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**IMPLEMENTATION PLAN REVIEW  
FOR  
NEW YORK  
AS REQUIRED  
BY  
THE ENERGY SUPPLY  
AND  
ENVIRONMENTAL COORDINATION ACT**



**U. S. ENVIRONMENTAL PROTECTION AGENCY**

IMPLEMENTATION PLAN REVIEW

FOR

NEW YORK

AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT  
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

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## 1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO<sub>2</sub> emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO<sub>2</sub> regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are (1) The use of the example region approach in developing State-wide air quality control strategies; (2) the existence of State Air Quality Standards which are more stringent than NAAQS; and (3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there have been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based are the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP,  $\text{NO}_x$ , and HC emissions which occur in fuel switching, and other potential air pollution situations such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide ( $\text{SO}_2$ ) emissions. This is because stationary fuel combustion sources constitute the greatest source of  $\text{SO}_2$  emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO<sub>2</sub> and TSP emission tolerance within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Section 2 and Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, and E.

The State Implementation Plan for the State of New York has been reviewed for the most prevalent causes of over-restrictive fuel combustion emission limiting regulations. The major findings of the review are:

FOR TOTAL SUSPENDED PARTICULATES, THERE ARE NO AQCR'S WHICH INDICATE A GOOD OR MARGINAL POTENTIAL FOR REVISING FUEL COMBUSTION SOURCE EMISSIONS LIMITING REGULATIONS.

FOR SO<sub>2</sub>, THERE ARE TWO AQCR'S WHICH INDICATE A GOOD POTENTIAL FOR REVISING FUEL COMBUSTION SOURCE EMISSION LIMITING REGULATIONS. THESE ARE CENTRAL NEW YORK AND SOUTHERN TIER EAST. TWO AQCR'S INDICATE A MARGINAL POTENTIAL FOR REVISION OF SO<sub>2</sub> EMISSION LIMITING REGULATIONS. THEY ARE GENESEE-FINGER LAKES AND SOUTHERN TIER WEST AQCR'S.

The supportive findings of the SIP review are as follows:

In all regions which indicated a poor potential for regulation revision, the predominant reason was violation of the NAAQS in 1973. In the case of SO<sub>2</sub>, air quality levels were below standards in several AQCR's, indicating some tolerance for an increase in emissions. However, emissions from fuel combustion sources contribute a large percentage of the total emissions in these regions, and an increase in emissions may have an adverse impact on air quality.

New York data for the National Emissions Data System (NEDS) are in the process of being compiled. Therefore, the findings of this review as regarding emissions of particulates and SO<sub>2</sub> are based entirely on the emission inventory data contained in the New York SIP. These data reflect 1970 conditions.

## 2.0 STATE IMPLEMENTATION PLAN REVIEW

### 2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on (1973) air quality data, are there no reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?
- Is there a significant clean fuels savings potential in the region?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices



provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants, other point sources, and area sources) has been carried out in Appendices C, D, and E.

Based on an overall evaluation of EPA's current information, AQCR's have been classified as good, marginal, or poor candidates for regulation revisions. Table 2-1 summarizes the State Implementation Plan Review. The remaining portion of the report supports this summary with explanations.

## 2.2 AIR QUALITY SETTING - - STATE OF NEW YORK

The state of New York is divided into eight AQCR's. These are AQCR 158, Central New York Intrastate; AQCR 159, Champlain Valley Interstate (Vermont); AQCR 160, Genesee-Finger Lakes Intrastate; AQCR 161, Hudson Valley Intrastate; AQCR 43, New Jersey - New York - Connecticut Interstate; AQCR 196, Niagara Frontier Intrastate; AQCR 163, Southern Tier East Intrastate; and AQCR 164, Southern Tier West Intrastate. The New York portion of the Champlain Valley AQCR is the same region as that referred to in the New York SIP as the Northern AQCR, while the New York portion of the New Jersey - New York - Connecticut AQCR is the same as the Metropolitan AQCR. Figure 2-1 shows the geographical boundaries of, and the counties included in, each region.

Tables A-1, A-2, and A-3 are a summary description of the State air quality setting. Table A-1 shows each region's priority classifications for TSP, SO<sub>2</sub>, and NO<sub>2</sub>; population of the region; and counties which have been proposed as part of an Air Quality Maintenance Area (AQMA). Table A-2 lists the projected date by which each region will attain the applicable air quality standards. A summary of the Federal and State Air Quality Standards follows in Table A-3.

TABLE 2-1  
STATE IMPLEMENTATION PLAN REVIEW  
(SUMMARY)

"Indicators"	New York		Central New York AQCR 158		Champlain Valley AQCR 159		Genesee-Finger Lakes AQCR 160		Hudson Valley AQCR 161		New Jersey, New York, Connecticut AQCR 43		Niagara Frontier AQCR 162		Southern Tier East AQCR 163		Southern Tier West AQCR 164	
	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>	TSP	SO <sub>2</sub>
• Does the State have air quality standards which are more stringent than NAAQS?	Yes	Yes																
• Does the State have emission limiting regulations for control of:																		
1. Power plants	Yes	Yes																
2. Industrial sources	Yes	Yes																
3. Area sources	Yes	Yes																
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	No	No																
• Has the State <u>not</u> initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	No																
• Are there no proposed Air Quality Maintenance Areas?			No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No	Yes
• Are there indications of a sufficient number of monitoring sites within a region?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Is there an expected 1975 attainment date for NAAQS?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes
• Based on (1973) Air Quality Data, are there no reported violations of NAAQS?			No	Yes	No	Yes	No	Yes	No	Yes	No	No	No	No	No	Yes	No	Yes
• Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	Yes	No	Yes	No	Yes	No	Yes	No	No	No	No	No	Yes	No	Yes
• Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?			No	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No	No	No	No	No
• Do modeling results for fuel combustion sources show a potential for a regulation revision? <sup>a</sup>			N.A.	Yes	N.A.	N.A.	N.A.	Yes	No	No	Yes	Yes	N.A.	Yes	N.A.	No	N.A.	No
• Must emission limiting regulations be revised to accommodate significant fuel switching? <sup>b</sup>			Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			Poor	Good	Poor	Poor <sup>c</sup>	Poor	Marg.	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Good	Poor	Marg.
• Is there a significant Clean Fuels Saving potential in the region?			Unk		Unk		Unk		No		No		No		Unk		Unk	

<sup>a</sup> Modeling results available only for power plants. In all regions except 161 and 43, only SO<sub>2</sub> was modeled. N.A. - no modeling results available.

<sup>b</sup> No data available on individual fuel combustion sources. Therefore, answers to this question are unknown.

<sup>c</sup> Air quality violation occurred in Vermont in 1974.

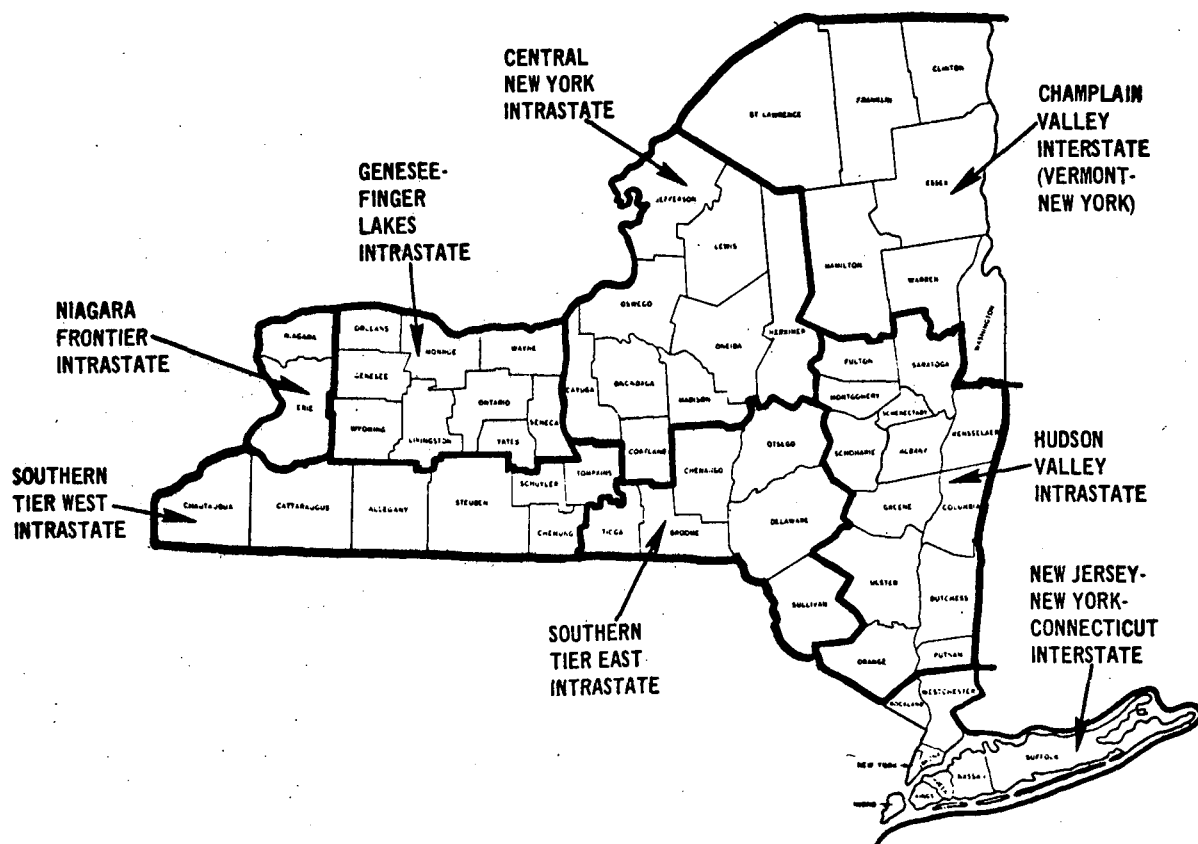


Figure 2-1 New York Air Quality Control Regions

A summary of the New York air quality status is presented in Tables A-4 and A-5. Data included in these tables were extracted from the Storage and Retrieval of Aerometric Data (SAROAD) system of the National Air Data Bank. The most current air quality data available are for 1973.

