area be redesignated from nonattainment to attainment for the 1-hour SO₂ standard. This document addresses each of above requirements, and provides additional information to support continued compliance with the 1-hour SO₂ standard.

Geographical Description and Background

The current Lake County, OH nonattainment area is located in northeastern Ohio along the southern border of Lake Erie and is comprised of the entirety of Lake County, OH. This area is shown in Figure 1 under Chapter Three.

The Lake County, OH area was previously subject to nonattainment area rulemakings for the 1971 SO₂ NAAQS. Initial designations were promulgated on March 3, 1978, effective May 2, 1978 (43 FR 8962). However, as a result of public comment, final amended designations were promulgated and effective on October 5, 1978 (43 FR 45993). Subsequently, a revision to the boundary was made on March 15, 1982 and effective April 14, 1982 (47 FR 11014). Within Lake County, the Cities of Eastlake, Timberlake, Lakeline, Willoughby (north of U.S. 20), and Mentor (north of U.S. 20 west of S. R. 306) were designated nonattainment. U.S. EPA approved a redesignation request and maintenance plan for this area on August 30, 1999, effective September 29, 1999 (64 FR 47113).

Status of Air Quality

SO₂ complete quality-assured ambient air quality monitoring data for the three (3) years, 2015 through 2017, demonstrate that the air quality has met the 1-hour SO₂ standard in this nonattainment area. (See Chapter Three) The NAAQS attainment, accompanied by decreases in emission levels discussed in Chapter Four, supports a redesignation to attainment for the Lake County, OH area based on the requirements in Section 107(d)(3)(E) of the CAA as amended.

CHAPTER TWO: Requirements for Redesignation

U.S. EPA has published detailed guidance in a document entitled *Procedures for Processing Requests to Redesignate Areas to Attainment* (redesignation guidance), issued September 4, 1992, to Regional Air Directors. U.S. EPA has also published guidance specific to SO₂ in a document entitled *Guidance for 1-Hour SO₂ Nonattainment Area SIP Submissions* (SO₂ nonattainment area SIP guidance), issued April 23, 2014, to Regional Air Division Directors. This redesignation request and maintenance plan is based on the redesignation guidance and SO₂ nonattainment area SIP guidance, supplemented with additional guidance received from U.S. EPA Region 5 staff.

Below is a summary of each redesignation criterion as it applies to the Lake County, OH area.

1. Attainment of the standard (CAA Section 107(d)(3)(E)(i))

There are two components involved in making this demonstration.

The first component relies on ambient air quality data. For SO₂, all available monitoring data in the area should indicate the standard is being met according to 40 CFR 50.17 and 40 CFR Part 50, Appendix T. Analyses should indicate whether any of the monitors located in the nonattainment area are located in the area of maximum concentration.

Demonstration: Chapter Three discusses this requirement in more detail and provides the demonstration.

The second component relies upon supplemental U.S. EPA-approved air quality modeling. Where a monitor is located in the area of maximum concentration, a determination of attainment may be made based on monitoring data alone without the need for additional air quality modeling. When a nonattainment area has no monitors, or monitors not located in the area of maximum concentration, air quality dispersion modeling is *generally* needed to estimate SO₂ concentrations in the area.

Demonstration: Chapter Three discusses this requirement in more detail (Requirement 4 of 4) and provides the demonstration.

2. Approved SIP for the area under CAA Section 110(k) (CAA Section 107(d)(3)(E)(ii))

The SIP for the nonattainment would need to be fully approved and satisfy all applicable requirements for the area. U.S. EPA approval of SIP elements and redesignation requests may occur simultaneously.

Demonstration: Ohio EPA has submitted all required SIP elements for this area in either previous submittals, or as a part of this submittal. On April 3, 2015, and supplemented on October 13, 2015, Ohio EPA submitted our attainment demonstration SIP for this area. The attainment demonstration SIP satisfied the CAA Section 172 general requirements for areas designated as nonattainment for all NAAQS and the CAA Sections 191 and 192 nonattainment area requirements specific to SO₂. The October 13, 2015 submittal also included regulations promulgated under Ohio Administrative Code (OAC) Chapter 3745-18, effective October 23, 2015, containing federally enforceable limitations on emissions for subject sources in this area. Subsequently, on March 13, 2017 Ohio EPA submitted amended regulations in OAC Chapter 3745-18, effective February 16, 2017, containing updated federally enforceable limitations on emissions for subject sources in this area.¹

3. Permanent and enforceable improvement in air quality (CAA Section 107(d)(3)(E)(iii))

The state must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. The state should estimate the percent reduction achieved from federal measures as well as control measures that have been adopted and implemented by the state.

Demonstration: Chapter Four discusses this requirement in more detail (Requirement 4 of 5) and provides the demonstration.

4. Maintenance plans (CAA Section 107(d)(3)(E)(iv))

Section 107(d)(3)(E) stipulates that for an area to be redesignated, U.S. EPA must fully approve a maintenance plan that meets the requirements of Section 175A. The maintenance plan will constitute a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least ten years after redesignation along with a commitment to review the plan. Section 175A further states that the plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance.

¹ All three submittals can be found in the table under the heading "Attainment Demonstration" at <http://www.epa.ohio.gov/dapc/SIP/so2.aspx>

In addition, the maintenance plan shall contain such contingency measures as the Administrator deems necessary to ensure prompt correction of any violation of the NAAQS. At a minimum, the contingency measures must include a requirement that the state will implement all measures contained in the nonattainment SIP prior to redesignation.

Demonstration: States seeking approval of a maintenance plan for a nonattainment area should consider the following provisions:

- attainment inventory (Chapter Four contains the discussion and demonstration);
- maintenance demonstration (Chapter Four contains the discussion and demonstration);
- monitoring network (Chapter Three contains the discussion and demonstration);
- verification of continued attainment (in Chapter Four (Requirement 5 of 5) contains the discussion and demonstration); and
- contingency plan (Chapter Six contains the discussion and demonstration).

5. Section 110 and Part D requirements (CAA Section 107(d)(3)(E)(v))

For purposes of redesignation, a state must meet all requirements of Section 110 and Part D that were applicable prior to submittal of the complete redesignation request but not those that come due after submittal of the redesignation request.

a. Section 110(a) requirements

Section 110(a) of Title I of the CAA contains the general requirements for a SIP. Section 110(a)(1) generally directs states to submit a SIP that provides for implementation, maintenance, and enforcement of the air quality standards to the U.S. EPA after reasonable notice and public hearing. Section 110(a)(2) provides that the infrastructure SIP submitted by a state must have been adopted by the state after reasonable public notice and hearing, and that, among other things, it must include enforceable emission limitations and other control measures², means or techniques necessary to meet the requirements of the CAA; provide for establishment and operation of appropriate devices, methods, systems and procedures necessary to monitor ambient air quality; provide for implementation of a source permit program to regulate the modification and construction of any stationary source within the areas covered by the plan; include provisions for the implementation of Part C, prevention of significant deterioration (PSD) and Part D, new source review (NSR) permit programs;

² Other than nonattainment emission limitations and measures which are a part of nonattainment area plans and subject to the timing requirements of Section 172 of the CAA.

include criteria for stationary source emission control measures, monitoring, and reporting; include provisions for air quality modeling; and provide for public and local agency participation in planning and emission control rule development.

Demonstration: In Ohio's June 7, 2013 infrastructure SIP submission, Ohio verified that the state fulfills the requirements of Section 110(a)(1) and Section 110(a)(2) of the CAA with respect to the 2010 SO₂ NAAQS. Ohio's June 7, 2013 infrastructure SIP for the 2010 1-hour SO₂ standard contains SIP approved Ohio Administrative Code Chapter 3745-18, through which SO₂ emissions are directly regulated.

Section 110(a)(2)(D) also requires state plans to prohibit emissions from within the state which contribute significantly to nonattainment or maintenance areas in any other state, or which interfere with programs under Part C to prevent significant deterioration of air quality or to achieve reasonable progress toward the national visibility goal for Federal class I areas (national parks and wilderness areas).

