Technical Support Document:

Chapter 6
Final Round 4 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for New York

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). On or about August 13, 2020, EPA sent states our responses to certain designation recommendations for the 2010 SO_2 NAAQS. On August 21, 2020, EPA published a notice of availability (NOA) in the *Federal Register* (*see* 85 FR 51694), initiating a 30-day public comment period. The NOA and the technical support document (TSD) for EPA's intended designations provided background on the relevant CAA definitions and the history of the designations for this NAAQS. The TSD for EPA's intended designations also described New York's recommended designations and EPA's assessment of the available information.

This TSD for EPA's final Round 4 area designations for New York addresses any change in New York's recommended designations since EPA communicated its intended designations in August 2020 and provides our assessment of additional relevant information that was timely submitted by New York or other parties since the publication of the NOA. This TSD does not repeat information contained in the TSD for EPA's intended designations except as needed to explain our assessment of the newer information and to make clear the final action we are taking and its basis, but that information is incorporated as part of our final designations. If the assessment of the information that was already considered in the TSD for EPA's intended designations has changed based on new timely information and we are finalizing a designation based on such change in our assessment, this TSD also explains that change. For areas of New York that are not explicitly addressed in this chapter, we are finalizing the designations described in our 120-day letters and Chapter 2 of the TSD for EPA's intended Round 4 area designations as explained in those documents.

In a letter dated September 25, 2020, New York responded to EPA's intended designations by providing additional technical information and revised designation recommendations. EPA also received public comments regarding the intended designation for the St. Lawrence County, New York, area. These public comments are addressed in the Response to Comments document associated with this final action and in Section 2.4.2 of this TSD.

Table 1 identifies New York's revised designation recommendations, EPA's final Round 4 designations, and the areas in New York to which those designations apply. Chapter 1 of this TSD for EPA's final designations explains the definitions we are applying in the final designations process.

Table 1. Summary of EPA's Final Designations and the Designation Recommendations by New York

Area/County	New York's Recommended Area Definition	New York's Recommended Designation	EPA's Intended Designation	EPA's Final Area Definition	EPA's Final Designation
St. Lawrence	The partial Town of Massena, the entire Village of Massena; and, the partial Town of Louisville	Nonattainment	Nonattainment	That portion of St. Lawrence County encompassed by the polygon with the vertices using Universal Traverse Mercator (UTM) coordinates in UTM zone 18 with datum NAD83 as listed in Table 10 of the TSD.	Nonattainment
Remaining portion of St. Lawrence	Partial County	Attainment	Attainment/ Unclassifiable	Partial County	Attainment/ Unclassifiable
Cayuga *	Entire County	Attainment	Attainment/ Unclassifiable	Cayuga County	Attainment/ Unclassifiable
Seneca*	Entire County	Attainment	Attainment/ Unclassifiable	Seneca County	Attainment/ Unclassifiable
Tompkins*	Entire County	Attainment	Attainment/ Unclassifiable	Tompkins County	Attainment/ Unclassifiable

* EPA addresses this area in Chapter 2 with all other areas which EPA is designating "attainment/unclassifiable" or "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.

2. Technical Analysis for the St. Lawrence County, New York Area

2.1. Introduction

EPA must designate the St. Lawrence County area by December 31, 2020, because the area has not been previously designated, and New York installed and began operating new EPA-approved monitors pursuant to the Data Requirements Rule (DRR), 40 CFR part 51 subpart BB. This section presents all the available air quality information for the portion of St. Lawrence County that includes the following SO_2 source around which the DRR required the State to characterize air quality:

- The Alcoa Massena facility emits 2,000 tons of SO_2 or more annually. Specifically, Alcoa Massena emitted 2,490 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and New York has chosen to characterize it via monitoring.

The Alcoa Massena facility is located in St. Lawrence County (Figure 1) within the town of Massena, NY, near the junction of the St. Lawrence and Grass Rivers and approximately 2 miles (3.2 kilometers) from Massena International Airport, as seen in Figure 1a below. SO_2 monitors are located northwest and northeast of the Alcoa Massena facility.

Figure 1. Map of the St. Lawrence County Area Addressing Alcoa Massena

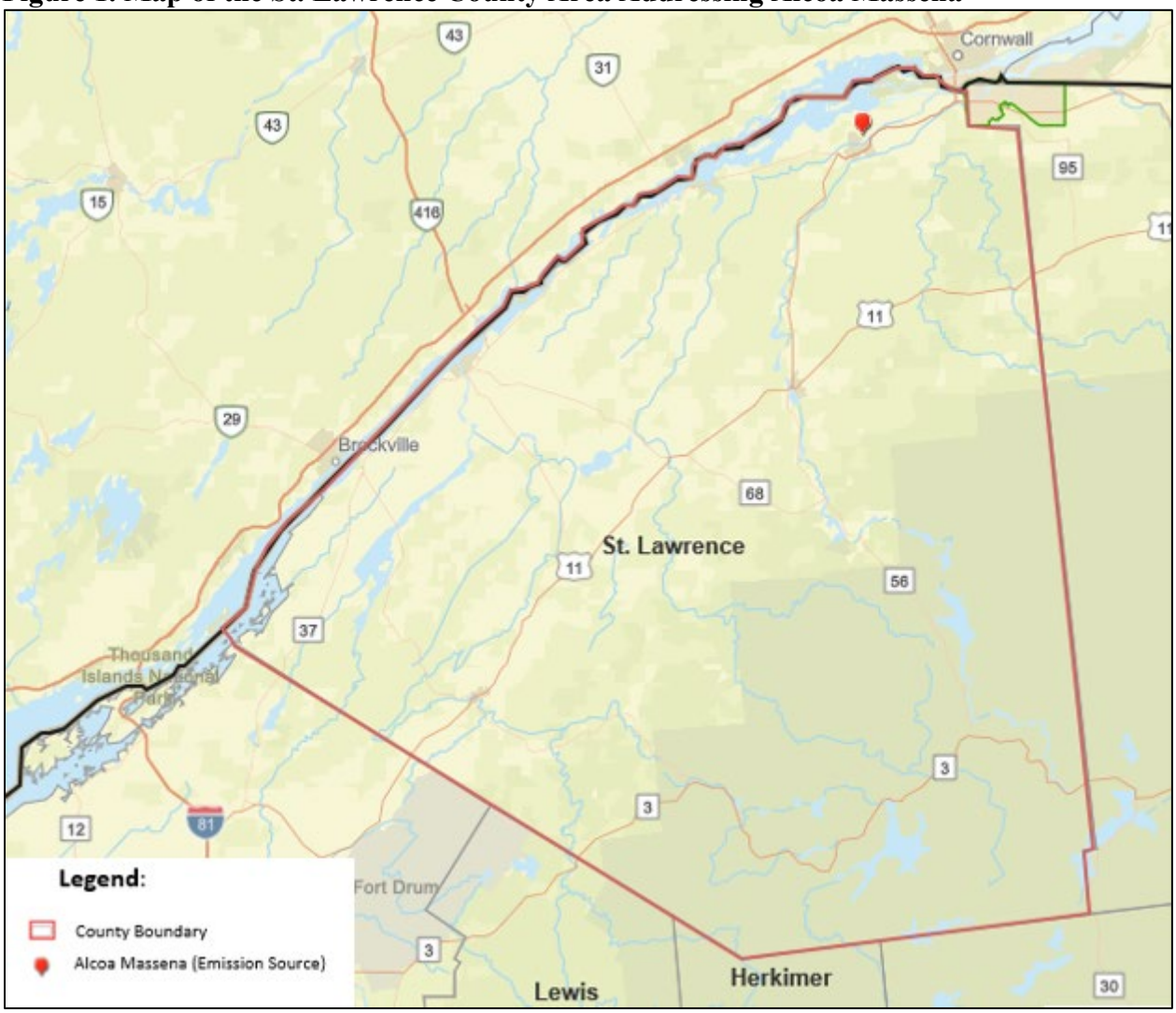
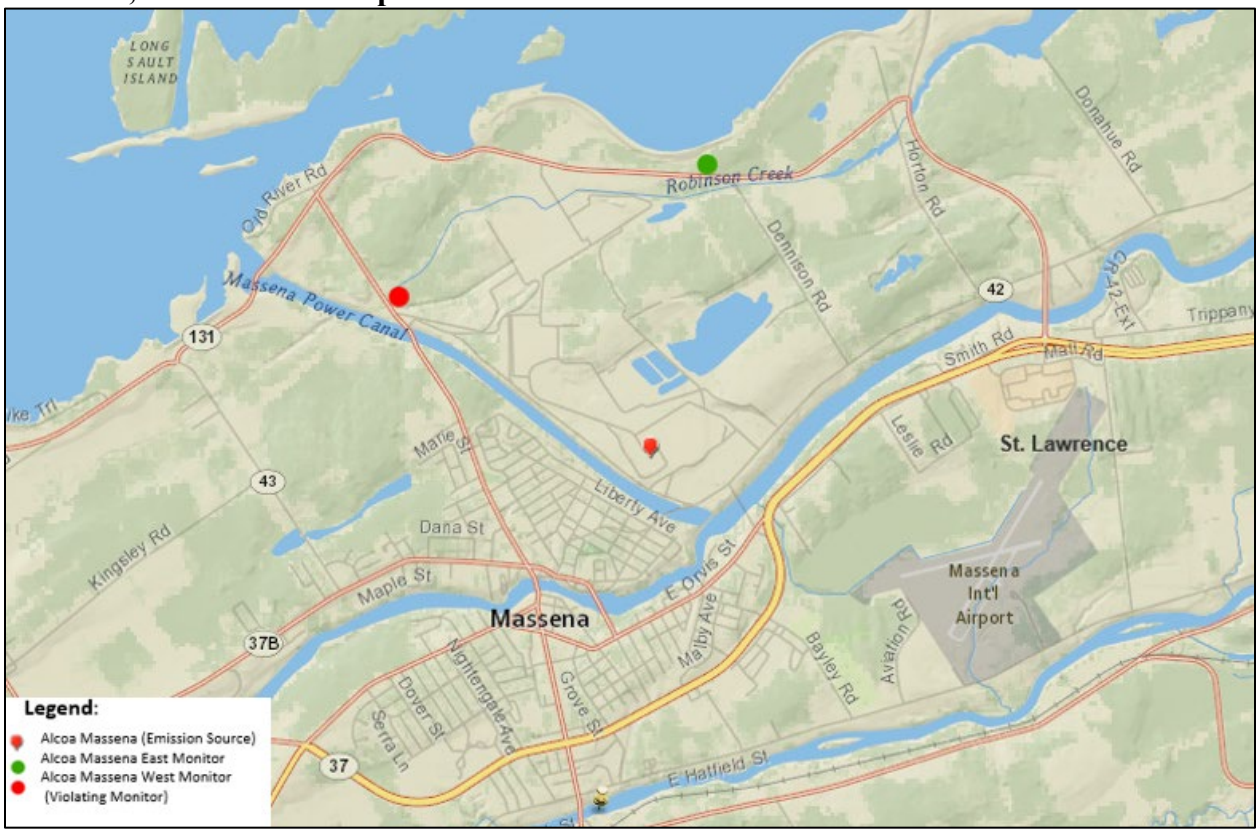


Figure 1a. Map of Massena and Surrounding Area including Alcoa Massena, SO_2 Monitors, and Massena Airport.