Table A-6 gives a brief summary of New York fuel combustion sources, followed by Tables A-7 and A-8 which display similar data, but in a much more detailed form. EPA and the State of New York are presently in the process of compiling an accurate emission inventory for submission to the National Emissions Data System (NEDS). Because a certain amount of emission data were required for this review, and since NEDS data were not available, the emission inventory from the SIP for New York was used. These data are representative of 1970 conditions, and no attempt was made to project them to a more current date. This point should be kept in mind when reviewing data in Tables A-6, A-7, and A-8; B-1 and B-2; D-1 and D-2; and E-1 and E-2.

Summaries of the New York regulations for the control of particulate and SO<sub>2</sub> emissions from fuel combustion sources are presented in Table A-9 and Figure A-1. With the unavailability of any detailed source data for any individual plants, it is impossible to assess quantitatively either the impact of strict compliance with the regulations, or the effect of regulation revision.

### 2.3 BACKGROUND ON THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

On January 31, 1972 and May 19, 1972 the State of New York submitted their Air Quality Implementation Plan as required by EPA. On May 31, 1972, and September 22, 1972 the Administrator of the EPA granted 18-month extensions for submission of plans to attain the secondary particulate standards for the New York portion of the New Jersey - New York - Connecticut AQCR, the Niagara Frontier AQCR, and the Central New York AQCR. He also granted 18-month extensions for submission of plans to attain secondary SO<sub>2</sub> standards for the New York portion of the New Jersey - New York - Connecticut AQCR, and the Niagara Frontier AQCR. EPA eliminated the need for the SO<sub>2</sub> plans by

revoking the 24-hour and annual average secondary SO<sub>2</sub> standards. The required particulate plans were submitted on July 31, 1973, and were disapproved because they did not demonstrate the attainment of the secondary particulate control regulations for the three affected regions.

### 3.0 AQCR ASSESSMENTS

The purpose of this section is to evaluate the available information for the State of New York and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessments will be made by AQCR addressing each type of fuel combustion source: power plants, other point sources, and area sources. The criteria used to make the assessments are listed and tabulated in Section 2.1 and Table 2-1 of this report. Tables B-1 and B-2 present a quantitative display of some of the criteria in Table 2-1.

The source type groups are evaluated separately using such variables for criteria as modeling results, emissions data from the SIP and air quality data.

#### 3.1 CENTRAL NEW YORK INTRASTATE AQCR 158

##### 3.1.1 Regional Assessment

The Central New York AQCR was determined to have a poor potential for particulate regulation revision, and a good potential for SO<sub>2</sub> regulation revision. The indicators are summarized below:

- Particulates - A proposed Air Quality Maintenance Area, numerous violations of the air quality standards in 1973, no tolerance for emission increase, and a high percentage of the total emissions contributed by fuel combustion sources.
- Sulfur Dioxide - All indicators considered indicate a good potential except the high percentage of the total emissions contributed by fuel combustion sources.

Tables B-1 and B-2 list the indicators by AQCR for particulates and SO<sub>2</sub> respectively.

##### 3.1.2 Power Plant Assessment

There is one power plant in the Central New York AQCR. Available source data are presented in Table C-1. This plant was the subject of a recent modeling effort by Walden Research Division of Abcor, Inc. The results are presented in Table C-4, and indicate that the plant has not contributed sufficient SO<sub>2</sub> to violate the ambient air standards, based on its

1972 operations. No modeling of particulates was accomplished, nor was any evaluation made of the effects of alternate fuels.

#### 3.1.3 Point Source Assessment

Available data on point sources is found in Tables D-1 and D-2, and is limited to data published in the New York SIP. No modeling of point sources has been accomplished, therefore an assessment of their impact on air quality cannot be made.

#### 3.1.4 Area Source Assessment

Tables E-1 and E-2 present the available area source data. Insufficient data are available to evaluate the impact of area sources on air quality.

### 3.2 CHAMPLAIN VALLEY INTERSTATE AQCR 159

#### 3.2.1 Regional Assessment

The regional evaluation of the regulation revision potential in the Champlain Valley AQCR resulted in ratings of poor for particulates and SO<sub>2</sub>. The indicators are as follows:

- Particulates - reported violations of the particulate air quality standards in 1973, and no tolerance for emission increase.
- Sulfur Dioxide - all indicators examined suggested a good potential except for a 1974 air quality violation in the Vermont portion of the AQCR.

Tables B-1 and B-2 list these indicators by AQCR for particulates and SO<sub>2</sub> respectively.

#### 3.2.2 Power Plant Assessment

There are no power plants in the New York portion of the Champlain Valley AQCR.

#### 3.2.3 Point Source Assessment

Tables D-1 and D-2 show the available point source data from the SIP.

No point source modeling results are available, and therefore no assessment can be made of the point source effect on air quality.

#### 3.2.4 Area Source Assessment

Tables E-1 and E-2 show the area source data obtained from the SIP. No evaluation can be made of the impact of these sources on regional air quality.

### 3.3 GENESEE-FINGER LAKES INTRASTATE AQCR 160

#### 3.3.1 Regional Assessment

The regional evaluation of the Genesee-Finger Lakes AQCR resulted in a poor potential for particulate regulation revision and a marginal potential for revision of SO<sub>2</sub> regulations. The pertinent indicators are as follows:

- Particulates - proposed Air Quality Maintenance Area designations, violations of the particulate air quality standards in 1973, and no tolerance for emission increase.
- Sulfur Dioxide - all indicators point to a good potential for revision of SO<sub>2</sub> regulations except for the high percentage of total emissions which are contributed by combustion sources. The potential was rated as marginal, because it was felt that the good air quality was due to a previous power plant fuel switch from coal to oil, and any conversion back to coal, would result in air quality standard violations.

The indicators for particulates and SO<sub>2</sub> are presented by AQCR in Tables B-1 and B-2 respectively.

#### 3.3.2 Power Plant Assessment

There are three power plants in the Genesee-Finger Lakes AQCR. All available source data are presented in Table C-1, and modeling results are presented in Table C-4. The modeling results indicate that none of the three plants contributed enough SO<sub>2</sub> in 1972 to cause violations of the SO<sub>2</sub> air quality standard by themselves. No particulate modeling results are available, nor are there any evaluations of the impact on air quality of fuel conversions.



### 3.3.3 Point Source Assessment

Available point source information is presented in Tables D-1 and D-2. No point source modeling results are available with which to assess the impact on air quality from sources of this category.

### 3.3.4 Area Source Assessment

Area source fuel combustion data are presented in Tables E-1 and E-2. The limited nature of the available area source data makes it impossible to assess the impact on air quality.

## 3.4 HUDSON VALLEY INTRASTATE AQCR 161

### 3.4.1 Regional Assessment

Evaluation of the Hudson Valley AQCR indicated the region has a poor potential for particulate regulation revision and a poor potential for SO<sub>2</sub> revision. The indicators are listed below:

- Particulates - proposed Air Quality Maintenance Area designations, reported violations of particulate air quality standards in 1973, no tolerance for emission increase, and modeling results showing power plants to be violating air quality standards with currently used fuels.
- Sulfur Dioxide - proposed Air Quality Maintenance Area designations, modeling results showing that fuel conversions will cause power plants to violate SO<sub>2</sub> air quality standards, and fuel combustion sources contributing a high percentage of the total SO<sub>2</sub> emissions. In addition, the tolerance for emission increase is relatively small.

All indicators for both particulates and SO<sub>2</sub> are presented in Tables B-1 and B-2 respectively.

### 3.4.2 Power Plant Assessment

There are three power plants in the Hudson Valley AQCR. Two of these (Albany, and Danskammer) were modeled by Walden, and the results are listed in Table C-3. To summarize the results, they indicate that a fuel conversion at either plant would be detrimental, and would produce air quality levels which exceed both the particulate and the SO<sub>2</sub> ambient air quality standards. No modeling results are available for the third plant.

#### 3.4.3 Point Source Assessment

No modeling results are available for point sources in this region and therefore it is impossible to evaluate their impact on air quality. Point source data from the SIP are presented in Tables D-1 and D-2.

