CARGILL
FERTILIZER, INC.

8813 Highway 41 South - Riverview, Florida 33569 - Telephone 813-677-9111 - TWX 810-876-0648 - Telex 52666 - FAX 813-671-6146

Certified Mail:P 204 941 266

April 27, 1998

RECEIVED
MAY 01 1998
BUREAU OF
AIR REGULATION

Mr. Clair H. Fancy, Bureau Chief
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

Dear Mr. Fancy:

Re: Cargill Fertilizer, Inc. - Tampa Plant
No. 7 Sulfuric Acid Plant Construction Permit Application
AIRS No. 0570008, EU ID No. 004 0570008-035-AC PSD-FL-250

Please find enclosed six copies of a construction permit application for the No. 7 Sulfuric Acid Plant. A copy of this application has been sent to the Hillsborough County Environmental Protection Commission. Included with these applications is a check in the amount of $7,500 (check # 301058720) for the Florida Department of Environmental Protection.

If you have any questions or require additional information, please call me at (813) 671-6369.

Sincerely,

Kathleen Edgemon
Environmental Engineer

cc: Morris
Jellerson
File P-10-7
CC: A. Linero, BAR
EPA
NPS
SWD
Polk Co.
C. Holladay, BAR

recycled paper

PSD PERMIT APPLICATION FOR NO. 7 SULFURIC ACID PLANT CARGILL FERTILIZER, INC. RIVERVIEW, FLORIDA

Prepared For:

Cargill Fertilizer, Inc.
8813 Highway 41 South
Riverview, Florida 33569

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

April 1998
9837526Y/F1

PART A

APPLICATION FOR AIR PERMIT

Department of
Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1. Facility Owner/Company Name: **Cargill Fertilizer, Inc.**	
2. Site Name: **Tampa Plant**	
3. Facility Identification Number: **0570008**	[ ] Unknown
4. Facility Location Information: Street Address or Other Locator: **8813 U.S. Highway 41 South** City: **Riverview** County: **Hillsborough** Zip Code: **33569**	
5. Relocatable Facility? [ ] Yes [x] No	6. Existing Permitted Facility? [x] Yes [ ] No

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	May 1, 1998
2. Permit Number:	0570008-025-AC
3. PSD Number (if applicable):	PSD-FL-250
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:

   David Jellerson, Environmental Superintendent

2. Owner/Authorized Representative or Responsible Official Mailing Address:

Organization/Firm: **Cargill Fertilizer, Inc.**
Street Address: **8813 Highway 41 South**
City: **Riverview** State: **FL** Zip Code: **33569**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:

Telephone: **(813) 671-6297** Fax: **(813) 671-6149**

4. Owner/Authorized Representative or Responsible Official Statement:

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

David B. Jellerson — 4-27-98

Signature Date

* Attach letter of authorization if not currently on file.

Scope of Application

This Application for Air Permit addresses the following emissions unit(s) at the facility. An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

Emissions Unit ID		Description of Emissions Unit	Permit Type
Unit #	Unit ID		
1R	004	Sulfuric Acid Plant No. 7	AC1A

See individual Emissions Unit (EU) sections for more detailed descriptions.
Multiple EU IDs indicated with an asterisk (*). Regulated EU indicated with an "R".

Purpose of Application and Category

Check one (except as otherwise indicated):

Category I: All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: _____

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed: _____

[ ] Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: _____

Operation permit to be renewed: _____

[ ] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. Also check Category III.

Operation permit to be revised/corrected: _____

_____

[ ] Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit. Give reason for the revision e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit to be revised: _____

Reason for revision: _____

_____

Category II: All Air Construction Permit Applications Subject to Processing Under Rule 62-210.300(2)(b),F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s): _____

_____

[ ] Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed: _____

[ ] Air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g.; to address one or more newly constructed or modified emissions units.

Operation permit to be revised: _____

Reason for revision: _____

_____

Category III: All Air Construction Permit Applications for All Facilities and Emissions Units.

This Application for Air Permit is submitted to obtain:

[X] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any: _____

AC29-241660, AO29-178406

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s): _____

_____

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Check one:

[X] Attached - Amount: **$ 7,500.00** [ ] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations:

This application is for the proposed expansion of the No. 7 Sulfuric Acid Plant, from 2,200 TPD of sulfuric acid produced to 3,200 TPD of sulfuric acid produced.

2. Projected or Actual Date of Commencement of Construction :

1 May 1998

3. Projected Date of Completion of Construction :

1 May 2001

Professional Engineer Certification

1. Professional Engineer Name: **David A. Buff**
   Registration Number: **19011**

2. Professional Engineer Mailing Address:
   Organization/Firm: **Golder Associates Inc.**
   Street Address: **6241 NW 23rd Street, Suite 500**
   City: **Gainesville** State: **FL** Zip Code: **32653-1500**

3. Professional Engineer Telephone Numbers:
   Telephone: **(352) 336-5600** Fax: **(352) 336-6603**

4. Professional Engineer's Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

David A. Buff — 4/24/98

Signature (seal) — Date

* Attach any exception to certification statement.

Application Contact

1. Name and Title of Application Contact:
   Kathy Edgemon, Environmental Engineer

2. Application Contact Mailing Address:

   Organization/Firm: **Cargill Fertilizer, Inc.**
   Street Address: **8813 Highway 41 South**
   City: **Riverview** State: **FL** Zip Code: **33569**

3. Application Contact Telephone Numbers:

   Telephone: **(813) 671-6369** Fax: **(813) 671-6149**

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates:
   Zone: 17 East (km): 362.9 North (km): 3082.5

2. Facility Latitude/Longitude:
   Latitude (DD/MM/SS): 27 / 51 / 28 Longitude: (DD/MM/SS): 82 / 23 / 15

3. Governmental Facility Code:	4. Facility Status Code:	5. Facility Major Group SIC Code:	6. Facility SIC(s):
0	A	28	2874

7. Facility Comment (limit to 500 characters):

Facility Contact

1. Name and Title of Facility Contact:
   David Jellerson, Environmental Superintendent

2. Facility Contact Mailing Address:
   Organization/Firm: **Cargill Fertilizer, Inc.**
   Street Address: **8813 U.S. Highway 41 South**
   City: **Riverview** State: **FL** Zip Code: **33569**

3. Facility Contact Telephone Numbers:
   Telephone: **(813) 671-6297** Fax: **(813) 671-6149**

Facility Regulatory Classifications

1. Small Business Stationary Source? [ ] Yes [x] No [ ] Unknown
2. Title V Source? [x] Yes [ ] No
3. Synthetic Non-Title V Source? [ ] Yes [x] No
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)? [x] Yes [ ] No
5. Synthetic Minor Source of Pollutants Other than HAPs? [ ] Yes [x] No
6. Major Source of Hazardous Air Pollutants (HAPs)? [x] Yes [ ] No
7. Synthetic Minor Source of HAPs? [ ] Yes [x] No
8. One or More Emissions Units Subject to NSPS? [x] Yes [ ] No
9. One or More Emissions Units Subject to NESHAP? [x] Yes [ ] No
10. Title V Source by EPA Designation? [ ] Yes [x] No
11. Facility Regulatory Classifications Comment (limit to 200 characters):

B. FACILITY REGULATIONS

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

Not Applicable

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted		2. Pollutant Classification
PM	Particulate Matter - Total	A
PM10	Particulate Matter - PM10	A
FL	Fluorides - Total	A
SO2	Sulfur Dioxide	A
NOx	Nitrogen Oxides	A
H107	Hydrogen fluoride	A
SAM	Sulfuric Acid Mist	A

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Detail Information:

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hr)	(tons/yr)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

Facility Pollutant Detail Information:

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hr)	(tons/yr)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

E. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable [ ] Waiver Requested

2. Facility Plot Plan:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable [ ] Waiver Requested

3. Process Flow Diagram(s):
   [X] Attached, Document ID(s): Part B
   [ ] Not Applicable [ ] Waiver Requested

4. Precautions to Prevent Emissions of Unconfined Particulate Matter:
   [ ] Attached, Document ID: _____
   [X] Not Applicable [ ] Waiver Requested

5. Fugitive Emissions Identification:
   [X] Attached, Document ID: Section B.6
   [ ] Not Applicable [ ] Waiver Requested

6. Supplemental Information for Construction Permit Application:
   [X] Attached, Document ID: Part B
   [ ] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities:
   [ ] Attached, Document ID: _____
   [ ] Not Applicable

8. List of Equipment/Activities Regulated under Title VI:
   [ ] Attached, Document ID: _____
   [ ] Equipment/Activities On site but Not Required to be Individually Listed
   [ ] Not Applicable

9. Alternative Methods of Operation:
   [ ] Attached, Document ID: _____
   [ ] Not Applicable

10. Alternative Modes of Operation (Emissions Trading):
    [ ] Attached, Document ID: _____
    [ ] Not Applicable

11. Identification of Additional Applicable Requirements: [ ] Attached, Document ID: _____ [ ] Not Applicable
12. Compliance Assurance Monitoring Plan: [ ] Attached, Document ID: _____ [ ] Not Applicable
13. Risk Management Plan Verification: [ ] Plan Submitted to Implementing Agency - Verification Attached Document ID: _____ [ ] Plan to be Submitted to Implementing Agency by Required Date [ ] Not Applicable
14. Compliance Report and Plan [ ] Attached, Document ID: _____ [ ] Not Applicable
15. Compliance Statement (Hard-copy Required) [ ] Attached, Document ID: _____ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one:

[x] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

B. GENERAL EMISSIONS UNIT INFORMATION (Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Sulfuric Acid Plant No. 7**		
2. Emissions Unit Identification Number: [ ] No Corresponding ID [ ] Unknown **004**		
3. Emissions Unit Status Code: **A**	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code: **28**
6. Emissions Unit Comment (limit to 500 characters): **For Sulfuric Acid Plant No. 7, there exists a potential for fugitive emissions of PM/PM10/SO2/NOx/SAM to occur from this emissions unit. It is our understanding, based on past FDEP interpretations and permitting history, that these emissions are not regulated under federal/state/local emission standards.**		

Emissions Unit Control Equipment Information

A.

1. Description (limit to 200 characters):

Sulfuric Acid Plant - Double Contact Process

2. Control Device or Method Code: **44**

B.

1. Description (limit to 200 characters):

Mist Eliminator - High Velocity

2. Control Device or Method Code: **14**

C.

1. Description (limit to 200 characters):

2. Control Device or Method Code:

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date:	
2. Long-term Reserve Shutdown Date:	
3. Package Unit: Manufacturer:	Model Number:
4. Generator Nameplate Rating:	MW
5. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lbs/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:	3,200	TPD 100% H2SO4
5. Operating Capacity Comment (limit to 200 characters):		

Emissions Unit Operating Schedule

1. Requested Maximum Operating Schedule:			
	24 hours/day	7	days/week
	52 weeks/yr	8,760	hours/yr

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II Applications and Category III applications involving non Title-V sources. See Instructions.)

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

40 CFR 60.11 - Compliance with Standards and Maintenance
40 CFR 60.12 - Circumvention
40 CFR 60.13(a) - Monitoring Requirements
40 CFR 60.13(b) - Monitoring Requirements
40 CFR 60.13(c)(2) - Monitoring Requirements
40 CFR 60.13(d)(1) - Monitoring Requirements
40 CFR 60.13(f) - Monitoring Requirements
40 CFR 60.13(i) - Monitoring Requirements
40 CFR 60.19 - General Notification/Reporting
40 CFR 60.7 - Notification and Recordkeeping
40 CFR 60.8 - Performance Tests
40 CFR 60.82 - NSPS for Sulfuric Acid Plants
40 CFR 60.83 - NSPS for Sulfuric Acid Plants
40 CFR 60.84 - NSPS for Sulfuric Acid Plants
40 CFR 60.85 - NSPS for Sulfuric Acid Plants
40 CFR 64 - Compliance Assurance Monitoring
62.204.800(7)(b)9. - Reference to NSPS
62.212.400(7)(b) - PSD
62.296.402(3) - Emission Standards for SAP Plants
62.296.402(4) - Emission Standards for SAP Plants
62.296.402(5) - Emission Standards for SAP Plants
62.297.310 - General Compliance Test Requirements
62.297.401 - Compliance Test Methods
62.297.520(2) - Continuous Monitor Performance Standards

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: SAP 7	
2. Emission Point Type Code: [x] 1 [ ] 2 [ ] 3 [ ] 4	
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [x] V [ ] W	
6. Stack Height:	150 feet
7. Exit Diameter:	6.3 feet
8. Exit Temperature:	155 °F

9. Actual Volumetric Flow Rate:	**148,800** acfm
10. Percent Water Vapor:	%
11. Maximum Dry Standard Flow Rate:	dscfm
12. Nonstack Emission Point Height:	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters): **Exit Diameter = 6.25 (rounded to 6.3).**	

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Chemical Manufacturing; Sulfuric Acid; Contact Process; Absorber at 99.9% Conversion.**	
2. Source Classification Code (SCC): **3-01-023-01**	
3. SCC Units: **Tons of 100% H2SO4**	
4. Maximum Hourly Rate: **133.33**	5. Maximum Annual Rate: **1,168,000**
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
9. Million Btu per SCC Unit:	
10. Segment Comment (limit to 200 characters):	

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **In-process Fuel Use; Distillate Oil**	
2. Source Classification Code (SCC): **3-90-005-99**	
3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:
6. Estimated Annual Activity Factor:	
7. Maximum Percent Sulfur: **0.5**	8. Maximum Percent Ash:
9. Million Btu per SCC Unit: **140**	
10. Segment Comment (limit to 200 characters): **Fuel oil usage results from startup of the Sulfuric Acid plant. Typically, the plant experiences 3 startups per year and 13,000 gals per startup.**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
SO2	044		EL
SAM	014		EL
NOx			NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: SO2

2. Total Percent Efficiency of Control: %

3. Potential Emissions: 533.3 lb/hour 2,004 tons/year

4. Synthetically Limited? [ ] Yes [x] No

5. Range of Estimated Fugitive/Other Emissions:

[ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr

6. Emission Factor: 3.5 lb/ton100%H2SO4

Reference: Prop. Permit Limit

7. Emissions Method Code:

[x] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

8. Calculation of Emissions (limit to 600 characters):

3-hr average: 4.0 lb/ton 100% H2SO4 x 133.3 tons/hr 100% H2SO4 = 533.3 lb/hr. 24-hr average: 3.5 lb/ton 100% H2SO4 x 133.33 ton/hr 100% H2SO4 = 466.67 lb/hr. 466.67 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 2,044.0 TPY

9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):

Proposed limits are 4.0 lb/ton for 3-hr average, and 3.5 lb/ton for 24-hr average.

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **3.5 lb/ton100%H2SO4**
4. Equivalent Allowable Emissions: **533.33** lb/hour **2,044** tons/year
5. Method of Compliance (limit to 60 characters): **Annual Stack Test with EPA Method 8 & Continuous SO2 Monitor**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Requested Allowable Emissions also 4.0 lb/ton100%H2SO4. Based on proposed BACT & Permit Limit**

B.

1. Basis for Allowable Emissions Code:
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

Emissions Unit Information Section 1 of 1

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: OTHER	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 3.5 lb/ton100%H2SO4	
4. Equivalent Allowable Emissions: 533.33 lb/hour	2,044 tons/year
5. Method of Compliance (limit to 60 characters): Annual Stack Test with EPA Method 8 & Continuous SO2 Monitor	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): Requested Allowable Emissions also 4.0 lb/ton100%H2SO4. Based on proposed BACT & Permit Limit	

B.

1. Basis for Allowable Emissions Code:	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SAM**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **20** lb/hour **87.6** tons/year
4. Synthetically Limited? [ ] Yes [**x**] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **0.15 lb/ton100%H2SO4** Reference: **40CFR60.83**
7. Emissions Method Code: [**x**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **0.15 lb/ton 100% H2SO4 x 133.33 ton/hr 100% H2SO4 = 20.0 lb/hr. 20.0 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 87.6 TPY**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):

Emissions Unit Information Section 1 of 1

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: RULE	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 0.15 lb/ton100%H2SO4	
4. Equivalent Allowable Emissions: 20 lb/hour	87.6 tons/year
5. Method of Compliance (limit to 60 characters): Annual stack test using EPA Method 8	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): 40CFR60.83 and Rule 62-296.402(2)(c)	

B.

1. Basis for Allowable Emissions Code:	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **NOx**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **16** lb/hour **70.1** tons/year
4. Synthetically Limited? [ ] Yes [x] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **0.12 lb/ton100%H2SO4** Reference: **Bartow Data**
7. Emissions Method Code: [ ] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [x] 5
8. Calculation of Emissions (limit to 600 characters): **0.12 lb/ton 100% H2SO4 x 133.33 ton/hr 100% H2SO4 = 16.0 lb/hr. 16.0 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 70.1 TPY**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):

Emissions Unit Information Section 1 **of** 1

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitations: Visible Emissions Limitation 1 of 1

1.	Visible Emissions Subtype: **VE10**
2.	Basis for Allowable Opacity: [X] Rule [ ] Other
3.	Requested Allowable Opacity Normal Conditions: **10** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour
4.	Method of Compliance: **Annual Visible Emissions Test using EPA Method 9**
5.	Visible Emissions Comment (limit to 200 characters): **40CFR60.83 and Rule 62-296.402(2)(a)**

Visible Emissions Limitations: Visible Emissions Limitation _____ of _____

1.	Visible Emissions Subtype:
2.	Basis for Allowable Opacity: [ ] Rule [ ] Other
3.	Requested Allowable Opacity Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour
4.	Method of Compliance:
5.	Visible Emissions Comment (limit to 200 characters):

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System Continuous Monitor 1 of 1

1. Parameter Code: EM	2. Pollutant(s): SO2
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Monitor Manufacturer: Ametek Model Number: 4600B Serial Number: 7566	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

Continuous Monitoring System Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement: [ ] Rule [ ] Other	
4. Monitor Information: Monitor Manufacturer: Model Number: Serial Number:	
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION
(Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [X] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and the emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and the emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and the source consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and the source consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and the emissions unit consumes increment.

