Proposed Revision to the Allegheny County Portion of the Pennsylvania State Implementation Plan

Attainment Demonstration for the Allegheny, PA SO_2 Nonattainment Area 2010 Standards

Allegheny County Health Department
Air Quality Program

June 13, 2017

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ACRONYMS AND ABBREVIATIONS

ACHD	Allegheny County Health Department
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AQS	Air Quality System (EPA)
CAA	Clean Air Act
CAMD	Clean Air Markets Division
CFR	Code of Federal Regulations
cf	Cubic feet (or ft^3)
dscf	Dry standard cubic feet
EGU	Electric Generating Unit
EPA	United States Environmental Protection Agency
ERC	Emission Reduction Credit
FGD	Flue gas desulfurization
FR	Federal Register
lb/hr	Pounds per hour of pollutant emissions
MARAMA	Mid-Atlantic Regional Air Management Association, Inc.
MMIF	Mesoscale Model Interface program
mmBtu	Millions of British thermal units (Btu)
MW	Megawatt
µg/m³	Microgram per cubic meter
NAAQS	National Ambient Air Quality Standard
NAA	Nonattainment Area
NEI	National Emission Inventory (EPA database)
PA DEP	Pennsylvania Department of Environmental Protection
PIT	Pittsburgh International Airport
$PM_{2.5}$	Particulate Matter less than or equal to a nominal 2.5 microns in aerodynamic diameter, also referred to as fine particulates
ppb	Parts per billion
RACM	Reasonably Available Control Measure
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SCOT	Shell Claus Off-gas Treatment
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
tpy	Tons per year of pollutant emissions
TSD	Technical Support Document
USGS	United States Geological Survey
USS	United States Steel Corporation
WRF	Weather Research and Forecasting model

1 Executive Summary

According to the United States Environmental Protection Agency (EPA), current scientific evidence "links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms. These effects are particularly important for asthmatics at elevated ventilation rates (e.g., while exercising or playing). Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics."[1]

On June 2, 2010, the EPA promulgated a SO_2 national ambient air quality standard (NAAQS) of 75 ppb (196 µg/m³) on a 1-hour average basis. The new standard was published in the *Federal Register* on June 22, 2010 (75 FR 35520) and became effective August 23, 2010. The new SO_2 NAAQS is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.[2] (EPA also revoked the previous two existing primary standards "because they would not provide additional public health protection given a 1-hour standard at 75 ppb.")

Initial SO_2 nonattainment area (NAA) designations for the 1-hour standard were set by EPA on August 5, 2013 (75 FR 47191), effective October 4, 2013. These designations were based on areas with certified ambient air monitoring data collected from consecutive calendar years 2009-2011 during which the design value exceeded the 75 ppb NAAQS. The extent of these select NAAs was based on several factors, including monitored air quality, emissions and emissions-related data, meteorology, geography/topography, and jurisdictional boundaries. After considering these factors, EPA's technical support document (TSD) for area designations goes on to explain:

> "… EPA finds that the portions of Allegheny County that are nonattainment for the 2010 SO_2 NAAQS include the following: City of Clairton, City of Duquesne, City of McKeesport, Borough of Braddock, Borough of Dravosburg, Borough of East McKeesport, Borough of East Pittsburgh, Borough of Elizabeth, Borough of Glassport, Borough of Jefferson Hills, Borough of Liberty, Borough of Lincoln, Borough of North Braddock, Borough of Pleasant Hills, Borough of Port Vue, Borough of Versailles, Borough of Wall, Borough of West Elizabeth, Borough of West Mifflin, Elizabeth Township, Forward Township, and North Versailles Township. …"
>
> " … Available emissions, meteorological data, and geographical data suggest that the sources in the cities, boroughs and townships as identified … contribute to SO_2 NAAQS violations in Allegheny County." (U.S. EPA, 2013)

The jurisdictions named by EPA and the area comprised by these jurisdictions are shown in Figure 2-1 of the next section. This area, identified as the Allegheny, PA NAA, is characterized by complex terrain as can be seen by the cutout in Figure 2-1.

[1] See http://www3.epa.gov/airquality/sulfurdioxide/health.html

[2] NAAQS are given in CFR Title 40 Part 50: http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/index.tpl

Areas deemed in nonattainment of the new NAAQS are required to meet established deadlines for planning and demonstrating compliance with the standard. Therefore, by April 6, 2015, 18 months after the effective date of nonattainment designations, State Implementation Plans (SIPs) for NAAs were due to the EPA. Because of technical complications regarding completion of a comprehensive attainment demonstration, the Allegheny County Health Department (ACHD) was unable to submit a SIP to EPA by the original due date. A subsequent notice published by EPA on March 18, 2016 (81 FR 14736) requires that a complete SIP be submitted by October 18, 2017. The SIP must demonstrate that, by October 4, 2018, NAAs under the state/local agency's jurisdiction will be in attainment of the new standard.

This SIP provides a control strategy and attainment demonstration of the 2010 SO_2 standard for the Allegheny, PA NAA. Based on 2014-2016 monitored data, SO_2 design values for the Allegheny, PA NAA were 94 ppb on an hourly basis. Modeling for this SIP shows attainment of the 75 ppb standard for future case year 2018.

The primary control measures that enable the Allegheny, PA NAA to demonstrate attainment of the SO_2 NAAQS are described in Section 3 of this SIP. These measures include cleaner coke oven gas (COG) and the installation of new equipment at the U. S. Steel Mon Valley Works.

Section 4 provides the emissions inventory used for the SIP, and Section 5 describes the modeling used for the attainment demonstration. Reasonably Available Control Measures and Technology (RACM/RACT) analyses for the NAA are given in Section 6. Section 7 discusses Contingency Measures, Reasonable Further Progress (RFP), and nonattainment New Source Review (NSR), and Section 8 addresses Transportation Conformity for the area. Additional controls and conditions affecting the area that have not been used as part of the modeled demonstration have been included as "weight of evidence" in Section 9, supporting the case that the area will achieve emission reductions.

The modeling demonstration was performed using AERMOD. For meteorology, MMIF was used as developed from WRF meteorological modeling, with grid sizes ranging from 36 km for the continental U.S. to 0.444 km for the Allegheny, PA NAA. Years included in the inventory were 2011 for base case and 2018 for future projected case, with modeled simulations performed using 2012-2014 meteorological data.

Procedures for modeling and determination of attainment were followed in accordance with EPA's SO_2 SIP Guidance and Modeling Guideline and the ACHD Allegheny, PA SO_2 modeling protocol (see Appendix A).

The modeling demonstration showed that all locations within the NAA will achieve attainment of the NAAQS at maximum possible operating conditions for all sources in the NAA.

<u>Maximum Modeled 1-Hour Design Value (Standard = 75 ppb)</u>
Allegheny, PA NAA = 74.9 ppb

2 Problem Statement

2.1 Introduction

The Clean Air Act requires a State Implementation Plan (SIP) to be written for any area designated nonattainment for the 1-hour SO_2 standard of 75 ppb. In 2013, the United States Environmental Protection Agency (EPA) designated a portion of southern Allegheny County, PA as a SO_2 nonattainment area (NAA) for the 2010 standard (identified by EPA as the Allegheny, PA nonattainment area).

2.2 Location and Topography

The Allegheny, PA NAA, consists of numerous communities in the Monongahela Valley, namely, City of Clairton, City of Duquesne, City of McKeesport, Borough of Braddock, Borough of Dravosburg, Borough of East McKeesport, Borough of East Pittsburgh, Borough of Elizabeth, Borough of Glassport, Borough of Jefferson Hills, Borough of Liberty, Borough of Lincoln, Borough of North Braddock, Borough of Pleasant Hills, Borough of Port Vue, Borough of Versailles, Borough of Wall, Borough of West Elizabeth, Borough of West Mifflin, Elizabeth Township, Forward Township, and North Versailles Township.

The NAA is located roughly 10 miles southeast of the City of Pittsburgh and is made up of complex river valley terrain, approximately 10 miles wide (west to east) by 15 miles long (north to south). The area includes rural land, densely populated neighborhoods, and industrial facilities. The 2010 population of the Allegheny, PA NAA is 126,934, about 10.38% of the population of the Allegheny County.[3]

The river valleys lie at 718 feet in elevation above mean sea level (MSL), while adjacent hilltops can be greater than 1250 feet MSL. Large temperature differences can be observed between the hilltop and valley floor (e.g., 2° to 7° F) during clear, light-wind, nighttime conditions. Strong nighttime drainage flows can cause differences of up to 180° in wind direction with 3-4 mph downward flows. Spikes in localized SO_2 concentrations have coincided with temperature inversions.

The Allegheny, PA NAA is home to several industrial sources of SO_2 pollution. Among these sources are the U. S. Steel (USS) Mon Valley Works (Clairton, Edgar Thomson, and Irvin Plants). The Clairton Plant is the largest coke plant in the country, producing roughly 4.7 million net tons of coke annually. Several additional permitted major and minor sources and numerous small sources (not requiring operating permits) are also located in the NAA or just outside the NAA.

The Allegheny, PA SO_2 NAA is shown in Figure 2-1.

[3] U.S. Census Bureau data: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

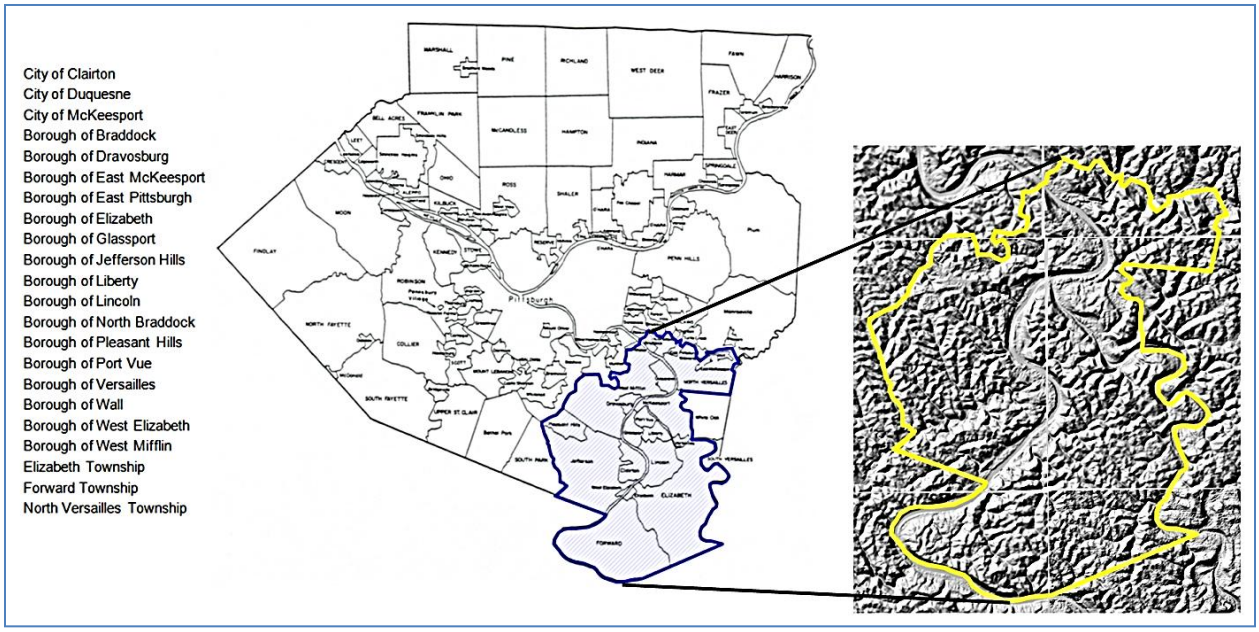

Figure 2-1. Allegheny, PA SO_2 NAA within Allegheny County, with Terrain Features

2.3 Meteorology

Temperature inversions contribute to elevated levels of SO_2. (Note that, for the local region, temperature inversions are measured at least twice daily by balloon-borne radiosondes sent into the atmosphere by the National Weather Service (NWS) forecasting office near the Pittsburgh (PIT) International Airport and are assumed to represent the stability condition all across the county.) A temperature inversion occurs when the air at the surface becomes cooler than the air above it, i.e., the rate of cooling of the air is greatest at ground level and less at elevated levels. The cooler, heavier air then settles at the lower elevation. As the major and minor sources in the area continue to emit SO_2 pollution and the lower, cooler air becomes buoyantly stable, the SO_2 is limited in its upward movement to disperse into the regional airflow. Typically, upon the inversion's break, local SO_2 is free to be spread by the upper atmospheric winds.

Figure 2-2 displays a wind, pollution, and temperature rose derived from ACHD Liberty Borough continuous monitoring data from 2012 through 2014. (The Liberty monitor is located near the center of the NAA.) As indicated on the graph, the most frequent and fastest winds were generally from the SW through W directions. Concentrations of SO_2 were largest from the S through SW directions. These are directions from which local and long-range transport carries substantial amounts of SO_2 to the Liberty monitoring site from large, stationary sources.

The first full, recent year of wind and SO_2 data from the ACHD North Braddock station (located near the top of the NAA) is 2015. The wind, SO_2, and temperature roses from this site are shown in Figure 2-3. Note that wind directions show a distinct valley flow characteristic, as this station is within the Monongahela River valley. Also, concentrations of SO_2 are largest from the SE through S directions.

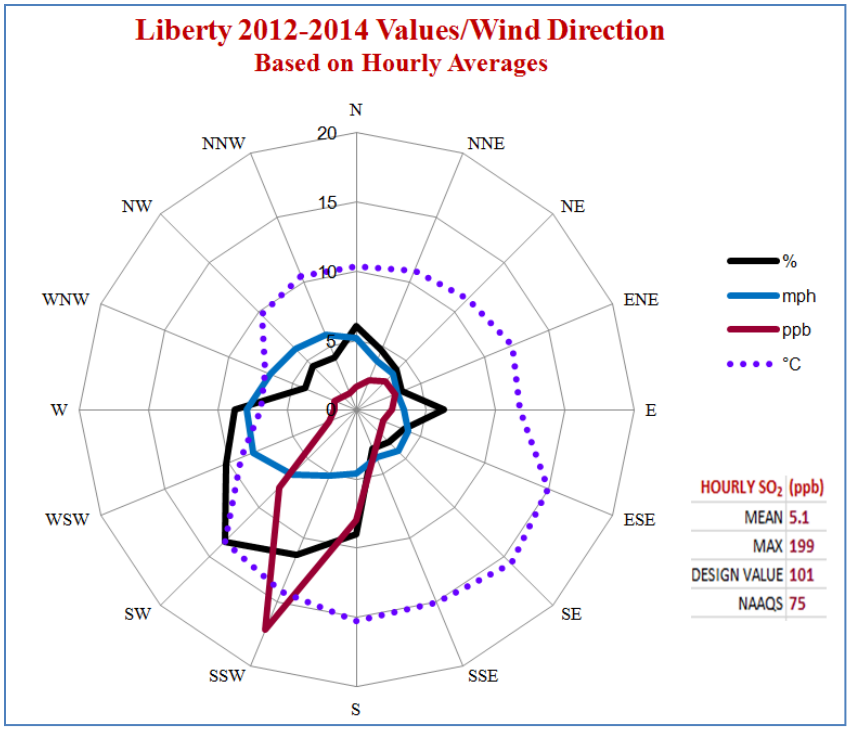

Figure 2-2. Wind Frequency and Speed, SO_2 Concentration, and Temperature Roses for the Liberty Monitoring Site, 2012 through 2014

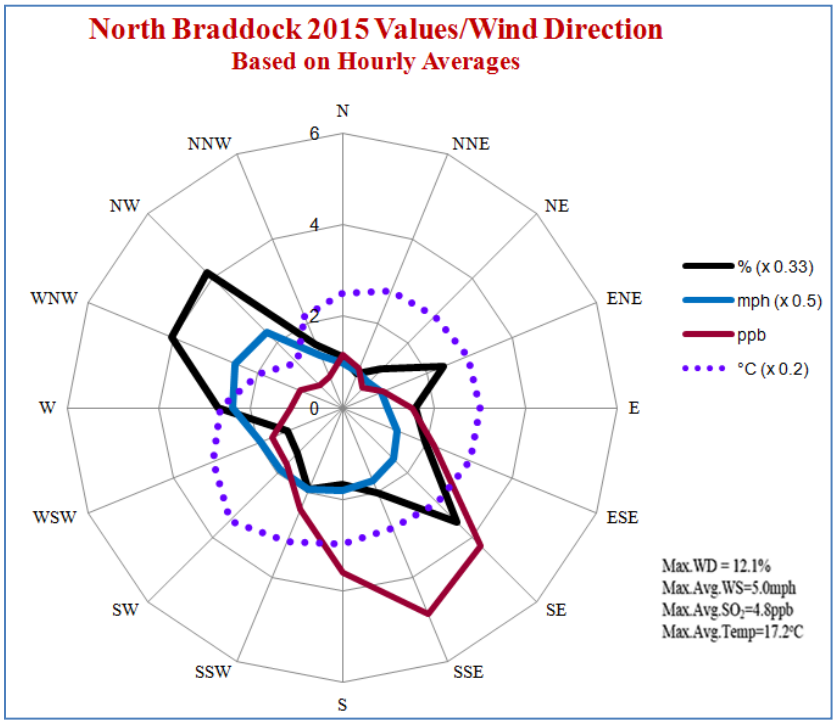

Figure 2-3. Wind Frequency and Speed, SO_2 Concentration, and Temperature Roses for the North Braddock Monitoring Site, January 8 through December 31, 2015

(Note: Values for wind frequency, wind speed, and temperature in Figure 2-3 have been scaled for better visual representation.)