2.2. Summary of Information Reviewed in the TSD for the Intended Round 4 Area Designations

In its June 1, 2011 recommendation letter, New York recommended that St. Lawrence County be designated as attainment for the 2010 SO_2 NAAQS. Specifically, the State's recommended boundaries consisted of all of St. Lawrence County. New York, however, provided EPA with this recommendation prior to the installation and operation of EPA-approved monitors and before the State had monitoring data for the 2017-2019 period. EPA did not agree with New York's 2011 recommendation as to the designation category, as explained in the intended designations TSD, and EPA intended to designate a portion of St. Lawrence County, NY as nonattainment for the 2010 SO_2 NAAQS based upon currently available monitoring information showing violations of the 2010 SO_2 NAAQS for the 2017-2019 period. Our intended boundaries were different than New York's recommended boundaries.

EPA evaluated the five factors and all available information to determine the geographic extent of the violating area.

A monitor in the St. Lawrence County area, which is near Alcoa Massena, is violating the NAAQS based on the 2017-2019 design value. The only other monitor in St. Lawrence County,

also near Alcoa Massena (approximately two kilometers northeast of the facility) is meeting the NAAQS.

There was no indication that any other point source in the area contributes to the violating monitor. According to 2017 data, Alcoa Massena is the only point source in the area that emits more than 1 ton of SO_2. Based on the information discussed above, Alcoa Massena is the primary contributor to the monitored violations.

EPA believed that our intended nonattainment area, St. Lawrence County, excluding the Adirondack State Park, as bounded by the northern Adirondack State Park borders, had clearly defined legal boundaries, and we found these boundaries to be a suitable basis for defining our intended nonattainment area.

EPA ascertained that based on various factors, such as the predominant wind direction coming from the southwest, which is away from the area of the Park, and the distance from the Park to Alcoa Massena and the violating monitor, there is minimal nonpoint contribution to the SO_2 NAAQS violation in St. Lawrence County. Based on these and other factors, EPA determined that the portion of St. Lawrence County containing Adirondack State Park neither has violations nor contributes to ambient air quality in an area that violates the NAAQS. Therefore, EPA intended to designate the remainder of St. Lawrence County, as bounded by the Adirondack State Park borders and the St. Lawrence County borders, as attainment/unclassifiable.

2.3. Air Quality Monitoring Data for the St. Lawrence County, New York Area

In the TSD for the intended area designations, EPA considered design values for air quality monitors in the St. Lawrence County area. Specifically, EPA determined that the Alcoa Massena West monitor (AQS ID# 36-089-0004) violated the 2010 SO_2 NAAQS with a 2017-2019 design value of 86 ppb. EPA has no new quality assured monitoring information that warrants revising our prior analysis of available monitoring data.

2.4. Assessment of New Technical Information for the St. Lawrence County, New York Area Addressing Alcoa Massena

On September 25, 2020, the New York State Department of Environmental Conservation (NYSDEC, also referred to as New York or the State) submitted new modeling analyzing air quality in the area surrounding the Alcoa Massena Facility in the Massena, St. Lawrence County area. This assessment and characterization were performed using EPA's air dispersion modeling software, i.e., AERMOD, analyzing actual emissions. The NYSDEC's analysis supports a different nonattainment boundary than EPA's intended boundary for this area. EPA's intended nonattainment boundary for the area was the entire St. Lawrence County excluding the northern portion of Adirondack State Park within St. Lawrence County, whereas NYSDEC's analysis supports a designation as a partial Town of Massena, the entire Village of Massena, and partial Town of Louisville in St. Lawrence County. After careful review of NYSDEC's new assessment, supporting documentation, and all available data, EPA is relying on NYSDEC's September 25,

2020, analysis for its final nonattainment area boundary. Our reasoning for this conclusion is explained in a later section of this TSD, after all the available information is presented. The discussion and analysis that follows below will reference the "SO_2 NAAQS Designations Modeling Technical Assistance Document" (Modeling TAD) and the factors for evaluation contained in EPA's September 5, 2019, guidance, July 22, 2016, guidance and March 20, 2015, guidance, as appropriate.[1]

For this area, EPA received and considered two different modeling assessments, including one assessment from New York and one assessment from Alcoa. To avoid confusion in referring to these assessments, Table 2 indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 2. Modeling Assessments for the St. Lawrence County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
NYSDEC	September 25, 2020	NYSDEC modeling	Revised recommendation; Modeling files and report
Alcoa	September 21, 2020	Alcoa's modeling	Public comment with modeling report

2.4.1. Modeling Analysis Provided by the State.

2.4.1.1. Differences Between and Relevance of the Modeling Assessments Submitted by the State and Submitted by Alcoa

The intended designations TSD did not rely on a modeling analysis but rather relied on the 5-factor analysis to define the county wide designation. On September 25, 2020, EPA received a modeling report and a modeling analysis from NYSDEC, and a modeling report from Alcoa. The Alcoa submission is discussed in Section 2.4.2 following the NYSDEC modeling discussion below.

2.4.1.2. Model Selection and Modeling Components

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

[1] https://www.epa.gov/sites/production/files/2016-04/documents/so2modelingtad.pdf.

- 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

New York used the most current AERMOD version 19191 as well as the most current versions of the preprocessors listed above including AERMAP (18081), AERMET (19191), AERMINUTE (15272), and AERSURFACE (20060). A discussion of New York's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

2.4.1.3. 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, New York determined that it was most appropriate to run the model in rural mode. NYSDEC determined the area surrounding Alcoa Massena is rural. Other than Alcoa Massena, the area does not have significant industrial development and the vast majority of the land use contains vegetation and water bodies such as the St. Lawrence River and other estuaries which are categorized as rural. The population density is low relative to urban areas. The NYSDEC does not believe that this Alcoa facility meets the criteria of being characterized as an urban source since the temperature differential between its location and off property is not large enough to contribute to a heat island effect far beyond its fence-line. Further, a rural characterization is conservative since it does not allow for enhanced nighttime dispersion.

EPA agrees that the area is rural as per both the land use and population density criteria in 7.2.1.1 of the Guideline on Air Quality Models. The 3 km area surrounding the facility is largely vegetative including water bodies nearby. In addition, the temperature differential between this facility and off property is not significant enough to approve a model urban source option which enhances nighttime dispersion. Therefore, EPA agrees that it is appropriate to use rural dispersion coefficients in this case.

2.4.1.4. 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.

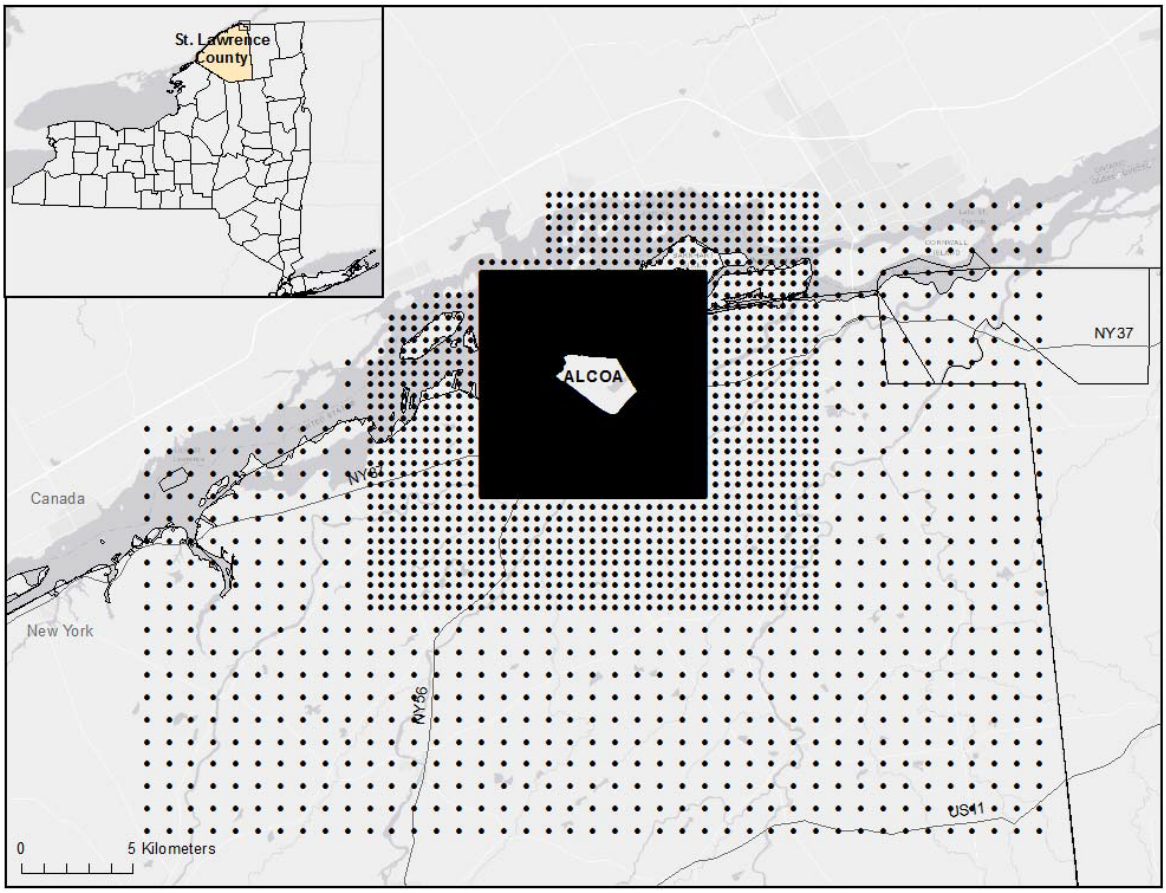
For the Alcoa Massena area, New York has included no other emitters of SO_2 within 20 kilometers (km) of the Alcoa Massena facility in any direction. New York determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS violations in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to Alcoa Massena, the other emitters of SO_2 included in the area of analysis are accounted for in the measured ambient background concentrations. No other sources beyond 20 km were determined by New York 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 New York is as follows:
A cartesian receptor grid that centered on the Alcoa facility and extended to out to 20 km was used in the dispersion modeling. The receptor grid spacing was defined as follows:

- 25 m spacing along the fence-line,
- 70 m spacing extending from the facility center to 2.5 km,
- 100 m spacing extending from 2.5 km to 5 km,
- 500 m spacing extending from 5 km to 10 km,
- 1000 m spacing extending from 10 km to 20 km.