[x] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3.	Increment Consuming/Expanding Code:			
	PM	[ ] C	[ ] E	[ ] Unknown
	SO_2	[ ] C	[x] E	[ ] Unknown
	NO_2	[ ] C	[ ] E	[x] Unknown
4.	Baseline Emissions:			
	PM	lb/hour		tons/year
	SO_2	**1,752** lb/hour	**7,673**	tons/year
	NO_2			tons/year
5.	PSD Comment (limit to 200 characters):			
	Baseline emissions represents total baseline emission from Nos. 7,8 & 9 Sulfuric Acid Plants.			

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1.	Process Flow Diagram	
	[X] Attached, Document ID: Part B	
	[ ] Not Applicable	[ ] Waiver Requested
2.	Fuel Analysis or Specification	
	[X] Attached, Document ID: CR-E01-L2	
	[ ] Not Applicable	[ ] Waiver Requested
3.	Detailed Description of Control Equipment	
	[X] Attached, Document ID: Part B	
	[ ] Not Applicable	[ ] Waiver Requested
4.	Description of Stack Sampling Facilities	
	[ ] Attached, Document ID: _____	
	[X] Not Applicable	[ ] Waiver Requested
5.	Compliance Test Report	
	[ ] Attached, Document ID: _____	[X] Not Applicable
	[ ] Previously Submitted, Date: _____	
6.	Procedures for Startup and Shutdown	
	[X] Attached, Document ID: Part B	[ ] Not Applicable
7.	Operation and Maintenance Plan	
	[ ] Attached, Document ID: _____	[X] Not Applicable
8.	Supplemental Information for Construction Permit Application	
	[X] Attached, Document ID: Part B	[ ] Not Applicable
9.	Other Information Required by Rule or Statute	
	[ ] Attached, Document ID: _____	[X] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

10.	Alternative Methods of Operation [ ] Attached, Document ID: _____ [ ] Not Applicable
11.	Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID: _____ [ ] Not Applicable
12.	Identification of Additional Applicable Requirements [ ] Attached, Document ID: _____ [ ] Not Applicable
13.	Compliance Assurance Monitoring Plan [ ] Attached, Document ID: _____ [ ] Not Applicable
14.	Acid Rain Permit Application (Hard Copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____ [ ] Not Applicable

ATTACHMENT CR-E01-L2

FUEL ANALYSIS OR SPECIFICATION

Attachment CR-E01-L2

No. 7 Sulfuric Acid Plant
Fuel Analysis

Fuel	Density (lb/scf)	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
No. 2 Fuel Oil	6.83	< 0.01	0.5	0.006	< 0.01	140,000 Btu/gal

PART B

PSD REPORT

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1.0 INTRODUCTION

Cargill Fertilizer, Inc., is proposing to modify the existing No. 7 Sulfuric Acid (H_2SO_4) plant at its phosphate fertilizer manufacturing facility located in Riverview, Florida. The modifications will allow the No. 7 H_2SO_4 plant to increase its maximum H_2SO_4 production rate from 2,200 tons per day (TPD) to 3,200 TPD of 100 percent H_2SO_4. As a result of this production rate increase, an increase in the allowable sulfur dioxide (SO_2) and H_2SO_4 mist emissions for the plant is being requested.

Based on the requested maximum emissions for the affected source, the proposed modification will constitute a major modification at a major stationary source under current federal and state air quality regulations. This report addresses the requirements of the prevention of significant deterioration (PSD) review procedures pursuant to rules and regulations implementing the Clean Air Act (CAA) Amendments of 1977. The Florida Department of Environmental Protection (FDEP) has PSD review and approval authority in Florida. Based on the PSD source applicability analysis, a PSD review is indicated for SO_2 and H_2SO_4 mist.

This application contains six additional sections. A complete description of the project, including air emission rates, is presented in Section 2.0. The air quality review requirements and new source review applicability of the project are discussed in Section 3.0.

Ambient monitoring requirements under PSD are addressed in Section 4.0. The best available control technology (BACT) analysis is presented in Section 5.0. The air quality impact analysis and impacts on soils, vegetation and visibility required as part of the PSD permitting process are addressed in Sections 6.0 and 7.0, respectively.

1.0 INTRODUCTION

Cargill Fertilizer, Inc., is proposing to modify the existing No. 7 Sulfuric Acid (H_2SO_4) plant at its phosphate fertilizer manufacturing facility located in Riverview, Florida. The modifications will allow the No. 7 H_2SO_4 plant to increase its maximum H_2SO_4 production rate from 2,200 tons per day (TPD) to 3,200 TPD of 100 percent H_2SO_4. As a result of this production rate increase, an increase in the allowable sulfur dioxide (SO_2) and H_2SO_4 mist emissions for the plant is being requested.

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2.0 PROJECT DESCRIPTION

Cargill is proposing to expand the maximum production capacity of the existing No. 7 H_2SO_4 plant at its phosphate fertilizer manufacturing plant located in Riverview, Florida. The plant is located south of Tampa on Hillsborough Bay (see Figure 2-1). Cargill operates a total of three H_2SO_4 plants (Nos. 7, 8 and 9) at the facility. The location of the three existing H_2SO_4 plants at Cargill are shown in Attachment CR-FE-2, which is a plot plan of the Cargill facility (Source ID's are 7 CAP, 8 CAP, and 9 CAP).

Phosphate fertilizers are manufactured at the Cargill facility. A raw material utilized in the manufacture of phosphate fertilizers is sulfuric acid. Sulfuric acid is used to react with phosphate rock to produce phosphoric acid. Sulfuric acid can either be purchased, or produced on site. In the manufacture of sulfuric acid, molten sulfur is burned in a sulfuric acid plant. SO_2 and H_2SO_4 mist emissions are a byproduct of the chemical reaction. All of the H_2SO_4 plants at Cargill use double adsorption technology to increase the efficiency of sulfuric acid recovery and to minimize emissions. A flow diagram of the process is presented in Figure 2-2.

The current capacity of the No. 7 H_2SO_4 plant is 2,200 TPD expressed as 100 percent H_2SO_4. The maximum capacity after modification will be 3,200 TPD. Together with the existing No. 8 and No. 9 H_2SO_4 plants, which are permitted for a combined total of 5,700 TPD production rate, the total H_2SO_4 production rate of the Cargill facility will be 8,900 TPD. The No. 8 and No. 9 H_2SO_4 plants are not being modified at this time.

The No. 7 H_2SO_4 plant at Cargill is currently subject to emission limits of 4.0 pounds per ton (lb/ton) for SO_2 and 0.15 lb/ton for H_2SO_4 mist emissions. These limits are equivalent to the federal new source performance standards (NSPS) for new sulfuric acid plants. The current permit limitations for the plant at Cargill are summarized in Table 2-1.

The proposed permit limitations for the expanded No. 7 H_2SO_4 plant are presented in Table 2-1. It is proposed to retain the current NSPS limit for SO_2 of 4.0 lb/ton of 100% sulfuric acid produced for the short-term averaging time (3-hours), but to reduce 24-hour SO_2 emissions to 3.5 lb/ton. It is also proposed to retain the current NSPS limit for H_2SO_4 mist of 0.15 lb/ton H_2SO_4. The basis

for these limits as BACT is presented in Section 5.0. Cargill will employ a larger volume of vanadium catalyst, compared to the current operation, in order to achieve the lower SO_2 emissions. This aspect is described further in Section 5.0, along with a description of the new acid mist elimination system.

Stack parameters for the both the current and expanded No. 7 H_2SO_4 plant are presented in Table 2-2. The existing stack at Cargill serving the No. 7 H_2SO_4 plant will be utilized for the expanded plant. However, the existing stack will be modified, which will reduce the stack diameter. The stack parameters shown in Table 2-2 will be used in the modeling analysis to determine the net increase in impacts due to the proposed expansion, as well as the total ambient impacts due to the expanded facility.

Recently the subject of nitrogen oxides (NO_x) emissions from sulfuric acid plants has been addressed in Florida (e.g., Agrico Chemical Company, Cargill-Bartow, IMC Fertilizer and Piney Point Phosphates air construction permits). In each of these cases, an NO_x emission factor of 0.12 lb/ton H_2SO_4 was used. In addition, IMC subsequently performed NO_x emission tests on one sulfuric acid plant, which exhibited average NO_x emissions of 0.08 lb/ton H_2SO_4. Cargill has also obtained NO_x data from the Bartow H_2SO_4 plants over the last 3 years, and emissions have ranged from 0.10 to 0.12 lb/ton. In spite of a lack of actual test data from Cargill's Riverview sulfuric acid plants, the emission factor of 0.12 lb/ton was used as the best estimate of current NO_x emissions. The estimated maximum emissions from No. 7 H_2SO_4 plant are presented in Table 2-3.

Cargill currently has in place startup/shutdown procedures for the No. 7 H_2SO_4 plant, in order to minimize SO_2 and H_2SO_4 mist emissions during these times. These procedures will remain in place for the expanded No. 7 H_2SO_4 plant.

The molten sulfur handling system at Riverview is capable of accommodating the increased sulfur throughput needed as raw material for the H_2SO_4 plants. The current permitted capacity of 1,340,000 tonnes/yr throughput (reference permit No. AC29-239262) is greater than the 993,371 tonnes/yr of sulfur required to produce 8,900 TPD H_2SO_4 for 365 days/yr. The 8,900 TPD H_2SO_4 rate is the sum of the current combined permitted capacity of the No. 8 and No. 9 H_2SO_4 plants at 5,700 TPD, and 3,200 TPD for the No. 7 H_2SO_4 plant. Although there will

be a slight increase in emissions from the molten sulfur handling system as a result of the throughput increase, maximum total emissions from the system will remain small, and are as follows (refer to Appendix A):

Sulfur PM emissions	- 2.74 TPY
TRS (as H_2S) emissions	-. 0.96 TPY
SO_2 emissions	- 1.99 TPY
VOC emissions	- 1.42 TPY

Table 2-1. Current and Proposed Permit Limitations for No. 7 Sulfuric Acid Plant, Cargill Fertilizer, Inc.

	Sulfur Dioxide	Sulfuric Acid Mist
Current Limitations		
Production Rate (100% H_2SO_4)	2,200 TPD	2,200 TPD
Emission Factor (a)	4.0 lb/ton	0.15 lb/ton
Hourly Emissions (b)	366.67 lb/hr	13.75 lb/hr
Annual Emissions	1,606.0 TPY	60.2 TPY
Proposed Limitations		
Production Rate (100% H_2SO_4)	3,200 TPD	3,200 TPD
Emission Factor (a)	3.5 lb/ton, 24-hr 4.0 lb/ton, 3-hr	0.15 lb/ton
Hourly Emissions	466.67 lb/hr, 24-hr 533.33 lb/hr, 3-hr	20.00 lb/hr
Annual Emissions	2,044.0 TPY	87.6 TPY

Notes: lb/day = pounds per day
lb/hr = pounds per hour
lb/ton = pounds per ton
H_2SO_4 = sulfuric acid
% = percent
SO_2 = sulfur dioxide
TPD = tons per day
TPY = tons per year

(a) lb/ton of 100% H_2SO_4.
(b) 3-hour average.

Table 2-2. Stack Parameters for Existing and Expanded No. 7 Sulfuric Acid Plant

Plant	H_2SO_4 Production Rate[a] (TPD)	Stack Height (ft)	Stack Diameter (ft)	Gas Flow Rate (acfm)	Gas Velocity (fps)	Gas Temperature (°F)
Existing Conditions						
No. 7 H_2SO_4	2,200	149.5	7.5	114,000	43.01	155
Future Conditions						
No. 7 H_2SO_4	3,200	149.5	6.25	148,800	80.84	155

Note: acfm = actual cubic feet per minute.
°F = degrees fahrenheit.
fps = feet per second.
ft = feet.
H_2SO_4 = sulfuric acid.
TPD = tons per day.
TPH = tons per hour.

[a] As 100% H_2SO_4.

Table 2-3. Estimated Maximum NO_x Emissions From No. 7 Sulfuric Acid Plant

Plant	Production (TPD)	NO_x RatePlant Emissions
No. 7 H_2SO_4 (current)	2,200	11.0 lb/hr 48.2 TPY
No. 7 H_2SO_4 (expanded)	3,200	16.0 lb/hr 70.1 TPY

Note: lb/hr = pounds per hour.
TPD = tons per day.
TPY = tons per year.

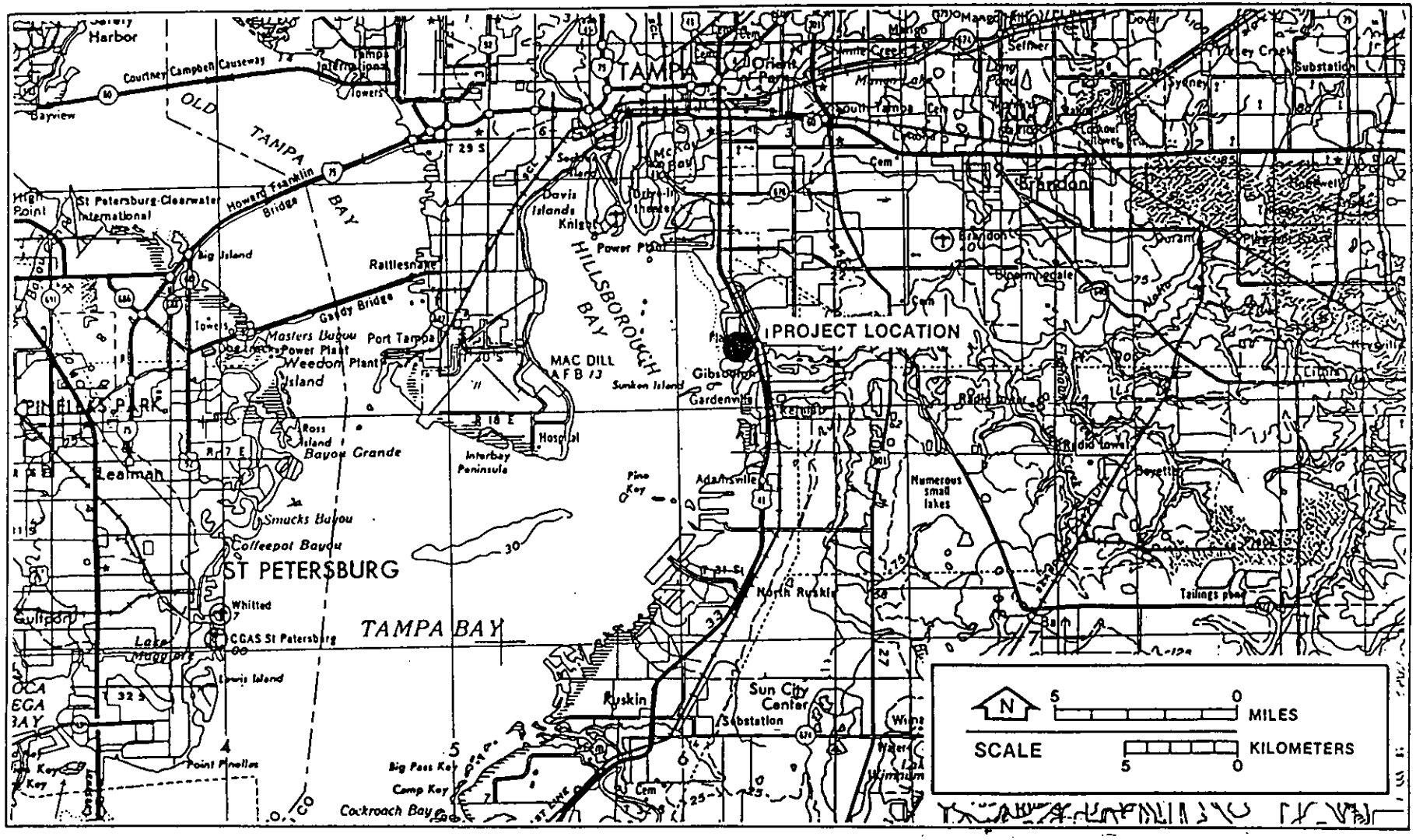


Figure 2-1 GENERAL LOCATION MAP OF CARGILL FERTILIZER, INC.

SOURCE: USGS, 1981.