More details of the distinctive meteorological and pollution characteristics in and around the Allegheny, PA NAA, especially from a historical perspective, can be found in the conceptual model section of Appendix A (Modeling Protocol). In addition, Appendix C (Meteorological Analysis) contains documentation of meteorological conditions affecting Allegheny County in general and the Allegheny, PA NAA in particular. Appendix C provides an analysis of meteorology when hourly SO_2 concentrations exceeded 75 ppb in 2011-15. This appendix also gives an evaluation of surface inversion conditions that influence dispersion potential within the NAA.

2.4 Monitored Data

SO_2 monitors are currently sited at five different locations throughout Allegheny County: Avalon, Liberty Borough, North Braddock, Lawrenceville, and South Fayette. The Avalon monitor, located roughly 6 miles northwest of downtown Pittsburgh, was originally established to measure impacts from the Shenango coke plant that ceased operation in early 2016. The Liberty and North Braddock sites, as indicated previously, are located within the Allegheny, PA NAA.

The monitor at Liberty is located on the roof of a school at a high elevation near the center of the Allegheny, PA NAA. The monitor at North Braddock is located atop a municipal building in the northern portion of the area. The South Fayette monitor near the southwestern edge of Allegheny County provides an indication of SO_2 entering the county from generally the S through W, and entering the NAA from generally the SW through W. Appendix B contains detailed monitored data and EPA Air Quality System (AQS) reports for these sites.

Allegheny County SO_2 one-hour design values (3-year average of the annual 99^{th} percentile of 1-hour daily maximum concentrations) for the 10-year timeframe 2007-2016 are shown in Figure 2-4.

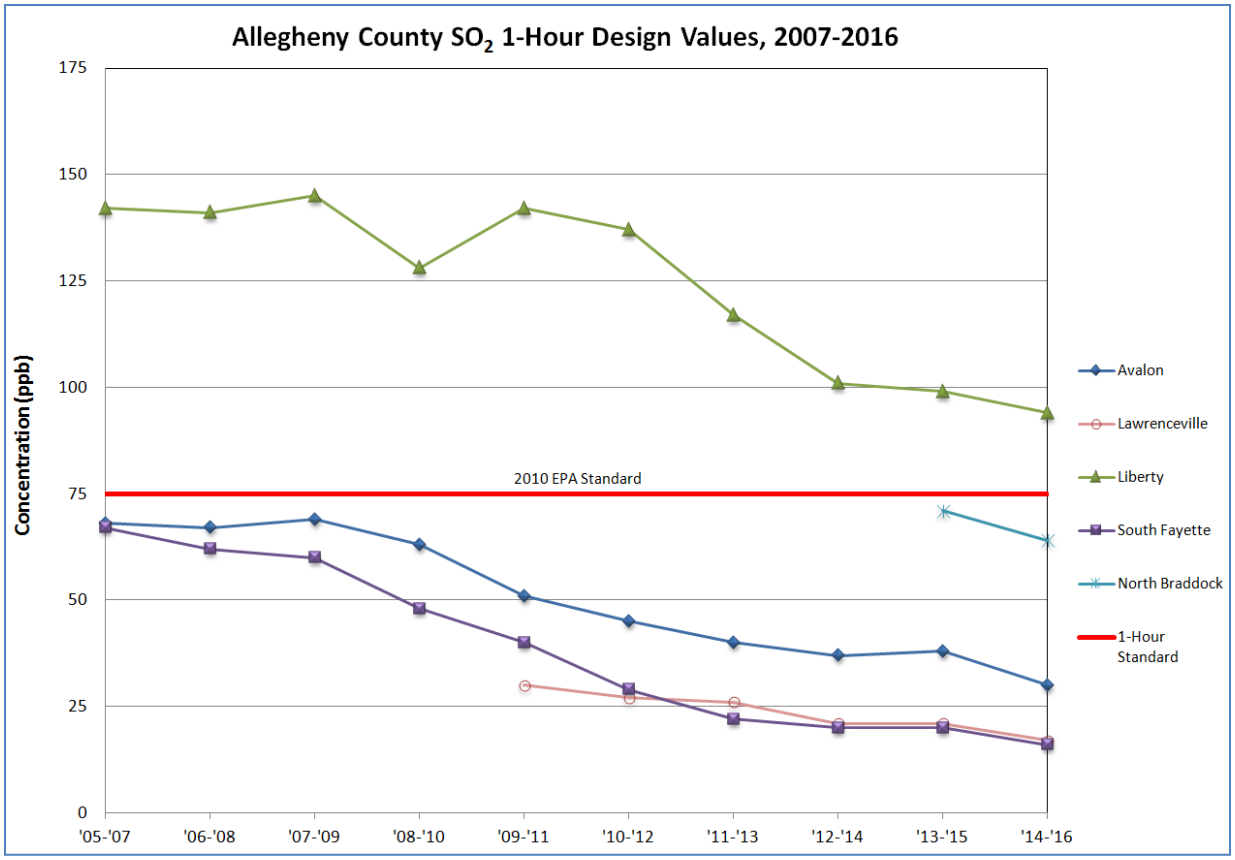

Figure 2-4. SO_2 1-Hour Design Values, Allegheny County, 2007-2016

The monitored network shows decreasing concentrations over the 10-year period, with the Liberty monitor showing concentrations that are higher than the other sites.

Note: Monitoring began at Lawrenceville in 2010 and at North Braddock in 2014; initial values for these sites in Figure 2-4 are two-year averages.

3 Control Strategy

3.1 Introduction

This section describes the control strategy needed to reduce levels of SO_2 in the Allegheny, PA NAA. These controls have been incorporated in the future case modeling for this SIP. The selection of these controls and, in some cases, their associated timetables for installation is designed to ensure that affected sources implement appropriate control measures as expeditiously as practicable in order to ensure attainment of the SO_2 NAAQS by the attainment date.

Federal enforceability for limits given in this section will be achieved through permit conditions or consent orders effective on or before October 6, 2017. Permits or consent orders will be included with the final SIP submittal. Note that while the permits will be enforceable and therefore effective by October 6, 2017, the limits themselves may not effective until on or before October 4, 2018.

3.2 U. S. Steel Mon Valley Works

The United States Steel Corporation's Mon Valley Works, including the Clairton, Irvin, and Edgar Thomson plants, are the largest known individual sources of SO_2 in the Allegheny, PA NAA. The Clairton Plant is located in the City of Clairton on the west bank of the Monongahela River, S through SW of the Liberty monitor site. The Irvin Works are north of the Clairton Plant and also on the west bank of the Monongahela River. The Irvin Works is NNW of the Liberty monitor. The Edgar Thomson plant is on the east bank of the Monongahela River, a few blocks to the SSE of the North Braddock monitor.

Controls at the Clairton and Edgar Thomson Plants represent the majority of the SO_2 reductions required within the Allegheny, PA area for the future case. Controls at the USS Mon Valley Works are described below.

A. For the USS Mon Valley Works (all plants/properties):

   A 100 and 600 Vacuum Carbonate Unit (VCU) project has been initiated at the Clairton Plant to reduce the content of hydrogen sulfide (H_2S) in the "downriver" coke oven gas (COG) lines utilized at all Mon Valley Works plants.

   The 100 Vacuum Carbonate Unit (VCU) upgrade has already been completed by USS in 2016. An upgrade is planned for the 600 VCU that will add redundant controls for the downriver COG line. USS must also provide source monitoring results to demonstrate continuous efficient operation of the VCU system. Completion of the VCU project and full operation of both the 100 and 600 upgraded units must be on or before October 4, 2018.

   Figure 3-1 shows hourly H_2S grain content in COG (B Line) in 2016, before and after the 100 VCU upgrade. The upgrade was completed on April 20, 2016, leading to significant decreases in sulfur content in COG.

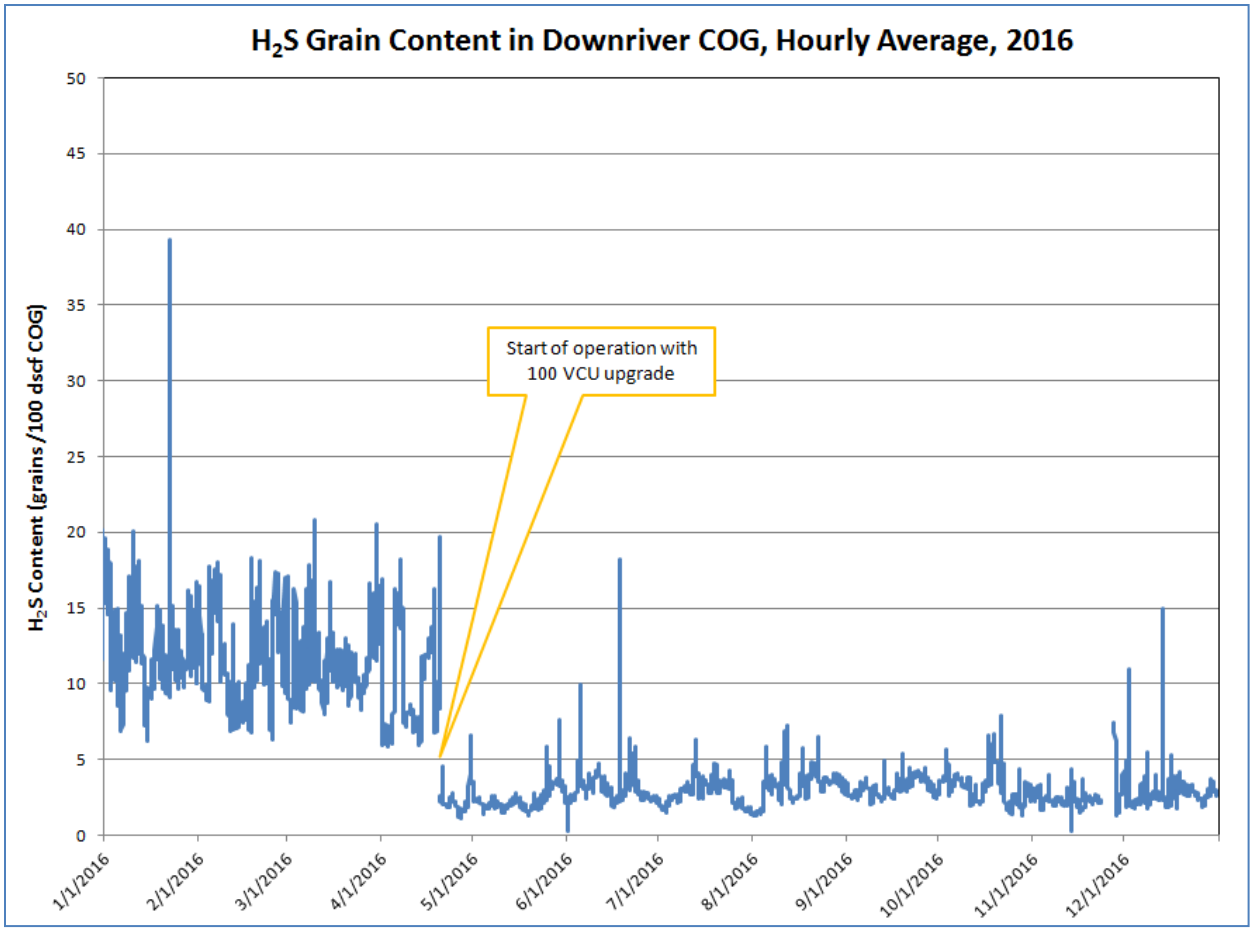

Figure 3-1. H_2S Content in COG, Before/After VCU Upgrade, 2016

In accordance with EPA's SO_2 SIP Guidance,[4] longer-term averaging will be allowed for several sources that utilize COG as a fuel, based on variability of sulfur content in the COG. Compliance for these sources will be based on the H_2S content as measured by continuous source monitoring devices, with SO_2 calculated from the combustion of H_2S. The SO_2 values will be calculated on an hourly basis, averaged over a block 24-hour basis (calendar day) and then averaged over a rolling 30-day basis. The SIP limits will be based on the 30-day averages, with an additional restriction of no more than three consecutive days above the supplementary 24-hour limits. Both the 30-day and 24-hour averages are lower than the modeled rates for sources with longer-term average limits. More information on the COG grain content and the longer-averaging methodology has been included in Appendix D (Emissions and Modeling Inventories).

To further reduce SO_2 emissions from COG operations, a tail gas recycling project is also planned for completion on or before October 4, 2018. This project would reroute sulfur-rich gases at the SCOT plant back into the by-products facility during planned and unplanned

[4] Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions, April 2014: https://www.epa.gov/so2-pollution/guidance-1-hour-sulfur-dioxide-so2-nonattainment-area-state-implementation-plans-sip

outages. More detailed descriptions of the COG projects are contained in Appendix J (Source Documentation).

Reductions from these COG controls result in substantial decreases of both actual and allowable emissions from the USS Mon Valley Works. Table 3-1 shows the maximum modeled rates and new short-term limits that will be adopted by October 4, 2018 for USS sources that are most affected by the COG controls. Note: a control case modeled rate is a constant "critical emissions value" (CEV) that was determined to be the maximum rate that demonstrates modeled attainment for every hour. This rate is equal to the SIP limit unless longer-term averaging is applied, coinciding with a lower limit on an average basis.