In order to assist states in addressing their obligations regarding regionally transported pollution, U.S. EPA finalized the Clean Air Interstate Rule (CAIR) and then the Cross State Air Pollution Rule (CSAPR) to reduce SO₂ and NO_x emissions from large electric generating units (EGU). Ohio has met the requirements of the federal CAIR to reduce NO_x and SO₂ emissions contributing to downwind states. On February 1, 2008, U.S. EPA approved Ohio's CAIR program, which can be found in Ohio Administrative Code (OAC) Chapter 3745-109³. On July 6, 2011, U.S. EPA finalized a replacement to the CAIR program, the CSAPR. CSAPR assisted, and will further assist, states in addressing their obligations regarding regionally transported pollution by providing reductions in NO_x and SO₂ emissions in 2015 and 2017⁴.

b. Part D requirements

Subpart 1 of Part D consists of general requirements applicable to all areas which are designated nonattainment based on a violation of the NAAQS. Subpart 5 of Part D consists of more specific requirements applicable to SO₂⁵.

i. Section 172(c) requirements

³ Note, Ohio EPA rescinded our CAIR rules effective January 29, 2018 as compliance is now required under the CSAPR Federal Implementation Plan.

⁴ Timeline for implementation of CSAPR was adjusted from 2012 and 2014 to 2015 and 2017. (79 FR 71663)

⁵ Subpart 5 of Part D identifies requirements related only to plan submission deadlines and attainment dates. SIP submittal and attainment dates are discussed in the introduction of this submittal.

This Section contains general requirements for nonattainment plans. The requirements for reasonable further progress (RFP), identification of certain emissions increases, and other measures needed for attainment will not apply for redesignations because they only have meaning for areas not attaining the standard. The requirements for an emission inventory will be satisfied by the inventory requirements of the maintenance plan.

Demonstration: The emissions inventory is discussed in Chapter Four and the maintenance plan is discussed below. The requirements of the Part D NSR program will be replaced by the PSD program once the area has been redesignated. The PSD program is discussed in Chapter Five (Requirement 5 of 6). The demonstrations are provided in these locations.

ii. Conformity

The state must work with U.S. EPA to show that its SIP provisions are consistent with the Section 176(c)(4) conformity requirements. The redesignation request should include conformity procedures, if the state already has these procedures in place. If a state does not have conformity procedures in place at the time that it submits a redesignation request, the state must commit to follow U.S. EPA's conformity regulation upon issuance, as applicable.

Demonstration: Ohio EPA meets all of U.S. EPA's conformity procedures. Ohio EPA commits to following the general conformity requirements of 40 CFR 93.150 to 93.165. On August 20, 2014, Ohio EPA submitted signed Memorandums of Understanding (MOUs) to U.S. EPA establishing transportation conformity procedures for inclusion in Ohio's SIP. U.S. EPA issued a direct final rulemaking approving the MOUs on March 2, 2015 (80 FR 11133) with an effective date of May 1, 2015.

As described in the SO₂ nonattainment area SIP guidance, due to the relatively small, and decreasing, amounts of sulfur in gasoline and on-road diesel fuel, the U.S. EPA's transportation conformity rules provide that they do not apply to SO₂ unless transportation conformity budgets exist for other reasons, such as that SO₂ is found to be a significant contributor to a PM_{2.5} nonattainment problem, or if the SIP has established an approved or adequate budget for such emissions as part of the RFP, attainment or maintenance strategy. Neither of these circumstances applies here. As discussed in Ohio EPA's

October 5, 2011⁶ redesignation request and maintenance plan for the Cleveland-Akron-Lorain, OH area under the 1997 PM_{2.5} standard and the May 30, 2012⁷ redesignation request and maintenance plan for the Cleveland-Akron-Lorain, OH area under the 2006 PM_{2.5} standard, mobile SO₂ was found to be an insignificant contributor to the PM_{2.5} nonattainment problem. All of Lake County, OH was included in those historical nonattainment areas and no SO₂ budgets exist for Lake County. As discussed above, portions of the 2010 Lake County SO₂ nonattainment area was also designated as nonattainment under the 1971 SO₂ standard. However, no SO₂ budgets exist for Lake County under the older SO₂ standard. Therefore, mobile source SO₂ emission budgets are not required for this area.

⁶ http://www.epa.ohio.gov/portals/27/SIP/Attain/PM2_5/Cleveland_PM25_annual_redesignation-FINAL.pdf

⁷ http://www.epa.ohio.gov/portals/27/SIP/Attain/PM2_5_24hr/CleAkr_PM25_24-hr_redesig_Final.pdf

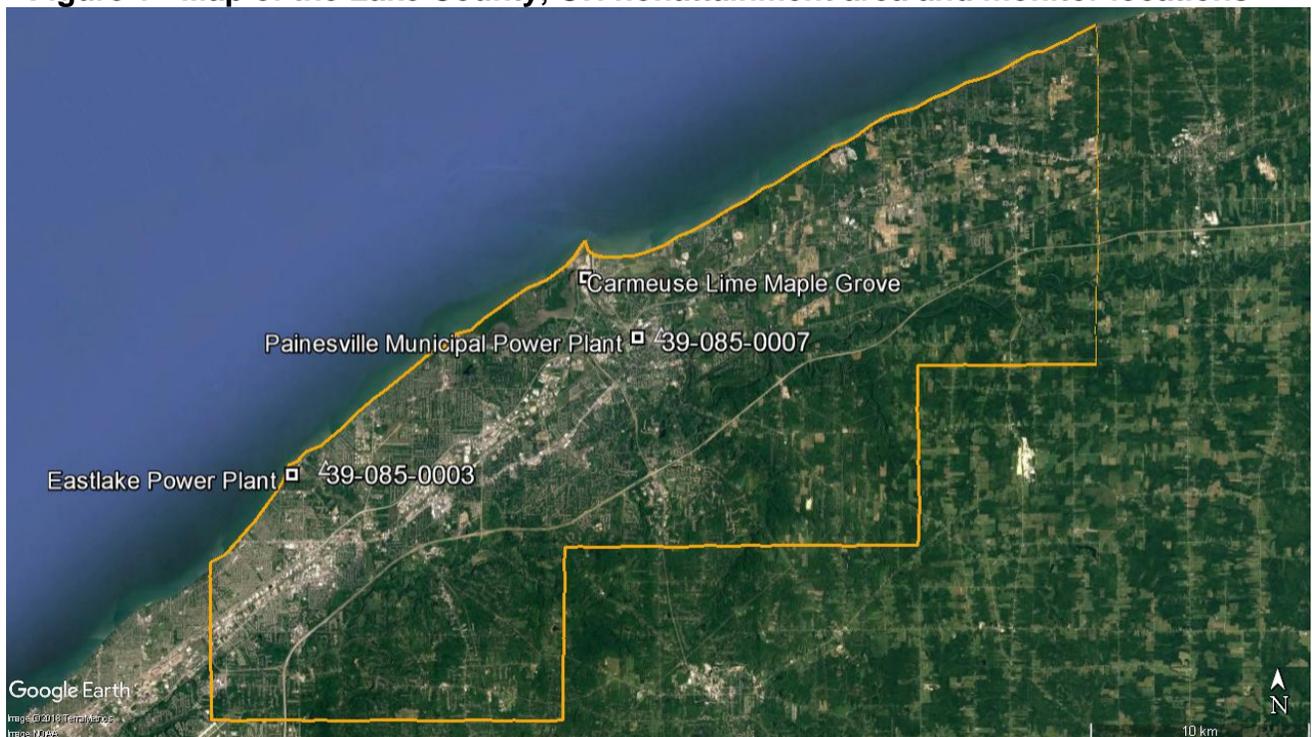
CHAPTER THREE: SO₂ Monitoring

CAA Section 107(d)(3)(E)(i)

Requirement 1 of 4: A demonstration that the NAAQS for 1-hour SO₂, as published in 40 CFR 50.17, has been attained.

There are two monitors measuring SO₂ concentrations in this nonattainment area. The monitors are operated by Ohio EPA's Northeast District Office. The location of the monitoring sites for this nonattainment area are shown in Figure 1.