Golder Associates

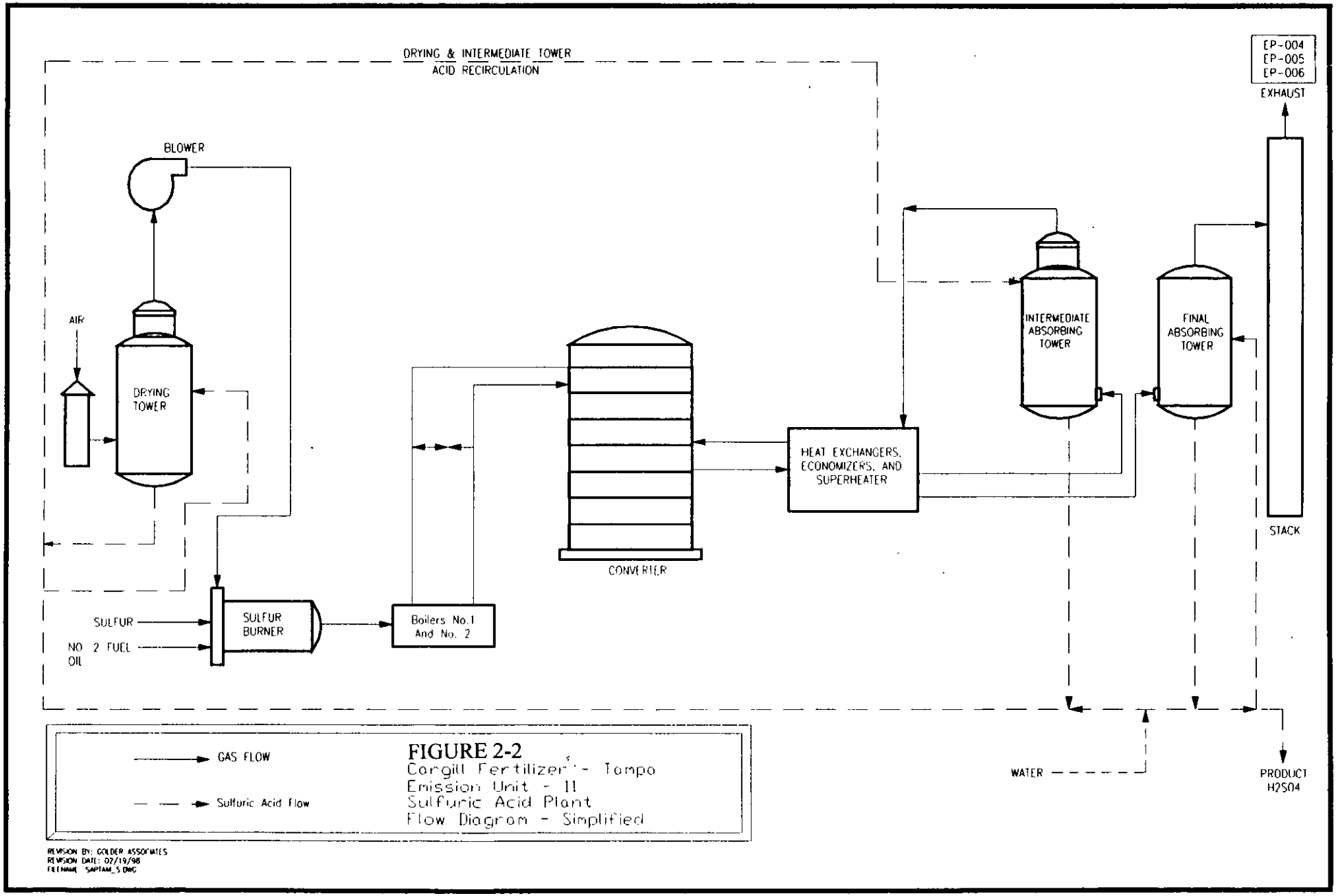
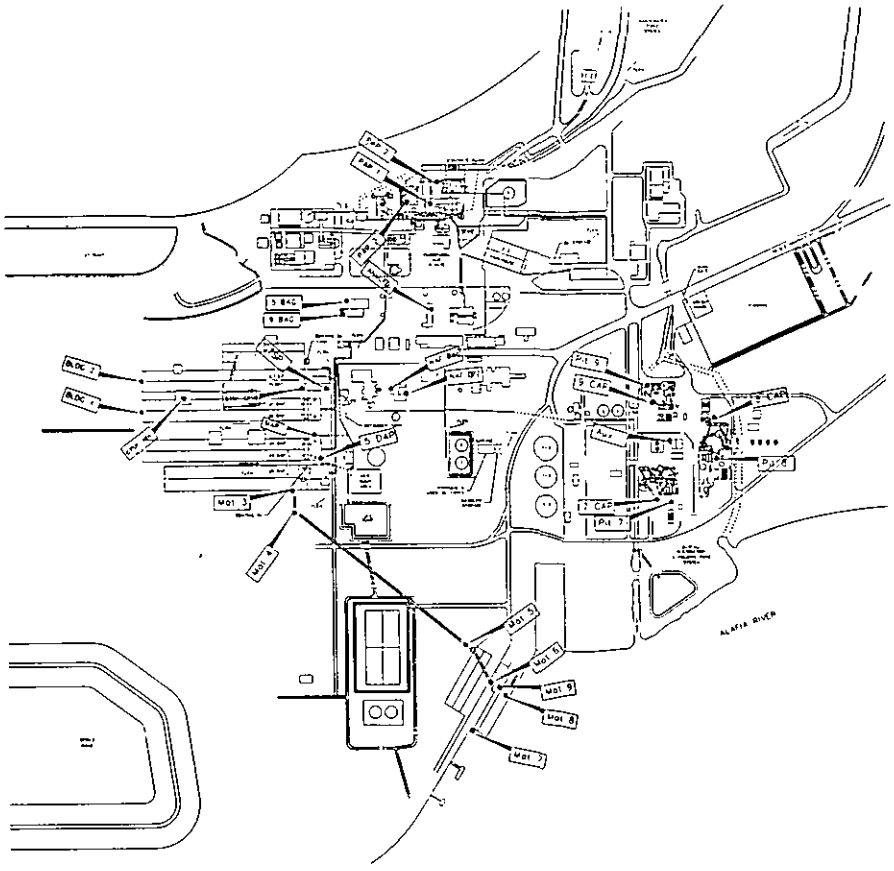


FIGURE 2-2
Cargill Fertilizer - Tampo
Emission Unit - 11
Sulfuric Acid Plant
Flow Diagram - Simplified

REVISION BY: GOLDER ASSOCIATES
REVISION DATE: 02/19/98
FILENAME: SAPTAM_S.DWG



PLOT PLAN

Attachment CR-FI-E2
Facility Plot Plan

Facility	Cargill Fertilizer Plant
Location:	Riverview, FL
Filename:	tpa-pll2.dwg
Date	June 6, 1996

3.0 SOURCE APPLICABILITY

3.1 PSD REVIEW

3.1.1 POLLUTANT APPLICABILITY

The Cargill facility is located in Hillsborough County, which has been designated by EPA and FDEP as an attainment area for SO_2. Hillsborough County and surrounding counties are designated as PSD Class II areas for SO_2. The site is located about 85 km from a PSD Class I area (Chassahowitzka National Wilderness Area).

The Cargill facility is considered to be an existing major stationary facility because potential emissions of certain regulated pollutants exceed 100 TPY (for example, potential SO_2 emissions currently exceeds 100 TPY). As a result, PSD review is required for the proposed modification for each pollutant for which the net increase in emissions exceeds the PSD significant emission rates (i.e., a major modification) see Table 3-1.

The net increase in allowable emissions due to the proposed expansion is shown in Table 3-2 (reference Tables 2-1 and 2-3). As shown, the increase in allowable SO_2 emissions is 793 TPY, and the increase in allowable H_2SO_4 mist emissions is 74.6 TPY. The increase in SO_2 and H_2SO_4 mist emissions will exceed the PSD significant emission rates. Therefore, the proposed project is subject to PSD review for these pollutants. The increase in NO_x emissions is 30.5 TPY, which is below the PSD significant emission rate of 40 TPY.

There have been no contemporaneous SO_2 emission increases occurring during the last five years at the Cargill facility. The phosphoric acid plants at Cargill will utilize the increased H_2SO_4 produced by the No. 7 H_2SO_4 plant. The increased H_2SO_4 capacity will allow the phosphoric acid plants to meet their permitted capacities, while reducing requirements for purchase of H_2SO_4 from outside producers. In addition, sulfuric acid may be transferred to Cargill's Bartow facility.

3.1.2 AMBIENT MONITORING

Based upon the increase in emissions from Cargill's proposed project, a PSD preconstruction ambient monitoring analysis is required for SO_2 and H_2SO_4 mist. However, if the increase in impacts of a pollutant is less than the *de minimis* monitoring concentration, then an exemption from the preconstruction ambient monitoring requirement may be granted for that pollutant. In addition,

if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

For SO_2, the maximum 24-hour impact due to the proposed expansion is 6.7 micrograms per cubic meter ($\mu g/m^3$), based on emitting SO_2 at 3.5 lb/ton H_2SO_4 for the 24-hour averaging time (refer to Section 6.0). The increase in impacts is below the *de minimis* monitoring concentration of 13 $\mu g/m^3$. In addition, there is no approved ambient monitoring method for H_2SO_4 mist. As a result, the proposed modification can be exempted from the preconstruction monitoring requirements for both these pollutants.

3.1.3 GEP STACK HEIGHT ANALYSIS

The GEP stack height regulations allow any stack to be at least 65 m [213 feet (ft)] high. The No. 7 H_2SO_4 plant at Cargill is an existing source with a stack less than 65 m. The stack height of the No. 7 H_2SO_4 plant will not be increased. As a result, the de minimis GEP stack height will not exceeded.

3.1.4 PSD INCREMENT CONSUMPTION

The PSD regulations provide that any emission increases or decreases occurring after January 6, 1975, due to construction at major stationary sources affects PSD increment consumption. A review of the history of the Cargill H_2SO_4 plants in regards to SO_2 emissions is presented in Table 3-3. The changes to the plants which affect PSD increment consumption are described below.

The Nos. 4, 5, 6, 7 and 8 H_2SO_4 plants were all operating at Cargill prior to the PSD SO_2 major source baseline date of January 6, 1975. In addition, the No. 9 plant received its initial construction permit on November 25, 1974. As a result, all of these plants (Nos. 4 through 9) are included in the baseline for the purposes of determining PSD increment consumption.

The H_2SO_4 plant Nos. 4, 5, and 6 were shutdown in October 1976. The annual averaged baseline emissions for these units are based on an average of the actual emissions for the previous 2 years of operation (i.e., 1975 and 1976).

The Nos. 7 and 8 plants also received construction permits on November 25, 1974, to modify the plants from single adsorption to double adsorption, with a reduced allowable SO_2 level of 10 lb/ton H_2SO_4. Since the Nos. 7, 8 and 9 plants had received construction permits just prior to the PSD major source baseline date, but their operation did not yet reflect these modifications, the PSD baseline emissions for these plants are based on the allowable emission limits as specified in the construction permits.

The SO_2 emission changes that affect PSD increment consumption for the sulfuric acid plants are presented in Table 3-4. The total baseline SO_2 emissions are 14,194 TPY. Total future SO_2 emissions after expansion are 6,205 TPY. Thus, there has been a net decrease of 7,989 TPY of SO_2. This represents an expansion of the available PSD increments. Actual SO_2 emissions for the baseline date of January 6, 1975, can also be determined from the annual reports submitted to FDER by Gardinier. The 1974 annual report showed total SO_2 emissions from all sulfuric acid plants (Nos. 4 through 8) were 18,211 TPY in 1974.

3.2 NON-ATTAINMENT REVIEW

The Cargill facility is located in Hillsborough County, which has been designated as an attainment area for SO_2. As a result, non-attainment review does not apply to the proposed project.

3.3 NEW SOURCE PERFORMANCE STANDARDS

Federal NSPS have been promulgated for new and modified sulfuric acid plants (40 CFR 60, Subpart H). The NSPS currently apply to the No. 7 H_2SO_4 plant, and will continue to apply in the future. The NSPS limits are 4.0 lb/ton for SO_2, and 0.15 lb/ton for H_2SO_4 mist emissions.

Table 3-1. PSD Significant Emission Rates and De Minimis Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	De Minimis Monitoring Concentration (ug/m^3)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter (PM10)	NAAQS	15	10, 24-hour
Nitrogen Oxides	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[a]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Asbestos	NESHAP	0.007	NM
Beryllium	NESHAP	0.0004	0.001, 24-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Vinyl Chloride	NESHAP	1	15, 24-hour

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below de minimis monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
NM = No ambient measurement method.
NSPS = New Source Performance Standards.
PM10 = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.
PSD = prevention of significant deterioration.
TPY = tons per year.
TSP = total suspended particulate matter.
ug/m^3 = micrograms per cubic meter.

[a] No de minimis concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.

Source: F.A.C., Rule 62-212.400, Tables 212.400-2 and 212.400-3.

Table 3-2. PSD Source Applicability Analysis, Cargill No. 7 Sulfuric Acid Plant Expansion

Emission Scenario	Emission Rate (TPY) SO_2	H_2SO_4 Mist	NO_x
Current Actual Emissions			
No. 7 H_2SO_4	1,251	13.0	39.6
Proposed Allowable Emissions[b]			
No. 7 H_2SO_4 @ 3,200 TPD	2,044	87.6	70.1
Total Net Increase	793	74.6	30.5
PSD Significant Emission Rate	40	7	40

Note: H_2SO_4 = sulfuric acid.
NO_x = nitrogen oxides.
PSD = prevention of significant deterioration.
SO_2 = sulfur dioxide.
TPD = tons per day.
TYP = tons per year.

[a] Based on average production during 1996 and 1997 of 673,691 TPY and 647,692 TPY, respectively, and annual stack test results as follows:
1996: SO_2-3.9 lb/ton; H_2SO_4 mist-0.026 lb/ton
1997: SO_2-3.67 lb/ton; H_2SO_4 mist-0.053 lb/ton

[b] Proposed emission rates are 3.5 lb/ton, 24-hour average, for SO_2, 0.15 lb/ton for H_2SO_4 mist, and 0.12 lb/ton for NOx.

Table 3-3. Permit History of H_2SO_4 Plants at Cargill Fertilizer, Inc, Tampa Plant

Permit No.	Date	Comments
Nos. 4, 5, and 6 H_2SO_4	October 1976	Units shutdown
No. 7 H_2SO_4		
AC 29-2391	11/25/74	Modify to double absorption plant
AO 29-5762	11/02/77	Operating permit for double absorption plant (1,380 TPD)
AO 29-22820	8/24/79	Renew operating permit
AC 29-21337	9/07/79	Increase to 1,750 TPD H_2SO_4 and reduce allowable SO_2 emissions from 10 lb/ton to 4 lb/ton
AO 29-56993	9/10/82	Operating permit for 1,750 TPD expansion
AC 29-089697	2/8/85	Modify to 2,200 TPD
AO 29-104895	8/23/85	Operating permit (2,200 TPD)
AO 29-178406	6/29/90	Renew operating permit (2,200 TPD)
No. 8 H_2SO_4		
AC 29-3290	11/25/74	Modify to double absorption plant
AO 29-2390	5/21/77	Operating permit for double absorption plant (1,784 TPD)
AO 29-18228	5/26/79	Renew operating permit (1,770 TPD)
AC 29-089696	2/8/85	Increase to 2,200 TPD H_2SO_4 and reduce allowable SO_2 emissions from 10 lb/ton to 4 lb/ton
AC 29-130371 (PSD-F1-118)	7/21/87	Increase to 2,500 TPD H_2SO_4
AO 29-162411	8/10/89	Operating permit for 2,500 TPD
AC 29-241660	3/7/95	Revise operating permit to 2,900 TPD; Nos. 8 and 9 plants combined limit of 5,700 TPD.
No. 9 H_2SO_4		
AC 29-2391	11/25/74	Original construction permit for 2,600 TPD double absorption plant
AO 29-2391	3/29/77	Operating permit (2,800 TPD)
AO 29-16532	2/09/79	Renew operating permit (2,631 TPD)
AO 29-78960	2/28/84	Renew operating permit (2,600 TPD)
A0 29-157890	2/10/89	Renew operating permit (2,600 TPD)
Permit amendment	10/19/89	Revise operating permit to 2,800 TPD
AC 29-241660	3/7/95	Revise operating permit to 3,200 TPD; Nos. 8 and 9 plants combined limit of 5,700 TPD.

Notes: H_2SO_4 = sulfuric acid.
lb/ton = pounds per ton.
SO_2 = sulfur dioxide.
TPD = tons per day.

Table 3-4. PSD Increment Consumption Baseline and Future SO2 Emissions, Cargill Fertilizer, Inc.

Emission Scenario	SO2 Emissions (TPY)	SO2 Emissions (lb/hr)	Basis
Baseline Emissions (a)			
No. 4 H2SO4	1,276	291.3	274 TPD; 6,992 lb SO2/day
No. 5 H2SO4	2,216	505.9	475 TPD; 12,140 lb SO2/day
No. 6 H2SO4	3,029	691.6	650 TPD; 16,598 lb SO2/day
No. 7 H2SO4	2,519	575.1	1,380 TPD; 10 lb/ton
No. 8 H2SO4	3,256	743.4	1,784 TPD; 10 lb/ton
No. 9 H2SO4	1,898	433.3	2,600 TPD; 4 lb/ton
Total	14,194	3,241	
Future Emissions (b)			
No. 7 H2SO4	2,044	466.7(c)	3,200 TPD; 3.5 lb/ton
No. 8 H2SO4	1,825	416.7	2,500 TPD; 4 lb/ton
No. 9 H2SO4	2,336	533.3	3,200 TPD; 4 lb/ton
Total	6,205	1,483	
Net Change	-7,989	-1,758	

Note:
H2SO4 = sulfuric acid.
lb/ton = pounds per ton.
PSD = prevention of significant deterioration.
SO2 = sulfur dioxide.
TPD = tons per day.
TPY = tons per year.