The receptor network contained 13593 receptors. Figure 2, included in New York's revised recommendation, shows the State's chosen area of analysis surrounding the Alcoa Massena facility, as well as the receptor grid for the area of analysis.

Figure 2. Receptor Grid for the Massena and Surrounding area within St. Lawrence County Area



Consistent with the Modeling TAD, New York placed receptors for the purposes of this designation effort in locations that would be considered ambient air. The NYSDEC placed receptors evenly spaced throughout the modeling domain using the receptor spacing resolution described above. Only receptors on Alcoa's property were removed since these receptors would not be considered ambient air relative to Alcoa. New York did not exclude receptors in other locations that it considered to not be ambient air relative to each modeled facility since there were no other nearby sources that would cause a significant concentration gradient and need to be explicitly modeled. However, the receptor grid did not extend past the US/Canadian border.

EPA agrees that the receptor grid is adequate to capture the maximum and design value impacts in the undesignated portion of St. Lawrence County. Since there are no other nearby sources, there was no need to exclude receptors on other sources' property. The receptor grid ends at the US/Canadian border. However, this border is beyond the maximum design value area which decreases with distance to this border, and future emission reductions will show impact reductions in this area as well since all of the US receptors must show attainment for EPA to approve a future attainment state implementation plan (SIP) submitted by New York. All receptors are ambient air.

2.4.1.5. Modeling Parameter: Source Characterization

Section 6 of the Modeling TAD offers recommendations on source characterization including source types, use of accurate stack parameters and the use of actual stack heights with actual emissions.

The modeled emission sources at Alcoa Massena included 36 potline reactor stacks, two roof vents, and an anode bake furnace. These are the primary emitters of SO_2. New York characterized these sources within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, New York used actual stack heights in conjunction with actual emissions. New York also adequately characterized the source's stack parameters, e.g., exit temperature, exit velocity, location, and diameter.

The actual stack parameters such as the exit temperature, exit velocity, location and diameter were provided to the State by Alcoa. The 36 potline reactor stacks are divided into three distinct groups, each composed of 12 stacks. They are designated as Reactor Stack Group A, Reactor Stack Group B and Reactor Stack Group C. For modeling purposes, the 12 stacks in each Reactor Stack Group were further defined as having 6 eastern and 6 western stacks. NYSDEC consulted with Alcoa and their consultants, AECOM, to determine the exact stack configuration for each hour in the 3-year SO_2 emissions dataset. All 36 stacks in the three Reactor Groups did not operate simultaneously between 2017-2019. The 6 western stacks in Reactor Group C were physically capped between June 5, 2018 and November 20, 2019. During this time period, all SO_2 emissions from the potlines in Group C were emitted from the 6 eastern stacks in Reactor Group C. For both Reactor Stack Group B and Reactor Stack Group A, the 6 western stacks in each Group were physically capped between September 18, 2018 and November 20, 2019. For this 14-month time period, the potline emissions from Reactor Stack Groups B and A were emitted from their 6 respective eastern stacks. The stack parameters for Alcoa's SO_2 emission sources for both the uncapped and capped stack time periods are listed in Table 6 (stack parameters). Each of the 36 reactor stacks are denoted by the initial RS followed by the Reactor Stack group number, either A, B or C.

New York did not include building dimensions that would account for building downwash. This is because Alcoa provided an analysis to NYSDEC that compared the modeled results with the measured monitored values. After reviewing this analysis, New York determined that the effects from the enhanced buoyancy of the plumes because of the high effluent temperatures are stronger than effects caused by aerodynamic cross wind building effects. EPA believes the violations would not extend beyond the current violating receptors even if downwash was included. The effects of downwash occur nearby the source and do not significantly affect the edge of the boundary areas that are further away beyond the building wakes.

2.4.1.6. 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.

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, 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, EPA recommends using detailed throughput, operating schedules, and emissions information from the impacted source(s). Alcoa is not an electric generating unit with CEMS but NYSDEC did indeed use the HOUREMIS keyword with hourly emissions and stack parameters as listed in Tables 4 to 6 below. The source parameters and actual 2017-2019 SO_2 emissions for the facility were obtained by the State from Alcoa. Description of how New York derived these hourly data is provided below.

As previously noted, New York included SO_2 emissions from Alcoa's 36 potline dry scrubber stacks, 2 roof vents, and an anode bake furnace. New York has chosen to model Alcoa using actual emissions. Alcoa and its associated annual actual SO_2 emissions between 2017 and 2019 are summarized below.

For Alcoa Massena, New York provided annual actual SO_2 emissions between 2017 and 2019. This information is summarized in Table 3. A description of how the State obtained hourly emission rates is given below this table.

Table 3. Actual SO_2 Emissions Between 2017 – 2019 from Facilities in the St. Lawrence County Area

Facility Name	SO_2 Emissions (tpy)		
	2017	2018	2019
Alcoa Massena	2,406	2,406	2,437
Total Emissions from All Modeled Facilities in the State's Area of Analysis	2,406	2,406	2,437

Alcoa provided NYSDEC with 3 years of actual monthly varying SO_2 emissions from 2017 to 2019 for both the potline stacks and the anode baker furnace (see Tables 4 & 5). The actual monthly emissions were converted to hourly emission rates based on the actual operating scenarios and operating times over each month. This was done for the 36 potline stacks and for the anode bake furnace. The emissions from the 2 roof vents were calculated by Alcoa to be 1.6% of the total SO_2 potline emissions and added to the potline emissions.

For the hours when the western reactor stacks were capped, the modeled emission rate for each of the eastern stacks were doubled. Alcoa also provided NYSDEC with the respective stack temperature and gas exit velocity for each operating scenario (see Table 6).

Table 4: Monthly-Varying Modeled SO_2 Emission Rates (g/s) Per Dry Potline Scrubber Stack

Month	2017	2018	2019
January	1.841	1.850	1.882
February	1.938	1.915	1.918
March	1.841	1.882	1.858
April	1.924	1.808	1.934
May	1.932	1.845	1.746
June	1.861	1.767	1.887
July	1.881	1.871	1.969
August	1.787	1.740	1.962
September	1.819	1.929	1.972
October	1.849	1.900	1.852
November	1.759	1.850	1.799
December	1.793	1.904	1.857

Table 5: Monthly-Varying Modeled SO_2 Emission Rates (g/s) for the Anode Bake Furnace Stack

Month	2017	2018	2019
January	2.503	2.275	2.674
February	2.363	2.607	2.544
March	2.121	2.628	2.554
April	2.382	2.124	2.516
May	2.598	2.273	2.485
June	2.391	2.581	2.604
July	2.497	2.507	2.429
August	2.311	2.597	2.422
September	2.327	2.588	2.434
October	2.536	2.375	2,575
November	2.627	2.331	2.301
December	2.273	2.378	2.430

Table 6: Modeled Stack Parameters

Point Source	Easting(m)	Northing(m)	BaseElev(m)	StackHt(m)	StackTemp(K)	ExitVel-Unca	ExitVel-Cappe	StackDiam(m)
RS_A1	508104.376	4978592.715	66.76	21.64	369.2	10.374	-	1.22
RS_A2	508107.198	4978588.866	66.75	21.64	369.2	10.374	-	1.22
RS_A3	508111.047	4978581.681	66.68	21.64	369.2	10.374	-	1.22
RS_A4	508113.357	4978577.319	66.65	21.64	369.2	10.374	-	1.22
RS_A5	508117.462	4978571.417	66.62	21.64	369.2	10.374	-	1.22
RS_A6	508120.542	4978567.055	66.61	21.64	369.2	10.374	-	1.22
RS_A7	508109.764	4978596.051	66.72	21.64	369.2	10.374	20.748	1.22
RS_A8	508113.357	4978591.175	66.71	21.64	369.2	10.374	20.748	1.22
RS_A9	508116.436	4978584.760	66.68	21.64	369.2	10.374	20.748	1.22
RS_A10	508119.515	4978579.628	66.65	21.64	369.2	10.374	20.748	1.22
RS_A11	508124.391	4978573.983	66.61	21.64	369.2	10.374	20.748	1.22
RS_A12	508126.443	4978570.134	66.58	21.64	369.2	10.374	20.748	1.22
RS_B1	508171.477	4978490.785	66.18	21.64	369.2	10.374	-	1.22
RS_B2	508186.616	4978477.698	65.90	21.64	369.2	10.374	20.748	1.22
RS_B3	508191.492	4978472.053	65.79	21.64	369.2	10.374	20.748	1.22
RS_B4	508193.545	4978468.204	65.75	21.64	369.2	10.374	20.748	1.22
RS_B5	508174.300	4978486.936	66.13	21.64	369.2	10.374	-	1.22
RS_B6	508178.149	4978479.751	66.03	21.64	369.2	10.374	-	1.22
RS_B7	508180.458	4978475.389	65.98	21.64	369.2	10.374	-	1.22
RS_B8	508184.564	4978469.487	65.86	21.64	369.2	10.374	-	1.22
RS_B9	508187.643	4978465.125	65.80	21.64	369.2	10.374	-	1.22
RS_B10	508176.866	4978494.120	66.12	21.64	369.2	10.374	20.748	1.22
RS_B11	508180.458	4978489.245	66.04	21.64	369.2	10.374	20.748	1.22
RS_B12	508183.537	4978482.830	65.97	21.64	369.2	10.374	20.748	1.22
RS_C1	508270.970	4978328.245	63.78	21.64	369.2	10.374	-	1.22
RS_C2	508276.359	4978331.581	63.98	21.64	369.2	10.374	20.748	1.22
RS_C3	508279.951	4978326.706	63.95	21.64	369.2	10.374	20.748	1.22
RS_C4	508283.030	4978320.291	63.94	21.64	369.2	10.374	20.748	1.22
RS_C5	508286.110	4978315.159	63.99	21.64	369.2	10.374	20.748	1.22
RS_C6	508290.985	4978309.513	64.05	21.64	369.2	10.374	20.748	1.22
RS_C7	508293.038	4978305.664	64.11	21.64	369.2	10.374	20.748	1.22
RS_C8	508273.793	4978324.396	63.71	21.64	369.2	10.374	-	1.22
RS_C9	508277.642	4978317.211	63.76	21.64	369.2	10.374	-	1.22
RS_C10	508279.951	4978312.849	63.79	21.64	369.2	10.374	-	1.22
RS_C11	508284.057	4978306.947	63.98	21.64	369.2	10.374	-	1.22
RS_C12	508287.136	4978302.585	64.09	21.64	369.2	10.374	-	1.22
Bake Furnace	508939.700	4978791.700	65.62	32.00	357.4	15.993	-	2.134

EPA agrees with the method used by NYSDEC to calculate hourly averaged emission rates. The hourly emissions and corresponding stack flow characteristics also reflect actual operating configurations when some western stacks were capped, and the effluent was rerouted to adjacent eastern stacks. While, the emission rates were provided by Alcoa on a monthly basis, it was assumed that the operating rates were steady and could be converted to hourly rates when the facility actually operated.