Table 3-1. Maximum Emission Rates and Limits, Base and Future Cases, USS COG Downriver Sources

Facility/Process	Base Case Modeled Allowable Rate (lb/hr)	Control Case Modeled Rate (lb/hr)	SIP Limit* (lb/hr)	Suppl. 24-hr Limit* (lb/hr)
US STEEL CLAIRTON Boiler 1	163.50	142.01 (aggregate basis)	118.44	134.06
US STEEL CLAIRTON Boiler 2	103.47			
US STEEL CLAIRTON Boiler R1	49.26			
US STEEL CLAIRTON Boiler R2	49.26			
US STEEL CLAIRTON Boiler T1	33.56			
US STEEL CLAIRTON Boiler T2	33.56			
US STEEL CLAIRTON SCOT Incinerator	37.68	24.00	24.00	--
US STEEL IRVIN Boiler #1	17.17	9.45	7.88	8.92
US STEEL IRVIN Boiler #2	18.20	10.02	8.36	9.46
US STEEL IRVIN Boilers #3-4 (aggregate)	17.90	9.85	8.21	9.30
US STEEL IRVIN 80" Mill Reheat	150.59	128.10	108.63	118.75
US STEEL IRVIN HPH Annealing Furnaces	32.70	14.39	12.00	13.58
US STEEL IRVIN Open Coil Annealing	25.05	13.79	11.50	13.02
US STEEL IRVIN Continuous Annealing	9.68	9.68	8.07	9.14

* If lower than the control case modeled rate, the SIP limit will be based on a rolling 30-day average of 24-hour (calendar day) averages, with an additional restriction of no more than 3 consecutive days above a supplementary 24-hour limit

Note: the aggregate limit for the Clairton boilers would restrict all boilers collectively to a single hourly limit

B. At the USS Mon Valley Works - Edgar Thomson plant:

Construction of a new stack and a combined flue system is planned for the Riley Boilers 1, 2, and 3. All boilers will exhaust to the new stack, constructed to a minimum release height of 70 meters,[5] located adjacently to the boiler house on the northeast side of the building.

Allowable emissions for the boilers will be reduced on an aggregate basis. Actual emissions will also be reduced, as the boilers use downriver COG in combination with other fuels. Complete installation and operation of the new stack will be on or before October 4, 2018, with an aggregate short-term limit equal to the control case CEV as listed in Table 3-2 for the boilers.

Table 3-2. Maximum Emission Rates and Limits, Base and Future Cases, Edgar Thomson Boilers

Facility/Process	Base Case Modeled Allowable Rate (lb/hr)	Control Case Modeled Rate (lb/hr)	SIP Limit (lb/hr)
US STEEL EDGAR THOMSON Riley Boiler 1	371.35	556.91 (aggregate basis)	556.91 (aggregate basis)
US STEEL EDGAR THOMSON Riley Boiler 2	371.35		
US STEEL EDGAR THOMSON Riley Boiler 3	371.35		

Note: the aggregate limit applies to all Edgar Thomson boilers collectively for any hour

C. For Harsco Metals (Braddock Recovery Inc.):

A maximum short-term limit of 1.8 lb/hr for the rotary kiln dryer will be adopted on or before October 4, 2018. This source is located on Edgar Thomson property and utilizes COG supplied by USS.

D. For the USS Mon Valley Works (all plants):

Maximum modeled rates and new short-term limits as listed in Table 3-3 will be adopted on or before October 4, 2018. Some reductions given in Table 3-3 are partially associated with the COG controls if a source uses downriver COG in combination with other fuels, while other reductions are to allowable limits or potential emissions in general.

Clairton battery underfiring utilizes COG from different process streams than the downriver lines, but these streams are also associated with variability. The underfiring stacks have been assigned longer-term average limits, similar to sources that utilize the downriver COG lines, monitored for compliance by continuous source monitoring devices.

[5] Good Engineering Practice (GEP) stack height for these boilers is 96.75 m (more information is provided in Appendix J).

Table 3-3. Maximum Emission Rates and Limits, Base and Future Cases, Other USS Sources

Facility/Process	Base Case Modeled Allowable Rate (lb/hr)	Control Case Modeled Rate (lb/hr)	SIP Limit* (lb/hr)	Suppl. 24-hr Limit* (lb/hr)
US STEEL CLAIRTON Quench Tower 1	0.75	0.75	0.75	--
US STEEL CLAIRTON Quench Tower B	4.09	4.09	4.09	--
US STEEL CLAIRTON Quench Tower C	2.92	5.00	5.00	--
US STEEL CLAIRTON Quench Tower 5A	7.56	7.56	7.56	--
US STEEL CLAIRTON Quench Tower 7A	7.21	7.21	7.21	--
US STEEL CLAIRTON Batteries 1-3 Fugitives (Soaking)	6.32	6.32	6.32	--
US STEEL CLAIRTON Batteries 1-3 Fugitives (PEC Push.)	2.09	2.09	2.09	--
US STEEL CLAIRTON Batteries 1-3 Fugitives (Pre-Push)	0.18	0.18	0.18	--
US STEEL CLAIRTON Batteries 1-3 Fugitives (Hot Car)	15.66	10.64	10.64	--
US STEEL CLAIRTON Batteries 13-15 Fugitives (Soaking)	0.46	0.46	0.46	--
US STEEL CLAIRTON Batteries 13-15 Fugitives (PEC Push.)	2.20	2.20	2.20	--
US STEEL CLAIRTON Batteries 13-15 Fugitives (Pre-Push)	0.19	0.19	0.19	--
US STEEL CLAIRTON Batteries 13-15 Fugitives (Hot Car)	16.50	11.21	11.21	--
US STEEL CLAIRTON Batteries 19-20 Fugitives (Soaking)	1.53	1.53	1.53	--
US STEEL CLAIRTON Batteries 19-20 Fugitives (PEC Push.)	2.69	2.69	2.69	--
US STEEL CLAIRTON Batteries 19-20 Fugitives (Pre-Push)	0.23	0.23	0.23	--
US STEEL CLAIRTON Batteries 19-20 Fugitives (Hot Car)	20.21	13.73	13.73	--
US STEEL CLAIRTON B Battery Fugitives (Soaking)	1.06	1.06	1.06	--
US STEEL CLAIRTON B Battery Fugitives (PEC Pushing)	0.83	0.83	0.83	--
US STEEL CLAIRTON B Battery Fugitives (Pre-Push)	0.11	0.11	0.11	--
US STEEL CLAIRTON C Battery Fugitives (Soaking)	0.62	0.62	0.62	--
US STEEL CLAIRTON C Battery Fugitives (PEC Pushing)	1.54	1.54	1.54	--
US STEEL CLAIRTON C Battery Fugitives (Pre-Push)	0.10	0.10	0.10	--
US STEEL CLAIRTON C Battery Fugitives (Hot Car)	8.57	5.82	5.82	--
US STEEL CLAIRTON PEC Baghouse 1-3	15.30	7.10	7.10	--
US STEEL CLAIRTON PEC Baghouse 13-15	16.12	7.46	7.46	--
US STEEL CLAIRTON PEC Baghouse 19-20	19.73	7.78	7.78	--
US STEEL CLAIRTON PEC Baghouse B	15.85	7.50	7.50	--
US STEEL CLAIRTON PEC Baghouse C	13.58	8.65	8.65	--
US STEEL CLAIRTON Battery 1 Underfiring	31.84	14.52	10.41	13.27
US STEEL CLAIRTON Battery 2 Underfiring	31.84	12.76	9.15	11.66
US STEEL CLAIRTON Battery 3 Underfiring	31.84	14.74	10.57	13.47
US STEEL CLAIRTON Battery 13 Underfiring	33.50	17.48	13.93	15.70
US STEEL CLAIRTON Battery 14 Underfiring	33.50	17.60	14.03	15.80
US STEEL CLAIRTON Battery 15 Underfiring	33.50	23.43	18.67	21.04

Facility/Process	Base Case Modeled Allowable Rate (lb/hr)	Control Case Modeled Rate (lb/hr)	SIP Limit* (lb/hr)	Suppl. 24-hr Limit* (lb/hr)
US STEEL CLAIRTON Battery 19 Underfiring	61.53	36.85	29.37	33.09
US STEEL CLAIRTON Battery 20 Underfiring	61.53	33.88	27.00	30.42
US STEEL CLAIRTON B Battery Underfiring	91.54	29.82	21.38	27.26
US STEEL CLAIRTON C Battery Underfiring	21.00	44.67	32.03	40.83
US STEEL EDGAR THOMSON BF1 Casthouse (Roof+Fume)	2.73	2.01	2.01	--
US STEEL EDGAR THOMSON BF3 Casthouse (Roof+Fume)	2.29	1.69	1.69	--
US STEEL EDGAR THOMSON BOP Process (Roof)	4.43	6.64	6.64	--
US STEEL EDGAR THOMSON Continuous Casting (Roof)	5.25	5.25	5.25	--
US STEEL EDGAR THOMSON Blast Furnace 1 Stoves	353.03	98.50	98.50	--
US STEEL EDGAR THOMSON Blast Furnace 3 Stoves	353.03	90.00	90.00	--
US STEEL EDGAR THOMSON Casthouse Baghouse	45.10	45.10	45.10	--
US STEEL IRVIN #1 Galv Line	14.63	0.04	0.04	--
US STEEL IRVIN #2 Galv Line	3.87	0.01	0.01	--

* If lower than the control case modeled rate, the SIP limit will be based on a rolling 30-day average of 24-hour (calendar day) averages, with an additional restriction of no more than 3 consecutive days above a supplementary 24-hour limit

Notes:
- Clairton C Battery quenching and underfiring emissions are increasing for the control case due to stack tests that showed higher concentrations than initial estimates
- Irvin Galvanizing uses natural gas only
- Edgar Thomson BOP emissions increase for the control case due to a correction in the calculation of emissions
- Several Edgar Thomson sources use downriver COG as a fuel (or in combination with other fuels), but these sources are not being assigned longer-term average limits

3.3 Source Monitoring

U. S. Steel Mon Valley Works sources with longer-term average limits (as indicated in Tables 3-1 and 3-3) will be monitored for compliance by way of continuous source monitoring devices.[6] Hourly SO_2 emissions for each of the sources will be calculated from hourly H_2S measured by the monitoring devices and flow meter equipment that measures actual hourly flow of gas to each associated process. Stoichiometric conversion will be assumed for H_2S to SO_2.

Sulfur content in the U. S. Steel COG lines will be monitored at the following locations:
- Prior to the Irvin 80-Inch Hot Strip Mill in downriver stream "A Line"
- Exiting the Clairton VCU system as the downriver stream "B Line"
- Supplying the "Unit 1" Clairton Batteries: 1-3, B, and C
- Supplying the "Unit 2" Clairton Batteries: 13-15 and 19-20

[6] All other sources listed in this section will be verified for compliance via stack testing or other methods.

Example calculations for the H_2S to SO_2 conversion and the longer-term averaging methodology have been included in Appendix D.

3.4 Source Shutdowns

The following major source in the NAA ceased operations in 2015:

- Guardian Industries: The Guardian glass plant closed in August 2015, with the permit terminated in November 2015.

Any future operation at this location would require a new permit and new source review (NSR). Emissions Reduction Credits (ERCs) have not been requested for this source, and all structures have been removed from the property.

Documentation for this source, including termination of the Title V operating permit and proof of discontinuation of operations, are included in Appendix J.

3.5 Emissions Reductions

The control strategy shows attainment of the SO_2 NAAQS through a dispersion modeling demonstration. Total maximum base and control case emission rates for sources in the NAA, along with changes in emissions due to the control strategy, are given in Table 3-4 below, on both short-term (lb/hr) and long-term (ton/yr) bases.

Table 3-4. Maximum SO_2 Emission Rates in NAA, Before and After Control Strategy

Basis	Base Case	Control Case	Emissions Change
Short-term (lb/hr)	3292	1540	-1752
Long-term (ton/yr)	14420	6744	-7676

Modeled emissions are given by source/process in Appendix D.

3.6 Additional Control Considerations

The ACHD existing nonattainment NSR program, as required by Clean Air Act (CAA) sections 172(c)(5) and 173, will ensure that the reactivation, construction, and/or modification "of major stationary sources of SO_2 will not interfere with reasonable further progress toward the attainment of the 2010 SO_2 NAAQS."

In addition, to meet the general conformity requirement of the CAA section 176(c), ACHD will ensure "that actions by federal agencies do not cause new air quality violations, worsen existing violations, or delay timely attainment" of the SO_2 NAAQS and/or interim reductions and milestones.

4 Emissions Inventory

The Clean Air Act section 172(c)(3) requires that a SIP includes an inventory of actual emissions from all sources of SO_2. The emissions inventory for this SIP includes base year 2011 actual emissions from the National Emissions Inventory (NEI) for all sources/sectors within the boundaries of the NAA.

Additionally, estimates of future case actual emissions for 2018 have been provided in this section. Base and future year actual inventories by process, along with modeling source inventories at maximum allowable or potential rates, are contained in Appendix D.

Tables 4-1 and 4-2 below show the 2011 base year SIP emissions inventory and 2018 projected future year inventory for the Allegheny, PA nonattainment area, in actual tons, by emissions sector.

Table 4-1. Base Case (SIP) Emissions Inventory (Tons/Year)

Inventory	Point	Area	Nonroad	Onroad
Base Case (2011 NEI)	3249.20	158.85	1.17	8.11

Table 4-2. Projected Case Emissions Inventory (Tons/Year)

Inventory	Point	Area	Nonroad	Onroad
Future Case (2018 Projected)	2676.52	119.18	0.44	2.96

Emissions are given by source/process in Appendix D.

Future projected point source emissions were estimated by scaling 2011 base case emissions based on the proposed reductions from the control strategy. For the other sectors, MARAMA Alpha 2 projections[7] were used for 2018 based on EPA growth/control factors. NAA emissions were apportioned by population (10.38%) of total Allegheny County emissions for nonpoint sectors.

Emissions from sources outside of the NAA are not included in the above tables. However, some sources outside of the NAA have been included in the modeling demonstration in order to properly account for transported emissions into the NAA. See Appendices A and D for additional information.

[7] Mid-Atlantic Regional Air Management Association emissions inventories: http://www.marama.org/technical-center/emissions-inventory/2011-inventory-and-projections

5 Modeling

The modeling demonstration was performed using the AERMOD model according to the procedures outlined in the modeling protocol (Appendix A).

This demonstration is the first to utilize Weather Research and Forecasting (WRF) modeling and Mesoscale Model Interface Program (MMIF) data for regulatory modeling under 40 CFR Part 51. Ramboll Environ developed and evaluated the WRF/MMIF data for ACHD, and EPA Region III was consulted on the approach.

5.1 Design and Modeling Protocol

ACHD followed modeling procedures outlined by the modeling protocol given in Appendix A and according to EPA's SO_2 SIP Guidance and Guideline on Air Quality Models.[8] Modeling was performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (U.S. EPA, 2005; Cimorelli et al., 2005).

As discussed in more detail in the protocol, the EPA-recommended (guideline) air quality model for estimating the near-source (< 50 km) impacts of primary emitted pollutants is AERMOD. AERMOD has been demonstrated to perform adequately for many applications based on the results obtained from comprehensive field study results and when compared to the performance of the previous "workhorse" model of the EPA, the Industrial Source Complex Short Term, Version 3 (ISCST3) model (Perry et al., 2005). AERMOD along with additional models and techniques will be used to show that the emission control strategy proposed by Allegheny County will lead to attainment of the 1-hour NAAQS for SO_2 by the due date of October 2018.