(a) Nos. 7, 8, 9
Represents allowable SO2 emissions as of January 6, 1975, representative of construction permits issued in November 1974.

(b) Nos. 8 and 9 plants limited to combined 5,700 TPD production rate.

(c) Represents 24-hour average emissions. Three-hour average emissions are 533.3 lb/hr

4.0 AMBIENT MONITORING ANALYSIS

4.1 MONITORING REQUIREMENTS

The CAA Amendments of 1977 require that the owner or operator of any proposed major new source or major modification conduct ambient air monitoring for applicable pollutants. As discussed in the source applicability section, Section 3.1, only SO_2 requires an air quality analysis to meet PSD preconstruction monitoring requirements for the proposed Cargill expansion. Monitoring must be conducted for a period of up to 1 year prior to submission of a construction permit application. However, if the increase in impacts due to the proposed new source or modification is less than the PSD de minimis monitoring concentrations, the applicant may be exempted from the PSD preconstruction monitoring requirements. For SO_2, the *de minimis* level is 13 $\mu g/m^3$, 24-hour average. As demonstrated in Section 6.0, the predicted maximum increase in 24-hour SO_2 impacts due to the proposed modification at Cargill is 6.7 $\mu g/m^3$. As a result, the proposed modification may be exempted from preconstruction SO_2 monitoring.

4.2 BACKGROUND SO_2 CONCENTRATIONS

A background SO_2 concentration must be estimated to account for SO_2 sources which are not explicitly included in the atmospheric dispersion modeling analysis. In order to estimate reasonable background SO_2 concentrations, a review of recent, available SO_2 monitoring data in the area of Cargill was performed. Presented in Table 4-1 is a summary of ambient SO_2 data available for 1996 and for January through June 1997, for all monitors located within 10 km of the Cargill site. A total of four stations are located within 10 km of Cargill, all of which have continuous SO_2 monitors. The monitors are operated by Hillsborough County Environmental Protection Commission. Data recoveries exceed 98 percent for all the stations.

Annual average, 24-hour maximums, and 3-hour maximums for SO_2 are shown in Table 4-1. Since all of the monitors are located in an area of multi source emissions (refer to Section 6.0), these concentrations are expected to include substantial contributions from sources in the area, including the existing Cargill facility. These potential major contributing sources are explicitly included in the modeling analysis, as are almost all emissions from sources located within 50 km of the Cargill facility (refer to Section 6.2.2). As a result, these concentrations are not representative

of actual background concentrations which would be expected to occur in conjunction with the worst-case meteorology.

In order to develop a representative background concentration for the modeling analysis, a review of SO_2 monitoring data from throughout Florida was performed. Since the vast majority of point source SO_2 emissions are accounted for in the dispersion modeling analysis, the background concentration should represent distant point sources, local and distant area sources, and natural sources. The monitoring data indicate that the minimum second-high SO_2 values recorded in urban areas during 1996 in Florida were about 25 $\mu g/m^3$ for the 3-hour averaging time, 14 $\mu g/m^3$ for the 24-hour averaging time, and 4 $\mu g/m^3$ for the annual average, all recorded at a site in Miami (see Appendix B). These values were used as background concentrations in the modeling analysis.

Table 4-1. Summary of Ambient SO_2 Data for Sites Within 10 km of Cargill Fertilizer, Inc., 1996 - 1997

SAROAD Site No. (Distance Away)	City	Monitoring Method	Period	No. of Obs.	Percent Data Recovery	SO_2 Concentration ($\mu g/m^3$)		
						3-Hour[a]	24-Hour[a]	Annual Average
1800-021-GO2[b] (8.2 km)	South of Gibsonton	Continuous	1996	8681	99.1	360	77	10
			1997(Jan-June)	4305	99.1	341	70	12
1800-95-GO2[b] (7.0 km)	Tampa	Continuous	1996	8653	98.8	422	76	14
			1997(Jan-June)	4259	98.0	241	81	13
4360-035-GO2[b] (9.8 km)	Tampa	Continuous	1996	8663	98.9	261	84	18
			1997(Jan-June)	4309	99.2	276	84	19
4360-053-GO2[c] (9.5 km)	Tampa	Continuous	1996	8721	99.5	190	56	13
			1997(Jan-June)	4315	99.3	203	58	12

Note: No. = number.
Obs. = observations.
SO_2 = sulfur dioxide.
$\mu g/m^3$ = micrograms per cubic meter.

[a] Second-highest concentrations for calendar year are shown.
[b] Monitoring objective for this site is to measure the impact of a significant source.
[c] Monitoring objective for this site is to measure pollutant concentrations representative of areas of high population density.

Source: Florida DEP, 1996, 1997.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY

The source applicability analysis for the proposed Cargill No. 7 H_2SO_4 plant expansion, presented in Section 3.0, identified SO_2 and H_2SO_4 mist as air pollutants requiring a BACT review under federal and state PSD regulations. This section describes the proposed BACT and emission limits for each pollutant subject to BACT. An analysis of alternative control technologies is also presented.

5.1 SULFUR DIOXIDE

5.1.1 PROPOSED SO_2 BACT

The No. 7 H_2SO_4 plant at Cargill is a double-absorption plant. The existing double absorption plant is considered to be state-of-the-art in reducing SO_2 emissions from H_2SO_4 plants and is already in operation at the No. 7 H_2SO_4 plant. Therefore, this control technology is proposed as BACT for SO_2.

In order to expand the existing No. 7 H_2SO_4 plant, Cargill will increase the size of the existing converter. Currently, there are two converter vessels, with the first vessel containing three sections of vanadium catalyst (termed "passes"). The second vessel contains the fourth pass. Cargill plans on increasing the height and diameter of the second converter vessel, and to replace the existing fourth pass and to install a new first pass. The existing passes one through three will be reconfigured to become passes two and three, thereby increasing their catalyst volume. The current total catalyst volume is 371,000 liters, representing a volume to production rate ratio of 168.6 liters/ton-day of 100% H_2SO_4. The future catalyst volume will be approximately 586,000 liters, representing a ratio of 183.1 liters/ton-day. Therefore, the effective catalyst volume will be increased by about 10% on a unit production basis.

The proposed BACT SO_2 emission limit for the expanded plant is 3.5 lb/ton of H_2SO_4 produced, 24-hour average, which is more stringent than the BACT emission rate recently determined by FDEP for Piney Point Phosphates proposed reconstructed sulfuric acid plant of 2,000 TPD capacity. The Piney Point determination was 3.5 lb/ton for a 48-hour average.

On a 3-hour average, the proposed BACT emission rate is 4.0 lb/ton, equivalent to the NSPS. This higher 3-hour average emission rate is necessary to account for plant process fluctuations and variability.

SO_2 compliance test data for the No. 7 H_2SO_4 plant for the last 5 years are presented in Table 5-1. The current permitted production rate for the plant is 2,200 TPD. As shown, the most recent test was conducted at a production rate of 2,191 TPD and the average emission rate was 3.7 lb/ton, with a maximum individual test of 3.8 lb/ton. These levels are above the proposed 3.5 lb/ton, 24-hour average limit, but less than the proposed 3-hour limit of 4.0 lb/ton. Variable emissions result from changing operating rates, process variables, and catalyst aging. An SO_2 emission level lower than 3.5 lb/ton, 24-hour average, may not be achievable on a continuous basis, particularly in light of the potential effects of higher production, catalyst aging, and other process variables.

5.1.2 ALTERNATIVE SO_2 CONTROL TECHNOLOGIES

EPA's latest review of NSPS for H_2SO_4 plants (MITRE Corp., 1979) presents a comprehensive assessment of alternative control technologies for removing SO_2 from H_2SO_4 plant tail gases. Alternative technologies identified included the double-absorption contact H_2SO_4 plant, sodium sulfite-bisulfite scrubbing, ammonia scrubbing, and molecular sieves. The study concluded that the best demonstrated control technology to reduce SO_2 emissions is the double-absorption H_2SO_4 plant. Nearly all the H_2SO_4 plants built in the United States since 1971 have used the double-absorption process, wherein two absorber stages are used. The SO_2 conversion efficiency for the double-absorption plant is 96 percent or greater.

A review of H_2SO_4 plant BACT determinations was conducted to determine control technologies and emission rates associated with plants constructed or modified since the EPA study was conducted in 1979. The results of the review are summarized in Table 5-2. This information was obtained from the EPA's BACT/LAER Clearinghouse. As indicated in the table, all BACT determinations since 1979 have resulted in allowable SO_2 levels equivalent to the NSPS of 4.0 lb/ton, except for the Piney Point plant. The Piney Point plant was permitted for allowable SO_2 emission rates of 4.0 lb/ton (3-hr average) and 3.5 lb/ton (48-hr average). These plants have

ranged in capacity from 700 TPD to 7,800 TPD. All have utilized the double-absorption technology.

Reduction of SO_2 emissions below those proposed for the No. 7 H_2SO_4 double-absorption plant would require add-on control equipment, such as one of the flue gas desulfurization (FGD) processes described above. This would add considerable capital and operating costs to the present system and produce a waste disposal problem. The proposed Cargill expansion will increase allowable SO_2 emissions from the No. 7 plant by 100 lb/hr based on a 24-hour average. This represents less than a 30-percent increase in total allowable SO_2 emissions from the No. 7 H_2SO_4 plant. The air quality impact analysis presented in Section 6.0 demonstrates that the proposed increase in emissions will have a very minor impact upon current air quality levels.

The EPA NSPS review analyzed the SO_2 control alternative of replacing the catalyst bed in the dual-absorption plant more frequently than is normally practiced. Complete replacement of the first three beds of a 4-stage converter at a frequency rate three times greater than is normally practiced was estimated to result in a cost impact of $0.50/ton of H_2SO_4 produced. This was considered to be an unacceptable method because pretax profits to the plant could be reduced by 20 percent or more.

FGD systems have not been applied to sulfuric acid plants. This is because the double adsorption plants result in a high degree of reduction in potential SO_2 emissions (greater than 99 percent), resulting in rather low SO_2 flue gas concentrations. For example, proposed SO_2 emissions for the No. 7 H_2SO_4 plant equate to approximately 370 ppm SO_2 in the flue gases.

A significant impediment to applying an FGD system to a sulfuric acid plant is the economic impact, reflected in an increase in capital costs, annual operating costs, and the cost per ton of H_2SO_4 manufactured. No sulfuric acid plant is known to have employed addition FGD as a control technology. In the recent PSD permit issued to Piney Point Phosphates, FGD systems were dismissed as not being practical or economically feasible. As a result of these considerations, FGD systems were not considered further as BACT.

Use of a cesium-promoted vanadium catalyst in place of the conventional vanadium catalyst in the final converter pass was required as a specific condition of the Piney Point Phosphates, Inc., by FDEP. A cesium-promoted vanadium catalyst can theoretically reduce SO_2 emissions by 20 to 40 percent. However, cesium catalyst is 2.5 times more expensive than vanadium, and therefore is normally used only where space limitations prohibit the use of vanadium. Cargill proposes an increase in volume of the conventional vanadium catalyst to achieve a more stringent emission rate compared to the Piney Point BACT limit (3.5 lb/ton H_2SO_4 48-hour average). This increase in volume is more cost effective than the cesium-promoted catalyst. Therefore, cesium-promoted vanadium catalyst was not considered further as BACT.

None of the alternative SO_2 control technologies is considered to be superior to the selected BACT, based on economic, energy, and environmental impacts. The chosen SO_2 BACT for the No. 7 H_2SO_4 plant is the currently operating double-absorption plant with increased vanadium catalyst, reflective of a maximum 24-hour SO_2 emission rate of 3.5 lb/ton.

5.2 SULFURIC ACID MIST

The No. 7 H_2SO_4 plant at Cargill is currently equipped with a high efficiency mist eliminator to control H_2SO_4 mist emissions. The current emission limit is 0.15 lb/ton for H_2SO_4 mist based upon the NSPS. The proposed BACT emission level for H_2SO_4 mist is the current allowable of 0.15 lb/ton.

Currently, Cargill uses conventional mist eliminations to control acid mist emissions. In order to accommodate the higher production rate for the No. 7 H_2SO_4 plant, the final tower mist elimination system will be replaced with Monsanto type CS elements (or equivalent). The existing final absorbing tower will be expanded to hold the new elements, at additional cost. The CS type eliminator is an impaction based product which is stated to remove approximately 100% of particles above 3 microns in diameter, and 50 to 95% of particles between 0.5 and 3 microns (See attached vendor literature - Appendix C).

Piney Point phosphates was recently required to meet the NSPS level for H_2SO_4 mist of 0.15 lb/ton using high efficiency mist eliminators of the brownian diffusion type (see attached vendor literature in Appendix C). This type mist eliminator is much more expensive that the impaction type

proposed by Cargill, and the existing tower at Cargill could not be modified; a new tower would need to be built to accommodate the larger size requirements, structural support, etc. The brownian type product (Monsanto ES, or equivalent) is estimated to cost an additional $530,000 for just the mist eliminator elements. This additional cost is considered economically prohibitive, considering that a significant reduction in total mass emissions of mist would not be achieved. This is because the smaller particles controlled by the brownian type elements constitute a small fraction of the total mass emissions.

H_2SO_4 mist source test data from the No. 7 plant operating near its current permitted rate are presented in Table 5-3. Review of the source test data presented in Table 5-3 shows that past H_2SO_4 mist compliance test values have ranged from 0.010 lb/ton to 0.083 lb/ton for the No. 7 H_2SO_4 plant. These data indicate that emissions can fluctuate significantly, due to the factors discussed previously for SO_2, and may range close to the 0.15 lb/ton current allowable limit. Based on the source test data, no reduction in the current allowable level is proposed for the No. 7 H_2SO_4 plant.

Previous BACT determinations for H_2SO_4 plants throughout the U.S. are summarized in Table 5-4. This information was obtained from the EPA's BACT/LAER Clearinghouse. The data show that all BACT determinations for H_2SO_4 plants constructed or modified since 1980 have resulted in allowable H_2SO_4 mist emission rates equivalent to the NSPS of 0.15 lb/ton. Based upon these considerations, the selected BACT for control of H_2SO_4 mist emissions is the proposed impaction type, high efficiency mist eliminators to control mist emissions to 0.15 lb/ton.

The proposed Cargill H_2SO_4 expansion will increase allowable H_2SO_4 mist emissions by 6.25 lb/hr. This will result in only a 31 percent increase in the current allowable H_2SO_4 emissions from the No. 7 H_2SO_4 plant of 13.75 lb/hr. A lower BACT emission limit would not result in significant benefits to the environment.

Table 5-1. Summary of Recent No. 7 H_2SO_4 Plant SO_2 Emission Tests

Date	Average Production Rate[a] (tons/hr)	Sulfur Dioxide (lb/hr) Avg.	Sulfur Dioxide (lb/hr) Max.	Sulfur Dioxide (lb/ton) Avg.	Sulfur Dioxide (lb/ton) Max.
04/15/93	1,913	267.5	--	3.4	--
03/10/94	2,011	268	--	3.2	--
4/11/95	2,060	339	--	3.9	--
02/19/96	1,949	313	317	3.9	3.9
05/08/97	2,191	336	350	3.7	3.8

Note:
avg. = average.
H_2SO_4 = sulfuric acid.
lb/hr = pounds per hour.
lb/ton = pounds per ton.
max. = maximum.
SO_2 = sulfur dioxide.
tons/hr = tons per hour.

[a] As 100 percent sulfuric acid.

Table 5-2 Summary of BACT Determinations for Sulfuric Acid Plants

Company	Permit Issue Date	Pollutant	Throughput (Units)	Emission Limit	Control Equipment
PINEY POINT PHOSPHATES INC	2/98	SO2 H2SO4	2000 TPD	4.0 lb/ton (3-hr) & 3.5 lb/ton (48-hr) 0.15 lb/ton	DOUBLE ABSORBTION MIST ELIMINATORS (BROWNIAN DIFFUSION)
CARGILL FERTILIZER	11/16/95	SO2 H2SO4	7800 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORPTION MIST ELIMINATORS
CARGILL FERTILIZER	03/07/95	SO2 H2SO4	3200 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORPTION MIST ELIMINATORS
SEMINOLE FERTILIZER CORP	12/31/92	SO2 H2SO4	2280 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORPTION
COAL GASIFICATION, INC	02/29/88	SO2 H2SO4	700 TPD	4 lb/ton 0.15 lb/ton	-- --
GARDINIER, INC	07/21/87	SO2 H2SO4	2500 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORPTION MIST ELIMINATORS
CHEVRON CO, USA	06/13/84	SO2 H2SO4	1900 TPD	4 lb/ton 0.15 lb/ton	-- --
CONSERV, INC	10/02/81	SO2 H2SO4	2000 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORBTION ACID MIST ELIMINATORS
NEW WALES CHEMICAL, INC	06/01/81	SO2 H2SO4	2750 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORBTION --
U.S.S. AGRI-CHEMICALS	04/01/81	SO2 H2SO4	1850 TPD	4 lb/ton 0.15 lb/ton	-- --
GARDINIER, INC	07/11/80	SO2 H2SO4	1750 TPD	4 lb/ton 0.15 lb/ton	DOUBLE ABSORBTION --

Source: EPA's RACT/BACT/LAER Clearinghouse, 1997.

