Technical Support Document:

Chapter 12
Intended Round 4 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Pennsylvania

1. Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA, we, or us) must designate areas as either "nonattainment," "attainment," or "unclassifiable" for the 2010 1-hour sulfur dioxide (SO_2) primary national ambient air quality standard (NAAQS) (2010 SO_2 NAAQS). The CAA defines a nonattainment area as an area that does not meet the NAAQS or that contributes to a nearby area that does not meet the NAAQS. An attainment area is defined by the CAA as any area that meets the NAAQS and does not contribute to a nearby area that does not meet the NAAQS. Unclassifiable areas are defined by the CAA as those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS. See CAA section 107(d)(1)(A)(i)-(iii).

In this action, EPA defines a nonattainment area as an area that, based on available information including (but not limited to) monitoring data and/or appropriate modeling analyses, EPA has determined either: (1) does not meet the 2010 SO_2 NAAQS, or (2) contributes to ambient air quality in a nearby area that does not meet the NAAQS. An attainment/unclassifiable area is defined as an area that, based on available information including (but not limited to) appropriate monitoring data and/or modeling analyses, EPA has determined meets the NAAQS and does not likely contribute to ambient air quality in a nearby area that does not meet the NAAQS. An unclassifiable area is defined as an area for which the available information does not allow EPA to determine whether the area meets the definition of a nonattainment area or the definition of an attainment/unclassifiable area.

EPA is under a December 31, 2020, deadline to designate all remaining undesignated areas as required by the U.S. District Court for the Northern District of California.[1] This deadline is the final of three deadlines established by the court for EPA to complete area designations for the 2010 SO_2 NAAQS. The remaining undesignated areas are: 1) those areas which, under the court order, did not meet the criteria that required designation in Round 2 and also were not required to be designated in Round 3 due to installation and operation of a new SO_2 monitoring network by January 2017 in the area meeting EPA's specifications referenced in EPA's SO_2 Data Requirements Rule (DRR)[2], and 2) those areas which EPA has not otherwise previously

[1] *Sierra Club v. McCarthy*, No. 3-13-cv-3953 (SI) (N.D. Cal. Mar. 2, 2015).
[2] *See* 80 FR 51052 (August 21, 2015), codified at 40 CFR part 51 subpart BB.

designated for the 2010 SO_2 NAAQS. EPA previously issued guidance on how to appropriately and sufficiently monitor ambient air quality in the "SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document" (SO_2 NAAQS Designations Monitoring TAD).[3]

In previous final actions, EPA has issued designations for the 2010 SO_2 NAAQS for most areas of the country.[4] We are referring to the set of designations being finalized by the deadline of December 31, 2020, as "Round 4" or the final round of the designations process for the 2010 SO_2 NAAQS. After these Round 4 designations are completed, there will be no remaining undesignated areas for the 2010 SO_2 NAAQS.

This technical support document (TSD) addresses designations for all remaining undesignated areas in Pennsylvania for the 2010 SO_2 NAAQS. Pennsylvania submitted its first and only recommendation regarding designations for the 2010 1-hour SO_2 NAAQS on June 23, 2011. On May 26, 2017, pursuant the DRR, Pennsylvania submitted a modeling analysis for the Brunner Island Steam Electric Station area in York County but did not update its recommendation. In our intended designations, we have considered all the submissions from the Commonwealth, except where a later submission indicates that it replaces an element of an earlier submission.

Table 1 identifies EPA's intended Round 4 designations and the areas in Pennsylvania to which they would apply. It also lists Pennsylvania's current recommendations. EPA intends to designate these areas by December 31, 2020, through an assessment and characterization of air quality based primarily on ambient monitoring data, including data from existing and new EPA-approved monitors that have collected data from January 2017 forward, pursuant to the DRR; however, other available evidence and supporting information, such as air dispersion modeling in certain situations, may also be considered.[5]

Table 1. Summary of EPA's Intended Designations and the Designation Recommendations by Pennsylvania

Area/County	Pennsylvania's Recommended Area Definition	Pennsylvania's Recommended Designation	EPA's Intended Area Definition	EPA's Intended Designation
York County	York County	Unclassifiable	Same as Pennsylvania's Recommendation	Attainment/ Unclassifiable

Areas that EPA previously designated in Round 1 (*see* 78 FR 47191), Round 2 (*see* 81 FR 45039 and 81 FR 89870), and Round 3 (*see* 83 FR 1098 and 83 FR 14597) are not affected by the designations in Round 4 unless otherwise noted.

[3] https://www.epa.gov/sites/production/files/2016-04/documents/so2monitoringtad.pdf

[4] Most areas of the U.S. were previously designated in actions published on August 5, 2013 (78 FR 47191), July 12, 2016 (81 FR 45039), December 13, 2016 (81 FR 89870), January 9, 2018 (83 FR 1098) and April 5, 2018 (83 FR 14597). EPA is not reopening these previous designation actions in this current Round 4 of designations under the 2010 SO_2 NAAQS, except where specifically discussed.

[5] Detailed SO_2 monitor information may be found in either the 2016 or 2017 ambient monitoring network plans, or associated addenda.

2. General Approach and Schedule

An updated designations guidance document was issued by EPA through a September 5, 2019, memorandum from Peter Tsirigotis, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Regional Air Division Directors, U.S. EPA Regions 1-10.[6] To better reflect the Round 4 designations process, this memorandum supplements, where necessary, prior designations guidance documents on area designations for the 2010 primary SO_2 NAAQS issued on March 24, 2011, March 20, 2015, and July 22, 2016. This memorandum identifies factors that EPA intends to evaluate in determining whether areas are in violation of the 2010 SO_2 NAAQS. The document also contains the factors that EPA intends to evaluate in determining the boundaries for all remaining areas in the country. These factors include: 1) air quality characterization via ambient monitoring and/or dispersion modeling results; 2) emissions-related data; 3) meteorology; 4) geography and topography; and 5) jurisdictional boundaries.

EPA does not plan to revise this intended designations TSD after consideration of state and public comment on our intended designation. A separate final TSD will be prepared as necessary to document how we have addressed such comments in the final designations.

The following are definitions of important terms used in this document:

1) 2010 SO_2 NAAQS – The primary NAAQS for SO_2 promulgated in 2010. This NAAQS is 75 ppb, based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations. See 40 CFR 50.17.
2) Design Value - a statistic computed according to the data handling procedures of the NAAQS (in 40 CFR part 50 Appendix T) that, by comparison to the level of the NAAQS, indicates whether the area is violating the 2010 SO_2 NAAQS.
3) Intended designated nonattainment area –an area that, based on available information including (but not limited to) monitoring data and/or appropriate modeling analyses, EPA intends to determine either: (1) does not meet the 2010 SO_2 NAAQS, or (2) contributes to ambient air quality in a nearby area that does not meet the NAAQS.
4) Intended designated attainment/unclassifiable area – an area that, based on available information including (but not limited to) appropriate monitoring data and/or appropriate modeling analyses, EPA intends to determine meets the 2010 SO_2 NAAQS and does not likely contribute to ambient air quality in a nearby area that does not meet the NAAQS.
5) Intended designated unclassifiable area – an area for which the available information does not allow EPA to determine whether the area meets the definition of a nonattainment area or the definition of an attainment/unclassifiable area.
6) Modeled violation – a modeled design value impact above the 2010 SO_2 NAAQS demonstrated by air dispersion modeling.
7) Recommended attainment area – an area that a state, territory, or tribe has recommended that EPA designate as attainment.
8) Recommended nonattainment area – an area that a state, territory, or tribe has recommended that EPA designate as nonattainment.

[6] https://www.epa.gov/sites/production/files/2019-09/documents/round_4_so2_designations_memo_09-05-2019_final.pdf

9) Recommended unclassifiable area – an area that a state, territory, or tribe has recommended that EPA designate as unclassifiable.
10) Recommended attainment/unclassifiable (or unclassifiable/attainment) area – an area that a state, territory, or tribe has recommended that EPA designate as attainment/unclassifiable (or unclassifiable/attainment).
11) Violating monitor – an ambient air monitor meeting 40 CFR parts 50, 53, and 58 requirements whose valid design value exceeds 75 ppb, based on data analysis conducted in accordance with Appendix T of 40 CFR part 50.
12) We, our, and us – these refer to EPA.

3. Technical Analysis for the York County Area

3.1. Introduction

EPA must designate the York County, Pennsylvania area by December 31, 2020, because the area has not been previously designated. Pennsylvania selected to characterize one portion of York County using a new EPA-approved monitor pursuant to the DRR, and Pennsylvania selected to characterize the remaining portion of the county through air dispersion modeling. The first portion of York County includes the following SO_2 sources around which the DRR required Pennsylvania to characterize air quality:

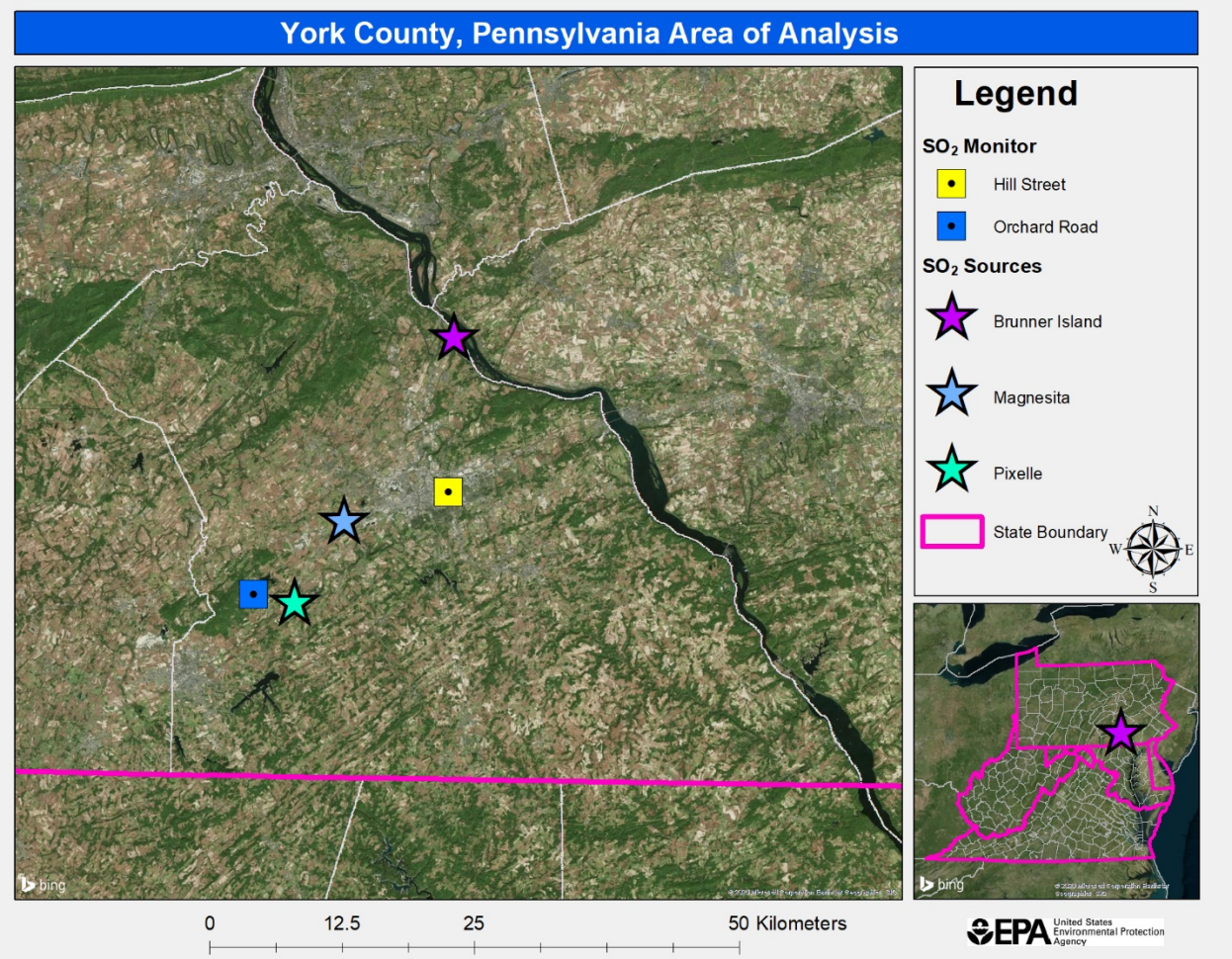
- The Pixelle Specialty Solutions LLC Spring Grove facility (Pixelle), formerly the PH Glatfelter Company, emits 2,000 tons of SO_2 or more annually. Specifically, the facility emitted 6,676 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Pennsylvania has chosen to characterize it via monitoring.
- The Magnesita Refractories facility (Magnesita) emits less than 2,000 tons of SO_2 annually. Specifically, the facility emitted 1,500 tons of SO_2 in 2014. Pennsylvania included this source on the SO_2 DRR Source list due to its proximity to the Pixelle facility in York County, and Pennsylvania has chosen to characterize it via monitoring.

The second portion of York County includes the following SO_2 source around which the DRR required Pennsylvania to characterize air quality:

- The Brunner Island Steam Electric Station (Brunner Island) emits 2,000 tons of SO_2 or more annually. Specifically, the facility emitted 9,815 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Pennsylvania has chosen to characterize it via modeling.

As seen in Figure 1, the Orchard Road SO_2 monitor is located approximately 4 km west of Pixelle in slightly elevated terrain that Pennsylvania's monitor siting analysis showed as having the highest concentrations from the modeled facilities. Magnesita was one of the other sources included in Pennsylvania's monitor siting analysis and is approximately 9 km northeast of Pixelle and 11 km northeast of the Orchard Road monitor. Brunner Island is located in northern York County along the western shore of the Susquehanna River. It is well removed from the Orchard Road monitor (approximately 30 km to the northeast) and was expected to have minimal impact on the area of the monitor. The Hill Street monitor located near the City of York is the only other SO_2 monitor in York County. It is located well away (10 or more kilometers) from the 3 primary sources included in Pennsylvania's modeling analysis.

Figure 1. Map of the York County, Pennsylvania Area



In its June 23, 2011 recommendation letter, Pennsylvania recommended that York County be designated as unclassifiable for the 2010 SO_2 NAAQS. Pennsylvania, however, provided EPA with this recommendation prior to the installation and operation of an EPA-approved monitor characterizing the Pixelle and Magnesita facilities and prior to submitting an air dispersion modeling analysis characterizing Brunner Island. EPA does not agree with Pennsylvania's designation recommendation, as described below, and intends to designate York County, Pennsylvania as attainment/unclassifiable for the 2010 SO_2 NAAQS based upon both currently available monitoring information and air dispersion modeling.

3.2. Air Quality Monitoring Data for the York County Area

EPA considered design values for air quality monitors in the York County area by assessing the most recent 3 consecutive years (i.e., 2017-2019) of quality-assured, certified ambient air quality data in the EPA Air Quality System (AQS) using data from Federal Reference Method and Federal Equivalent Method monitors that are sited and operated in accordance with 40 CFR parts

50 and 58.[7] Procedures for using monitored air quality data to determine whether a violation has occurred are given in 40 CFR part 50 Appendix T, as revised in the 2010 SO_2 NAAQS rulemaking. The 2010 1-hour SO_2 NAAQS is met when the design value is 75 ppb or less. Whenever several monitors are located in an area, the design value for the area is determined by the monitor with the highest valid design value. Table 2 contains the 2017-2019 design values for the area of analysis.

Table 2. 2010 SO_2 NAAQS Design Values for the York County Area

AQS Site ID	Monitor Location	2017 99th Percentile (ppb)	2018 99th Percentile (ppb)	2019 99th Percentile (ppb)	2017-2019 Design Value (ppb)
42-133-0012	Orchard Road (39.8751, -76.912256)	6.2	5.6	6.5	**6**
42-133-0008	Hill Street (39.965278, -76.699444)	10.0	8.0	8.0	**9**

The Orchard Road DRR monitor (42-133-0012) was sited to characterize the maximum 1-hour SO_2 concentrations in the area surrounding the Pixelle and Magnesita facilities. The monitor is located approximately 4 km west of the Pixelle facility and 11 km southwest of the Magnesita facility. The Hill Street monitor (42-133-0008) is located near the center of York County and was not sited to specifically characterize the maximum 1-hour SO_2 concentrations in relation to a particular SO_2 emissions facility; however, the monitor provides additional data to support the designation of York County. Both the Orchard Road and Hill Street monitors are attaining the 2010 SO_2 NAAQS with design values of 6 ppb and 9 ppb, respectively.

3.3. Air Quality Modeling Analysis for the York County Area Addressing Brunner Island Steam Electric Station

In Pennsylvania's June 23, 2011 recommendation letter, Pennsylvania recommended that all of York County be designated as unclassifiable. On June 23, 2016, Pennsylvania notified EPA that they intend to conduct a modeling analysis for Brunner Island.[8] On May 26, 2017, Pennsylvania submitted a modeling analysis for Brunner Island in York County but did not update its recommendation. As seen in Figure 1 previously, the area around Brunner Island is located along the Susquehanna River just south of the junction of Dauphin, Lancaster, and York counties (approximately 24 km southeast of the City of Harrisburg).

This assessment and characterization were performed using air dispersion modeling software, i.e., AERMOD, analyzing a combination of actual and potential SO_2 emissions. After careful review of the Pennsylvania's assessment, supporting documentation, and all available data, EPA does not agree with the Commonwealth's unclassifiable designation recommendation for the

[7] SO_2 air quality data are available from EPA's website at https://www.epa.gov/outdoor-air-quality-data. SO_2 air quality design values are available at https://www.epa.gov/air-trends/air-quality-design-values.
[8] https://www.epa.gov/sites/production/files/2016-07/documents/pennsylvania_source_characterization.pdf

area, and intends to designate the York County area as attainment/unclassifiable. Our reasoning for this conclusion is explained in a later section of this TSD, after all the available information is presented.

3.3.1. Modeling Analysis Provided by the State

3.3.1.1.Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified. The AERMOD modeling system contains the following components:

- AERMOD: the dispersion model
- AERMAP: the terrain processor for AERMOD
- AERMET: the meteorological data processor for AERMOD
- BPIPPRM: the building input processor
- AERMINUTE: a pre-processor to AERMET incorporating 1-minute automated surface observation system (ASOS) wind data
- AERSURFACE: the surface characteristics processor for AERMET
- AERSCREEN: a screening version of AERMOD

The Commonwealth used AERMOD version 16216 and its submittal included both the default version and the Adjusted_U* low wind option. AERMOD version 19191 is the current regulatory version of AERMOD. However, EPA proposes that use of AERMOD version 16216 is acceptable for this analysis because it was the current regulatory version of the model when the modeling analysis was performed by Pennsylvania. A discussion of the Commonwealth's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

3.3.1.2.Modeling Parameter: Rural or Urban Dispersion

For any dispersion modeling exercise, the determination of whether a source area is "urban" or "rural" is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 sources. Section 6.3 of the Modeling TAD details the procedures used to determine if a source area is urban or rural based on land use or population density.

For the purpose of performing the modeling for the area of analysis, the Commonwealth determined that it was most appropriate to run the model in rural mode. An examination of the 2011 USGS National Land Cover Database imagery indicated over 50% if the land classifications within 3 km of Brunner Island (using the Auer method) consisted of croplands and vegetation supporting a rural classification. EPA agrees with this assessment.