Specifics of the modeling design include:

- Model: AERMOD version 16216r and most recent preprocessors
- Meteorology: prognostic WRF/MMIF data, for site-specific meteorological data
- Modeled years: 2012-2014
- Background based on multiple monitor sites
- Nested receptor grid at 200/100 m, with fenceline receptors at every 50 m
- Special characterization for buoyant fugitive sources
- Emissions: allowables (or potentials, if no permitted limit)

5.2 Meteorological and Dispersion Modeling Assistance

To better understand air-quality impacts from SO_2 emissions in Allegheny County, especially in the Allegheny, PA NAA, and to continue with effective programs to attain and maintain the NAAQS, ACHD contracted Ramboll Environ, an international, environmental consulting firm, to provide meteorological and dispersion modeling assistance to produce a more-realistic

[8] EPA's Guideline on Air Quality Models: https://www3.epa.gov/ttn/scram/guidance/guide/appw_05.pdf

representation of SO_2 impacts in Allegheny County (ACHD contract title *Sulfur Dioxide Modeling Assistance II*).

The "dispersion" aspect of the modeling work was conducted by ACHD's analysis of ongoing county and federal meteorological station data. Weather data was processed for use with AERMOD via the Weather Research and Forecasting (WRF) model and the Mesoscale Model Interface (MMIF) program. WRF is a prognostic meteorological model originally developed with assistance from the National Center for Atmospheric Research, the National Oceanic and Atmospheric Administration, and other government and university organizations. MMIF was used to prepare WRF output for direct input into AERMOD. Large- and fine- mesh grids at numerous vertical levels were employed to simulate atmospheric conditions across Allegheny County, with a focus on the Allegheny, PA NAA. (See Maranche & Sadar (2016) and Sadar, Maranche & McNally (2014) for further discussion of the use of AERMOD and WRF for modeling SO_2 in Allegheny County.)

5.3 Methodology

This section describes the steps used to model the Allegheny, PA NAA. More information on the model methodology can be found in Appendices A and I.

5.3.1 Models Selection

The most recent version of AERMOD (v. 16216r) was used by ACHD and Ramboll Environ for the modeling of the NAA. The modeling was designed to include both regional and localized SO_2 impacts.

Meteorological inputs for AERMOD were generated by Ramboll Environ using the WRF model and MMIF tool. The MMIF grids followed the same grid resolutions as WRF, generating several layers of meteorological data for each modeled grid cell.

5.3.2 Modeling Domains

WRF was run for a nested 36/12/4/1.33/0.444 km domain structure by resolution, defined as follows:

- d01: 36 km continental U.S. (CONUS) domain
- d02: 12 km NEUS domain that includes states in the Midwestern and Mid-Atlantic Northeastern U.S.
- d03: 4 km domain that covers southwestern Pennsylvania and adjacent areas in West Virginia and Ohio
- d04: 1.33 km domain covering Allegheny County and portions of surrounding counties
- d05: 0.444 km domain surrounding the Allegheny, PA NAA

Figures 5-1 and 5-2 on the following page provide maps of the modeled WRF domains.

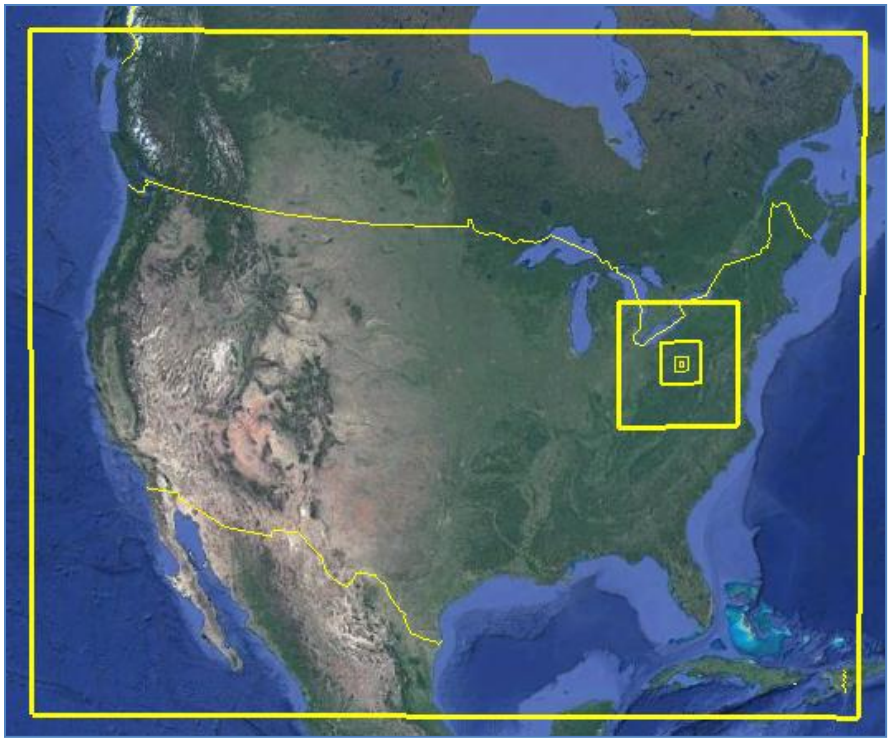

Figure 5-1. WRF Modeling Domains, 36/12/4/1.33/0.444 km Resolutions

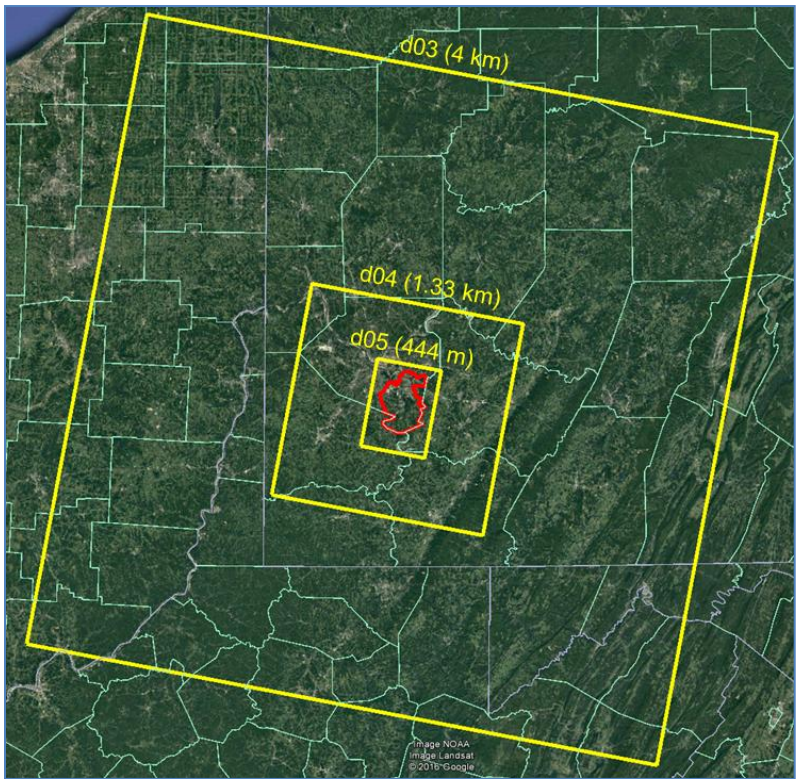

Figure 5-2. Close-Up, 4/1.33/0.444 km Resolution WRF Domains

The model domain for AERMOD was defined according to the model protocol and is similar in size to the 0.444 km WRF domain. Specific MMIF cells were selected from within the 0.444 km domain that best corresponded with the modeled sources.

5.3.3 Meteorological Data

MMIF was selected as the most appropriate meteorological data for the modeling demonstration. MMIF data can be extracted for any grid cell within a WRF domain. The 0.444 km domain was selected as the best representative domain for the Monongahela River valley in the NAA.

MMIF locations within the NAA selected for the AERMOD modeling are shown in Figure 5-3. Each of these cells provided site-specific onsite, upper air, and surface characteristics from MMIF as meteorological input to AERMET (the AERMOD preprocessor).

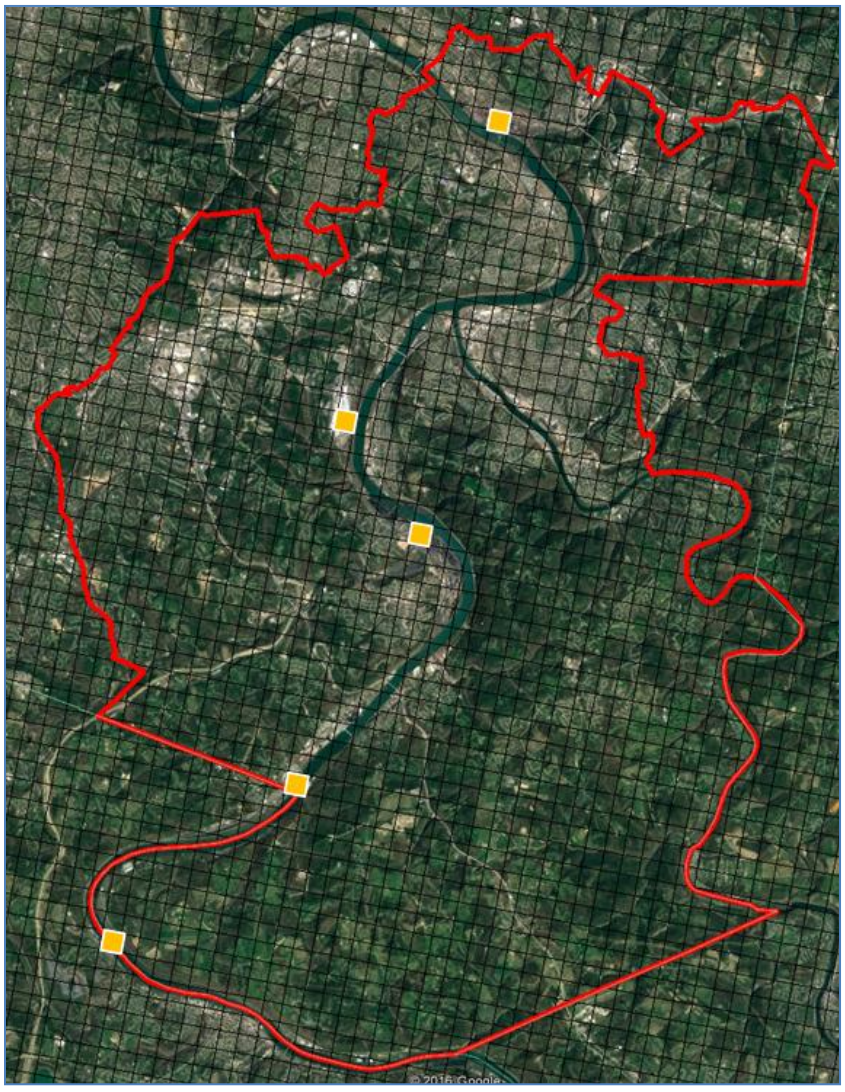

Figure 5-3. MMIF 0.444 km Cells within the NAA

Model runs were performed using 2012-2014 meteorological data for each source included in the model, with impacts stored in hourly concentration files. Total cumulative impacts were then summed in post-processing (with background added as an additional component) and design values were calculated from the 4th-highs at each receptor.

5.3.4 Receptor Grid

The receptor grid used for the modeling effort is shown below in Figure 5-4. The receptors were generated from USGS data at 10 m resolution, as processed by the AERMAP preprocessor. Receptors located within the fence lines of the three Mon Valley Works plants were excluded from the receptor grid.

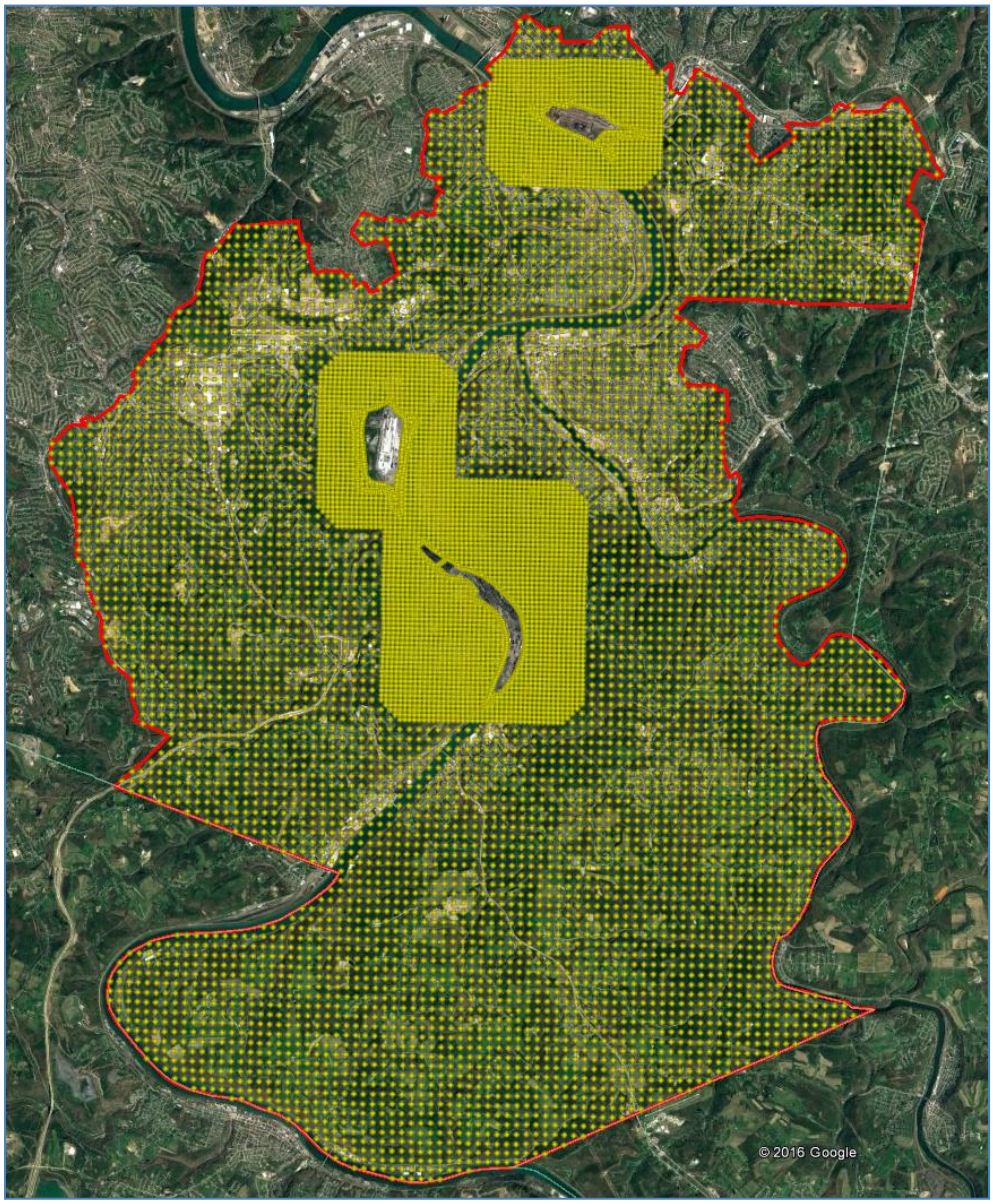

Figure 5-4. AERMOD Receptor Grid for NAA

Modeled design values were required to show attainment of the SO_2 NAAQS at each location within the receptor grid. Based on the NAAQS, this corresponded with a 3-year average of the 4th-highest daily maximum 1-hour modeled concentration that showed a value of 196.18 µg/m³ or lower.

More information on the model methodology and configuration can be found in Appendices A and I.

5.3.5 Sources Modeled

All sources potentially impacting the nonattainment area were considered for the modeling demonstration, based on procedures in the modeling protocol (Appendix A). Sources that were screened out from the modeling are described in Appendix E (Screening Analysis).