Table 5-3. Summary of Recent No. 7 H_2SO_4 Plant Sulfuric Acid Mist Emission Tests

	Average Production Rate[a] (tons/day)	Sulfuric Acid Mist (lb/hr) Avg.	Max.	(lb/ton) Avg.	Max.
04/15/93	1,913	2.1	--	0.083	--
03/10/94	2,011	0.9	--	0.010	--
04/11/95	2,060	7.1	--	0.026	--
02/19/96	1,949	2.2	2.4	0.026	0.029
05/08/97	2,191	4.9	5.4	0.053	0.059

Note: H_2SO_4 = sulfuric acid.
lb/hr = pounds per hour.
lb/ton = pounds per ton.
tons/hr = tons per hour.

[a] As 100 percent sulfuric acid.

Table 5-4. Summary of Recent No. 7 H_2SO_4 Plant Sulfuric Acid Mist Emission Tests

	Average Production Rate[a] (tons/day)	Sulfuric Acid Mist (lb/hr) Avg.	Max.	(lb/ton) Avg.	Max.
04/15/93	1,913	2.1	--	0.083	--
03/10/94	2,011	0.9	--	0.010	--
04/11/95	2,060	7.1	--	0.026	--
02/19/96	1,949	2.2	2.4	0.026	0.029
05/08/97	2,191	4.9	5.4	0.053	0.059

Note: H_2SO_4 = sulfuric acid.
lb/hr = pounds per hour.
lb/ton = pounds per ton.
tons/hr = tons per hour.

[a] As 100 percent sulfuric acid.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 SIGNIFICANT IMPACT ANALYSIS

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. For all criteria pollutants that will be emitted in excess of the PSD significant emission rate due to a proposed project, a significant impact analysis is performed to determine whether the emission and/or stack configuration changes due to the project alone will result in predicted impacts that are in excess of the EPA significant impact levels at any location beyond the plant property boundaries.

Generally, if the facility undergoing the modification also is within 200 kilometers of a PSD Class I area, then a significant impact analysis is also performed for the PSD Class I area. Currently, the National Park Service (NPS) has recommended significant impact levels for PSD Class I areas. The recommended levels have not been promulgated as rules.

If the project's impacts are above the significant impact levels, then a more detailed air modeling analysis that includes background sources is performed. Current FDEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be compared to the applicable significant impact levels. Based on the screening modeling analysis results, additional modeling refinements with a denser receptor grid are performed, as necessary, to obtain the maximum concentration.

6.2 AAQS/PSD MODELING ANALYSIS

For each pollutant for which a significant impact is predicted, a more detailed impact analysis is required. This analysis must consider other nearby sources and background concentrations and predict concentrations for comparison to ambient standards. In general, when 5 years of meteorological data are used in the analysis, the highest annual and the highest, second-highest (HSH) short-term concentrations are compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with air quality standards and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the proposed project, the modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. For this study, the only difference between the two modeling phases is the density of the receptor grid spacing employed when predicting concentrations. Concentrations are predicted for the screening phase using a coarse receptor grid and a 5-year meteorological data record.

If the original screening analysis indicates that the highest concentrations are occurring in a selected area(s) of the grid and, if the area's total coverage is too vast to directly apply a refined receptor grid, then an additional screening grid(s) will be used over that area. The additional screening grid(s) will employ a greater receptor density than the original screening grid, so refinements can be performed if necessary.

Refinements of the maximum predicted concentrations are typically performed for the receptors of the screening receptor grid at which the highest and/or HSH concentrations occurred over the 5-year period. Generally, if the maximum concentration from other years in the screening analysis are within 10 percent of the overall maximum concentration, then those other concentrations are refined as well.

Modeling refinements are performed for short-term averaging times by using a denser receptor grid, centered on the screening receptor to be refined. The angular spacing between radials is one or two degrees and the radial distance interval between receptors is 100 m. Annual modeling refinements employ an angular spacing between radials of one or two degrees and a distance interval from 100 to 300 m, depending on the concentration gradient in the vicinity of the screening receptor to be refined. If the maximum screening concentration is located on the plant property boundary, additional plant boundary receptors are input, spaced at a 2 degree angular interval and centered on the screening receptor. The domain of the refinement grid will extend to all adjacent screening receptors. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred. This approach is used to

ensure that a valid HSH concentration is obtained. A more detailed description of the model, along with the emission inventory, meteorological data, and screening receptor grids, is presented in the following sections.

6.2.1 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 97363) dispersion model (EPA, 1995) was used to evaluate the pollutant impacts due to the proposed modification to Cargill's No. 7 Sulfuric Acid Plant. This model is maintained on the EPA's Technical Transfer Network (TTN) bulletin board service. A listing of ISCST3 model features in presented in Table 6-1. The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights).

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. Based on the land-use within a 3-km radius of the Cargill facility, the rural dispersion coefficients were used in the modeling analysis. The ISCST3 model was used to provide maximum concentrations for the annual and 24-hour averaging times.

6.2.2 METEOROLOGICAL DATA

Meteorological data used in the ISCST3 model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Tampa International Airport and Ruskin, respectively. The 5-year period of meteorological data was from 1987 through 1991. The NWS station at Tampa International Airport, located approximately 18 km to the northwest of the Cargill plant site, was selected for use in the study because it is the closest primary weather station to the study area that is representative of the plant site.

6.2.3 EMISSION INVENTORY

6.2.3.1 Cargill Facility

The Cargill SO_2 emission inventory is presented in Table 6-2. Stack data for the Cargill sources were obtained from current operating permits and stack test data. SO_2 emissions for all Cargill

sources were developed using data from current permits and AP-42 emission factors (refer to Appendix A). The fuel oil burning sources at Cargill (GTSP, DAP5, and SSF plants) all are permitted to burn No. 2 fuel oil with a maximum of 0.5 percent sulfur. Operating data for the No. 7 H_2SO_4 plant was derived by taking the average of the last 2 years of stack test data and prorating it based on the proposed production rate increase.

Tables 2-1 2-2

In order to determine the SO_2 significant impact area, the current and future operating conditions of the No.7 H_2SO_4 plant were modeled to determine the net air quality change due to the proposed expansion. The modeled SO_2 emissions rates are shown in Table 2-1, and stack parameters are shown in Table 2-2.

ROI 7km

Modeling of the current and future No. 7 H_2SO_4 plant demonstrated that the proposed expansion would have a significant impact at a distance out to 2.5 and 6.5 km from the Cargill facility for the 24- and 3-hour averaging times, respectfully. Therefore, the project's significant impact area was established as 7.0 km.

6.2.3.2 AAQS Emission Inventory

The inventory data were based on information developed for the PSD permit application for the Hardee Power Station, the FPL Manatee Orimulsion SCA, data obtained from the FDEP (Golder, 1998), and Cargill's No. 9 Sulfuric Acid Plant Expansion PSD Permit Application (KBN, 1993).

The FDEP recommends a technique for eliminating competing facilities in the modeling analysis if the facility's emissions do not meet an emission criteria. The technique is the "Screening Threshold" method, developed by the North Carolina Department of Natural Resources and Community Development, and approved by the EPA. The method is designed to objectively eliminate from the emission inventory those sources which are not likely to have a significant interaction with the source undergoing evaluation. In general, sources that should be considered in the modeling analysis are those with emissions greater than Q (in TPY) which is calculated by the following criteria:

$$Q = 20 \times D$$

where D is:

1. the distance (km) from Cargill to the source undergoing evaluation for short-term analysis, or
2. the distance (km) from the edge of Cargill's significant impact area (**8 km**) to the source undergoing evaluation for long-term analysis.

For this analysis the long-term criteria was used since less facilities would be eliminated than with the short-term criteria and would thus result in a more conservative approach.

A listing of the sources in the inventory, along with associated maximum allowable emissions, distance from Cargill, and associated Q, are presented in Table 6-3. An alphabetized listing of Table 6-3 is presented as Table D-1, Appendix D. Those sources with maximum allowable SO_2 emissions which are below the calculated "screening threshold" emissions were eliminated from further consideration in the modeling analysis. In general, sources located more than 50 km from Cargill's significant distance (7 km) were not considered in the screening analysis.

Sources with similar stack heights and stack parameters were sometimes combined and treated as one stack to reduce computation time. The individual emissions, stack, and operating parameters for the competing sources considered in the air modeling analysis are presented in Appendix D, Table D-2. The combined source parameters are presented in Table D-3.

6.2.3.3 PSD Class I and Class Ii Emission Inventories

A summary of SO_2 sources used in the PSD Class II modeling analysis is presented in Table E-1, Appendix E. At the bottom of Table E-1 are a list of additional SO_2 sources used in the PSD Class I modeling analysis for the Chassahowitzka NWA. The additional PSD Class I sources, plus the PSD Class II sources, make up the total PSD Class I source inventory.

6.3 RECEPTOR LOCATIONS

6.3.1 SITE VICINITY

To determine the SO_2 significant impact area for the proposed project, concentrations were predicted for 324 regular and 119 discrete polar grid receptors located in a radial grid centered on H_2SO_4 No. 9 stack. Receptors were located in "rings" with 36 receptors per ring, spaced at 10° intervals and at distances of the fenceline 2, 2.5, 3, 4, 5, 6, 7, 9, and 11 km from the H_2SO_4 No. 9

stack location. Discrete receptors included 36 receptors located on the plant property boundary at 10° intervals, plus 83 additional off-property receptors at distances of 0.5, 0.8, 1.1 and 1.5 km from the H_2SO_4 No. 9 stack to cover the area between the property boundary and the closest regular receptor grid distance (i.e., 2.0 km). The 36 property boundary receptors used for the screening analysis are presented in Table 6-4. All receptor locations are relative to the H_2SO_4 No. 9 stack location, an origin which has been used for this site since the 1993 PSD report for H_2SO_4 No. 9. Based on the results of the significant impact analysis, a maximum receptor distance of 7 km was used for the screening grid for the AAQS and PSD Class II analysis.

6.3.2 CLASS I AREA

Maximum SO_2 impacts for the Chassahowitzka NWA were predicted at 13 discrete receptors located along the border of the PSD Class I area. Impacts for the proposed modification only were also compared to the Class I significance levels recommended by the National Park Service (NPS). A listing of Class I receptors is provided in Table 6-5.

6.4 BACKGROUND CONCENTRATIONS

To estimate total air quality concentrations, a background concentration must be added to the modeling results. The background concentration is considered to be the air quality concentration contributed by sources not included in the modeling evaluation.

The derivation of the background concentration for the modeling analysis was presented in Section 4.0. Based on this analysis, the background SO_2 concentration was determined to be 25 and 14 $\mu g/m^3$ for the 3- and 24-hour averaging periods, respectively, and 4 $\mu g/m^3$ for the annual averaging period. These background levels were added to model-predicted concentrations to estimate total air quality levels for comparison to AAQS.

6.5 BUILDING DOWNWASH EFFECTS

All significant building structures within Cargill's existing plant area were determined by a site plot plan. A total of 21 building structures were evaluated. All building structures were processed with the EPA Building Input Profile (BPIP, Version 95086) program to determine direction-specific building heights and projected widths for each 10-degree azimuth direction for each source that was

included in the modeling analysis. A listing of dimensions for each structure is presented in Table 6-6.

6.6 MODEL RESULTS

6.6.1 SIGNIFICANT IMPACT ANALYSIS

A summary of the maximum SO_2 concentrations predicted for the proposed modification only in the screening analysis is presented in Table 6-7. These results indicate that the maximum 24-hour and 3-hour screening grid concentrations of 6.5 and 48.4 $\mu g/m^3$ are above the significance levels of 5 and 25 $\mu g/m^3$, respectively. The maximum annual concentration is 0.4 $\mu g/m^3$ is below the significance level of 1 $\mu g/m^3$. It was further determined that the significant impact area for the proposed modification extends out approximately 7.0 km from the Cargill facility, based on the maximum 3-hour impacts.

6.6.2 AAQS ANALYSIS

Summaries of the maximum predicted annual average, 24-hour, and 3-hour SO_2 concentrations predicted for all sources for the screening analysis are presented in Table 6-8. Based on the results presented in the table, the maximum SO_2 concentrations due to all sources are predicted to exceed the AAQS at different locations for all averaging times with the appropriate SO_2 background concentrations. ISCST3 model output files, listing the time period and receptor location for each modeled AAQS exceedance for the 24-hour and 3-hour averaging times, are presented in Appendix F. The time period and location at which each exceedance occurs are also written to the EVENT input file for additional processing.

Cargill's proposed project is considered licensable if it does not pose an air quality impact that is greater than the EPA significant impact levels to any modeled violation (i.e. two or more exceedances at the same receptor in one year). Whether the project was significant was determined by taking the EVENT input file and replace the AAQS source data with the project only. Execution of the EVENT model then provided the proposed project's contribution to each exceedance. It is to be noted that the EVENT program determines contributions to all exceedances, not just violations. Therefore, if the project's contribution to one or more exceedances is significant, it would then be necessary to determine whether any of the exceedances were actually modeled violations.

The results of this analysis are summarized in Table 6-9. The results indicate that the proposed project's maximum 24-hour and 3-hour contributions to any exceedances of 4.9 and 3.2 $\mu g/m^3$, respectively, are below the significant impact levels of 5 and 25 $\mu g/m^3$, respectively. Therefore, the proposed project is not significant at any modeled violation (or exceedance, in this case).

All EVENT modeling files are provided in the project's air modeling printout which is included with the PSD permit application submittal.

6.6.3 PSD CLASS II ANALYSIS

The results of the screening analysis for PSD Class II increment consumption are presented in Table 6-10. Based on the screening modeling results, 24-hour refinements were performed. The refined model impacts are presented in Table 6-11. The refined modeling results indicate that the maximum predicted PSD Class II 24-hour increment exceeds the allowable SO_2 PSD Class II increment in an area approximately 5-6 km north-northwest of the proposed project site.

An analysis was performed to determined if the proposed project a significant impact at the area of the modeled 24-hour PSD Class II exceedances. The impact of the proposed project alone was determined for a receptor grid covering the exceedance area. The results of this analysis are summarized in Table 6-12. The results indicate that the proposed project's maximum 24-hour impact in this area is 2.5 $\mu g/m^3$ which is half of the significant impact level of 5 $\mu g/m^3$. Therefore, the project's maximum impact will not significantly affect the area of modeled PSD Class II exceedance.

6.6.4 PSD CLASS I ANALYSIS

Maximum SO_2 concentrations predicted for the proposed project alone at the Chassahowitzka NWA PSD Class I area are compared with the NPS' recommended PSP Class I significance levels in Table 6-13. As the proposed project's impacts exceed the Class I significant impact levels, a full PSD Class I incremental analysis was performed with all increment consuming (expanding) competing sources.

A summary of the maximum predicted PSD increment predicted at the Class I area is presented in Table 6-14. The maximum predicted annual, 24-, and 3-hour increments are 0.15, 6.5, and ,

26.9 $\mu g/m^3$, respectively. The 24- and 3-hour increments exceed the allowable SO_2 PSD Class I increments of 5 and 25 $\mu g/m^3$, respectively. It was, therefore, determined if the proposed project's maximum impact would significantly contribute to any predicted Class I exceedances. This was performed in the same manner as was done for the AAQS analysis. The ISCST3-generated lists of PSD Class I increment exceedances are presented in Appendix G.

The results of this analysis are summarized in Table 6-15. The results indicate that the proposed project's maximum 24-hour and 3-hour contribution to any exceedances of 0.016 and .003 $\mu g/m^3$, respectively, are below the NPS' recommended significant impact levels of 0.07 and 0.48 $\mu g/m^3$, respectively. Therefore, the proposed project is predicted to not significantly affect any modeled PSD Class II increment exceedance at the Chassahowitzka NWA.

Table 6-1. Major Features of the ISCST3 Model

ISCST3 Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975; Bowers, et al., 1979).
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulman and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple emission sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, area, and open pit sources
• Capability to calculate dry and wet deposition, including both gaseous and particulate precipitation scavenging for wet deposition
• Variation of wind speed with height (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average times
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm for ISCST3; a built-in algorithm for predicting concentrations in complex terrain
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing including setting wind speeds less than 1 m/s to 1 m/s.

Note: ISCST3 = Industrial Source Complex Short-Term.

Source: EPA, 1995.

Table 6-2. Summary of Cargill SO_2 Sources Used for the Modeling Analysis

Sources	SO_2 Emissions (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Velocity (m/s)	Exit Gas Temperature (K)	Stack Location[a] X (m)	Stack Location[a] Y (m)	PSD Increment Affecting Source?
GTSP	3.83	38.4	2.44	14.19	325	-520.9	22.9	No
DAP 5	2.56	40.4	2.13	16.07	316	-520.9	-96.1	Yes
SSF	0.21	12.2	0.51	12.52	322	-481.9	11.9	No
No. 7 H_2SO_4 [b] (current)	46.2 ✓	45.7	2.29	13.11	341	-18.9	-129.1	Yes
No. 7 H_2SO_4 [c] (expanded)	58.8 ✓ 67.2 3hr	45.7	1.91	24.64	341	-18.9	-129.1	Yes
No. 8 H_2SO_4 [d]	52.5	45.7	2.44	12.48	339	78.1	-28.1	Yes
No. 9 H_2SO_4 [d]	67.2	45.7	2.74	12.66	350	0	0	Yes
No. 4, 5, 6 H_2SO_4 [e]	-187.6	22.6	1.52	7.00	363	-125.3	-100.3	Yes
Animal Feed #1	5.92	41.5	1.83	17.07	339	-358	126	Yes
Animal Feed #2	5.92	41.5	1.83	15.27	339	-358	126	Yes
No. 5 Rock Mill	0.83	27.74	0.76	19.66	347	-499	152	No
No. 9 Rock Mill	0.83	27.74	0.76	19.66	347	-499	158	No
No. 7 Rock Mill (proposed)	0.83	27.74	0.91	14.37	347	-499	148	Yes

Notes:
g/s = grams per second.
H_2SO_4 = sulfuric acid.
K = Kelvin.
lb = pound.
m = meter.
m/s = meters per second.
SO_2 = sulfur dioxide.
TPH = tons per hour.

