EPA-450/3-75-001

JANUARY 1975

IMPLEMENTATION PLAN REVIEW

FOR

VIRGIN ISLANDS

AS REQUIRED

BY

THE ENERGY SUPPLY

AND

ENVIRONMENTAL COORDINATION ACT

U. S. ENVIRONMENTAL PROTECTION AGENCY

EPA-450/3-75-001

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FOR
VIRGIN ISLANDS
AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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U.S. VIRGIN ISLANDS

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_2 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_2 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 effect 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 has 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, 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 (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of 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_2 and TSP emission tolerances 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 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 U.S. Virgin Islands State Implementation Plan has been reviewed for the most prevalent causes of over-restrictive fuel combustion and emission limiting regulations. The major findings of the review are:

FOR SULFUR DIOXIDE, THERE ARE INDICATIONS OF SOME POTENTIAL FOR RELAXING EXISTING EMISSION LIMITING REGULATIONS.

FOR TOTAL SUSPENDED PARTICULATES, THERE ARE NO INDICATIONS OF ANY POTENTIAL FOR REVISING FUEL COMBUSTION SOURCE EMISSION LIMITING REGULATIONS.

The supportive findings of the SIP review are as follows:

Recent revision of the Virgin Islands sulfur in fuel regulations has been withdrawn, however, the Virgin Islands are in the process of developing a regulation which will be compatible with the intention of Section IV of ESECA.

Fuel combustion sources emit approximately 13 percent of all total suspended particulate emissions in the Virgin Islands. With air quality standards being exceeded in 1973, relaxation of existing fuel combustion emission limiting regulations would tend to further increase emissions and aggravate the existing air quality levels.

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?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?
- Is there a significant clean fuels savings potential in the region?

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.

TABLE 2-1

STATE IMPLEMENTATION PLAN REVIEW
(SUMMARY)

"Indicators"	U.S. Virgin Islands TSP	U.S. Virgin Islands SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	No	No
• 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 <u>no</u> proposed Air Quality Maintenance Areas?	Yes	Yes
• Are there indications of a sufficient number of monitoring sites within a region?	No	No
• Is there an expected 1975 attainment date for NAAQS?	Yes	Yes
• Based on (1973) Air Quality Data, are there no reported violations of NAAQS?	No	Yes
• Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?	No	No
• Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?	Yes	No
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?	N/A	N/A
• Must emission limiting regulations be revised to accommodate significant fuel switching?	Yes	Yes
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?	Poor	Marg.
• Is there a significant Clean Fuels Saving potential in the region?	Yes	

CARIBBEAN SEA

U. S. VIRGIN ISLANDS

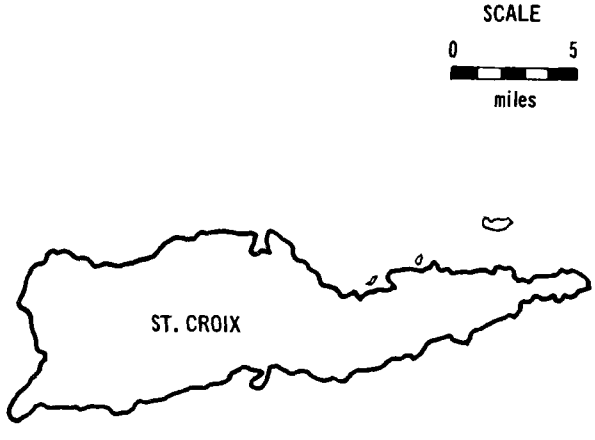

Figure 2-1 AIR QUALITY CONTROL REGION IN U.S. VIRGIN ISLANDS

2.2 CURRENT AIR QUALITY STATUS OF U.S. VIRGIN ISLANDS

2.2.1 Definition of Air Quality Control Regions

The entire U.S. Virgin Islands comprise one Air Quality Control Region (No. 247). As illustrated in Figure 2-1, it includes the islands of St. Thomas, St. John, St. Croix, and the islands surrounding each. Other information pertaining to the AQCR is presented in the Appendix. The priority classification for TSP, SO_2 and NO_x are given in Table A-1. These data are discussed in more detail in Section 3.0.

2.2.2 Air Quality Standards

The Federal ambient air quality standards and the U.S. Virgin Islands standards are identical for TSP, SO_2, and NO_x as given in Table A-2.

