See disk enclosed.

OFFICE OF THE COMMISSIONER

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JAN - 4 2017

Ms. Judith Enck
Regional Administrator
United States Environmental Protection Agency
Region 2
290 Broadway, 26th Floor
New York, New York 10007-1866

Dear Ms. Enck:

On behalf of the Governor of the State of New York, I am submitting for consideration by the United States Environmental Protection Agency (EPA) the "Revised Designation Recommendation for Sulfur Dioxide: Statewide (With the Exception of Erie, Niagara, Seneca, St. Lawrence and Tompkins Counties): 2010 Primary National Ambient Air Quality Standard: January 2017."

DEC is recommending that EPA designate the entire State of New York, with the exception of Erie, Niagara, Seneca, St. Lawrence and Tompkins Counties, as in attainment of the 2010 sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS). EPA has already designated Erie and Niagara Counties as "unclassifiable/attainment"; and Seneca, St. Lawrence and Tompkins Counties will be designated by December 31, 2020 using air quality data from newly installed monitors.

This revised designation recommendation pertains to the second round of designations for the 2010 primary SO_2 NAAQS to be completed by EPA no later than December 31, 2017 pursuant to the Consent Decree approved by the U.S. District Court for the Northern District of California on March 2, 2015. It was developed using the March 20, 2015 EPA Memorandum entitled "Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard" and the July 22, 2016 EPA Memorandum entitled "Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard – Round 3."

This revised designation recommendation also satisfies New York's June 20, 2016 commitment to characterize air quality around several sources in New York State using the air quality modeling approach pursuant to requirements of EPA's Data Requirements Rule (80 FR 51052).

Should you have any questions regarding this submission, please do not hesitate to contact Mr. Steven Flint, Director of the Department's Division of Air Resources at (518) 402-8452 with any questions you may have.

Sincerely,

Basil Seggos
Commissioner

Enclosures

c: S. Flint
R. Ruvo, EPA Region 2

Department of Environmental Conservation

REVISED DESIGNATION RECOMMENDATION FOR SULFUR DIOXIDE

Statewide

(With the Exception of Erie, Niagara, Seneca, St. Lawrence and Tompkins Counties)

2010 Primary National Ambient Air Quality Standard

January 2017

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Introduction

Sulfur dioxide (SO_2) is one of a group of highly reactive gasses known as "oxides of sulfur." The largest sources of SO_2 emissions are from fossil fuel combustion at power plants and other industrial facilities. Smaller sources of SO_2 emissions include industrial processes and the burning of high sulfur containing fuels by locomotives, large ships, and non-road equipment. SO_2 is linked to a number of adverse effects on the respiratory system. Exposure to sulfur dioxide can cause irritation and/or inflammation of the skin and mucous membranes of the eyes, nose, throat, and lungs. The respiratory system is particularly affected during heavy physical activity. High concentrations of SO_2 can affect lung function, worsen asthma attacks, and aggravate existing heart disease in sensitive groups, such as children, the elderly, and those with chronic lung disease.

The United States Environmental Protection Agency (EPA, or Agency) must designate areas as either "unclassifiable," "attainment," or "nonattainment" for the 2010 one-hour SO_2 primary national ambient air quality standard (NAAQS) pursuant to 42 United States Code section 7406 (section 107(d) of the Clean Air Act (CAA)). The CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to a nonattainment in a nearby area. An attainment area is defined as any area other than a nonattainment area that meets the NAAQS. Unclassifiable areas are defined as those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS.

On March 2, 2015, the U.S. District Court for the Northern District of California (Court) accepted as an enforceable order an agreement between the EPA and Sierra Club and Natural Resources Defense Council to resolve litigation concerning the deadline for completing designations for the 2010 primary SO_2 NAAQS. The Court's order directs EPA to complete designations for the 2010 primary SO_2 NAAQS for all areas of the country in up to three rounds: the first round by July 2, 2016, the second round by December 31, 2017, and the final round by December 31, 2020.

EPA finalized the first round of designations for the 2010 primary SO_2 NAAQS pursuant to the Court's order on July 12, 2016 (81 FR 45039). In that final rule, EPA designated Erie and Niagara Counties as "unclassifiable/attainment" for the 2010 primary SO_2 NAAQS.

This revised designation recommendation pertains to the second round of designations for the 2010 primary SO_2 NAAQS to be completed by EPA no later than December 31, 2017. EPA must designate any remaining undesignated areas where, by January 1, 2017, states have not installed and begun operating a new SO_2 monitoring network meeting the EPA's specifications referenced in EPA's Data Requirements Rule[1] (DRR). For New York, this includes the remainder of the State with the exception of Seneca, St.

[1] https://www.epa.gov/so2-pollution/final-data-requirements-rule-2010-1-hour-sulfur-dioxide-so2-primary-national-ambient

Lawrence and Tompkins Counties. EPA will designate Seneca, St. Lawrence and Tompkins Counties by December 31, 2020 based on certified monitoring data from new SO_2 monitors for the years 2017 through 2019.

This revised designation was developed using the March 20, 2015 EPA Memorandum entitled "Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard"[2] and the July 22, 2016 EPA Memorandum entitled "Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard – Round 3."[3] Both of these guidance documents provide information on determining area designations and appropriate area boundaries for the SO_2 NAAQS.

[2] https://www.epa.gov/sites/production/files/2016-04/documents/20150320so2designations.pdf
[3] https://www.epa.gov/sites/production/files/2016-07/documents/areadesign.pdf

Background

2010 1-hour SO_2 NAAQS and Designations

On June 2, 2010, EPA strengthened the primary (health based) SO_2 NAAQS by establishing a new 1-hour standard at a level of 75 parts per billion (ppb) which is attained when the 3-year average of the 99th percentile of 1-hour daily maximum concentrations does not exceed 75 ppb. This NAAQS was published in the Federal Register (FR) on June 22, 2010 (75 FR 35520) and is codified at 40 CFR 50.17. The secondary (welfare based) standard for SO_2, set at 500 ppb evaluated over 3 hours was not revised, and EPA is not currently designating areas on the basis of the secondary standard.

DEC submitted New York's designation request for the 2010 primary SO_2 NAAQS on June 1, 2011[4] and recommended that all areas of New York be designated as "attainment" based on certified monitoring data from our network of 27 SO_2 monitors located throughout the state, with the exception of the Poughkeepsie-Middletown-Newburgh Core-Based Statistical Area (CBSA). DEC recommended that this area be classified as "unclassifiable" since sufficient monitoring data was not available at the time to make an attainment determination. The Poughkeepsie-Middletown-Newburgh CBSA now has sufficient monitoring data to make a designation recommendation.

On July 27, 2012, EPA extended the deadline for area designations for the 2010 primary SO_2 standard by approximately 1 year due to comments received on the approach for informing initial designations, and remaining uncertainties about the analytic approach states would use for designation determinations and for general implementation. With this extension, EPA intended to complete initial designations by June 3, 2013.

EPA responded to New York's June 1, 2011 designation request on February 6, 2013. At that time, EPA was only proceeding with designating nonattainment areas in locations where existing monitoring data for 2009-2011 indicated violations of the 1-hour SO_2 standard. Since EPA's review of the monitoring data for 2009-2011 showed no violations of the 2010 SO_2 NAAQS in any areas in New York State, EPA deferred action to designate any areas in New York.

[4] http://www.dec.ny.gov/chemical/102194.html

Three lawsuits were filed against EPA alleging the Agency failed to designate areas by June 2013. On March 2, 2015, the U.S. District Court for the Northern District of California issued an enforceable order under which EPA must complete 1-hour SO_2 NAAQS designations of the remaining areas of the country in up to three additional rounds: the first round by July 2, 2016, the second round by December 31, 2017, and the final round by December 31, 2020. The designations to be completed by these later deadlines are expected to be informed by information provided by states pursuant to the SO_2 DRR.

1. For the designations to be completed by July 2, 2016, EPA designated in two groups:
    1. Areas that monitored violations of the 2010 SO_2 standard based on 2013 through 2015 air quality data.
        i. No areas in New York State monitored violations of the 2010 SO2 NAAQS based on 2013 through 2015 air quality data.
    2. Areas that contained any stationary source not announced for retirement that according to EPA's Air Markets Database emitted in 2012 either (a) more than 16,000 tons of SO_2, or (b) more than 2,600 tons of SO_2 and had an average emission rate of at least 0.45 lbs. SO_2/mmBtu.
        i. On March 20, 2015, EPA notified DEC that two electric power plants in New York State (Huntley Generating Station, Erie County and Somerset Station, Niagara County) met the criteria for emitting more than 2,600 tons of SO_2 and having an emission rate of at least 0.45 lbs. SO_2/mmBtu in 2012 and have not announced (as of March 2, 2015) that they will be retired. DEC submitted a revised designation recommendation on September 18, 2015 that provided the technical analysis supporting an "attainment" designation for Cattaraugus, Erie and Niagara Counties[5]. EPA designated Erie and Niagara Counties as "attainment"[6] and deferred designating Cattaraugus County.

2. The Court's order directs the EPA to complete an additional round of area designations by December 31, 2017 addressing areas where states have not installed and begun operating a new SO_2 monitoring network meeting the EPA's specifications referenced in the Agency's anticipated (at that time) final rule titled, "Data Requirements Rule for the 1-hour SO_2 primary NAAQS". This revised designation recommendation will be used by EPA to make their final designations in this round.

3. Lastly, the court's order directs the EPA to designate all remaining areas by December 31, 2020. Seneca, St. Lawrence and Tompkins Counties will be designated in this final round.

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[5] http://www.dec.ny.gov/chemical/103397.html

[6] https://www.gpo.gov/fdsys/pkg/FR-2016-07-12/pdf/2016-16348.pdf

EPA's SO_2 Data Requirement Rule

On August 10, 2015, EPA finalized requirements for air agencies to monitor or model ambient SO_2 levels in areas with large sources of SO_2 emissions in order to help implement the 1-hour SO_2 NAAQS. The final rule gives air agencies the flexibility to characterize air quality using either modeling of actual source emissions or using appropriately sited ambient air quality monitors. It also establishes a schedule for air agencies to characterize air quality and to provide that air quality data to EPA.

The DRR establishes minimum criteria for identifying the emissions sources and associated areas for which air agencies are required to characterize SO_2 air quality; namely sources emitting greater than 2,000 tons SO_2 per year. DEC chose to characterize air quality in additional areas beyond those required to be characterized under the DRR. Air quality near two sources with annual emissions less than 2,000 tons but with high hourly emissions was characterized given that the NAAQS is based on 1-hour concentrations. Air quality around five power plants in the New York City metropolitan area along the East River was also characterized because of their close proximity to each other and potential environmental justice concerns.

Milestones in the DRR final rule implementation timeline[7] that are addressed in this revised designation recommendation are as follows:

- "For source areas that an air agency decides to evaluate through air quality modeling ... The modeling analysis must be submitted to the EPA by January 13, 2017".
    - This revised designation recommendation contains the modeling analysis for sources in New York:
        - that exceeded the 2,000 tpy threshold in 2014;
            - Eastman Business Park – RED (RED-Rochester),
            - Lafarge North America – Ravena;
        - had low annual emissions but high hourly emissions;
            - Northport Power Station,
            - Roseton Generating Station;
        - in close proximity to each other and with environmental justice concerns;
            - Astoria Generating Station,
            - Ravenswood Generating Station,
            - Consolidated Edison – 59th Street Station,
            - Consolidated Edison – 74th Street Station, and
            - Consolidated Edison – East River Generating Station.

[7] Source: https://www.epa.gov/sites/production/files/2016-06/documents/so2_data_requirements_rule_factsheet_081215.pdf

- "For source areas that an air agency decides to evaluate through ambient monitoring … the air agency must ensure that ambient monitors are operational by January 1, 2017".
    - DEC confirms that air quality in Seneca, St. Lawrence and Tompkins Counties will be characterized in the future using new monitors that will be operated in accordance with New York's EPA approved "2016 Annual Monitoring Network Plan."

The remaining milestone in the DRR final implementation rule timeline that will be addressed in the future is:

- "For source areas that an air agency decides to evaluate through ambient monitoring … air agencies will quality assure data from these monitors and submit them to the EPA Air Quality System in the same manner as is currently done for existing SO_2 monitors. The first 3 years of data will be collected for calendar years 2017 through 2019."

Identifying Attainment Areas

EPA may designate an area as attainment if it is clear that it meets the SO_2 NAAQS and does not contribute to a violation in a nearby area. An area may demonstrated attainment if the most recent three years of ambient air quality monitoring data indicate no violations and if the monitoring network in the area is sufficient to be compared to the NAAQS per the SO_2 NAAQS Designations Monitoring Technical Assistance Document[8] (TAD). An area may be also be demonstrated in attainment if appropriate modeling analysis indicates no violations of the 2010 SO_2 NAAQS. In either case, it is necessary to show that sources in the area are not contributing to a violation in a nearby area.

Determining Nonattainment Area Boundaries

Ambient SO_2 is a pollutant that arises from direct emissions, and SO_2 concentrations are generally expected to be highest relatively close to the source(s) and lower at further distances due to dispersion. Accordingly, EPA expects to consider county boundaries as the analytical starting point for determining SO_2 nonattainment areas.

EPA recommends that states base their updated boundary recommendations on an evaluation of five factors:

1. air quality data or dispersion modeling results;
2. emissions-related data;
3. meteorology;
4. geography and topography; and
5. jurisdictional boundaries.

Determining Attainment Area Boundaries

An attainment area cannot contain any area that violates the NAAQS or contributes to a violation of the NAAQS in a nearby area. County boundaries may be appropriate for defining attainment area boundaries in the absence of any other relevant information that would help define a more specific boundary around the SO_2 sources in question. To define more specific boundaries, EPA recommends an evaluation of the five factors mentioned previously, and, in particular, the use of dispersion modeling, as discussed in the modeling TAD, to simultaneously assess multiple factors.

[8] https://www.epa.gov/sites/production/files/2016-06/documents/so2monitoringtad.pdf

Designation Recommendations Based on Ambient Air Quality Monitoring Data (Factor 1)

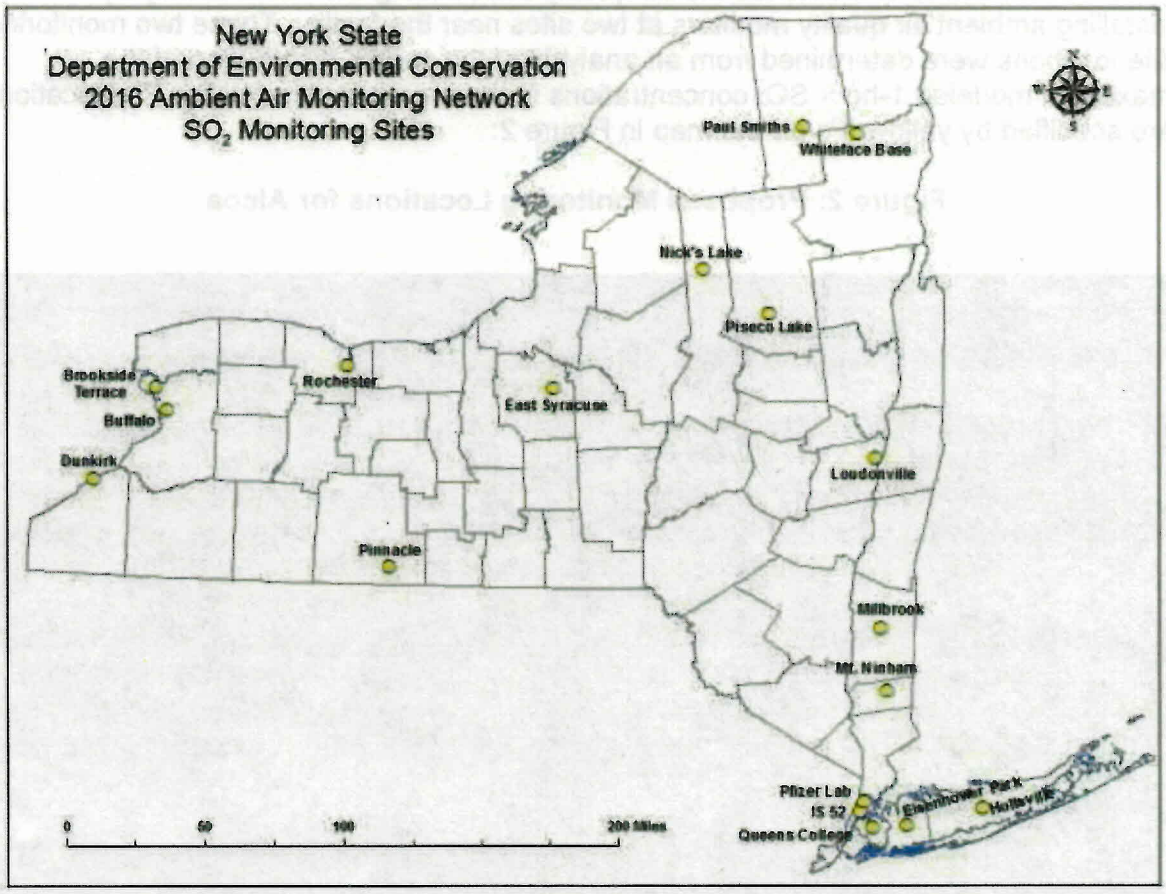
DEC recommends that Albany, Bronx, Chautauqua, Dutchess, Essex, Franklin, Hamilton, Herkimer, Monroe, Nassau, Onondaga, Putnam, Queens, Steuben and Suffolk Counties be designated attainment for the 1-hour SO_2 NAAQS because the most recent three years of ambient air quality monitoring data indicate no violations and the EPA approved monitoring network is sufficient to be compared to the NAAQS per the SO_2 NAAQS Designations Monitoring TAD. No sources in these counties are contributing to a violation in any nearby area, including areas outside of New York State.

New York's Ambient Air Monitoring Network

The DEC Division of Air Resources operates an ambient air monitoring network for several air contaminants, including SO_2, in New York State. DEC conducts an annual review of the existing monitoring network to determine its adequacy and to propose any network modifications. The 2016 Annual Monitoring Network Plan[9], approved by EPA on July 28, 2016, describes in detail the specifics of the monitoring network as required by federal regulations. There are 18 SO_2 monitors currently in operation, as shown in Figure 1. TEI Model 43C and 43i TLE instruments using the pulsed fluorescence method are deployed in the network.

[9] http://www.dec.ny.gov/chemical/33276

Figure 1: 2016 Ambient Air Monitoring Network SO_2 Monitoring Sites



As previously discussed, ambient air quality in St. Lawrence County near Alcoa and Seneca and Tompkins Counties near Cayuga Generating Station will be characterized in the future using new ambient air monitors in order to satisfy requirements of the DRR. The DRR classifies these source-oriented sites as "State and Local Air Monitoring Stations" (SLAMS) and requires the monitors be operated in a SLAMS-like manner subject to the requirements of 40 CFR part 58 regarding data reporting and certification; and also subject to the requirements of 40 CFR Appendices A, C, and E.

Data from these monitors will be used to determine 1-hour concentrations of SO_2 at locations where maximum impact around these facilities is expected to occur, as determined by DEC dispersion modeling and summarized below. Meteorological data will also be collected for use in future evaluations of monitoring or modeling data.

Monitoring: Alcoa

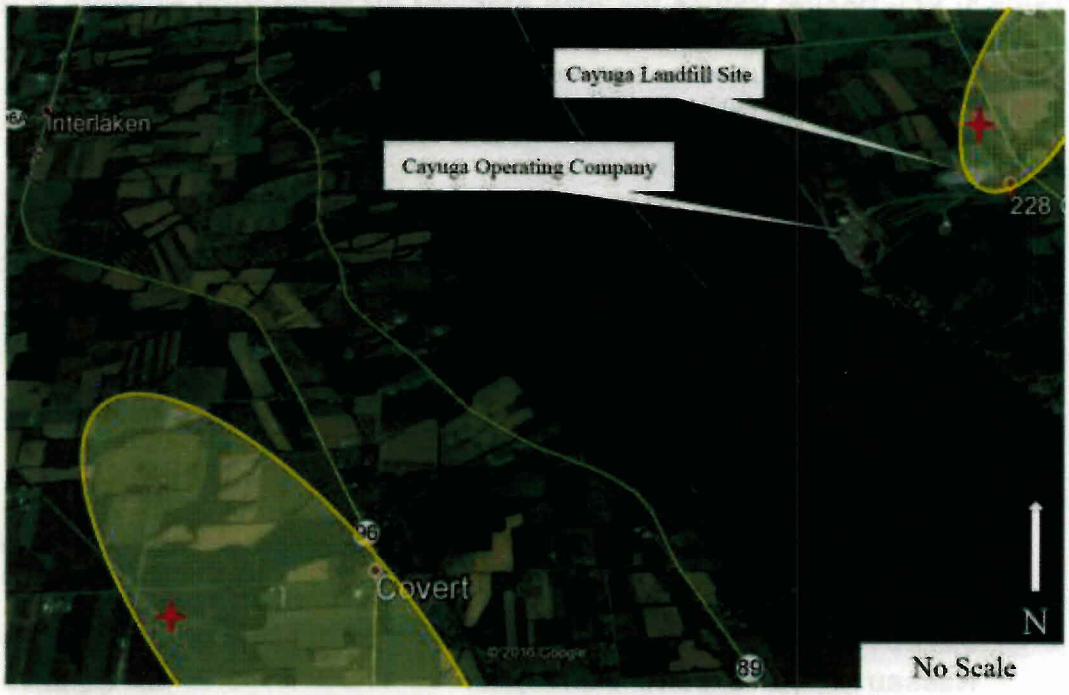
DEC has chosen to characterize the air quality surrounding the Alcoa facility by installing ambient air quality monitors at two sites near the facility. These two monitoring site locations were determined from an analysis of the spatial distribution of the maximum modeled 1-hour SO_2 concentrations in the area near the facility. The locations are specified by yellow X's on the map in Figure 2:

Figure 2: Proposed Monitoring Locations for Alcoa

Monitoring: Cayuga Generating Station

DEC has chosen to characterize the air quality surrounding the Cayuga facility by installing ambient air quality monitors at two sites near the facility. These two monitoring site locations were determined from an analysis of the spatial distribution of the maximum modeled 1-hour SO_2 concentrations in the area near the facility. The locations are specified by red crosses in Figure 3:

Figure 3: Proposed Monitoring Locations for Cayuga Generating Station



SO_2 Monitoring Data and Design Values

The 2010 primary SO_2 NAAQS is set at a level of 75 ppb with the form of the standard being the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum SO_2 concentrations. For example, the design value for 2016 is calculated by averaging the 99th percentile of the yearly distribution of 1-hour daily maximum SO_2 concentrations from 2014, 2015 and 2016. All monitors in New York State demonstrate attainment with the 2010 primary SO_2 NAAQS by a large margin when considering design values from 2013 through 2016.