Figure 1 - Map of the Lake County, OH nonattainment area and monitor locations



In accordance with 40 CFR Part 50, Appendix T, three complete years of monitoring data are required to demonstrate attainment at a monitoring site. The 1-hour SO₂ standard is met at an ambient air quality monitoring site when the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations is less than or equal to 75 ppb. The three-year average of the annual 99th percentile of 1-hour daily maximum concentrations is also called the site's "design value." To be complete, at least 75 percent of the days in each quarter of each of the three consecutive years must have at least one reported hourly value. Hourly SO₂ data are reported to U.S. EPA's Air Quality System (AQS). While calculating design values, one decimal place must be carried in the computations, with final values rounded to the nearest 1 ppb. Decimals 0.5 or greater are rounded up, and those less than 0.5 are rounded down. Values at or below 75 ppb meet the standard. Values greater than 75

ppb exceed the standard. An area is in compliance with the 1-hour SO₂ standard only if every monitoring site in the area meets the NAAQS. The air quality design value for the area is the highest design value among all sites in the area.

Demonstration: The highest three-year average of the annual 99th percentile of 1-hour daily maximum concentrations, based on data from the monitoring sites in the area, is 66 ppb. A listing of the design value for 2015 through 2017 is shown in Table 1.

Table 1 - Monitoring data for the Lake County, OH area for 2015 – 2017

Site	County	Year (ppb)			Average 2015-2017 (ppb)
		2015	2016	2017	
39-085-0003	Lake	36	10	5	17
39-085-0007	Lake	89	80	29	66
	Less than 75% capture in at least one quarter				

Source: U.S. EPA Air Quality System (AQS); <http://www.epa.gov/ttn/airs/airsaqs/index.htm>

Requirement 2 of 4: Ambient monitoring data quality assured in accordance with 40 CFR 58.10, recorded in the AQS database, and available for public view.

Demonstration: Ohio EPA has quality assured all data shown in Appendix A in accordance with 40 CFR 58.10 and all other federal requirements. Ohio EPA has recorded the data in the AQS database and, therefore, the data are available to the public.

Requirement 3 of 4: A commitment that once redesignated, the state will continue to operate an appropriate monitoring network to verify the maintenance of the attainment status.

Demonstration: Ohio EPA commits to continue monitoring SO₂ levels at the Ohio sites indicated in Figure 1 and Table 1. Ohio EPA will consult with U.S. EPA Region 5 prior to making changes to the existing monitoring network, should changes become necessary in the future. Ohio EPA will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58 and all other federal requirements.

Requirement 4 of 4: Supplemental U.S. EPA-approved air quality modeling.

Where a monitor is located in the area of maximum concentration, a determination of attainment may be made based on monitoring data alone without the need for additional air quality modeling. When a nonattainment area has no monitors, or monitors not located in the area of maximum concentration, air quality dispersion modeling is *generally* needed to

estimate SO₂ concentrations in the area.

Demonstration: Ohio EPA prepared supplemental air quality modeling and submitted that modeling for approval as a part of Ohio's attainment demonstration SIP.

Within Lake County, OH there are two sources categorized as electric generating units (EGU), Eastlake Power Plant and Painesville Municipal Power, and 14 non-EGU sources. In 2011, Eastlake Power Plant accounted for 93% of SO₂ emissions in this area while Painesville Municipal Power accounted for 5%. In 2011, Eastlake Power Plant emitted 48,303 tons of SO₂ and Painesville Municipal Power emitted 2,745 tons. Combined they represent 98% of the area's SO₂ emissions (52,143 tons). One non-EGU, Carmeuse Lime, emitted 890.60 tons of SO₂ in 2011, and inclusion of this source accounts for over 99% of 2011 SO₂ emissions (see Figure 1 for locations).

As a part of Ohio's attainment demonstration SIP, Ohio EPA performed extensive modeling analyses to determine if controls were necessary to provide for attainment of the 2010 SO₂ standard and ensure maintenance, once the standard was attained.

Multiple dispersion modeling analyses were performed for the attainment demonstration SIP analysis. The first was an analysis of the 2010-2012 period, using actual variable emissions from each facility included in the modeling domain. This portion of Ohio EPA's analysis demonstrated the contribution of each facility to the then violating monitor 39-085-0007 in Lake County, Ohio, which is located near Painesville, OH, and was used to assess model performance. This specific modeling analysis is herein referred to as the "base case," and all modeling analyses not associated with monitor-only specific impacts are herein referred to as "future case" scenarios.

The second analysis demonstrated the impact of each individual facility on the nonattainment area when operating at permitted or potential SO₂ emission rates in effect at that time. This portion of the analysis was used to establish emission rates that eliminate facility-specific hotspots exceeding the standard (herein referred to as "ceiling rates").

The third analysis demonstrated the interactive impact of all facilities in the nonattainment area when operating at previously identified ceiling rates. This portion of the analysis was used to establish emission rates at all facilities required to model attainment of the standard over the nonattainment area (herein referred to as "attainment rates").

The final analysis demonstrated attainment of the standard. These analyses are discussed in greater detail in Appendix F of the attainment demonstration SIP (Appendix B).

Only two major sources were found to necessitate control; Painesville Municipal Power and Eastlake Power Plant. While Carmeuse Lime was analyzed as part of Ohio's SIP, it was found to not be a contributor to nonattainment and did not necessitate control. Table 2

identifies the modeled attainment rates for each facility.

Table 2 – Lake County modeled attainment rates (critical values)

	Source ID	Previous Chapter 18 SIP Limit	Capacity	Previous Permitted SO ₂ Rate	Final Attainment SO ₂ Rate
		(lb/MMBtu)	(MMBtu/hr)	(lb/hr)	(lb/hr)
Eastlake Power Plant	B001_EL	5.64	1,325	7,473	1,158.89
	B002_EL	5.64	1,325	7,473	1,158.89
	B003_EL	5.64	1,325	7,473	1,158.89
	B004_EL	5.64	2,253	12,707	0 (Shutdown)
	B005_EL	5.64	6,040	34,066	0 (Shutdown)
Painesville Municipal	B001_PV	5.7	593.0	1,127	362.997 or
	B003_PV	5.7		1,127	430.499
	B004_PV	5.7		1,127	

All five coal-fired boilers at Eastlake Power Plant ceased operations by April 16, 2015. There are no other significant point sources of SO₂ emissions located at Eastlake Power Plant. However, at the time of development of the initial attainment demonstration SIP submittal, only two of the five coal-fired boilers at Eastlake Power Plant had been permanently shutdown. Therefore, Ohio EPA established emissions limitations commiserate with those determined necessary in the modeling for the remaining three coal-fired boilers. A reduction in allowable emissions from 7473 lbs/hr to 1158.89 lbs/hr (modeled critical value) for each boiler was determined necessary for this facility. This represented an 85% reduction in allowable SO₂ emissions. Days before Ohio EPA was to submit our initial attainment demonstration SIP, Eastlake Power Plant notified Ohio EPA of the intent to permanently shutdown the remaining coal-fired boilers. However, Eastlake Power Plant requested Ohio EPA continue with the determination of the modeled emissions rates providing for attainment to preserve their ability to generate emission reduction credits upon shutdown of the remaining three coal-fired boilers.

Painesville Municipal Power also required significant reductions as a part of the attainment demonstration SIP. Painesville Municipal Power's three coal-fired boilers were, and remain, subject to U.S. EPA's Boiler Maximum Achievable Control Technology (MACT) standards. As a result, part of the strategy for this facility included acceptance of a federally enforceable emissions limitation that reduced each unit's annual heat input capacity by 90% to meet the "Limited Use" definition under the applicable Boiler MACT rule (40 CFR 63.7575). As a result, operation of these units is intermittent to serve the City of Painesville during high demand

periods and during service interruptions. In addition, Ohio's Reasonably Available Control Measure (RACM) analysis for Painesville Municipal Power established a reduced emission limit that reflects an average fuel sulfur content of 2.5%, which equates to an SO₂ emission rate of 4.0 lbs/MMBtu using an average fuel heat content of 12,500 Btu/lb. This is a significant reduction from the 5.7 lbs/MMBtu SO₂ limit in the previous Ohio SIP applicable to Painesville Municipal Power.