3.3.1.3.Modeling Parameter: Area of Analysis (Receptor Grid)

The Modeling TAD recommends that the first step towards characterization of air quality in the area around a source or group of sources is to determine the extent of the area of analysis and the spacing of the receptor grid. Considerations presented in the Modeling TAD include but are not limited to: the location of the SO_2 emission sources or facilities considered for modeling; the

extent of significant concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The Brunner Island facility is the primary source of SO_2 emissions subject to the DRR in this portion of York County. The Commonwealth has also included two other emitters of SO_2 within York County. Pennsylvania determined that, to adequately characterize air quality through modeling for this area, the modeling needed to assess the potential extent of any 2010 SO_2 NAAQS exceedances and any potential impact on SO_2 air quality from other nearby sources. In addition to Brunner Island, the other emitters of SO_2 included in the area of analysis are Pixelle and Magnesita. These 3 sources are the only sources in York County with emissions above 100 tpy. No other sources beyond 50 km were determined by the Commonwealth to have the potential to cause significant concentration gradients within the area of analysis.

The grid receptor spacing for the area of analysis chosen by the Commonwealth is as follows:

- Two (2) fence lines surrounding portions of Brunner Island; one surrounding the main plant (~5.0 km in length) and one surrounding the plant's limestone and gypsum handling area across Wago Road just west of the main plant (~3.0 km in length). Receptor placement is at approximately 25 m intervals.
- a 100 m Cartesian receptor grid extending from the ambient boundary (fence line) out to 5 km from the Brunner Island flue-gas desulfurization (FGD) stack.
- a 250 m Cartesian receptor grid extending from 5 km to 10 km from the Brunner Island FGD stack.
- a 100 m Cartesian receptor grid surrounding Pixelle (no ambient boundary demarcation).
- a 100 m Cartesian receptor grid surrounding Magnesita (no ambient boundary demarcation).
- a 500 m Cartesian receptor grid for the areas outside of the other grids defined above. The total grid measures 58 km east-west and 64 km north-south.
- A refined 21 rows by 21 columns 10 m Cartesian receptor grid located approximately 4.2 km northeast of Brunner Island.
- A refined 10 m Cartesian receptor grid covering an un-named island in the Susquehanna River (near Ely Island) located approximately 4 km southeast (downstream) of Brunner Island.

The combined receptor network contained a total of 46,789 receptors, and the network covered portions of Adams, Cumberland, Dauphin, Lancaster, Lebanon, and York Counties in Pennsylvania and extreme northern portions of Baltimore, Carroll, and Harford Counties in Maryland.

Figures 2, 3, and 4, taken from the Commonwealth's May 26, 2017, modeling analysis, show the Commonwealth's chosen area of analysis surrounding Brunner Island, as well as the receptor grid for the area of analysis.