2.4.1.7. 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

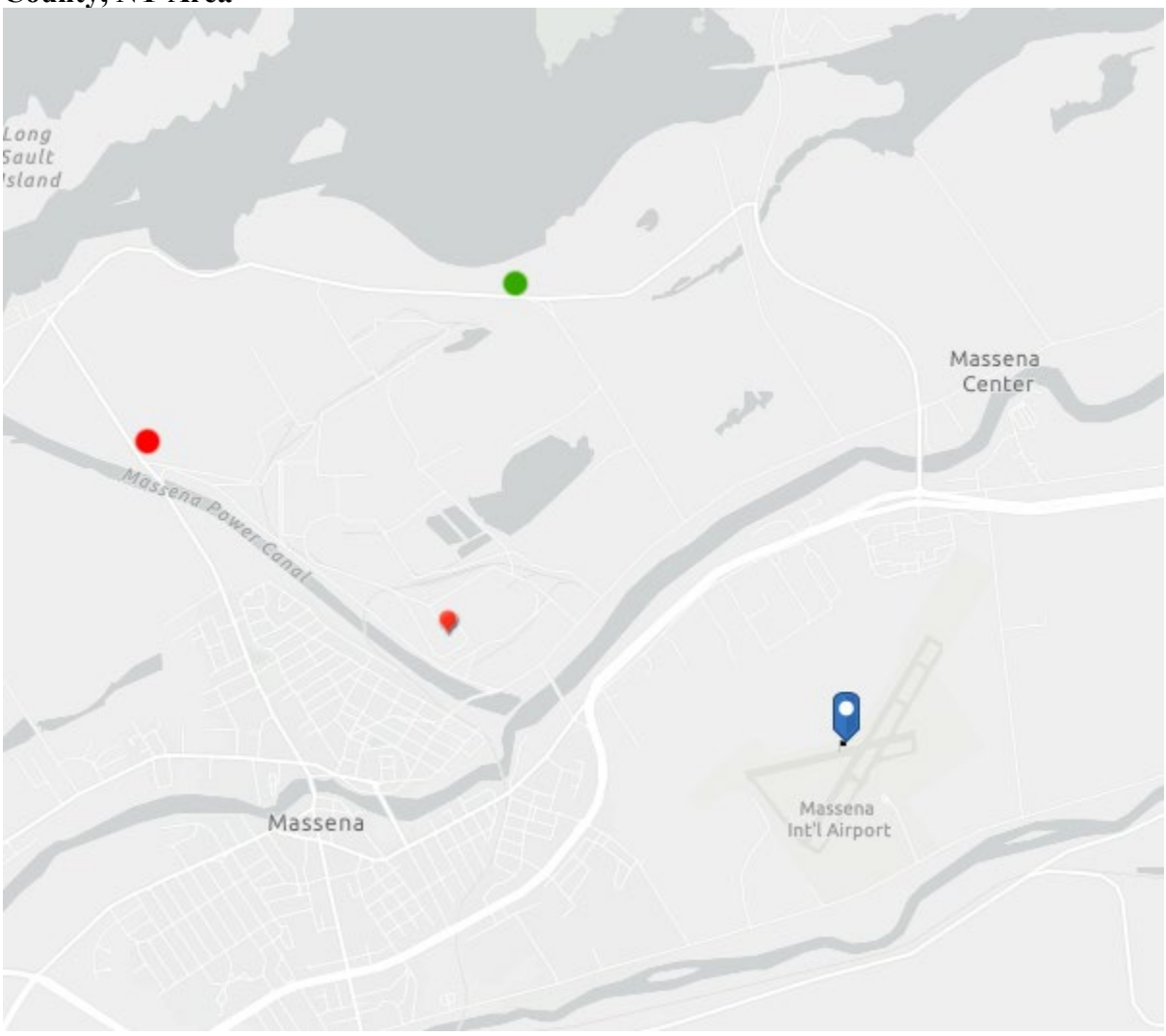
(NWS) stations, site-specific or onsite data, and other sources such as universities, Federal Aviation Administration (FAA), and military stations.

For the area of analysis for the Massena, St. Lawrence County area, the NYSDEC selected the surface meteorology from the National Weather Service (NWS) site at the Massena Airport located approximately 2 miles south of the Alcoa facility and coincident upper air observations from the NWS site at the Albany International Airport as best representative of meteorological conditions within the area of analysis.

New York 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). These surface characteristics were calculated using AERSURFACE version 20060 using 2016 National Land Cover Data (NLCD) supplemented with 2016 NLCD impervious and tree canopy data. The NLCD was centered on the Massena Airport to estimate the surface characteristics of the area of analysis. The NYSDEC estimated values for 12 spatial sectors out to 1 km centered at the meteorological site for the surface roughness, and a 10x10 km cartesian grid for the albedo and Bowen ratio with a seasonal temporal resolution and for average moisture conditions. The sector located between 240-270 degrees relative to due north was identified as a non-airport sector[2] for the purpose of calculating the appropriate sector-averaged surface roughness length. In Figure 3 below, generated by EPA, the location of this NWS station for the surface meteorology is shown relative to the area of analysis.

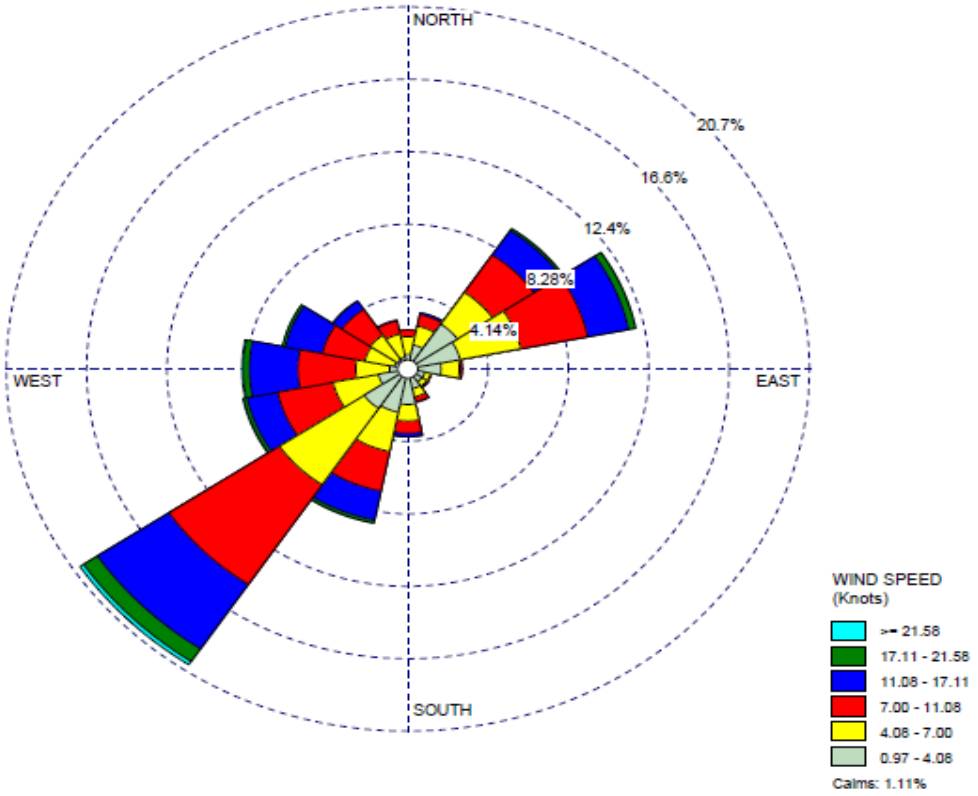
[2] Prior to the release of AERSURFACE version 20060, the full circular area around the meteorological tower, out to a radial distance of 1 kilometer, had to be characterized as either airport or non-airport, based on a generalization of land use around the tower. Within 1 km of the meteorological tower, the land use at an airport is commonly characterized as having a large area of paved impervious surfaces with low effective surface roughness lengths (parking lots, roadways, and runways), relative to the area of impervious surfaces with higher roughness lengths (buildings and other structures). However, that is not always the case and land use can vary widely by direction at an airport. With the release of AERSURFACE version 20060, individual wind sectors representing a range of wind directions, can now be characterized as either airport or non-airport, based on the land use within the sector that has a predominant influence on the effective surface roughness length.

Figure 3. Area of Analysis and the Massena Airport NWS station in the St. Lawrence County, NY Area



As part of its revised September 2020 recommendation, New York provided the 3-year surface wind rose for the NWS station at the Massena Airport between 2017 to 2019, In Figure 4, the frequency and magnitude of wind speed and direction are defined in terms of from where the wind is blowing. As seen, the prevailing wind directions run parallel to the river valley flow in a southwest and northeast direction including low wind speeds which are important for dispersion modeling.

Figure 4: Massena, NY Cumulative Annual Wind Rose for Years 2017 – 2019



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 is suitable for being applied with AERMOD input files for AERMOD modeling runs. New York followed the methodology and settings presented in EPA's Guideline on Air Quality Models and the associated user's guide to each meteorological data processor in the processing of the raw meteorological data into an AERMOD-ready format and used AERSURFACE to best represent surface characteristics.