#### 3.4.4 Area Source Assessment

Area source data from the SIP are presented in Tables E-1 and E-2. No evaluation can be made based on the limited data available.

### 3.5 NEW JERSEY - NEW YORK - CONNECTICUT INTERSTATE AQCR 43

#### 3.5.1 Regional Assessment

Both the particulate and SO<sub>2</sub> regulation revision potentials were considered to be poor for the New York portion of this region. Pertinent indicators are listed below:

- Particulates - proposed Air Quality Maintenance Areas, a 1977 date for attaining the particulate air quality standards, 1973 air quality data showing violations of the particulate standards, no tolerance for emission increase, and a high ratio of fuel combustion emissions to total emissions.
- Sulfur Dioxide - proposed air quality maintenance areas, 1973 air quality data showing violations of the SO<sub>2</sub> standards (some of the violations were during the first four months of 1973 when the State granted SO<sub>2</sub> variances due to fuel shortages), no tolerance for emission increase, and a high ratio of fuel combustion emissions to total emissions.

The indicators are listed in Tables B-1 and B-2 for particulate and SO<sub>2</sub> respectively.

#### 3.5.2 Power Plant Assessment

There are 17 power plants in the New York portion of the region. They were all modeled by Walden in one of two groups. The first group includes the 74th Street, Waterside, Arthur Kill, Astoria, Ravenswood, Barrett, Far Rockaway, Port Jefferson, Bowline, and Lovett plants. The results of the modeling of these ten plants are presented in Table C-3, and for seven of the ten plants include expected maximum concentrations following a fuel conversion. Both particulates and SO<sub>2</sub> were modeled for these ten plants.

The other seven plants were modeled later and include the 59th Street, East River, Indian Point, Hell Gate, Hudson Avenue, Glenwood and Northwood plants. These results are for SO<sub>2</sub> only, 1972 operations only (no fuel conversion), and are presented in Table C-4.

A summary of the modeling results indicate that two of the plants (Bowline and Lovett) violate the particulate standards based on 1972 operations, and none violate the SO<sub>2</sub> standard. After a fuel conversion (fuel data are in Table C-2), of those modeled, three plants (Astoria, Port Jefferson, and Lovett) can be expected to violate the particulate standards, and one (Lovett) can be expected to violate the SO<sub>2</sub> standards.

One thing must be kept in mind when evaluating these modeling results. The listed concentrations include the contribution from only the applicable power plant. They do not include the contribution from other nearby sources. In some cases the results do consider the contribution from other power plants, and are footnoted as such in the tables.

### 3.5.3 Point Source Assessment

Available point source data are shown in Tables D-1 and D-2. These data are taken from the New York SIP, and with no point source modeling results are inadequate to assess the point source impact on air quality.

### 3.5.4 Area Source Assessment

Area source data from the New York SIP are presented in Tables E-1 and E-2. There are insufficient data available with which to make an assessment of the area source impact on air quality.

## 3.6 NIAGARA FRONTIER INTRASTATE AQCR 162

### 3.6.1 Regional Assessment

The regulation revision potentials in the Niagara Frontier AQCR were rated as poor for both particulates and SO<sub>2</sub>. The indicators on which these ratings were based are listed below:

- Particulates - proposed Air Quality Maintenance Areas, 1977 expected data of attainment for particulate air quality standards, reported violations of air quality standards in 1973, and no tolerance for particulate emission increase.
- Sulfur Dioxide - proposed Air Quality Maintenance Areas, 1977 expected date of attainment for SO<sub>2</sub> air quality standards, reported violations of air quality standards in 1973, and no tolerance for SO<sub>2</sub> emission increase.

Tables B-1 and B-2 list the indicators for particulate and SO<sub>2</sub> respectively.

### 3.6.2 Power Plant Assessment

There is only one power plant in the Niagara Frontier AQCR. Its source data are shown in Table C-1. 1972 operations at this plant were modeled by Walden, and the estimated maximum ground level concentrations of SO<sub>2</sub> are presented in Table C-4. The results indicate that this plant alone did not contribute a sufficient amount of SO<sub>2</sub> to violate the ambient air quality standards.

### 3.6.3 Point Source Assessment

No assessment of point source impact on air quality can be made due to the lack of modeling data for this class of sources. Available point source data from the SIP are presented in Tables D-1 and D-2.

### 3.6.4 Area Source Assessment

Area source data from the SIP are presented in Tables E-1 and E-2. No further evaluation of area sources is possible without additional data.

## 3.7 SOUTHERN TIER EAST INTRASTATE AQCR 163

### 3.7.1 Regional Assessment

The regulation revision potentials in the Southern Tier East AQCR are poor for particulate and good for SO<sub>2</sub>. The pertinent indicators are listed below:

- Particulates - proposed Air Quality Maintenance Areas, 1973 air quality data indicating violations of the air quality standards, no tolerance for emission increase, and fuel combustion sources contribute a large portion of the total emissions. It is felt however that because of the very rural nature of the AQCR, any air quality problems are localized, and should be evaluated on a case by case basis.
- Sulfur Dioxide - all indicators point to a good rating except the high contribution by fuel combustion sources, and some power plant modeling results which indicate they cannot change fuel types.

Tables B-1 and B-2 list the particulate and SO<sub>2</sub> indicators respectively by AQCR.

### 3.7.2 Power Plant Assessment

There are two power plants in this region, as listed in Table C-1 with their source data. Both plants were modeled by Walden, and based on their 1972 operations, they both emit sufficient quantities of SO<sub>2</sub> to violate the ambient air quality standards. The modeling results are presented in Table C-4.

### 3.7.3 Point Source Assessment

The available point source data from the SIP are presented in Tables D-1 and D-2. No assessment of the impact of point sources can be made due to the lack of point source modeling data.

### 3.7.4 Area Source Assessment

The only available data on area sources was taken from the SIP and appear in Tables E-1 and E-2. These data are insufficient for an assessment of the area source impact on air quality.

## 3.8 SOUTHERN TIER WEST INTRASTATE AQCR 164

### 3.8.1 Regional Assessment

The Southern Tier West AQCR was determined to have a poor potential for particulate regulation revision and a marginal potential for SO<sub>2</sub> revision.

The indicators are summarized below:

- Particulates - proposed Air Quality Maintenance Areas, 1973 violations of air quality standards, no tolerance for emission increase, and a high ratio of fuel combustion emissions to total emissions.
- Sulfur Dioxide - high ratio of fuel combustion emissions to total emissions, and modeling results indicating that fuel conversion by power plants is not feasible.

Tables B-1 and B-2 list the indicators by AQCR for particulates and SO<sub>2</sub> respectively.

### 3.8.2 Power Plant Assessment

There are four power plants in the region. 1972 operations at three of these were modeled by Walden, and the results indicate that all three were exceeding the SO<sub>2</sub> standard in 1972. No particulate modeling or fuel switching results are available.

### 3.8.3 Point Source Assessment

Point source data from the New York SIP appear in Tables D-1 and D-2. Since no point source modeling results are available, no assessment can be made of the point source impact on air quality.

### 3.8.4 Area Source Assessment

Tables E-1 and E-2 show the area source data from the SIP. No further analysis can be performed for area sources without additional data.



APPENDIX A  
STATE IMPLEMENTATION PLAN BACKGROUND



TABLE A-1 NEW YORK AIR POLLUTION CONTROL AREAS

AQCR Name	AQCR No.	AQCR Priority Classification <sup>a</sup>			1975 <sup>b</sup> AQCR Population (millions)	Proposed AQMA Designations	
		TSP	SO <sub>2</sub>	NO <sub>x</sub>		TSP Counties	SO <sub>2</sub> Counties
Central New York	158	I	II	III	1.3	Herkimer <sup>c</sup> , Oneida <sup>c</sup> , Onondaga	No
Champlain Valley <sup>d</sup>	159	II	II	III	0.6	No	No
Genesee-Finger Lakes	160	II	II	III	1.2	Livingston <sup>c</sup> , Ontario <sup>c</sup> , Monroe, Wayne <sup>c</sup>	No
Hudson Valley	161	I	II	III	1.7	Albany <sup>c</sup> , Montgomery <sup>c</sup> , Rensselaer <sup>c</sup> , Saratoga <sup>c</sup> , Schenectady <sup>c</sup> , Dutchess <sup>c</sup> , Orange, Putnam, Ulster <sup>c</sup>	Albany <sup>c</sup> , Montgomery <sup>c</sup> , Rensselaer <sup>c</sup> , Saratoga <sup>c</sup> , Schenectady <sup>c</sup>
New Jersey, New York, Connecticut <sup>d</sup>	43	I	I	I	18.7	Bronx, Kings, New York, Queens, Richmond, Nassau, Rockland, Suffolk, Westchester	Bronx, Kings, New York, Queens, Richmond, Nassau, Rockland, Suffolk, Westchester
Niagara Frontier	162	I	I	III	1.4	Erie, Niagara	Erie, Niagara
Southern Tier East	163	II	II	III	0.5	Broome <sup>c</sup> , Tioga <sup>c</sup>	No
Southern Tier West	164	II	II	III	0.6	Chautauqua <sup>c</sup> , Chemung <sup>c</sup> , Steuben <sup>c</sup>	No

<sup>a</sup> Classification based on maximum measured (or estimated) pollution concentration in the area:

Priority	I	II	III
	Greater than	From - To	Less than
Sulfur oxide:			
Annual arithmetic mean	100	60-100	60
24-hour maximum	455	260-455	260
Particulate matter:			
Annual geometric mean	95	60-95	60
24-hour maximum	325	150-325	150

<sup>b</sup> AQCR population projections from: Projections of Economic Activity for Air Quality Control Regions, prepared by U.S. Department of Commerce, Bureau of Economic Analysis, August 1973.