Painesville Municipal Power also requested longer term emission limits equivalent to their critical values. Ohio EPA amended our SO₂ regulations under OAC Chapter 3745-18 to incorporate these new SIP limitations as part of the supplement to the attainment demonstration SIP submittal (Appendix M of the October 13, 2015 supplement to the attainment demonstration SIP). Ohio EPA performed an analysis of 30-day average emission limits in accordance with the SO₂ nonattainment area SIP guidance. The following strategy was submitted for incorporation into Ohio's SIP:

- B001, B003 and B004 will be restricted to allow operation of only one unit at any time, except for coinciding periods of start-up and shutdown.
- An SO₂ emission rate of 4.0 lb/MMBtu for emissions units B001, B003, and B004 (RACM as discussed above).
- A 30-day average limit for B001 of 71.692 MMBtu/hr.
- A 30-day average limit for B003 or B004 of 85.024 MMBtu/hr.
- A combined 24-operating hour average limit of 249 MMBtu/hr for any calendar day for units B001, B003 and B004.
- A 10% "Limited Use" capacity restriction with compliance determined for each boiler in accordance with U.S. EPA's Boiler MACT.

Appendix H of Ohio's attainment demonstration SIP provided an analysis of the 30-day averaging methods employed to assure the combination of the limited use restriction, the 24-hour average limitation and the 30-day average limitation was sufficient to conservatively provide assurance that the 1-hour SO₂ standard will be maintained in this area.

As part of Ohio's rulemaking, a compliance schedule was incorporated that provided for compliance no later than January 1, 2017 unless another compliance schedule is properly justified.

Subsequent to the October 13, 2015 supplement to the attainment demonstration SIP submittal with finalized supporting regulations, U.S. EPA contacted Ohio EPA requesting adjustments be made to the requirements for Painesville Municipal Power. Therefore, Ohio EPA worked with U.S. EPA and Painesville Municipal Power to develop revised regulations that were submitted to U.S. EPA for replacement in Ohio's attainment demonstration SIP on March 13, 2017. The final compliance strategy for Painesville Municipal Power included removing the option to extend the compliance deadline thereby requiring compliance with the following requirements by January 1, 2017 for all three boilers:

- Not cause or permit the emission of sulfur dioxide to exceed a maximum of 4.0 pounds of sulfur dioxide per MMBtu actual heat input from each boiler.
- Operate said boilers such that their combined average operating rate shall not exceed two hundred forty-nine MMBtu per hour for any calendar day, excluding any heat input from burning biomass⁸ or natural gas.
- Operate only one boiler on coal at any time.
- Operate boiler number 5 (OEPA source number B001) such that the average sulfur dioxide emission rate shall not exceed two hundred eighty-seven pounds per hour for any thirty operating-day period.
- Operate boiler number 3 (OEPA source number B003) such that the average sulfur dioxide emission rate shall not exceed three hundred forty pounds per hour for any thirty operating-day period.
- Operate boiler number 4 (OEPA source number B004) such that the average sulfur dioxide emission rate shall not exceed three hundred forty pounds per hour for any thirty operating-day period.
- Operate each boiler with an annual capacity factor of no more than ten per cent, using the definition of annual capacity factor” in 40 CFR 63.7575 except that for purposes of this paragraph, the determination of the annual capacity factor shall exclude any heat input from burning biomass or natural gas.
- For the purpose of this paragraph, "biomass" means any of the following:
 - Any organic material grown for the purpose of being converted to energy.
 - Any organic byproduct of agriculture that can be converted into energy (other than manure).
 - Any material that can be converted into energy and is nonmerchantable for other purposes, that is segregated from other nonmerchantable material, and that is either of the following:
 - A forest-related organic resource, including mill residues (other than black liquor), precommercial thinnings, slash, brush, or by product from conversion of trees to merchantable material.
 - A wood material, including pallets, crates, dunnage, manufacturing and construction materials (other than pressure-treated, chemically-treated, or painted wood products), and landscape or right-of-way tree trimmings.

⁸ At Painesville Municipal Power’s request, Ohio EPA incorporated an exception in the event the facility converts to biomass in the future.

CHAPTER FOUR: Emission Inventory

CAA Section 107(d)(3)(E)(iii)

U.S. EPA's redesignation guidance requires the submittal of a comprehensive inventory of SO₂ emissions representative of the year when the area achieves attainment of the 1-hour SO₂ air quality standard. Ohio also must demonstrate that the improvement in air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. Other emission inventory related requirements include a projection of the emission inventory to a year at least 10 years following redesignation; a demonstration that the projected level of emissions is sufficient to maintain the 1-hour SO₂ standard; and a commitment to provide future updates of the inventory to enable tracking of emission levels during the 10-year maintenance period.

Requirement 1 of 4: A comprehensive emission inventory of SO₂ completed for the base year and a projection of the emission inventory to a year at least 10 years following redesignation.

Periodic inventories, which include emissions from all sectors - mobile, area, non-road, and point sources - are prepared every three years. The 2011 periodic inventory has been identified as one of the preferred databases for SIP development and coincides with nonattainment air quality in the Lake County, OH area. The 2011 inventory is used as the base year for the purpose of this submittal and coincides with the base year inventory submitted to U.S. EPA to fulfill all emissions inventory requirements under the 2010 SO₂ standard.

For the attainment year, 2016 was selected since it corresponds to one of the years in the design value showing attainment (2015 – 2017). The 2016 attainment year also corresponds to the year where the permanent and enforceable improvement in air quality leading to attainment occurred due to Eastlake Power Plant permanently ceasing coal burning operations. Painesville Municipal Power was not required to begin compliance with their SO₂ strategy developed as a part of Ohio's attainment demonstration until January 1, 2017 but significant reductions in SO₂ emissions also occurred at this facility in preparation for meeting these limitations (278.37 tons in 2016 compared to 2,745.29 tons in 2011).

In consultation with U.S. EPA, Ohio EPA selected the year 2030 as the maintenance year for this redesignation request. This document contains projected emissions inventories for 2023 (interim year) and 2030.

The information below describes the procedures Ohio EPA used to generate the 2011 base year inventory, 2016 attainment inventory and future year emission projections.

In summary, inventories and projections were developed for each sector as follows:

- Non-road, point source (EGUs and non-EGUs), other and on-road emissions were collected from the data available on U.S. EPA’s Air Emissions Modeling website⁹. Using Emissions Modeling platform 2011v6.3, data were collected for the 2011 National Emissions Inventory (NEI) year and the 2017, 2023 and 2028 U.S. EPA-projected inventories. Therefore, 2011 point emissions are actual reported emissions from the 2011 NEI.
 - Specific versions of the 2011v6.3 platform used were 2011el, 2017ek, 2023el and 2028el. Differences between the ek and el platforms are not expected to be significant in the Lake County, OH area as updated emissions were primarily for California, Mexico and Canada¹⁰.
- Ohio EPA derived 2016 actual point emissions (for EGUs and non-EGUs) from state inventory databases (e.g., Ohio’s Emission Inventory System (EIS) database which serves as the basis for the NEI).
- Using the above datasets:
 - An adjustment was made to 2011 EGU emissions. Upon request, U.S. EPA provided Ohio EPA with a detailed report of EGU emissions for 2011 by specific emissions unit and facility.¹¹ The EGU emissions total in the detailed file (51,045.50 tons) did not match the 2011el summary files (51,581.24 tons) nor did they match Ohio EPA’s own EIS database (51,048.39 tons). Ohio EPA confirmed the accuracy of Ohio’s EIS database (51,048.39 tons) and substituted this total for the 2011el summary total.
 - An adjustment was made to 2011 non-EGU emissions. Ohio EPA’s own EIS database (918.92 tons) did not match the 2011el summary files (919.31 tons). Ohio EPA confirmed the accuracy of Ohio’s EIS database (918.92 tons) and substituted this total for the 2011el summary total.
 - An adjustment was made to the 2017ek “other” sector emissions. Ohio EPA noticed large discrepancies and unusual trends for several counties in the country when comparing the 2011el, 2017ek, 2023el and 2028el inventories, likely due to differences in methodology. Large decreases between 2011 and 2017 were predicted with large increases then occurring between 2017 and 2023 and nearly flat emissions trends for 2023 to 2028. While federal programs will lead to reductions in emissions between 2011 and 2017 as these programs are phased in, it is highly unlikely that large increases will then occur into 2023 as more programs will be phased in further reducing emissions. It is more likely that a smooth transition in declining emissions will occur for this sector, especially given the minimal population changes expected across Ohio, and especially in Lake County, which is expected to have a decline in population in

⁹ <https://www.epa.gov/air-emissions-modeling/2011-version-63-platform>

¹⁰ https://www.epa.gov/sites/production/files/2017-11/documents/2011v6.3_2028_update_emismod_tsd_oct2017.pdf

(see p. 5)

¹¹ ohio_only_2011NEIv2_POINT_ptegu_2011ei_08mar2017_v10

2020 and 2030¹². Therefore, Ohio EPA interpolated emissions for 2017 based on 2011 and 2023 emissions.