Table 1: SO_2 Design Values for 2016 Ambient Air Monitoring Network SO_2 Monitoring Sites

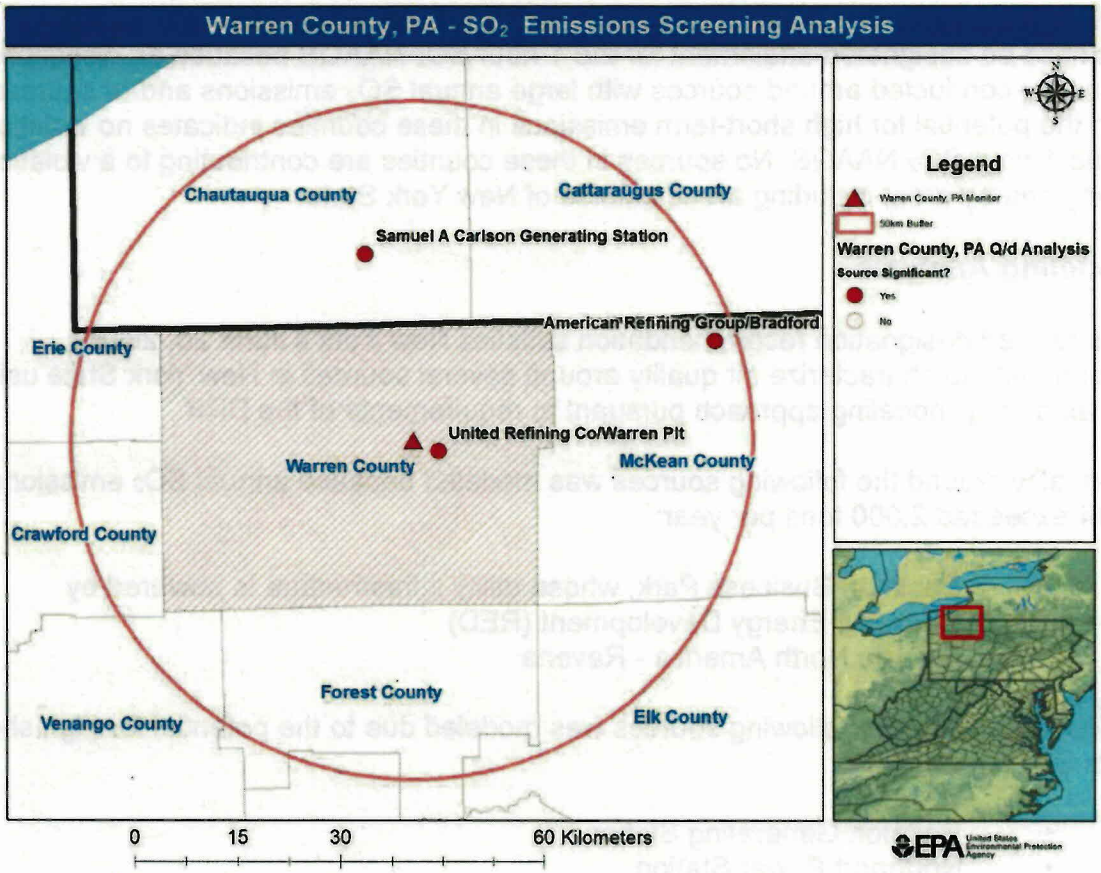
County	Monitor	SO_2 Design Values (ppb)			
		2013	**2014**	**2015**	**Preliminary 2016**
Albany	Loudonville	11	8	8	6
Bronx	IS 52	N/A	17	14	11
Bronx	Pfizer Lab	31	22	16	11
Chautauqua	Dunkirk	22	18	17	13
Dutchess	Millbrook	7	6	5	4
Erie	Buffalo	15	10	9	9
Erie	Brookside Terrace	25	22	19	20
Essex	Whiteface Base	4	3	3	4
Franklin	Paul Smith's	4	3	3	3
Hamilton	Piseco Lake	4	3	4	3
Herkimer	Nick's Lake	4	4	4	4
Monroe	Rochester	20	20	18	19
Nassau	Eisenhower Park	17	11	7	7
Onondaga	East Syracuse	7	6	5	4
Putnam	Mt. Ninham	8	6	6	5
Queens	Queens College	20	14	11	9
Steuben	Pinnacle State Park	10	9	9	8
Suffolk	Holtsville	15	11	9	7

Source: EPA AQS Design Value Report generated November 16, 2016; and, EPA Standard Retrievals AMP450/ Quicklook Criteria Parameters Generated November 17, 2016.

Adjacent States

DEC has evaluated monitoring and SO_2 design value data for the bordering States of New Jersey, Connecticut, and Vermont; as well as the bordering Commonwealths of Pennsylvania and Massachusetts. Warren County, Pennsylvania is the only area bordering New York State (Chautauqua and Cattaraugus Counties) that is designated

nonattainment and violating the 1-hour SO_2 NAAQS; and it has a 2015 Design Value of 118 ppb.



In the conclusion of the document entitled "Draft Technical Support Document: PENNSYLVANIA: Area Designations For the 2010 SO_2 Primary National Ambient Air Quality Standard,"[10] EPA states that it "is not prepared to find that any nearby areas contribute to the monitored violations in Warren County … Additionally, EPA is not prepared to conclude that ... the large sources in neighboring counties are likely to impact the monitor in Warren County. The monitored violation in Warren County is likely driven by the source within close proximity of the monitor (i.e. United Refining – Warren Plant)."

DEC agrees with EPA's analysis that sources in Chautauqua and Cattaraugus Counties in New York State do not contribute to, or interfere with, the 2010 1-hour SO_2 NAAQS in Warren County, Pennsylvania. The Samuel A. Carlson Generating Station in Chautauqua County no longer burns coal and reported SO_2 emissions of 0.63 tons in both 2014 and 2015. Dunkirk Steam Generating Station in Chautauqua County was mothballed in 2016. Cattaraugus County's point source emissions are less than 1 tpy.

[10] https://www.epa.gov/sites/production/files/2016-03/documents/pa-epa-tsd.pdf

Designation Recommendations Based on Dispersion Modeling (Factor 1)

DEC recommends that Albany, Monroe, New York, Orange, Queens and Suffolk Counties be designated attainment for the 1-hour SO_2 NAAQS because air dispersion modeling conducted around sources with large annual SO_2 emissions and/or sources with the potential for high short-term emissions in these counties indicates no violations of the 1-hour SO_2 NAAQS. No sources in these counties are contributing to a violation in any nearby area, including areas outside of New York State.

Modeling Analysis

This revised designation recommendation satisfies New York's June 20, 2016 commitment to characterize air quality around several sources in New York State using the air quality modeling approach pursuant to requirements of the DRR.

Air quality around the following sources was modeled because annual SO_2 emissions in 2014 exceeded 2,000 tons per year:

- Eastman Business Park, whose utility infrastructure is powered by Recycled Energy Development (RED)
- Lafarge North America - Ravena

Air quality around the following sources was modeled due to the potential for high short-term SO_2 emissions:

- Roseton Generating Station
- Northport Power Station

Air quality around the following facilities was modeled due to their close proximity to each other and environmental justice concerns:

- New York City power stations
  - Astoria Generating Station
  - Ravenswood Generating Station
  - Consolidated Edison – 59th Street Station
  - Consolidated Edison – 74th Street Station
  - Consolidated Edison – East River Generating Station

The air dispersion modeling methodology that DEC used was based on policies and procedures contained in EPA's "Guideline on Air Quality Models" (40 CFR Part 51, Appendix W) and DEC's recommended dispersion modeling procedures for conducting ambient impact analyses as detailed in "DAR-10 / NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis," modified where applicable by EPA's "SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document" dated February 2016.

A detailed technical modeling analysis is included in this revised designation recommendation in Appendix A. A summary of dispersion modeling results that support a designation of attainment for the affected counties for the 2010 SO_2 NAAQS are summarized in Table 2.

Table 2: Modeling Analysis Summary

Facility	County	2013 Point Source Emissions (tons)	2014 Point Source Emissions (tons)	2015 Point Source Emissions (tons)	Facility Impact (ppb)	Background Impact (ppb)	Total (ppb)
RED	Monroe	4,281*	10,188	8,713	10.7	19.6	30.3
Lafarge	Albany	5,418	4,582	4,806	4.9	8.3	13.2
Roseton	Orange	120	608	608	54.8	6.3	61.1
Northport	Suffolk	894	1,693	1,589	16.4	10.9	27.3
NYC Power Stations	New York & Queens	748	823	463	14.5	15.8	30.3

* As Eastman Business Park

Designation Recommendations Based on Emissions Data (Factor 2)

DEC recommends that the 49 counties identified in Table 4 be designated attainment for the 1-hour SO_2 NAAQS because cumulative SO_2 emissions from point sources in these counties are below the DRR threshold and are so low that they would not cause or contribute to violations of the 1-hour SO_2 NAAQS. DEC used a more conservative threshold of 463 tons/year, as explained below, in order to use this criteria (Factor 2) for designation recommendation purposes.

SO_2 Control Programs

Over the years, New York has adopted several regulations that have had a significant impact on reducing SO_2 emissions. These include:

Regulation	Title
6 NYCRR Part 248	Use of Ultra Low Sulfur Diesel Fuel and Best Available Retrofit Technology for Heavy Duty Vehicles
6 NYCRR Subpart 225-1	Fuel Use and Composition – Sulfur Limitations
6 NYCRR Part 245	CAIR SO_2 Trading Program
6 NYCRR Part 249	Best Available Retrofit Technology (BART)

In addition to the regulations cited above, the shutdown of coal burning power plants (i.e. Huntley Steam Generating Station, Dunkirk Steam Generating Station) and fuel switching (i.e. S.A. Carlson Generating Station, Morton Salt Inc.) has, and will continue to have, a significant impact on reducing SO_2 emissions.

The average decrease in SO_2 emissions between 2011 and 2014, across all inventory sectors (point, nonpoint, onroad, and nonroad) in the 49 counties recommended for attainment in this section, was 26 percent. Individual county reduction percentages are identified in Table 4, and more detailed emissions reductions (i.e. in tons by inventory sector) are identified in Appendix B.

Emissions Data

There were 329 sources in New York State that reported SO_2 emissions in 2015 (see Appendix C). DEC recommends that counties with cumulative annual point source SO_2 emissions less than 463 tons/year be designated attainment because dispersion modeling for the 5 New York City power stations indicates that the combined emissions from all five facilities (463 tons/year) with the potential for high short-term emissions does not cause or contribute to a violation of the 1-hour SO_2 standard and that their cumulative impact is not significant.

Table 3: Emissions from 5 New York City Power Stations

Facility name	Facility County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons
Con-Ed East River Station	New York	69	165	156
Ravenswood Generating Station	Queens	158	296	89
Con-Ed 74th Street Station	New York	335	76	86
Astoria Generating Station	Queens	63	218	73
Con Ed- 59th Street Station	New York	123	68	59
	Total*	746	822	463

*May not add up due to rounding

The following counties had cumulative SO_2 emissions less than 463 tons/year in 2015:

Table 4: Counties with Cumulative Point Source SO_2 Emissions Less Than 463 tons/yr

County	Cumulative Point Source 2015 SO_2 Emissions (tons/year)	Nearest Downwind Monitor 2016 Prelim. DV (ppb)	% Reduction in SO_2 Emissions across Point, Nonpoint, Onroad and Nonroad Sectors from NEI Years 2011 to 2014
Allegany	1	Pinnacle, 8	22
Bronx	122	IS52, 11	44
Broome	114	Loudonville, 6	26
Cattaraugus	1	Pinnacle, 8	27
Cayuga	174	E. Syracuse, 4	17
Chemung	390	E. Syracuse, 4	12
Chenango	0	Loudonville, 6	18
Clinton	6	Whiteface Base, 4	22
Columbia	1	Springfield, MA*, 8	18
Cortland	0	E. Syracuse, 4	24
Delaware	59	Loudonville, 6	14
Dutchess	16	Millbrook, 4	18
Franklin	1	Paul Smith's, 3	25
Fulton	1	Piseco Lake, 3	22
Genesee	1	Rochester, 19	25
Greene	7	Loudonville, 6	31
Herkimer	0	Nick's Lake, 4	18
Jefferson	133	Nick's Lake, 4	10
Kings	83	Queens College, 9	32

County	Cumulative Point Source 2015 SO_2 Emissions (tons/year)	Nearest Downwind Monitor 2016 Prelim. DV (ppb)	% Reduction in SO_2 Emissions across Point, Nonpoint, Onroad and Nonroad Sectors from NEI Years 2011 to 2014
Lewis	9	Nick's Lake, 4	24
Livingston	0	Rochester, 19	26
Madison	0	Piseco Lake, 3	22
Montgomery	0	Loudonville, 6	18
Nassau	184	Eisenhower Park, 7	31
New York	370	Queens College, 9	51
Oneida	34	Piseco Lake, 3	27
Onondaga	79	E. Syracuse, 4	66
Ontario	236	E. Syracuse, 4	12
Orleans	0	Rochester, 19	67
Oswego	212	E. Syracuse, 4	26
Otsego	0	Loudonville, 6	23
Putnam	4	Mt. Ninham, 5	17
Queens	254	Queens College, 9	15
Rensselaer	11	Springfield, MA*; 8	25
Richmond	5	Queens College, 9	43
Rockland	163	Mt. Ninham, 5	-26
Saratoga	5	Rutland, VT*; 9	26
Schenectady	28	Loudonville, 6	27
Schoharie	0	Loudonville, 6	16
Schuyler	0	E. Syracuse, 4	95
Steuben	5	Pinnacle, 8	23
Sullivan	36	Mt. Ninham, 5	19
Tioga	0	E. Syracuse, 4	8
Ulster	222	Millbrook, 4	-3
Warren	394	Rutland, VT; 9	9
Washington	38	Rutland, VT; 9	30
Wayne	24	E. Syracuse, 4	45
Westchester	143	Bridgeport Edison Sch, CT;	23
Yates	0	E. Syracuse, 4	62

* The design values for the Rutland,VT and Springfield, MA monitors are from 2015

The following facilities emitted greater that 463 tons/year of SO_2 in 2015:

Table 5: Facilities that emitted >463 tons/year SO_2 in 2015

Facility name	County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons	Rationale for Designation Recommendation
Lafarge Ravena Plant	Albany	5,418	4,582	4,806	Models Attainment
Dunkirk Steam Generating Station	Chautauqua	1,334	951	1,228	See Discussion Below
Huntley Steam Generating Station	Erie	3,218	3,192	1,158	Already designated attainment
International Paper Ticonderoga Mill	Essex	1,042	1,087	1,051	See Discussion Below
RED-Rochester LLC	Monroe	0	10,188	8,784	Models Attainment
Somerset Operating Co. LLC	Niagara	5,723	4,817	1,385	Already Designated Attainment
Globe Metallurgical Inc.	Niagara	633	573	568	Already Designated Attainment
Roseton Generating Station	Orange	120	608	608	Models Attainment
Alcoa	St. Lawrence	2,547	2,490	2,282	To be designated by 12/31/20
Northport Power Station	Suffolk	894	1,693	1,590	Models Attainment
Cayuga Operating Co. LLC	Tompkins	2,655	2,846	1,121	To be designated by 12/31/20
Morton Salt Inc.	Wyoming	1,371	1,373	1,277	See Discussion Below

Dunkirk Steam Generating Station

Dunkirk Steam Generating Station was mothballed in January 2016. DEC recommends an attainment designation for Chautauqua County because the most recent three years of ambient air quality monitoring data at the Dunkirk monitor in Chautauqua County indicates no violations. The design value for Dunkirk monitor was 22 ppb in 2013, 18 ppb in 2014 and 17 ppb in 2015 when Dunkirk Generating Station was operating. The preliminary design value for 2016 is 13 ppb.

International Paper Ticonderoga Mill (IP)

IP is the only point source in Essex County with SO_2 emissions. With 2015 SO_2 emissions of 1,051 tons, it is slightly more than half the threshold of DRR applicability. DEC did not model the impacts from IP because the modeled impact for two large power plants, with emissions more than double those at IP, did not cause or contribute to violations of the 1-hour SO_2 NAAQS in their areas.

- The modeled impact for Huntley Generating Station, which emitted 3,218 tons of SO_2 in 2014, including background (which included Globe Metallurgical Inc.), was only 54.3 ppb[11].
- The modeled impact for Somerset, which emitted 4,817 tons of SO_2 in 2014, including background, was only 42.6 ppb.

[11] See "Revised Designation Recommendation for the 2010 Sulfur Dioxide NAAQS" submitted on 9/18/2015 at http://www.dec.ny.gov/chemical/8403.html

The two closest facilities to IP that emit greater than 100 tons/year (Finch Paper LLC (287 tons in 2015) and Lehigh Northeast Cement Company (107 tons)) are located 50 miles away in Warren County, so DEC does not believe there are any impacts from these facilities extending into the Ticonderoga area.

DEC recommends that Essex County be designated attainment because:

- the monitor in Essex County has a 2016 preliminary design value of 4 ppb,
- the monitor in Rutland, VT (located 26 miles to the southeast from IP) has a design value of 9 ppb,
- emissions from IP will not cause or contribute to violations of the 1-hour NAAQS when compared with modeling from larger sources.

Morton Salt Inc.

Morton Salt is one of four point sources in Wyoming County with SO_2 emissions, and changed from a Title V permit to an Air State Facility permit effective December 5, 2016. Facility emissions have been reduced below major source thresholds following conversion of the coal-fired boiler to a natural gas-fired boiler. A new natural gas 148 MMBtu/hr steam boiler and eight (8) small direct fired building heaters replaced an existing 138 MMBtu/hr coal boiler and an existing 92.5 MMBtu/hr natural gas boiler. The potential to emit of SO_2 emissions from the new sources, alone, is 0.4 tons per year.

The three other point sources in Wyoming County emit 0.34 tons per year SO_2 combined. The nearest operating facility with emissions greater than 100 tons/year that could be impacted by Morton Salt is RED-Rochester, which is located about 55 miles to the northeast. Consequently, DEC does not believe that the potential impacts from emissions from Morton Salt extend to RED-Rochester.

DEC recommends that Wyoming County be designated attainment because the emissions from Morton Salt are too low to cause or contribute to violations of the 1-hour SO_2 NAAQS.

Factors 3 and 4: Meteorology, Geography and Topography

DEC considered meteorological data, geography and topography in the modeling analysis for:

- Eastman Business Park, whose utility infrastructure is powered by Recycled Energy Development (RED)
- Lafarge North America - Ravena
- Roseton Generating Station
- Northport Power Station
- New York City power stations
    - Astoria Generating Station
    - Ravenswood Generating Station
    - Consolidated Edison – 59th Street Station
    - Consolidated Edison – 74th Street Station
    - Consolidated Edison – East River Generating Station

As detailed above and in Appendix A, DEC recommends that Albany, Monroe, New York, Orange, Queens and Suffolk Counties be designated attainment for the 1-hour SO_2 NAAQS because air dispersion modeling conducted around sources with large annual SO_2 emissions and/or sources with the potential for high short-term emissions in these counties indicates no violations of the 1-hour SO_2 NAAQS.

Factor 5: Jurisdictional Boundaries

Pursuant to EPA's March 20, 2015 guidance, county boundaries may be appropriate for defining attainment areas in the absence of any other information that would help define a more specific boundary around the SO_2 source(s) in question. To define more specific boundaries, EPA recommends an evaluation of the five factors, and, in particular, the use of dispersion modeling, as discussed in the modeling TAD, to simultaneously assess multiple factors.

DEC used county boundaries to define attainment areas and considered all five factors, as appropriate.

Designation Recommendations

County	Designation Recommendation	Rationale			
		Monitoring	Modeling	Low Emissions	Special
Albany	Attainment	X	X		
Allegany	Attainment			X	
Bronx	Attainment	X		X	
Broome	Attainment			X	
Cattaraugus	Attainment			X	
Cayuga	Attainment			X	
Chautauqua	Attainment	X			X
Chemung	Attainment			X	
Chenango	Attainment			X	
Clinton	Attainment			X	
Columbia	Attainment			X	
Cortland	Attainment			X	
Delaware	Attainment			X	
Dutchess	Attainment	X		X	
Erie	Already Designated Attainment				
Essex	Attainment	X			X
Franklin	Attainment	X		X	
Fulton	Attainment			X	
Genesee	Attainment			X	
Greene	Attainment			X	
Hamilton	Attainment	X			
Herkimer	Attainment	X		X	
Jefferson	Attainment			X	
Kings	Attainment			X	
Lewis	Attainment			X	
Livingston	Attainment			X	
Madison	Attainment			X	
Monroe	Attainment	X	X		
Montgomery	Attainment			X	
Nassau	Attainment	X		X	
New York	Attainment		X	X	
Niagara	Already Designated Attainment				
Oneida	Attainment			X	
Onondaga	Attainment	X		X	
Ontario	Attainment			X	
Orange	Attainment		X		
Orleans	Attainment			X	
Oswego	Attainment			X	

County	Designation Recommendation	Rationale			
		Monitoring	Modeling	Low Emissions	Special
Otsego	Attainment			X	
Putnam	Attainment	X		X	
Queens	Attainment	X	X	X	
Rensselaer	Attainment			X	
Richmond	Attainment			X	
Rockland	Attainment				
St. Lawrence	To Be Monitored; Designated by December 31, 2020				
Saratoga	Attainment			X	
Schenectady	Attainment			X	
Schoharie	Attainment			X	
Schuyler	Attainment			X	
Seneca	To Be Monitored; Designated by December 31, 2020				
Steuben	Attainment	X		X	
Suffolk	Attainment	X	X		
Sullivan	Attainment			X	
Tioga	Attainment			X	
Tompkins	To Be Monitored; Designated by December 31, 2020				
Ulster	Attainment			X	
Warren	Attainment			X	
Washington	Attainment			X	
Wayne	Attainment			X	
Westchester	Attainment			X	
Wyoming	Attainment				X
Yates	Attainment			X	

Department of Environmental Conservation

REVISED DESIGNATION RECOMMENDATION FOR SULFUR DIOXIDE

Appendix A

Modeling Report

2010 Primary National Ambient Air Quality Standard

January 2017

DIVISION OF AIR RESOURCES
Bureau of Air Quality Planning

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Table of Contents

SO_2 NAAQS Designations Modeling Report

Introduction

On August 21, 2015, the United States Environmental Protection Agency (EPA) promulgated the SO_2 Data Requirements Rule (80 FR 51052) pertaining to the 2010 SO_2 National Ambient Air Quality Standard (NAAQS). The rule requires the characterization of ambient SO_2 air quality in the areas around facilities emitting over 2000 tons of SO_2 per year. Two such facilities in New York were already addressed in the first round of designations. DEC determined that four other facilities exceed the emissions threshold. Two of those four facilities chose to determine the nearby air quality through ambient monitoring. For the other two, DEC used dispersion modeling to characterize the SO_2 impacts. In addition, three other areas were analyzed for SO_2 air quality. These areas contained a source (or sources) that, while not exceeding the annual emissions threshold, have potential for relatively high short-term emissions that could be significant in terms of the 1-hour SO_2 NAAQS.
The following sources were addressed because their annual SO_2 emissions exceed the threshold:

- Eastman Business Park, whose utility infrastructure is powered by Recycled Energy Development (RED) (Rochester, NY)
- Lafarge North America (Ravena, NY)

The following sources were addressed due to their potential for high short-term SO_2 emissions:

- Roseton Generating Station (Newburgh, NY)
- Northport Power Station (Northport, NY)
- New York City power stations (five sites combined)

The purpose of this document is to present the results of the five separate dispersion modeling analyses performed to assess the SO_2 designation status of the areas surrounding the facilities listed above.

The air dispersion modeling methodology used was based on policies and procedures contained in the EPA Guideline on Air Quality Models (40 CFR Appendix W) and the New York State Department of Environmental Conservation's (NYSDEC) Air Quality Modeling Procedures as outlined in DAR-10 / NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis, modified by EPA's *SO_2 NAAQS Designations Modeling Technical Assistance Document* (modeling TAD) where applicable.