Figure 2: Brunner Island Area of Analysis in York County

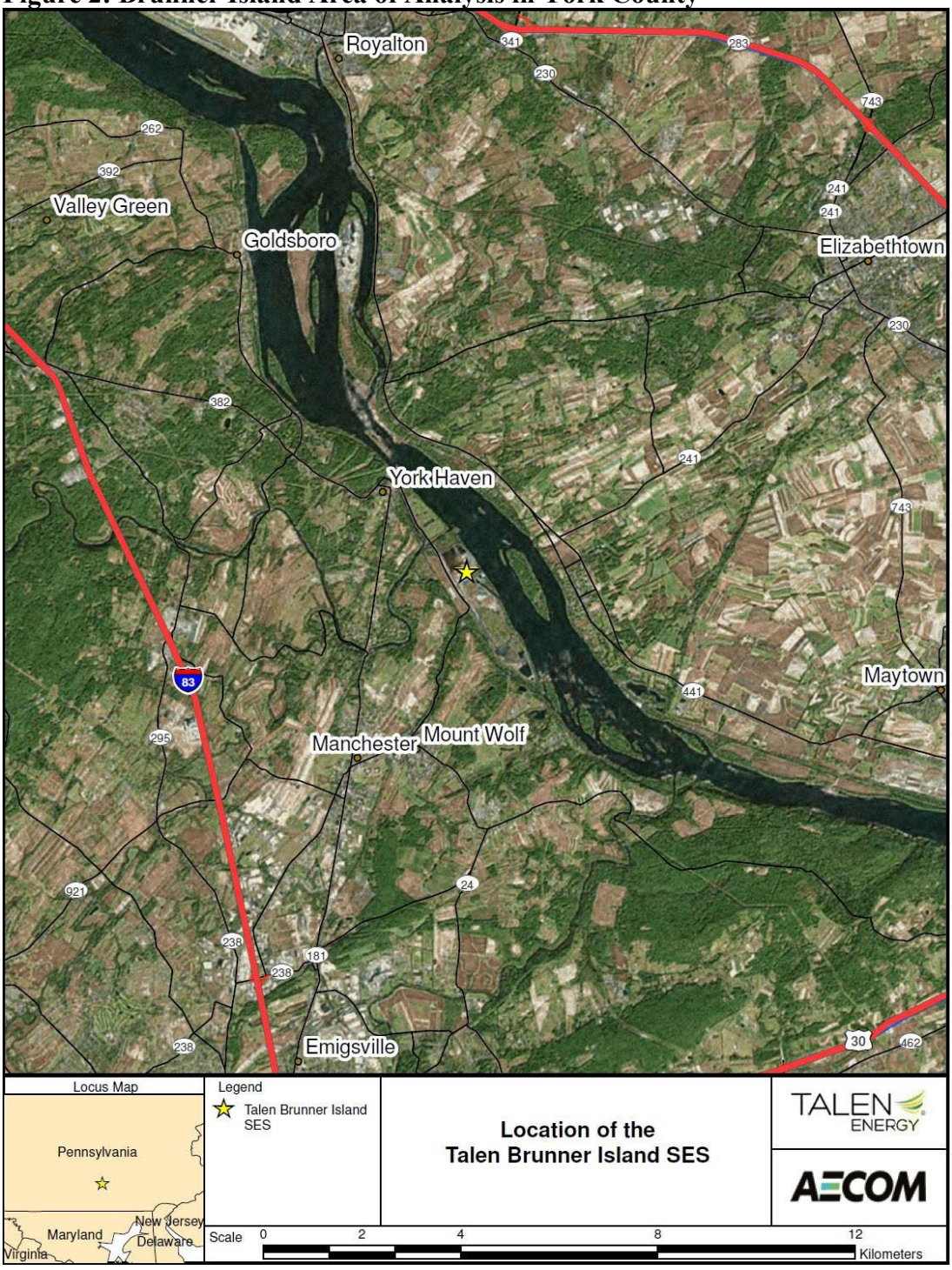


Figure 3. Full Extent of the Receptor Grid for the York County Area

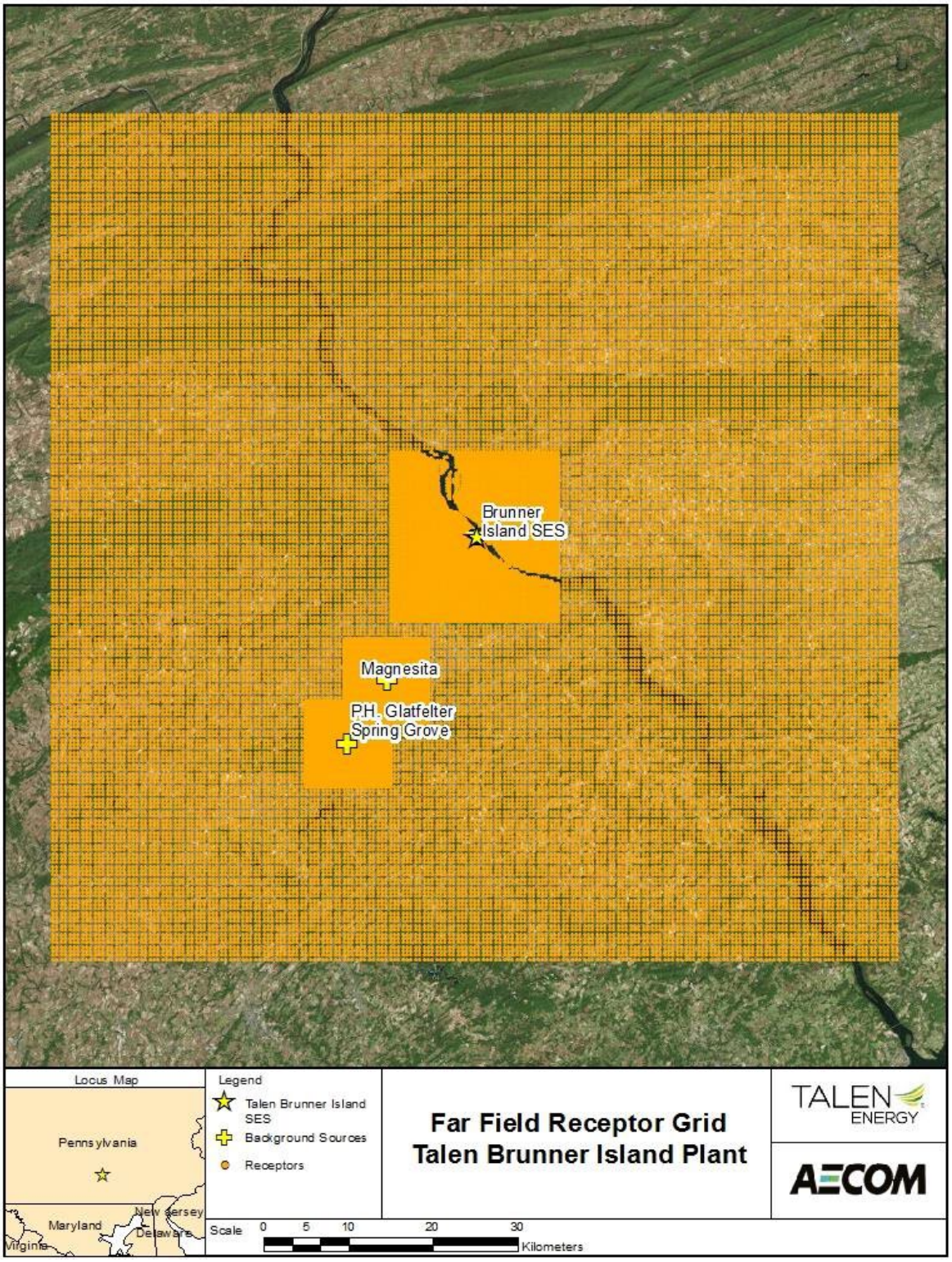
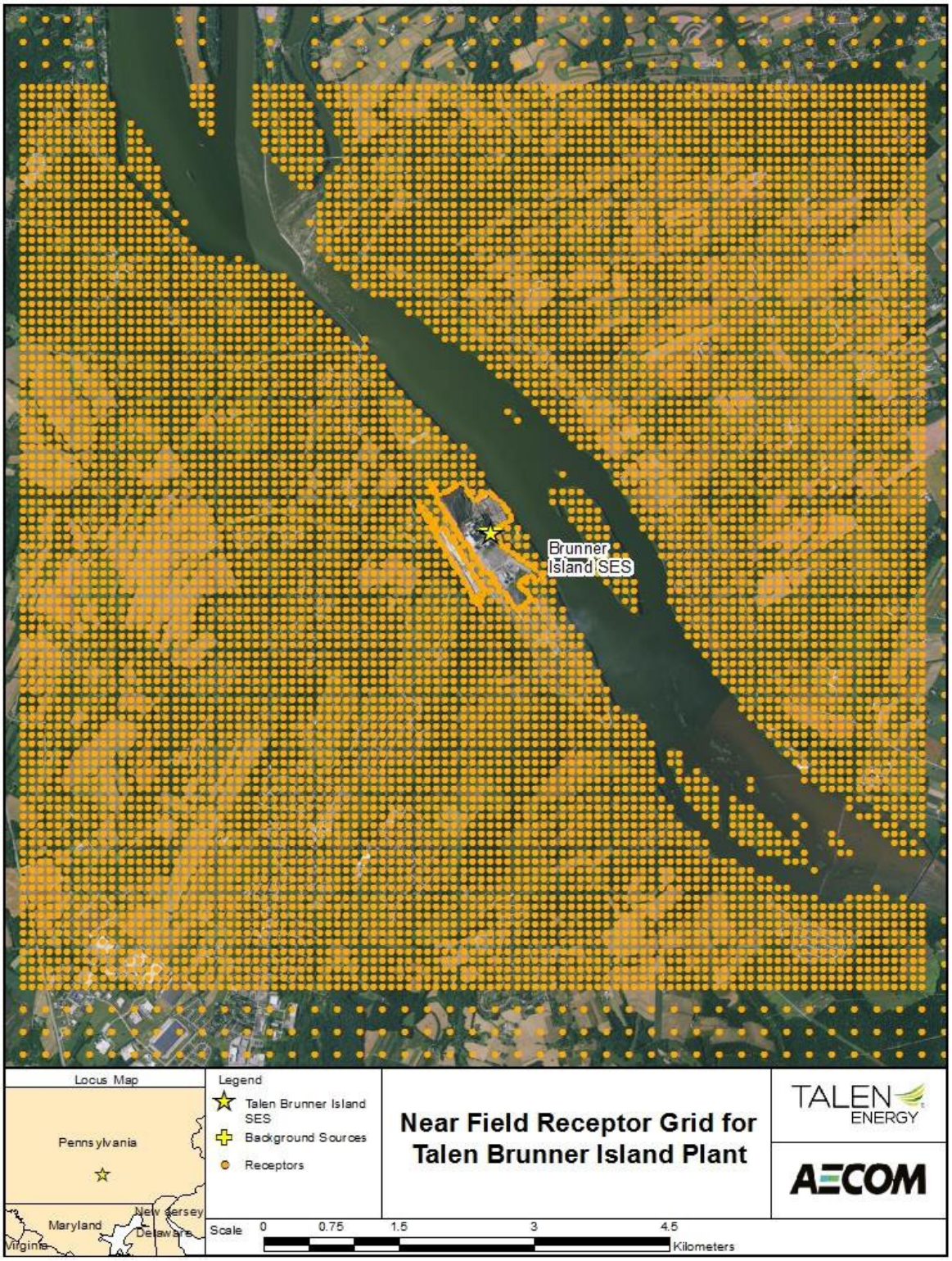


Figure 4. Receptor Grid for the Brunner Island Area in York County (Zoomed in from Figure 3)



Consistent with the Modeling TAD, the Commonwealth placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property with the exceptions of locations described in Section 4.2 of the Modeling TAD as not being feasible locations for placing a monitor. These boundaries were generally reviewed using GIS aerial imagery to confirm physical barriers were in place. Receptors were excluded over the open waters of the nearby Susquehanna River, though receptors were retained over several islands on the river. In addition, receptors were retained over the Pixelle and Magnesita facility areas. No deference was made to account for either source's potential ambient air boundary. A more refined analysis would have removed each source's impact from within its respective ambient air boundary. The Commonwealth also did not place receptors in other locations that it considered to not be ambient air relative to each modeled facility.

EPA examined fenceline facility property boundaries for Brunner Island using GIS software and believes ambient boundaries are correctly delineated. Model results include building downwash for Brunner Island. Peak model concentrations occur well away from this facility's ambient property boundaries meaning proper boundary delineation is not an overly critical component of the modeling analysis. EPA also believes the model receptor grid is adequate to capture the maximum modeled concentrations.

3.3.1.4.Modeling Parameter: Source Characterization

Section 6 of the Modeling TAD offers recommendations on source characterization including source types, use of accurate stack parameters, inclusion of building dimensions for building downwash (if warranted), and the use of actual stack heights with actual emissions.

As noted previously, Pennsylvania included 3 emissions sources in its modeling analysis. These sources are Brunner Island, a coal-fired electric generating facility; Pixelle, a manufacturer of specialty paper products; and Magnesita, a manufacturer of refractory products. Source information for Pixelle and Magnesita were provided by separate consultants. Only the main coal-combustion units at Brunner Island were included in the modeling analysis. Other sources including auxiliary boilers and emergency equipment were not included because they are intermittent sources that have all operated a small number of hours.

The FGD stack emissions from Brunner Island's Units 1 and 2 exhaust from one flue in a multi-flue stack. Unit 3, the largest unit, exhausts through a separate flue in the stack. The modeling analysis utilized EPA's merged stack policy outlined in Model Clearinghouse Memos 91-II-01 and 96-V-10. Modeled stack velocities and temperatures were scanned for any unusual values. Some hourly stack temperatures were modeled below 273 K, which is not consistent with coal-fired units. In all likelihood, hourly stack temperatures below 273 K are occurring when the modeled emission rate is zero (based on a quick check of the hourly file). EPA noted that the maximum stack velocity for the merged stack when all 3 units were operating was nearly 50% higher than the maximum stack velocity for the flue for Units 1 and 2.

Pennsylvania characterized these sources within the area of analysis in accordance with the best practices outlined in the Modeling TAD. BPIP output for Brunner Island indicates the stack exceeds GEP stack height. Brunner Island's actual stack height was used since actual emissions

for this source were used in the modeling analysis in accordance with the Modeling TAD. Building downwash output was provided for the Pixelle and Magnesita facilities but specific building location information was not included in the analysis. Lacking this information, EPA was only able to assess the building information provided for Brunner Island. This building information was confirmed using GIS software. EPA believes the information provided by Pennsylvania is adequate to assess impacts in the vicinity of Brunner Island.

3.3.1.5.Modeling Parameter: Emissions

EPA's Modeling TAD notes that for the purpose of modeling to characterize air quality for use in designations, the recommended approach is to use the most recent 3 years of actual emissions data and concurrent meteorological data. However, the TAD also indicates that it would be acceptable to use allowable emissions in the form of the most recently permitted (referred to as PTE or allowable) emissions rate that is federally enforceable and effective.

EPA believes that continuous emissions monitoring systems (CEMS) data provide acceptable historical emissions information, when they are available. These data are available for many electric generating units. In the absence of CEMS data, the EPA's Modeling TAD highly encourages the use of AERMOD's hourly varying emissions keyword HOUREMIS, or through the use of AERMOD's variable emissions factors keyword EMISFACT. When choosing one of these methods, the EPA recommends using detailed throughput, operating schedules, and emissions information from the impacted source(s).

In certain instances, states and other interested parties may find that it is more advantageous or simpler to use PTE rates as part of their modeling runs. For example, where a facility that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 emissions to a level that indicates compliance with the NAAQS, the state may choose to model PTE rates. These new limits or conditions may be used in the application of AERMOD for the purposes of modeling for designations, even if the source has not been subject to these limits for the entirety of the most recent 3 calendar years. In these cases, the Modeling TAD notes that a state should be able to find the necessary emissions information for designations-related modeling in the existing SO_2 emissions inventories used for permitting or state implementation plan (SIP) planning demonstrations. If these short-term emissions are not readily available, they may be calculated using the methodology in Table 8-1 of Appendix W to 40 CFR Part 51 titled, "Guideline on Air Quality Models."

Pennsylvania included Brunner Island and two other emitters of SO_2 in York County in this analysis. The Commonwealth has used a hybrid approach, where emissions from Brunner Island are expressed as actual emissions, emissions from Pixelle are based on PTE from a January 31, 2017, federally enforceable fuel replacement, and emissions from Magnesita were estimated using a scaling factor as described in detail below. The facilities in Pennsylvania's modeling analysis and their associated actual or PTE emission rates are also summarized below.

For Brunner Island, the Commonwealth provided actual hourly SO_2 emissions based on CEM data for its 3 coal-fired units between 2012 and 2014. Emissions for Pixelle were provided by the facility's consultant and based on Pennsylvania's plan approval which required replacement of

several coal boilers with natural gas boilers by January 31, 2017.[9] As expected, the emissions modeled are less than Pixelle's 2014 reported emissions in Pennsylvania's Environment Facility Application Compliance Tracking System (eFACTS) and the 2014 NEI, as shown in Tables 3, 5, and 6, because the fuel change did not go into effect until January 2017.[10]

Hourly emission files were provided by Magnesita's consultant for the years 2012-2014 which contained normalized emission rates for three of Magnesita's sources, and for Brunner Island emissions (which had previously been provided from Pennsylvania to Magnesita). To determine the actual emissions from the normalized hourly emissions file, the Brunner Island normalized emissions were compared to the Brunner Island actual emissions. Based on this comparison, the normalized emissions multiplied by a factor of 740.5014 were found to match the Brunner Island actual emissions. Therefore, actual hourly emissions for Magnesita sources were derived using this multiplication factor.