<sup>c</sup> Less than the entire county designated.

<sup>d</sup> Interstate Region.

TABLE A-2 ATTAINMENT DATES

AQCR	AQCR No.	TSP Attainment Dates		SO <sub>2</sub> Attainment Dates
		Primary	Secondary	
Central New York	158	7/75	a	b
Champlain Valley	159	b	b	b
Genesee-Finger Lakes	160	7/75	7/75	7/75
Hudson Valley	161	7/75	7/75	7/75
New Jersey, New York Connecticut	43	7/77	a	7/75
Niagara Frontier	162	7/77	a	7/77
Southern Tier East	163	7/75	7/75	b
Southern Tier West	164	b	7/75	b

<sup>a</sup> 18-month extension granted.

<sup>b</sup> Air quality levels were below standards when attainment dates were established.

TABLE A-3 AMBIENT AIR QUALITY STANDARDS ( $\mu\text{g}/\text{m}^3$ )

	TSP			SO <sub>2</sub>				NO <sub>2</sub>
	Level <sup>a</sup>	Annual	24 hr	Annual	24 hr	3 hr	1 hr	Annual
Federal								
Primary	---	75 <sup>b</sup>	260 <sup>c</sup>	80 <sup>d</sup>	365 <sup>c</sup>	---	---	100 <sup>d</sup>
Secondary	---	60 <sup>b</sup>	150 <sup>c</sup>	--	---	1300 <sup>c</sup>	---	100 <sup>d</sup>
New York	I	45 <sup>e</sup> /70 <sup>f</sup>	250	80 <sup>d</sup>	260 <sup>g</sup> /365 <sup>h</sup>	---	650 <sup>i</sup> /1300 <sup>j</sup>	100 <sup>d</sup>
	II	55 <sup>e</sup> /85 <sup>f</sup>	250	--	---	---	---	--
	III	65 <sup>e</sup> /100 <sup>f</sup>	250	--	---	---	---	--
	IV	75 <sup>e</sup> /110 <sup>f</sup>	250	--	---	---	---	--

<sup>a</sup> Levels (applicable to New York TSP standards only), based on land use:

Level I - predominantly used for timber agricultural crops, dairy farming or recreation.  
Habitation and industry sparse.

Level II - predominantly single and two family residences, small farms, and limited commercial services and industrial development.

Level III - densely populated, primarily commercial office buildings, department stores, and light industries in small and medium metropolitan complexes, or suburban areas of limited commercial and industrial development near large metropolitan complexes.

Level IV - densely populated, primarily commercial office buildings, department stores and industries in large metropolitan complexes or areas of heavy industry.

<sup>b</sup> Annual geometric mean.

<sup>c</sup> Maximum concentration not to be exceeded more than once a year.

<sup>d</sup> Annual arithmetic mean.

<sup>e</sup> Value not to be exceeded by more than 50 percent of the 24-hour average concentrations during any 12 consecutive months.

Footnotes continued on following page

TABLE A-3 footnotes continued

- <sup>f</sup> Value not to be exceeded by more than 16 percent of the 24-hour average concentrations during any 12 consecutive months.
- <sup>g</sup> Value not to be exceeded by more than one percent of the 24-hour average concentrations during any 12 consecutive months.
- <sup>h</sup> 24-hour average concentration not to be exceeded.
- <sup>i</sup> Value not to be exceeded by more than one percent of the one-hour average concentrations during any 12 consecutive months.
- <sup>j</sup> One-hour average concentration not to be exceeded.

TABLE A-4 NEW YORK AQCR AIR QUALITY STATUS (1973), TSP

AQCR Name	AQCR No.	No. Stations Reporting	TSP Concentration (µg/m <sup>3</sup> )			No. Stations Violating Federal Ambient Air Quality Standards						% Reduction Required to meet Standards <sup>c</sup>	Standard on Which Reduction Is Based
			Highest Reading		2nd Highest Reading 24-hour	Primary		Secondary					
			Annual	24-hour		Annual	24-hr <sup>b</sup>	Annual	%	24-hr <sup>b</sup>	%		
Central New York	158	47	118	414	378	6	3	11	23.4	12	25.5	69.9	Annual
Champlain Valley <sup>d</sup>	159	18	102 <sup>e</sup>	262	211	1	0	2	11.1	2	11.1	58.3	Annual
Genesee-Finger Lakes	160	28	85	450	171	2	0	3	10.7	2	7.1	50.0	Annual
Hudson Valley	161	40	111	581	389	6	4	16	40.0	12	30.0	67.5	24-hour
New Jersey, New York, Connecticut <sup>d</sup>	43	166	125 <sup>f</sup>	489	462	12	13	36	21.7	46	27.7	72.2	Annual
Niagara Frontier	162	47	123	558	385	12	3	29	61.7	24	51.1	75.9	Annual
Southern Tier East	163	14	58	220	159	0	0	0	0	1	7.1	7.0	24-hour
Southern Tier West	164	19	94	342	243	2	0	5	26.3	5	26.3	53.1	Annual

<sup>a</sup> 1973 air quality data in National Air Data Bank as of July 28, 1974.

<sup>b</sup> Violations based on second highest reading at any station.

<sup>c</sup> Formula: 
$$\frac{(\text{2nd Highest 24-hr} - \text{24-hr Secondary Standard})}{(\text{2nd Highest 24-hr} - \text{Background})} \times 100 \quad \text{or} \quad \frac{(\text{Highest Annual} - \text{Annual Secondary Standard})}{(\text{Highest Annual} - \text{Background})} \times 100$$

whichever is more stringent.

Background levels used:

AQCR	Background ( $\mu\text{g}/\text{m}^3$ )
158	35
159 NY	30
159 VT	30
160	35
161	35
43 NY	35
43 NJ	35
43 CONN.	35
162	40
163	30
164	30

<sup>d</sup> Interstate Region

<sup>e</sup> Reading occurred in Vermont. Highest New York reading 56  $\mu\text{g}/\text{m}^3$ .

<sup>f</sup> Reading occurred in New Jersey. Highest New York reading 101  $\mu\text{g}/\text{m}^3$ .

TABLE A-5 NEW YORK AQCR AIR QUALITY STATUS (1973), SO<sub>2</sub><sup>a</sup>

AQCR Name	AQCR No.	No. Stations Reporting		SO <sub>2</sub> Concentration (µg/m <sup>3</sup> )			No. Stations Violating Federal Ambient Air Quality Standards			% Reduction Required to meet Standards <sup>c</sup>	Standard on Which Reduction is Based
		24-hr Bubbler	Contin.	Highest Reading		2nd Highest Reading 24-hr	Primary		Secondary		
				Annual	24-hr <sup>b</sup>		Annual	24-hour <sup>b</sup>	3-hour		
Central New York	158	7	5	40	84	70	0	0	0	-100.0	Annual
Champlain Valley <sup>d,f</sup>	159	2	3	35	461	453 <sup>c</sup>	0	1	0	j	Annual
Genesee-Finger Lakes	160	15	1	48	262	128	0	0	0	- 66.7	Annual
Hudson Valley	161	10	4	64	223	134	0	0	0	- 25.0	Annual
New Jersey, New York, Connecticut <sup>d</sup>	43	47	71	115	1381 <sup>g</sup>	93 <sup>h</sup>	11	10 <sup>i</sup>	2	+ 30.4	Annual
Niagara Frontier	162	24	8	96	1729	335	2	0	0	+ 16.7	Annual
Southern Tier East	163	1	1	45	154	65	0	0	0	- 77.8	Annual
Southern Tier West	164	2	0	56	320	71	0	0	0	- 42.9	Annual

<sup>a</sup> 1973 air quality data in National Air Data Bank as of July 28, 1974.

<sup>b</sup> Violations based on second highest reading at any station.

<sup>c</sup> Formula:  $\frac{(\text{2nd Highest 24-hr} - \text{24-hr Standard})}{\text{2nd Highest 24-hr}} \times 100$  or  $\frac{(\text{Highest Annual} - \text{Annual Standard})}{\text{Highest Annual}} \times 100$

whichever is more stringent.

<sup>d</sup> Interstate region.

<sup>e</sup> This reading occurred in the Vermont portion of the AQCR (1974 data).

<sup>f</sup> All noted values occurred in New York.

<sup>g</sup> Reading occurred in Connecticut. Highest New York reading 930 µg/m<sup>3</sup>.

<sup>h</sup> Reading occurred in New Jersey. Highest New York reading 86 µg/m<sup>3</sup>. Second highest values not reported in New York City.

<sup>i</sup> National Air Data Bank contains number of violations of 24-hour standard, but actual concentrations are not listed.

<sup>j</sup> Based on 1973 data. However there was a violation of the NAAQS in Vermont in 1974.