Modeling Methodology

The steps taken to conduct the air dispersion modeling analyses are summarized below:

- Compile information on the stack parameters and building dimensions for the facility or facilities;
- Obtain and prepare hourly SO_2 emissions data with associated flow rates and temperatures for the most recent available three year period;
- Develop a comprehensive receptor grid to capture the maximum offsite impacts from the facility;
- Process meteorological data for the appropriate time period using the current versions of the meteorological pre-processor AERMET along with AERMINUTE and AERSURFACE;
- Obtain and prepare appropriate SO_2 background data from the nearest representative ambient monitoring site;
- Complete an ambient air quality modeling analysis using EPA's regulatory dispersion model, AERMOD (Version 15181);
- Summarize the results in tabular format and compare the modeled results to the 1-hour SO_2 ambient air quality standard.

Meteorological Data

For each area modeled, the most appropriate National Weather Service data site was chosen based on proximity and similarity of the wind and weather regime to the modeled site. For facilities modeled using past actual emissions data, three years of meteorological data corresponding to the dates of the actual hourly emissions data were used. For facilities modeled using maximum future potential emissions (RED and Lafarge), the most recent five-year meteorological data sets (2011-2015) were used.

Prior to processing the meteorological data with AERMET, the land use within 1 km of the meteorological tower was analyzed using the AERSURFACE pre-processor (version 13016). AERSURFACE uses land cover data from the National Land Cover Data (NLCD) 1992 database to determine three key surface parameters needed for modeling: surface roughness, albedo, and the Bowen ratio. For this analysis, the 1-km radius circular area centered at the meteorological station site was divided into 12 equal 30-degree sectors. For the Bowen ratio calculations, the land use values can be linked to three categories of surface moisture corresponding to average, wet and dry conditions, depending on the site and meteorological data period. For this analysis, the "average" surface moisture option was used.

The AERSURFACE results were used as input into the AERMET (version 15181) meteorological data processor. Additionally, 1-minute ASOS wind data were processed using the AERMINUTE (version 15272) pre-processor for AERMET.

Site-Specific Modeling Reports

The following sections present the results of the five separate dispersion modeling analyses in this order: RED – Rochester; Lafarge – Ravena; Roseton; Northport; and New York City Power Stations (five sites combined).

RED is currently undergoing a permit modification and Lafarge will soon begin operating under a recent permit modification; both taking steps to reduce their SO_2 emissions. With new/modified permit conditions taking place in the near future, these facilities can take credit for future cleaner operations. Instead of modeling their past actual hourly emissions, each facility was modeled with the maximum hourly SO_2 potential emission rate and five years of meteorological data - as it would be done for permit modeling. The latter three facilities were modeled with three years of their actual hourly SO_2 emissions data matched with three years of concurrent meteorological data and the true stack heights - as required per the SO_2 modeling TAD.

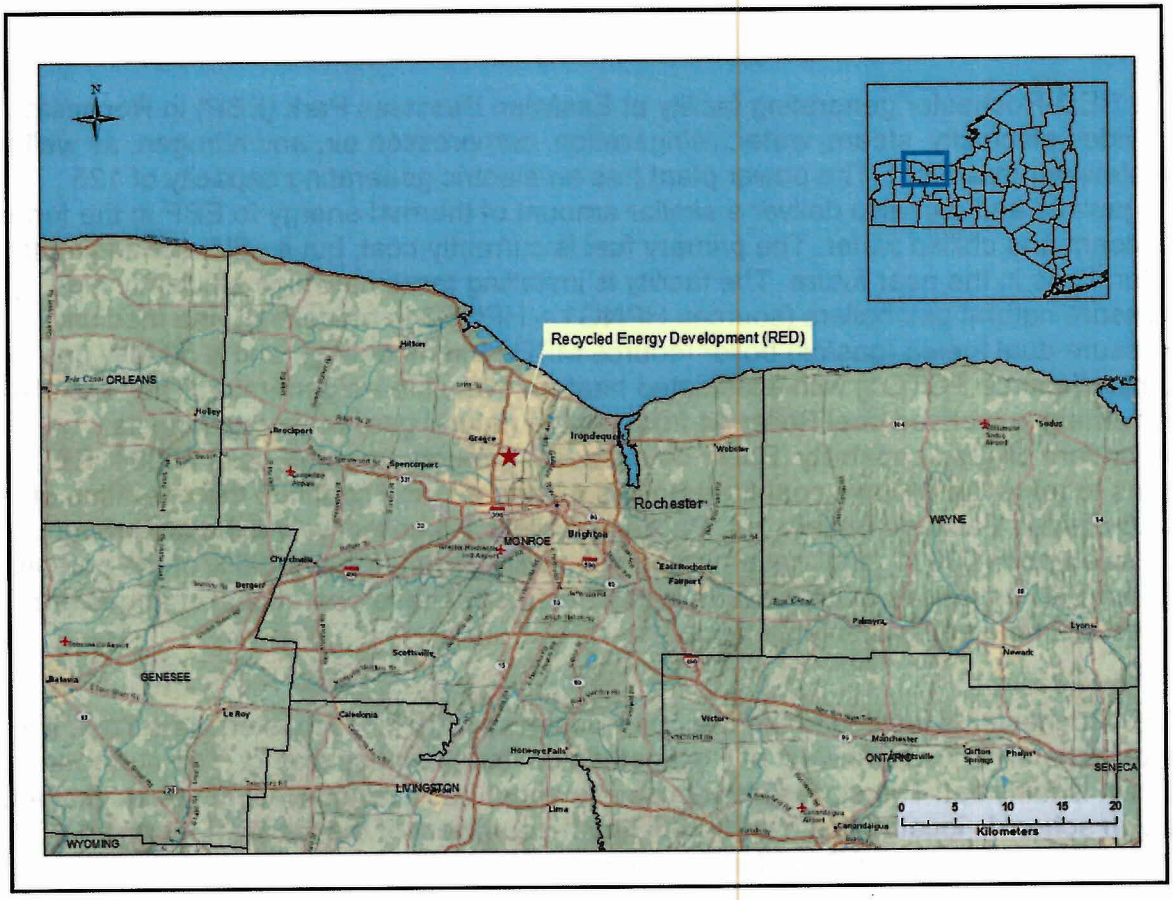
Recycled Energy Development (RED), Rochester, NY

Facility Description

The RED-Rochester generating facility at Eastman Business Park (EBP) in Rochester provides electricity, steam, water, refrigeration, compressed air, and nitrogen, as well as wastewater treatment. The power plant has an electric generating capacity of 125 megawatts and can also deliver a similar amount of thermal energy to EBP in the form of steam and chilled water. The primary fuel is currently coal, but it will be changing to natural gas in the near future. The facility is installing three new high efficiency high pressure natural gas boilers (sources HPNG1 – HPNG3 in modeling), one medium pressure dual fueled (gas/oil) boiler (source MPDF1 in modeling), and a 50 MW gas turbine (source PGTO1) with associated heat recovery steam generator. They are also converting pulverized coal Boiler 44 from coal to natural gas, while retaining its secondary oil fired capability. Boiler 44 exhausts through emission point 00004. RED plans to retire the cyclone coal-fired Boilers 42 and 43, and continue the operation of No.6 oil fired Package Boilers 1-4. Package Boilers 1-4 collectively exhaust through emission point 00001, and that emission point will account for over 98% of the potential 1-hour SO_2 emissions once the plan is implemented. These operational changes are reflected in the emissions table below.

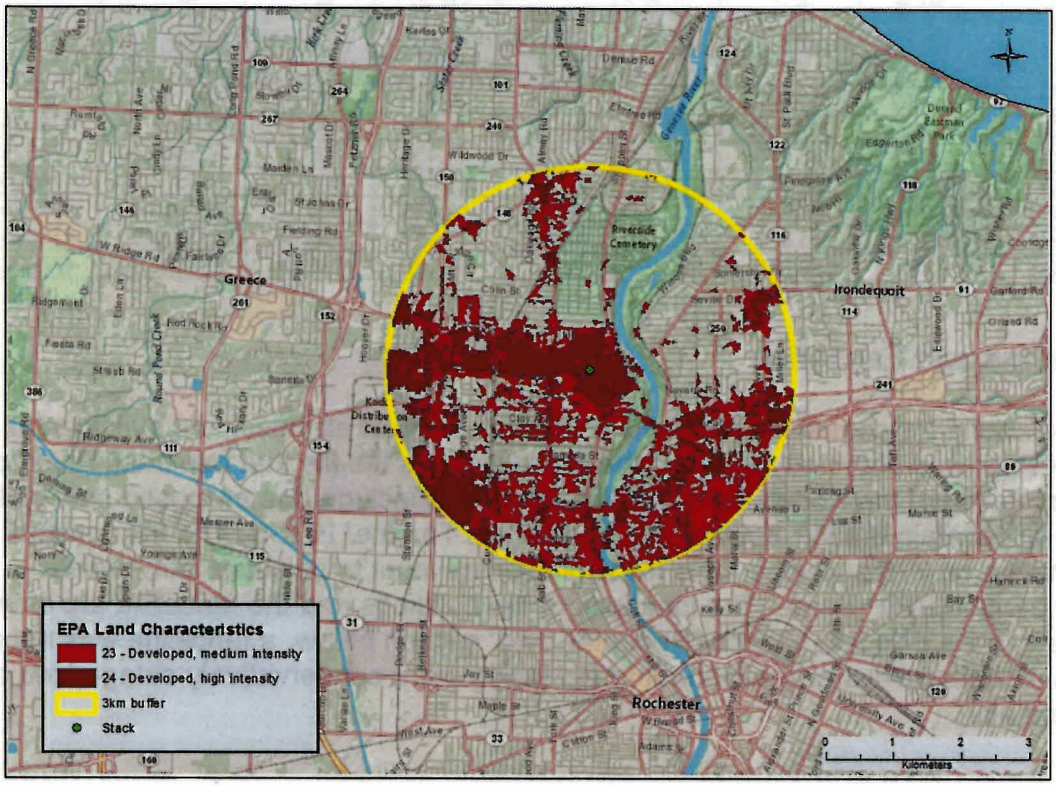
RED-Rochester is located in the Eastman Business Park in Rochester, New York. It is approximately 6 km northwest of Rochester's central business district. The surrounding terrain is fairly flat. The closest residences lie about 250 m southwest of the stacks, and a high school is located just over 500 m south-southwest of the facility. Figure 1-1 shows the location of RED in Monroe County, NY.

Figure 1-1: Location of RED near Rochester, NY



Analysis of the land use within a 3 km radius of the primary source using the National Land Cover Database (NLCD) shows that 33.6% of the area is in the NLCD's "medium" and "high" development categories (Figure 1-2). These categories are generally considered equivalent to the urban land use types specified in the Auer scheme which is referenced in the Guideline on Air Quality Models. Since the urban land use within 3 km is under 50%, it was determined that AERMOD's urban dispersion algorithms are not appropriate for this location, and the modeling was performed using rural dispersion characteristics.

Figure 1-2: EPA Multi-Resolution Land Characteristics within 3 km of RED



Source Parameters and Emission Rates

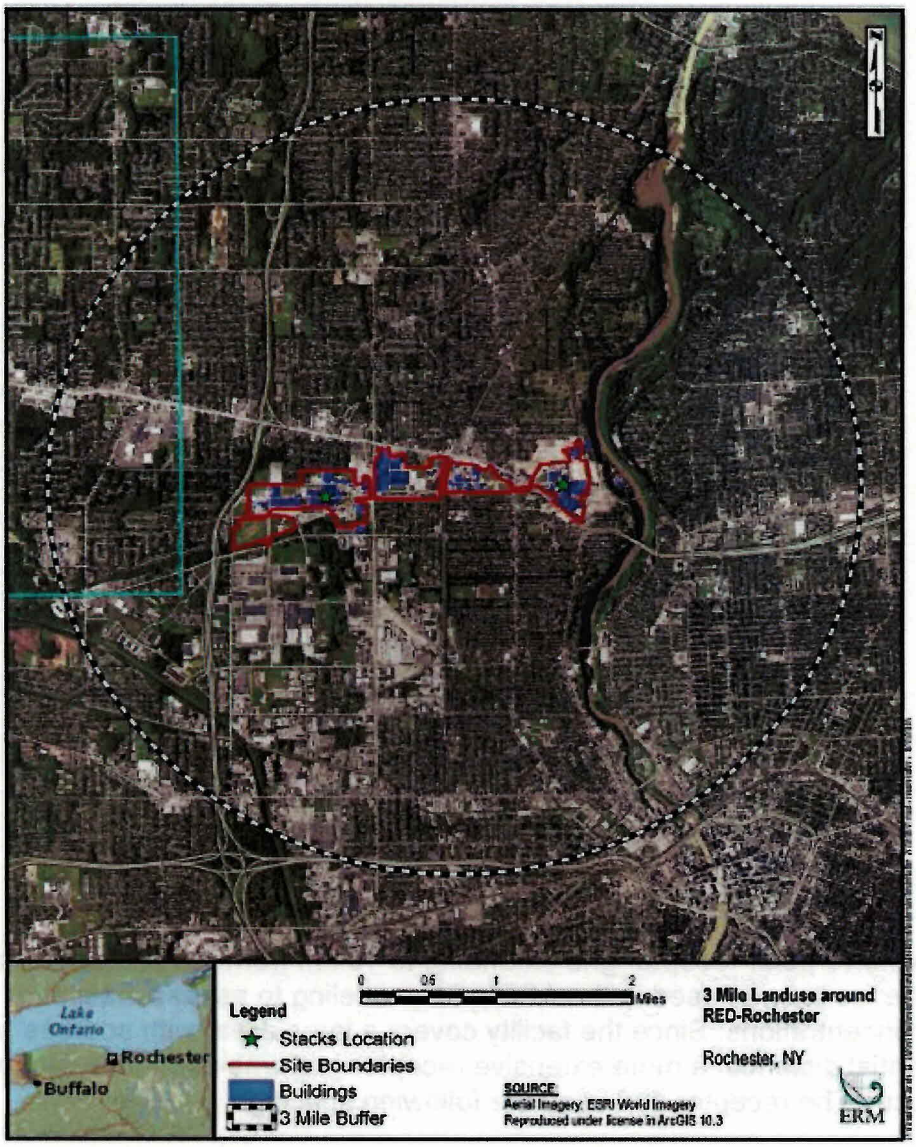
The facility is currently taking steps to increase its supply of natural gas and plans to discontinue the use of coal as a fuel by January 2018. The expected future emissions data was obtained from the permit application, and included in the draft permit noticed on October 26, 2016, by NYSDEC. This dispersion modeling study is based on the expected source parameters and emission rates and five years of meteorological data - as it would be done for permit modeling. The table below shows the source parameters used in modeling. All sources except for 00004 were found to be below their respective GEP heights. Source 00004 was found to be approximately 2 meters taller than GEP height. Therefore, GEP height was used for source 00004 in the modeling analysis, and all of the other sources were modeled with their actual stack heights.

Emission Point	Maximum SO_2 Emission Rate (g/s)	Stack Height (m)	GEP Formula Height (m)	Stack Diameter (m)	Velocity (m/s)	Temp (K)	UTM Easting (m)	UTM Northing (m)
00001	25.9452	111.557	74.39	3.353	2.880	499.82	286195.64	4786327.04
00004	0.1294	124.358	122.23	4.572	5.852	430.37	283356.18	4786253.75
HPNG1	0.0274	36.576	122.23	1.219	41.436	405.37	283500.00	4786256.00
HPNG2	0.0274	36.576	122.23	1.219	41.436	405.37	283513.00	4786256.00
HPNG3	0.0274	36.576	122.23	1.219	41.436	405.37	283526.00	4786256.00
MPDF1	0.051	36.576	122.23	1.219	30.943	422.04	283539.00	4786256.00
PGTO1	0.1429	36.576	122.23	2.743	30.029	389.26	283534.00	4786226.00

Buildings and Fenceline

A pre-existing file containing locations and dimensions of all significant buildings at Kodak Park was obtained for use in the modeling. It is the file that has been used for past modeling of the Kodak Park facilities, altered to include one proposed new building which will contain the HP Boilers, MP Boiler, Gas Turbine/ HRSG. The file contains information on 275 buildings. This file was used as input to calculate downwash parameters in BPIP-Prime. The locations of the buildings and the fenceline are shown in Figure 1-3. As discussed in the "Receptor Grid" section below, a fenceline was not used in this modeling. All areas surrounding the facility were conservatively categorized as ambient air.

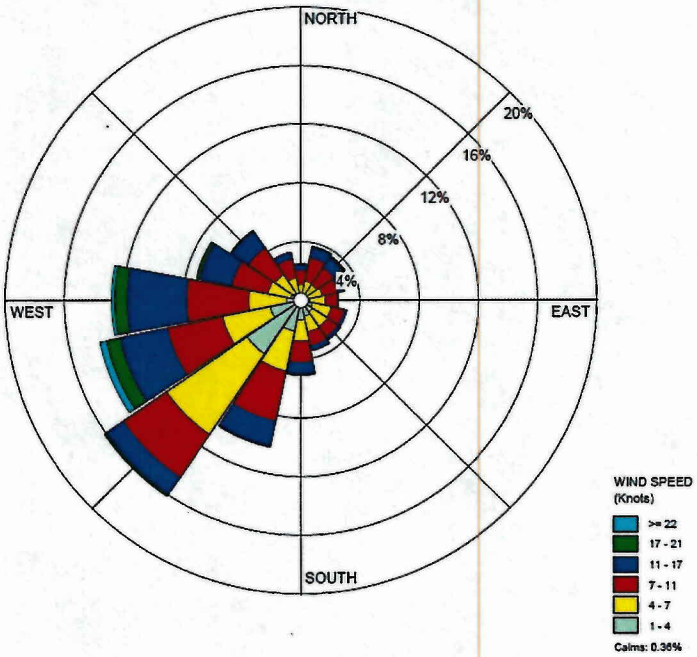
Figure 1-3: Aerial View of RED-Rochester buildings and fenceline



Meteorological Data

The closest and most representative surface weather data for this site is Rochester International Airport. The airport is approximately 8 km south of the facility in an area with similar topography. The upper-air met data set came from Buffalo Airport, which is the closest upper-air observing site. The Rochester wind rose for 2011-2015 period is shown in Figure 1-4.

Figure 1-4: Wind Rose for Rochester International Airport 2011-2015



Receptor Grid

A comprehensive polar receptor grid extending to 10 km from the primary SO_2 emission source at the facility was used in the AERMOD modeling to assess maximum ground-level SO_2 concentrations. Since the facility covers a large area, with sources separated by a substantial distance, a more extensive receptor grid was used than that proposed in the protocol. The receptor grid used the following spacing:

- 100 m spacing from the primary source to 5 km
- 250 m spacing from 5 km to 10 km from the primary source.

The receptors were placed on 36 radials 10 degrees apart, centered on the primary SO_2 emission source at the facility. The base elevation and hill scale parameters for all receptors were assigned using AERMAP (version 11103) based on data obtained from the National Elevation Dataset website. Even though fenceline receptors were originally proposed, they were not used in this modeling. Instead, the entire facility area was conservatively considered ambient air.

Ambient Background Data

Hourly SO_2 data from the Rochester Primary 2 monitor site was used to represent background SO_2 levels in the area of RED-Rochester. This site is located on the southeast side of Rochester, near the I-490/I-590 interchange. The design value from the monitor, defined as the 3-year average of the 99th percentile of the daily maximum 1-hour SO_2, is 19.6 ppb for the period 2012-2014. This background value was added to the predicted facility impact for comparison with the National Ambient Air Quality Standard (NAAQS).

Modeling Results for RED - Rochester

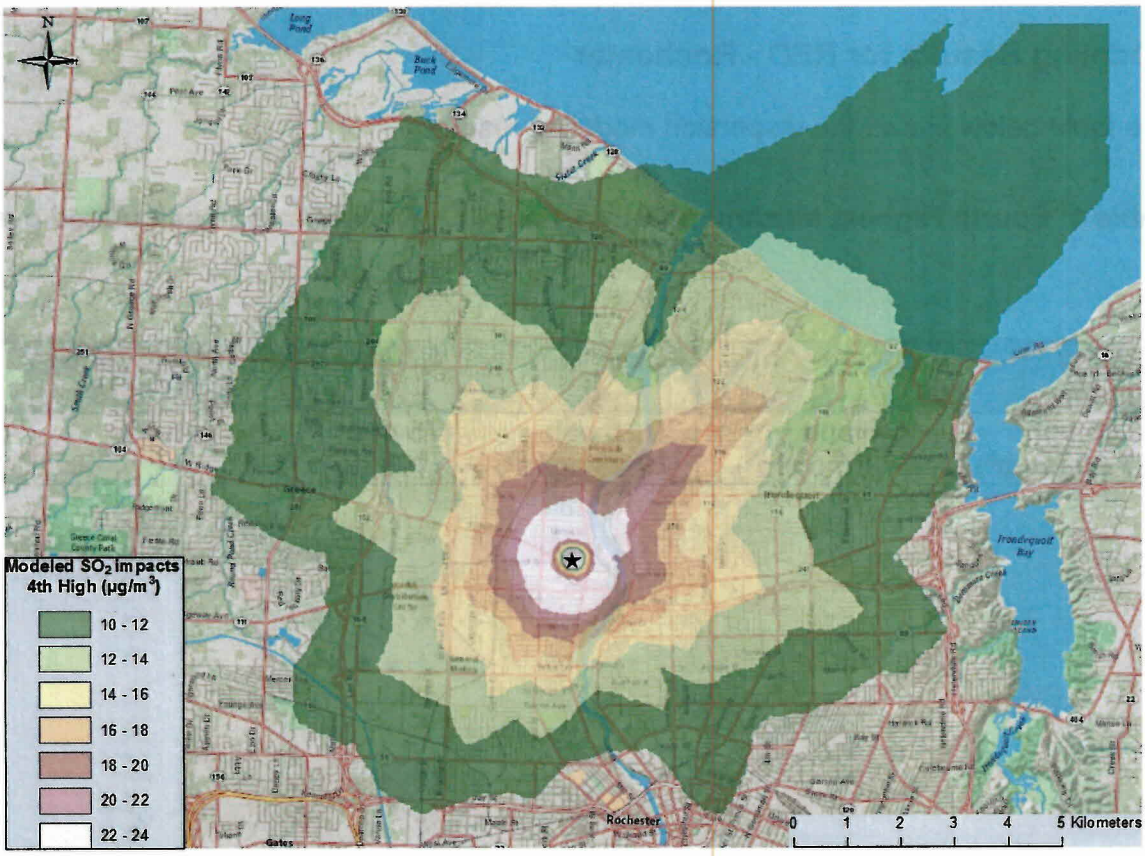
The table below shows the dispersion modeling results.

Table 1: Fourth Highest Maximum Daily 1-hour SO_2 Concentration calculated over 2011-2015 period.

Facility Impact	Background	Total	SO_2 NAAQS	Percent of NAAQS
10.65 ppb (27.90 µg/m^3)	19.6 ppb (51.35 µg/m^3)	30.25 ppb (79.26 µg/m^3)	75 ppb (196 µg/m^3)	40.3%

Figure 1-5 shows the nearby impacts of the facility (not including background) on the 1-hour SO_2 design value over the 2011-2015 period. The highest 1-hour SO_2 impacts occur just north of the northeast corner of the facility's property and are well below the 1-hour SO_2 NAAQS.

Figure 1-5: Modeled Impact of RED-Rochester 1-hour SO_2 design value (2011-2015)



Lafarge North America - Ravena

Facility Description

Lafarge Building Materials, Inc. (Lafarge) is a cement manufacturing facility in the Town of Coeymans, New York (commonly known as the Ravena Plant). The Ravena Plant is located on US Route 9W, approximately 18 km south of Albany, New York (Figure 2-1). Lafarge owns approximately 3,274 contiguous acres east and west of US Route 9W. The site includes the quarry, the cement plant, the conveying system from the plant to the docking and loading facilities on the Hudson River, and a piece of land that is leased to Callanan Industries for its aggregate operation.