Hourly surface meteorological data records are read by AERMET and include all the necessary elements for data processing. However, wind data taken at hourly intervals may not always portray wind conditions for the entire hour, which can be variable in nature. Hourly wind data may also be overly prone to indicate calm conditions, which are not modeled by AERMOD. In order to better represent actual wind conditions at the meteorological tower, wind data of 1-minute duration was provided from the Massena Airport NWS site. One-minute wind data, recorded by the ASOS (Automated Surface Observing System) instrument at the Massena Airport, was processed using the AERMINUTE pre-processor.

These data were subsequently integrated into the AERMET processing to produce final hourly wind records of AERMOD-ready meteorological data that better estimate actual hourly average conditions and that are less prone to over-report calm wind conditions. This allows AERMOD to apply more hours of meteorology to modeled inputs, and therefore produce a more complete set

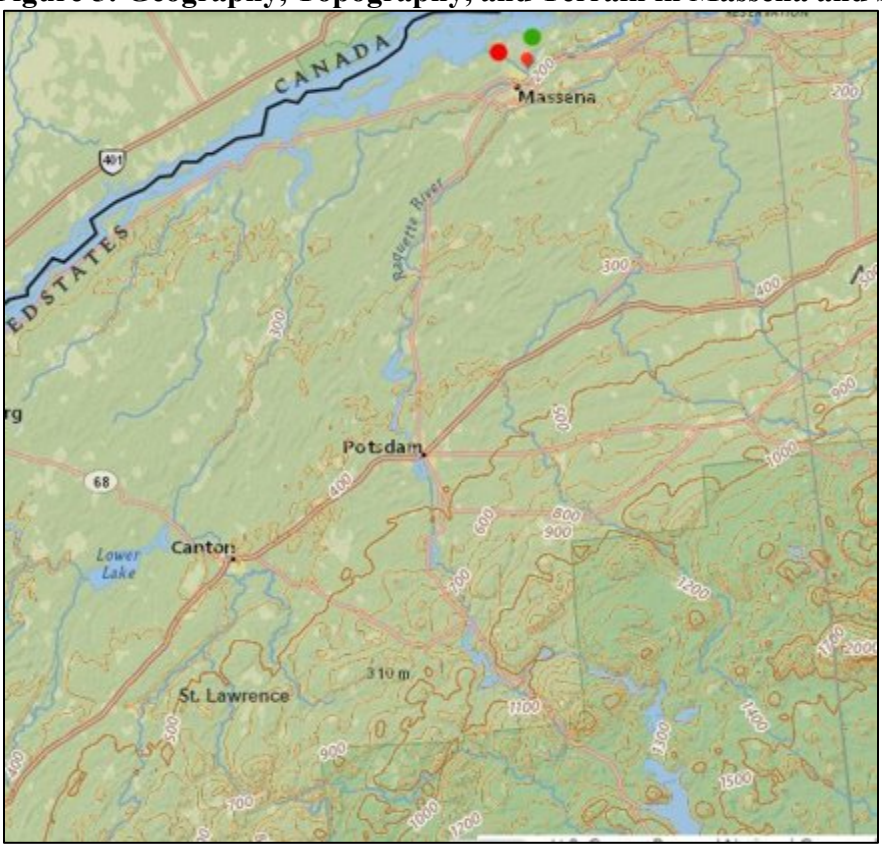
of concentration estimates. As a guard against excessively high concentrations that could be produced by AERMOD in very light wind conditions, the State set a minimum threshold of 0.5 meters per second in processing meteorological data for use in AERMOD. In setting this threshold, no wind speeds lower than this value would be used for determining concentrations. This threshold was specifically applied to the 1-minute wind data. Further, the ADJ_U* option was selected in AERMET which adjusts the surface friction velocity under low wind and stable atmospheric conditions.

EPA agrees that the meteorological data measured at the NWS station at the Massena Airport is representative and appropriate for modeling the impacts from the Alcoa Massena facility. Given that it is approximately 2 miles (3.2 kilometers) south of the facility and located in the same river valley, the meteorological measurements are representative of the conditions at the facility. In addition, the concurrent meteorological data measured at the Albany International Airport is representative of the upper air meteorological conditions at the facility. The surface data were appropriately processed with AERMET including AERMINUTE to obtain better resolution. AERSURFACE provided surface roughness, albedo, and Bowen ratios using 2016 National Land Cover Data including the impervious and tree canopy data layers which are also concurrent with the meteorological period. The wind rose clearly demonstrates the prevailing wind patterns in the Massena area illustrating the southwest and northeast wind fields that align with the river valley flow including the low wind speeds which are important in dispersion modeling.

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

The terrain in the area of analysis is best described as flat to complex. The area closest to the facility and the Massena Airport is flat and becomes complex to the southeast and east as it approaches, for example, the Adirondack State Park. To account for these terrain changes, the AERMAP terrain program within AERMOD was used to specify terrain elevations and hill height scales for all the receptors. The source of the elevation data incorporated into the model is from the USGS National Elevation Database based on 1-arcsecond elevation data obtained from EPA. See Figure 5 below.

Figure 5: Geography, Topography, and Terrain in Massena and St. Lawrence County



EPA agrees that the method used to incorporate terrain using AERMAP into AERMOD follows EPA guidance procedures and recommendations. Therefore, the terrain information is appropriate.

2.4.1.9. 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 State selected the tier 2 approach. There are two ambient monitors, which were installed pursuant to the DRR, sited close to Alcoa's fenceline that align with the predominant SW and NE winds, identified as Alcoa West and Alcoa East, respectively. The monitored data were added to Alcoa's modeled impacts in order to determine a total impact for NAAQS comparisons. NYSDEC examined the hourly SO_2 data from both monitors and determined that the SO_2 plume emitted from Alcoa impacted only one monitor at a time, depending on the wind direction. In order to avoid double counting of Alcoa's contribution to the total impact, NYSDEC developed a data set with the lowest concentration from either monitor since it would not include Alcoa Massena but rather include the regional background concentrations. Since there are no other major SO_2 sources in the area, the data set accurately represents ambient background concentrations from other minor, distant, and natural sources. This hourly ambient data was further organized into 96 bins so that the 99th percentile of the daily maximum concentrations

could be calculated for each season on an hour-of-day basis. This procedure is in accordance with the March 1, 2011 EPA Guidance Memorandum for representing the tier 2 method. The results are presented below in Table 7 below. The monitor background values were directly input into AERMOD and AERMOD added the values to the modeled impacts matching the values with the modeled season and hour-of-day.

Table 7: SO_2 Design Values ($\mu g/m^3$) by Season and Hour-of-Day

Hour	Winter	Spring	Summer	Fall
1	7.432	2.611	1.904	2.655
2	7.091	3.354	2.332	2.952
3	6.498	2.777	2.899	2.716
4	5.703	3.554	5.380	3.083
5	5.616	2.742	2.891	2.672
6	6.375	4.602	4.105	2.803
7	9.484	3.991	4.664	2.838
8	6.506	6.305	7.074	3.039
9	7.048	8.070	5.886	3.362
10	6.760	7.921	10.48	5.118
11	7.109	6.253	7.397	9.511
12	9.249	6.209	8.908	6.157
13	10.139	5.144	9.790	7.022
14	11.170	4.166	9.511	9.100
`15	8.559	4.393	11.519	6.585
16	8.340	4.987	7.493	4.515
17	6.917	4.934	8.594	3.834
18	7.633	4.725	6.358	4.236
19	6.105	3.563	7.450	4.288
20	8.183	2.821	3.266	3.458
21	5.345	2.830	2.175	2.349
22	6.209	3.624	4.576	2.402
23	7.135	2.943	6.524	2.672
24	7.100	3.450	2.253	2.768

EPA agrees that ambient monitors are representative of the area and that the method used to determine the regional background contribution from minor, distant, and natural sources is acceptable for establishing a nonattainment boundary. The tier 2 method is an acceptable method under EPA memoranda, (*i.e.*, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard"[3] and the August 2016 EPA document "SO_2 NAAQS Designations Modeling Technical Assistance Document"[4]).

2.4.1.10. Summary of Modeling Inputs and Results

[3] *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*, March 2011. https://www.epa.gov/sites/production/files/2015-07/documents/appwno2_2.pdf.

[4] *SO_2 NAAQS Designations Modeling Technical Assistance Document*, August 2016. https://www.epa.gov/so2-pollution/technical-assistance-documents-implementing-2010-sulfur-dioxide-standard

The AERMOD modeling input parameters for the Massena/St. Lawrence County area of analysis are summarized below in Table 8.

Table 8: Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the St. Lawrence County Area

Input Parameter	Value
AERMOD Version	19191
Dispersion Characteristics	Rural
Modeled Sources	1
Modeled Stacks	37
Modeled Structures	NA
Modeled Fencelines	1
Total receptors	13,593
Emissions Type	Actual
Emissions Years	2017-2019
Meteorology Years	2017-2019
NWS Station for Surface Meteorology	Massena Airport
NWS Station Upper Air Meteorology	Albany International Airport
NWS Station for Calculating Surface Characteristics	Massena Airport
Methodology for Calculating Background SO_2 Concentration	Site specific ambient data organized by Season, Hour-of-Day, i.e., Tier 2
Calculated Background SO_2 Concentration	See Table 7

The results presented below in Table 9 and Figure 6 show the geographic extent of the predicted modeled violations based on the input parameters.