Point source facilities included in the modeling demonstration are as follows:

- USS Mon Valley Works (all plants)
- Harsco
- Guardian
- NRG Elrama
- Allegheny Energy Mitchell
- ArcelorMittal Monessen

Guardian, Elrama, and Mitchell were deactivated since the base case (and initial designation analysis) and were excluded from the future control case model runs. Documents for these sources, including inactivation of operating permits, are included in Appendix J.

All emissions from nonpoint sectors were assumed to be part of background concentrations, which were calculated from surrounding monitored data. (See Appendices A and I.)

5.4 Modeled Results

Below in Table 5-1 are the modeled design values for the base and control cases for the NAA, given in µg/m³. (The design values are the highest 3-year averages of the 4th-highest daily maximum 1-hour impacts at any receptor in the NAA.)

Table 5-1. Modeled Design Values, Base and Control Case

Modeled Impacts	Base Case	Control Case
Design Value (µg/m³)	1176.60	196.17

Note: 75 ppb of SO_2 = 196.18101 µg/m³ at 25°C and 1 atm[9]

[9] This conversion is built into AERMOD for ppb of SO_2 to µg/m³.

The highest modeled impact for the base case scenario was located in North Braddock, while the maximum control case location was in West Mifflin. Since both the base and control cases were modeled at maximum possible emission rates for all sources in the NAA, these locations may or may not correspond to highest impacts during normal or low operations. Model runs at lower capacities, using lower emissions and lower stack exit velocities, also showed concentrations below the NAAQS. The modeling demonstration also showed attainment of the former annual (0.03 ppm) and 24-hour (0.14 ppm) primary standards and the 3-hour secondary standard (0.5 ppm).

Figures 5-5 and 5-6 show classed post maps of base and future case modeled emissions by facility in tons/year. Larger/darker circles represent larger maximum emissions.

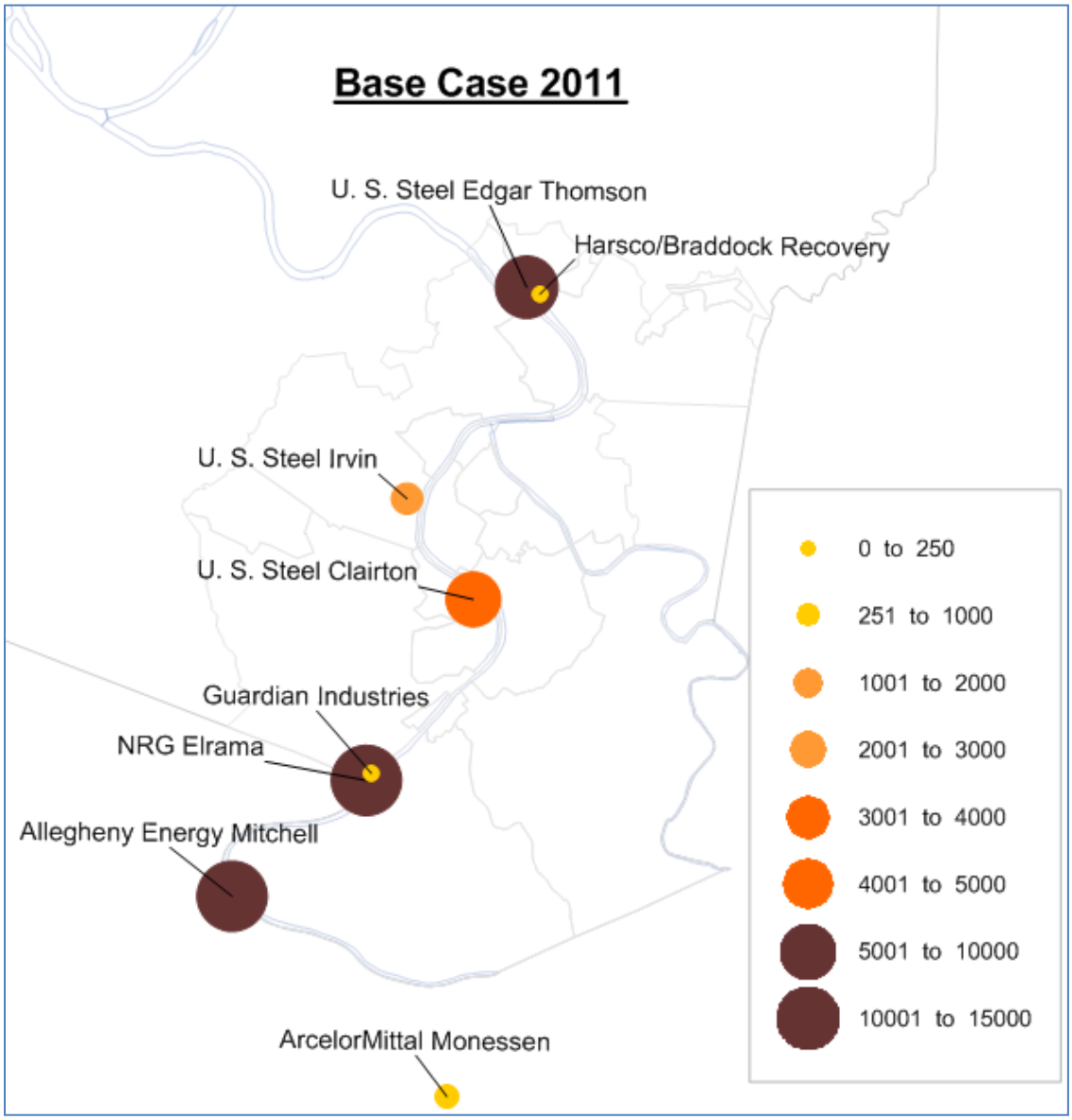

Figure 5-5. Base Case 2011 Maximum Modeled Emissions, by Facility (tons/year)

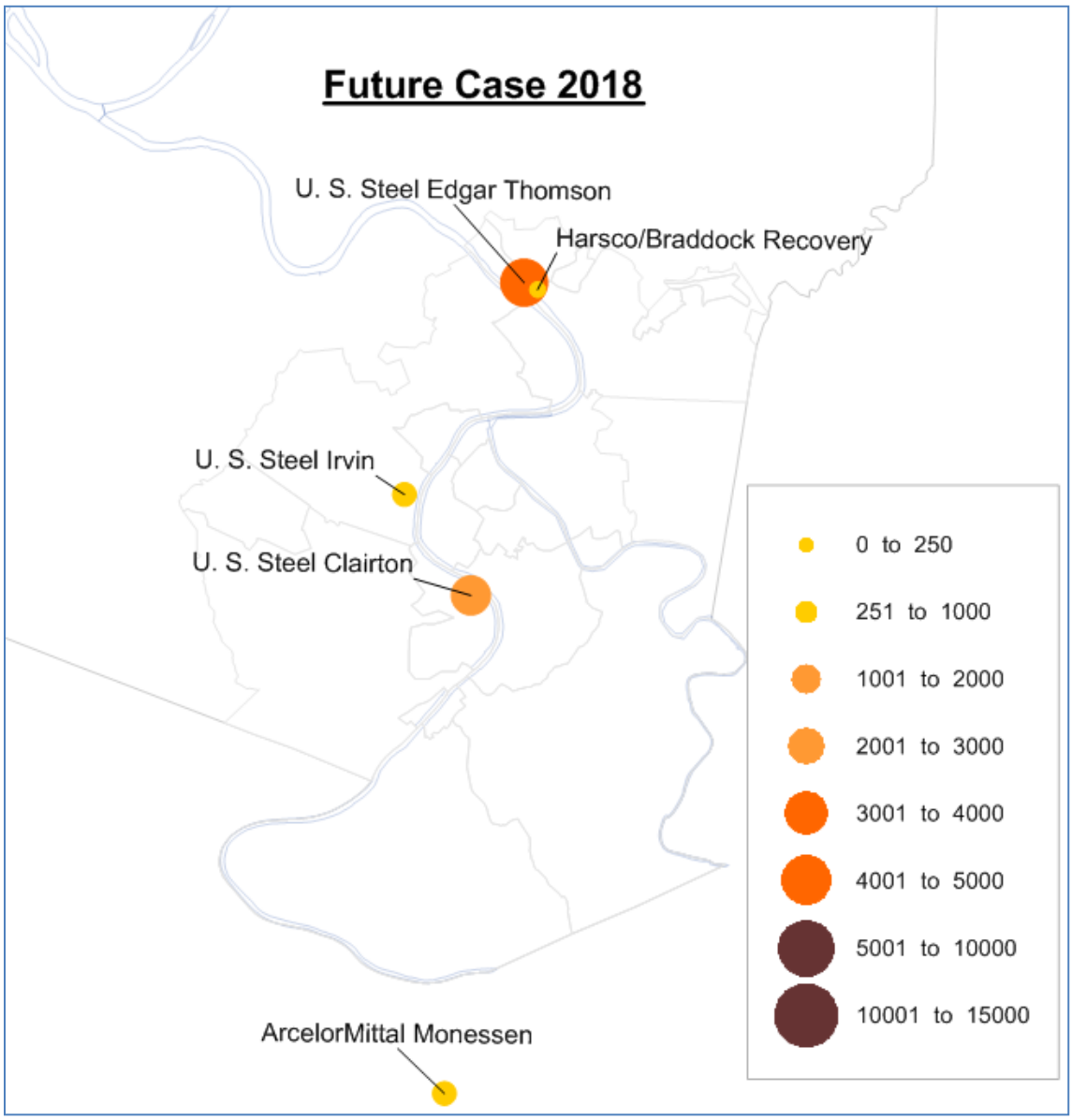

Figure 5-6. Future Case 2018 Maximum Modeled Emissions, by Facility (tons/year)

Table 5-2 on the following page presents the modeled control case design values by individual municipality for the NAA. These design values represent the highest modeled concentration anywhere within the municipality boundaries.

Table 5-2. Modeled Design Values, Control Case, by Municipality

Municipality	Control Case Design Value (µg/m³)
City of Clairton	143.57
City of Duquesne	59.94
City of McKeesport	98.16
Borough of Braddock	92.26
Borough of Dravosburg	132.51
Borough of East McKeesport	65.36
Borough of East Pittsburgh	68.67
Borough of Elizabeth	44.39
Borough of Glassport	169.18
Borough of Jefferson Hills	128.63
Borough of Liberty	146.42
Borough of Lincoln	196.14
Borough of North Braddock	195.07
Borough of Pleasant Hills	86.71
Borough of Port Vue	104.75
Borough of Versailles	46.95
Borough of Wall	53.14
Borough of West Elizabeth	45.43
Borough of West Mifflin	196.17
Elizabeth Township	89.39
Forward Township	66.82
North Versailles Township	83.98

5.5 Model Performance

Model performance review provides a method to examine modeled data in comparison to actual measured data for the same timeframe. WRF and MMIF meteorological results were compared to measured airport and local site data, and dispersion model results (at actual emission rates) were compared to actual monitored results at Liberty and North Braddock.

Results showed good overall performance with known data. Highlights include the following:

- WRF showed good performance throughout southwestern PA at high-resolution
- MMIF showed a combination of in-valley and plateau flow that is representative of meteorology in the NAA
- AERMOD with MMIF showed the best performance compared to other models

- MMIF meteorological data outperformed other available meteorological data sets with AERMOD

- The use of ADJ_U* led to the most realistic planetary boundary layer parameters from AERMET processing of MMIF inputs

Detailed results from the model performance evaluations and analysis can be found in Appendices F through I.

6 Reasonably Available Control Measures and Technology

Section 172 of the Clean Air Act establishes planning requirements for areas that do not meet the NAAQS, including the application of Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT). For the SO_2 NAA, a demonstration is required that the agency has adopted all reasonably available control measures, including RACT for stationary sources, necessary to demonstrate attainment as expeditiously as practicable.

6.1 RACT Analysis for U. S. Steel Facilities

The USS Mon Valley Works is the largest source of SO_2 within the Allegheny, PA NAA. As described in detail in the control strategy (Section 3), controls at these plants represent the majority of the SO_2 reductions required within the Allegheny, PA NAA in order to demonstrate attainment as expeditiously as practicable.

Based on the control strategy, RACT at the USS Mon Valley Works has been identified as follows, to be completed by Oct. 4, 2018:

- Upgrades to the 100 and 600 Vacuum Carbonate Units (VCUs) at the Clairton Plant to reduce the content of hydrogen sulfide (H_2S) in the downriver coke oven gas (COG) utilized at all Mon Valley Works plants.

- Source monitoring to demonstrate continuous efficient operation of the Clairton VCU system.

- A tail gas recycling project that would reroute sulfur-rich gases at the Clairton SCOT plant back into the by-products facility during planned and unplanned outages.

Additionally, Harsco Metals (Braddock Recovery Inc.) is located on the property of the USS Mon Valley Works Edgar Thomson plant. It is a minor source of all criteria pollutants and Hazardous Air Pollutant (HAPs), as defined in Section 2101.20 of Allegheny County's Article XXI regulations. However, the facility is considered a major source based on operation, management, or support of the Edgar Thomson Plant waste product recycling and briquetting process.

This facility receives waste products from USS, including furnace flue dust, slag and sludge, mill scale, and coke fines. Harsco dries these materials in a rotary kiln fired with coke oven gas (COG), and combines them with other materials to form briquettes. These finished briquettes are piled on-site and sent back to USS to be used in the furnaces.

The rotary kiln is controlled by a cyclone and a fabric filter for particulates, with no control for SO_2. However, as described in Section 3, lower sulfur content in USS-produced COG will lead to lower emissions for COG combustion sources. As a result, a lower maximum short term limit of 1.8 lb/hr of SO_2 for the rotary kiln will be adopted on or before October 4, 2018. Based on these considerations, ACHD has determined that a further SO_2 RACT evaluation is not necessary for the rotary kiln dryer.

6.2 RACT Analysis at Other Sources in the NAA

The following analyses apply to point sources in the NAA that are not mentioned in the control strategy (Section 3). Note: These reviews should not and cannot be used by any source to satisfy any RACT analysis required by that source in a present or future permitting project.

RACT at Koppers Inc. – Clairton Plant

Koppers Inc., Clairton Tar Plant is a tar refining facility that distills crude tar, petro tar, and decanted oil into various tar products, pitches, distillates, chemical oils, and creosotes. The recovery of the coal tar distillates is done by processing the tars through a series of flash and distillation columns, process heating units, centrifuges, and storage tanks. Emissions from the tar refining and creosote processes, railcar loading and various storage tanks are controlled by a thermal oxidizer.

The facility is a minor source of criteria pollutants as defined in Article XXI, §2101.20.

According to operating permit #0029, facility units with SO_x emissions are as follows:

- The direct-fired thermal oxidizer, which controls emissions from the tar refining and several other plant processes, has a SO_x emission limit of 1.776 ton/year. The thermal oxidizer is essentially controlling VOCs and HAPs. Restrictions are in place per the operating permit to require the thermal oxidizer to be properly operated and maintained according to good engineering practices and the manufacturer's recommendations, and to prohibit operating the thermal oxidizer with any fuel other than utility grade natural gas. With the existence of the latter, i.e., the fueling restriction, already in place, and the overall low emission limitation, no additional equipment was considered necessary for RACT.

- The 10 process heaters (B-001 through B-010) with a combined SO_x emission limit of 0.216 ton/year. All are fired with natural gas and none have an emission limitation greater than 0.047 ton/year. Given already existing low emission limitations, no additional equipment was considered necessary for RACT.