Figure 2-1: Geographical location of Lafarge Ravena Plant

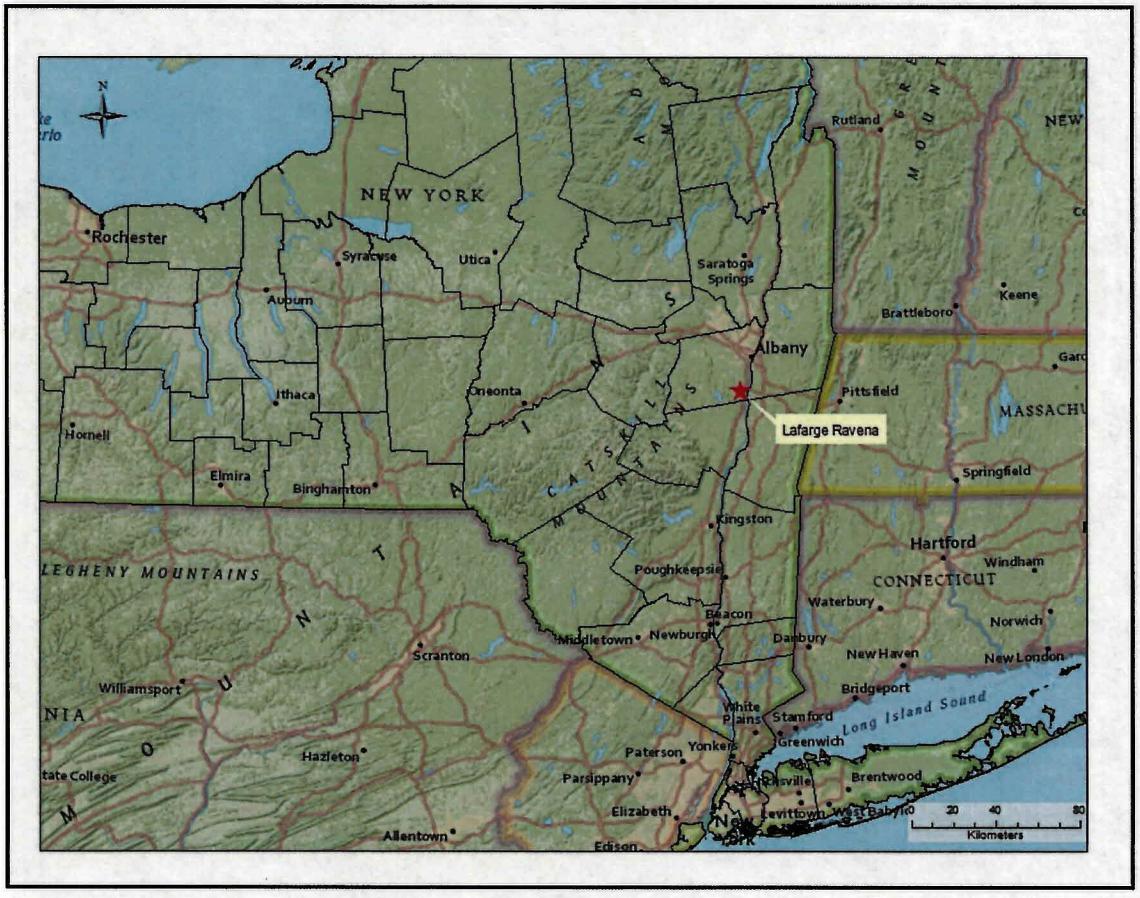
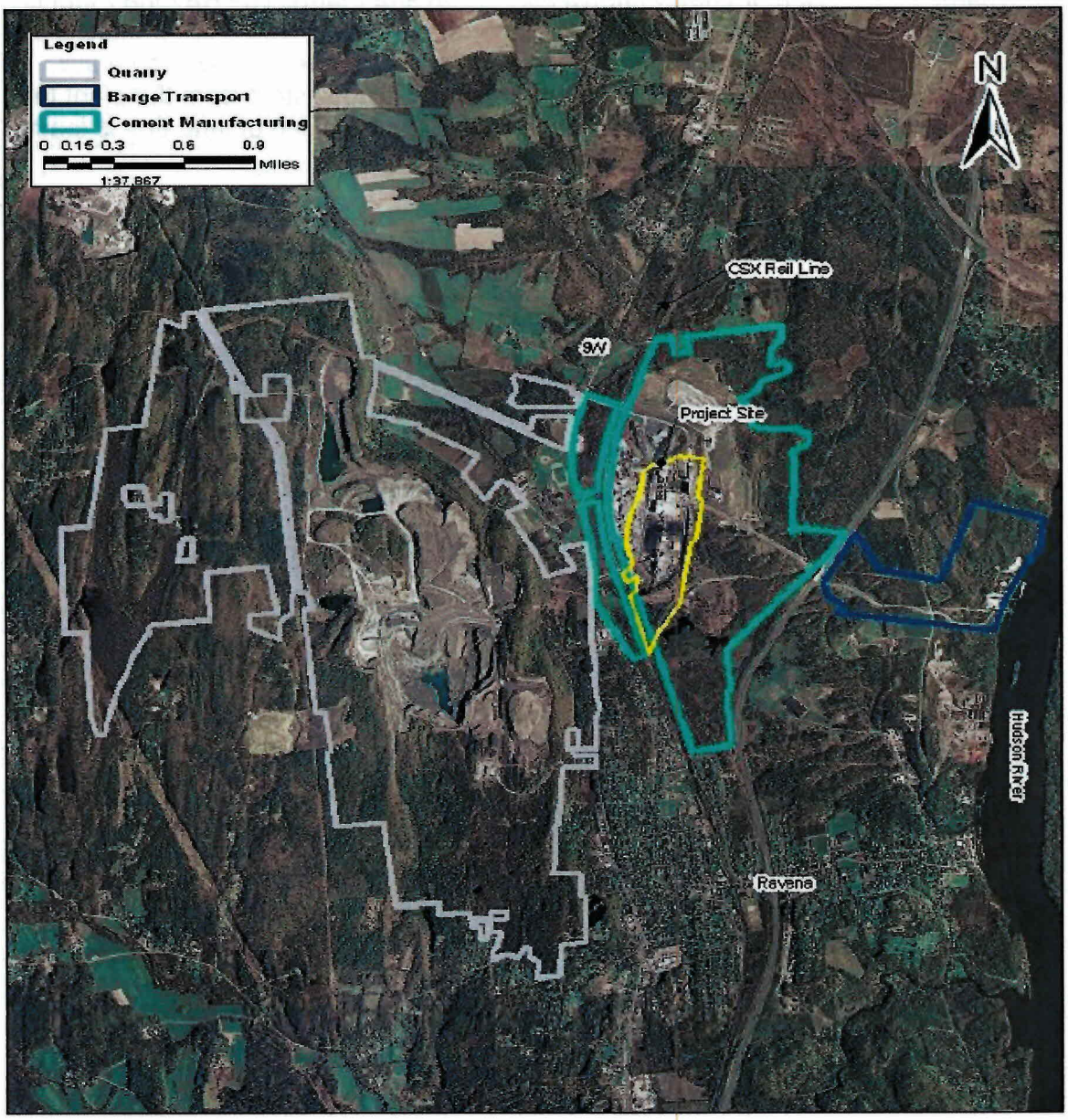


Figure 2-2 shows the facility location on an aerial photograph. An examination of land use within 3 km of the facility showed that the area is predominantly vegetated land, so the use of AERMOD's rural dispersion characteristics was appropriate. The large green outline in Figure 2-2 corresponds to the fenceline used in modeling.

Figure 2-2: Aerial view of the Lafarge Ravena facility



Source Parameters and Emission Rates

Per the SO_2 modeling TAD, air dispersion modeling for SO_2 designation requires three years of hourly SO_2 emission rates, stack flow rates (or exit velocity) and stack temperature. However, the Ravena plant is currently undergoing a modification where the "old" kiln has been removed and is no longer operational, and the "replacement" kiln should be complete and begin operations in Spring 2017. Therefore, DEC modeled Lafarge using federally enforceable permit conditions (i.e. maximum hourly SO_2 potential emission rate) instead of modeling its past actual hourly emissions.

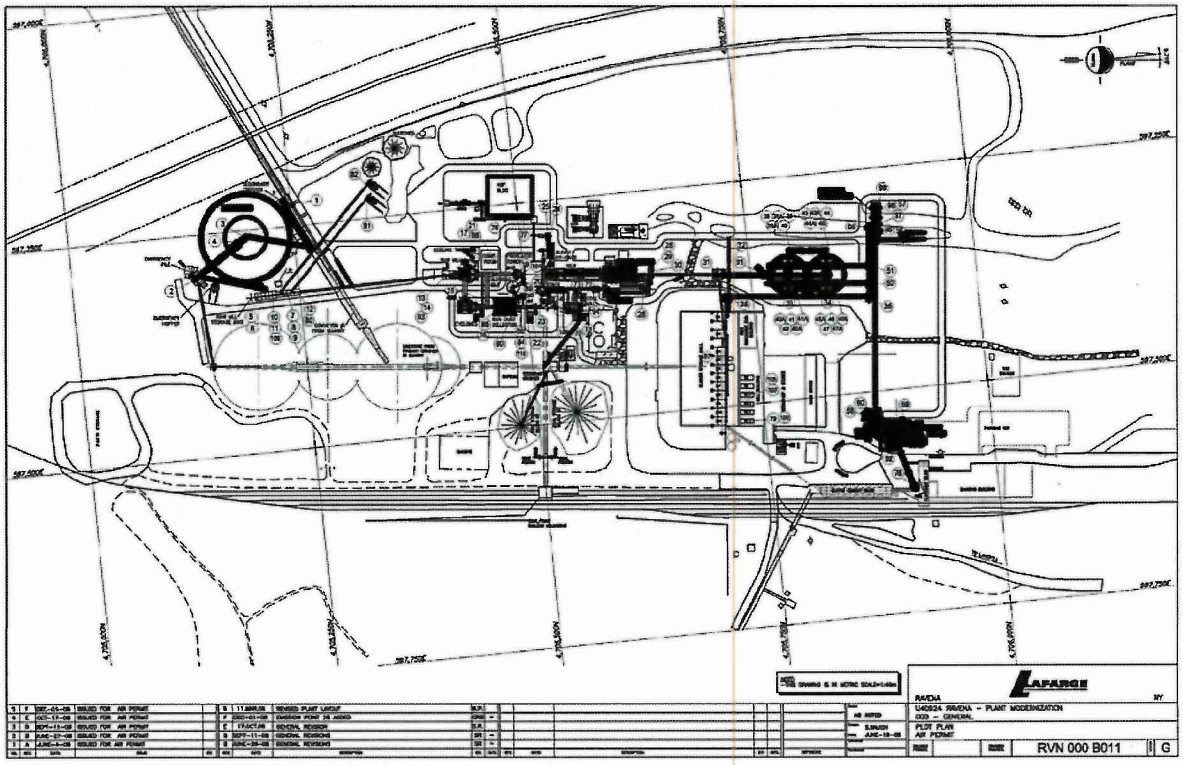
The facility stack parameters were obtained from the modeling report submitted to NYSDEC in 2009, updated with information found in NYSDEC Air Facilities System (AFS) database. The old stack # 42101 was removed from operations and therefore eliminated from the modeling. The table below shows the source parameters used in modeling. Both stacks listed here are lower than the Good Engineering Practice (GEP) - calculated stack heights. As per the 1-hour SO_2 modeling TAD, the actual stack heights were used in modeling.

Emission Point	Description	Maximum SO_2 emission rate (g/s)	Stack height (m)	Stack diameter (m)	Velocity (m/s)	Temp (K)	UTM Easting (m)	UTM Northing (m)
EP23	Kiln/Mill/Cooler#3	16.17	132.9	7.0	16.15	360.3	597.350	4,705.515
EP59	Finish Mill #5	1.46	44.2	3.9	15.77	364.2	597.535	4,705.901

Buildings and Fenceline

Figure 2-3 shows the plant layout of existing and proposed buildings used in the 2009 modeling submitted to NYSDEC. Information on the dimensions and locations of all of the buildings and the facility fence has been provided by the facility. All detailed point source and building dimension parameters were verified and processed through BPIP-Prime program (version 04274) and prepared for use in AERMOD. The fenceline used in this modeling was shown in green in the previous figure.

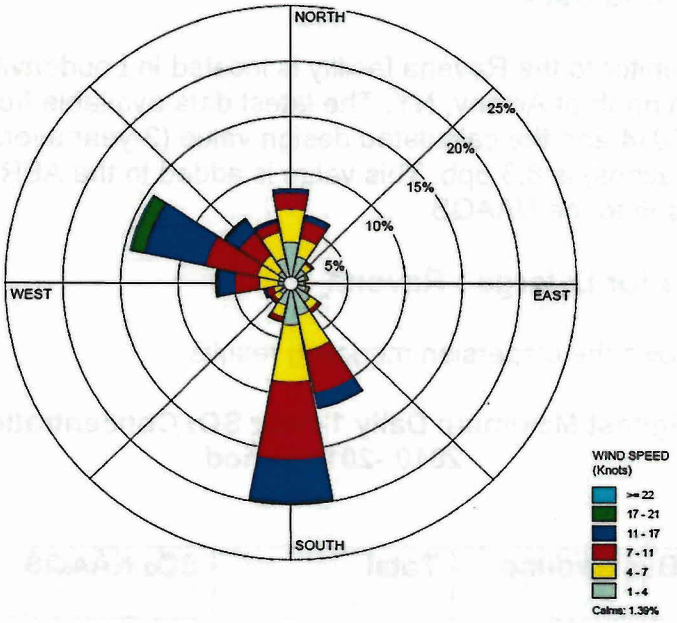
Figure 2-3: Structures and stacks included in Ravena plant GEP analysis



Meteorological Data

The closest and most representative site for both surface and upper-air weather data for the Ravena site is Albany. Albany's surface weather data is measured at Albany International Airport, 29 km north of the facility, and is generally representative of locations near the Hudson River. Southerly winds predominate, partly due to the terrain effects of the Hudson Valley, with west-northwesterly winds also occurring frequently. Upper-air data measurements are based at the Albany National Weather Service office and are representative of the entire area. The most recent available five years of surface and upper data from Albany were used in this study, and the wind rose is shown in Figure 2-4.

Figure 2-4: Wind rose for Albany International Airport (2011-2015)



Receptor grid

A comprehensive polar receptor grid, extending to 15 km from the Ravena facility, was used in the AERMOD modeling. To best capture the maximum ground-level SO_2 concentrations, the receptor grid was designed with the following receptor spacing:

- 100 m spacing extending from the source to 3 km
- 250 m spacing extending from 3 km to 7 km
- 500 m spacing extending from 7 km to 15 km

Receptors were placed on 36 radials 10 degrees apart and the grid was centered on the new kiln, emission source EP23. The base elevation and hill scale parameters for all receptors were assigned using AERMAP (version 11103) based on data obtained from the National Elevation Dataset website.

Ambient background data

The closest SO_2 monitor to the Ravena facility is located in Loudonville, NY, approximately 4 km north of Albany, NY. The latest data available from NYSDEC are for the period 2012 – 2014 and the calculated design value (3-year average of the 99th percentile concentrations) is 8.3 ppb. This value is added to the AERMOD-calculated impact for comparison to the NAAQS.

Modeling Results for Lafarge - Ravena

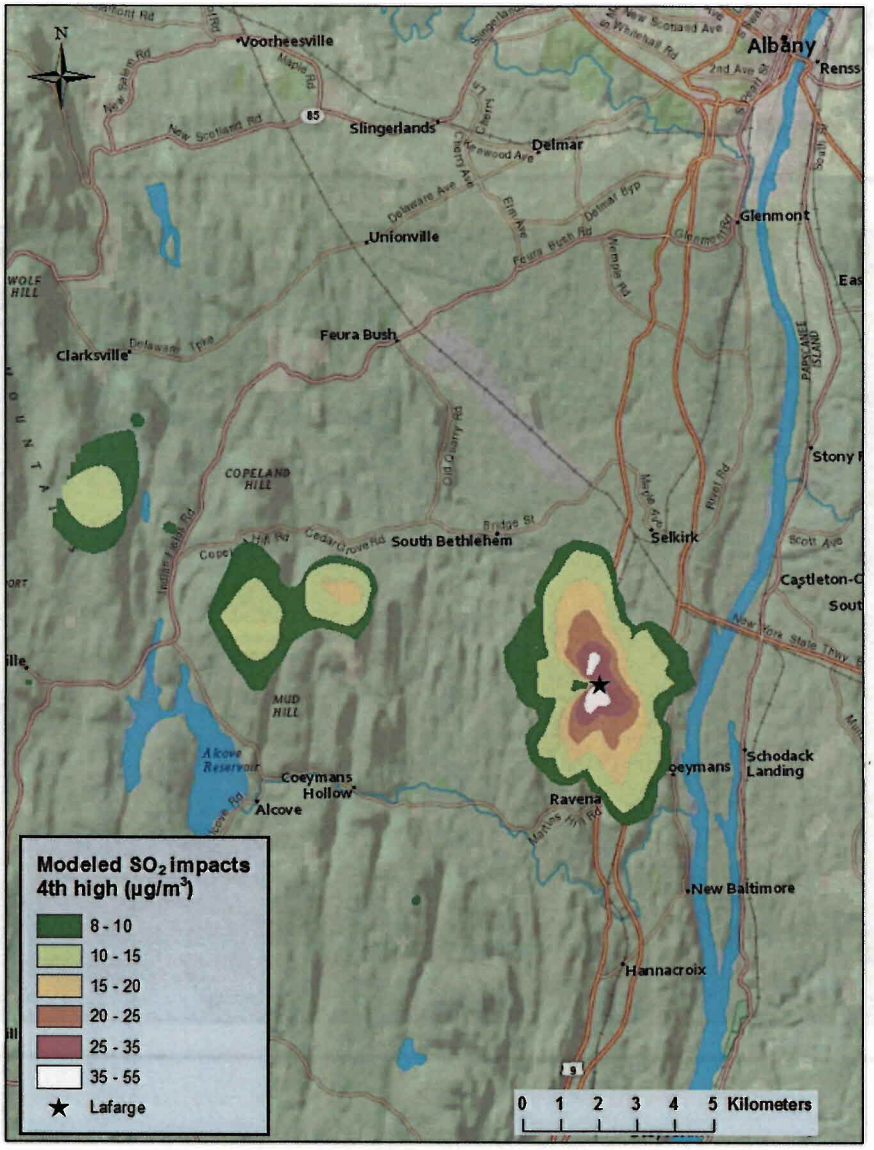
The table below shows the dispersion modeling results.

Table 2: Fourth Highest Maximum Daily 1-hour SO_2 Concentration calculated over 2010 -2014 period

Facility Impact	Background	Total	SO_2 NAAQS	Percent of NAAQS
24.11 ppb (63.18 µg/m^3)	8.3 ppb (21.75 µg/m^3)	32.41 ppb (84.93 µg/m^3)	75 ppb (196 µg/m^3)	43.2 %

Figure 2-5 shows the nearby impacts of the facility (not including background) on the 1-hour SO_2 design value over the 2011-2015 period. The highest 1-hour SO_2 impacts occur to the west of the facility property and are well below the 1-hour SO_2 NAAQS.

Figure 2-5: Modeled Impact of Lafarge 1-hour SO_2 design value (2011-2015)

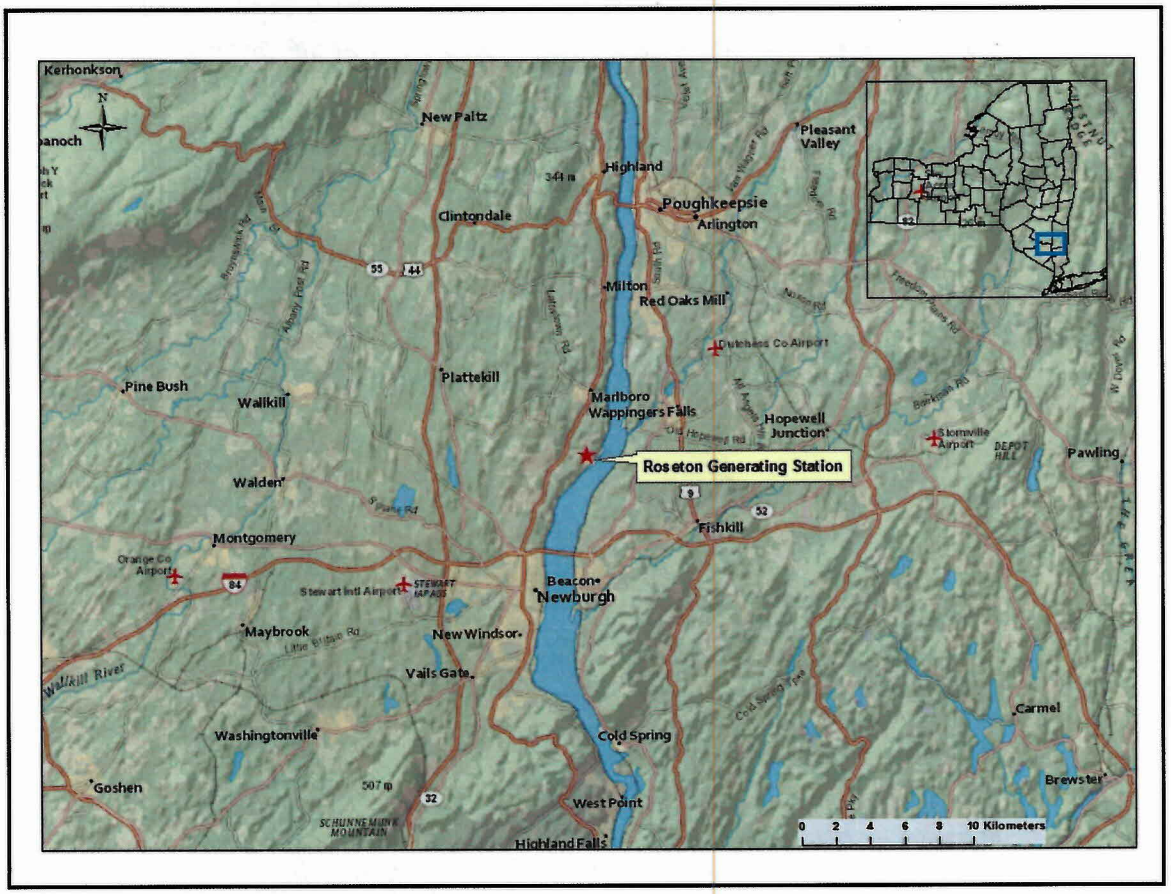


Roseton Generating Station

Facility Description

Roseton Generating Station is located on the west bank of the Hudson River in the Town of Newburgh, New York. It is approximately 8 km north-northeast of the City of Newburgh and 15 km south-southwest of the City of Poughkeepsie. To the northwest of the facility, a ridge rises to elevations of 180 m to slightly over 300 m, at a distance between 6 and 15 km from the facility. To the south-southeast of the facility at a distance of 10.3 km, Mount Beacon rises to an elevation of 491 m. Figure 3-1 shows the location of the Roseton facility.

Figure 3-1: Location of Roseton Generating Station



Roseton Generating Station is a dual fuel fired 1,242 megawatt nameplate facility using tangentially fired Combustion Engineering steam boilers and GE 3600 RPM turbines and is capable of running on both natural gas and fuel oil. There are two stacks, each

79.25 m tall. The stacks have base elevations of 8.2 m and 19.2 m above sea level. The two boiler house buildings are 59.74 m tall. An examination of land use within 3 km of the facility shows that the use of rural dispersion characteristics in modeling is the most appropriate option. The area is predominantly vegetated land, water, and low-density residential and light commercial/industrial uses. An aerial view of Roseton Station vicinity is shown in Figure 3-2.