Tables 3 through 6 provide the modeled versus actual emissions for facilities included in the Brunner Island modeling analysis. Specifically, Table 3 provides the modeled emissions and Tables 4 through 6 provide actual emissions. As shown, the modeled emissions for Magnesita are greater than the actual reported 2012-2014 emissions. The modeled emissions for Pixelle are less than the actual 2012-2014 emissions because the Commonwealth modeled a federally enforceable permit requirement that went into effect in January 2017. In Table 3, the modeled emissions for Brunner Island are listed by unit depending on which units were operating. The model used an equivalent diameter merged stack when certain units were on at the same time, and actual stack diameters when not, thus the stack emissions are separated to ensure the total emissions were comparable to the EPA's Clean Air Markets Division (CAMD) emissions totals.[11] The total emissions modeled for Brunner Island are similar to the emissions reported to CAMD, Pennsylvania eFACTs, and the 2014 NEI.

Although Pennsylvania has chosen to operate a new SO_2 monitor to evaluate ambient air quality in the vicinity of Pixelle and Magnesita, the two facilities were included in this modeling analysis to assess their potential impacts on the area surrounding Brunner Island.

[9] Pennsylvania's Plan Approval 67-05004S for Pixelle allowed for the installation of two natural gas fired power boilers (038 and 039) to replace three coal fired power boilers (IDs 033, 034, and 035). The three coal fired boilers have been shut down as of January 31, 2017. The plan approval also authorized the installation of a hydrated lime injection system to reduce HCI emissions from Power Boiler No. 5 (PBS), with associated equipment; storage silo, and pneumatic conveying equipment. Pixelle Specialty Solutions LLC Title V Operating Permit: http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Permits/PermitDocuments/1251373[67-05004]_Issued_v1.pdf

[10] Pennsylvania's Environment Facility Application Compliance Tracking System (eFACTS) is available at https://www.ahs.dep.pa.gov/eFACTSWeb/default.aspx.

[11] EPA's Clean Air Markets Division, Air Market Program Data are available at https://ampd.epa.gov/ampd/.

Table 3. Modeled 2012-2014 SO_2 Emissions from Facilities in the Brunner Island Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Brunner Island Unit 1 & 2	1,436.2	1,472.1	756.3
Brunner Island Unit 3	439.2	752.3	285.1
Brunner Island Unit 1, 2 & 3 Merged	10,405.8	9,953.5	8,775.4
Magnesita: No 1. Rotary Kiln	351.7	300.2	383.7
Magnesita: No 2. Rotary Kiln	1,146.8	1,131.7	1,231.0
Magnesita: TK5 and TK6 Outlet	36,762.0	36,661.6	36,661.6
Pixelle (Total Emissions)	3,388.2	3,388.2	3,388.2
Total Emissions from Brunner Island	**12,281.2**	**12,177.9**	**9,816.8**
Total Emissions from Magnesita	**38,260.5**	**38,093.5**	**38,276.3**
Total Emissions from All Modeled Facilities in Pennsylvania's Area of Analysis	**53,929.8**	**53,659.5**	**51,481.2**

Table 4. Brunner Island 2012-2014 Actual SO_2 Emissions from CAMD

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Brunner Island Unit 1	2,055.8	2,798.2	2,426.5
Brunner Island Unit 2	3,887.1	3,101.2	2,675.7
Brunner Island Unit 3	6,311.6	6,277.5	4,712.8
Total Emissions from Brunner Island	**12,254.5**	**12,176.9**	**9,815.0**

Table 5. 2012-2014 Actual SO_2 Emissions from Pennsylvania's eFACTS Website

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Brunner Island	12,254.8	12,176.1	9,815.1
Pixelle	4,446.8	5,594.1	6,675.8
Magnesita Refractories	1,417.8	1,464.1	1,460.7
Total Emissions from All Modeled Facilities in Pennsylvania's Area of Analysis	**18,119.4**	**19,234.2**	**17,951.6**

Table 6. 2014 NEI Actual SO_2 Emissions for Facilities in the York County Area

Facility Name	2014 NEI SO_2 Emissions (tpy)
Brunner Island	9,815.1
Pixelle	6,675.6
Magnesita	1,500.0
Total Emissions from All Modeled Facilities in Pennsylvania's Area of Analysis	**17,990.7**

For Brunner Island, the actual hourly emissions were derived from data submitted by the facility to Pennsylvania through the CEMS database and included in the modeling documentation. Stack temperature and flow rates were examined to obtain modeled hourly values and vary for each hour of the simulation. As noted previously, when all units were simultaneously operated, a merged stack was utilized. To model a merged stack, calculations were performed to determine the equivalent parameters needed for modeling. Emissions for the merged stack are the sum of all units' emissions. Merged stack temperatures were calculated using a weighted average based on stack flow data. Computing the merged stack exit velocity is a multi-step process. Generally, CEMs do not measure exit velocity directly, but rather determine the volumetric flow rate based on standard atmospheric conditions. Because standard flow rate is rarely representative of the flow rate based on actual atmospheric conditions, standard flow rate is converted to actual flow rate using the exit temperature and a pressure correction that accounts for the stack top elevation. Once the actual flow rate is determined, the exit velocity is computed by dividing the volumetric flow rate by the area of the merged stack. The stack flow rate and exit temperature data include several periods of missing data. For short time periods of missing flow or temperature data, the average of the valid hours before and after the missing hour's data were used.

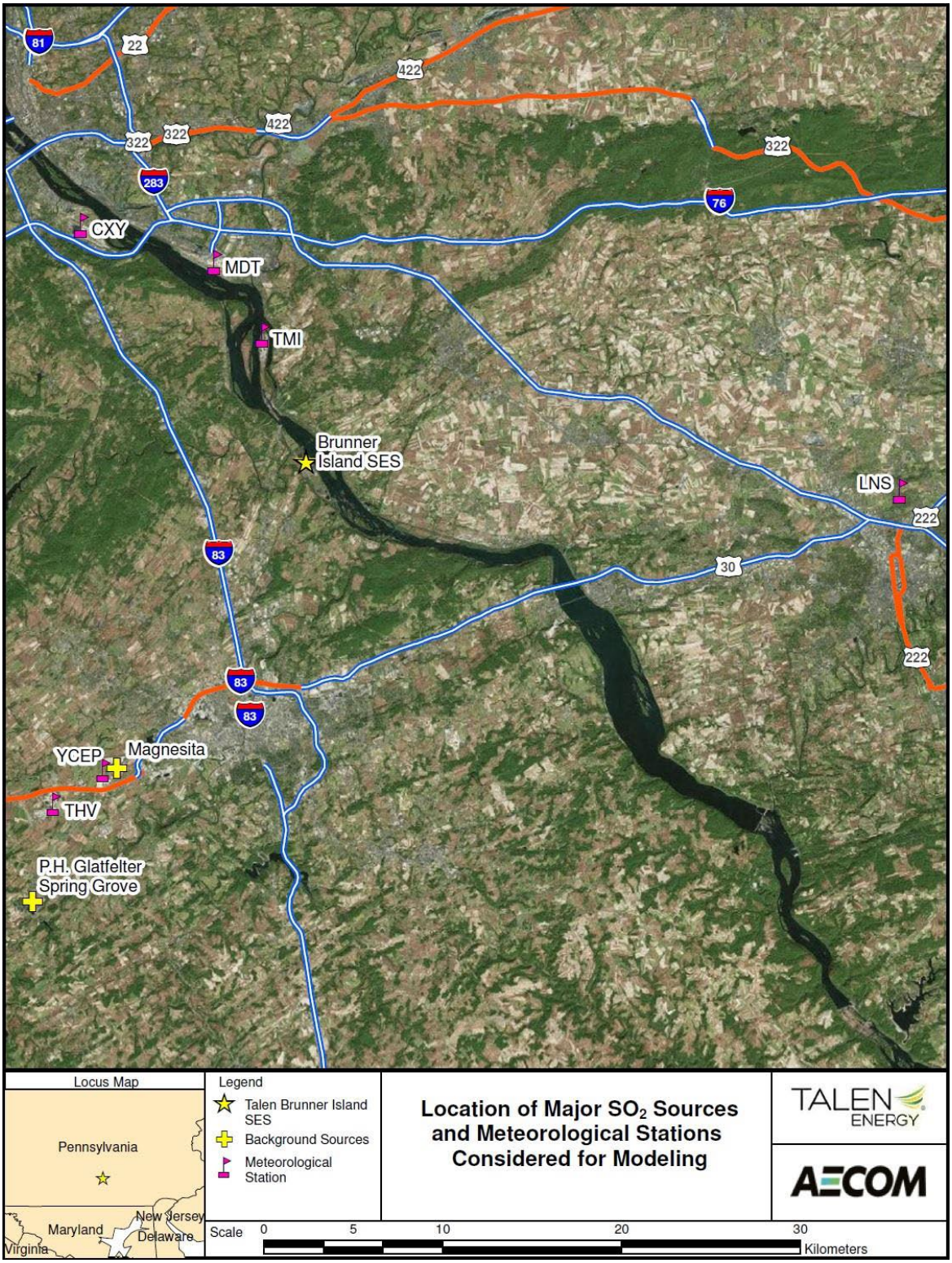
EPA believes the modeling analysis is representative of the Brunner Island area. This source appears to have an accurate (actual) source characterization. Pixelle was modeled using PTE based on a federally enforceable fuel change, which is an appropriate emissions estimation approach. Magnesita's emissions were calculated using a scaling factor as described above. This approach resulted in an overestimation of emissions being modeled for this source. However, EPA believes that the overestimation of emissions for Magnesita would only overestimate the impacts from the source in terms of SO_2 concentrations. Considering Pixelle and Magnesita are at least 20 km southwest of Brunner Island, their impacts near Brunner Island are likely minimal. Therefore, the modeling analysis provided by Pennsylvania provides a reasonable if not conservative representation of SO_2 concentrations around Brunner Island.