2.2.3 Air Quality Monitoring

1973 air quality data, the most currently available for the U.S. Virgin Islands for TSP and SO_2 are given in Tables A-3 and A-4, respectively. In brief these data indicate the following:

- As of 1973, the U.S. Virgin Islands had three monitoring stations reporting for particulates, one violation of the secondary air quality standards, a Priority 1A classification for particulates and required approximately a 42 percent reduction in particulate emissions to attain the secondary standard.
- As of 1973, the U.S. Virgin Islands had two 24-hr Bubbler monitoring stations and no continuous monitoring stations for SO_2. No violations were reported; however, the AQCR has a Priority 1A classification for SO_2.
- The air quality monitoring network for both TSP and SO_2 is inadequate according to population and AQCR Priority classification criteria.

2.2.4 Emissions of Sulfur Dioxide and Particulates

The contribution of fuel combustion sources in the U.S. Virgin Islands to the total emissions in the AQCR are summarized in Table A-5 for both particulates and sulfur dioxide. Tables A-6 and A-7 provide a categorization in terms of combustion source type, for example, electricity generation, industrial-commercial-institutional, and area sources. The tables tend to indica—

- Fuel combustion sources account for approximately 69 percent of the AQCR SO_2 emissions and 13 percent of the particulate emissions.
- Fuel combustion sources other than electricity generation contribute approximately 11 percent of the total AQCR particulate emissions.
- Industrial sources are the major source of SO_2 emissions contributing approximately 55 percent of the total AQCR SO_2 emissions.

2.2.5 Particulate and SO_2 Regulations

Virgin Islands regulations for control of particulates and SO_2 from fuel-burning sources are based on a particulate emission limitation and fuel sulfur content regulations summarized in Table A-8. The regulations are discussed in more detail in Section 2.3.

2.2.6 Control Strategy Assessments

Tables A-9 and A-10, the control strategy assessments for particulates and SO_2, respectively, were developed primarily as inputs to the assessments of Appendix B, which are discussed in Section 3.0. Basically, the tables represent attempts to examine the following:

(1) Are the allowable emissions projections made in the original SIP in reasonable agreement with such estimates based on more recent data?

(2) Does a tolerance for an emission increase exist within the AQCR?

Table A-9 indicates that there is no tolerance for an increase in particulate emissions using current data and Table A-10 indicates the same status for SO_2. The detailed assessment of an AQCR's potential for revising combustion regulations which considers many other factors are presented in Section 3.0.

2.3 GENERAL REVIEW OF THE CURRENT IMPLEMENTATION PLAN

There are three possible reasons for the existence of overly restrictive emission limitations in a control strategy.

- "the example region" - as noted in the executive summary, the regulations for one AQCR can be utilized for another AQCR, where a less restrictive strategy would be adequate.

- "conservative ambient standards" - ambient standards which are lower than the NAAQS can be promulgated.
- "hot spots" - an inordinately high pollutant level in part of an AQCR can be used as the basis for a regionwide emission rollback via the proportional approach.

The U.S. Virgin Islands Implementation Plan utilizes neither the example region approach, since there is only one AQCR, nor conservative ambient standards, since they have adopted the national standards.

2.3.1 Background To The Development Of The Particulate And Sulfur Dioxide Control Strategies

The Virgin Islands SIP contains control strategies and regulations which are adequate to attain the national standards for particulate matter and SO_2 on all three islands. The Islands' review procedure for new sources and modifications was deficient and the EPA, on October 28, 1972, promulgated a regulation to correct this deficiency.

The Islands' regulations for the control of particulate matter include opacity limitations (Ringelmann No. 2), fuel burning limitations (0.6 lbs/ 10^6 BTU for small sources to 0.09 lbs/10^6 BTU for large sources), incinerator restrictions (0.2 gr/scf), industrial process limitations (~99+% control), and fugitive dust restrictions.

Emissions of SO_2 are controlled through controlling the emissions of hydrogen sulfide (0.03 ppm by volume) and through sulfur in fuel limitations (0.5% as of April 1, 1974).

3.0 AIR QUALITY CONTROL REGION ASSESSMENTS

The purpose of this section is to evaluate the available information for the U.S. Virgin Islands and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessment will be made for the AQCR by addressing each type of fuel combustion source: power plants, large industrial and commercial/institutional sources, and area sources. The assessments must be made for each pollutant separately and are made on the basis of six criteria: (1) 1973 air quality violations; (2) expected NAAQS attainment dates; (3) proposed Air Quality Maintenance Area (AQMA) designations; (4) total emissions; (5) regional tolerance for emissions increase; and (6) pollutant priority classifications. Tables B-1 and B-2 tabulate these criteria for each AQCR for TSP and SO_2, respectively.