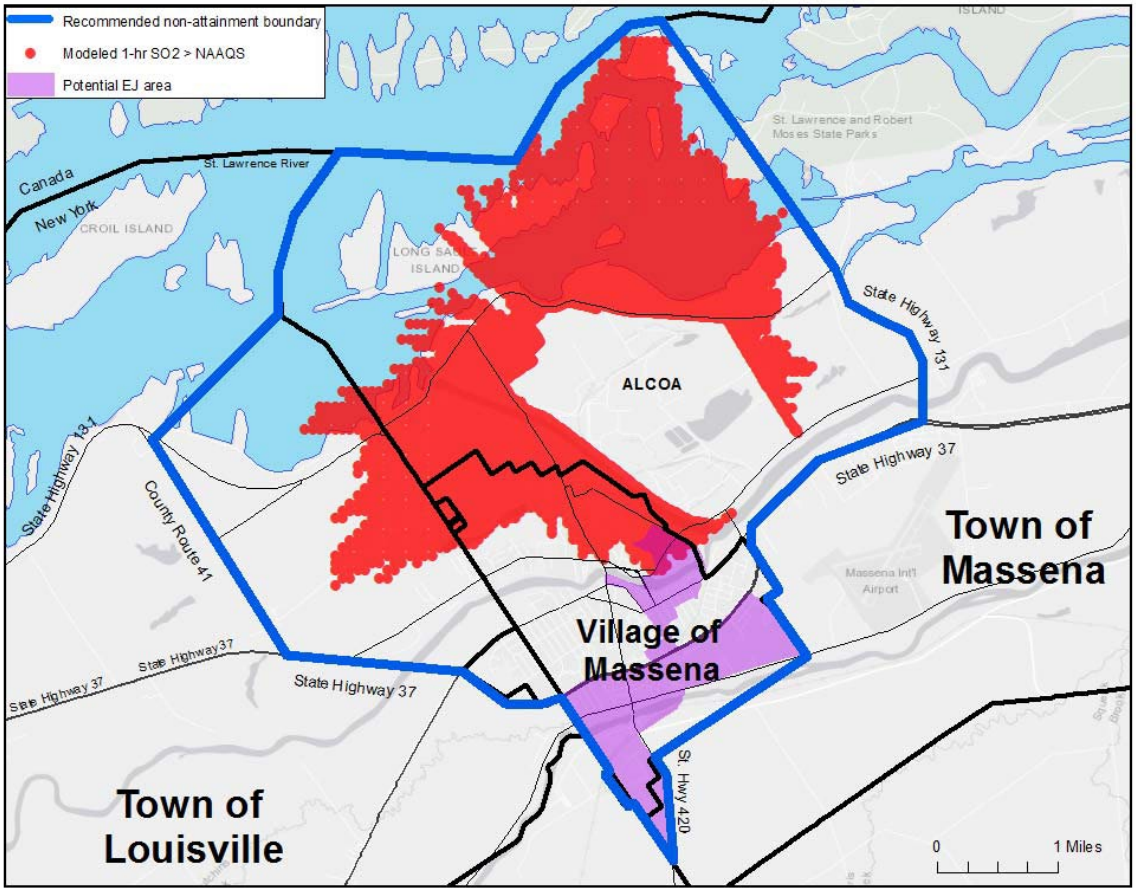
Table 9. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentration Averaged Over Three Years for the Area of Analysis for the St. Lawrence County Area

Averaging Period	Data Period	Receptor Location UTM Zone 18N		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	2017-2019	508636.87	4979133.25	326.5	196.4*

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

Figure 6 was included as part of New York's recommendation and indicates that the predicted modeled violations are fully contained within the State's September 2020 recommended nonattainment area boundary. The State's receptor grid is also shown in the figure.

Figure 6: Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the St. Lawrence County Area



The modeling submitted by New York indicates that the 1-hour SO_2 NAAQS is violated at numerous receptors shown in red in Figure 6, with the highest modeled concentration determined to be 326.5 $\mu g/m^3$ close to the northern fenceline. The modeling results also include the area in which a NAAQS violation was modeled, information that is relevant to the selection of the boundaries of the area that will be designated. The boundary includes jurisdictional areas where AERMOD results indicated a modeled violation of 196.5 $\mu g/m^3$ or greater.

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

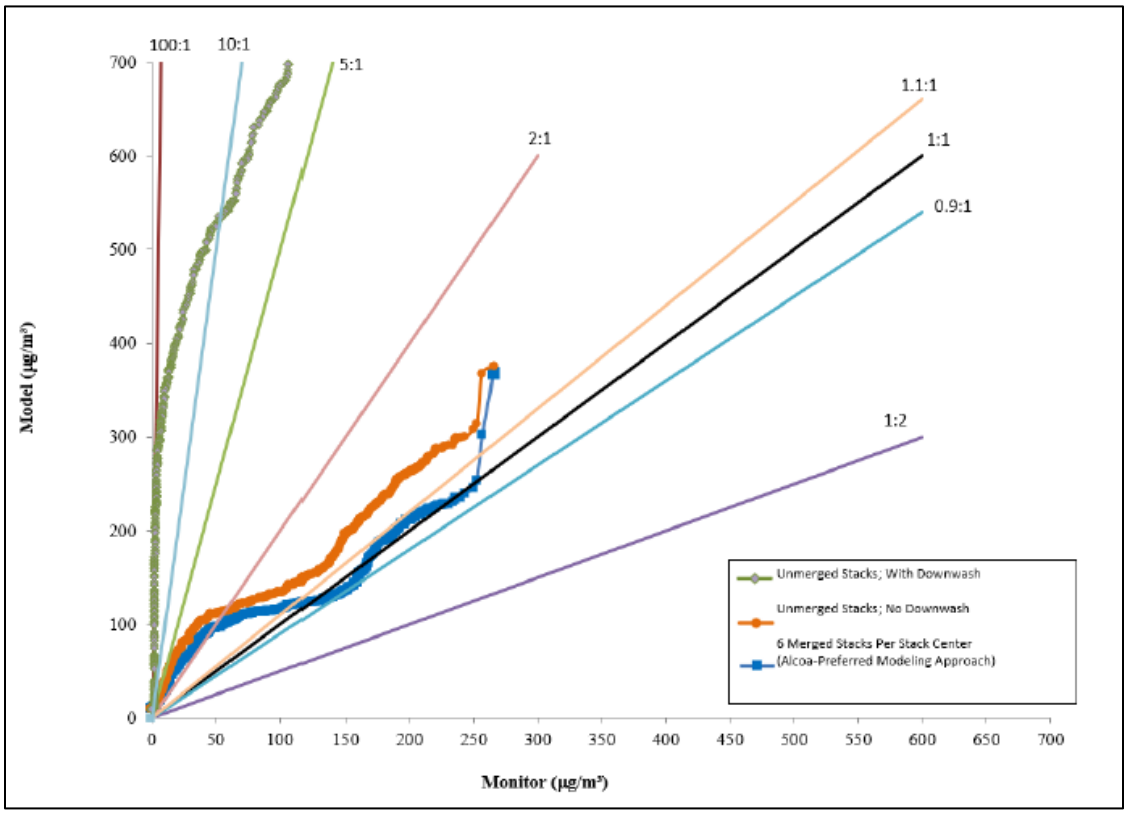
The NYSDEC provided a modeling analysis in order to establish a nonattainment boundary for the SO_2 designations. The modeling followed EPA guidelines and recommended procedures using the latest versions of AERMOD and the latest version of all the preprocessors. The meteorological data is representative of the area near the facility. The emission rates were based on actual monthly emissions that were converted to hourly rates assuming steady operations. The area is rural and rural dispersion parameters were used. The tier 2 method was used to determine background concentrations. Modeling components that deviated from guidance were noted and justified by NYSDEC such as not incorporating downwash. EPA agrees with the approach taken in this case and for the justification provided for not including building downwash.

2.4.2. Modeling Analysis Provided by Alcoa

On September 21, 2020, Alcoa submitted comments claiming to demonstrate the geographic extent of the NAAQS violations to support a smaller nonattainment boundary around the Alcoa Massena facility. However, the comments did not provide sufficient modeling information nor did the submission contain the modeling files necessary for EPA to complete a full technical analysis similar to that presented for NYSDEC's modeling.

Alcoa's modeling approach uses partial merging of the stacks by determining the effective diameter of pairs of nearby stacks and modeling these as a single stack. Alcoa claims that the partial merging represents better correlation with measured ambient data. However, there is insufficient information provided to conclude this correlation. The Quantile-Quantile (QQ) plot (Figure 7) from Alcoa's comment shows that both the unmerged and the merged model results are similar with a slight underprediction in the lower impact areas. However, the maximum impacts are the same. It is also unclear which years of data were used for this correlation and if the data in the QQ plots account for the capped stacks, which could influence impacts at the measurement locations.

Figure 7: (*Figure 4 from Alcoa's Report*) - Quantile-Quantile Plot for Various Modeling Approaches



Alcoa's preferred approach did not include building downwash. Figure 7 provides some evidence that modeling with building downwash overpredicts the monitored design values as compared to modeling without downwash. NYSDEC stated in their September 25, 2020 submission that they reviewed Alcoa's analysis and determined that downwash would not be considered in this case, since the enhanced plume liftoff generated by the high effluent temperature would have a stronger impact than downwash. The effects of downwash are most prominent close to the facility where the aerodynamic building wake effects are most important. Beyond the wake effects, the concentrations become more streamlined and have less of an effect on the boundary itself. As can be seen in the two figures 8 and 9 below containing the concentration isopleth using both NYSDEC and Alcoa's approach, the maximum impact occurs at the same general location on the northern fenceline and diminishes with distance.

Alcoa used a single value of 10 µg/m^3 for the background concentration estimated from the 90th percentile daily maximum concentrations at the Hogansburg, NY ambient monitor (AQS ID 36-033-7003 in 2016-2017. This value is not a valid 3-year design value, since it includes only 2 years of data. NYSDEC used the 3 years of concurrent measured values from the Alcoa East and West monitors using season hour-of-day tier 2 option. While the values do not differ greatly, EPA believes that NYSDEC's approach is more representative.

Alcoa used rural dispersion characterization as used by NYSDEC even though Alcoa noted that two other Alcoa facilities used the urban option, namely Intalco in Washington State, and

Warrick in Indiana. NYSDEC determined in their September 25, 2020 submission that the Massena facility could not be characterized similarly as an urban source since the facility's power consumption, as well as the temperature differential between the facility and the surrounding area are not sufficiently large enough to classify this area as urban.

Alcoa states they used the dispersion model, AERMOD. However, the version number of the model and the version number of the preprocessors used were not specified. Additionally, the receptor resolution or the extent of the modeling domain was not specified. However, figures were provided with the modeled isopleths that show the difference in the nonattainment area based on the NYSDEC and Alcoa's modeling.