- 2016 emissions for non-road, other and on-road were assumed to be equivalent to the 2017 U.S. EPA-projected emissions (2017ek).
- Adjustment was made to 2023 and 2028 emissions for EGU and non-EGU sectors. In the 2023el and 2028el, U.S. EPA projected emissions from two facilities to remain the same as the 2011 inventory: Painesville Municipal Power and Carmeuse Lime.
 - Painesville Municipal Power's 2016 emissions dropped to 278.37 tons in preparation to meet the January 1, 2017 deadline for compliance with the SO₂ emission reduction strategy developed as part of the attainment demonstration SIP. All boilers are now subject to the Boiler MACT and under the 10% limited use provisions. Ohio EPA anticipates future SO₂ emissions will be lower than 2016. However, in order to remain conservative, Ohio EPA maintained the 2023 and 2028 emissions levels commiserate with 2016 levels and replaced those values predicted in the 2023el and 2028el inventories developed by U.S. EPA.
 - Carmeuse Lime's 2016 emissions dropped to 48.40 tons. This was the result of a new stack test and emissions factor development. Production levels remained commiserate with previous years and Ohio EPA does not anticipate any changes in future production levels; however, the new emission factor will be used in the future as a part of emissions reporting. Ohio EPA maintained the 2023 and 2028 emissions levels commiserate with 2016 levels and replaced those values predicted in the 2023el and 2028el inventories developed by U.S. EPA.
- 2030 emissions for all sectors were derived by extrapolating from the 2028 U.S. EPA-projected emissions (2028el) using the TREND function in Microsoft Excel. If the TREND function resulted in a negative value, the emissions were assumed to not change.
- Biogenic emissions are not included in these summaries.

Demonstration: Sectors included in Table 3 are: Electrical Generating Unit (EGU-Point); Non-Electrical Generating Unit (Non-EGU); Non-road Mobile (Non-road); Other (Area); and On-road Mobile (On-road).

¹² https://development.ohio.gov/reports/reports_countytrends_map.htm

Table 3 - Lake County SO₂ emission inventory totals for base year 2011, attainment 2016, and projected 2023 and 2030 (tpy)

Sector	2011 Base	2016 Attainment	2023 Interim	2030 Maintenance	Safety Margin
EGU Point	51,048.39	279.37	279.37	279.37	0.00
Non-EGU	918.92	83.33	76.78	76.78	6.55
Non-road	4.23	2.12	2.61	2.88	-0.76
Other	152.85	109.21	65.57	66.07	43.14
On-road	20.89	9.10	8.43	7.88	1.22
TOTAL	52,145.28	483.13	432.76	432.98	50.15

As part of the redesignation request and maintenance plan, motor vehicle emission budgets must be established unless it is determined mobile sources are insignificant contributors for a specific pollutant. As discussed under Section 5.b.ii of Chapter Two, mobile SO₂ emissions are considered an insignificant contributor under the 2010 SO₂ NAAQS for this area.

Requirement 2 of 4: A demonstration that the projected level of emissions is sufficient to maintain the SO₂ standard.

Maintenance is demonstrated either by showing that future emissions of SO₂ will not exceed the level of the attainment inventory at levels that could cause a violation of the NAAQS, or by modeling to show that the future mix of sources and emission rates will not cause a violation of the NAAQS.

A maintenance demonstration should also include a listing of all SO₂ control measures being implemented in the area by sector (See Chapter Five).

Demonstration: As discussed under Requirement 4 of 4 in Chapter Three, a modeling analysis of the future mix of sources and control measures was conducted as a part of Ohio's attainment demonstration SIP and that analysis demonstrated attainment would be achieved and maintained.

In addition to the modeling analysis, emission trends are an important gauge for continued compliance with the SO₂ standard. Therefore, to meet this requirement, Ohio EPA also performed an initial comparison of the inventories for the base year and maintenance years identified in Requirement 1 of 4 of this Chapter. Maintenance is demonstrated when the future-year (2030) projected emission totals are below the 2016 attainment year totals.

Table 4 – Lake County, OH area comparison of 2016 attainment year and 2023 and 2030 projected emission estimates (tpy)

	2016 Attainment	2023 Interim	2023 Projected Decrease	2030 Maintenance	2030 Projected Decrease
SO ₂	483.13	432.76	50.37	432.98	50.15

As shown in the Table 4 above, SO₂ emissions in the nonattainment area are projected to decrease by just over 50 tpy in both 2023 and 2030 from 2016 attainment levels. This drop in emissions from the attainment year in conjunction with the fact that the entire nonattainment area’s total emissions will be 433 tpy after the attainment year demonstrates maintenance.

Requirement 3 of 4: A demonstration that improvement in air quality between the year violations occurred and the year attainment was achieved is based on permanent and enforceable emission reductions and not on temporary adverse economic conditions or unusually favorable meteorology.

Permanent and enforceable reductions should be a result of emission limitations in the SIP. In making this showing, sufficient quantitative information about emission reductions should be provided to demonstrate the improvement in air quality is attributed to permanent and enforceable measures.

Demonstration: Permanent and enforceable reductions of SO₂ emissions have contributed to the attainment of the 1-hour SO₂ standard in this area.

As demonstrated in Table 5 below, permanent and enforceable reductions were realized in this area due to the permanent shut down of all coal-fired boilers at Eastlake Power Plant. In addition, significant reductions at Painesville Municipal Power also occurred in preparation for meeting their new emission limitations for which compliance was required no later than January 1, 2017.

Table 5 – Lake County, OH area comparison of 2011 base year and 2016 attainment year EGU reductions

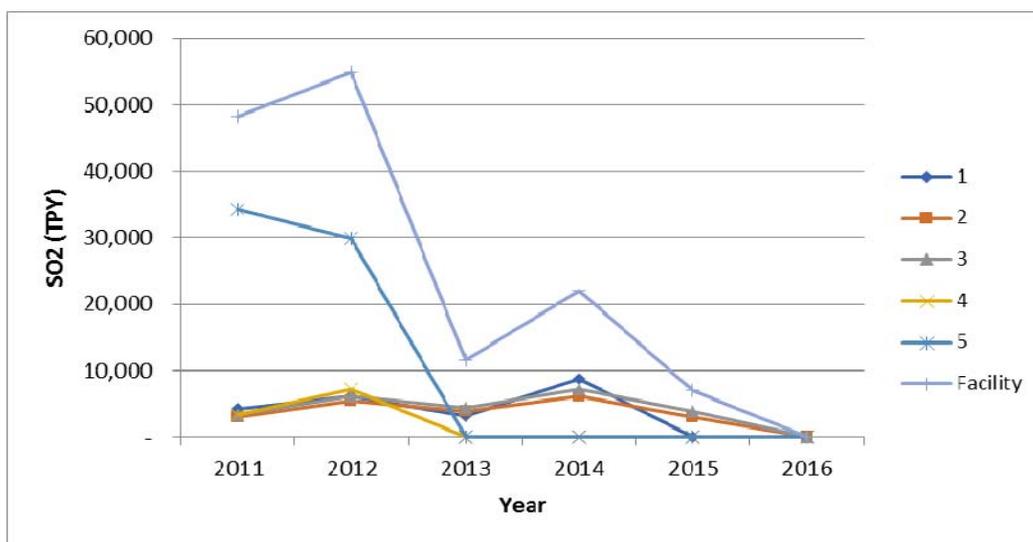
SO ₂	2011	2016
Eastlake Power Plant	48,303.10	1.00
Painesville Municipal Power	2,745.29	278.37

When an owner or operator notifies Ohio EPA of the permanence of shut down, the facility cannot resume operations of any emissions unit without being considered a new emissions

unit and being subject to the NSR requirements. OAC Chapter 3745-31¹³ contains Ohio's Permits-to-Install New Sources and Permit-to-Install and Operate Program rules. OAC rule 3745-31-02 prevents installation or modification, and subsequent operation of new sources without properly obtaining appropriate permits. A new source is defined in OAC rule 3745-31 as any air contaminant source for which an owner or operator undertakes a continuing program of installation or modification, wherein a modification is defined as any physical change in, or change in the method of operation of any air contaminant source that results in an increase in the allowable emissions. In addition, it has been Ohio's longstanding policy and memorialized under OAC Chapter 3745-31 that for any emission unit that is permanently shut down (physically removed from service or altered in such a way that it can no longer operate without a subsequent "modification" or installation), authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. No emission unit certified by the authorized official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31. Thus, the cessation of emissions from Eastlake Power Plant's coal fired boilers is permanent and enforceable, and that this cessation has been demonstrated to markedly improve ambient air quality.