- Vehicle/roadway emissions of 0.512 ton/year. The permit requires maintaining records of the amount of gasoline and diesel fuel used in vehicles to verify the emission limitation is not exceeded. Lowered national limits on gasoline and diesel fuel sulfur content, will produce reduced emissions of SO_2. Given that, no additional equipment was considered necessary for RACT.

Based on the considerations above, no additional equipment is considered necessary for purposes of SO_2 RACT. No additional RACT was considered for this facility.

RACT at Clairton Slag Inc. – West Elizabeth Plant

Clairton Slag, Inc. is a materials trans-shipment terminal and hot asphalt plant. This source has facilities to mix hot asphalt cement. These facilities include cold aggregate handling, rotary dryer, hot elevator, hot screens, pugmill, asphalt heater, storage silo, and truck plant loadout. Although the facility has a cyclone and baghouse in place to control particulate emissions, no controls are in place to control SO_2 emissions of 1.11 ton/year from the asphalt cement process (rotary dryer, hot elevator, hot screens and pugmill) and 0.005 ton/year from the asphalt cement heater.

Given the insignificant emissions, no additional equipment is considered necessary for purposes of SO_2 RACT. No additional RACT was considered for this facility.

RACT at Eastman Chemical Resins Inc. – Jefferson Plant

Eastman Chemical Resins, Inc. (Eastman) operates an organic chemical manufacturing facility in Jefferson Hills Borough. Eastman primarily manufactures hydrocarbon resins, which are low molecular weight polymers, derived from organic chemical feed stocks. These resins are used in hot melt adhesives, sealants, coatings, plastics modification, pressure sensitive adhesives, cosmetics, and some medical devices.

The plant is comprised of four polymerization processes, a resin hydrogenation process, five finishing processes, and an emulsion process, five boilers ranging from 30 mmBtu/hr to 38.2 mmBtu/hr, a wastewater treatment plant, a pilot plant for testing formulations and processes and approximately 200 storage tanks of various sizes. The facility is a major source of volatile organic compounds (VOCs), nitrogen oxides (NO_x) and hazardous air pollutants (HAPs). SO_2 emissions, primarily from the natural gas-fired boilers, as well as various heaters, are very low, (less than 0.1 ton/year per unit).

Given the insignificant emissions, no additional equipment is considered necessary for purposes of SO_2 RACT. No additional RACT was considered for this facility.

RACT at Kelly Run Sanitation – Forward Twp.

The Kelly Run Sanitation, Inc. municipal solid waste landfill in Forward Township is approximately 400 acres in surface area and is composed of four units or cells and has an active landfill gas (LFG) collection system with one enclosed ground flare to control gas emissions. Total SO_2 emissions allowed by permit from this plant are 2.96 ton/year from all sources.

The primary source of emissions at the facility is the landfill itself, which emits VOCs and HAPs. This facility is subject to the Part 70 major source operating permit requirements by virtue of regulation, not the amount of emission of any pollutant. The Kelly Run Landfill is a minor source of criteria pollutant and HAP emissions.

Flare #2, an enclosed ground flare for combusting collected landfill gas VOC destruction, has a permit-established SO_2 limit of 2.64 ton/year. This control equipment is part of the VOC RACT.

No additional equipment related to control of landfill gas is considered reasonable for purposes of SO_2 RACT.

Additional permit allowed SO_2 emissions in the amount of 0.32 ton/year result from portable combustion sources, including a gasoline powered generator, a diesel-powered air compressor and two diesel-powered light plants.

Given the insignificant emissions, no additional equipment is considered necessary for purposes of SO_2 RACT. No additional RACT was considered for this facility.

6.3 RACT for Point Sources with Negligible Emissions

Table 6-1 below lists the point sources of SO_2 emissions in the Allegheny, PA SO_2 nonattainment area with negligible emissions. This group includes the facilities with emissions less than 0.06 tons per year. No RACT analysis has been done.

Table 6-1. SO_2 Point Sources in the NAA with Negligible Emissions

Facility	2011 SO_2 (tpy)
Facilities for which the SO_2 emissions are negligible (less than 0.06 ton per year) and no RACT analysis was performed	
BASIC CARBIDE/Elizabeth	0.001
BETTIS ATOMIC POWER LABORATORY/West Mifflin	0.053
CP INDUSTRIES/McKeesport	0.006
GARDNER DENVER NASH/Elizabeth	0.001
KINDER MORGAN LIQUIDS/Dravosburg	0.014
LIBERTY PULTRUSIONS/West Mifflin	0.002
MARATHON ASHLAND/Jefferson Hills	0.030
PENNSYLVANIA ELECTRIC COIL/Glassport	0.004
PEOPLES NATURAL GAS/Wall	0.005
SOUTH HILLS HEALTH SYSTEM/Jefferson Hills	0.033
TUBE CITY IMS/West Mifflin	0.003
TYK AMERICA/Jefferson Hills	0.009
VALLEY NATURAL GASES/West Mifflin	0.001

6.4 RACT for Terminated Facilities

One source in the NAA, Guardian Industries, permanently shut down in 2015. No RACT analysis was performed for this source. This facility had 2011 actual SO_2 emissions of 73.263 ton/year. Documentation for this source is included in Appendix J.

6.5 RACM for Nonpoint Sources

ACHD examined several RACM options for area, nonroad, and mobile sources in the Allegheny County nonattainment area. RACM/RACT and alternatives for point and nonpoint sources are summarized in Table 6-2 below.

Table 6-2. RACM/RACT and Alternatives Considered for the Allegheny, PA NAA

Source	Reasonably Available Control Measure	Alternative(s) Considered	Remarks
Residential Wood Burning –Stoves and Fireplaces	Currently no RACM.	1) Woodstove exchange program; 2) Education & outreach on burning clean; and 3) Replacement of old stoves when homes are sold.	Options 1 and 3 do not generate significant SO_2 reductions. Option 2 is difficult to quantify.
Residential Wood Burning – Wood Fired Boilers	Currently no RACM.	Compliance with county OWB regulation.	Does not produce significant SO_2 emissions reductions.
Residential Coal Furnaces	Currently no RACM.	Replace coal furnaces with natural gas or electric systems.	Coal furnace SO_2 emissions are negligible.
Four Stroke Gasoline Lawnmowers	Currently no RACM.	Gas for Electric mower trade program, Upgrade mower engine to higher Tier standards, native landscaping, and reduced commercial mowing.	Extremely small SO_2 reductions for trading programs and commercial mowing reductions, and unquantifiable reductions from native landscaping.
Recreational Marine Boats	Currently no RACM.	Reduce emissions or accelerate retirement of high emitting boats.	Recreational boats SO_2 emissions are negligible.
Diesel-Powered Short-Haul and Long-Haul Trucks	Currently no RACM.	Diesel retrofits or engine replacement, compliance with idling law, and emission/opacity testing.	Negligible SO_2 reductions.

6.6 RACM/RACT Summary

Emission reductions needed to reach attainment in Allegheny County are dependent on the control measures implemented at the U. S. Steel Mon Valley Works. The other identified RACM/RACT for the Allegheny, PA SO_2 nonattainment area are insignificant. ACHD has, therefore, adopted RACM and RACT as defined for this SO_2 SIP.

7 Contingency Measures, Reasonable Further Progress, and New Source Review

As outlined in EPA's SO_2 SIP Guidance, contingency measures are additional control measures to be implemented in the event that an area fails to meet Reasonable Further Progress (RFP) or fails to attain the standards by its attainment date. RFP includes annual incremental reductions in emissions prior to the attainment date. New Source Review (NSR) entails conditions that must be met by new sources or source modifications in a nonattainment area.

7.1 Contingency Measures

Planned SO_2 controls are expected to help assure compliance with the NAAQS. However, if SO_2 concentrations violate the NAAQS – i.e., ambient air quality reference monitors measure enough exceedances in a consecutive three-year period that would cause a design value above 75 ppb – a thorough analysis of circumstances that led to the violation will be conducted by ACHD. The analysis, which will begin immediately upon verification of a violation and take no longer than 10 days to complete, will include source and meteorological conditions contributing to the violation.[10]

Source(s) that are identified by ACHD as having been most likely responsible for contributing substantially to the violation will be required to submit to ACHD, within 10 days of notification by ACHD of findings of likely culpability, a written system audit report that details operating parameters of all SO_2 emissions units for the four 5-day periods up to and including the dates upon which the reference monitor registered each of the exceedances of the SO_2 NAAQS. Recommended provisional SO_2 emission control strategies for each affected unit must be included with the audit report.

Upon receipt of the written audit report and recommended strategies, ACHD will commence a 30-day evaluation period as part of its continuing investigation of the NAAQS violation. This evaluation period will be followed by a 30-day consultation period with the source(s).

If necessary, additional control measures will be implemented as expeditiously as possible to bring the NAA back into compliance. If a permit modification is necessary, ACHD would issue a final permit within the statutory timeframes required in Article XXI. Any new emission limits required by such permit would be submitted as a SIP revision to EPA.

7.2 Reasonable Further Progress (RFP)

Section 171(1) of the CAA requires Reasonable Further Progress (RFP) for a NAA that ensures attainment of a NAAQS by the applicable date through annual incremental reductions in emissions. However, SO_2 controls included in this SIP are based on point source controls, which generally involve single "steps" in reductions before and after implementation of controls. For

[10] All hourly monitored results are unofficial until fully validated, quality-assured, and certified. The immediate response to a violation would assume that concentrations are valid upon initial verification of proper monitor operation.

this SIP, time is required for completion of the control projects, including construction of a new flue system and stack at USS Edgar Thomson.

However, due to partially-completed projects by USS (including projects that have not been quantified for this SIP) and reductions to background/transported SO_2, a yearly downward trend in monitored design values of SO_2 since 2011 can be seen for the Liberty site in Figure 2-4 in Section 2 (Problem Statement). Steady decreases are evident for other sites such as South Fayette and Lawrenceville due to incremental decreases of background SO_2 emissions from all sectors.

As a way to estimate incremental changes in concentrations for the highest monitor (Liberty) in the NAA, a linear trend line was added to the 1-hour design values for Liberty for 2009 through 2016 and extrapolated to 2018, as shown in Figure 7-1 below.

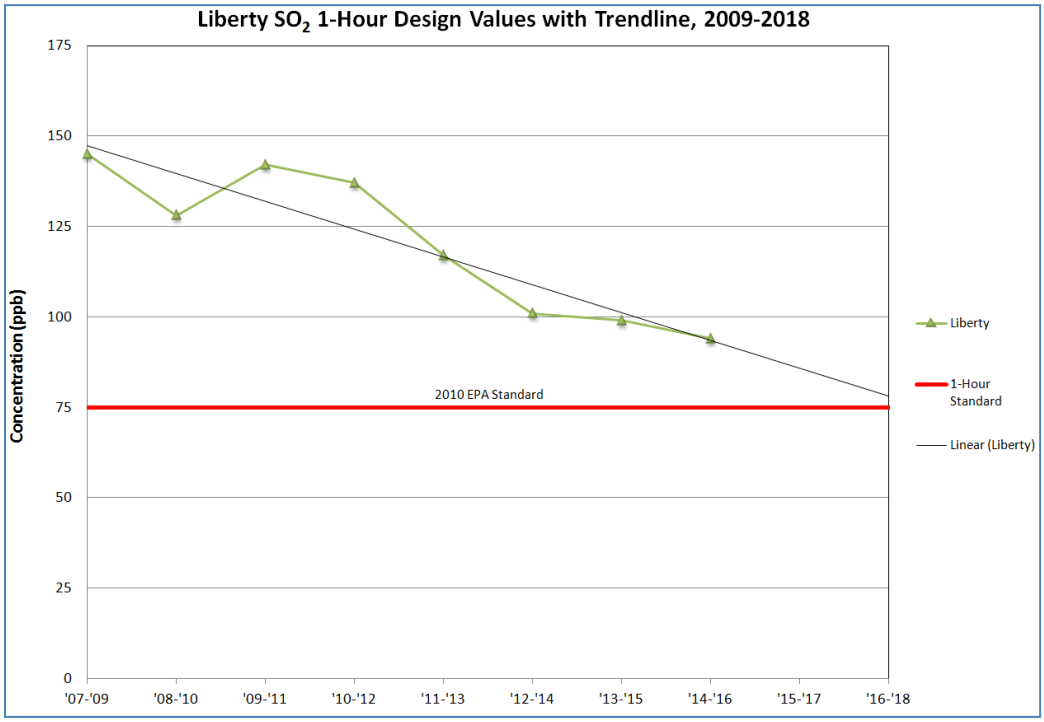

Figure 7-1. Liberty 1-Hour Design Value Trends, 2009-2018

Figure 7-1 indicates that a design value near the NAAQS could be expected even prior to implementation of all controls for this SIP, with a yearly incremental decrease in concentration over the 10-year timeframe of about 7.7 ppb per year.

The shutdown of Guardian Industries in 2015 is an additional decrease in emissions for the NAA, with a reduction of 57.31 tons of actual SO_2 emissions (based on 2015 emissions) and 136.40 tons of maximum allowable emissions.

Section 9 (Weight of Evidence) includes additional information that supports the continued decrease of SO_2 emissions in general for the NAA.

7.3 New Source Review (NSR)

Title 1, Part D, Subpart 1, §172(c)(5) of the Clean Air Act requires that, included in the nonattainment plan that is to be submitted under this part, are provisions that shall require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area, to be in accordance with §173.

In Allegheny County, the procedures and conditions under which a new major stationary source or major modification may obtain a preconstruction permit in an area designated nonattainment for SO_2 are stipulated in the ACHD Rules and Regulations, Article XXI[11], Air Pollution Control, at §2102.06, "Major Sources Locating in or Impacting a Nonattainment Area."

To form the ACHD nonattainment NSR Program, §2102.06 incorporates by reference applicable portions of the Pennsylvania Department of Environmental Protection's New Source Review regulations codified at 25 Pa. Code Chapter 127.[12], as follows:

Table 7-1. ACHD Nonattainment NSR Incorporation

Article XXI Section, Title	25 Pa. Code Incorporated by Reference
§2102.06.a.1, Applicability	§127.203 (except §127.203(b)), §127.203a, and §127.204, as well as all terms used therein, and defined in §121.1
§2102.06.b.1, "Conditions for Approval"	§127.201 through §127.205 (except §127.201(f))), as well as all terms used therein, and defined in §121.1
§2102.06.b.3, "Conditions for Approval-Emission Offsets"	§127.206 through §127.210, as well as all terms used therein, and defined in §121.1
§2102.06.e, "Portable Facilities"	§127.212, as well as all terms used therein, and defined in §121.1
§2102.06.g, "Plantwide Applicability Limits"	§127.218, as well as all terms used therein, and defined in §121.1

[11] http://www.achd.net/air/pubs/pdf/Article21.pdf
[12] http://www.pacode.com/secure/data/025/chapter127/subchapetoc.html

The following delineates how the ACHD nonattainment NSR program meets the CAA §173 requirements through incorporation by reference of specific sections of 25 Pa. Code Chapter 127.