Figure 3-2: Aerial View of Roseton Generating Station

Source Parameters and Emission Rates

A data file containing actual hourly SO_2 emission rates, flow rates, and temperatures for each stack at the facility was downloaded from EPA's Air Markets Program Data website for the period 2012-2014. The data was processed into the format needed to model hourly varying emissions using AERMOD. The table below shows the stack parameters used in modeling. Both stacks listed here are lower than the GEP stack heights. As per the 1-hour SO_2 modeling TAD, the actual stack heights were used in modeling.

Emission Point	Stack Height (m)	GEP Formula Height (m)	Stack Diameter (m)	Velocity (m/s)	Temp (K)	UTM Easting (m)	UTM Northing (m)
00001	79.248	143.54	7.010	18.288	402.59	585469.26	4602757.77
00002	79.248	154.60	7.010	18.288	402.59	585404.40	4602735.58

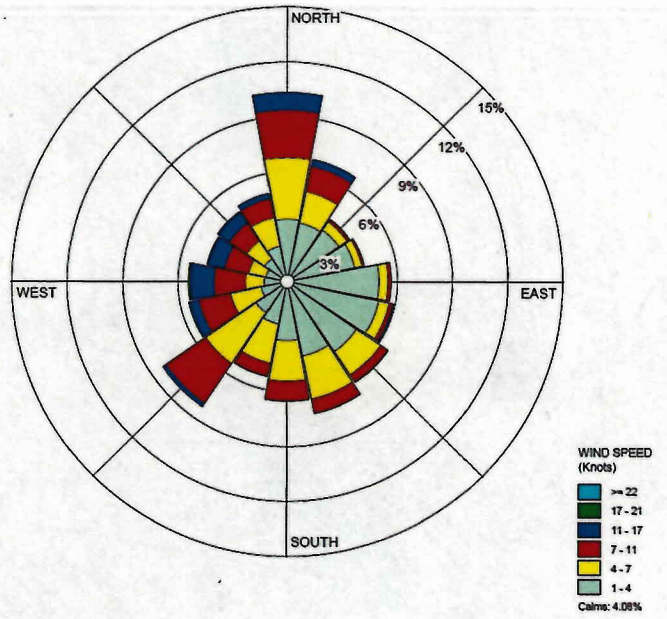
Buildings and Fenceline

The height of the two boiler house buildings was provided to us as 59.74 m. The remaining building dimensions and locations were estimated using Google Earth. The main facility building as well as the two boiler houses were included in the BPIP-Prime analysis used by AERMOD to calculate the effects of downwash. Since the preliminary modeling run indicated that the maximum SO_2 impacts occurred at a considerable distance from the facility property, the fenceline was not included in the modeling analysis.

Meteorological Data

Surface meteorological observations used for the modeling were from Dutchess County Airport in the Town of Wappinger, approximately 9.6 km northeast of the facility. Both the facility and the airport are located at low elevation close to the Hudson River, with similar terrain influences. Upper-air data was from Albany, which is approximately 129 km north of the facility. Albany is the closest and most representative upper-air measurement site. Meteorological data used were concurrent with the emissions data period, 2012-2014.

Figure 3-3: Wind Rose for Dutchess County Airport



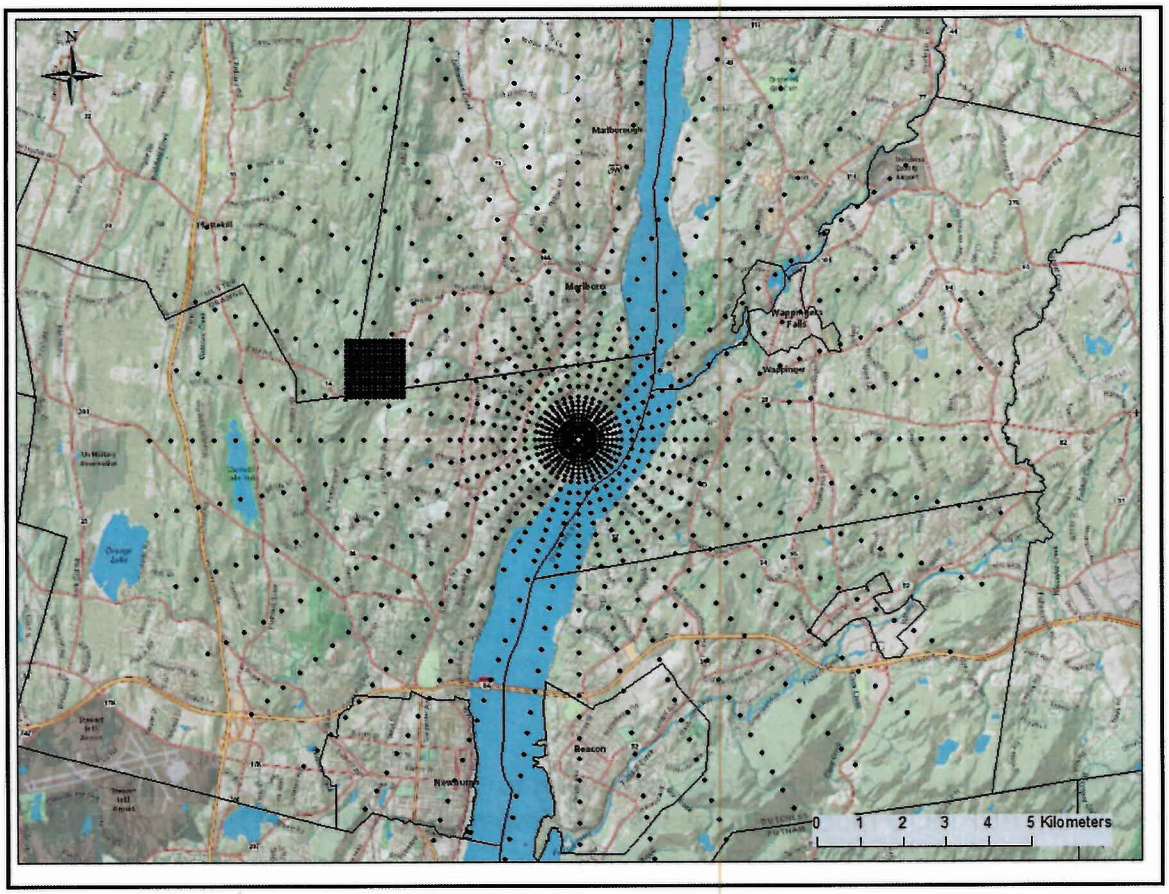
Receptor Grid

A comprehensive polar receptor grid, extending to 10 km from the Roseton Station, was used in the AERMOD modeling to assess maximum ground-level SO_2 concentrations. The grid used the following receptor spacing:

- 100 m spacing from the source to 1 km
- 250 m spacing from 1 km to 3 km
- 500 m spacing from 3 km to 10 km

The receptors were placed on 36 radials 10 degrees apart, centered on the facility. The base elevation and hill scale parameters for all receptors were assigned using AERMAP (version 11103) based on data obtained from the National Elevation Dataset website. After an initial model run predicted maximum impacts to occur in an area with 500 m receptor spacing, a nested grid was added with 70 m receptor spacing in the area of predicted maximum impact and the model was run again. Figure 3-4 shows the two grids set up for this modeling.

Figure 3-4: Receptor grid for Roseton SO_2 modeling



Ambient Background Data

Hourly SO_2 data from the Mount Ninham monitor site in Putnam County was used to represent background SO_2 levels in the area of Roseton Station. Mount Ninham is approximately 24 km southeast of the facility in a rural location. The design value, defined as the 3-year average of the 99th percentile of the daily maximum 1-hour SO_2 concentration, is 6.3 ppb for the period 2012-2014 for the Mount Ninham site. This background value was added to the predicted facility impact for comparison with the NAAQS.

Modeling Results for Roseton Generating Station

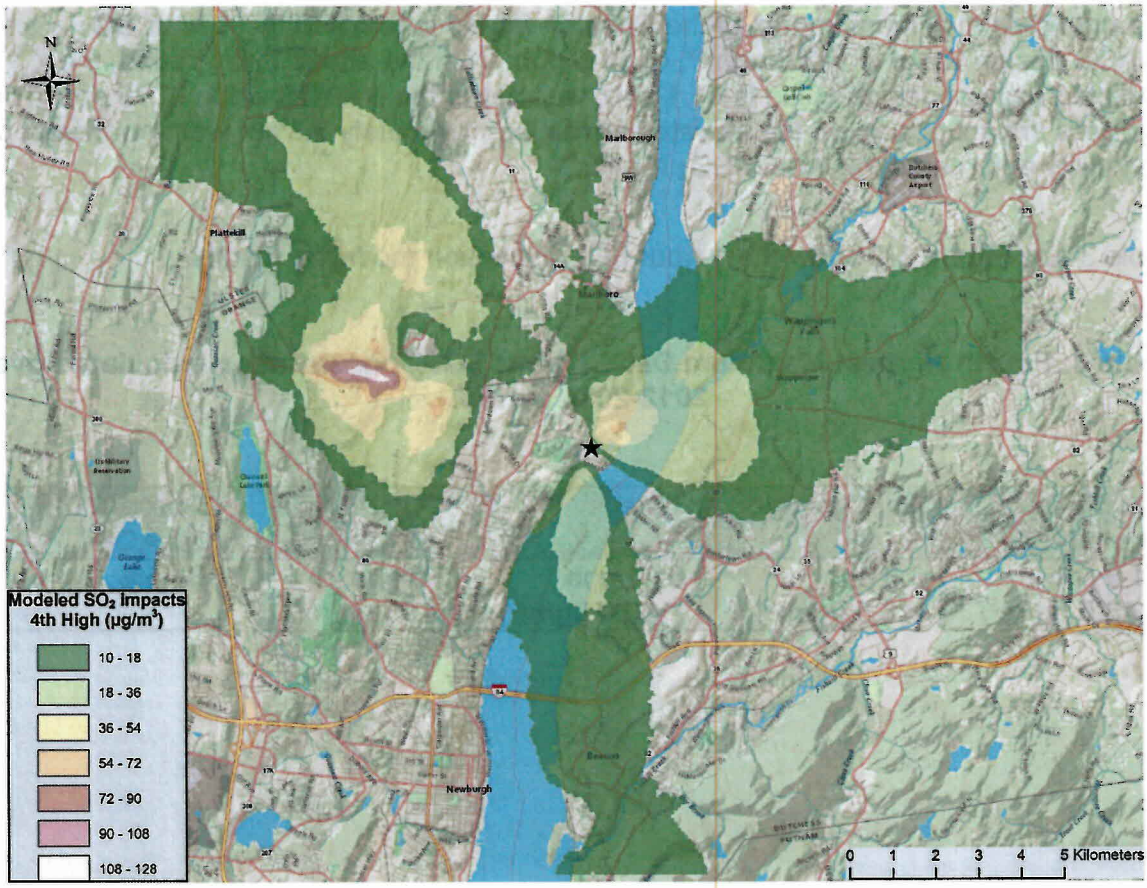
The predicted maximum impact of the Roseton facility in terms of the 1-hour SO_2 NAAQS design value is 143.5 µg/m³, or 54.8 ppb. With the added background, the predicted highest design value is 61.1 ppb, well below the NAAQS value of 75 ppb. This predicted impact occurs on the elevated terrain approximately 5.3 km west-northwest of the facility and meets the 1-hour SO_2 NAAQS.

Table 3 and Figure 3-5 show the 1-hour SO_2 dispersion modeling results.

Table 3: Fourth Highest Maximum Daily 1-hour SO_2 Concentration calculated over 2012-2014 period.

Facility Impact	Background	Total	SO_2 NAAQS	Percent of NAAQS
54.8 ppb (143.5 µg/m³)	6.3 ppb (16.5 µg/m³)	61.1 ppb (160.0 µg/m³)	75 ppb (196 µg/m³)	81.5%

Figure 3-5: Modeled Impact of Roseton 1-hour SO_2 design value (2012-2014)



Northport Power Station

Facility Description

The Northport Power Station is a natural gas and conventional oil electric power generating station located on the north shore of Long Island, at Waterside Avenue & Eatons Neck Road in Northport, New York. Nearby cities are Town of Smithtown (3.6 km), Town of Huntington (14 km) and New York City, New York (77 km). The location of Northport Power Station is shown in Figure 4-1.

The facility has 4 generators operating on natural gas, #1, #2 or #6 fuel oils. Each generator outputs 385 MW of power and vents into its own 600 ft stack. Figure 4-2 is a street-view photograph of the facility.

Figure 4-1: Geographical location of Northport Power Station

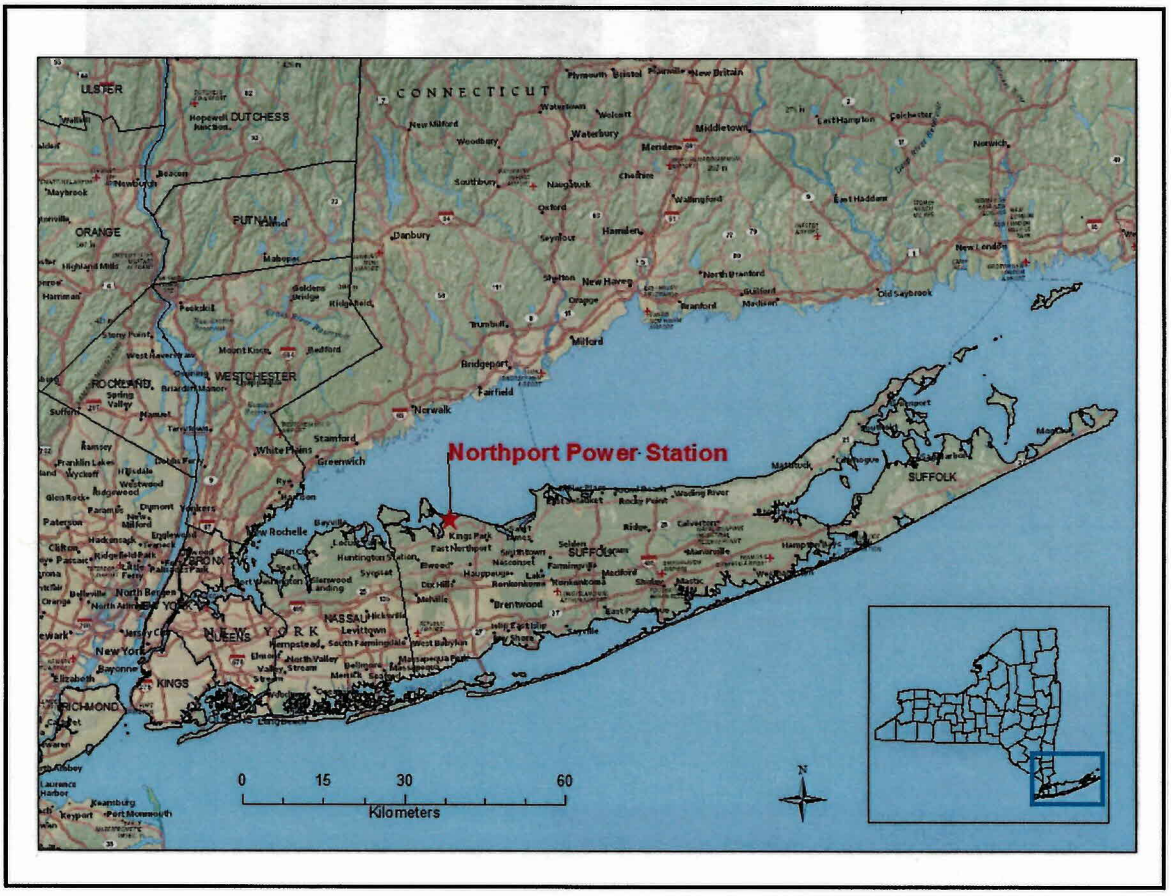


Figure 4-2: Photograph of the Northport Power Station

Source Parameters and Emission Rates

Hourly SO_2 emission rates for the Northport facility were downloaded from the EPA's Air Markets Program Data website for the period 2012-2014. Since the stack exit velocity and temperature were not available on hourly bases they were obtained from NYSDEC Air Facilities System (AFS) database, and assumed constant for each hour of the three year period. The hourly SO_2 emission rate, exit velocity and temperature were converted into appropriate units (g/s, m/s and K respectively) and written into an AERMOD-ready format.

The facility stack heights and diameters were also obtained from the NYSDEC AFS database. All four stacks have the same height (182.88 m) and diameter (5.10 m). These stacks are higher than the GEP-calculated stack heights (148 m). As per the 1-hour SO_2 modeling TAD, for modeling with actual emissions, the actual stack heights were used in modeling.

Buildings and Fenceline

The Northport Power Station buildings and stack locations were verified based on Google Earth images of the facility. The building heights were provided to us as 59.13 m. The locations and heights were processed through the BPIP-Prime program (version 04274) to prepare the building files for input into AERMOD. Structures and stacks included in Northport BPIP-Prime run are shown in Figure 4-3. A fenceline was not used in this modeling analysis, therefore all areas surrounding the facility were conservatively categorized as ambient air.

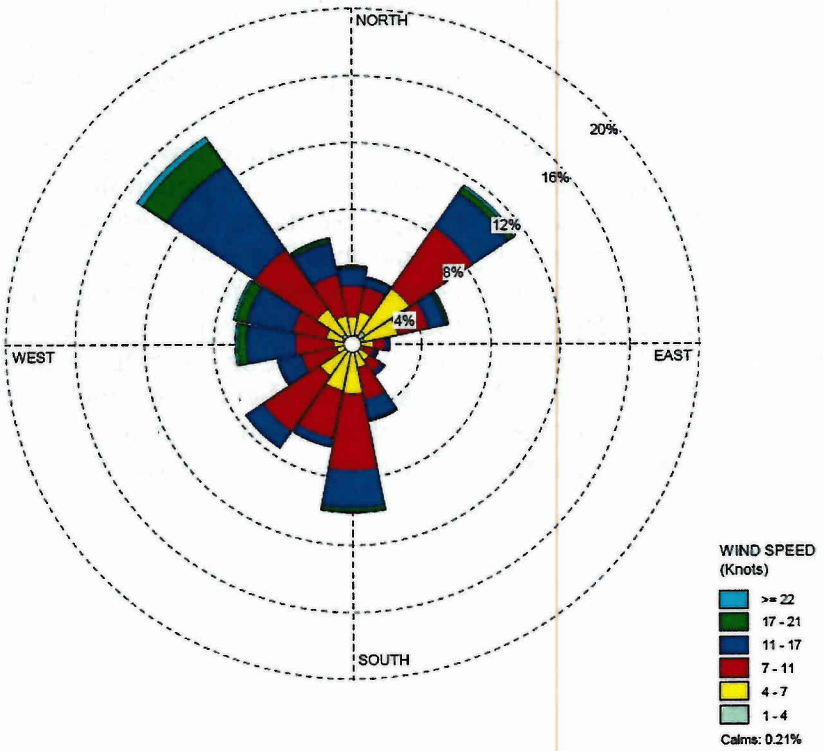
Since the actual stack heights are higher than the GEP stack height, the building downwash calculation would normally not have to be included in the AERMOD dispersion modeling runs. However, as required by EPA, for the SO_2 designation purpose modeling, AERMOD was run with the downwash option turned on.

Figure 4-3: Structures and stacks Included in Northport GEP Analysis

Meteorological Data

Meteorological data for the 2012-2014 period were obtained from LaGuardia International Airport. Note that LaGuardia Airport is not the closest weather reporting station to the Northport facility. However, the closer stations (Islip, Farmingdale, Shirley) are also closer to the south shore of Long Island and therefore experience a different wind regime during spring and summer than locations on the north shore. LaGuardia Airport, due to its proximity to the west end of Long Island Sound, tends to have a wind pattern similar to locations on the north shore of Nassau and western Suffolk Counties. On spring and summer days when sea breeze circulations dominate over synoptic-scale winds, locations along the north shore usually experience northeast or north-northeast wind from Long Island Sound beginning by mid-morning and continuing through about noon. At the same time, stations along the south shore are experiencing a developing onshore wind from the south. By later in the day, depending on the details of the weather pattern and water temperatures, the ocean breeze eventually crosses the entire island, causing winds along the north shore to shift to a southerly direction. Because of this common weather pattern, wind conditions at LaGuardia Airport (Figure 4-4) were deemed to be more representative of the Northport site than closer stations near the south shore.

Figure 4-4: Wind rose for LaGuardia International Airport (2012-2014)



Receptor Grid

A comprehensive polar receptor grid, extending to 10 km from the Northport Power Station was used in the AERMOD modeling to assess maximum ground-level SO_2 concentrations. The receptor grid was set up with following receptor spacing:

- 100 m spacing extending from the source to 2 km
- 250 m spacing extending from 2 km to 5 km
- 500 m spacing extending from 5 km to 10 km

Receptors were placed on 36 radials 10 degrees apart and the grid centered on the stack #2 emission source. The base elevation and hill scale parameters for all receptors were assigned using AERMAP (version 11103) based on data obtained from the National Elevation Dataset website. An examination of land use within 3 km of the

facility showed that the use of rural dispersion characteristics in AERMOD modeling was the most appropriate option.

Ambient Background Data

The closest SO_2 monitor to Northport facility is located in Holtsville, NY. The design value (3-year average of the 99th percentile concentrations) for the period 2012-2014 was 10.9 ppb. This value was added to the AERMOD-calculated impact and compared to the NAAQS.

Modeling Results for Northport Power Station

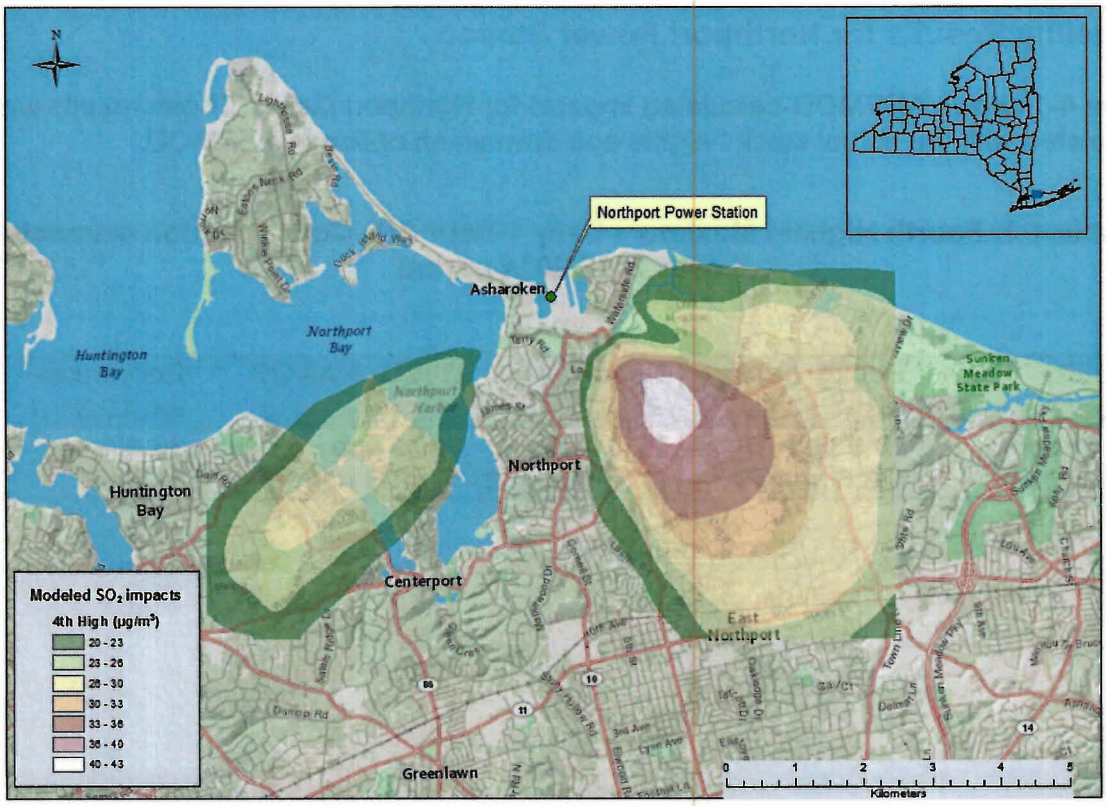
Table 4-1 shows AERMOD-calculated impacts for Northport facility. These results were calculated with the actual stack heights and downwash option in AERMOD.