The Eastlake Power Plant was comprised of five coal-fired boilers: B001, B002 and B003 were capable of 1325 MMBtu/hr each; B004 was capable of 2253 MMBtu/hr; and B005 was capable of 6040 MMBtu/hr. Emissions of SO₂, by unit and for the entire facility (including insignificant emissions units), from 2011 through 2016 can be seen in Figure 2 below.

Figure 2: Eastlake Power Plant SO₂ emissions by unit and entire facility

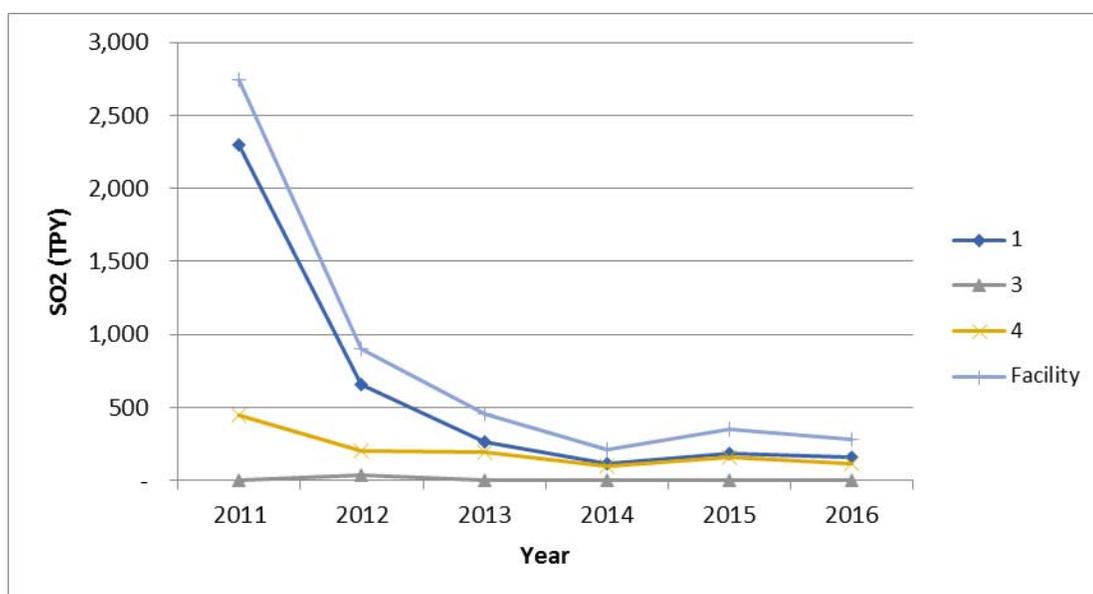


¹³ http://epa.ohio.gov/dapc/regs/3745_31.aspx

B002 and B003 last operated in 2015, B001 in 2014, B004 and B005 in 2012.

Painesville municipal power is comprised of three coal-fired boilers: B001, B003 and B004 each capable of 250 MMBtu/hr, 218.5 MMBtu/hr, and 379 MMBtu/hr, respectively. Emissions of SO₂, by unit and for the entire facility (including insignificant emissions units), from 2011 through 2016 can be seen in Figure 3 below. As noted above, Painesville Municipal Power was not required to begin compliance with their SO₂ strategy developed as a part of Ohio's attainment demonstration SIP until January 1, 2017 but significant reductions in SO₂ emissions also occurred at this facility in preparation for meeting these limitations (278.37 tons in 2016 compared to 2,745.29 tons in 2011).

Figure 3: Painesville Municipal Power SO₂ emissions by unit and entire facility



Inventories of SO₂ emissions for 2011 to 2016 can be found in Appendix C.

In addition to the above, emissions of SO₂ are limited by new source performance standards (NSPS) under Sections 111 and 129 of the CAA; and the national emission standards for hazardous air pollutants (NESHAP) under Section 112 of the CAA. Several recent U.S. EPA air quality regulations on EGUs and other large sources (such as various types of boilers and incinerators) have the potential to significantly reduce SO₂ emissions further, for example, the Mercury and Air Toxics Standards (MATS). Under MATS, EGUs meeting specific criteria may choose to demonstrate compliance with alternative SO₂ emission limits in lieu of demonstrating compliance with HCl emission limits. Also, Title IV of the CAA, CAIR, CSAPR and federal consent decrees required the reduction of SO₂ emissions from EGUs throughout the nation and will continue to achieve further reductions. U.S. EPA notes that for facilities subject to the previously listed MACT and regional interstate transport rules (such as CAIR

and CSAPR), additional control measures may not be necessary to demonstrate compliance with the 1-hour SO₂ NAAQS.

In addition to permanent and enforceable reductions for point sources, several regulations have led, and will continue to lead, to further reductions of SO₂ from other sectors. Examples include the application of tighter federal standards on non-road diesel vehicles (Clean Air Non-road Diesel Rule), requirements to reduce the sulfur content of various motor fuels including low-sulfur diesel fuel standards phased in from 2004 through 2007 for larger on-road vehicles (Highway Heavy Duty Engines Rule), and the application of tighter federal standards on new vehicles.

Requirement 4 of 4: Provisions for future annual updates of the inventory to enable tracking of the emission levels, including an annual emission statement from major sources.

Demonstration: In Ohio, major point sources in all counties are required to submit air emissions information annually, in accordance with U.S. EPA's Consolidated Emissions Reporting Rule (CERR). Ohio EPA prepares a new periodic inventory for all SO₂ emission sectors every three years. These SO₂ inventories will be prepared for future years as necessary to comply with the inventory reporting requirements established in the CFR. Emissions information will be compared to the 2011 base year and the 2030 projected maintenance year inventories to assess emission trends, as necessary, and to assure continued compliance with the 1-hour SO₂ standard.

CHAPTER FIVE: Control Measures and Regulations

CAA Section 107(d)(3)(E)(ii), 107(d)(3)(iii), and 107(d)(3)(E)(v)

Requirement 1 of 6: Section 172(c)(1) of the 1990 Clean Air Act Amendments requires states with nonattainment areas to implement RACM and RACT.

Section 172(c)(1) requires states with nonattainment areas to submit a SIP providing for implementation of all RACMs as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of Reasonable Available Control Technology (RACT)). The SO₂ nonattainment area SIP guidance also provides that to the extent that U.S. EPA has promulgated national and regional rules that will require significant SO₂ emission reductions in the period after areas are designated as nonattainment, “expeditious attainment” may in many cases mean that attainment will be possible earlier than the attainment date.

Demonstration: RACM and RACT requirements are established as part of the attainment demonstration SIPs. Ohio EPA performed a RACM/RACT analysis for this area and submitted with our attainment demonstration SIP.

The SO₂ nonattainment area SIP guidance also provides that to the extent that U.S. EPA has promulgated national and regional rules that will require significant SO₂ emission reductions in the period after areas are designated as nonattainment, “expeditious attainment” may in many cases mean that attainment will be possible earlier than the attainment date. The SO₂ nonattainment area SIP guidance references programs such as the MATS for EGUs and MACT standards for industrial, commercial and institutional (ICI) boilers. U.S. EPA acknowledges that the control strategies sources may use to comply with these federal programs may also provide for significant SO₂ emission reductions and additional control measures may not be necessary to meet the requirements under the SO₂ standard.

Ohio EPA analyzed RACM/RACT for the two major sources in the Lake County nonattainment areas that emitted at least 98% of the nonattainment area’s SO₂ emissions. Ohio EPA has determined that no additional RACM/RACT requirements are needed beyond those already established in OAC Chapter 3475-18; those that will be required under federal measures such as the MATS or MACT that provide for equivalent or better control than RACM/RACT; or those reductions that will be required as a part of Ohio’s attainment/control strategy discussed under Chapter 7 of the attainment demonstration SIP and are equivalent to or more stringent than RACM/RACT. Below is a discussion for the Lake County area supporting this finding and demonstrating RACM/RACT is met.