Table 7-2. ACHD Nonattainment NSR and CAA Requirements

CAA Section	Article XXI Nonattainment NSR Program	IBR's portion of 25 Pa. Code
§173(a)(1)(A) – Sufficient Offsets	§2102.06.b.3	§127.206 through §127.210
§173(a)(1)(B) – Location of a new source in a designated economic development zone	§2102.06.b.1	§127.205(6)
§173(a)(2) – Proposed Source must comply with LAER	§2102.06.b.1	§127.205(1)
§173(a)(3) – Certification that all major sources, owned and operated in the state by the same owner, are in compliance with all applicable requirements of the CAA	§2102.06.b.1	§127.205(2)
§173(a)(4) – the Administrator has not determined that the applicable plan is not being adequately implemented for the nonattainment area in which the proposed source is to be constructed	ACHD is adequately implementing all other SIPs	n/a
§173(a)(5) -- An analysis of alternative sites, etc., demonstrates that the benefits of the proposed source significantly outweigh the environmental and social costs	§2102.06.b.1	§127.205(5)
§173(b) – Prohibition on Use of Old Growth Allowances	Not applicable for this SIP	
§173(c)(1) – Offsets – Use of offsets from another nonattainment area	§2102.06.b.3	§127.208(8)
§173(c)(2) – Offsets – Emission reductions otherwise required by the Act shall not be creditable as emission reductions for purposes of any such offset requirement	§2102.06.b.3	§127.206(i), §127.207(1)(i).
§173(d) – Control Technology Information	Not applicable for this SIP	n/a

As outlined in the SO_2 SIP Guidance, the nonattainment NSR requirements apply on a pollutant-specific basis with respect to each nonattainment pollutant for which a source has the potential to emit in amounts greater than the applicable major source threshold for the pollutant, i.e., in major amounts (40CFR51.165(a)(1)(iv)). For new sources, in areas that are designated nonattainment for the 2010 SO_2 NAAQS, 100 tpy or more of SO_2 represents a major amount.

The ACHD nonattainment NSR program meets this requirement. Article XXI, at §2102.06.a, incorporates by reference 25 Pa. Code §§127.203, and 127.203a, which state that the requirements of the nonattainment NSR program are applicable to the construction of a new "major facility" or modification of an existing "major facility,' with the term "major facility" defined in §121.1, as "a facility which emits or has the potential to emit 100 tpy or more of a regulated NSR pollutant…"

As also described in the SO_2 Guidance document, nonattainment NSR requirements for SO_2 also apply to any existing major stationary source of SO_2 that proposes a major modification, i.e., a physical change or change in the method of operation that results in a significant net emissions increase (40 tpy or more) of SO_2 (40CFR 51.165(a)(1)(x)(A)). The ACHD nonattainment NSR program meets this requirement. Article XXI, at §2102.06.a.1 incorporates by reference 25 Pa. Code §127.203a, which states the manner in which significant net emission increases at an existing major facility are determined, and 25 Pa. Code §121.1, which defines "significant" with reference to a net emission increase as a rate of emissions that would equal or exceed 40 tpy for sulfur oxides.

Recent approval history of ACHD's nonattainment NSR regulations:

- May 14, 2012, the PA DEP nonattainment NSR program regulations, which are incorporated by reference into Article XXI as described above, were approved as a revision of the PA SIP (77FR28261).
- April 3, 2012 - Article XXI, §2102.06, updated effective to incorporate the U.S. EPA's 2002 NSR reforms.
- June 25, 2012 - These updates were submitted by PA DEP to EPA as a revision of the PA SIP.
- December 17, 2014 - EPA proposed approval of this SIP revision (79 FR 75104).
- March 30, 2015 - EPA granted final approval of the ACHD nonattainment NSR SIP revision (80 FR 16568).

8 Transportation Conformity

Section 176 of the Clean Air Act (CAA) provides a mechanism by which federally funded or approved highway and transit plans, programs, and projects are determined not to produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS or delay any interim milestones. EPA regulations in 40 CFR Part 93 pertaining to transportation conformity provide that motor vehicle emission "budgets" establish caps of these emissions that cannot be exceeded by the predicted transportation system emissions in the future.

Due to the small amount of SO_2 from the mobile sources in comparison to point sources, transportation conformity is not applicable to this SIP. Pursuant to 40 CFR 93.102(b)(2)(v), there has been no determination of transportation-related SO_2 as a significant contributor to a $PM_{2.5}$ nonattainment, and there is no established budget for SO_2 in Allegheny County.

8.1 Insignificance of Motor Vehicle Emissions

Furthermore, federal transportation conformity requirements in 40 CFR Part 93.109 allow for pollutants to be exempt from conformity analysis if motor vehicle emissions are found to be insignificant based on the following factors:

- The percentage of motor vehicle emissions in the context of the total SIP inventory
- The current state of air quality as determined by monitoring data for that NAAQS
- The absence of SIP motor vehicle control measures
- Historical trends and future projections of the growth of motor vehicle emissions

Each of these factors is examined in more detail below in regard to this SIP.

8.1.1 Motor Vehicle Emissions Constitute a Low Percentage of Total SIP Inventory

Sources in the emissions inventories given in Tables 4-1 and 4-2 of Section 4 include stationary point sources, area sources, nonroad sources, and onroad (mobile) sources. Emissions for mobile sources were generated using the Motor Vehicle Emissions Simulator (MOVES) model.

In the base year inventory of 2011, mobile sources accounted for 0.24% of the total emissions for the NAA. The projected inventory for 2018 shows an even smaller percentage, 0.11% of total emissions.

8.1.2 Current State of Air Quality as Determined by Monitoring Data

The Allegheny, PA NAA is currently not attaining the 2010 SO_2 NAAQS. However, the disparity between the NAA monitors (Liberty and North Braddock) and surrounding monitors as seen in Figure 2-4 in Section 2 indicate the dominance of stationary point source influences in the NAA. Section 3 of this SIP provides the control strategy required to attainment, based on point sources.

8.1.3 Absence of SIP Motor Vehicle Control Measures

Historically, there have been no Allegheny County SIP requirements for Transportation Control Measures (TCMs). TCMs are strategies that reduce transportation-related air pollution and fuel use by reducing vehicle miles traveled and improving roadway operations.

Onroad vehicles are subject to federal emission standards. In addition, a vehicle inspection and maintenance program is in place in the area, as well as vehicle idling restrictions, and low vapor pressure gasoline requirements during the ozone season. These controls were either required or selected for implementation in order to reduce emissions and to bring the larger Pittsburgh MSA into attainment of the ozone NAAQS.

Additionally, RACM analysis given in Section 6 listed options for onroad mobile sources, with none showing benefits for SO_2 for this SIP.

8.1.4 Historical Trends and Future Projections of the Growth of Motor Vehicle Emissions

Population trends given in Section 9 show that the NAA has decreased in population since 2000, suggesting a decrease in vehicle usage in the NAA. Additionally, ongoing clean vehicle/fuel programs will lead to continued decrease in vehicle emissions. The projections given in Table 4-2 of Section 4 also show the highest decrease by sector for onroad emissions (64% decrease).

8.2 Transportation Conformity Summary

Based on the above findings, ACHD concludes that the onroad sector is an insignificant contributor to nonattainment of the 2010 SO_2 NAAQS in the Allegheny, PA nonattainment area. Upon a positive adequacy review and approval of the information included in this SIP submittal for transportation conformity, no highway emissions analysis will be required for SO_2 for the area. Allegheny County is, however, subject to transportation conformity requirements for the 8-hour ozone standard, with SIP-approved MVEBs for NOx and VOC.

9 Weight of Evidence

Corroboratory analyses that support the modeled attainment demonstration, or "weight of evidence" (WOE), help bolster the assertions that an area will achieve attainment in the allotted time. Weight of evidence can also indicate that an area will continue to attain the NAAQS beyond the projected timeframe. Such analyses can include:

- Additional reductions/scenarios not quantified for the SIP
- Monitored data and emissions trends
- Declining population trends
- Cleaner fuels/vehicles

9.1 Additional Controls in the NAA

The following controls or scenarios have not been quantified for this SIP:

- The Consent Judgment between USS and ACHD in March 2016 will lead to additional reductions of SO_2 from the Clairton Plant battery fugitives and combustion stacks.

- An additional project under consideration at the Clairton Plant is the development of a switching valve replacement program for the No. 2 Control Room. This project would reduce the sulfur content in the underfire COG gas stream.

- The projected inventory totals in Section 4 (and provided in Appendix D) are initial estimates of projected actual emissions for 2018. ACHD believes that the control strategy in Section 3 may lead to greater SO_2 reductions than modeled in the demonstration and enforced by the emission limits.

- The modeling demonstration (according to SIP Guidance and the Guideline on Air Quality Models) included sources at maximum capacities along with 99th percentile background values added to each hour. In real-world operation, the modeled processes do not operate at their maximum capacity simultaneously. The modeling also assumes that maximum operation is occurring during all meteorological conditions. All possible future scenarios will likely be lower than as predicted by the modeling.

9.2 Monitored Trends

Monitored data has shown a steady decline in SO_2 concentrations throughout Allegheny County and southwestern PA in recent years. The highest monitor (Liberty) has also shown a steady decline over the past 10 years, as shown in Figures 2-4 and 7-1 in previous sections. The North Braddock monitor is currently showing attainment based on 2014-2016 data, and the Liberty 2016 99th percentile was the lowest recorded concentration to-date (64 ppb) and below the level of the NAAQS (75 ppb). These declining trends are expected to continue with decreases in overall emissions within the NAA and surrounding areas.

9.3 Local Major Source Modifications and Shutdowns

Major source modifications outside of the NAA that were not included in the modeling demonstration will lead to additional reductions of background and/or direct emissions that can affect the Allegheny, PA NAA. These modifications include the following:

- Bay Valley: The Bay Valley steam generation plant on the North Shore of Pittsburgh switched from coal to natural gas in mid-2014

- Shenango: The Shenango coke plant on Neville Island ceased operations in Jan. 2016

- Bruce Mansfield: The First Energy Bruce Mansfield power plant near Shippingport (Beaver County) will undergo servicing of its Flue Gas Desulfurization (FGD) system in 2018, increasing control efficiency of the FGD and potentially reducing SO_2 emissions in southwestern PA.

9.4 EGU Deactivations

The following coal-fired electric generating units (EGUs) adjacent to the NAA have been deactivated in 2012-2103:

- NRG Elrama Station: The power plant located in Elrama in Union Township in Washington County was deactivated in October 2012.

- Allegheny Energy Mitchell Station: The power plant located near New Eagle in Union Township in Washington County was deactivated in October 2013.

Appendix J contains documentation on these sources. Any future operation at these locations would require a new permit and NSR.

Several additional EGUs in the surrounding area have deactivated since 2011 or plan to deactivate in the next few years. These deactivations will lead the continued decrease of background and transported SO_2 emissions in the NAA.

On the following pages, Table 9-1 shows a summary of the unit deactivations by plant capacity (in MW) for 2011-2016 within the PJM territory, and Table 9-2 shows announced deactivations in the PJM region for 2017-2020. Figure 9-1 shows a map of the PJM electric transmission territory that includes PA and surrounding states.

Additionally, federal rules such as EPA's Mercury and Air Toxics Standards (MATS) and Interstate Air Pollution Transport provisions should lead to continued decreases in SO_2 emissions from upwind and surrounding EGUs.

Table 9-1. PJM Unit Deactivations by Plant Capacity, 2011-2016

Plant	Year	State	Decrease in Capacity (MW)
Brunot Island	2011	PA	30
Burger Plant	2011	OH	101
Chesapeake	2011	VA	67.3
Cromby	2011	PA	347.7
Eddystone	2011	PA	279
Hudson	2011	NJ	383
Indian River	2011	DE	90
Kitty Hawk	2011	NC	34
Albright	2012	WV	283
Armstrong	2012	PA	343
Bay Shore	2012	OH	495
Benning	2012	DC	550
Buzzard Point	2012	DC	240
Conesville	2012	OH	165
Crawford	2012	IL	532
Eastlake	2012	OH	837
Eddystone	2012	PA	309
Elrama	2012	PA	460
Fisk Street	2012	PA	326
Kearny	2012	NJ	250
Niles	2012	OH	217
Potomac River	2012	VA	482
R. Paul Smith	2012	MD	115
Rivesville	2012	WV	121
SMART Paper	2012	OH	25
Sporn	2012	WV	440
State Line	2012	IN	515
Viking Energy	2012	PA	16
Vineland	2012	NJ	23
Walter C Beckjord	2012	OH	94
Willow Island	2012	WV	189
Hatfield's Ferry	2013	PA	1590
Indian River	2013	DE	170
Ingenco Petersburg	2013	VA	2.9
Koppers Co. IPP	2013	PA	8
Mitchell	2013	PA	359
O H Hutchings	2013	OH	62
Piney Creek	2013	PA	31
Schuylkill	2013	PA	169
Titus	2013	PA	243

Plant	Year	State	Decrease in Capacity (MW)
Walter C Beckjord	2013	OH	222
Kearny	2014	NJ	21
Walter C Beckjord	2014	OH	244
AES Beaver Valley	2015	PA	125
Ashtabula	2015	OH	244
Bergen	2015	NJ	21
Big Sandy	2015	KY	800
Burger Plant	2015	OH	7
Burlington	2015	NJ	205
Cedar	2015	NJ	66
Clinch River	2015	VA	230
Dale	2015	KY	46
Eastlake	2015	OH	396
Edison	2015	NJ	504
Essex	2015	NJ	536
Gilbert	2015	NJ	98
Glen Gardner	2015	NJ	160
Glen Lyn	2015	VA	325
Kammer	2015	WV	600
Kanawha River	2015	WV	400
Lake Kingman	2015	VA	115
Lake Shore	2015	OH	245
Mercer	2015	NJ	115
Miami Fort	2015	KY	163
Middle Energy Center	2015	NJ	75
Missouri Avenue	2015	NJ	60
Muskingum River	2015	OH	1390
National Park	2015	NJ	21
O H Hutchings	2015	OH	277
Picway	2015	OH	95
Pottstown	2015	PA	2
Sewaren	2015	NJ	111
Sporn	2015	WV	580
Tanner Creek	2015	IN	988
Werner	2015	NJ	212
Will County	2015	IL	251
Avon Lake	2016	OH	94.6
BL England Diesel	2016	NJ	8
Dale	2016	KY	147
Harrisburg	2016	PA	14

Table 9-2. Future PJM Deactivations by Plant Capacity, 2017-2020

Plant	Projected Deactivation Date	State	Decrease in Capacity (MW)
Bayonne	2017	NJ	163
BL England	2017	NJ	303.9
Edgecomb	2017	NC	116
Hopewell	2017	VA	92
Hudson	2017	NJ	617.9
McKee	2017	DE	34
Mercer	2017	NJ	321
Mercer	2017	NJ	320.3
Roanoke Valley	2017	NC	209
Spruance	2017	VA	202
Yorktown	2017	VA	324
Sewaren	2018	NJ	451
Elmer Smith	2019	KY	52
Marcus Hook	2019	PA	50
Oyster Creek	2019	NJ	607.7
Bay Shore	2020	OH	136
W H Sammis	2020	OH	668.6
Wagner	2020	MD	135
Will County	2020	IL	510

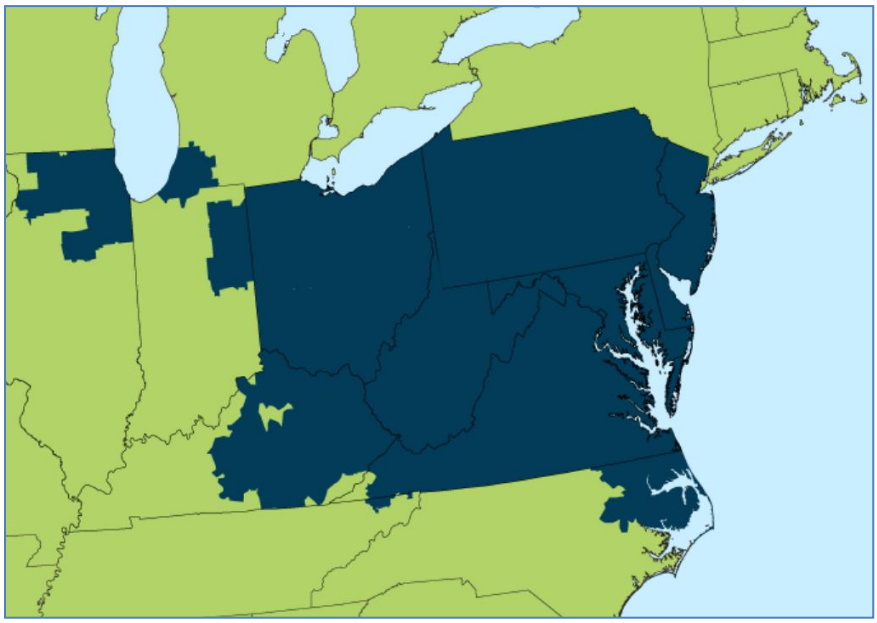

Figure 9-1. PJM Interconnection Territory

9.5 Population Trends

Allegheny County is unique in the fact that the population has been declining since the 1960s. Localized regions of population growth are occurring, but the general trend for the county is one of negative growth.