Table 4-1: Fourth Highest Maximum Daily 1-hour SO_2 Concentration calculated over 2012-2014 period

Facility Impact	Background	Total	SO_2 NAAQS	Percent of NAAQS
16.41 ppb (43 µg/m^3)	10.9 ppb (28.6 µg/m^3)	27.31 ppb (71.56 µg/m3)	75 ppb (196 µg/m^3)	36.4%

Figure 4-6 shows the calculated impacts of the facility (not including background) on the 1-hour SO_2 design value over the 2012-2014 period. The greatest fourth-high impacts occur to the southeast of the facility property and meet the 1-hour SO_2 NAAQS.

Figure 4-6: Modeled Impact of Northport Station 1-hour SO_2 design value (2012-2014)



New York City Power Stations

This part of the report describes a cumulative dispersion modeling analysis performed for the following five facilities:

- Consolidated Edison - 59th Street Station
- Consolidated Edison - 74th Street Station
- Consolidated Edison - East River Generating Station
- Astoria Generating Station
- Ravenswood Generating Station

Figure 5-1 shows the geographic locations of the five electric generating stations. While none of these facilities individually exceeds the annual emissions threshold of SO_2, they each have a potential for relatively high short-term SO_2 emissions. Dispersion modeling was done to examine if their cumulative impact was significant in terms of the 1-hour SO_2 NAAQS. Actual hourly SO_2 emissions data for three years (2013-2015) were obtained for all but one of the above listed facilities. For the 59th Street Consolidated Edison station, the maximum hourly emission was used in the modeling analysis. The emissions data were processed into AERMOD-ready format and matched with 3 years of concurrent meteorological data from LaGuardia airport. Following the modeling TAD, actual stack heights were used for all sources regardless of their GEP stack height.

Figure 5-1: Geographical Locations of the five generating stations

Facility Descriptions

Consolidated Edison - 59th Street Station

This facility is located on the west side of Manhattan and the east bank of the Hudson River at 850 12th Ave (Figure 5-1). It operates two large boilers each rated at 805 MMBtu/hr; three smaller boilers rated at 180 MMBtu/hr each and one 220 MMBtu/hr combustion turbine. The boilers burn residual oil as well as natural gas. All boilers are used to generate steam only, and they share the same stack. The combustion turbine burns distillate oil and natural gas and it is used to generate electricity. The facility is prohibited from using any residual oil which has sulfur content greater than 0.30 percent by weight.

Consolidated Edison - 74th Street Station

This facility is located on the east side of Manhattan and the west bank of the East River, between 74th and 75th Streets (Figure 5-1). The facility produces electricity and steam. It operates three very large boilers rated at 836 MMBtu/hr each, six large boilers rated at 180 MMBtu/hr each (192 MMBtu/hr when natural gas fired), and two combustion turbines rated at 223 MMBtu/hr each. The boilers combust residual oil, however, they are also equipped for natural gas ignition and have the capability to combust natural gas. The turbines combust distillate oil only. Emissions from all boilers

and combustion turbines are exhausted through one stack.

Consolidated Edison - East River Generating Station

This facility is located on the east side of Manhattan and the west bank of the East River, at Avenue C and E 14th Street (Figure 5-1). It is about 5 km southwest of Consolidated Edison – 74th Street Station. The facility generates electricity and steam. It operates one 1,930 MMBtu/hr boiler, one 1,982 MMBtu/hr boiler, five 180 MMBtu/hr boilers (192 MMBtu/hr when natural gas fired) and two truncated combined cycle combustion turbine (CT) units (2,054 MMBtu/hr) with heat recovery steam generators (HRSG) (1,332 MMBtu/hr).

The two very larger boilers have the capability to burn residual oil and natural gas, and can fire these fuels alone or together. During the period April 1st through November 14th, the use of fuel oil in these boilers is limited such that 90 percent of the fuel combusted, on a heating value basis, will on average be natural gas during that period. Each of these two boilers exhausts through its own separate stack (emission points E0060 and E0070 in the modeling).

The five smaller boilers also have the capability to burn residual oil and natural gas. The maximum total heat input for these boilers is limited to 900 MMBtu/hr during oil firing and 960 MMBtu/hr during natural gas firing. All five smaller boilers exhaust through one stack (emission point E0001 in modeling).

The two CT units can fire natural gas and low sulfur distillate oil (during an emergency and up to 16 hours per year per generator). Their associated HRSGs are equipped with duct burners and only fire natural gas. One CT and its associated HRSG exhaust through the same stack as the five smaller boilers (emission point E0001). The other CT and its associated HRSG exhaust through a different stack (emission point E0002 in the modeling).

Astoria Generating Station

This facility is located on the east bank of the East River in the Borough of Queens (Figure 5-1). The Astoria Generating Station, with a total electric generating capacity of approximately 1,315 MW, consists of four very large boilers that currently operate on No. 6 fuel oil and natural gas; one small boiler, and one simple cycle combustion turbine.

- Boiler 20 is a very large (1,795 MMBtu/hr) Babcock & Wilcox boiler burning only natural gas. Emissions from Boiler 20 are exhausted through one stack (emission point A0020 in the modeling) and limited to 39.5 tons per year of SO_2.

- Boiler 30 is a very large (3,984 MMBtu/hr) Babcock & Wilcox boiler, which has the capability to burn residual oil and natural gas and can fire these fuels in various combinations. Emissions from this boiler are exhausted through two different stacks (emission points A0031 and A0032 in the modeling).

- Boiler 40 is a tangentially fired Combustion Engineering boiler rated at 4,074 MMBtu/hr. It has the capability to burn residual oil and natural gas and can fire these fuels in various combinations. Emissions from this boiler are exhausted through two different stacks (identified as emission points A0041 and A0042 in the modeling).

- Boiler 50 is a very large (4,094 MMBtu/hr) Combustion Engineering boiler, which has the capability to burn residual oil and natural gas and can fire these fuels in various combinations. Emissions from Boiler 50 are exhausted through two different stacks (identified as emission points A00051 and A0052 in modeling).

Ravenswood Generating Station

This facility is located on the east bank of the East River in the Borough of Queens (Figure 5-1). It is about 4 km southwest of the Astoria Generating Station.

Ravenswood Generating Station consists of multiple units employing steam turbine, combined cycle and combustion turbine technology. Units 10 and 20 each have a single controlled circulation, dual furnace, balanced draft, Combustion Engineering boiler and a cross-compound General Electric turbine generator. Each unit is rated at 390 MW.

Unit 30 has two identical controlled circulation, balanced draft, divided furnace boilers by Combustion Engineering and an Allis Chalmers/Westinghouse cross-compound turbine generator that produces 972 MW of power.

The boilers in Units 10, 20 and 30 are all capable of burning both No. 6 fuel oil and natural gas. Emissions from Unit 10, 20 and 30 are exhausted through separate stacks (respectively identified as emission points R0010, R0020 and R0030 in the modeling).

Combined cycle technology was added to Ravenswood with the installation of Unit 40, with a nominal generating capacity of approximately 250 megawatts, in 2002. Unit 40 consists of a General Electric 7FA combustion turbine generator with an ALSTOM steam turbine generator, a Kawasaki heat recovery system generator, and an air-cooled condenser. The combustion turbine is rated at 1,779 MMBtu/hr when firing natural gas (the primary fuel) and 2,028 MMBtu/hr when firing Kerosene (back-up fuel). Emissions from Unit 40 are exhausted through one stack (identified as emission unit R0040 in the modeling).

Figures 5-2 (a - e) show street-view photographs of each facility.

Figure 5-2a: Consolidated Edison - 59th Street Station

Figure 5-2b: Consolidated Edison - 74th Street Station

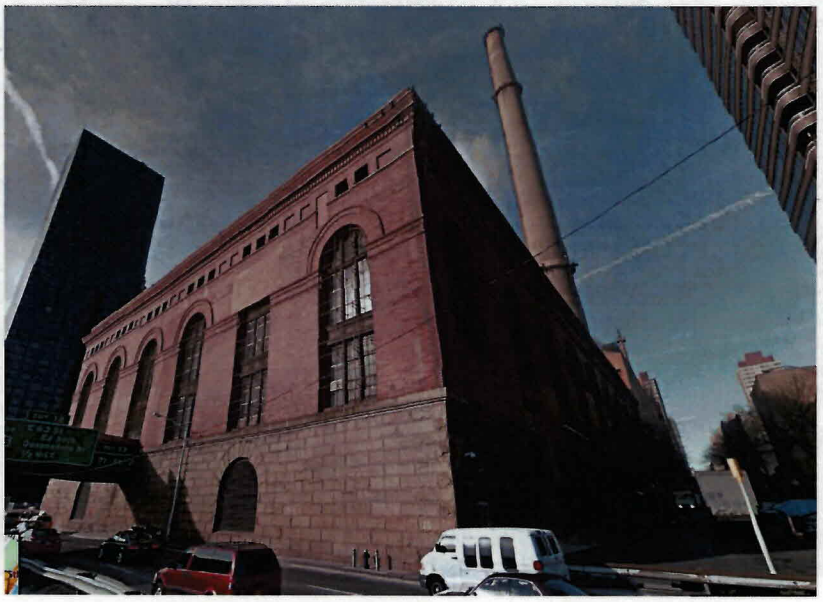


Figure 5-2c: Consolidated Edison - East River Generating Station

Figure 5-2d: Astoria Generating Station

Figure 5-2e: Ravenswood Generating Station

Source Parameters and Emission Rates

Hourly SO_2 emission rates for four stations (74th Street Station, East River Station, Astoria Generating Station, and Ravenswood Generating Station) were downloaded from the EPA's Air Markets Program Data (AMPD) website for the period 2013-2015. Since the stack exit velocity and temperature were not available on an hourly basis, they were obtained from NYSDEC's AFS database, and assumed constant for each hour of the three year period. The data were processed into the format needed to model hourly varying emissions using AERMOD. The stack locations, heights and diameters were also obtained from the AFS database.

The stack emission rate and stack parameters for 59th Street Station were obtained from NYSDEC's AFS database. The SO_2 emission rate was estimated based on the boiler heat rate (found in NYSDEC title V Permit) and the sulfur content within the Number 6 oil. For this calculation, it was conservatively assumed that the facility operated 100% of the time, all year round.

Table 5-1 lists the five facilities and their corresponding emission points (stacks) and parameters used in AERMOD modeling analysis. Several parameters (exit temperature and exit velocity) have been updated since the original June 2016 protocol and confirmed by the NYSDEC regional engineer or the facility engineers. The stack locations were verified through Google Earth images and converted to UTM coordinates to provide higher precision.

Table 5-1: Stack parameters used in cumulative AERMOD modeling analysis of five NYC facilities

Facility Name	Stack Height (Ft)	Emission Diameter (in)	Emission Flow (ACFM)	Exit Temp. (F)	Exit Velocity (FPS)	UTM Coordinate (Easting)	UTM Coordinate (Northing)	Emission Point ID
59TH ST STA	507	198	782510	370	61	585144.18	4513862.51	F5901
74TH ST STA	494	192	1346067	363	112	588537.0	4513537.0	S0012
CON ED- EAST RIVER GENERATING STATION	370	258	599270	360	28	586764.0	4509010.0	E0001
	368	255	647843	292	29.5	586731.0	4509028.0	E0002
	370	180	690424	325	33	586664.59	4509065.38	E0060
	370	180	700196	315	66	586617.5	4509088.0	E0070
ASTORIA GENERATING STATION	299	164	1056203	270	120	591683.66	4515663.90	A0020
	299	168	663270	270	71	591716.79	4515702.22	A0031
	299	168	663270	270	71	591723.55	4515708.38	A0032
	299	168	667941	280	72	591797.27	4515790.06	A0051
	299	168	667941	280	72	591802.83	4515796.24	A0052
	299	168	681953	280	73	591761.82	4515751.29	A0041
	299	168	681953	280	73	591768.89	4515757.13	A0042
RAVENSWOOD GENERATING STATION	400	222	1213877	283	75	589040.11	4512706.84	R0040
	499	160	1327299	260	158	588958.16	4512514.77	R0010
	499	162	1360000	260	158	588989.30	4512572.75	R0020
	499	282	2925000	270	112	589032.38	4512621.10	R0030

Buildings and Fencelines

The five electric generating facilities selected for the cumulative modeling analysis are located relatively close together, within the urban area of New York City, and they all have tall stacks. Since none of these facilities individually emits enough SO_2 to cause an exceedance of the 1-hour standard, their cumulative impact was determined to be of primary concern. In order to calculate the most conservative estimate of the cumulative impact of these five facilities, modeling was done without including downwash. To the extent that downwash can even be accurately simulated in the dense urban environment of New York City, its use would tend to cause the model to predict maximum impacts close to each facility. Modeling without downwash will likely allow the plumes from two or more facilities to travel far enough to merge. Since the no-downwash option was determined to be most conservative, this cumulative modeling analysis was done without including buildings or fencelines in calculations.

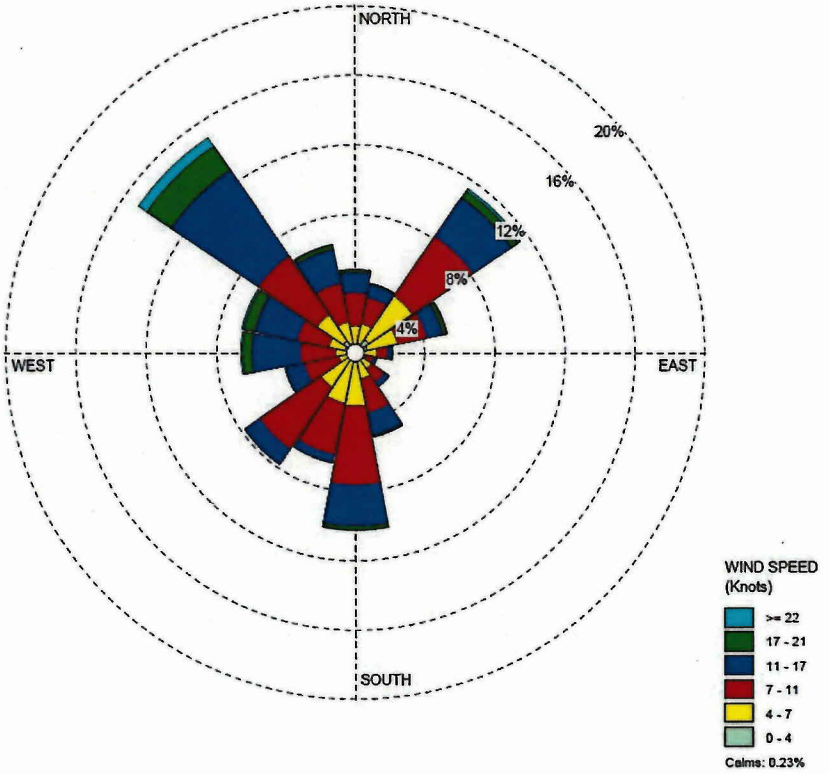
An examination of land use within 3 km of each site showed that the urban modeling option was appropriate. A population of 8,000,000 was used in AERMOD.

Meteorological Data

Three years of surface meteorological data (2013-2015) from LaGuardia International Airport, which is about 3 km east of Astoria Generating Station, was used along with upper air data from Brookhaven/Upton, NY. LaGuardia's location was deemed to provide the best representation of surface wind conditions in the study area. The Central Park weather station, although slightly closer, has winds that are heavily influenced by urban canyon effects. The Brookhaven/Upton upper air site is the closest and most representative site for upper air data.

Figure 5-3 shows a wind rose for the 3 years of meteorological data processed for the modeling analysis.

Figure 5-3: Wind Rose for LaGuardia International Airport (2013-2015)



Receptor Grid

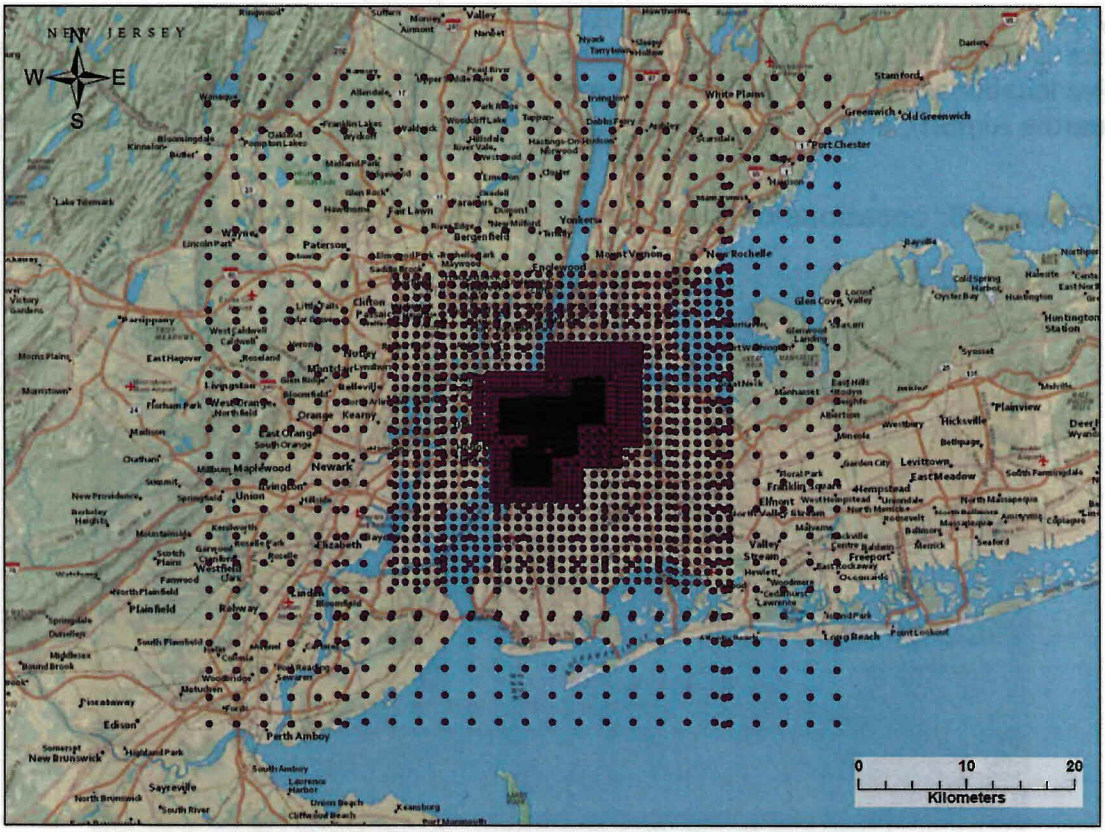
A comprehensive receptor grid, covering an area of approximately 50 km by 50 km was designed for this cumulative impact analysis (Figure 5-4). Each facility had its own Cartesian grid with following spacing:

- 70 m spacing from the source out to 1 km
- 500 m spacing from 1 km to 2.5 km
- 1000 m spacing from 2.5 km to 10 km
- 2500 m spacing from 10 km to 20 km.

After the overlapping receptors were eliminated, the grid had a total of 12,401 receptors. The receptor grid was modified after the modeling protocol was submitted in order to cover a bigger overall area and to refine impact analysis near each facility.

The base elevation and hill scale parameters for all receptors were assigned using AERMAP (version 11103) based on data obtained from the National Elevation Dataset website.

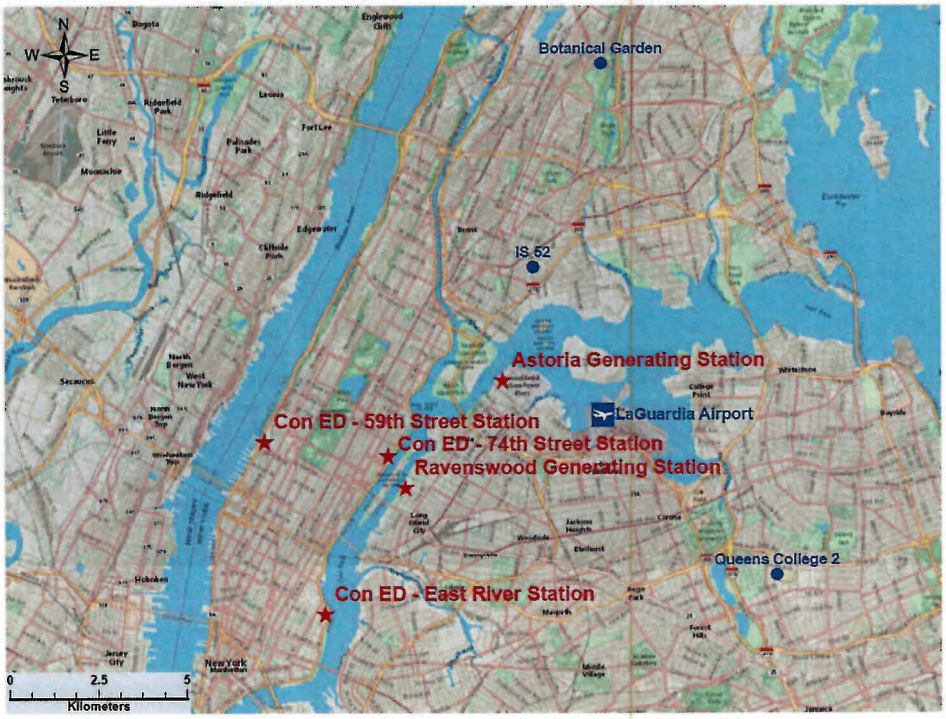
Figure 5-4: Receptor grid for NY City 5 Generating Stations SO_2 modeling



Ambient Background Data

There are three SO_2 monitors relatively close to the five generating station study area. They are Botanical Garden (Pfizer Lab), IS 52 and Queens College 2. The closest monitor is IS 52, about 3.5 km north of Astoria Generating Station. Figure 5-5 shows the relative locations of the five facilities, the meteorological data collection site (at LaGuardia Airport), and the ambient background monitors considered for the modeling.

Figure 5-5: Locations of five facilities, SO_2 monitors and met data station



The SO_2 monitoring design values (defined as the 3-year average of the 99th percentile of the daily maximum 1-hour SO_2 concentrations) were obtained from the New York State Ambient Air Quality Report for 2015 (http://www.dec.ny.gov/chemical/8536.html). The design values for Botanical Garden, IS 52, and Queens College 2 are 15.8 ppb, 14.0 ppb and 11.1 ppb, respectively. To be conservative, the highest background value (from the Botanical Garden) was added to the AERMOD-calculated 1-hour SO_2 impacts and the results compared with the NAAQS.