[a] Relative to grid center located at the H_2SO_4 No. 9 stack location.

[b] Emissions based on a production rate of 2,200 TPD (91.7 TPH) of H_2SO_4 and 4.0 lb SO_2 per ton of H_2SO_4 produced. Stack parameters based on Title V application.

[c] Emissions based on a production rate of 3,200 TPD (133.3 TPH) of H_2SO_4 and 3.5 lb SO_2 per ton of H_2SO_4 produced representing worst case 24-hr conditions. Maximum 3-hour emissions are 67.2 g/s based on 4.0 lb/ton. ✓

[d] Emissions based on Nos. 8 and 9 H_2SO_4 plants combined maximum production rate of 5,700 TPD and 4.0 lb SO_2 per ton of H_2SO_4 produced. For modeling purposes, No. 8 was at 2,500 TPD and No. 9 was at 3,200 TPD.

[e] Baseline sources, shutdown in October 1976: 1,276 TPY for No. 4; 2,216 TPY for No. 5; and 3,029 TPY for No. 6; total of 6,521 TPY.

Source: Golder Associates, 1986, 1992,1998.

Table 6-3 SO2 Screening Analysis for the AAQS and PSD Class II Inventories for Cargill - Riverview Facility

Facility Name	UTM Coordinates (km) E	N	Relative to Cargill Riverview Facility X (km)	Y (km)	Distance (km)	Direction (degrees)	Screening Emission Threshold (TPY)(a)	Maximum Allowable Emissions (TPY)	Included in AAQS and/or PSD Class II Modeling Analysis?
TECO - Gannon	360.0	3082.5	-2.9	5.0	5.8	330	SIA	93 265	YES
CLM/Pacific Chlorine	361.8	3088.3	-1.1	5.8	5.9	349	SIA	731	YES
TECO - Big Bend (b)	361.9	3075.0	-1.0	-7.5	7.6	188	11	237,854	YES
Sulphur Terminals Tampa	358.0	3080.0	-4.9	7.5	9.0	327	39	210	YES
Lil'ape Corp	357.7	3090.6	-5.2	8.1	9.6	327	51	29 293	YES
TECO - Hookers Point	358.0	3091.0	-4.9	8.5	9.8	330	56	13524	YES
Tampa McKay Bay RTE	360.0	3091.9	-2.9	9.4	9.8	343	57	745	YES
Gulf Coast Lead	364.0	3093.5	1.1	11.0	11.1	6	81	1,498	YES
Hillsborough RRF	368.2	3092.7	5.3	10.2	11.5	27	90	1,029	YES
Sulphuric Acid Trading Company	349.0	3081.5	-13.9	-1.0	13.9	266	139	159	YES
Gold Bond Building Products	347.3	3082.7	-15.6	0.2	15.6	271	172	367	YES
EPC - Bartow	312.4	3082.6	-20.5	0.1	20.5	270	270	62 618	YES
EPC Bayboro	338.8	3071.3	-24.1	-11.2	26.6	245	392	6876	YES
Pinellas RRF (b)	335.2	3081.1	-27.7	1.6	27.7	273	415	2300	YES
FPL - Manatee	367.2	3054.1	4.3	-28.4	28.7	171	431	83,351	YES
Piney Point (b)	338.7	3057.3	-14.2	-25.2	28.9	209	149	1,229	YES
EPC - Higgins	330.5	3098.1	-22.4	15.9	30.8	301	476	19 619	YES
Consolidated Minerals Plant City	333.8	3096.4	-19.1	13.8	33.8	66	537	809	YES
IMC Agrico Chem - New Wales (b)	396.6	3078.9	31.7	-3.6	33.9	96	598	13 921	YES
Borden Hillsborough (b)	391.6	3069.6	31.7	-12.9	34.2	112	544	(225)	NO
Mobil Mining - Big Four Mine (b)	391.8	3067.7	31.9	-14.8	35.2	115	561	589	YES
IMC Agrico/Conserve (b) - Nichols	398.4	3084.2	35.5	1.7	35.5	87	571	1,591	YES
Mobil Mining -Nichols (b)	398.1	3085.3	35.5	2.8	35.6	86	572	2,301	YES
Geologic Recovery	401.8	3085.8	38.9	4.3	39.0	85	641	98	NO
IMC Fertilizer - Pralde	402.9	3087.0	40.0	4.5	40.3	84	665	109	NO
IMC-Agrico Chem - Pierce (b)	404.1	3079.0	41.2	-3.5	41.3	95	687	(1 615)	PSD Only
TECO - Polk Power Station (b)	402.5	3067.4	39.6	-15.1	42.1	111	707	2 010	YES
Mobil Electrophosphate (b)	405.6	3079.4	42.7	-3.1	42.8	359	716	(1 411)	PSD Only
Duline(b)	404.8	3069.5	41.9	-13.0	43.9	107	737	-355	NO
Imperial Phosphate	404.8	3069.5	41.9	-13.0	43.9	107	737	275	NO
Imperial Phosphate (Brewer)(b)	404.8	3069.5	41.9	-13.0	43.9	107	737	275	NO
Mulberry Phosphates Bioyster) (b)	406.8	3085.1	43.9	2.6	44.0	87	770	2 013	YES
Tropicana Products	316.8	3040.9	-16.1	-41.6	44.6	201	752	137	NO
GF Industries Bartow Bonnie Mine Road(b)	408.4	3082.1	45.5	-0.1	45.5	90	770	1,982	YES
IMC Agrico Chem - S. Pierce (b)	407.5	3071.3	44.6	-11.2	46.0	104	780	3 811	YES
Cargill/Seminole Fertilizer Bartow (b)	409.8	3087.0	46.9	4.5	47.1	85	802	5 000	YES
Farmland Industries Green Bay (b)	410.1	3079.7	47.4	-2.8	47.5	93	810	5,116	YES
Seminole Electric Hardee Unit 3	405.0	3057.7	42.1	-23.8	48.9	121	837	952	YES
TPS Hardee Station [295 MW] (b)	404.8	3052.3	41.9	-25.2	48.9	121	838	2 112	YES
Estech/Swift (b)	411.5	3074.2	48.6	-8.3	49.3	100	846	(4 853)	PSD Only
Imperial/Pavex Corp - W Bartow	413.0	3086.2	50.1	3.7	50.2	86	865	75	NO
US Agri Chemicals Bartow (b)	413.2	3086.1	50.3	3.8	50.4	86	869	(1,579)	PSD Only
Lakeland City Power Larsen (b)	409.2	3102.8	46.3	20.3	50.5	66	871	5 024	YES
Mulberry Cogeneration (b)	413.6	3089.6	50.7	-1.9	50.7	92	875	164	NO
Lakeland City Power McIntosh (b)	409.5	3105.8	45.6	23.3	51.2	63	884	40 547	YES
IMC Agrico Chem - Noralyn Mine Road	414.7	3080.4	51.8	-2.2	51.8	92	897	505	NO
EPC - Polk (b)	414.3	3073.9	51.1	-8.6	52.1	99	902	859	NO
U S Agri Chemicals Ft. Meade (b)	416.0	3069.0	53.1	-13.5	54.8	46	956	3 438	YES
Central Florida Power	416.2	3069.2	53.3	-13.3	54.9	104	950	38	NO
Kaplan Industries	418.3	3079.3	55.4	-3.2	55.5	93	970	308	NO
Gardinier Fort Meade	415.3	3083.3	52.4	-19.2	55.8	110	976	1,173	YES
Orange Co	418.7	3083.6	55.8	1.1	55.8	89	976	20	NO
Ridge Cogeneration (b)	416.7	3100.1	53.8	17.9	56.7	72	994	480	NO
Borden Polk (b)	414.5	3109.0	51.6	26.5	58.0	63	1020	(168)	NO
Auburndale Cogen (b)	420.8	3103.3	57.9	20.8	61.5	70	1080	222	NO
Adams Packing Auburndale	421.1	3104.2	58.2	21.7	62.1	70	1102	93	NO
Coca Cola Auburndale	421.6	3104.7	58.7	21.2	62.4	70	1108	709	NO
Laidlaw Env. Services	424.7	3091.9	61.8	9.3	62.5	81	1110	240	NO
SFE Processing	421.7	3104.2	58.8	21.7	62.7	70	1114	168	NO
Massphalt Winter Haven	423.1	3101.5	60.2	19.0	63.1	72	1123	48	NO
Owens Brockway	423.4	3102.8	60.5	20.3	63.8	71	1136	120	NO
City of Wauchula	418.4	3047.0	55.5	-35.5	65.9	123	1178	180	NO
American Orange Corp	429.8	3047.3	66.9	-35.2	75.6	118	1372	198	NO
Florida Crushed Stone (b)	380.0	3102.5	-2.9	80.0	80.1	358	1461	3 532	PSD Only
Cargill Citro America	447.9	3068.3	85.0	-14.2	86.2	99	1584	223	NO
Citrus Hill	447.9	3068.3	85.0	-14.2	86.2	99	1584	411	NO
Alcoma Parking	451.6	3085.5	88.7	3.0	88.8	88	1635	327	NO
EPC - Intercession City (b)	446.3	3126.0	83.1	43.5	94.1	62	1741	17 667	PSD Only
FPL Avon Park	451.4	3050.5	88.5	-32.0	94.1	110	1742	67	NO

Note: All facilities with a total maximum allowable SO2 emissions of more than 20 TPY

(a) Screening emissions threshold is 20 x [Distance (km) to facility -7 km], based on North Carolina Screening Method
A significant impact distance of 7 km was assumed for including competing SO2 facilities into the inventory.

(b) Indicates PSD sources at this facility
Cargill- Riverview facility UTM coordinates (km): 362.9 3082.5
Screening area is 57 km from the proposed facility.

(c) Sources within 7 km of the Cargill Riverview site are modeled without regard to the screening criteria

Source: RBS, 1994, Golder Associates, 1998

Table 6-4. Cargill Property Boundary Receptors Used in the Modeling Analysis

Direction (deg)	Distance (m)	Direction (deg)	Distance (m)
10	965	190	362
20	805	200	390
30	675	210	796
40	597	220	971
50	550	230	1,296
60	525	240	1,512
70	517	250	1,494
80	524	260	1,019
90	550	270	1,064
100	596	280	1,151
110	414	290	1,296
120	338	300	1,421
130	294	310	1,623
140	285	320	1,962
150	293	330	2,000
160	311	340	1,843
170	343	350	1,759
180	347	360	1,245

Note: Distances are relative to the H_2SO_4 No. 9 stack location.
deg = degree.
m = meter.

Table 6-5. Chassahowitzka Wilderness Area Receptors Used in the Modeling Analysis

UTM Coordinates	
East (km)	North (km)
340.3	3,165.7
340.3	3,167.7
340.3	3,169.8
340.7	3,171.9
342.0	3,174.0
343.0	3,176.2
343.7	3,178.3
342.4	3,180.6
341.1	3,183.4
339.0	3,183.4
336.5	3,183.4
334.0	3,183.4
331.5	3,183.4

Table 6-6. Building Dimensions for Cargill Riverview Plant Structures Used in the Modeling Analysis

Structure	Height		Length		Width	
	(ft)	(m)	(ft)	(m)	(ft)	(m)
Phosphoric Acid Plant						
South Building	100	30.48	73	22.25	33	10.06
North Building	100	30.48	76	23.16	46	14.02
Dry Rock Processing Plant						
No 5/9 Mills Building	35	10.67	40	12.19	30	9.14
No. 7 Rock Mill Building	35	10.67	26	7.92	30	9.14
Ground Rock Silo	63	19.20	32	9.75	32	9.75
No. 5/9 Dust Collectors	84	25.60	9	2.74	9	2.74
Animal Feed Proc. Plant						
AFI Building	120	36.58	120	36.58	30	9.14
AFI Loadout Silos	100	30.48	298	90.83	37	11.28
Material Storage Area						
Building No. 6	74	22.56	812	247.50	122	37.19
Building No. 5	54.7	16.67	879	267.92	174	53.04
Building No. 4	54.7	16.67	799	243.54	105	32.00
Building No. 2 (Bottom)	62	18.90	919	280.11	102	31.09
Building No. 2 (Top)	70.1	21.37	402	122.53	126	38.40
GTSP Building	127	38.71	127	38.71	64	19.51
DAP 5 Building Tier A	86.5	26.37	100	30.48	46	14.02
DAP 5 Building Tier B	126.5	38.56	37	11.28	27	8.23
Map 3/4 Building	90	27.43	109	33.22	54	16.46
Docks						
West Building	30	9.14	126	38.40	100	30.48
East Building Tier A	30	9.14	130	39.62	80	24.38
East Building Tier B	50	15.24	60	18.29	50	15.24
Sulfuric Acid Plant						
Auxiliary Boiler Building	18	5.49	46	14.02	45	13.72

Table 6-7. Maximum Predicted SO_2 Concentrations for the Proposed Project Only - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)
Annual	0.4	90	1500	87123124
	0.3	60	1100	88123124
	0.4	10	1500	89123124
	0.4	100	1500	90123124
	0.4	90	1500	91123124
HIGH 24-Hour	5.0	240	2500	87100424
	4.6	10	1500	88082124
	6.0	200	1500	89091824
	6.5	90	1100	90062024
	5.8	100	1500	91060224
HSH 24-Hour	4.3	100	1500	87090824
	4.3	10	965	88071324
	4.6	10	1100	89040924
	4.5	90	1100	90053024
	5.4	90	1100	91080424
HIGH 3-Hour	42.6	100	1100	87091915
	44.9	220	971	88070415
	46.8	50	800	89072812
	44.9	110	1100	90072512
	48.4	50	800	91051612
HSH 3-Hour	39.9	20	805	87081615
	37.8	200	1100	88072912
	41.8	50	800	89061215
	41.4	110	1100	90091515
	44.3	70	800	91072815

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported with respect the H_2SO_4 #9 stack location.

Table 6-8. Maximum Predicted SO_2 Concentrations for the AAQS Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Distance (m)	Period Ending (YYMMDDHH)
Annual	61.0	360	5000	87123124
	47.7	220	1100	88123124
	53.8	220	971	89123124
	56.6	260	1019	90123124
	53.9	360	5000	91123124
HSH 24-Hour	245.6	340	7000	87081624
	254.9	360	5000	88041424
	295.4	160	800	89050224
	245.7	300	7000	90091824
	300.2	360	5000	91060224
HSH 3-Hour	1007.1	340	7000	87081615
	915.9	10	965	88102412
	1417.5	330	7000	89062212
	1115.5	320	6000	90072612
	1169.5	350	6000	91072815

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported with respect the H_2SO_4 #9 stack location.

Table 6-9. Summary of Project Contributions to Modeled AAQS Exceedances

Averaging Time	Modeled Year	Maximum Contribution By the Proposed Project (ug/m3)	EPA Significant Impact Level (ug/m3)
24-Hour	1987	2.18	5
	1988	3.88	
	1989	4.91	
	1990	0.08	
	1991	0.49	
3-Hour	1987	No Exceedance	25
	1988	No Exceedance	
	1989	3.21	
	1990	No Exceedance	
	1991	No Exceedance	

Table 6-10. Maximum Predicted SO_2 PSD Class II Increment Consumption - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)
Annual	0.0	0	0	87123124
	0.0	0	0	88123124
	0.0	0	0	89123124
	0.0	0	0	90123124
	0.5	340	6000	91123124
HSH 24-Hour	56	260	1019	87112424
	49	340	5000	88100624
	82	350	5000	89101924
	55	340	6000	90122824
	77	340	6000	91010624
HSH 3-Hour	190	140	285	87121106
	185	340	5000	88070209
	195	350	5000	89022212
	214	270	1064	90121603
	195	340	6000	91020321

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported with respect the H_2SO_4 #9 stack location.

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Table 6-11. Maximum Predicted SO_2 PSD Class II Concentrations - Refined Analysis

Averaging Time	Modeled Year	Maximum Predicted PSD Class II Increment (ug/m^3)	Receptor Location		Allowable PSD Class II Increment (ug/m^3)
			Direction (degree)	Distance (m)	
Annual	1991	0.5	340	6000	20
24-Hour	1989	99.2	349	5500	91
3-Hour	1990	214	270	1064	512

Table 6-12. Maximum Predicted 24-Hour SO_2 Concentrations for the Proposed Project Only at the Area of Modeled PSD Class II Exceedances

Averaging	Concentration	Receptor Location[a] UTM-E	UTM-N	Period Ending (YYMMDDHH)	EPA Significance Levels ($\mu g/m^3$)
HIGH 24-Hour	2.43	348	4500	87030124	5
	2.51	355	5200	88090724	
	2.23	336	4500	89120824	
	2.44	343	4500	90022224	
	1.75	344	4500	91073124	

Note: YY=Year, MM=Month, DD=Day, HH=Hour

[a] All receptor coordinates are reported in Universal Transverse Mercator (UTM) Coordinates.