Only two major sources that impacted nonattainment are located in the area; Painesville Municipal Power and Eastlake Power Plant. Carmeuse Lime was analyzed as part of the attainment/control strategy but was found to not be a contributor to nonattainment and did not

necessitate control.

As noted above, Eastlake Power Plant's coal-fired boilers were permanently shut down. However, Ohio EPA established emissions limitations for three of the units reducing the allowable emissions from 7473 lbs/hr to 1158.89 lbs/hr (modeled critical value). This is an 85% reduction in SO₂ emissions. The shutdown addressed all RACM/RACT requirements.

Painesville Municipal Power also required significant reductions. As discussed above, Painesville Municipal Power operates three coal-fired boilers for electrical generation. These boilers, as currently operated, are subject to U.S. EPA's Boiler MACT standards for which Painesville Municipal Power accepted a federally enforceable operating limit that reduced each unit's annual heat input capacity by 90% to meet the "Limited Use" definition under the applicable Boiler MACT rule (40 CFR 63.7575). As a result, operation of these units is intermittent to serve the City of Painesville during high demand periods and during service interruptions. Intermittent operations require frequent startups and shutdowns. Add-on emission control systems cannot be optimized during startup and shutdown because boiler conditions, including air flow velocities and temperature, are not at optimum levels for control efficiency. Frequent, short-duration operations are not the steady-state conditions for which control devices are designed. For these reasons, the Boiler MACT rule did not require that limited use units install additional control technology to satisfy MACT obligations. Similarly, add-on SO₂ control such as flue gas desulfurization (FGD) should not be considered RACT for limited use units already curtailed to 10% of capacity. Compliance with the Boiler MACT that dramatically reduces the capacity of the operating units should be considered RACT/RACM.

Additional controls will not be cost effective for these units. The cost effectiveness of additional controls must be applied to a limited use unit already curtailed to 10% of capacity. When operating at only 10% of capacity, the additional emission reductions are insufficient to justify the full cost of an FGD. The cost per ton of additional emission reduction from the installation of an FGD would be unreasonably high.

Painesville Municipal Power also considered the use of coal with low sulfur content. Powder River Basin (PRB) sub-bituminous coal has lower sulfur content but it is far more volatile and it contains more ash per MMBtu. The high volatility caused safety problems in storage and handling equipment at the R.H. Gorsuch facility, where it caught fire. This raises technical feasibility concerns because Painesville Municipal Power has storage piles and hoppers that could also catch fire where PRB gathers in the material handling system. The units at Painesville Municipal Power are old boilers that would require substantial modification to handle PRB both in fuel handling, combustion and air pollution control. It would not be cost effective to undergo these larger modifications for boilers that have limited use due to the Boiler MACT.

In addition, Painesville Municipal Power supplied information indicating the sulfur content in

coal can only be reduced to a certain point before the lack of sulfur begins to have negative impacts on control device performance. Painesville Municipal Power uses an electrostatic precipitator (ESP) for particulate control. ESP experts warn against reducing the sulfur content of coal below 2.5% because it interferes with ESP performance. This is because low sulfur levels in coal can reduce the resistivity of the fly ash, which reduces the effectiveness of the ESP. Reduced ESP effectiveness can lead to increases in particulate emissions.

Therefore, RACM for Painesville Municipal Power is a reduced emission limit that reflects an average fuel sulfur content of 2.5%, which equates to an SO₂ emission rate of 4.0 lbs/MMBtu using an average fuel heat content of 12,500 Btu/lb. This is a significant reduction from the 5.7 lbs/MMBtu SO₂ limit in the previous Ohio SIP applicable to Painesville Municipal Power. Coupled with the other measures and reductions incorporated in the attainment strategy SIP, Painesville Municipal Power will have reductions that are equivalent or better than RACM/RACT.

In addition, in 1979, 1987 and 1996, Ohio promulgated rules requiring reasonably available controls measures for SO₂ from stationary sources.

Statewide RACT rules have been applied to all new sources locating in Ohio since that time. RACT requirements are incorporated into permits along with monitoring, recordkeeping, and reporting necessary to ensure ongoing compliance. Ohio EPA also has an active enforcement program to address violations discovered by field office staff. The Ohio RACT rules for SO₂ are found in OAC Chapter 3745-18¹⁴.

In addition, Ohio EPA promulgated and implemented CAIR (OAC Chapter 3745-109¹⁵) between 2009 and 2015. Emissions from EGUs make up a significant contribution to Ohio's inventory. Beginning in 2009, Ohio implemented CAIR which provided for significant reductions in SO₂. Beginning in 2015, the more restrictive CSAPR was implemented and more significant reductions in SO₂ were realized.

Requirement 2 of 6: Section 172(c)(2) of the 1990 CAA Amendments requires attainment demonstration SIPs for nonattainment areas to show RFP.

Section 171(1) defines RFP as “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part (part D) or may reasonable be required by the EPA for the purposes of ensuring attainment of the applicable NAAQS by the applicable attainment date.” The SO₂ nonattainment area SIP guidance explains that this definition is most appropriate for pollutants emitted by numerous and diverse sources where inventory-wide reductions are often needed to attain a standard. Furthermore, the definition is

¹⁴ http://www.epa.ohio.gov/dapc/regs/3745_18.aspx

¹⁵ http://www.epa.ohio.gov/dapc/regs/3745_109.aspx

generally less pertinent to pollutants like SO₂ that usually have a limited number of sources affecting areas and where emissions controls for such sources result in swift and dramatic improvement in air quality. Therefore, U.S. EPA explained that RFP is best construed as “adherence to an ambitious compliance schedule.”

Demonstration: RFP requirements are established as part of the attainment demonstration SIPs. All coal-fired boilers at Eastlake Power Plant permanently shutdown by April 16, 2015, days after the attainment demonstration SIP was submitted and years prior to the October 4, 2018 attainment date. Ohio EPA set an ambitious compliance deadline for Painesville Municipal Power as January 1, 2017, approximately 20 months after the attainment demonstration SIP was submitted and 21 months prior to the required attainment date. As can be seen by the emissions trends for Painesville Municipal Power, early reductions occurred as the facility prepared to meet the compliance deadline. Therefore, the requirement for an ambitious compliance schedule has been met.

Requirement 3 of 6: Section 172(c)(3) requires states to submit a comprehensive inventory of actual emissions.

Section 172(c)(3) requires states to submit a comprehensive inventory of actual emissions in the area, including the requirement for periodic revisions as determined necessary. 40 CFR 51.1008 requires such inventory to be submitted within three years of designation and requires a baseline emission inventory for a suitable year to be used for attainment planning.

The SO₂ nonattainment area SIP guidance provides the SO₂ inventory requirements for attainment demonstration SIPs.

The inventory should also include an attainment year inventory with projected emissions for all SO₂ sources. The inventory should also include the best available information on current enforceable SO₂ emission rates (allowable or permitted rates) for the SO₂ sources located in the nonattainment area.

Demonstration: Ohio EPA submitted its 2011 base year inventory and 2018 future year inventory as a part of its attainment demonstration SIP.

Ohio also updates its inventory in accordance with U.S. EPA’s CERR rule (i.e. emissions statements). Ohio EPA submitted its emissions statement SIP on March 18, 1994 which was approved by U.S. EPA on October 13, 1995 (59 FR 51863). As discussed in Chapter Four (Requirement 4 of 4), Ohio EPA submits, and commits to submit, emission inventories (statements) every three years.

Requirement 4 of 6: Evidence that control measures required in past SO₂ SIP revisions have been fully implemented.

Demonstration: In addition to the historic RACM and RACT requirements for SO₂, Ohio has fully implemented the OAC Chapter 3745-18 regulations and CAIR/CSAPR requirements.

On March 10, 2004, the U.S. EPA promulgated the CAIR. Beginning in 2009, U.S. EPA's CAIR rule requires EGUs in 28 eastern states and the District of Columbia to significantly reduce emissions of NO_x and SO₂. Ohio submitted a CAIR SIP which was approved by U.S. EPA on February 1, 2007. Revisions to the CAIR SIP were again submitted on July 15, 2009. The revised CAIR SIP was approved as a direct final action on September 25, 2009 (74 FR 48857). CAIR was replaced by the more stringent CSAPR requirements beginning in 2015.