Modeling Results for five New York City Power Stations

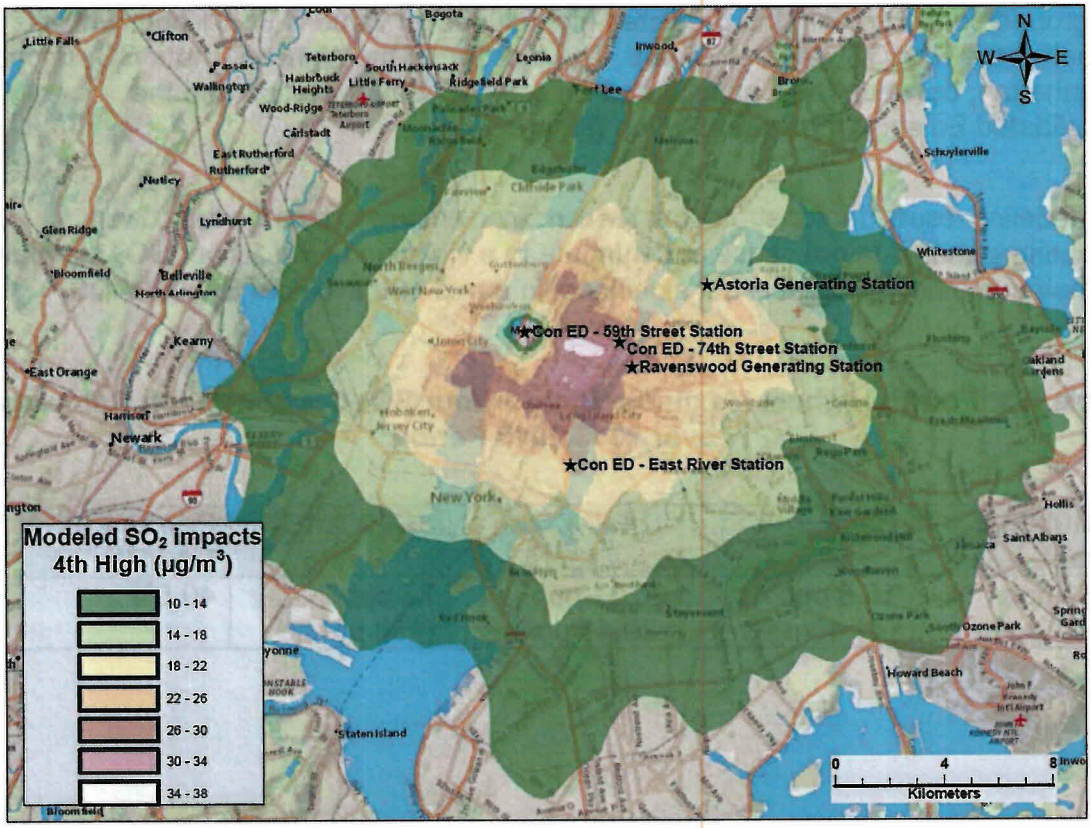
As shown in Table 5-3, the 4th highest maximum model-calculated cumulative 1-hour SO_2 impact of the five generating stations is 14.51 ppb. After adding the ambient background concentration, the predicted highest design value is 30.31 ppb, which is well below the NAAQS value of 75 ppb. The location of the highest 1-hour SO_2 impact is in Manhattan, between the Consolidated Edison-59th Street Station and the Consolidated Edison-74th Street Station (Figure 5-6).

The modeling results demonstrate that the combined emissions from the five power generating stations do not cause or contribute to a violation of the 1-hour SO_2 standard, and their cumulative impact is not significant in terms of the 1-hour SO_2 NAAQS.

Table 5-3: Fourth Highest Maximum Daily 1-hour SO_2 Concentration Calculated over 2013-2015 Period

Cumulative Impact	Background	Total	SO_2 NAAQS	Percent of NAAQS
14.51 ppb (38.01 µg/m^3)	15.8 ppb (41.40 µg/m^3)	30.31 ppb (79.41 µg/m^3)	75 ppb (196 µg/m^3)	40.5%

Figure 5-6: Modeled Impact of NYC 5 Generating Stations on 1-hour SO_2 over 2013-2015



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REVISED DESIGNATION RECOMMENDATION FOR SULFUR DIOXIDE

Appendix B

SO_2 Emissions Trends

2010 Primary National Ambient Air Quality Standard

January 2017

DIVISION OF AIR RESOURCES
Bureau of Air Quality Planning

Albany, NY 12233-3251
P: (518) 402-8396 | F: (518) 402-9035 | dar.sips@dec.ny.gov

www.dec.ny.gov

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Statewide	Point	114,601	66,684	41,738
Statewide	Non Point	74,185	46,674	30,242
Statewide	On Road	1,532	1,402	1,391
Statewide	Non Road	3,385	180	98
	Total	193,703	114,940	73,468

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Albany	Point	10,096	9,821	4,852
Albany	Non Point	2,184	1,590	1,015
Albany	On Road	40	33	32
Albany	Non Road	120	3	1
	Total	12,439	11,447	5,900

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Allegany	Point	0	20	19
Allegany	Non Point	198	122	92
Allegany	On Road	5	7	5
Allegany	Non Road	21	1	0
	Total	225	149	117

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Bronx	Point	198	123	92
Bronx	Non Point	1,571	1,383	729
Bronx	On Road	48	36	37
Bronx	Non Road	58	5	3
	Total	1,875	1,547	860

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Broome	Point	6,351	142	100
Broome	Non Point	1,214	687	505
Broome	On Road	27	20	19
Broome	Non Road	55	2	1
	Total	7,647	850	625

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Cattaraugus	Point	1	1	1
Cattaraugus	Non Point	405	276	200
Cattaraugus	On Road	9	10	9
Cattaraugus	Non Road	40	1	1
	Total	455	287	210

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Cayuga	Point	245	161	166
Cayuga	Non Point	465	268	187
Cayuga	On Road	8	8	8
Cayuga	Non Road	53	1	1
	Total	771	438	362

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Chautauqua	Point	14,412	6,359	980
Chautauqua	Non Point	648	498	284
Chautauqua	On Road	17	15	14
Chautauqua	Non Road	18	2	1
	Total	15,095	6,875	1,279

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Chemung	Point	412	390	381
Chemung	Non Point	442	256	186
Chemung	On Road	10	9	9
Chemung	Non Road	28	1	0
	Total	893	656	576

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Chenango	Point	5	1	0
Chenango	Non Point	456	223	183
Chenango	On Road	5	7	5
Chenango	Non Road	23	1	0
	Total	489	231	189

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Clinton	Point	34	13	8
Clinton	Non Point	869	485	380
Clinton	On Road	9	10	9
Clinton	Non Road	15	2	1
	Total	926	509	398

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Columbia	Point	1	1	1
Columbia	Non Point	602	336	271
Columbia	On Road	8	8	9
Columbia	Non Road	31	1	1
	Total	641	346	282

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Cortland	Point	0	0	0
Cortland	Non Point	283	152	114
Cortland	On Road	7	7	7
Cortland	Non Road	22	1	0
	Total	311	159	121

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Delaware	Point	118	105	86
Delaware	Non Point	497	236	207
Delaware	On Road	6	8	8
Delaware	Non Road	36	1	1
	Total	657	350	302

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Dutchess	Point	40	28	24
Dutchess	Non Point	2,367	1,362	1,120
Dutchess	On Road	31	25	23
Dutchess	Non Road	23	3	1
	Total	2,461	1,418	1,168

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Erie	Point	7,467	4,974	3,762
Erie	Non Point	3,849	2,825	1,821
Erie	On Road	102	68	67
Erie	Non Road	78	8	4
	Total	11,497	7,875	5,653

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Essex	Point	1,056	1,046	1,087
Essex	Non Point	452	250	191
Essex	On Road	6	6	6
Essex	Non Road	39	2	1
	Total	1,553	1,304	1,286

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Franklin	Point	9	6	2
Franklin	Non Point	544	326	245
Franklin	On Road	5	6	6
Franklin	Non Road	31	1	1
	Total	588	338	254

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Fulton	Point	2	2	2
Fulton	Non Point	442	249	193
Fulton	On Road	4	4	4
Fulton	Non Road	10	1	1
	Total	457	257	199

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Genesee	Point	1	1	2
Genesee	Non Point	327	202	148
Genesee	On Road	12	10	11
Genesee	Non Road	41	1	1
	Total	382	214	161

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Greene	Point	2,313	54	6
Greene	Non Point	458	262	209
Greene	On Road	8	7	8
Greene	Non Road	33	1	1
	Total	2,812	324	224

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Hamilton	Point	0	0	0
Hamilton	Non Point	59	34	25
Hamilton	On Road	1	1	1
Hamilton	Non Road	24	2	2
	Total	84	37	28

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Herkimer	Point	0	0	5
Herkimer	Non Point	476	254	201
Herkimer	On Road	9	8	8
Herkimer	Non Road	40	1	1
	Total	525	264	215

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Jefferson	Point	691	33	330
Jefferson	Non Point	935	772	396
Jefferson	On Road	13	14	11
Jefferson	Non Road	87	3	2
	Total	1,725	822	739

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Kings	Point	536	109	75
Kings	Non Point	3,012	1,346	894
Kings	On Road	51	57	58
Kings	Non Road	140	12	6
	Total	3,738	1,524	1,034

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Lewis	Point	27	9	1
Lewis	Non Point	239	128	102
Lewis	On Road	3	5	4
Lewis	Non Road	28	1	1
	Total	297	142	108

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Livingston	Point	0	0	2
Livingston	Non Point	284	179	130
Livingston	On Road	9	8	7
Livingston	Non Road	39	1	1
	Total	333	188	139

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Madison	Point	1	0	0
Madison	Non Point	442	244	189
Madison	On Road	8	8	7
Madison	Non Road	32	1	0
	Total	483	254	197

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Monroe	Point	21,489	4,358	10,246
Monroe	Non Point	4,030	2,529	1,642
Monroe	On Road	82	60	58
Monroe	Non Road	274	8	4
	Total	25,876	6,954	11,950

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Montgomery	Point	0	0	0
Montgomery	Non Point	403	206	169
Montgomery	On Road	9	8	7
Montgomery	Non Road	47	1	1
	Total	459	215	176

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Nassau	Point	176	85	181
Nassau	Non Point	3,393	2,332	1,456
Nassau	On Road	127	137	137
Nassau	Non Road	72	10	5
	Total	3,768	2,563	1,779

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
New York	Point	1,578	1,282	481
New York	Non Point	5,429	4,218	2,177
New York	On Road	45	54	56
New York	Non Road	208	20	11
	Total	7,259	5,574	2,726

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Niagara	Point	5,060	10,763	5,891
Niagara	Non Point	1,101	854	390
Niagara	On Road	19	14	14
Niagara	Non Road	21	2	1
	Total	6,202	11,633	6,296

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Oneida	Point	27	20	40
Oneida	Non Point	1,664	1,068	751
Oneida	On Road	26	21	21
Oneida	Non Road	98	3	1
	Total	1,815	1,112	814

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Onondaga	Point	3,309	1,995	105
Onondaga	Non Point	2,364	1,530	1,070
Onondaga	On Road	53	43	43
Onondaga	Non Road	166	5	2
	Total	5,892	3,573	1,220

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Ontario	Point	222	221	241
Ontario	Non Point	603	358	268
Ontario	On Road	15	13	15
Ontario	Non Road	69	2	1
	Total	909	594	524

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Orange	Point	14,345	4,950	706
Orange	Non Point	1,943	1,259	953
Orange	On Road	46	37	37
Orange	Non Road	27	3	1
	Total	16,360	6,249	1,697

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Orleans	Point	0	1	0
Orleans	Non Point	362	320	100
Orleans	On Road	4	4	5
Orleans	Non Road	29	1	0
	Total	394	326	106

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Oswego	Point	554	407	299
Oswego	Non Point	632	346	252
Oswego	On Road	12	11	12
Oswego	Non Road	47	2	1
	Total	1,246	765	565

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Otsego	Point	0	0	0
Otsego	Non Point	528	315	240
Otsego	On Road	7	8	9
Otsego	Non Road	30	1	0
	Total	565	324	250

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Putnam	Point	1	3	3
Putnam	Non Point	686	422	347
Putnam	On Road	32	14	14
Putnam	Non Road	8	1	1
	Total	727	439	365

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Queens	Point	1,855	939	1,281
Queens	Non Point	2,295	1,471	754
Queens	On Road	78	92	91
Queens	Non Road	103	10	5
	Total	4,332	2,513	2,132

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Rensselaer	Point	154	21	10
Rensselaer	Non Point	964	559	423
Rensselaer	On Road	16	14	13
Rensselaer	Non Road	56	1	1
	Total	1,191	596	447

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Richmond	Point	8	12	5
Richmond	Non Point	943	367	201
Richmond	On Road	20	26	27
Richmond	Non Road	38	3	2
	Total	1,009	409	234

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Rockland	Point	1,723	9	160
Rockland	Non Point	469	252	182
Rockland	On Road	28	33	31
Rockland	Non Road	20	2	1
	Total	2,241	296	374

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Saratoga	Point	16	4	6
Saratoga	Non Point	1,305	813	597
Saratoga	On Road	24	23	22
Saratoga	Non Road	109	3	1
	Total	1,454	842	627

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Schenectady	Point	62	51	45
Schenectady	Non Point	750	468	328
Schenectady	On Road	16	12	12
Schenectady	Non Road	38	1	0
	Total	866	532	386

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Schoharie	Point	0	0	6
Schoharie	Non Point	267	153	122
Schoharie	On Road	6	5	4
Schoharie	Non Road	19	1	0
	Total	292	159	133

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Schuyler	Point	818	911	0
Schuyler	Non Point	118	59	50
Schuyler	On Road	2	3	2
Schuyler	Non Road	13	1	1
	Total	950	973	53

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Seneca	Point	87	29	37
Seneca	Non Point	194	102	79
Seneca	On Road	5	5	5
Seneca	Non Road	37	1	1
	Total	324	138	121

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
St. Lawrence	Point	2,835	2,683	2,525
St. Lawrence	Non Point	890	606	486
St. Lawrence	On Road	9	13	12
St. Lawrence	Non Road	72	2	1
	Total	3,806	3,304	3,024

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Steuben	Point	3	4	3
Steuben	Non Point	551	288	223
Steuben	On Road	15	15	13
Steuben	Non Road	57	1	1
	Total	626	309	239

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Suffolk	Point	8,654	1,708	2,345
Suffolk	Non Point	9,469	5,978	3,104
Suffolk	On Road	208	165	168
Suffolk	Non Road	134	18	10
	Total	18,464	7,869	5,628

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Sullivan	Point	1	44	37
Sullivan	Non Point	608	370	299
Sullivan	On Road	8	10	9
Sullivan	Non Road	36	1	1
	Total	653	425	345

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Tioga	Point	0	0	0
Tioga	Non Point	432	189	174
Tioga	On Road	7	7	7
Tioga	Non Road	22	1	0
	Total	461	196	181

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Tompkins	Point	3,785	10,617	2,854
Tompkins	Non Point	575	369	253
Tompkins	On Road	8	7	7
Tompkins	Non Road	45	1	1
	Total	4,412	10,995	3,115

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Ulster	Point	852	33	231
Ulster	Non Point	1,436	866	694
Ulster	On Road	22	20	19
Ulster	Non Road	55	2	1
	Total	2,365	920	945

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Warren	Point	483	388	427
Warren	Non Point	642	392	285
Warren	On Road	10	9	9
Warren	Non Road	57	2	1
	Total	1,193	791	722

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Washington	Point	136	100	30
Washington	Non Point	544	292	241
Washington	On Road	6	7	6
Washington	Non Road	35	1	0
	Total	720	399	278

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Wayne	Point	0	0	0
Wayne	Non Point	606	386	207
Wayne	On Road	7	8	9
Wayne	Non Road	50	1	1
	Total	663	395	217

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Westchester	Point	210	231	182
Westchester	Non Point	3,933	1,804	1,360
Westchester	On Road	94	94	95
Westchester	Non Road	73	8	5
	Total	4,310	2,137	1,642

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Wyoming	Point	1,314	1,333	1,374
Wyoming	Non Point	201	125	94
Wyoming	On Road	3	4	5
Wyoming	Non Road	35	1	1
	Total	1,553	1,463	1,474

County	Source Category	2008 SO_2 (tons)	2011 SO_2 (tons)	2014 SO_2 (tons)
Yates	Point	826	83	0
Yates	Non Point	136	66	54
Yates	On Road	2	3	3
Yates	Non Road	22	1	1
	Total	986	152	57

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REVISED DESIGNATION RECOMMENDATION FOR SULFUR DIOXIDE

Appendix C

Facilities with SO_2 Emissions in 2015

2010 Primary National Ambient Air Quality Standard

January 2017

DIVISION OF AIR RESOURCES
Bureau of Air Quality Planning

Albany, NY 12233-3251
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Facility	County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons
RED-ROCHESTER LLC AT EASTMAN BUSINESS PARK	MONROE	0.00	10188.49	8713.84
LAFARGE RAVENA PLANT	ALBANY	5418.02	4582.02	4806.02
ARCONIC (ALCOA)	ST LAWRENCE	2547.45	2490.00	2282.93
NORTHPORT POWER STATION	SUFFOLK	893.94	1692.66	1589.53
SOMERSET OPERATING COMPANY LLC	NIAGARA	5722.67	4817.21	1384.84
MORTON SALT INC	WYOMING	1370.71	1372.84	1276.82
DUNKIRK STEAM GENERATING STATION	CHAUTAUQUA	1333.96	951.00	1228.10
HUNTLEY STEAM GENERATING STATION	ERIE	3218.00	3192.00	1158.40
CAYUGA OPERATING COMPANY, LLC	TOMPKINS	2654.87	2845.71	1121.46
INTERNATIONAL PAPER TICONDEROGA MILL	ESSEX	1042.18	1087.06	1051.03
ROSETON GENERATING STATION	ORANGE	119.70	607.80	607.83
GLOBE METALLURGICAL INC	NIAGARA	633.31	572.73	568.14
ANCHOR GLASS CONTAINER CORP	CHEMUNG	399.35	376.65	388.97
TONAWANDA COKE CORP	ERIE	346.03	260.12	336.18
PORT JEFFERSON POWER STATION	SUFFOLK	76.45	367.14	315.54
FINCH PAPER LLC	WARREN	282.83	345.57	286.88
NORTHEAST SOLITE CORPORATION	ULSTER	238.25	230.90	222.14
GUARDIAN INDUSTRIES CORP	ONTARIO	200.31	207.50	207.67
OSWEGO HARBOR POWER	OSWEGO	333.08	265.23	188.10
PVS CHEMICAL SOLUTIONS INC	ERIE	139.29	163.13	183.25
CON ED-EAST RIVER GENERATING STATION	NEW YORK	68.54	164.65	155.98
BOWLINE GENERATING STATION	ROCKLAND	26.64	146.41	151.90
OWENS-BROCKWAY GLASS CONTAINER INC	CAYUGA	143.61	142.04	141.83
BROOKHAVEN LANDFILL CELL 6	SUFFOLK	140.09	151.07	126.87
NORLITE LLC	ALBANY	116.14	118.59	117.20
COVANTA NIAGARA I, LLC	NIAGARA	130.91	225.21	115.49
SUNY AT BINGHAMTON	BROOME	108.43	97.83	114.01
LEHIGH NORTHEAST CEMENT COMPANY	WARREN	68.64	80.44	107.32
DANSKAMMER GENERATING STATION	ORANGE	0.00	18.10	107.00
WHEELABRATOR WESTCHESTER LP	WESTCHESTER	416.05	103.32	93.61
REENERGY BLACK RIVER LLC	JEFFERSON	350.60	258.02	91.70
RAVENSWOOD GENERATING STATION	QUEENS	157.65	295.98	89.25
CON ED-74TH STREET STA	NEW YORK	334.82	75.94	86.03
ASTORIA GENERATING STATION	QUEENS	62.76	218.41	72.73
REVERE SMELTING & REFINING CORP	ORANGE	57.95	70.10	71.33
CEDAR CREEK WPCP	NASSAU	1.55	1.57	63.86
HEMPSTEAD RESOURCE RECOVERY FACILITY	NASSAU	114.68	69.93	60.57
CON ED-59TH ST STATION	NEW YORK	122.52	67.51	58.74
AMPHENOL CORP - AEROSPACE OPERATIONS	DELAWARE	70.13	71.03	58.31
ANHEUSER BUSCH BALDWINSVILLE BREWERY	ONONDAGA	69.16	61.78	55.43
CHAFFEE LANDFILL	ERIE	46.39	45.61	49.24
RAVENSWOOD STEAM PLANT	QUEENS	67.78	62.55	48.70
3M TONAWANDA	ERIE	45.33	47.68	43.99
SENECA ENERGY LFGTE FACILITY	SENECA	34.31	34.43	43.70
EF BARRETT POWER STATION	NASSAU	34.69	77.31	41.95
NYS OGS SHERIDAN STEAM PLANT	ALBANY	0.41	8.61	41.10
INNOVATIVE DANC	JEFFERSON	115.01	61.46	39.48
RIVERBAY CORP-CO-OP CITY	BRONX	4.81	0.68	36.41
SULLIVAN COUNTY LANDFILL	SULLIVAN	37.85	36.36	35.90
WHEELABRATOR HUDSON FALLS	WASHINGTON	22.22	25.62	35.22
NUCOR STEEL AUBURN INC	CAYUGA	30.40	22.52	31.75
BLYDENBURGH ROAD LANDFILL	SUFFOLK	40.54	31.48	31.48
WM ONEIDA HERKIMER RENEWABLE ENERGY FACILITY	ONEIDA	21.34	26.89	28.61
ONTARIO COUNTY LFG TO ENERGY FACILITY	ONTARIO	31.17	32.72	28.40
GE GLOBAL RESEARCH CENTER	SCHENECTADY	18.24	22.66	27.69
CHAUTAUQUA COUNTY LANDFILL	CHAUTAUQUA	25.50	25.99	26.82
FRANKLIN PLAZA APARTMENTS	NEW YORK	29.20	31.64	26.24
BROOKLYN NAVY YARD COGENERATION PLANT	KINGS	7.52	18.25	24.52
HIGH ACRES LANDFILL & RECYCLING CENTER	WAYNE	33.71	28.28	23.80
ASTORIA ENERGY LLC & ASTORIA ENERGY II LLC	QUEENS	13.04	18.41	23.45
THOMAS J WATSON RESEARCH CENTER	WESTCHESTER	24.04	23.91	22.62
PARKCHESTER SOUTH CONDOMINIUM	BRONX	3.23	18.35	22.18
ALBANY LANDFILL GAS TO ENERGY FACILITY	ALBANY	17.88	29.64	21.15
ONONDAGA CO RESOURCE RECOVERY FACILITY	ONONDAGA	25.01	16.08	20.82
TOWN OF COLONIE LANDFILL FACILITY	ALBANY	6.74	29.94	20.69
NYC-DOC - RIKERS ISLAND	BRONX	3.65	15.89	19.62