3.3.1.6.Modeling Parameter: Meteorology and Surface Characteristics

As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data, for sources modeled with actual emissions) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of the data is determined based on: 1) the proximity of the meteorological monitoring site to the area under consideration, 2) the complexity of terrain, 3) the exposure of the meteorological site, and 4) the period of time during which data are collected. Sources of meteorological data include National Weather Service (NWS) stations, site-specific or onsite data, and other sources such as universities, Federal Aviation Administration (FAA), and military stations.

For the area of analysis around Brunner Island, the Commonwealth selected the surface meteorology from a combination of the Three-Mile Island (TMI) met tower and the Capital City Airport (CXY) near Harrisburg, PA, and coincident upper air observations from Sterling, VA, as best representative of meteorological conditions within the area of analysis. The TMI met tower is a multi-level meteorological monitoring site near the TMI Nuclear Power Station. It measures wind speed and wind direction (at 9.4 m, 29.9 m, and 44.2 m) along with temperature and turbulence information. Brunner Island is approximately 7.5 km down river from the TMI Met Tower station and approximately 19 km southeast of the CXY Airport near Harrisburg, PA. Sterling, VA, (upper-air site) is approximately 141 km south-southwest of Brunner Island. In Figure 5 below, the location of this TMI met tower, CXY (Surface), and Sterling, VA, (Upper-Air) sites shown relative to the area of analysis.

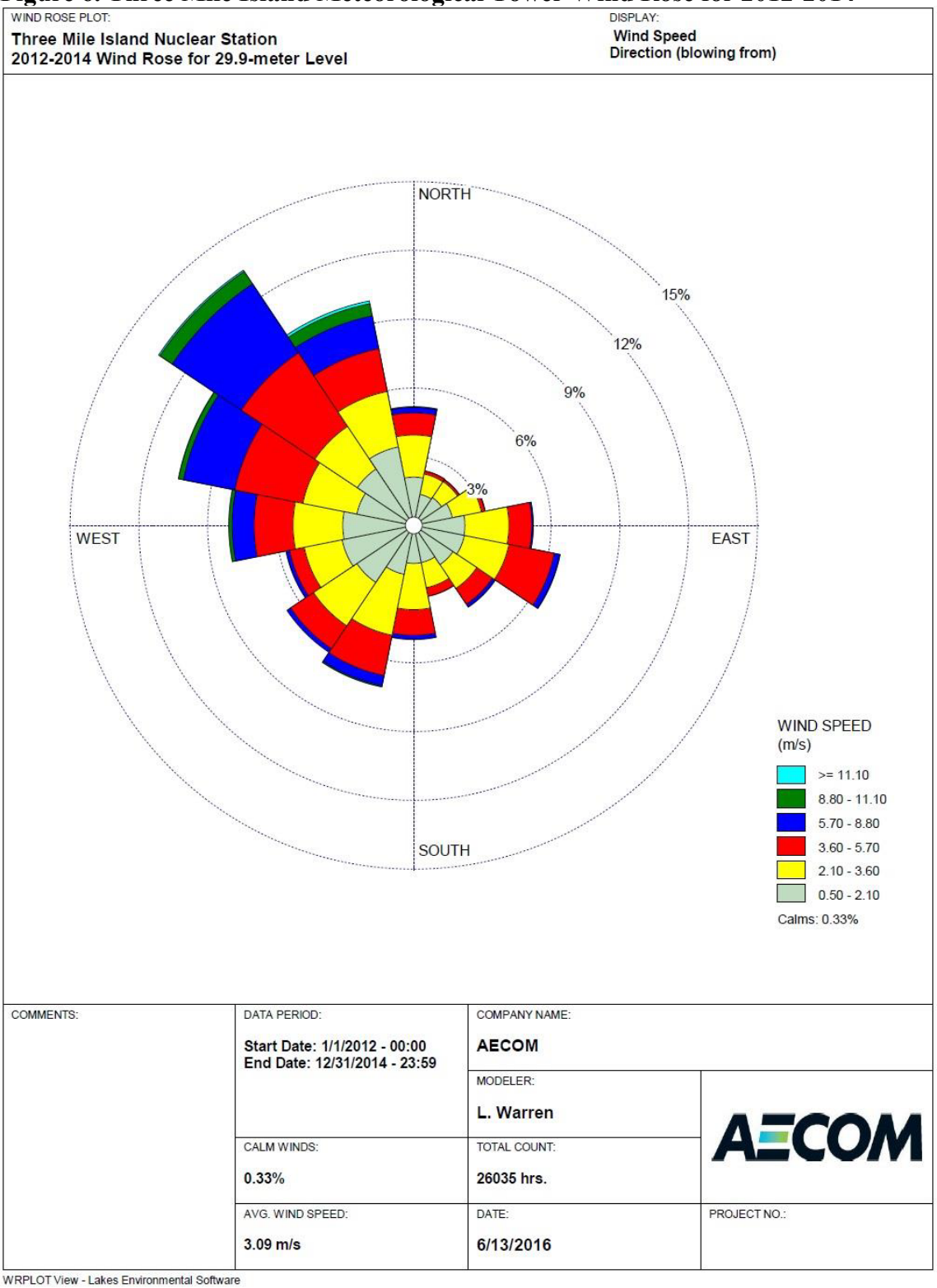
Figure 5. Area of Analysis and the TMI Met Tower and NWS stations in the Brunner Island Area



The Commonwealth used AERSURFACE version 13016 using data from the TMI met tower site to estimate the surface characteristics of the area of analysis. The Commonwealth estimated values for 12 spatial sectors out to 1.0 km at a default seasonal temporal resolution for dry, wet, average conditions based on local precipitation values. The Commonwealth also estimated values for albedo (the fraction of solar energy reflected from the earth back into space), the Bowen ratio (the method generally used to calculate heat lost or heat gained in a substance), and the surface roughness (sometimes referred to as "Zo" and is related to the height of obstacles to the wind flow, which is an important factor in determining the magnitude of mechanical turbulence and the stability of the boundary layer). Seasonal snow cover for the area was also incorporated into the AERSURFACE determined surface characteristics.

As part of its recommendation, the Commonwealth provided the 3-year surface wind rose for the TMI met tower site for 2012-2014. In Figure 6, the frequency and magnitude of wind speed and direction are defined in terms of from where the wind is blowing. TMI tower winds were predominately from the northwest with a resultant wind vector from the west-northwest. Wind measurements in the sfc file were generally made at the 9.4 m level, though missing data could be filled in with wind measurements from the 24.9 m or the 44.2 m tower levels. Typically, NWS anemometer heights are in the 7.9 m to 10 m range. Consistent with EPA Modeling Clearinghouse memo (Record No: 16-X-01), the TMI met tower turbulence measurements were not used in the final AERMET (version 16216) produced files and the Adjusted_U* option was utilized.[12] The TMI sigma-theta (turbulence data) did not meet completeness criteria and were therefore not usable.

Figure 6. Three Mile Island Meteorological Tower Wind Rose for 2012-2014



[12] https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=16-X-01

Meteorological data from the above surface and upper air NWS stations were used in generating AERMOD-ready files with the AERMET processor. The output meteorological data created by the AERMET processor are suitable for being applied with AERMOD input files for AERMOD modeling runs. Pennsylvania followed the methodology and settings presented in the Modeling TAD, and associated guidance, in the processing of the raw meteorological data into an AERMOD-ready format used AERSURFACE to best represent surface characteristics. The Commonwealth processed and provided the AERMET-ready file used in the modeling analysis.

Hourly surface meteorological data records are read by AERMET and include all the necessary elements for data processing. Since the wind measurements were taken at the TMI met tower, wind measurements did not suffer variable wind conditions often observed in National Weather Service surface data. EPA's AERMINUTE program, therefore, was not utilized in the modeling analysis. The minimum threshold for the TMI met tower data was set to 0.3 m/s in the AERMET input file. EPA believes the files were processed correctly and reflect surface condition such as soil moisture and seasonal snow cover for the area of analysis.

3.3.1.7.Modeling Parameter: Geography, Topography (Mountain Ranges or Other Air Basin Boundaries) and Terrain

The terrain in the area of analysis is best described as gently rolling. York County sits just to the south of Blue Mountain, which marks the front edge of the Appalachian Mountains Ridge and Valley province. To the west is South Mountain, which marks the end of the of the Blue Ridge Mountains. York County is considered part of the Piedmont terrain feature that is located between the Atlantic Coastal Plain and the formal Appalachian Mountains.

To account for these terrain changes, the AERMAP terrain program within AERMOD was used to specify terrain elevations for all the receptors. The source of the elevation data incorporated into the model is from the USGS National Elevation Dataset (NED) data. The appropriate file for 1-arc-second, or 30-meter, NED data were obtained from the Multi-Resolution Land Characteristics Consortium (MRLC) link and processed in AERMAP. EPA believes the receptor grid information was properly processed.

3.3.1.8.Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 that are ultimately added to the modeled design values: 1) a "tier 1" approach, based on a monitored design value, or 2) a temporally varying "tier 2" approach, based on the 99th percentile monitored concentrations by hour of day and season or month. For this area of analysis, the Commonwealth used a combination of 2 SO_2 monitors to develop a seasonal, hourly varying (Tier 2) background concentration for use in the modeling analysis. Monitors in Perry County (Little Buffalo, 42-099-0301) and neighboring Adams County (Arendtsville, 42-001-0001) were combined to account for the Little Buffalo monitor being discontinued in the later part of 2014. Both sites had incomplete data for design value calculation purposes. The Little Buffalo monitor is approximately 57 km northwest of Brunner Island while the Arendtsville monitor is located approximately 56 km to the west. Design values, though incomplete, were within 1 ppb of each other for the 2012-2014 time period. Both sites are well away from the York County modeled emission sources and should provide a reasonable background concentration.