Total population in the NAA showed a decrease of 16,228 from 2000 through 2015. Figure 9-2 shows the percent change in population by municipality for 2000-2015.[13] The overall decrease in population for the NAA suggests less anthropogenic SO_2 emissions from vehicles, woodstoves, and other sources.

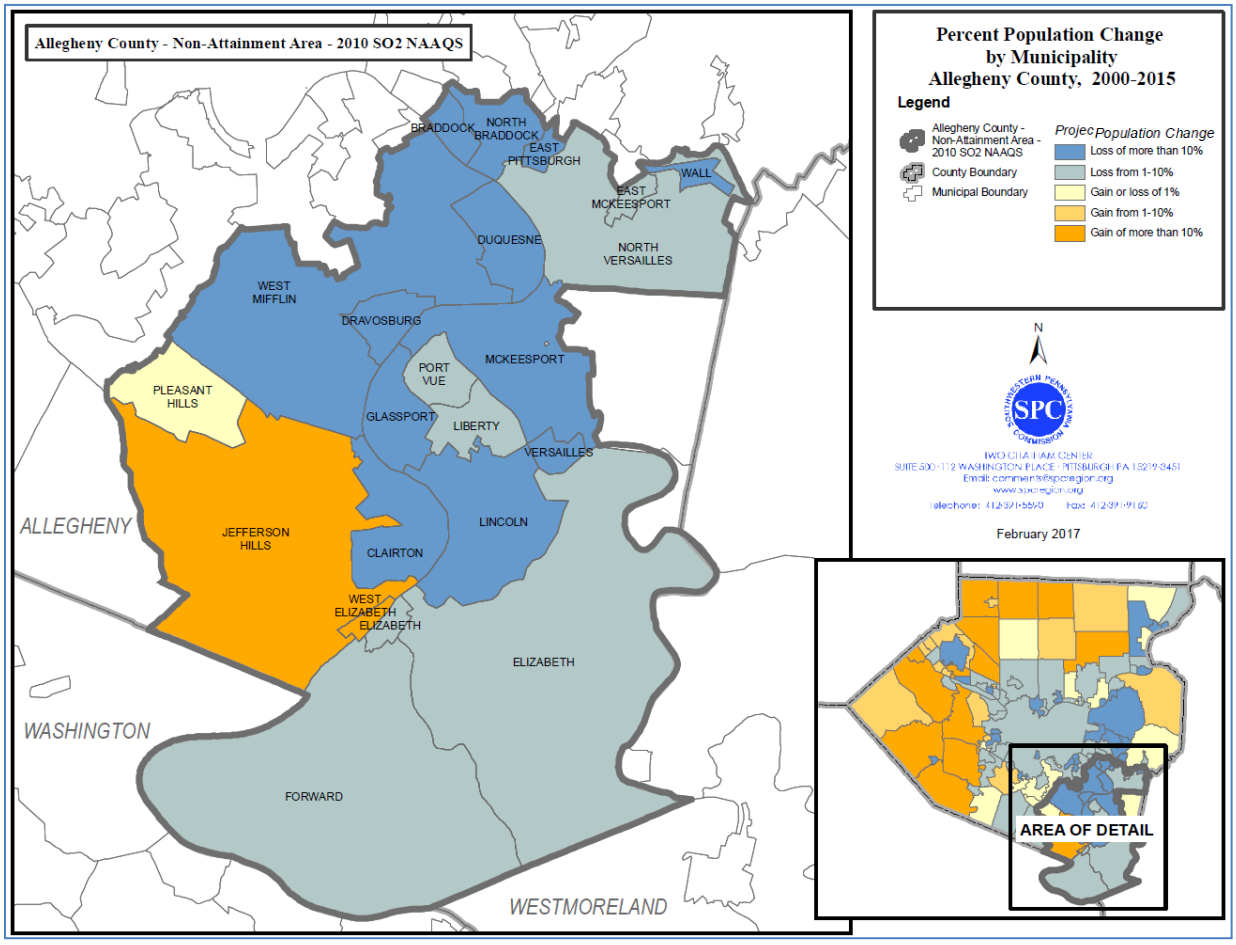

Figure 9-2. Percent Population Change in NAA, 2000-2015

All communities show decreases in population over the past decade and a half, except for the suburban areas of Pleasant Hills, Jefferson Hills, and West Elizabeth. Projections through 2040 show similar overall trends, with only the larger suburbs showing increases in population. These increases are due mostly to new housing plans, with little SO_2 impact.

[13] Data provided by the Southwestern Pennsylvania Commission (SPC)

9.6 National Clean Fuel/Vehicle Programs

Several national clean fuel and vehicle programs will lead to the continued decrease of SO_2 emissions in the NAA and nationwide.

- Since 2010, EPA requires the use of diesel fuel with 15 ppm sulfur specification (known as ultra-low sulfur diesel, or ULSD). All diesel fuel supplied to the US market must be ULSD and all vehicles must use ULSD. All nonroad, locomotive, and marine diesel fuel must be ULSD and all engines must use ULSD.[14]

- In 2015, EPA issued the final rule for light duty Tier 3 motor vehicle emissions and fuel standards. The Tier 3 gasoline sulfur program sets new vehicle emissions standards and lowers the sulfur content on gasoline from 30 ppm to 10 ppm beginning in 2017.[15]

- EPA and NHTSA (National Highway Traffic Safety Administrations) partnered for a program to reduce emissions and improve fuel efficiency of medium and heavy duty vehicles in two phases.

    - Phase 1 applies to vehicles model year 2014-2018 in the categories of combination tractors (semi trucks), heavy duty pickup trucks and vans, and vocational vehicles.[16]

    - Phase 2 encourages the development and deployment of new cost-effective technologies to improve fuel efficiency for medium and heavy duty vehicles from 2018 through 2027.[17]

While reductions from these programs are minor compared to point source controls, they will help to lower the overall nonpoint component of SO_2 concentrations in the NAA.

9.7 PA Commercial Fuel Oil Sulfur Limits

Pennsylvania is part of a regional planning organization, the Mid-Atlantic/Northeast Visibility Union (MANE-VU), established in 2000 to help the Northeast states plan for meeting regional haze requirements. MANE-VU states evaluated several categories for potential sulfur reductions and adopted a formal statement agreeing to pursue a regional low-sulfur oil strategy, among other means.

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[14] https://www.epa.gov/diesel-fuel-standards/diesel-fuel-standards-and-rulemakings
[15] https://www.epa.gov/gasoline-standards/gasoline-sulfur
[16] https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-phase-1-greenhouse-gas-emissions-standards-and
[17] https://www.epa.gov/newsreleases/epa-and-dot-finalize-greenhouse-gas-and-fuel-efficiency-standards-heavy-duty-trucks-0

In 43 Pa. Bulletin 806 (February 9, 2013) the Pennsylvania Department of Environmental Protection updated its regulations (25 Pa. Code §123.22) by lowering the allowable sulfur content of commercial fuel oil used in residential and commercial/industrial boilers, furnaces and other heaters in the five separate geographical "air basins" delineated in the state. Importantly, prior to the 2013 update, all of the state air basins except that which includes Allegheny County, had regulatory limits on sulfur content of commercial fuel oil. Thus, the newly revised state regulations provide heretofore unavailable limits to sulfur in fuel oil for Allegheny County.

Effective July 1, 2016, new limits on sulfur in commercial fuel oil for the Allegheny County Air basin are as follows:

No. 2 and lighter oil	500 ppm	(0.05%)
No. 4 oil	2,500 ppm	(0.25%)
No. 5, No. 6 and heavier oil	5,000 ppm	(0.5%)

While the amount of SO_2 reductions in Allegheny County attributable to this new regulation is not known, statewide SO_2 reductions would be approximately 21,000 tons per year from the reduced fuel oil sulfur content.

10 Legal Documents

10.1 Notice of Public Hearing and Comment Period

Pittsburgh Post Gazette Classifieds

Legal Notices

Posted May 01, 2017

NOTICE OF PUBLIC HEARING on t...

NOTICE OF PUBLIC
HEARING
on the Proposed Revision to the Allegheny County Portion of the Pennsylvania State Implementation Plan Attainment Demonstration for the Allegheny, PA Sulfur Dioxide (SO2) Nonattainment Area 2010 Standards
The Allegheny County Board of Health will hold a public hearing on Thursday, June 1, 2017, at 6:00 PM at the Allegheny County Health Department, Clack Health Center Bldg. 7, 301 39th St., Pittsburgh, PA 15201 to take testimony on the proposed revision to Allegheny County's portion of the Pennsylvania State Implementation Plan (SIP) for SO2.
The proposed revision demonstrates that the Allegheny, PA area will attain the 2010 SO2 National Ambient Air Quality Standards (NAAQS) by Oct. 2018, based on pollutant emission reductions and air dispersion modeling for industrial facilities within the Monongahela Valley. This revision will be submitted to EPA for approval as a SIP revision.
A copy of the proposed SIP revision may be examined beginning Wednesday, May 3, 2017, at the Allegheny County Health Department, Clack Health Center Bldg. 7, Document Control Room, from 8:30 AM until 4:00 PM, Monday through Friday.
The proposed SIP revision may also be found on the Allegheny County Health Department web site:
http://www.achd.
net/air/index.php
Oral testimony must be scheduled by calling 412-578-8120 at least 24 hours in advance of the public hearing. Speakers will be limited to five minutes and should provide a written copy of their comments at the hearing.
The Board will accept written testimony beginning Wednesday, May 3, 2017, and concluding 11:59 PM on Tuesday, June 6, 2017, by mail to ACHD Air Program, 301 39th Street, Bldg #7, Pittsburgh, PA 15201-1811, by email to aqcomments@alleghenycounty.us , or by fax to 412-578-8144.

10.2 Transmittals of Hearing Notice to PA DEP and EPA

COUNTY OF ALLEGHENY

RICH FITZGERALD
COUNTY EXECUTIVE

May 1, 2017

Ms. Cristina Fernandez, Director
Air Protection Division
Region III (3AP00)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Ms. Fernandez:

Enclosed is a Notice of Public Hearing for a proposed revision to the Allegheny County portion of the Pennsylvania State Implementation Plan regarding the Attainment Demonstration for the Allegheny, PA Sulfur Dioxide (SO_2) Nonattainment Area 2010 Standards. The SIP revision itself is available for download at http://www.achd.net/air/index.php.

The SIP revision demonstrates that the Allegheny, PA area will attain the 2010 SO_2 National Ambient Air Quality Standards (NAAQS) by Oct. 2018, based on pollutant emission reductions and air dispersion modeling for industrial facilities within the Monongahela Valley.

This revision will be submitted to EPA for approval as a SIP revision, and is being tracked under our internal Revision Tracking Number 82.

The public comment period begins May 3, 2017 and concludes June 6, 2017. The public hearing will be held June 1, 2017. Your comments are welcome.

Sincerely,

Sandra Etzel, Supervisor
Air Quality Program Planning

cc: J.M. Maranche (ACHD)
File

Enclosure:

ALLEGHENY COUNTY HEALTH DEPARTMENT • AIR QUALITY PROGRAM
301 39TH STREET BUILDING #7 • PITTSBURGH, PA 15201-1811
PHONE (412) 578-8103 • FAX (412) 578-8144

COUNTY OF ALLEGHENY

RICH FITZGERALD
COUNTY EXECUTIVE

May 1, 2017

Mr. Krishnan Ramamurthy, Acting Director
Bureau of Air Quality
Department of Environmental Protection
Rachel Carson Building
400 Market Street
P O Box 8468
Harrisburg, PA 17105-8468

Dear Mr. Ramamurthy:

Enclosed is a Notice of Public Hearing for a proposed revision to the Allegheny County portion of the Pennsylvania State Implementation Plan regarding the Attainment Demonstration for the Allegheny, PA Sulfur Dioxide (SO_2) Nonattainment Area 2010 Standards. The SIP revision itself is available for download at http://www.achd.net/air/index.php.

The SIP revision demonstrates that the Allegheny, PA area will attain the 2010 SO_2 National Ambient Air Quality Standards (NAAQS) by Oct. 2018, based on pollutant emission reductions and air dispersion modeling for industrial facilities within the Monongahela Valley.

This revision will be submitted to EPA for approval as a SIP revision, and is being tracked under our internal Revision Tracking Number 82.

The public comment period begins May 3, 2017 and concludes June 6, 2017. The public hearing will be held June 1, 2017. Your comments are welcome.

Sincerely,

Sandra Etzel, Section Head, Planning
Air Quality Program

cc: Kirit Dalal (PA DEP)
Steve Hepler (PA DEP)
J.M. Maranche (ACHD)

Enclosure

ALLEGHENY COUNTY HEALTH DEPARTMENT • AIR QUALITY PROGRAM
301 39TH STREET BUILDING #7 • PITTSBURGH, PA 15201-1811
PHONE (412) 578-8103 • FAX (412) 578-8144

10.3 Proof of Publication and Certification of Public Hearing

[To be added at a later date]

10.4 Summary of Public Comments and Responses

Summary of Public Comments and Department Responses on the Proposed State Implementation Plan Revision (No. 82) for the Allegheny, PA Nonattainment Area, 2010 SO_2 NAAQS

June 1, 2017 Public Hearing
Public Comment Period of May 3, 2017 through June 6, 2017

[Notice of the opportunity for public comment appeared in the legal section of the Pittsburgh Post-Gazette on May 1, 2017.]

[To be added at a later date]

10.5 Certification of Adoption

[To be added at a later date]

11 References

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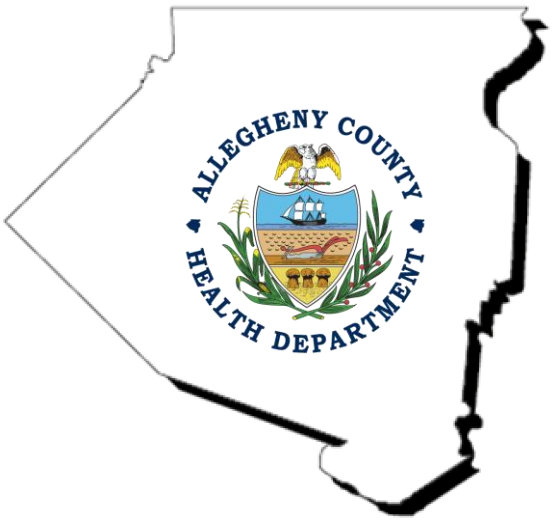

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Allegheny County Health Department
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Bureau of Environmental Health
James Kelly, Deputy Director

Air Quality Program
Jayme Graham, Manager