Figure 8: (*Figure 5 from Alcoa's Report*) - Modeling Results Using Approach <u>Without</u> Stack Merging

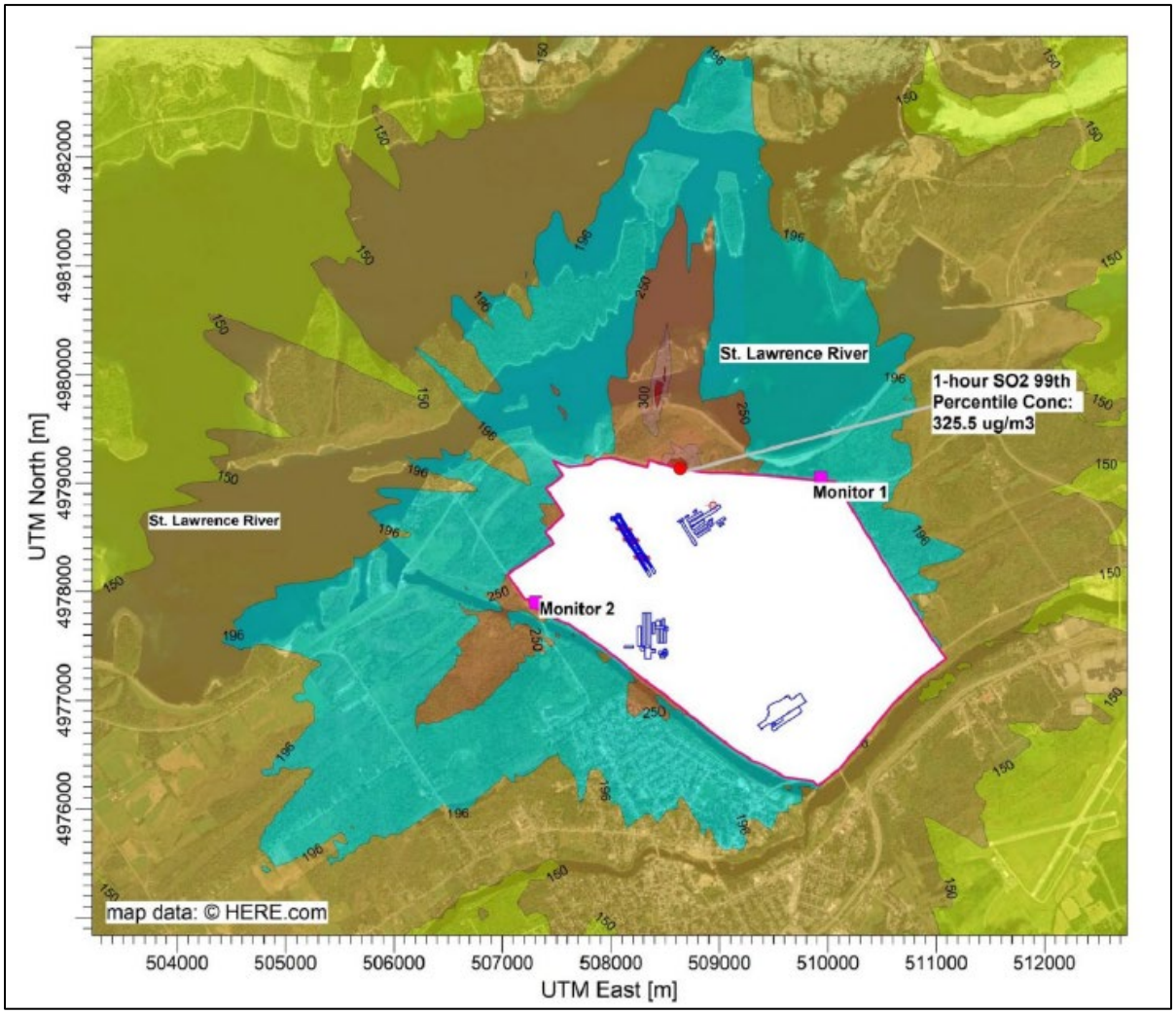
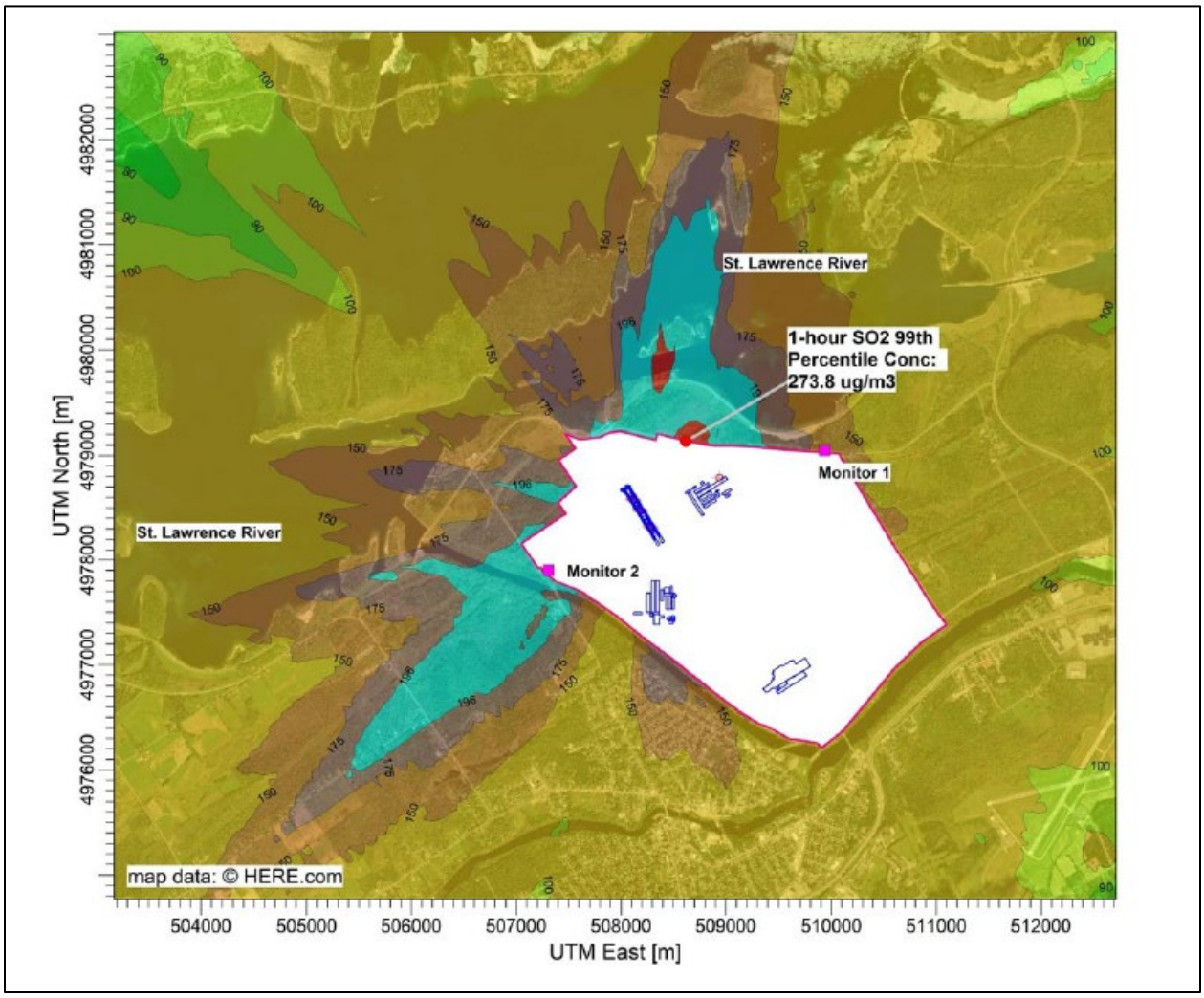


Figure 9: (*Figure 6 from Alcoa's Report*) - Modeling Results Using Approach <u>with</u> Stack Merging



Both, NYSDEC modeling and Alcoa modeling approaches support the designation of areas extending well beyond the facility fenceline as nonattainment. EPA cannot conclude that the comment provided by Alcoa supports their recommendation for the nonattainment area boundary. As stated above, Alcoa's comment did not provide sufficient modeling information nor did the submission contain the modeling files necessary for EPA to complete a full technical analysis similar to that presented for NYSDEC's modeling. The primary difference in the modeling discussed by Alcoa and the analysis done by NYSDEC lies with the partial merging of the stacks. Alcoa has not provided sufficient information in their report to support the use of their preferred stack merging approach.

2.5. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the St. Lawrence County, NY Area

These factors have been incorporated into the air quality modeling efforts and results discussed above. EPA is giving consideration to these factors by considering whether they were properly incorporated and by considering the air quality concentrations predicted by the modeling.

2.6. Jurisdictional Boundaries in the St. Lawrence County, NY 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. Existing jurisdictional boundaries used to define a nonattainment area must encompass the area that has been identified as meeting the nonattainment definition.

In consideration of all available information, data and modeling analyses, NYSDEC recommended a revised designation recommendation of nonattainment for St. Lawrence County inside the following boundary surrounding Alcoa Massena (Figure 10):

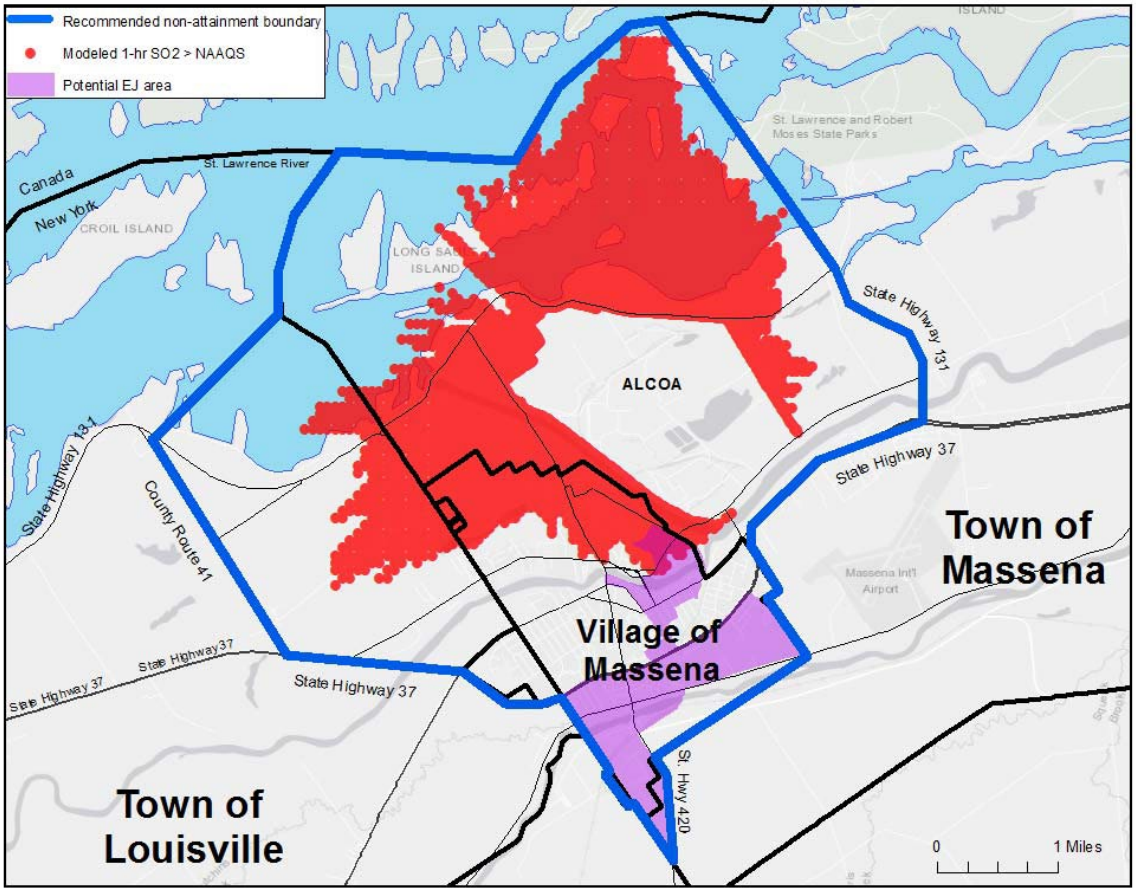
1. The partial Town of Massena bordered by:
    a. State Highway 37 to the south,
    b. State Highway 131 to the east, extending north-northwest from the point where State Highway 131 turns west in a straight line (including the westernmost non-roadway portion of Robert Moses State Park) to the town border to the north (US/Canada border),
    c. the town border to the north (US/Canada border), and
    d. the town border to the west; and,
2. The partial Town of Massena bordered by:
    a. the Village of Massena to the north,
    b. State Highway 420 to the east and south, and
    c. the town border to the west; and,
3. The entire Village of Massena; and,
4. The partial Town of Louisville bordered by:
    a. State Highway 37 to the south,
    b. County Route 41 to the west extending northeast in a straight line to the town border in the St. Lawrence River from the point where County Route 41 intersects with State Highway 131, and
    c. the town border to the east.