The background concentrations in Table 7 for this area of analysis were determined by the Commonwealth to vary from 0.87 micrograms per cubic meter ($\mu g/m^3$), equivalent to 0.3 ppb when expressed in 2 significant figures to 20.96 $\mu g/m^3$ (8 ppb), with an average value of 8.07$\mu g/m^3$ (3.08 ppb).[13]

[13] The SO_2 NAAQS level is expressed in ppb but AERMOD gives results in $\mu g/m^3$. The conversion factor for SO_2 (at the standard conditions applied in the ambient SO_2 reference method) is 1ppb = approximately 2.619 $\mu g/m^3$.

Table 7. 2012-2014 Combined Seasonal 1-hour SO_2 Background Concentrations, by hour of day, from the Little Buffalo and Arendtsville Monitors

Hour	3-Year Averaged 99th Percentile Hourly Values for Winter (µg/m³)	3-Year Averaged 99th Percentile Hourly Values for Spring (µg/m³)	3-Year Averaged 99th Percentile Hourly Values for Summer (µg/m³)	3-Year Averaged 99th Percentile Hourly Values for Fall (µg/m³)
1	12.23	6.11	0.87	7.86
2	13.10	3.49	0.87	6.99
3	12.23	4.37	0.87	5.24
4	9.61	6.11	0.87	5.24
5	13.10	4.37	0.87	4.37
6	11.35	3.49	0.87	3.49
7	12.23	2.62	1.75	3.49
8	10.48	6.99	3.49	6.99
9	12.23	7.86	5.24	7.86
10	15.72	7.86	9.61	7.86
11	17.47	7.86	9.61	10.48
12	17.47	9.61	6.11	10.48
13	15.72	11.35	7.86	10.48
14	14.85	9.61	6.11	7.86
15	17.47	10.48	6.11	8.73
16	20.09	11.35	5.24	7.86
17	20.96	12.23	5.24	8.73
18	18.34	9.61	3.49	6.99
19	13.10	9.61	2.62	6.99
20	9.61	8.73	2.62	5.24
21	13.10	7.86	0.87	6.99
22	14.85	6.11	1.75	6.11
23	13.10	4.37	1.75	7.86
24	13.10	5.24	0.87	6.11

3.3.1.9.Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Brunner Island area of analysis are summarized below in Table 8.

Table 8: Summary of AERMOD Modeling Input Parameters for the Brunner Island Area of Analysis

Input Parameter	Value
AERMOD Version	16216 (regulatory defaults)
Dispersion Characteristics	Rural
Modeled Sources	3
Modeled Stacks	12
Modeled Structures	29
Modeled Fencelines	2
Total Receptors	46,789
Emissions Type	Brunner Island (actual) Pixelle (PTE) Magnesita (estimated based on scaling factor)
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Three Mile Island Nuclear Met Tower
NWS Station Upper Air Meteorology	Capital City Airport, PA
NWS Station for Calculating Surface Characteristics	Sterling, VA
Methodology for Calculating Background SO_2 Concentration	Three Mile Island Nuclear Met Tower
Calculated Background SO_2 Concentration	Seasonal, Temporal Varying Tier 2 (Table 7)

The results presented below in Table 9 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

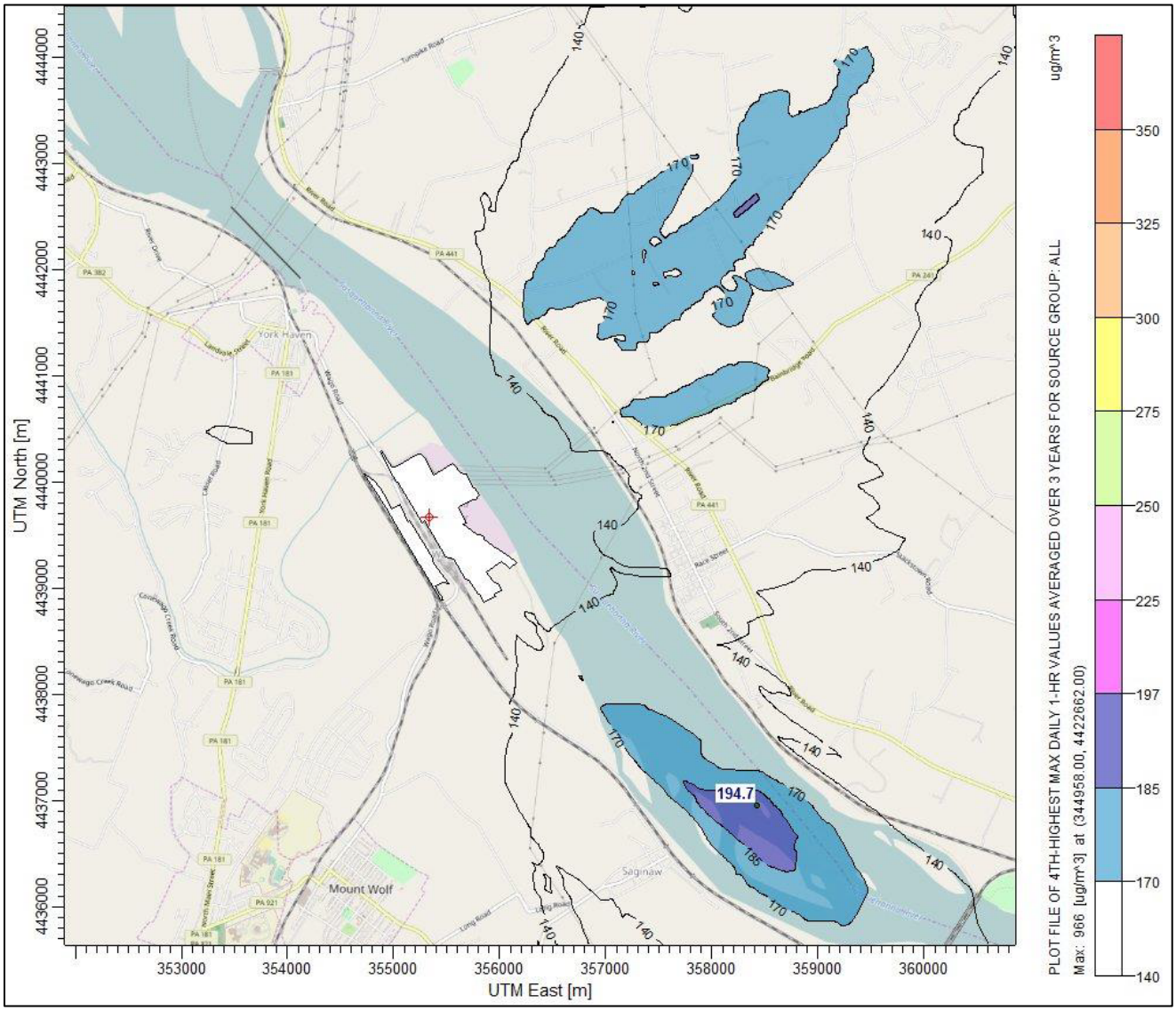
Table 9. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentration Averaged Over 3 Years for the Area of Analysis for the Brunner Island Area

Averaging Period	Data Period	Receptor Location UTM Zone 18		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM	UTM	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	358423.52	4436954.28	194.67	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

Pennsylvania's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is194.67 µg/m^3, equivalent to 74.3 ppb, which below the 2010 SO_2 NAAQS. This model concentration included a representative SO_2 background concentration and is based on a mixture of actual and possible PTE emissions from the 3 York County SO_2 emissions facilities. Figure 7, from the Commonwealth's January 2017, modeling report, indicates that the predicted value occurred on an unnamed island (near Ely Island in Lancaster County) in the Susquehanna River approximately 4 km southeast of the Brunner Island's FGD stack. The modeling indicates that the area is attaining the 2010 SO_2 at the receptor with the highest modeled concentration.

Figure 7: Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over 3 Years for the Area of Analysis for the Brunner Island Area



3.3.1.10. The EPA's Assessment of the Modeling Information Provided by the State

Pennsylvania submitted a modeling analysis for York County, Pennsylvania area, specifically for the area around Brunner Island, that included actual emissions from Brunner Island, as well as PTE based on a federally enforceable fuel change from Pixelle, and estimated actual emissions from Magnesita. Brunner Island is located approximately 20 km northeast of Magnesita and 29 km northeast of Pixelle. At these distances, emissions from the latter two facilities are expected to have minimal impacts in the immediate area of Brunner Island. Nevertheless, the inclusion of these sources in the modeling analysis for the area around Brunner Island was appropriate. EPA believes the modeling analysis of the Brunner Island area is reflective of the actual emissions from this facility and includes impacts from the Pixelle and Magnesita facilities, which are over 20 km away.

Actual emissions from 2012-2014 from Brunner Island were used in the modeling, which were the most recent 3 years of emissions data at the time of the analysis, and, emissions from this source have steadily declined since 2014 as shown in Table 10 below. Pixelle was modeled using PTE based on a federally enforceable fuel change which went into effect on January 31, 2017. Although the modeled PTE was greater than the actual 2017 and 2018 emissions for that source, EPA concurs that modeling PTE is an allowable approach. Magnesita's emissions were calculated using a scaling factor as described above. This approach resulted in an overestimation of emissions being modeled for this source. Actual emissions for Magnesita have been consistent from 2012 through 2018 ranging between 1,134 tpy to 1,500 tpy. EPA believes that the overestimation of emissions for Magnesita would only overestimate the impacts from the source in terms of SO_2 concentrations. Therefore, the modeling analysis provided by Pennsylvania provides a reasonable if not conservative representation of the SO_2 concentration around Brunner Island.

Table 10. Actual SO_2 Emissions (tpy) for Facilities Included in the Modeling

Facility	2012	2013	2014	2015	2016	2017	2018
Pixelle	4,447	5,597	6,676	6,449	4,555	796	819
Magnesita	1,418	1,464	1,500	1,463	1,134	1,376	1,141
Brunner Island	12,255	12,176	9,815	8,244	5,741	1,551	1,888

Meteorological data appears representative and were processed in accordance with EPA guidance. The Adjusted_U* option was used via processing with the most current version of AERMET available at the time when the modeling analysis was developed (version 16216), which fixed a known bug in the processor.[14] Turbulence data from the TMI met tower were not included in the final AEMET processing in accordance with current EPA guidance (Model Clearinghouse Memo Record No: 16-X-01). A representative background concentration that was not impacted by the three sources in York County was included in the model. The predicted 99th percentile daily maximum 1-hour SO_2 concentration averaged over 3 years demonstrates that air quality in the Brunner Island area is attaining the 2010 SO_2 NAAQS.