The Virgin Islands are rated as either a good, marginal, or poor candidate for regulation relaxation based on the evaluation of all the presented information. Using available data, an AQCR which displays a 1973 air quality violation would probably be given a poor ranking. Conversely, a region with no violations, no proposed AQMA designations, low to moderate emissions and a positive emission tolerance would receive a good ranking. If there are varying indicators or incomplete or missing data, the region would most likely receive a marginal ranking.

3.1 FUEL COMBUSTION SOURCE EVALUATION

3.1.1 Power Plant Evaluation

The evaluation of power plants was based upon an estimate of the emission reductions resulting from the compliance of these power plants with the existing Virgin Islands emission regulations for fuel combustion. Since no modeling data was available, the analysis was necessarily restricted to this one method. Table C-1 contains power plant capacity and fuel use for the two plants located within the Virgin Islands.

3.1.2 Significant Industrial Point Source Evaluation

The evaluation of significant industrial point sources was similar to that carried out for power plants. Since no modeling data were available

for both TSP and SO_2, the analysis was restricted to an estimate of the emission reductions resulting from the compliance of these sources with the existing Virgin Islands emission regulations for fuel combustion. A summary of these results are shown in Table D-1.

3.1.3 Area Source Evaluation

Area source emissions data were available for the AQCR from the National Emissions Data System (NEDS) summary report. In addition, the Office of Air Quality Planning and Standards has county summaries. Table E-1 indicates the types of fuel burned by fuel combustion area sources, the sulfur content and emissions.

3.1.4 Fuel Analysis

Table F-1 indicates the distribution of fuel use among sources in the Virgin Islands.

3.2 VIRGIN ISLANDS AIR QUALITY CONTROL REGION

3.2.1 Regional Assessment (Appendix B)

The regional evaluation of the AQCR indicates that little potential exists for increasing particulate emissions, however, further study is needed before consideration should be given to relaxing SO_2 emission limits. The indicators may be summarized as follows:

- Particulates - air quality violation, 1A priority classification and a zero tolerance for emission increase.
- Sulfur Dioxide - no reported air quality violations, 1A priority classification and a negative tolerance for emission increase.

However, the 1A classifications which reflect emissions from a single point source within an AQCR should be noted, especially for TSP for which there are little air quality data. Analysis of other factors to be considered in assessing a region's candidacy for emission regulations revision are carried out in the following sections.

3.2.2 Power Plant Assessments (Appendix C)

As indicated in Table C-1, there are only two power plants in the Virgin Islands AQCR with a total capacity of 88.5 MW plus four gas turbines as of July 1974. Between June, 1973 and June, 1974 residual oil total fuel consumption was 37.8 million gallons. Distillate fuel oil consumption for the same period was 5.04 million gallons.

As of 1973, power plants accounted for 2 percent and 10 percent of the total AQCR particulate and sulfur dioxide emissions, respectively. No modeling results were available for power plants, and therefore no statement can be made concerning the maximum sulfur content which would be acceptable without exceeding the standards.

3.2.3 Other Major Combustion Source Assessment (Appendix D)

There are two significant particulate sources, and one SO_2 source in this category. They contribute 11 percent of the particulate emissions, and 55 percent of the SO_2 emissions. As shown in Table D-1, existing regulations would allow for some increase in particulate emissions, but a very large decrease in SO_2 emissions. Again, as in power plants, no modeling results are available for sources of this type, and therefore no statement can be made concerning the maximum sulfur content which would be acceptable without exceeding the standards.

3.2.4 Area Source Assessment (Appendix E)

Area fuel combustion sources contribute less than one percent of the total AQCR emissions of both particulate and SO_2. As indicated in Table E-1, distillate oil is the only fuel used by area fuel combustion sources. The sulfur content of the distillate oil burned by these sources is 0.5 percent. The existing regulations permits only the use of fuels with a 0.5 percent sulfur content, thus any increase in emissions resulting from growth in the AQCR would be insignificant.

3.2.5 Fuel Assessment (Appendix F)

The purpose of this section is to examine the potential for clean fuel savings based on the analyses in sections 3.2.1 through 3.2.4 and actual fuel consumption in the AQCR. Table F-1 summarizes fuel use in the AQCR. It indicates that residual and distillate oil, natural gas and bagasse are the major fuels burned on the island. The conversion of oil-burning plants to coal might well be ruled out on the basis of the TSP levels in the Virgin Islands and the fact that no coal is burned on the island anyway. This is also true of bagasse, a solid residue remaining after sugar cane has been crushed, which is burned by a few point sources. Conversion to bagasse would probably be ruled out also because of the TSP levels and the heating efficiency of bagasse which is considerably less than oil.