TABLE A-6 NEW YORK FUEL COMBUSTION SOURCE SUMMARY

AQCR Name	AQCR No.	No. of Power Plants <sup>a</sup>	No. of Area Sources	Total AQCR Emissions <sup>b</sup> (tons/yr)		% AQCR Emissions From N.Y. Fuel Combustion Sources	
				Part.	SO <sub>2</sub>	Part.	SO <sub>2</sub>
Central New York	158	1	9	30,955	106,985	53.5	97.2
Champlain Valley <sup>c</sup>	159	0	7	60,142	40,183	7.1	65.5
Genesee-Finger Lakes	160	3	9	44,461	148,622	49.5	95.3
Hudson Valley	161	3	13	57,872	147,509	44.7	97.0
New Jersey, New York, <sup>c</sup> Connecticut	43	17	9	292,396	1,015,983	33.5	61.4
Niagara Frontier	162	1	2	124,617	168,874	35.4	85.5
Southern Tier East	163	2	6	18,400	38,640	63.5	98.1
Southern Tier West	164	4	7	34,548	114,698	62.2	98.9

<sup>a</sup> New York power plants only.

<sup>b</sup> New York emission data from New York State and City Implementation Plans (1970 data). Vermont, New Jersey, and Connecticut data from NEDS.

<sup>c</sup> Interstate region.

TABLE A-7 NEW YORK EMISSIONS SUMMARY<sup>a</sup>, PARTICULATES

AQCR Name	AQCR No.	Total (Tons/yr)	Percent Fuel Combustion <sup>b</sup>	Electricity Generation Point Sources		Other Point Source Fuel Combustion		Area Source Fuel Combustion	
				(Tons/yr)	% <sup>b</sup>	(Tons/yr)	% <sup>b</sup>	(Tons/yr)	% <sup>b</sup>
Central New York	158	30,955	54.0	2,401	7.7	9,479	30.6	4,859	15.7
Champlain Valley	159	60,142	10.9	1,147	1.9	2,196	3.7	3,225	5.4
New York Portion		53,698	8.0	0	0.0	1,885	3.5	2,414	4.5
Vermont Portion		6,444	35.2	1,147	17.8	311	4.8	811	12.6
Genesee-Finger Lakes	160	44,461	49.7	10,340	23.3	5,039	11.3	6,729	15.1
Hudson Valley	161	57,872	44.8	12,272	21.2	6,315	10.9	7,363	12.7
New Jersey, New York, Connecticut	43	292,396	47.7	29,556	10.1	29,431	10.1	80,514	27.5
New York Portion		177,392	55.2	16,189	9.1	20,203	11.4	61,607	34.7
New Jersey Portion		102,784	30.7	8,185	8.0	9,032	8.8	14,323	13.9
Connecticut Portion		12,220	81.5	5,182	42.4	196	1.6	4,584	37.5
Niagara Frontier	162	124,617	35.4	9,578	7.7	31,198	25.0	3,392	2.7
Southern Tier East	163	18,400	63.5	6,727	36.6	1,083	5.9	3,868	21.0
Southern Tier West	164	34,548	62.2	12,216	35.4	1,997	5.8	7,334	21.2

<sup>a</sup> New York emission data from New York State and City Implementation Plans (1970 data). Vermont, New Jersey, and Connecticut data from NEDS.

<sup>b</sup> Percentage of total emissions.



TABLE A-8 NEW YORK EMISSIONS SUMMARY<sup>a</sup>, SO<sub>2</sub>

AQCR Name	AQCR No.	Total (Tons/yr)	Percent Fuel Combustion <sup>b</sup>	Electricity Generation Point Sources		Other Point Source Fuel Combustion		Area Source Fuel Combustion	
				(Tons/yr)	% <sup>b</sup>	(Tons/yr)	% <sup>b</sup>	(Tons/yr)	% <sup>b</sup>
Central New York	158	106,985	97.2	41,287	38.6	39,601	37.0	23,048	21.5
Champlain Valley	159	40,183	93.9	698	1.7	21,146	52.6	15,906	39.6
New York Portion		31,551	94.2	0	0.0	19,382	61.4	10,345	32.8
Vermont Portion		8,632	92.9	698	8.1	1,764	20.4	5,561	64.4
Genesee-Finger Lakes	160	148,622	98.1	75,239	50.6	50,770	34.2	19,757	13.3
Hudson Valley	161	147,509	97.0	78,540	53.2	27,987	19.0	36,605	24.8
New Jersey, New York, Connecticut	43	1,015,983	92.9	474,080	46.7	77,660	7.6	391,630	38.5
New York Portion		640,402	97.5	278,888	43.5	32,443	5.1	313,022	48.9
New Jersey Portion		317,693	82.6	154,682	48.7	44,577	14.0	63,314	19.9
Connecticut Portion		57,888	97.5	40,510	70.0	640	1.1	15,294	26.4
Niagara Frontier	162	168,874	85.5	66,053	39.1	67,510	40.0	10,741	6.4
Southern Tier East	163	38,640	98.1	21,712	56.2	4,345	11.2	11,842	30.6
Southern Tier West	164	114,698	98.9	91,914	80.1	5,617	4.9	15,913	13.9

<sup>a</sup> New York emission data from New York State and City Implementation Plans (1970 data). Vermont, New Jersey, and Connecticut data from NEDS.

<sup>b</sup> Percentage of total emissions.

TABLE A-9 NEW YORK MAXIMUM SULFUR CONTENT LIMITATIONS

	<u>Oil</u> (percent Sulfur by weight)	<u>Solid Fuel</u> (Pounds of Sulfur per 10 <sup>6</sup> BTU)
New York City:		
Bronx County		
Kings County	0.30	0.2
New York County	0.20 <sup>a</sup>	
Queens County		
Richmond County		
Nassau County		
Rockland County	0.37	0.20
Westchester County		
Towns of:		
Babylon		
Brookhaven		
Huntington	1.0 <sup>b</sup>	0.6 <sup>b</sup>
Islip		
Smithtown		
(in Suffolk County)		
Erie County	2.2 <sup>b,c</sup>	1.4 <sup>b</sup>
Niagara County		
Remainder of State	2.0 <sup>b</sup>	1.9 <sup>b</sup>

<sup>a</sup> Distillate

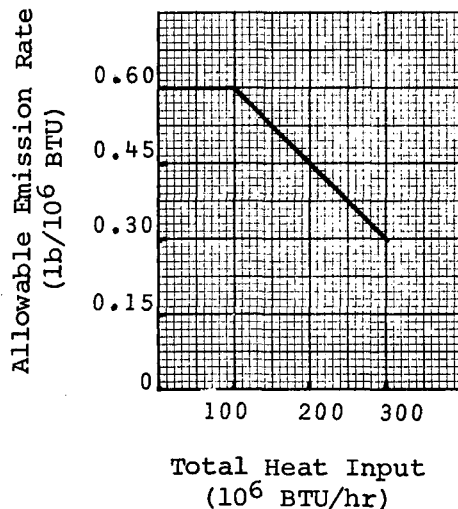
<sup>b</sup> Maximum sulfur content 0.75 percent sulfur by weight for oil, and 0.6 pounds sulfur per million BTU for coal in sources meeting the following criteria:

- Rated capacity greater than 250 million BTU per hour, and
- Application for a permit to construct received by the Department or an application for a certificate of environmental compatibility and public need received by the Public Service Commission after March 15, 1973, and
- Installation is not located in New York City, Nassau, Rockland or Westchester County.

<sup>c</sup> Decreases to 1.1% effective October 1, 1975.