Table 6-13. Maximum Predicted SO_2 Concentrations for the Proposed Modification Only at the Chassahowitzka Wilderness Area

Averaging	Concentration	Receptor Location[a] UTM-E	UTM-N	Period Ending (YYMMDDHH)	EPA Significance Levels ($\mu g/m^3$)
Annual	0.006	342000	3174000	87123124	0.03
	0.009	340300	3165700	88123124	
	0.016	342000	3174000	89123124	
	0.008	340300	3169800	90123124	
	0.007	343000	3176200	91123124	
HIGH 24-Hour	0.14	340300	3165700	87020224	0.07
	0.23	340300	3165700	88072524	
	0.21	343700	3178300	89030624	
	0.28	343700	3178300	90021924	
	0.20	340300	3165700	91012024	
HIGH 3-Hour	1.69	343700	3178300	87080124	0.48
	1.85	340300	3165700	88072503	
	2.28	342000	3174000	89100203	
	2.33	343000	3176200	90021906	
	1.74	343700	3178300	91072509	

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported in Universal Transverse Mercator (UTM) Coordinates.

Table 6-14. Maximum Predicted SO_2 PSD Class I Increment Consumption at the Chassahowitzka Wilderness Area

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] UTM-E (m)	Receptor Location[a] UTM-N (m)	Period Ending (YYMMDDHH)
Annual	0.05	340700	3171900	87123124
	0.00	0	0	88123124
	0.00	0	0	89123124
	0.03	340300	3165700	90123124
	0.15	340700	3171900	91123124
HSH 24-Hour	5.3	340300	3165700	87120724
	6.2	342400	3180600	88022324
	4.1	343700	3178300	89051924
	5.9	340300	3169800	90121424
	6.5	340300	3167700	91052524
HSH 3-Hour	24.8	341100	3183400	87062906
	26.9	343000	3176200	88071103
	24.2	343700	3178300	89111506
	26.0	340700	3171900	90121603
	22.6	342400	3180600	91041803

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are Universal Transverse Mercator (UTM) Coordinates.

Table 6-15. Summary of Project Contributions to Modeled PSD Class I Exceedances

Averaging Time	Modeled Year	Maximum Contribution By the Proposed Project (ug/m3)	NPS Recommended Significant Impact Level (ug/m3)
24-Hour	1987	0.016	0.07
	1988	0.001	
	1989	0.013	
	1990	0.001	
	1991	0.001	
3-Hour	1987	0.003	0.48
	1988	0	
	1989	0	
	1990	0	
	1991	0	

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 INTRODUCTION

Cargill is proposing to modify its existing facility in Riverview, Florida. The facility is subject to the PSD new source review requirements for SO_2, H_2SO_4 mist, and NOx. The additional impact analysis and the Class I area analysis addresses these pollutant.

The analysis addresses the potential impacts on vegetation, soils, and wildlife of the surrounding area and the nearest Class I area due to Cargill's proposed modification. The nearest Class I area is the Chassahowitzka National Wilderness Area (NWA), located approximately 86 kilometers (km) north-northwest of the Cargill Riverview plant. In addition, potential impacts upon visibility resulting from the proposal modification are assessed.

The analysis will demonstrate that the increase in impacts due to the proposed increase in emissions is extremely low. Regardless of the existing conditions in the vicinity of the site or in the Class I areas, the proposed project will not cause any significant adverse effects due to the predicted low impacts upon these areas.

7.2 IMPACTS UPON VEGETATION

Cut-over pine flatwoods and mixed forest comprise the natural vegetation in the vicinity of the Cargill site. Mangrove trees and salt-tolerant plants are found near the coast. Winter vegetables and pasture grasses are cultivated inland from the facility.

Air pollutants occurring at elevated levels have long been known to potentially cause injury to plants. For SO_2, acute injury usually develops within a few hours or days of exposure. Symptoms include marginal, flecked, and/or intercostal necrotic areas which appear water-soaked and dullish green initially. This injury generally occurs to younger leaves. Chronic injury usually is evident by signs of chlorosis, bronzing, premature senescence, reduced growth and possible tissue necrosis (EPA, 1982). Background levels of sulfur dioxide range from 2.5 to 25 $\mu g/m^3$. Phytotoxic symptoms demonstrated by plants can occur as low as 88 $\mu g/m^3$ (U.S. Department of Health, Education, and Welfare, 1971). However, this occurs with the more primitive plants (i.e., mosses, ferns, lichens).

Many studies have been conducted to determine the effects of high concentration, short-term SO_2 exposure on agronomic and natural community plants. Sensitive plants include ragweed, legumes, blackberry, southern pine, red and black oak, white ash, and sumac. These species can be injured by exposure to 3-hour SO_2 concentrations ranging from 790 to 1,570 $\mu g/m^3$. Intermediate sensitivity plants include maples, locust, sweetgum, cherry, elm, and many crop and garden species. These species can be injured by exposure to 3-hour SO_2 concentrations ranging from 1,570 to 2,100 $\mu g/m^3$. Resistant species (potentially injured at concentrations above 2,100 $\mu g/m^3$ for 3 hours) include white oak, potato, cotton, dogwood, and peach (EPA, 1982). A study of native Floridian species (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak, and mangrove exposed to 1,300 $\mu g/m^3$ SO_2 for 8 hours were not visibly damaged. This supports the levels cited by other researchers on the effects of SO_2 on vegetation. It is important to note that because plants possess metabolisms that can convert SO_2 into cellular constituents, they are capable of recovery when exposed to elevated levels of SO_2 for short periods of time.

The maximum predicted 3-hour SO_2 concentration due to all sources, 1465 $\mu g/m^3$, may slightly damage some sensitive species. However, it is important to realize that this maximum concentration represents an assumed worst-case scenario, since the impact is based on a combination of worst-case meteorology and all facilities modeled at their maximum allowable emissions. Plants would be exposed to this concentration for a minimal amount of time, if at all. Based on the SO_2 monitors in the area, the maximum measured HSH 3-hour concentration during 1996 and the first half of 1997 is 422 $\mu g/m^3$, or only about 29 percent of the maximum modeled 3-hour concentration. This demonstrates the conservatism of the modeling.

The maximum annual and 24-hour SO_2 concentrations predicted within 7 km of the Cargill facility (61 and 407 $\mu g/m^3$, respectively) represent levels that are lower than those known to cause damage to the majority of test species. Radish and barley are considered good indicators of SO_2 pollution because of their inherent sensitivities to this gas. When these two plants were exposed to 370 and 310 $\mu g/m^3$ SO_2 for 8 hours, respectively, visible damage occurred (EPA, 1982). By comparison of these levels, it is apparent that the 24-hour total maximum predicted SO_2 concentration is within a range that could potentially damage SO_2-sensitive plants. Again, it is important to realize that this modeled concentration represents a worst-case scenario. Although the concentrations of SO_2 appear to be within a hazardous range for SO_2-sensitive species in the 6- to 7-km area around the

facility, concentrations modeled represent worst-case scenarios which, in reality, are not likely to occur. Actual measured SO_2 concentrations in the area have been 14 $\mu g/m^3$, HSH 24-hour, and 4 $\mu g/m^3$, annual average. These actual levels pose minimal threats to area vegetation.

The increase in SO_2 levels due to the modification only, presented in Table 6-7, are low (0.4 $\mu g/m^3$, annual average and 6.7 $\mu g/m^3$, 24-hr average) and well below any threshold affect level.

7.3 IMPACTS UPON SOILS

Soils in the vicinity of the Cargill site consist primarily of tidal lands and poorly drained sands with organic pans. These tidal lands occur along the coast between the tidal swamps and the flatwoods. The tidal lands consist of mucky fine sand to dark-gray fine sand overlying gray fine sand, mixed with broken and whole shells. These soils will not be affected by SO_2 concentrations resulting from facility emissions, because both the underlying substrate and the sea spray from the nearby Hillsborough bay are neutral to alkaline and would neutralize any acidifying effects of SO_2 deposition.

The poorly drained sands are already strongly acidic. Normal liming practices currently used on soils in the vicinity of Cargill by agricultural interests will effectively mitigate the small effects of any increased SO_2 deposition resulting from the increased SO_2 emissions from the proposed expansion.

7.4 IMPACTS UPON VISIBILITY

General

A regional haze analysis was conducted to determine if the proposed Cargill modification would cause a perceptible degradation in visibility at the Chassahowitzka NWR. The CNWR is located approximately 86 kilometers (km) north-northwest of the Cargill plant. Visibility is an Air Quality Related Value at the CNWR. The visibility of an area is generally characterized by either its visual range, V_r (i.e., the greatest distance that a dark object can be seen) or its extinction coefficient, b_{ext} (i.e., the attenuation of light over a distance due to particle scattering and/or gaseous absorption). The visual range and extinction coefficient are related to one another by the following equation[a]:

$$b_{ext} = 3.912 / V_r \ (km^{-1}) \qquad (1)$$

The National Park Service (NPS) in coordination with the Fish and Wildlife Service (FWS) uses the Deciview index (NPS, 1992), d_v, to describe an area's change in extinction coefficient. The deciview is defined as:

$$d_v = 10 \ln (b_{ext}/0.01) \quad (2)$$

where ln represents the natural logarithm of the quantity in parentheses. A change in an area's deciview (NPS, 1995, 1997), Δd_v, of 0.5 corresponds to an approximate 5 percent changed in extinction, which is considered as a noticeable change in regional haze. The deciview change is defined by:

$$\Delta d_v = 10 \ln (1 + b_{exts}/b_{extb}) \quad (3)$$

where b_{exts} and b_{extb} represent the extinction coefficients due to the source (i.e., the proposed expansion) and for the CNWR background visual range, respectively. Based on recent communications with the NPS, the background visual range for the CNWR is 65 km based on air monitoring data (USFWS, 1995).

Calculation of Source Extinction

The source extinction due to the proposed plant expansion is calculated according to interim recommendations that are provided in the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase I Report, Appendix B. The report states that the primary sources of regional visibility degradation are mostly fine particles with diameters ≤ 2.5 μm, ammonium bi-sulfate $[(NH_4)_2SO_4]$ and ammonium nitrate (NH_4NO_3). The procedures for determining the ambient concentration levels of these compounds due to the proposed project are:

1. Obtain the maximum hourly sulfur dioxide (SO_2), nitrogen oxides (NO_x) and sulfuric acid (H_2SO_4) mist, as PM_{10}, impacts due to the proposed expansion from the MESOPUFF II air quality dispersion model with chemical transformation processes. Based on verbal communications with Bud Rolofson of the NPS, the NPS had changed it's policy of using the hourly maximum impacts to using the highest 24-hour impacts for these pollutants. The maximum 24-hour impacts are based on the highest predicted concentrations from the MESOPUFF II model for 1986. It should be noted that meteorological data for 1986 were used in the MESOPUFF II model since the necessary data were not readily available for 1987 to 1991, the years for which

pollutant concentrations were predicted for the project. The maximum 24-hour impacts at the CNWR due to the proposed project only are 0.0703, 0.0071, and 0.0088 $\mu g/m^3$ for SO_2, NO_x, and H_2SO_4 mist (as PM10), respectively.

2. Calculate maximum concentrations of ammonium sulfate and ammonium nitrate from multiplicative factors 1.375 and 1.29, respectively, from IWAQM, Appendix B.
3. Obtain hourly values of relative humidity (RH). The maximum predicted 24-hour impacts from the MESOPUFF II model occurred on 2/6/86. The Tampa National Weather Service hourly surface observations for this day were obtained.
4. Calculate the extinction coefficients of ammonium sulfate, ammonium nitrate, and primary fine particulate. The extinction coefficients for each compound are defined by:

$$b_{exts} = 0.003 \text{ (comp) } f(RH)$$

where (comp) represents the ambient concentration of the compound in question, and f(RH) is the relative humidity factor. Based on hourly relative humidity factors for 2/6/86, an average daily RH factor of 5.9 was computed. For H_2SO_4 mist (as fine particulate matter), an RH factor of unity was used per IWAQM recommendations. The total source extinction coefficient value is equal to the sum of the calculated extinction coefficients for each compound.

A summary of the calculations is provided in Table 7-1. The total source extinction coefficient due to the proposed project was determined to be 0.0022. From equation (3), above, the total deciview change due to the proposed project is 0.3261.

Based on this analysis, the proposed project will result in less that a 5 percent decrease in visibility to the clearest days observed at the CNWR. Therefore, no adverse impacts upon regional haze is expected to occur due to the proposed Cargill project.

The existing No. 7 H_2SO_4 plant must currently meet an opacity limitation of 10 percent. This opacity limit is expected to be met after the plant is expanded to greater capacity. This opacity

level produces essentially no visible emissions and, therefore, no increase in the visible plume from the No. 7 H_2SO_4 plant's expansion is expected.

7.5 ADDITIONAL GROWTH

Total H_2SO_4 production capacity for the Cargill plant will increase by 1,000 tons per day, representing a 13 percent increase in total capacity for this plant. No increase in jobs, payroll, and taxes in the area is expected as a result of these changes. Therefore, no significant growth-related impacts are expected due to the proposed expansion.

Table 7-1. Estimated Change in Deciview Due to the Cargill Riverview Project No. 7 Sulfuric Acid Plant Expansion

Pollutant	Value	Reference
Maximum Emission Rates (lb/hr)		
SO_2	19.80	
NOx	5.60	
PM_{10} (H_2SO_4 mist)	5.80	
Highest Predicted 24-Hour Concentrations (µg/m³)		
SO_2	0.0703	
NO_X	0.0071	
PM10	0.0088	(1)
SO_4	0.0872	(2)
NO_3	0.0031	(2)
$(NH_4)_2$ SO_4	0.1199	(3)
NH_4 NO_3	0.0040	(4)
Average RH (percent)	86	(5)
RH factor, f(RH)	5.9	(6)
Extinction Coefficients (km^{-1})		
Background: (bextb)	0.0602	(7)
Source: (bexts)		
$(NH_4)_2$ SO_4	0.00212	(8)
NH_4 NO_3	0.00007	(8)
PM_{10}	0.000026	(9)
Total (bexts)	0.002219	
Deciview Change		
total delta dv =	0.3621	(10)

(1) Highest predicted PM10 concentration (as SO4) in Mesopuff II model without chemistry for 1 year meteorological record from Tampa for 1986
(2) Highest predicted concentration from SO2 and NOx emissions from Mesopuff II model with chemistry for 1 year meteorological record from Tampa for 1986
(3) $(NH_4)_2$ SO_4 = SO_4 times 1.375 from IWAQM Appendix B
(4) NH_4 NO_3 = NO_3 times 1.29 from IWAQM Appendix B
(5) Based on meteorological data collected at the National Weather Service station in Tampa for February 6, 1986 (worst day).
(6) From IWAQM Figure B-1. Based on average of hourly computed RH factors
(7) bextb = 3.912 / 65 where background visual range is 65 km.
(8) values= 0.003 * compound concentration* f(RH) from IWAQM Appendix B
(9) PM10 = 0.003 * compound concentration. f(RH) set = 1 for fine PM
(10) Delta DV = 10 * ln (1 + bexts/bextb)