In the Virgin Islands, the potential for clean fuel savings is the saving of low sulfur oil. The absence of modeling results tends to make the evaluation process meaningless in terms of what limits should be placed on sulfur in fuels that would not cause emissions to exceed the NAAQS. However, any revision to the existing Virgin Islands sulfur in fuel regulations will cause some increase in SO_2 emissions which must be monitored to insure attainment and maintenance of NAAQS.

4.0 REFERENCES

1. "1972 National Emissions Report," Report No. EPA - 450/2-74-012, U.S. Environmental Protection Agency, June 1974.

2. "Steam - Electric Plant Factors/1972," 23rd edition, National Coal Association, 1973.

3. Electrical World Directory of Electric Utilities, 81st edition, McGraw Hill, Inc., New York, N. Y., 1972.

4. "Compilation of Air Pollutant Emission Factors,: Publication No. AP-42, U. S. Environmental Protection Agency, July 1974.

5. "Federal Air Quality Control Regions," Publication No. AP-102, U. S. Environmental Protection Agency, January 1972.

6. SAROAD (Storage and Retrieval of Aerometric Data) computer printouts for 1973.

7. "Stationary Source Fuel Summary Report," National Emissions Data System, Environmental Protection Agency, 23 September 1974.

8. "Air Quality Data - 1972 Annual Statistics," Publication No. EPA - 450, U. S. Environmental Protection Agency, March 1974.

APPENDIX A

STATE IMPLEMENTATION PLAN BACKGROUND

TABLE A-1 U.S. VIRGIN ISLANDS AIR POLLUTION CONTROL AREA

Air Quality Control Region	Federal Number	Priority Classification[a] Particulates	Priority Classification[a] SO_x	Priority Classification[a] NO_x	Pop. 1970 (thousand)	Square Miles	Pop. Density (Pop./sq.mi.)	Proposed AQMA Designations TSP Counties	Proposed AQMA Designations SO_x Counties
U.S. Virgin Islands	247	IA	IA	III	63	132	447	Not Required	

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

[a] Criteria based on measured or estimated air quality levels reflecting emissions predominately from a single point source.

TABLE A-2 U.S. VIRGIN ISLANDS AMBIENT AIR QUALITY STANDARDS

All concentrations in $\mu gm/m^3$

		Total Suspended Particulate		Sulfur Oxides			Nitrogen Dioxide
		Annual	24-Hour	Annual	24-Hour	3-Hour	Annual
Federal (Nov. 1972)	Primary	75(G)	260[a]	80(A)	365[a]	---	100(A)
	Secondary	60(G)	150[a]	---	--	1300[a]	100(A)
U.S. Virgin Islands		60(G)	150[a]	80(A)	365[a]	1300[a]	100(A)

[a]Not to be exceeded more than once per year.

(A) Arithmetic Mean

(G) Geometric Mean

TABLE A-3 U.S. VIRGIN ISLANDS AQCR AIR QUALITY STATUS (1973), TSP[a]

AQCR #	# Stations Reporting	TSP Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	Background	# Stations Violating Federal Ambient Air Quality Standards: Primary Annual	Primary 24-Hr[b]	Secondary Annual	Secondary %	Secondary 24-Hr[b]	Secondary %	% Reduction Required to Meet Standards[c]	Standard on Which Reduction Is Based
247	2 [d]	NA	316	240	24	NA	0	NA	0	1	50	+42	24-hour

[a] 1973 air quality data in National Air Data Bank as of June 7, 1974.

[b] Violations based on 2nd highest reading at any station

[c] Formula:

$$\frac{\text{(2nd Highest 24-hr - 24-hr Secondary Standard)} \times 100}{\text{2nd Highest 24-hr - Background}}$$

or:

$$\frac{\text{(Annual - Annual Secondary Standard)} \times 100}{\text{Annual - Background}}$$

whichever is most stringent.

[d] Monitoring stations at Charlotte Amalie

NA - Not available

TABLE A-4 U.S. VIRGIN ISLANDS AQCR AIR QUALITY STATUS (1973), SO_2[a]

AQCR #	# Stations Reporting 24-Hr (Bubbler)	# Stations Reporting (Contin.)	SO_2 Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Violating Ambient Air Quality Stds. Primary Annual	Primary 24-Hr[b]	Secondary 3-Hr	% Reduction Required To Meet Standards[c]	Standard on Which % Reduction Is Based
247	3[d]	0	10	73	62	0	0	0	-100	Annual

[a]1973 air quality data in National Air Data Bank as of July 29, 1974

[b]Violations based on 2nd highest reading at any station.