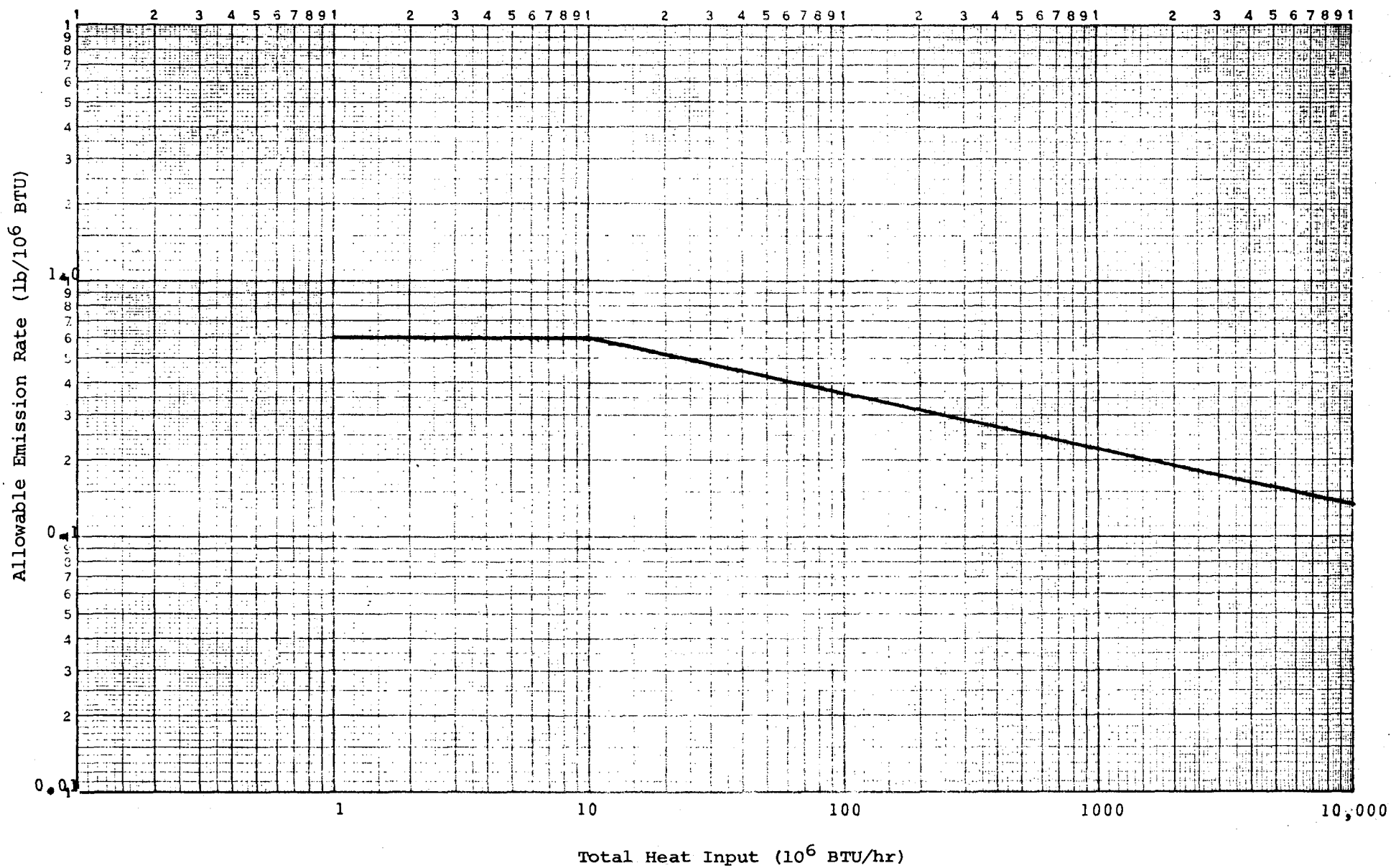
NEW YORK STATIONARY FUEL COMBUSTION SOURCE PARTICULATE  
LIMITATION REGULATIONS

1. Two hour average particulate emission shall not exceed 0.10 pounds per million BTU heat input from:
  - a) Any oil fired stationary combustion installation, or
  - b) any coal fired stationary combustion installations of more than 250 million BTU per hour total heat input for which an application for a Permit to Construct is submitted subsequent to August 12, 1972.
2. Installations with a total heat input equal to or less than 300 million BTU per hour and in operation prior to June 1, 1972 are limited to the following allowable emission rates:
  - a) Spreader stokers - 0.60 pounds per million BTU input
  - b) Other than spreader stokers - maximum emission rate as shown on the following graph:



3. All other sources are limited to the maximum emission rate as shown on the graph of Figure A-1 except sources smaller than one million BTU per hour which are exempt from the regulation.

FIGURE A-1 NEW YORK FUEL COMBUSTION MAXIMUM PARTICULATE EMISSIONS



APPENDIX B  
REGIONAL AIR QUALITY SUMMARY

TABLE B-1 REGIONAL INDICATORS FOR REVISION OF PARTICULATE REGULATIONS

AQCR Name	AQCR No.	No. of Stations		Expected Attainment Date	Total Emissions (T/yr) <sup>b</sup>	% Emissions from N.Y. Fuel Combustion	Proposed AQMA Designations	Tolerance for Emission Increase (T/yr) <sup>c</sup>
		Reporting	Violating Standards <sup>a</sup>					
Central New York	158	47	14	e	30,955	54.0	yes	0
Champlain Valley <sup>d</sup>	159	18	3	f	53,698	8.0	no	0
Genesee-Finger Lakes	160	28	3	7/75	44,461	49.7	yes	0
Hudson Valley	161	40	19	7/75	57,872	44.8	yes	0
New Jersey, New York, Connecticut <sup>d</sup>	43	166	58	e	177,392	55.2	yes	0
Niagara Frontier	162	47	32	e	124,617	35.4	yes	0
Southern Tier East	163	14	1	7/75	18,400	63.5	yes	0
Southern Tier West	164	19	6	7/75	34,548	62.4	yes	0

<sup>a</sup> 1973 SAROAD System data.

<sup>b</sup> For interstate regions this value is the contribution from sources in the New York portion only.

<sup>c</sup> Based on percent reduction required to meet standards from Table A-4 applied against total emissions.

<sup>d</sup> Interstate region.

<sup>e</sup> 18-month extension granted for submission of plan.

<sup>f</sup> Air quality levels were below standards when attainment dates were established.

TABLE B-2 REGIONAL INDICATORS FOR REVISION OF SO<sub>2</sub> REGULATIONS

<u>AQCR Name</u>	<u>AQCR No.</u>	<u>No. of Stations Reporting</u>	<u>Violating Standards<sup>a</sup></u>	<u>Expected Attainment Date</u>	<u>Total Emissions (T/yr)<sup>b</sup></u>	<u>% Emission from N.Y. Fuel Combustion</u>	<u>Proposed AQMA Designations</u>	<u>Tolerance for Emission Increase (T/yr)<sup>c</sup></u>
Central New York	158	12	0	e	106,985	97.2	no	106,985
Champlain Valley <sup>d</sup>	159	5	1	e	31,551	94.2	no	g
Genesee-Finger Lakes	160	16	0	7/75	148,622	98.1	no	99,131
Hudson Valley	161	14	1	7/75	147,509	97.0	yes	36,877
New Jersey, New York, Connecticut <sup>d</sup>	43	118	12	f	640,402	97.5	yes	0
Niagara Frontier	162	32	2	f	168,874	85.5	yes	0
Southern Tier East	163	2	0	e	38,640	98.1	no	30,062
Southern Tier West	164	2	0	7/75	114,698	98.9	no	49,205

<sup>a</sup> 1973 SAROAD System data.

<sup>b</sup> For interstate regions this value is the contribution from sources in the New York portion only.

<sup>c</sup> Based on percent reduction required to meet standards from Table A-5 applied against total emissions.

<sup>d</sup> Interstate region.

<sup>e</sup> Air quality levels were below standards when attainment dates were established.

<sup>f</sup> 18-month extension granted for submission of plan.

<sup>g</sup> Based on 1973 data. However there was a violation of the NAAQS in Vermont in 1974.

APPENDIX C  
POWER PLANT SUMMARY



TABLE C-1 POWER PLANT ASSESSMENT FOR NEW YORK

<u>AQCR Name</u>	<u>AQCR No.</u>	<u>Plant Ownership and (Name)</u>	<u>1975 Capacity<sup>a</sup> MW</u>	<u>Fuel Type</u>	<u>Est. 1975 Quantity<sup>b</sup></u>	<u>% SC By Regulation</u>
Central New York	158	Niagara Mohawk Power (Oswego)	1,192 <sup>d</sup>	Oil	3,571	2.00
Genesee-Finger Lakes	160	N.Y. State Elec. & Gas (Greenidge)	160	Coal	480	2.18
		Rochester Gas & Elec. (Rochester 3)	196	Coal	208	2.45
				Oil	998	2.00
		Rochester Gas & Elec. (Rochester 7)	253	Coal	559	2.44
Hudson Valley	161	Niagara Mohawk Power (Albany)	400	Oil	4,197	2.00
		Central Hudson Gas & Elec. (Danskammer)	537	Oil	5,172	2.00
		Central Hudson Gas & Elec. (Roseton 1 & 2) <sup>e</sup>	1,242	Oil	16,757	2.00
New Jersey, New York, Connecticut	43	Consolidated Edison of N.Y. (59th St.)	185	Oil	1,433	0.30
		Consolidated Edison of N.Y. (74th St.)	209	Oil	982	0.30
		Consolidated Edison of N.Y. (East River)	776	Oil	2,063	0.30
				Gas	17,664	
		Consolidated Edison of N.Y. (Waterside)	672	Oil	2,494	0.30
				Gas	9,008	
		Consolidated Edison of N.Y. (Indian Point)	275	Oil <sup>f</sup>	651	0.37
		Consolidated Edison of N.Y. (Arthur Kill)	912	Oil	5,605	0.30
		Consolidated Edison of N.Y. (Astoria)	2,351 <sup>g</sup>	Coal	6	0.21
				Oil	19,791	0.30
				Gas	4,176	
		Consolidated Edison of N.Y. Ravenswood)	1,828	Oil	12,904	0.30
				Gas	5,104	
		Consolidated Edison of N.Y. (Hell Gate)	311	Oil	3,445	0.30
				Gas	3,156	
		Consolidated Edison of N.Y. (Hudson Ave.)	715	Oil	3,398	0.30
		Long Island Lighting (Barrett)	375	Oil	3,402	0.37
				Gas	1,059	
		Long Island Lighting (Glenwood)	380	Oil	2,684	0.37
				Gas	1,078	
		Long Island Lighting (Far Rockaway)	114	Oil	927	0.30
				Gas	515	
		Long Island Lighting (Northport)	1,161	Oil	8,365	2.0
		Long Island Lighting (Port Jefferson)	467	Oil	4,405	2.0
		Orange and Rockland Util. (Bowline Pt.) <sup>h</sup>	1,242 <sup>i</sup>	Oil	10,186	0.37
				Gas	85	
		Orange and Rockland Util. (Lovett)	495	Oil	3,363 <sup>j</sup>	0.37
				Gas	9,657	
Niagara Frontier	162	Niagara Mohawk Power (Huntley)	828	Coal	1,380	2.15