OAC Chapter 3745-18¹⁶ is Ohio's SIP approved rules for the regulation of SO₂. This set of rules contains general requirements for the entire state along with facility specific requirements for significant emitters of SO₂. Specifically, OAC rule 3745-18-48 regulates emissions from Lake County.

Requirements are incorporated into permits along with monitoring, recordkeeping, and reporting necessary to ensure ongoing compliance. Ohio EPA also has an active enforcement program to address violations discovered by field office staff.

Requirement 5 of 6: Acceptable provisions to provide for new source review.

Demonstration: Ohio has a longstanding and fully implemented NSR program. This is addressed in OAC Chapter 3745-31¹⁷. The Chapter includes provisions for the PSD permitting program in OAC rules 3745-31-01 to 3745-31-20. Ohio's PSD program was conditionally approved on October 10, 2001 (66 FR 51570) and received final approval on January 22, 2003 (68 FR 2909) by U.S. EPA as part of the SIP. The latest revisions to OAC Chapter 3745-31 were approved into Ohio's SIP on February 20, 2013 (78 FR 11748).

Any facility that is not listed in the 2011 emission inventory, or for the closing of which credit was taken in demonstrating attainment, will not be allowed to construct, reopen, modify, or reconstruct without meeting all applicable NSR requirements. Once the area is redesignated, Ohio EPA will implement NSR through the PSD program.

¹⁶ http://www.epa.ohio.gov/dapc/regs/3745_18.aspx

¹⁷ http://www.epa.ohio.gov/dapc/regs/3745_31.aspx

Requirement 6 of 6: Assure that all existing control measures will remain in effect after redesignation unless the state demonstrates through modeling that the standard can be maintained without one or more control measures.

Demonstration: Ohio commits to maintaining the aforementioned control measures after redesignation. Ohio hereby commits that any changes to its rules or emission limits applicable to SO₂ as required for maintenance of the 1-hour SO₂ standard in the Lake County, OH area, will be submitted to U.S. EPA for approval as a SIP revision.

Ohio, through Ohio EPA's Legal office and the Ohio Attorney General's office, has the legal authority and necessary resources to actively enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of SO₂ precursors in the Lake County, OH area.

CHAPTER SIX: Contingency Measures

CAA Section 107(d)(3)(E)(v)

Requirement 1 of 4: A commitment to submit a revised plan eight years after redesignation.

Demonstration: Ohio hereby commits to review its maintenance plan eight years after redesignation, as required by Section 175A of the CAA.

Requirement 2 of 4: A commitment to expeditiously enact and implement additional contingency control measures in response to exceeding specified predetermined levels (triggers) or in the event that future violations of the ambient standard occur.

Section 175A(d) requires contingency provisions to promptly correct any violation of the SO₂ NAAQS that occur after redesignation. Unlike Section 172(c)(9), Section 175A does not explicitly require contingency measures take effect without further action by the state. Rather the maintenance plan should ensure contingency measures are adopted and implemented as expeditiously as practicable once they are triggered. The plan should clearly identify the measures to be adopted, provide a schedule and associated procedures for adoption and implementation, and provide a specific time limit for action.

The *General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990* (April 16, 1992, 57 FR 13498) and the SO₂ nonattainment area SIP guidance (page 41 to 42) provides further discussion on contingency measures specifically for SO₂. In many cases, attainment revolves around compliance of a single source, or small set of sources, with emission limits shown to provide for attainment. In those cases, U.S. EPA interprets contingency measures to mean the state has a comprehensive program to identify sources of violations of the SO₂ NAAQS and to undertake an aggressive follow-up for compliance and enforcement, including expedited procedures for establishing enforceable consent agreements pending the adoption of revised SIPs. (57 FR 13547)

Demonstration: Ohio EPA has an active enforcement program to address violations and Ohio EPA will continue to operate a comprehensive program to identify sources of violations of the SO₂ NAAQS and to undertake an aggressive follow-up for compliance and enforcement, including expedited procedures for establishing enforceable consent agreements pending the adoption of revised SIPs. Ohio hereby commits to adopt and expeditiously implement necessary corrective actions in the event of a violation.

In the event adoption of any additional control measures is necessary, they are subject to Ohio's administrative and legal process. This process will include publication of notices, an opportunity for public hearing, and other measures required by Ohio law for rulemaking.

If a new measure/control is already promulgated and scheduled to be implemented at the federal or state level, and that measure/control is determined to be sufficient to address a violation of the SO₂ NAAQS, additional local measures may be unnecessary. Furthermore, Ohio will submit to U.S. EPA an analysis to demonstrate the proposed measures are adequate to return the area to attainment.

Requirement 3 of 4: A list of potential contingency measures that would be implemented in such an event.

Demonstration: Potential measures could include tighter SO₂ emissions offsets for new and modified major sources or additional SO₂ RACT for affected sources in the area.

Ohio hereby commits to adopt and expeditiously implement necessary corrective actions in the following circumstances:

Warning Level Response:

A warning level response shall be prompted whenever the annual average 99th percentile maximum daily 1-hour SO₂ concentration of 79 ppb or greater occurs in a single calendar year within the maintenance area. A warning level response will consist of a study to determine whether the SO₂ value indicates a trend toward higher SO₂ values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend taking into consideration ease and timing for implementation as well as economic and social considerations. Implementation of necessary controls in response to a warning level response trigger will take place as expeditiously as possible, but in no event later than 12 months from the conclusion of the most recent calendar year.

Action Level Response:

An action level response shall be prompted whenever a two-year average of the 99th percentile maximum daily 1-hour SO₂ concentrations greater than 75 ppb occurs within the maintenance area. A violation of the standard (the three-year average of the 99th percentile maximum daily 1-hour value SO₂ concentration of greater than 75 ppb) shall also prompt an action level response. In the event that the action level is triggered and is not found to be due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, Ohio EPA in conjunction with the metropolitan planning organization or regional council of governments, will determine additional control measures needed to assure future attainment of the NAAQS for 1-hour SO₂. In this case, measures that can be implemented in a short time will be selected in order to be in place within 18 months from the close of the calendar year that prompted the action level. Ohio EPA will also consider the timing of

an action level trigger and determine if additional, significant new regulations not currently included as part of the maintenance provisions will be implemented in a timely manner and will constitute our response.

Contingency measures to be considered will be selected from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. The selection of measures will be based on cost-effectiveness, emission reduction potential, economic and social considerations or other factors that Ohio EPA deems appropriate. Ohio EPA will solicit input from all interested and affected persons in the maintenance area prior to selecting appropriate contingency measures.

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures, at the time they are under consideration, can be fully evaluated.

Requirement 4 of 4: A list of SO₂ sources potentially subject to future additional control requirements.

Demonstration: Potentially subject sources include Painesville Municipal Power, Carmeuse Lime or any other new source that may locate or expand in the area in the future.

CHAPTER SEVEN: Public Participation

Ohio published notification for a public comment period, including an opportunity to request a public hearing, concerning the draft redesignation petition and maintenance plan in a widely distributed county publication on February 1, 2018.

The public comment period closed on March 7, 2018. No public hearing was held because no requests were received. Appendix D includes a copy of the public notice.

CHAPTER EIGHT: Conclusions

The Lake County, OH SO₂ nonattainment area has attained the 2010 1-hour NAAQS for SO₂ and complied with the applicable provisions of the 1990 Amendments to the CAA regarding redesignations of SO₂ nonattainment areas. Documentation to that effect is contained herein. Ohio EPA has prepared a redesignation request and maintenance plan that meet the requirements of Section 110(a)(1) of the 1990 CAA.

Based on this presentation, the Lake County, OH 1-hour SO₂ nonattainment area meets the requirements for redesignation under the CAA and U.S. EPA guidance. Ohio has performed an analysis that shows the air quality improvements are due to permanent and enforceable measures. Furthermore, because one of the major contributing sources in this area has permanently shut down and the remaining significant source is subject to federally enforceable requirements that provide for attainment, continued compliance (maintenance) with the standard with an increasing margin of safety is ensured.

The State of Ohio hereby requests that the Lake County, OH 1-hour SO₂ nonattainment area be redesignated to attainment simultaneously with U.S. EPA approval of the maintenance plan provisions contained herein.

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