[c]Formula:

$$\frac{(\text{2nd Highest 24-hr} - \text{24-hr Standard})}{\text{2nd highest 24-hr}} \times 100$$

or:

$$\frac{(\text{Annual} - \text{Annual Standard})}{\text{Annual}} \times 100$$

whichever is most stringent.

[d]Monitoring stations at Charotte Amalie, Christiansted and St. Croix County

TABLE A-5 U.S. VIRGIN ISLANDS FUEL COMBUSTION SOURCE SUMMARY

AQCR No.	Power Plants	Other Fuel Combustion Point Sources[a] TSP	Other Fuel Combustion Point Sources[a] SO_2	Total Emissions (10^3 tons/year)[b] TSP	Total Emissions (10^3 tons/year)[b] SO_2	% Emissions From Fuel Combustion Sources TSP	% Emissions From Fuel Combustion Sources SO_2
247	2	2	1	7.6	11.0	9	69

a - All significant point sources, when combined with power plants, contribute at least 90% of the total emissions from fuel combustion point sources

b - AQCR total, 1972 National Emissions Report

TABLE A-6 U.S. VIRGIN ISLANDS EMISSIONS SUMMARY-PARTICULATES

AQCR	AQCR Total (tons/yr.)	Electricity Generation (tons/yr.)	Electricity Generation %[a]	Industrial, Commercial, Institutional Combustion Point Sources (tons/yr.)	Industrial, Commercial, Institutional Combustion Point Sources %[a]	Area Source Fuel Combustion (tons/yr.)	Area Source Fuel Combustion %[a]
247	7,631	120	2	945	11	1	<1

[a]Percentage of total emissions

TABLE A-7 U.S. VIRGIN ISLANDS EMISSIONS SUMMARY-SULFUR DIOXIDE

AQCR	AQCR Total (tons/yr.)	Electricity Generation (tons/yr.)	% [a]	Industrial, Commercial, Institutional Combustion Point Sources (tons/yr.)	% [a]	Area Source Fuel Combustion (tons/yr.)	% [a]
247	11,004	1,153	10	6,045	55	4	<1

[a]Percentage of total emissions

TABLE A-8

U.S. VIRGIN ISLANDS PARTICULATE EMISSION REGULATION FOR FUEL COMBUSTION

Heat Input[a,b]	Maximum Allowable[c]
≤10	0.60
100	0.352
1,000	0.207
≥10,000	0.0904

a - Heat input is the aggregate heat content of all fuels whose product of combustion pass through a single stack or stacks.

b - 10^6 BTU/hour

c - lbs/10^6 BTU of heat input

TABLE A-9 CONTROL STRATEGY ASSESSMENT - PARTICULATES

	State Implementation Plan Requirements				Requirements Based on 1973 Data			
AQCR	Baseline Air Quality ($\mu g/m^3$)	Baseline Emissions (Tons/Yr.)	Allowable Emissions (Tons/Yr.)	Predicted 1975 Emissions (Tons/Yr.)	1973 Air Quality ($\mu g/m^3$)	NEDS Emissions[a] (Tons/Yr.)	Allowable Emissions (Tons/Yr.)	Tolerance for Emission Increase[b] (Tons/Yr.)
247	99[c]	8,856	2,174	2,174	d	7,631	---[d]	0

a - From NEDS Summary Document June 1974.

b - Difference between 1973 based allowable and predicted 1975 emissions.

c - Annual average

d - Annual average for 1973 not available.

TABLE A-10 CONTROL STRATEGY ASSESSMENT - SO_2

	State Implementation Plan Requirements				Requirements Based on 1973 Data			
AQCR	Baseline Air Quality ($\mu g/m^3$)	Baseline Emissions (Tons/Yr.)	Allowable Emissions (Tons/Yr.)	Predicted 1975 Emissions (Tons/Yr.)	1973 Air Quality ($\mu g/m^3$)	NEDS Emissions[a] (Tons/Yr.)	Allowable Emissions (Tons/Yr.)	Tolerance for Emission Increase[b] (Tons/Yr.)
247	106[c]	19,505	3,509	3,509	10	11,004	---[d]	-7,495

a - From NEDS Summary Document June 1974.

b - 1973 and SIP data do not compare reasonably. Tolerance for Emission Increase was calculated as the difference bet. SIP Allowable Emissions - 1973 NEDS Emission = -7,495 tons which represents a reduction of 7,495 tons.

c - Baseline Air Quality of 106 $\mu g/m^3$ on which the SIP for SO_2 is based was converted from 0.4ppm.

d - The low monitored 1973 Air Quality does not indicate an emission reduction due to a possible malfunction in the monitoring equipment, therefore allowable emissions for 1973 were not calculated.