Facility	County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons
ONE LINCOLN PLAZA CONDOMINIUM	NEW YORK	17.41	17.03	18.45
BABYLON RESOURCE RECOVERY FACILITY	SUFFOLK	30.65	15.38	16.99
INNOVATIVE / COLONIE	ALBANY	14.55	14.69	16.62
BRONX PSYCHIATRIC CENTER	BRONX	15.62	16.45	15.40
MODEL CITY ENERGY FACILITY	NIAGARA	16.55	14.21	14.72
INDEPENDENCE STATION	OSWEGO	11.21	13.26	14.23
MONTEFIORE MEDICAL CTR-111 E 210TH ST	BRONX	7.17	11.02	12.98
MACARTHUR RESOURCE RECOVERY FACILITY	SUFFOLK	21.32	16.16	11.51
US ARMY GARRISON	ORANGE	0.23	0.25	11.34
AMERICAN SUGAR REFINING INC	WESTCHESTER	5.39	9.39	10.95
DUTCHESS CO RESOURCE RECOVERY FACILITY	DUTCHESS	26.92	17.92	10.94
BETHLEHEM ENERGY CENTER	ALBANY	8.39	9.53	10.76
NEW YORK METHODIST HOSPITAL	KINGS	0.18	0.18	10.70
OWENS-CORNING INSULATING SYSTEMS- FEURA BUSH	ALBANY	11.58	11.43	10.52
NYC-HH - KINGS COUNTY HOSPITAL CENTER	KINGS	2.07	7.82	10.09
CORNELL UNIVERSITY MAIN CAMPUS	TOMPKINS	7.57	6.76	9.14
OSWEGO CO ENERGY RECOVERY FAC	OSWEGO	18.35	13.02	9.04
NORTH RIVER WASTEWATER TREATMENT PLANT	NEW YORK	8.64	10.33	8.98
LYONSDALE BIOMASS LLC	LEWIS	10.11	0.38	8.91
NEWTOWN CREEK WASTEWATER TREATMENT PLANT	KINGS	10.45	9.10	8.71
SAINT JOHN'S RIVERSIDE HOSPITAL	WESTCHESTER	14.39	12.93	8.64
NYC-TA CONEY ISLAND YARD	KINGS	0.07	8.49	8.25
HUNTINGTON RESOURCE RECOVERY FACILITY	SUFFOLK	8.37	8.07	8.08
UNITED RIVERHEAD TERMINAL	SUFFOLK	48.12	16.42	8.05
EMPIRE POWER PLANT	RENSSELAER	6.31	6.01	7.35
POLETTI POWER PROJECT	QUEENS	8.35	7.52	6.70
ATHENS GENERATING PLANT	GREENE	56.23	5.72	6.29
PEARL RIVER CAMPUS LLC	ROCKLAND	1.06	8.79	6.12
VALHALLA CAMPUS (GRASSLANDS)	WESTCHESTER	6.42	13.10	5.76
MILL SEAT LANDFILL	MONROE	5.97	5.79	5.74
NY - PRESBYTERIAN HOSPITAL-525 E 68TH ST	NEW YORK	0.77	4.56	5.09
TAM CERAMICS LLC	NIAGARA	6.67	5.28	5.00
BAY PARK SEWAGE TREATMENT PLANT	NASSAU	0.78	9.33	4.99
GLOBALFOUNDRIES EAST FISHKILL FACILITY-HUDSON VALLEY	DUTCHESS	4.97	4.81	4.94
NASSAU ENERGY LLC	NASSAU	9.40	5.32	4.91
CAITHNESS LONG ISLAND ENERGY CENTER	SUFFOLK	4.86	4.85	4.23
OWLS HEAD WASTEWATER TREATMENT PLANT	KINGS	0.56	2.04	4.23
ALBERT EINSTEIN COLLEGE OF MEDICINE INC	BRONX	3.96	6.61	3.91
FORDHAM UNIVERSITY	BRONX	0.67	2.16	3.86
ALGONQUIN GAS SOUTHEAST COMPRESSOR STATION	PUTNAM	3.32	3.48	3.78
LONG ISLAND JEWISH MEDICAL CENTER-QUEENS	QUEENS	4.56	7.58	3.73
BIRD ISLAND STP	ERIE	3.75	3.84	3.69
COGEN CORP-111 LIVINGSTON ST	KINGS	3.12	3.73	3.55
ARTHUR KILL GENERATING STATION	RICHMOND	4.27	3.57	3.44
CLINTON COUNTY REGIONAL LANDFILL	CLINTON	4.14	3.53	3.40
SELKIRK COGENERATION PROJECT	ALBANY	5.25	3.50	3.32
NYC-HH - WOODHULL HOSPITAL	KINGS	0.96	3.06	3.26
AMALGAMATED HOUSING-130 GALE PL	BRONX	1.26	3.14	3.19
SREC BATH LFGTE FACILITY	STEUBEN	0.94	1.04	3.17
NEW YORK PRESBYTERIAN HOSPITAL	NEW YORK	4.21	0.32	3.15
PINELAWN POWER	SUFFOLK	0.66	1.05	2.92
NYU CENTRAL PLANT	NEW YORK	7.01	12.31	2.87
DOWNSTATE MEDICAL CENTER	KINGS	0.65	0.45	2.84
ONEIDA CO WATER POLLUTION CONTROL PLANT	ONEIDA	0.00	2.92	2.63
CONEY ISLAND WASTEWATER TREATMENT PLANT	KINGS	4.64	5.17	2.57
ROCKVILLE CENTRE POWER PLANT	NASSAU	4.18	3.08	2.49
RICHARD M FLYNN POWER PLANT	SUFFOLK	6.10	15.00	2.48
SARATOGA CO SEWER DIST #1	SARATOGA	0.00	1.70	2.44
CALPINE JFK ENERGY CENTER	QUEENS	1.65	2.95	2.43
NYC-HH - JACOBI MEDICAL CTR	BRONX	0.61	1.95	2.34
TBG COGEN FACILITY	NASSAU	1.71	9.10	2.17
SARANAC POWER PARTNERS COGENERATION FAC	CLINTON	7.94	1.99	2.13
INDECK-CORINTH ENERGY CENTER	SARATOGA	2.14	2.07	1.99
TENNESSEE GAS PIPELINE CO COMPRESSOR STATION 229	ERIE	0.57	2.68	1.99
ALGONQUIN GAS: STONY POINT COMPRESSOR STA	ROCKLAND	1.89	2.31	1.98
BUCKEYE RENSSELAER TERMINAL	RENSSELAER	6.66	2.23	1.96
NARROWS GENERATING STATION	KINGS	4.06	0.72	1.95

Facility	County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons
ALBANY COUNTY SEWER DISTRICT - NORTH PLANT	ALBANY	0.00	7.22	1.93
TALLMAN ISLAND WASTEWATER TREATMENT PLANT	QUEENS	3.78	2.36	1.90
ROCKLAND PSYCHIATRIC CENTER	ROCKLAND	0.66	1.45	1.83
TAINO TOWERS-2253 THIRD AVE	NEW YORK	0.50	1.21	1.77
BERGEN POINT WWTP	SUFFOLK	0.30	0.14	1.74
MANCHESTER WOOD INC	WASHINGTON	1.75	1.85	1.53
SENECA MEADOWS SWMF	SENECA	2.69	2.26	1.53
CHEMUNG COUNTY LANDFILL	CHEMUNG	1.21	1.08	1.53
HARDEN FURNITURE INC	ONEIDA	1.59	0.81	1.53
ST JOHNS UNIVERSITY	QUEENS	0.75	2.55	1.50
COMMONWEALTH PLYWOOD INC	WASHINGTON	0.57	1.49	1.40
AVA LANDFILL	ONEIDA	8.44	5.27	1.26
SOLID WASTE MANAGEMENT FACILITY	JEFFERSON	1.61	1.21	1.24
HOFSTRA UNIVERSITY	NASSAU	2.16	1.97	1.20
ORANGE COUNTY SANITARY LANDFILL	ORANGE	0.00	1.07	1.14
NOVELIS CORPORATION	OSWEGO	6.23	7.15	1.03
GLENWOOD LANDING ENERGY CENTER	NASSAU	0.45	1.44	1.02
PARKER TOWERS	QUEENS	12.09	2.37	1.02
NISSEQUOGUE COGEN PARTNERS PLANT	SUFFOLK	1.09	1.07	1.02
NORTH CENTRAL BRONX HOSPITAL	BRONX	0.38	1.70	0.99
INDECK OLEAN ENERGY CENTER	CATTARAUGUS	13.49	0.81	0.97
ASTORIA GAS TURBINE POWER	QUEENS	1.35	1.05	0.94
WestRock-Solvay LLC	ONONDAGA	0.00	0.97	0.92
LEHIGH NORTHEAST CEMENT CO - CEMENTON TERMINAL	GREENE	0.54	0.66	0.90
CONTINENTAL BUCHANAN LLC	WESTCHESTER	0.71	1.00	0.90
INNOVATIVE / FULTON	FULTON	0.94	0.96	0.90
SAINT GOBAIN PERFORMANCE PLASTICS	RENSSELAER	0.21	0.23	0.89
BAYSWATER / JAMAICA BAY PEAKING FACILITY	QUEENS	0.97	1.05	0.89
CFSWMA REGIONAL SOLID WASTE DISPOSAL FAC	FRANKLIN	0.00	1.49	0.86
ALBANY COUNTY SEWER DISTRICT - SOUTH PLANT	ALBANY	0.00	3.99	0.84
CASTLETON ENERGY CENTER	RENSSELAER	1.11	0.69	0.82
MOMENTIVE PERFORMANCE MATERIALS	SARATOGA	0.75	0.72	0.82
COMPRESSOR STATION 254	COLUMBIA	1.96	0.74	0.81
MONROE LIVINGSTON SANITARY LANDFILL	MONROE	3.88	0.76	0.80
METAULLICS SYSTEMS DIVISION OF PYROTEK INC	NIAGARA	2.69	1.60	0.80
CARR STREET GENERATING STATION	ONONDAGA	6.53	0.25	0.78
CON ED-EAST 60TH STREET STEAM PLANT	NEW YORK	0.95	1.42	0.74
FORTISTAR NORTH TONAWANDA INC	NIAGARA	0.91	0.76	0.72
CUMMINS INC - JAMESTOWN ENGINE PLANT	CHAUTAUQUA	0.54	0.63	0.72
ALBANY LANDFILL	ALBANY	24.39	10.34	0.69
EQUUS FREEPORT POWER GENERATING STATION	NASSAU	0.34	0.65	0.68
GOOD SAMARITAN HOSPITAL	ROCKLAND	0.04	0.73	0.65
PORT JEFFERSON ENERGY CENTER	SUFFOLK	0.45	0.92	0.64
AUBURN SANITARY LANDFILL NO 2	CAYUGA	0.00	0.20	0.63
SAMUEL A CARLSON GENERATING STATION	CHAUTAUQUA	37.20	0.63	0.63
U S GYPSUM CO OAKFIELD PLANT	GENESEE	0.52	0.49	0.59
CORNING DIESEL MANUFACTURING FACILITY	STEUBEN	0.03	0.48	0.59
INDECK-YERKES ENERGY SERVICES	ERIE	0.41	0.41	0.59
MOUNT SINAI HOSPITAL	NEW YORK	0.35	0.56	0.57
PRATT PAPER (NY), INC	RICHMOND	0.54	0.56	0.55
STARRETT CITY POWER PLANT	KINGS	1.65	13.66	0.52
GUNLOCKE CO	STEUBEN	0.50	0.50	0.51
NYCDOS - FRESH KILLS LANDFILL	RICHMOND	0.69	0.55	0.49
TGP COMPRESSOR STATION 245	HERKIMER	0.31	5.02	0.48
GOWANUS GENERATING STATION	KINGS	1.52	0.28	0.48
TENNESSEE GAS PIPELINE CO COMPRESSOR STATION 230-C	NIAGARA	4.34	4.31	0.48
SABIC INNOVATIVE PLASTICS US LLC	ALBANY	0.49	0.51	0.47
U S SALT - WATKINS GLEN REFINERY	SCHUYLER	0.39	0.38	0.44
NYPA JOSEPH J SEYMOUR - 23RD ST & 3RD AVE	KINGS	0.64	0.22	0.43
BROOKHAVEN NATIONAL LABORATORY	SUFFOLK	3.02	1.34	0.42
L & J G STICKLEY INC	ONONDAGA	0.40	0.40	0.40
EDGEWOOD ENERGY LLC	SUFFOLK	0.67	0.57	0.39
COLUMBIA UNIVERSITY-410 W 118TH ST	NEW YORK	3.21	0.34	0.39
ROCHDALE VILLAGE	QUEENS	0.41	0.42	0.38
BORGER STATION	TOMPKINS	0.36	0.49	0.37
STERLING ENERGY FACILITY	ONEIDA	0.40	0.36	0.36
LACKAWANNA PLANT- REPUBLIC STEEL	ERIE	0.36	0.39	0.34

Facility	County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons
INDECK-SILVER SPRINGS ENERGY CENTER	WYOMING	0.14	0.32	0.32
WYCKOFF HEIGHTS MEDICAL CENTER	KINGS	0.05	0.33	0.32
COMPRESSOR STATION 249	SCHOHARIE	3.48	5.04	0.31
KENNEDY VALVE DIV MC WANE INC	CHEMUNG	0.37	0.31	0.31
CORNING INC CANTON PLANT	ST LAWRENCE	0.07	0.12	0.31
SYRACUSE UNIVERSITY - STEAM STATION	ONONDAGA	0.31	0.32	0.31
FORT DRUM	LEWIS	0.28	0.33	0.30
WYETH PHARMACEUTICALS	CLINTON	0.68	0.60	0.30
ALLEGANY GENERATING STATION	ALLEGANY	0.08	0.28	0.29
AL TURI LANDFILL & LFGTE FACILITY	ORANGE	0.53	0.27	0.29
POUCH TERMINAL	RICHMOND	0.35	0.16	0.28
ERWIN MANUFACTURING COMPLEX	STEUBEN	0.06	0.26	0.27
INDECK-OSWEGO ENERGY CENTER	OSWEGO	0.13	0.20	0.25
MADISON COUNTY LANDFILL	MADISON	0.01	0.27	0.23
HUNTS POINT AVENUE COMPRESSOR STATION	BRONX	0.05	0.05	0.22
HOLTSVILLE GT & LNG FACILITIES	SUFFOLK	113.83	0.31	0.21
CONCORD COMPRESSOR STATION	ERIE	0.10	0.14	0.21
HARLEM RIVER YARDS PLANT	BRONX	0.09	0.19	0.21
HELL GATE	BRONX	0.18	0.17	0.21
HURON CAMPUS	BROOME	0.44	0.34	0.21
VERNON BLVD PLANT	QUEENS	0.29	0.14	0.21
BRENTWOOD PLANT	SUFFOLK	0.26	0.12	0.20
CENEX TERMINALS	RENSSELAER	0.26	0.19	0.20
AURUBIS BUFFALO INC	ERIE	0.27	0.23	0.20
XEROX JOSEPH C WILSON CTR FOR TECHNOLOGY	MONROE	0.00	0.21	0.20
TENNESSEE GAS PIPELINE CO - COMP STA 241	ONONDAGA	0.20	4.55	0.19
TONAWANDA ENGINE PLANT-GENERAL MOTORS POWERTRAIN	ERIE	0.17	0.28	0.19
HYLAND LANDFILL	ALLEGANY	17.66	18.45	0.19
GENERAL ELECTRIC STEAM TURBINE GENERATOR GLOBAL	SCHENECTADY	0.44	0.18	0.18
ROCKEFELLER UNIVERSITY	NEW YORK	0.17	4.10	0.18
CON EDISON - HUDSON AVE STATION	KINGS	0.40	0.58	0.18
SUMITOMO RUBBER USA LLC	ERIE	0.17	0.19	0.17
TENNESSEE GAS PIPELINE CO COMPRESSOR STATION 224	CHAUTAUQUA	1.55	0.16	0.17
FREEPORT POWER PLANT #2	NASSAU	0.33	0.19	0.17
MAIMONIDES MEDICAL CENTER	KINGS	0.42	0.24	0.17
QUEENS FRESH MEADOWS FACILITY	QUEENS	5.09	0.11	0.17
ELMHURST HOSP-79-01 BROADWAY	QUEENS	8.35	11.47	0.17
NYC-HH - HARLEM HOSPITAL	NEW YORK	0.16	0.00	0.17
REENERGY CHATEAUGAY LLC	FRANKLIN	0.24	0.24	0.16
WADING RIVER GT FACILITY	SUFFOLK	30.04	0.29	0.16
CRUCIBLE INDUSTRIES	ONONDAGA	0.00	0.74	0.15
CARTHAGE ENERGY COGEN FACILITY	JEFFERSON	0.03	0.27	0.13
KEYMARK CORP PLANT	MONTGOMERY	0.14	0.13	0.13
RENSSELAER COGEN FACILITY	RENSSELAER	0.23	0.13	0.12
CON ED - ASTORIA FACILITY	QUEENS	0.03	0.08	0.12
CHEMOURS NIAGARA	NIAGARA	0.02	0.19	0.12
MUTUAL REDEVELOPMENT HOUSES	NEW YORK	5.10	3.76	0.12
SI GROUP INC - ROTTERDAM JUNCTION FACILITY	SCHENECTADY	0.34	0.25	0.12
Hawkeye Energy Greenport	SUFFOLK	4.50	0.25	0.11
BROOME COUNTY LFG RECOVERY FACILITY	BROOME	0.10	0.11	0.11
NORTH SHORE UNIVERSITY HOSPITAL	NASSAU	0.09	0.59	0.11
KINDER MORGAN LIQUIDS TERMINALS LLC	RICHMOND	0.04	0.05	0.11
HOLLINGSWORTH & VOSE-EASTON MILL	WASHINGTON	0.10	0.10	0.11
INTERFACE SOLUTIONS INC	OSWEGO	0.01	0.10	0.10
E I DUPONT YERKES PLANT	ERIE	0.10	0.10	0.10
BATAVIA POWER PLANT	GENESEE	0.12	0.09	0.10
N 1ST STREET PLANT	KINGS	0.02	0.13	0.10
BRONX ZOO	BRONX	0.09	0.09	0.10
YONKERS JOINT WWTP	WESTCHESTER	0.78	6.28	0.10
VANDEMARK CHEMICAL INC	NIAGARA	0.03	0.02	0.09
KINGS PLAZA ENERGY LLC	KINGS	0.10	0.09	0.09
N SHORE TOWERS APT TOTAL ENERGY PLANT	QUEENS	0.20	0.09	0.09
AMRI RENSSELAER	RENSSELAER	0.10	0.08	0.09
BRISTOL-MYERS SQUIBB COMPANY	ONONDAGA	0.16	0.08	0.09
BEECH HILL COMPRESSOR STATION	ALLEGANY	0.08	0.10	0.08
SYRACUSE LLC	ONONDAGA	0.24	0.23	0.07
EAST HAMPTON GT FACILITY	SUFFOLK	3.99	0.05	0.07

Facility	County	2013 SO_2 tons	2014 SO_2 tons	2015 SO_2 tons
TGP COMPRESSOR STATION 237	ONTARIO	1.97	0.05	0.07
NYC-HH - CONEY ISLAND HOSPITAL	KINGS	0.07	0.08	0.07
METAL CONTAINER CORP	ORANGE	0.00	0.06	0.07
QUADGRAPHICS	SARATOGA	0.06	0.06	0.06
GENERAL MILLS OPERATIONS LLC	ERIE	0.09	0.09	0.06
OCCIDENTAL CHEMICAL CORP - NIAGARA PLANT	NIAGARA	0.40	0.07	0.06
FCINA - DELHI	DELAWARE	36.36	15.25	0.06
WOODHULL STATION & POOL	STEUBEN	0.05	0.01	0.06
BEAVER FALLS LLC	LEWIS	0.35	0.09	0.06
ST BARNABAS HOSPITAL	BRONX	25.95	13.04	0.06
BALL METAL BEVERAGE CONTAINER CORP	SARATOGA	0.05	0.06	0.05
OGDENSBURG ENERGY FACILITY	ST LAWRENCE	0.05	0.05	0.05
ALLIANCE ENERGY - SHOEMAKER GAS TURBINE FACILITY	ORANGE	0.05	0.01	0.05
CHEMTRADE SOLUTIONS SYRACUSE	ONONDAGA	0.05	0.06	0.05
INDEPENDENCE STATION	ALLEGANY	0.07	0.05	0.05
BALL METAL BEVERAGE CONTAINER CORP	ORANGE	0.07	0.07	0.05
KNOWLTON TECHNOLOGIES LLC	JEFFERSON	0.05	0.05	0.05
SAINT-GOBAIN ADFORS AMERICA INC	ORLEANS	0.00	0.05	0.05
LOCKPORT COGENERATION FACILITY	NIAGARA	0.02	0.05	0.04
MOOG INC	ERIE	0.00	0.00	0.04
RACHEL BRIDGE CORP	NEW YORK	0.03	0.04	0.04
BIG SIX TOWERS INC	QUEENS	0.03	0.03	0.04
BUCKEYE ALBANY TERMINAL LLC	ALBANY	0.04	0.03	0.04
TRACEY TOWERS	BRONX	0.13	0.04	0.03
BASF CORP	WESTCHESTER	0.03	0.03	0.03
PACTIV LLC	ONTARIO	0.03	0.04	0.03
Durez Niagara	NIAGARA	0.03	0.03	0.03
VARFLEX CORPORATION	ONEIDA	0.00	0.03	0.03
INTERNATIONAL IMAGING	ERIE	0.02	0.03	0.03
GLENWOOD COMBUSTION TURBINE FACILITY	NASSAU	2.04	0.03	0.03
GLOBAL COMPANIES LLC - ALBANY TERMINAL	ALBANY	0.05	0.04	0.03
NEW BATH LANDFILL	STEUBEN	0.00	0.02	0.03
CHEMPRENE INC	DUTCHESS	0.24	0.03	0.02
PRESTOLITE ELECTRIC NY INC	WYOMING	0.03	0.03	0.02
VON ROLL USA INC	SCHENECTADY	0.04	17.16	0.02
HOLLINGSWORTH & VOSE GREENWICH MILL	WASHINGTON	0.05	0.05	0.02
VULCRAFT OF NEW YORK INC	CHEMUNG	0.01	0.02	0.02
TRANSCONTINENTAL ULTRA FLEX INC.	KINGS	0.02	0.02	0.02
SHOREHAM ENERGY LLC	SUFFOLK	0.10	0.05	0.02
STEINWAY & SONS - QUEENS FACILITY	QUEENS	0.01	0.01	0.02
BARKER BROS - RIDGEWOOD	QUEENS	0.11	0.18	0.02
FIBERMARK NORTH AMERICA INC	LEWIS	0.02	0.02	0.02
ARKEMA INC	LIVINGSTON	0.00	0.01	0.02
AMERICAN PACKAGING CORP	MONROE	0.02	0.02	0.02
GENPAK LLC MIDDLETOWN MAIN PLANT	ORANGE	0.01	0.01	0.01
PAR PHARMACEUTICAL INC	ROCKLAND	0.00	0.01	0.01
ONTARIO CO LANDFILL	ONTARIO	1.32	0.01	0.01
WHITING DOOR MANUFACTURING CORP	ERIE	0.01	0.01	0.01
SPEAR USA	OSWEGO	0.01	0.01	0.01
SOUTHAMPTON GT FACILITY	SUFFOLK	2.45	0.01	0.01
AVERY DENNISON RIS, LLC.	ROCKLAND	0.01	0.01	0.01
MAGELLAN AEROSPACE PROCESSING LONG ISLAND INC	SUFFOLK	0.01	0.01	0.01
EASTMAN BUSINESS PARK	MONROE	4280.46	0.02	0.01
SOUTHOLD GT FACILITY	SUFFOLK	1.79	0.00	0.01
FLEXO-TRANSPARENT INC	ERIE	0.00	0.01	0.01
MASSENA ENERGY FACILITY	ST LAWRENCE	0.01	0.01	0.01
ADCHEM CORPORATION	SUFFOLK	0.01	0.04	0.01
SKF AEROENGINE NORTH AMERICA	CHAUTAUQUA	0.01	0.01	0.01
TRINITY PACKAGING CORP	ERIE	0.01	0.01	0.01
BUFFALO TERMINAL	ERIE	0.00	0.00	0.01
WEST BABYLON GT FACILITY	SUFFOLK	1.59	0.02	0.01