TABLE C-1

<u>AQCR Name</u>	<u>AQCR No.</u>	<u>Plant Ownership and Name</u>	<u>1975 Capacity<sup>a</sup> MW</u>	<u>Fuel Type</u>	<u>Est. 1975 Quantity<sup>b</sup></u>	<u>% S<sup>c</sup> By Regulation</u>
Southern Tier East	163	N.Y. State Elec. and Gas (Goudey)	146	Coal	315	2.19
		N.Y. State Elec. and Gas (Jennison)	60	Coal	169	1.98
Southern Tier West	164	N.Y. State Elec. and Gas (Hickling)	70	Coal	291	2.05
		N.Y. State Elec. and Gas (Milliken)	270	Coal	660	2.19
		Niagara Mohawk Power (Dunkirk)	628	Coal	1,286	2.41
		City of Jamestown (S.A. Carlson)	81	Coal	115	2.37

<sup>a</sup> Source: Steam Electric Plant Factors, 1973 Edition, National Coal Association, Washington, D.C., January 1974.

<sup>b</sup> Coal in  $10^3$  tons, Oil in  $10^3$  bbl., Gas in  $10^6$  cu. ft. If no projected change in generating capacity between 1972 and 1975, then 1972 consumption from the above reference assumed for 1975. Changes in fuel consumption due to increased generating capacity calculated using  $8.5 \times 10^{10}$  BTU/yr input per megawatt (assumes 35% overall plant energy conversion efficiency) and  $150 \times 10^3$  BTU per gallon of oil, and 1000 BTU per cubic foot of gas.

<sup>c</sup> Percent sulfur allowed for coal calculated from regulation ( $1\text{b}/10^6$  BTU) using heat content of coal as listed in above reference.

<sup>d</sup> Includes an 816 megawatt addition in 1974.

<sup>e</sup> New plant in 1973.

<sup>f</sup> Also designed for nuclear power generation.

<sup>g</sup> Includes an 800 megawatt addition in 1975.

<sup>h</sup> Plant jointly owned by Consolidated Edison (2/3), and Orange and Rockland Utilities (1/3).

<sup>i</sup> Includes a 621 megawatt addition in 1974.

<sup>j</sup> Also burned 1,329 barrels of light oil.

TABLE C-2  
POWER PLANT DATA USED FOR MODELING BY WALDEN

AQCR Name	AQCR No.	Plant/Conversion	Oil Use		Coal Use		
			Amount (10 <sup>3</sup> gal/yr)	Sulfur (%)	Amount <sup>a</sup> (10 <sup>3</sup> T/yr)	Sulfur (%)	Ash (%)
Hudson Valley	161	<u>Albany</u>					
		1972 Operations	176,274	2.4	-	-	-
		Switch Units 1-4	-	-	1036	3.0	15
		<u>Danskammer</u>					
New Jersey, New York, Connecticut	43	1972 Operations	217,098	1.5	-	-	-
		Switch Units 1-4	-	-	1236	3.0	15
		<u>74th Street</u>					
		1972 Operations	41,244	0.3	-	-	-
		<u>Waterside</u>					
		1972 Operations	104,748	0.5	-	-	-
		<u>Arthur Kill</u>					
		1972 Operations	260,274	0.4	-	-	-
		Switch Unit 30	133,980	0.4	710	3.0	15
		<u>Astoria</u>					
		1972 Operations	377,874	0.4	-	-	-
		Switch Units 10, 20, 30, 40, 50	-	-	2117	2.5	10
		<u>Ravenswood</u>					
		1972 Operations	541,968	0.4	-	-	-
		Switch Unit 30N, 30S	269,220	0.4	1551	3.0	15
		<u>Barrett</u>					
		1972 Operations	142,884	0.9	-	-	-
		Switch Unit 10	72,576	0.9	350	2.5	15

TABLE C-2  
(cont)

AQCR Name	AQCR No.	Plant/Conversion	Oil Use		Coal Use		
			Amount (10 <sup>3</sup> gal/yr)	Sulfur (%)	Amount (10 <sup>3</sup> T/yr)	Sulfur (%)	Ash (%)
New Jersey, New York,	43	<u>Far Rockaway</u>					
		1972 Operations	39,018	0.5	-	-	-
		Switch Unit 40	-	-	209	3.0	15
		<u>Port Jefferson</u>					
		1972 Operations	185,010	2.4	-	-	-
		Switch Units 30, 40	27,426	2.4	782	3.0	15
		<u>Bowline</u>					
		1972 Operations	84,504	0.4	-	-	-
		<u>Lovett</u>					
		1972 Operations	141,246	0.7	-	-	-
		Switch Units 4,5	22,008	0.7	664	3.1	15

a Estimated by Walden on the basis of equivalent BTU heating value.

TABLE C-3  
SUMMARY OF POWER PLANT MODELING RESULTS

AQCR Name	AQCR No.	Plant/Conversion	Maximum 24-hr Concentration ( $\mu\text{g}/\text{m}^3$ )				Max. Annual Conc. ( $\mu\text{g}/\text{m}^3$ )	
			Part.		SO <sub>2</sub>		Part.	SO <sub>2</sub>
			Nominal Load <sup>a</sup>	Max. Load <sup>b</sup>	Nominal Load <sup>a</sup>	Max. Load <sup>b</sup>		
Hudson Valley	161	<u>Albany<sup>c</sup></u>						
		1972 Operations	303	366	6	8	-	-
		Switch Units 1-4	494	597	771	932	-	-
		<u>Danskammer<sup>c</sup></u>						
New Jersey, New York, Connecticut	43	1972 Operations	784	910	26	30	-	-
		Switch Units 1-4	2117	2445	472	545	-	-
		<u>74th Street<sup>d</sup></u>						
		1972 Operations	4	5	< 1	< 1	2	< 1
		<u>Waterside<sup>d</sup></u>						
		1972 Operations	9	28	< 1	3	1	< 1
		<u>Arthur Kill</u>						
		1972 Operations	15	17	2	2	< 1	< 1
		Switch Unit 30	82	109	9	12	< 1	< 1
		<u>Astoria<sup>d</sup></u>						
		1972 Operations	43	60	5	8	3	< 1
		Switch Units 10, 20, 30, 40	408	499	22	26	34	3
		<u>Ravenswood<sup>d</sup></u>						
		1972 Operations	18	29	2	3	< 1	< 1
		Switch Units 30N, 30S	73	99	3	4	10	1

TABLE C-3  
(cont)

AQCR Name	AQCR No.	Plant/Conversion	Maximum 24-hr Concentration ( $\mu\text{g}/\text{m}^3$ )				Max. Annual Conc. ( $\mu\text{g}/\text{m}^3$ )	
			Part.		SO <sub>2</sub>		Part.	SO <sub>2</sub>
			Nominal Load <sup>a</sup>	Max. Load <sup>b</sup>	Nominal Load <sup>a</sup>	Max. Load <sup>b</sup>		
New Jersey, New York, Connecticut	43	Barrett <sup>e</sup>						
		1972 Operations	33	49	2	3	3	< 1
		Switch Unit 10	89	127	42	60	8	4
		Far Rockaway <sup>e</sup>						
		1972 Operations	12	21	1	1	1	< 1
		Switch Unit 40	69	79	31	35	6	3
		Port Jefferson						
		1972 Operations	124	129	3	3	8	< 1
		Switch Units 30, 40	171	176	49	49	11	3
		Bowline <sup>c,f</sup>						
		1972 Operations	670	953	91	129	-	-
		Lovett <sup>c,f</sup>						
		1972 Operations	860	1454	62	104	-	-
		Switch Units 4, 5	5824	5981	1247	1230	-	-

TABLE C-3

FOOTNOTES

- a Nominal Load Case - This presents maximum concentrations calculated by the model based upon average monthly emission rates.
- b Maximum Load Case - This case was calculated assuming the plant to be operating at 95% of rated capacity. Since the maximum load case also involves a greater plume rise, a somewhat higher concentration may actually occur on a different day than that found by using the average monthly emission rates. This contingency was examined by considering in detail the 20 highest concentration days. a 10% safety factor was added to the computed concentration.
- c This plant is located in severely restricting valley terrain. The assumptions made in the special model used for this plant are such that an appreciably lower degree of confidence must be assigned to these results.
- d Concentrations include the influence of interactions between the 74th Street, Astoria, Waterside, Ravenswood, and Bergen (N. J.) plants.
- e Concentrations include the influence of interactions between the Barrett and Far Rockaway plants.
- f Concentrations include the influence of interactions between the Bowline and Lovett plants.