NYSDEC recommends a designation of "attainment" for the rest of St. Lawrence County.

The modeling submitted by New York indicates that the 1-hour SO_2 NAAQS is violated at numerous receptors shown in red in Figure 10. The modeling results also include the area in which a NAAQS violation was modeled, and information that is relevant to the selection of the boundaries of the area that will be designated. New York's recommendation indicates that the

predicted modeled violations are fully contained within the State's recommended nonattainment area boundary, which consists of a portion of the Town of Massena, the entire Village of Massena, and a portion of the Town of Louisville. This boundary includes the potential environmental justice area in the Village of Massena, as shown in purple in Figure 10 below. EPA agrees with New York's recommendation to provide additional protection and include the potential environmental justice area in the nonattainment boundary.

Figure 10: Proposed Nonattainment Boundary by New York State



2.7. Other Information Relevant to the Designation of the St. Lawrence County, NY Area

EPA did not receive additional information relevant to the designation of this area.

2.8. EPA's Assessment of the Available Information for the St. Lawrence County, NY Area

A monitor in the St. Lawrence County area is violating the NAAQS based on the 2017-2019 design value. New York submitted air dispersion modeling to demonstrate the extent of the NAAQS violations and to establish a nonattainment boundary.

EPA is finalizing the designation boundaries for St. Lawrence County, New York based on the predicted modeled violations with consideration of existing jurisdictional boundaries.[5] The final boundaries as determined by EPA include all modeled receptors that violate the 1-hour NAAQS. For simplicity, EPA has converted New York's September 2020 recommended boundaries in Section 2.6 from roadways to Universal Traverse Mercator (UTM) coordinates in UTM zone 18, but the boundary remains the same. Specifically, EPA's final nonattainment area is bounded by the lines connecting the UTM coordinates in Table 10. Generally, the final boundaries include the entire Village of Massena, and portions of the townships of Louisville and Massena.

EPA has no evidence to suggest that violations are occuring in the remainder of the County or that there are sources outside of the final nonattainment area that are contributing to the violations in that area. Specifically, the remainder of St. Lawrence County does not contain any sources emitting greater than 1 ton per year of SO_2. For these reasons, EPA is designating the remainder of St. Lawrence County as attainment/unclassifiable.

[5] EPA's assessment of the modeling for the St. Lawrence County area to inform our nonattainment boundary for 2010 SO_2 NAAQS designations does not imply that the modeling is appropriate for other purposes, such as new source review (NSR), interstate transport, or SIP demonstrations.

Table 10: UTM Coordinates (zone 18) for EPA's Final Nonattainment Area

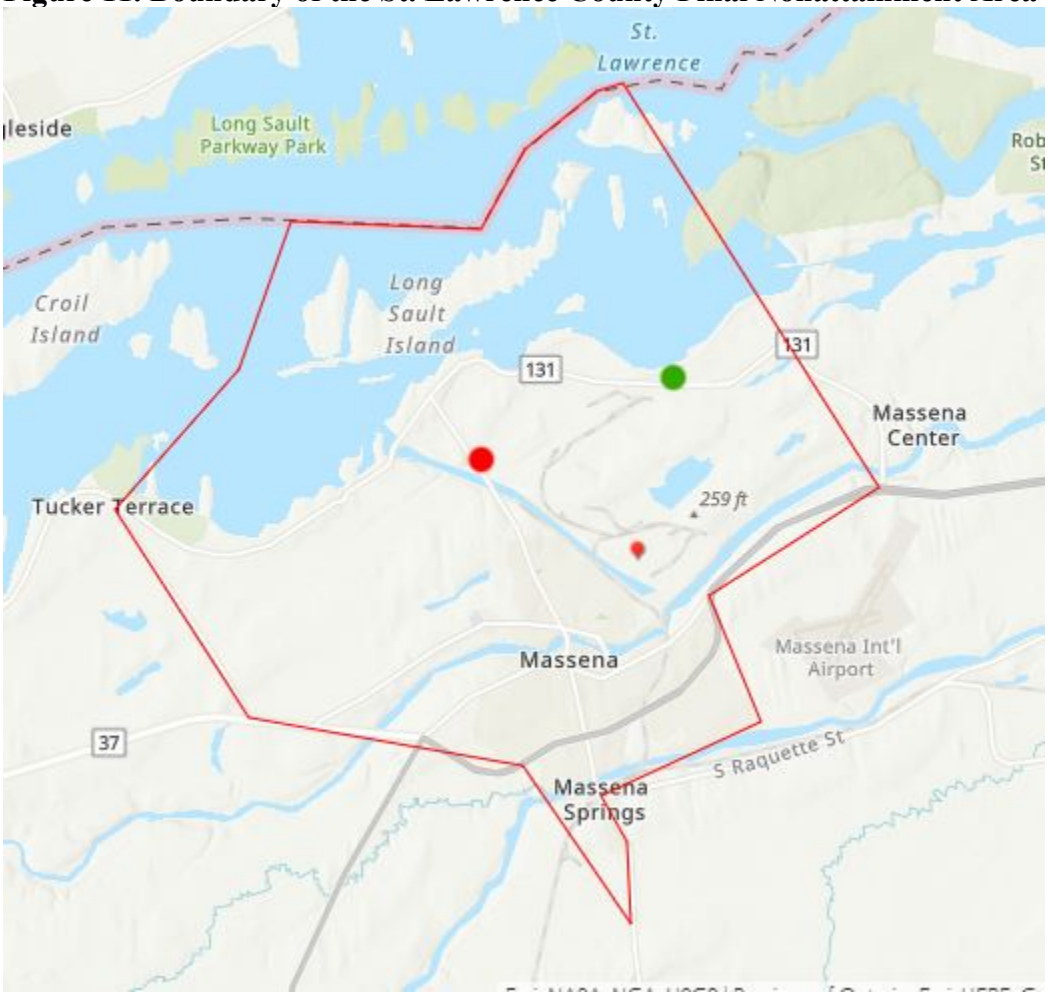
Reference Point	Town/Village	From UTM Easting, UTM Northing (m)	To UTM Easting, UTM Northing (m)
NY 37 @ NY 131	Massena (T)	512656.82, 4977651.30	510357.28, 4976189.48
Highland Rd. @ NY 37 Intersection on Massena Village Border	Massena (V)	510357.28, 4976189.48	511064.47, 4974489.71
Bayley Rd. @ East Hatfield St. @ North Raquette River Rd. on Massena Village Border	Massena (V)	511064.47, 4974489.71	508898.25, 4973487.12
Depot St. @ Main St. on Massena Village Border	Massena (V)	508898.25, 4973487.12	509251.42, 4972866.32
NY 420 near Commerce and Trade Rds.	Massena (V)	509251.42, 4972866.32	509307.26, 4971758.87
NY 420 @ Dump Rd.	Massena (V)	509307.26, 4971758.87	507840.93, 4973890.76
NY 37 near Massena H.S. on Village Border	Massena (V)	507840.93, 4973890.76	504128.10, 4974535.47
NY 31 @ CR 41	Louisville (T)	504128.10, 4974535.47	502311.79, 4977342.26
Tucker Terrace near NY 131 & CR 41 intersection	Louisville (T)	502311.79, 4977342.26	503989.74, 4979232.22
St. Lawrence River (U.S.) West of Long Sault Island	Massena (T)	503989.74, 4979232.22	504692.16, 4981230.33
St. Lawrence River @ U.S. / Canada Border	Massena (T)	504692.16, 4981230.33	509220.53, 4983035.59
St. Lawrence River @ U.S. Canada Border	Massena (T)	509220.53, 4983035.59	512656.82, 4977651.30

V = Village, T = Town

2.9. Summary of EPA's Final Designation for the St. Lawrence County, NY Area

After careful evaluation of New York's recommendation and supporting information, as well as all available relevant information, EPA is designating the Alcoa Massena area as nonattainment for the 2010 SO_2 NAAQS. Specifically, the nonattainment area is bounded by lines connecting the UTM coordinates in Table 10. Additionally, EPA is designating the remainder of St. Lawarence County, New York as attainment/unclassifiable. Figures 11 and 12 show the boundaries for the final area designations.

Figure 11. Boundary of the St. Lawrence County Final Nonattainment Area



EPA's Final Nonattainment Boundary

- Alcoa Massena (Emission Source)
- Alcoa Massena Monitor East
- Alcoa Massena Monitor West (Violating Monitor)

Figure 12. Boundary of the St. Lawrence County Final Nonattainment Area and Attainment/Unclassifiable Area