3.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the York County, Pennsylvania Area

EPA analyzed Brunner Island's Part 75 hourly SO_2 emissions using EPA's Field Audit Checklist Tool (FACT) for both the 2012-2014 time period, which covered Pennsylvania's modeling period, and the most recent 3 years of available emissions (2017-2019).[15] This analysis was completed using R, an open-source language and environment for statistical computing and graphics.[16]

Figure 8 shows Brunner Island's hourly emissions for 2012-2014 and 2017-2019. Brunner Island's most recent emissions are much lower than the period modeled by Pennsylvania. The decline in operations (and therefore SO_2 emissions) at Brunner Island is consistent with general trends for most coal-fired electric generating units in the region. Brunner Island is part of the Pennsylvania-Jersey-Maryland (PJM) Interconnection, the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. Reviewing reports from PJM provides some insight into overall operating trends from sources like Brunner Island. From the PJM State of the Market – 2019, Volume II, Section 3, page 111:

> *In 2019, coal units provided 23.8 percent, nuclear units 33.6 percent and natural gas units 36.2 percent of total generation. Compared to 2018, generation from coal units decreased 17.7 percent, generations from natural gas units increased 16.9 percent and generation from nuclear units decreased 2.5 percent. In 2019, output from natural gas units was larger than any other fuel source for the first year since the establishment of the PJM energy market in 1999.*[17]

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[14] See Model Clearinghouse Memo dated March 8, 2017: https://www3.epa.gov/ttn/scram/guidance/clarification/SO2_DRR_Designation_Modeling_Clarificaiton_Memo-03082017.pdf

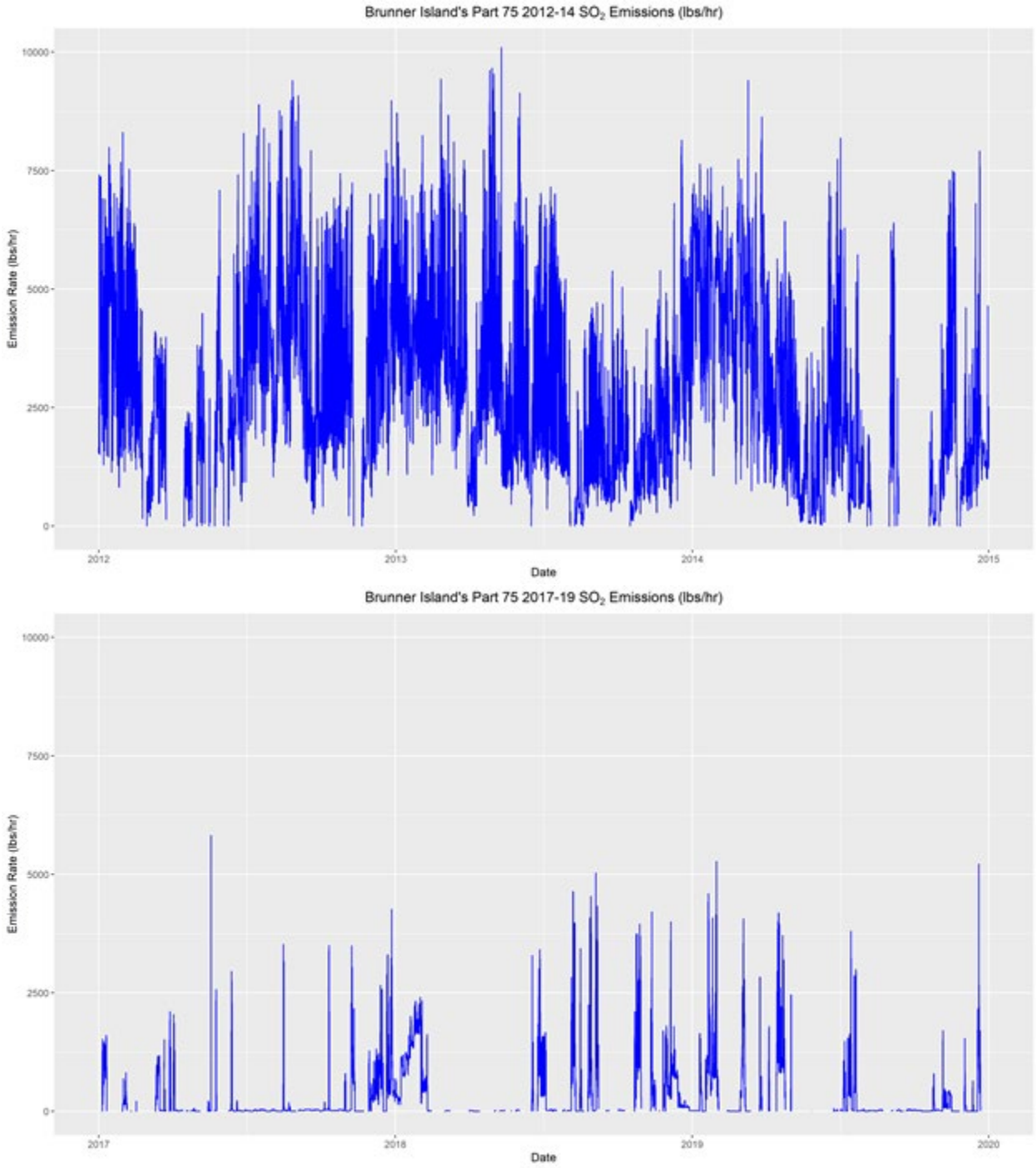
[15] https://www.epa.gov/airmarkets/field-audit-checklist-tool-fact

[16] R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

[17] https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2019.shtml

Coal use in the electric grid market is expected to continue following recent trends observed by PJM, so there should be little change in future operations at Brunner Island. EPA believes that the Brunner Island's modeled emissions, though higher compared to recent emissions, still provide a reasonable if not conservative representation of concentrations in northern York County given the facility's reduced operations (and emissions) as reflected in their 2017-2019 Part 75 SO_2 emissions.

Figure 8. Brunner Island's Part 75 SO_2 Emissions for 2012-2014 and 2017-2019 in lbs/hr



3.5. Jurisdictional Boundaries in the York County, Pennsylvania Area

EPA considers existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary for carrying out the air quality planning and enforcement functions for the area. Our goal is to base designations on clearly defined legal boundaries that align with existing administrative boundaries when reasonable.

In Pennsylvania's June 23, 2011 designation recommendation letter, the Commonwealth recommended that all of York County be designated as unclassifiable. York County is bounded by Adams, Cumberland, Dauphin, and Lancaster Counties in Pennsylvania and Carroll, Baltimore, and Hartford Counties in Maryland.

3.6. The EPA's Assessment of the Available Information for the York County, Pennsylvania Area

In Pennsylvania's designation recommendation letter submitted on June 23, 2011, the Commonwealth recommended that all of York County be designated as unclassifiable. In accordance with the DRR, Pennsylvania began operating a new EPA-approved monitor, which has collected data from January 2017 forward, to characterize air quality around the Pixelle and Magnesita facilities. On May 26, 2017, Pennsylvania submitted a modeling analysis for Brunner Island area in York County but did not update its designation recommendation.

The EPA finds that available air quality monitoring data are representative of portions of York County's air quality. The Orchard Road monitor was sited to characterize the maximum 1-hour SO_2 concentrations in the area surrounding the Pixelle and Magnesita facilities. The Hill Street monitor, although it is not sited to specifically characterize the maximum 1-hour SO_2 concentrations in relation to a particular SO_2 emissions facility in the area, provides additional data to support the designation of York County. Both monitors are attaining the 2010 SO_2 NAAQS.

The EPA finds that available air dispersion modeling results demonstrate that the remaining portion of York County, specifically the Brunner Island area, is attaining the 2010 SO_2 NAAQS. The modeling submitted by Pennsylvania indicates that the 2010 SO_2 NAAQS is not violated at the receptor with the highest modeled concentration. The highest predicted 99^{th} percentile daily maximum 1-hour concentration within the chosen modeling domain is 194.67 $\mu g/m^3$, equivalent to 74.3 ppb. The modeling analysis included a background SO_2 concentration and is based on actual SO_2 emissions from Brunner Island, PTE from Pixelle, and estimated actual SO_2 emissions from Magnesita. EPA believes the modeling analysis of the Brunner Island area is reflective of the actual emissions from this facility and includes impacts from Pixelle and Magnesita, which are over 20 km away. Meteorological data are representative and were processed in accordance with EPA guidance.

A review of Brunner Island's most recent (2017-2019) Part 75 hourly SO_2 emissions show substantial declines since the modeling analysis was prepared. This decline is in line with noted

trends across the PJM-managed electric grid for coal-fired electric power plants such as Brunner Island. Thus, Pennsylvania's modeling analysis, while not based on the most recent data, still provides a conservative representation of SO_2 concentrations near Brunner Island.[18]

EPA believes that our intended attainment/unclassifiable area, bounded by the York County jurisdictional boundaries, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended attainment/unclassifiable area.

3.7. Summary of Our Intended Designation for the York County, Pennsylvania Area

After careful evaluation of the Pennsylvania's recommendation and supporting information, as well as all available relevant information, EPA intends to designate the York County, Pennsylvania area as attainment/unclassifiable for the 2010 SO_2 NAAQS. Specifically, the boundaries are comprised of York County in its entirety. Figure 9 shows the boundary of this intended designated area.

[18] EPA's reliance on the modeling for the Brunner Island area to inform our intended attainment/unclassifiable designation for the 2010 SO_2 NAAQS does not imply that the modeling is appropriate for other purposes, such as New Source Review (NSR), interstate transport, or SIP demonstrations.

Figure 9. Boundary of the Intended York County, Pennsylvania Attainment/Unclassifiable Area