TABLE C-4 ESTIMATED MAXIMUM GROUND LEVEL CONCENTRATION OF SO<sub>2</sub><sup>a</sup>

AQCR Name	AQCR No.	Plant	1972 Coal Use		1972 Oil Use		Max. SO <sub>2</sub> Concentration, µg/m <sup>3</sup>		
			Amount (10 <sup>3</sup> T/yr)	Sulfur (%)	Amount (10 <sup>3</sup> Gal/yr)	Sulfur (%)	24-hour		Annual
							Nominal Load <sup>b</sup>	Maximum Load <sup>c</sup>	
Central New York	158	Oswego			133,103	2.4	135	155	9
Genesee-Finger Lakes	160	Greenidge <sup>d</sup>	467	2.0	2,341	0.2	285	345	--
		Rochester 3			79,242 <sup>e</sup>	1.9	77	100	5
		Rochester 7	566	2.0	562	0.4	84	115	6
New Jersey, New York, Connecticut	43	59th Street <sup>f</sup>			60,215	0.4	27	33	1
		East River <sup>f,g</sup>			86,663	0.3	8	16	1
		Indian Point <sup>d</sup>			29,723	0.3	43	57	--
		Hell Gate <sup>f,h</sup>			144,698	0.4	39	57	3
		Hudson Ave. <sup>f,i</sup>			146,836	0.3	17	34	1
		Glenwood <sup>j</sup>			126,861	0.9	210	315	17
		Northport <sup>k</sup>			424,284	2.4	98	120	6
Niagara Frontier	162	Huntley	1,437	1.9			95	110	6
Southern Tier East	163	Gouden	319	2.3	503	0.2	395	355	--
		Jennison	170	1.0			430	695	--
Southern Tier West	164	Hickling <sup>d</sup>	331	1.6			2,310	2,500	--
		Milliken <sup>d</sup>	743	2.1	660	0.6	1,120	1,040	--
		Dunkirk <sup>d</sup>	1,256	2.6			485	520	--

See Footnotes On Following Page



TABLE C-4 Footnotes

- <sup>a</sup> Based on 1972 operations.
- <sup>b</sup> Nominal Load Case - This presents maximum concentrations calculated by the model based on average monthly emission rates.
- <sup>c</sup> Maximum Load Case - This case was calculated assuming the plant to be operating at 95 percent of rated capacity during selected days of highest concentration found by using the monthly average emission rates. Since the maximum load case involves a greater plume rise, a somewhat higher concentration may actually occur on a different day. To allow for this contingency, a ten percent safety factor was added to the computed concentration.
- <sup>d</sup> This plant is located in severely restrictive valley terrain. The assumptions made in the special model used for this plant are such that an appreciably lower degree of confidence must be assigned to these results.
- <sup>e</sup> All units converted from coal to oil firing in 1973. Coal consumption for 1972 was converted to oil on a BTU-equivalent basis to model this plant.
- <sup>f</sup> Results do not consider the possible interactions between the 59th Street, East River, Hell Gate, and Hudson Avenue plants.
- <sup>g</sup> East River Plant also burned  $17,719 \times 10^6$  cubic feet of gas in 1972.
- <sup>h</sup> Hell Gate Plant also burned  $3,156 \times 10^6$  cubic feet of gas in 1972.
- <sup>i</sup> Hudson Avenue Plant also burned  $1,154 \times 10^6$  cubic feet of gas in 1972.
- <sup>j</sup> Glenwood Plant also burned  $1,062 \times 10^6$  cubic feet of gas in 1972.
- <sup>k</sup> Diffusion model used does not adequately treat meteorological factors associated with an air/water interface. Therefore, less reliability can be attached to the results predicted for the Northport Plant.

APPENDIX D  
POINT SOURCE SUMMARY

TABLE D-1 POINT SOURCE<sup>a</sup> SUMMARY FOR NEW YORK, PARTICULATE<sup>b</sup>

AQCR Name	AQCR No.	Coal Combustion		Oil Combustion		Gas Combustion	
		Emissions (T/yr)	% of N.Y. Total <sup>c</sup>	Emissions (T/yr)	% of N.Y. Total <sup>c</sup>	Emissions (T/yr)	% of N.Y. Total <sup>c</sup>
Central New York	158	8743	92.2	625	6.6	111	1.2
Champlain Valley	159	1517	80.5	368	19.5	0	0.0
Genesee-Finger Lakes	160	4758	94.4	232	4.6	49	1.0
Hudson Valley	161	5475	86.7	786	12.4	54	0.9
New Jersey, New York, Connecticut	43	15743 <sup>d</sup>	77.9	4460	22.1	0	0.0
Niagara Frontier	162	29451	94.4	1705	5.5	42	0.1
Southern Tier East	163	890	82.2	185	17.0	8	0.7
Southern Tier West	164	1932	96.7	13	0.7	52	2.6

<sup>a</sup> Does not include power plants.

<sup>b</sup> Data from New York State and City Implementation Plans (1970 data).

<sup>c</sup> Total non-power plant fuel combustion emissions.

<sup>d</sup> This is 1970 data. Coal combustion has been reduced to near zero in New York City.

TABLE D-2 POINT SOURCE<sup>a</sup> SUMMARY FOR NEW YORK, SO<sub>2</sub><sup>b</sup>

AQCR Name	AQCR No.	Coal Combustion		Oil Combustion		Gas Combustion	
		Emissions (T/yr)	% of N.Y. Total <sup>c</sup>	Emissions (T/yr)	% of N.Y. Total <sup>c</sup>	Emissions (T/yr)	% of N.Y. Total <sup>c</sup>
Central New York	158	29,690	75.0	9,911	25.0	0	0.0
Champlain Valley	159	11,229	57.9	8,153	42.1	0	0.0
Genesee-Finger Lakes	160	46,555	91.7	4,214	8.3	1	0.0
Hudson Valley	161	14,955	53.4	13,030	46.6	2	0.0
New Jersey, New York, Connecticut	43	8,611 <sup>d</sup>	26.5	23,832	73.5	0	0.0
Niagara Frontier	162	31,250	46.3	36,260	53.7	0	0.0
Southern Tier East	163	1,296	29.4	3,047	70.6	0	0.0
Southern Tier West	164	4,966	88.4	617	11.0	34	0.6

<sup>a</sup> Does not include power plants.

<sup>b</sup> Data from New York State and City Implementation Plans (1970 data).

<sup>c</sup> Total non-power plant fuel combustion emissions.

<sup>d</sup> This is 1970 data. Coal combustion has been reduced to near zero in New York City.

APPENDIX E  
AREA SOURCE SUMMARY

TABLE E-1 AREA SOURCE SUMMARY FOR NEW YORK, PARTICULATE<sup>a</sup>

AQCR Name	AQCR No.	Coal Combustion		Oil Combustion		Gas Combustion	
		Emissions (T/yr)	% of N.Y. Total <sup>b</sup>	Emissions (T/yr)	% of N.Y. Total <sup>b</sup>	Emissions (T/yr)	% of N.Y. Total <sup>b</sup>
Central New York	158	2500	51.5	1980	40.7	379	7.8
Champlain Valley	159	1311	54.3	1096	45.4	7	0.3
Genesee-Finger Lakes	160	4682	69.6	1755	26.1	292	4.3
Hudson Valley	161	4291	58.3	2891	39.3	181	2.5
New Jersey, New York, Connecticut	43	4128 <sup>c</sup>	6.7	54912	89.1	2567	4.2
Niagara Frontier	162	1660	48.9	1479	43.6	253	7.5
Southern Tier East	163	3234	83.6	581	15.0	53	1.4
Southern Tier West	164	6286	85.7	906	12.4	142	1.9

<sup>a</sup> Data from New York State and City Implementation Plans(1970 data).

<sup>b</sup> Total area source fuel combustion emissions.

<sup>c</sup> This is 1970 data. Coal combustion has been reduced to near zero in New York City.

TABLE E-2 AREA SOURCE SUMMARY FOR NEW YORK, SO<sub>2</sub><sup>a</sup>

AQCR Name	AQCR No.	Coal Combustion		Oil Combustion		Gas Combustion	
		Emissions (T/yr)	% of N.Y. Total <sup>b</sup>	Emissions (T/yr)	% of N.Y. Total <sup>b</sup>	Emissions (T/yr)	% of N.Y. Total <sup>b</sup>
Central New York	158	4289	18.6	18,749	81.3	10	0.0
Champlain Valley	159	2250	21.7	8,095	78.3	0	0.0
Genesee-Finger Lakes	160	4303	21.8	15,445	72.5	9	0.0
Hudson Valley	161	10050	27.5	26,548	72.5	7	0.0
New Jersey, New York, Connecticut	43	9160 <sup>c</sup>	2.9	303,778	97.0	84	0.0
Niagara Frontier	162	2116	19.7	8,611	80.2	14	0.1
Southern Tier East	163	3897	32.9	7,941	67.1	4	0.0
Southern Tier West	164	8632	54.2	7,277	45.7	4	0.0

<sup>a</sup> Data from New York State and City Implementation Plans (1970 data).

<sup>b</sup> Total area source fuel combustion emissions.

<sup>c</sup> This is 1970 data. Coal combustion has been reduced to near zero in New York City.

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