APPENDIX B

REGIONAL AIR QUALITY SUMMARY

B-1 REGIONAL INDICATORS - PARTICULATES

AQCR	Air Quality: No. of Monitors	Air Quality: Sites with A.Q. Violations	Priority Classification	Expected Attainment Date for Stds.	Proposed AQMA Designations	Emissions: Total (10^3 Ton/Yr)	Emissions: % From Fuel Combustion	Tolerance for Emission Increase (10^3 Ton/Yr)
247	2	1	IA	1/75	None	7.6	14	0

B-2 REGIONAL INDICATORS - SO_2

AQCR	Air Quality: No. of Monitors	Air Quality: Sites with A.Q. Violations	Priority Classification	Expected Attainment Date for Stds.	Proposed AQMA Designations	Emissions: Total (10^3 Ton/Yr)	Emissions: % from Fuel Combustion	Tolerance for Emission Increase (10^3 Ton/Yr)
247	1	0	IA	1/75	None	11.0	65	-7.5

APPENDIX C

POWER PLANT SUMMARY

TABLE C-1 POWER PLANT ASSESSMENT FOR U.S. VIRGIN ISLANDS

AQCR	Plant	Capacity (Mw)	Fuel Use		Fuel Sulfur Regulation
			Type	Quantity (10^3/Gals.)	
247	V.I. Water & Power Authority (St. Thomas)	60.5	Oil	23,580	0.5%
	V.I. Water & Power Authority (St. Croix)	28.0	Oil	19,260	0.5%
			Total	42,840[a]	

[a] Includes total of residual oil and distillate oil used between June, 1973 and June, 1974. Residual oil consumption totaled 37.8 million gallons, distillate oil totaled 5.04 million gallons. Fuel consumption by plant was estimated based on ratio of firing rates; St. Thomas-4278 gals/hr, St. Croix - 3385 gals/hr.

APPENDIX D

INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SOURCE SUMMARY

TABLE D-1 U.S. VIRGIN ISLANDS SIGNIFICANT SOURCES[a]

AQCR Name	NEDS TSP Emissions (T/Yr)	NEDS SO_2 Emissions (T/Yr)	Reductions Under Existing Regulations (T/Yr) TSP	SO_2	% NEDS TSP Emissions From Coal
U.S. Virgin Islands	909[b]	5880[c]	-405	+1594	0

a - See Table A-5

b - Harvey Alumina V.I. Inc. and Hess Oil V.I. Corp. on St. Croix

c - Harvey Alumina V.I. Inc., St. Croix only

APPENDIX E

AREA SOURCE SUMMARY

TABLE E-1 U.S. VIRGIN ISLANDS FUEL COMBUSTION AREA SOURCES[a]

AQCR Name	AQCR No.	Fuel Burned				Emissions (tons/yr)	
		Type	Amount[b]	% S	% S Regulation	Particulate	SO_2
Virgin Islands	247	Oil:					
		Distillate	90	0.5	0.5	1	4
		Residual	0	2.0	0.5	0	0
		Gas:					
		Natural	0	---			

a - NEDS data

b - Coal in tons/yr; oil in 1000 gals.; gas in MCF; wood in tons.

APPENDIX F

FUEL USE SUMMARY

TABLE F-1

STATIONARY SOURCE FUEL USE SUMMARY
U.S. VIRGIN ISLANDS

	Residual Oil (10^3 Gals.)	Distillate Oil (10^3 Gals.)	Natural Gas (10^3 cu.ft.)	Bagasse (tons)
Area Sources				
Residential				
Industrial		100		
Comm/Inst.				
Total		100		
Point Sources				
External Comb.				
Elec. Gen.	29210			
Industrial	36400	1358	5203	18572
Comm/Inst.		284		
Total	65610	1642	5203	
Internal Comb.				
Elec. Gen.		6400		
Industrial		26938	22	
Comm/Inst.				
Total		33338	22	
GRAND TOTAL	65610	35080	5225	18572