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APPENDIX A

MOLTEN SULFUR HANDLING SYSTEM EMISSION ESTIMATES

Parameters	Units	Tank No. 2					Tank No. 3					Pit 7		Pit 8		Pit 9		Truck Loading Station
		Loading 18,000 ton tank from Ship	Unloading 18,000 ton tank into Pit	Idle 18,000 ton tank	Total Emissions 18,000 ton tank (tons/yr)	Max Emissions 18,000 ton tank (lb/hr)	Loading 18,000 ton tank from Ship	Unloading 18,000 ton tank into Pit	Idle 18,000 ton tank	Total Emissions 18,000 ton tank (tons/yr)	Max Emissions 18,000 ton tank (lb/hr)	to Plant 7 Loading	to Plant 7 Unloading / Idle	to Plant 8 Loading	to Plant 8 Unloading / Idle	to Plant 9 Loading	to Plant 9 Unloading / Idle	Loading
SULFUR FLOW RATES																		
Maximum loading rate	tonnes/hr	1300	300	0			1300	300	0			300	0	300	0	300	0	200
Annual loading rate	tonnes/yr	496 686	496 686	---			496 686	496 686	---			357,189	---	279 033	---	357,189	---	346 629
VENTILATION RATES																		
Loading/Unloading	dscfm	429	0	---			429	0	---			95	---	95	---	95	---	62
Natural Ventilation through vents	dscfm	30	30	30			30	30	30			5	5	5	5	5	5	5
Total Ventilation	dscfm	459	30	30			459	30	30			100	5	100	5	100	5	67
TRANSFER TIMES																		
Loading/Unloading time	hr/yr	382	1 656	---			382	1 656	---			1,191	---	930	---	1,191	---	1 733
Idle time	hr/yr	---	---	6,722			---	---	6,722			---	7,569	---	7,830	---	7,569	---
Operating time	hr/yr	---	---	---			---	---	---			---	---	---	---	---	---	---
EMISSION FACTORS																		
Sulfur particulate	grains/dscf	0 56	0 29	0 29			0 56	0 29	0 29			0 51	0 29	0 51	0 29	0 51	0 29	0 51
TRS (as H2S)	lb/cf	3 5E-05	3 5E-05	3 5E-05			3 5E-05	3 5E-05	3 5E-05			3 5E-06	3 5E-06	3 5E-06	3 5E-06	3 5E-06	3 5E-06	3 5E-06
SO2	lb/cf	7 3E-05	7 3E-05	7 3E-05			7 3E-05	7 3E-05	7 3E-05			7 3E-06	7 3E-06	7 3E-06	7 3E-06	7E-06	7 3E-06	7 3E-06
VOC	lb/cf	5 2E-05	5 2E-05	5 2E-05			5 2E-05	5 2E 05	5 2E-05			5 2E-06	5 2E-06	5 2E-06	5 2E-06	5 2E-06	5 2E-06	5 2E-06
EMISSIONS					Total Emissions 18,000 ton tank (tons/yr)	Max Emissions 18,000 ton tank (lb/hr)				Total Emissions 18,000 ton tank (tons/yr)	Max Emissions 18,000 ton tank (lb/hr)							
Sulfur particulate emissions from																		
	lb/hr	2,597	0 075	0 075	---	2 67	2 597	0 075	0 075	---	2 67	0 437	0 012	0 437	0 012	0 437	0 012	0 293
	TPY	0 496	0 062	0 251	0 808	---	0 496	0 062	0 251	0 808	---	0 260	0 047	0 203	0 049	0 260	0 047	0 254
TRS (as H2S) emissions from																		
	lb/hr	0 964	0 063	0 063	---	1 03	0 964	0 063	0 063	---	1 03	0 021	0 0011	0 021	0 0011	0 021	0 0011	0 014
	TPY	0 184	0 052	0 212	0 448	---	0 184	0 052	0 212	0 448	---	0 013	0 0040	0 010	0 0041	0 013	0 0040	0 012
SO2 emissions from																		
	lb/hr	2 010	0 131	0 131	---	2 14	2 010	0 131	0 131	---	2 14	0 044	0 0022	0 044	0 0022	0 044	0 0022	0 029
	TPY	0 384	0 109	0 442	0 934	---	0 384	0 109	0 442	0 934	---	0 026	0 0083	0 020	0 0086	0 026	0 0083	0 025
VOC emissions from																		
	lb/hr	1 432	0 094	0 094	---	1 53	1 432	0 094	0 094	---	1 53	0 031	0 0016	0 031	0 0016	0 031	0 0016	0 021
	TPY	0 274	0 077	0 315	0 666	---	0 274	0 077	0 315	0 666	---	0 019	0 0059	0 015	0 0061	0 019	0 0059	0 018

Process Rates

Total Sulfur Throughput = 1,340,000 tonnes/yr = 1 478 020 tons/yr
Total Sulfur to SAP 7, 8 and 9 = 1,094,000 tons/yr (Based on 8 900 tons/day H2SO4 production) = 993 371 tonnes/yr
Total Sulfur to SAP 7 = 393 350 tons/yr = 357,189 tonnes/yr
Total Sulfur to SAP 8 = 307 300 tons/yr = 279 033 tonnes/yr
Total Sulfur to SAP 9 =393,350 tons/yr = 357,189 tonnes/yr
Total Sulfur to Truck Loading Station = 384,020 tons/yr = 346 629 tonnes/yr

Density of Sulfur (280 F) = 112 lb / cf

Total Emissions from Molten Sulfur Handling	Total Emissions (tons/yr)	Max Emissions (lb/hr)
Sulfur particulate emissions	2.74	6.95
TRS (as H2S) emissions	0.96	2.13
SO2 emissions	1.99	4.44
VOC emissions	1.42	3.17

APPENDIX B

STATEWIDE SO_2 AMBIENT MONITORING DATA - 1996

	1960	082	H01	JACKSONVILLE/ 1611 S UNIVERSITY BLVD N JACKSO	JAN-OCT	54	6777	0.1	6	5	4		
	1960	083	H01	JACKSONVILLE/ R E LEE HS, 1200 S MCDUFF, JACK	JAN-DEC	54	8471	0.0	6	5	3		
	1960	084	H01	JACKSONVILLE/ ROSELLE & COPELAND ADJ TO I-10	JAN-DEC	54	8299	0.0	9	7	5		
	1960	095	H01	JACKSONVILLE/ BAY & MAIN STREETS	JAN-DEC	54	8530	0.0	6	6	3		
HILLS	4360	035	G02	TAMPA/ COAST GUARD STA DAVIS IS, TAMPA, HILLS	JAN-DEC	54	8695	0.1	3	3	2		
	4360	045	G01	TAMPA/ TAMPA STADIUM, BUFFALO & DALE MABRY, H	JAN-DEC	54	8669	0.1	8	6	4		
	4360	063	G01	TAMPA/ 200 MADISON AVE. HILLSBOROUGH CO.	JAN-DEC	54	8725	0.2	4	3	3		
	4360	068	G01	TAMPA - NORTHDALE/ 4013 RAGG ROAD, GAITHER HI	JAN-DEC	54	8672	0.1	5	4	3		
	4360	070	G01	TAMPA/ 4702 CENTRAL AVENUE (SEMINOLE ADULT SC	JAN-DEC	54	8710	0.1	7	7	6		
ORANG	3280	005	G01	ORLANDO/ ORANGE & CENTRAL AVE, ORANGE CO.	JAN-DEC	54	8578	0.0	23	12	7		
	4900	002	G01	WINTER PARK/ LAKE ISLE ESTATES, WINTER PARK,	JAN-DEC	54	8463	0.0	4	4	2		
PALM	4760	004	G01	WEST PALM BEACH/ 3730 BELVEDERE RD. ACROSS FR	JAN-DEC	88	8156	0.1	4	4	3		
	4760	005	G01	WEST PALM BEACH/ 4356 OKEECHOBEE BLVD. (CROSS	JAN-DEC	54	7719	0.0	6	5	4		
PINEL	0620	006	G01	CLEARWATER/ 3490 MCMULLEN BOOTH RD. (PINELLAS	JAN-DEC	54	8264	0.0	4	4	2		
	0620	006	G01	CLEARWATER/ 3490 MCMULLEN BOOTH RD. (PINELLAS	AUG-AUG	51	291	0.0	2	2	1		
	2260	002	G01	LARGO/ PINELLAS CO SHERIFFS DEPT 250 ULMERTON	JAN-DEC	54	8589	0.0	3	3	2		
	3600	008	G01	CLEARWATER/ 13280 34TH STREET N., PINELLAS CO	MAY-DEC	54	5356	0.0	4	4	3		
	3600	008	G01	CLEARWATER/ 13280 34TH STREET N., PINELLAS CO	JAN-MAY	51	3047	0.0	4	4	2		
	3980	018	G01	ST PETERSBURG/ AZALEA PARK, 7200 22ND AV N, S	JAN-MAY	51	2787	0.0	4	4	2		
	3980	018	G01	ST PETERSBURG/ AZALEA PARK, 7200 22ND AV N, S	MAY-DEC	54	5736	0.0	3	3	2		
	3980	024	G01	ST PETERSBURG/ 2301 66TH ST N, ACROSS FROM TY	JAN-DEC	51	8496	0.0	5	4	3		
SARAS	4080	002	G01	SARASOTA/ 3636 S. SHADE AVE. (SHADE & BEE RID	JAN-OCT	54	6401	0.0	8	5	3		
	4080	004	G01	SARASOTA/ 2000 MAIN STREET ,SARASOTA CO.	JAN-DEC	54	8637	0.0	9	8	6		
	4100	014	G01	VENICE/ 1683 U. S. 41 BYPASS SOUTH	JAN-DEC	54	8736	0.1	5	5	3		

* THE AIR QUALITY STANDARDS FOR CARBON MONOXIDE ARE 35 PPM , MAX 1-HOUR CONCENTRATION NOT TO BE EXCEEDED MORE TH PER YEAR, AND 9 PPM , MAXIMUM 8-HOUR CONCENTRATION NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR.

DATE: 97/04/09

COMPARISON OF AIR QUALITY DATA WITH
THE NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT: SULFUR DIOXIDE STATE: 10 FLORIDA YEAR: 1996

								MAXIMA (ug/m3)							
					SMPLNG		NUM	1-HOUR		3-HOUR		24-HOUR		ARTH	GSD
CNTY	AREA	SITE		LOCATION	PERIOD	METH	OBS	1ST	2ND	1ST	2ND	1ST	2ND	MEAN	
BRWRD	1260	010	G02	FT. LAUDERDALE/ N.W. CORNER OF LINC	JAN-DEC	60	8731	147	144	102	86	30	22	6	1.79
DADE	0860	019	G02	MIAMI/ DOT2US 27 & SR 821 #34, DADE	JAN-DEC	60	8610	45	37	30	27	16	14	4	1.65
DUVAL	1960	032	H02	JACKSONVILLE/ KOOKER PARK 2900 BENN	JAN-DEC	60	8367	207	173	179	143	58	50	6	2.08
	1960	080	H02	JACKSONVILLE/ 1605 MINERVA ST JACKS	JAN-DEC	60	8422	307	286	292	254	110	71	5	1.94
	1960	081	H02	JACKSONVILLE/ CEDAR BAY STP, 1840 C	JAN-DEC	60	8204	246	207	169	149	36	36	6	2.01
	1960	097	H02	JACKSONVILLE/ 6241 FORT CAROLINE RO	JAN-DEC	60	8488	215	191	146	124	59	41	6	2.02
ESCAM	3540	004	F01	PENSACOLA/ ELLYSON INDUSTRIAL PARK	JAN-DEC	60	8516	341	325	240	193	48	41	7	2.26
	3540	022	F02	PENSACOLA/ 11000 UNIVERSITY PARKWAY	JAN-DEC	60	8583	851	320	430	242	107	92	12	2.36

HAMIL	1660	015	F02	WHITE SPRINGS/ COUNTY RD 137 AT ENT	JAN-DEC	60	8689	312	144	174	114	58	52	7	2.19
HERNA	1740	006	G02	BROOKSVILLE/ 17045 FT. DADE AVE. (L	JAN-DEC	60	8511	479	155	283	117	31	27	5	1.90
HILLS	1800	021	G02	/ TECO =2 BB CO BARN ON BIG BEND RD	JAN-DEC	60	8681	846	582	495	360	77	77	10	2.49
	1800	081	G03	HILLSBOROUGH BAY/ SIMONS PARK, #113	JAN-DEC	60	8706	461	343	267	212	82	62	10	2.62
	1800	095	G02	TAMPA/ 5012 CAUSEWAY BLVD TAMPA(GAN	JAN-DEC	60	8653	770	723	455	422	91	76	14	2.65
	1800	106	J02	NORTH RUSKIN/ BIG BEND RD. 1.5 MI E	JAN-DEC	20	6289	443	354	247	178	72	43	9	2.41
	1800	107	J02	NORTH RUSKIN/ BULLFROG CREEK COUNTY	JAN-DEC	20	6223	765	432	517	263	80	64	9	2.43
	1800	108	G02	GIBSONTON/ GIANTS CAMP, U.S. HWY. 4	JAN-JUN	60	4064	516	514	496	472	386	275	25	3.66
	1800	109	G02	SOUTH OF TAMPA/ 9851 HIGHWAY 41 SOU	JUL-DEC	60	4368	417	409	402	286	101	99	12	2.55
	4360	035	G02	TAMPA/ COAST GUARD STA DAVIS IS, TA	JAN-DEC	60	8663	448	440	383	261	91	84	18	2.94
	4360	053	G02	TAMPA/ BALLAST PT PARK, INTERBAY BL	JAN-DEC	60	8721	396	325	248	190	72	56	13	2.88
	4360	068	G01	TAMPA - NORTHDALE/ 4013 RAGG ROAD,	JAN-DEC	60	8657	351	346	258	236	53	51	9	2.34
MANAT	3440	002	G02	PALMETTO/ PORT MANATEE, REEDER RD.	JAN-DEC	60	8707	304	280	264	162	63	62	11	2.33
MARTN	1930	001	J02	INDIANTOWN/ EAST OF PLANT CONTAINME	APR-DEC	20	6385	84	55	51	31	15	12	4	1.54
	1930	003	J02	INDIANTOWN/ SR 710 AT CALKINS INDIA	APR-DEC	20	6321	81	81	60	53	18	15	4	1.58
NASSA	1200	005	F02	FERNANDINA BEACH/ WWTP, 5TH ST N OF	JAN-DEC	60	8645	328	296	282	257	104	91	15	2.35
	1200	009	F02	FERNANDINA BEACH/ FERNANDINA BEACH	JAN-DEC	60	8668	238	183	186	119	53	51	8	2.19
ORANG	4900	002	G01	WINTER PARK/ LAKE ISLE ESTATES, WIN	JAN-DEC	60	8650	170	126	126	75	31	30	4	1.76
PALM	3840	004	G02	RIVIERA BEACH/ 1050 15TH ST. WEST	JAN-DEC	92	8273	322	272	202	183	46	43	5	1.82
	4150	001	J02	SOUTH BAY/ 300 NORTH U.S. HWY. 27,	JAN-JUN	20	4198	45	34	36	31	16	14	9	1.28
PINEL	3620	002	G05	PINELLAS PARK/ 11500 43RD AVE N PIN	JAN-DEC	39	8428	354	328	287	224	66	58	8	2.39
	3980	023	G02	ST PETERSBURG/ DERBY LANE 10100 SAN	JAN-DEC	39	8341	553	448	409	325	124	104	16	3.27
	4380	001	G02	TARPON SPRINGS/ 303A ANCLOTE RD, TA	JAN-OCT	39	6801	631	176	403	103	47	25	4	1.76
	4380	002	G03	TARPON SPRINGS/ BROOKER CREEK PK TA	JAN-JUN	39	4142	307	275	235	108	41	37	7	2.27
	4380	002	G03	TARPON SPRINGS/ BROOKER CREEK PK TA	JUN-DEC	60	4424	196	191	155	139	40	31	6	2.09
POLK	2860	006	F02	MULBERRY/ MULBERRY HIGH SCHOOL, NE	FEB-DEC	60	7272	204	165	150	124	57	43	11	2.70
	3680	010	F02	/ ANDERSON & PINE-CREST RD, NICHOLS	JAN-DEC	60	8610	1258	354	432	257	86	80	15	2.33
PUTNM	3780	007	J02	PALATKA/ WEST RIVER RD AND SR17 (PU	JAN-DEC	20	8766	377	335	266	244	47	42	4	1.74
	3780	008	F02	PALATKA/ 100 FT W. OF INTERSEC OF C	JAN-DEC	60	8413	314	312	262	217	57	57	8	2.30
SARAS	4080	002	G01	SARASOTA/ 3636 S. SHADE AVE. (SHADE	FEB-DEC	60	7804	280	217	196	161	61	51	5	1.81
	4080	005	G01	SARASOTA/ 450 MCKINLEY DRIVE	FEB-DEC	60	7818	196	183	151	139	81	48	5	1.84

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* THE AIR QUALITY STANDARDS FOR SO2 ARE AN ANNUAL ARITHMETIC AVERAGE OF 60 UG/M3, A MAXIMUM 24-HOUR CONCENTRATION 260 UG/M3 NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR, AND A MAXIMUM 3-HOUR CONCENTRATION OF 1300 UG/M3 NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR.

DATE: 97/04/09

COMPARISON OF AIR QUALITY DATA WITH
THE NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT: NITROGEN DIOXIDE

STATE: 10 FLORIDA

YEAR: 1996

CNTY	AREA	SITE	LOCATION	SAMPLING PERIOD	METHOD	NUM OBS	MAXIMA (ug/m3) 1-HOUR 1ST	1-HOUR 2ND	24-HOUR 1ST	24-HOUR 2ND	ARIT MEA

4 5/32 7

042897 151555

APPENDIX C

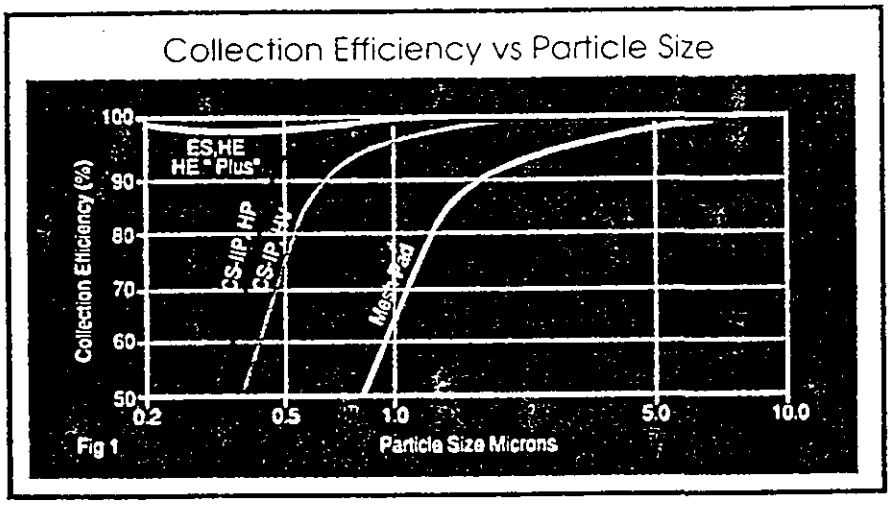
MONSANTO MIST ELIMINATOR VENDOR INFORMATION

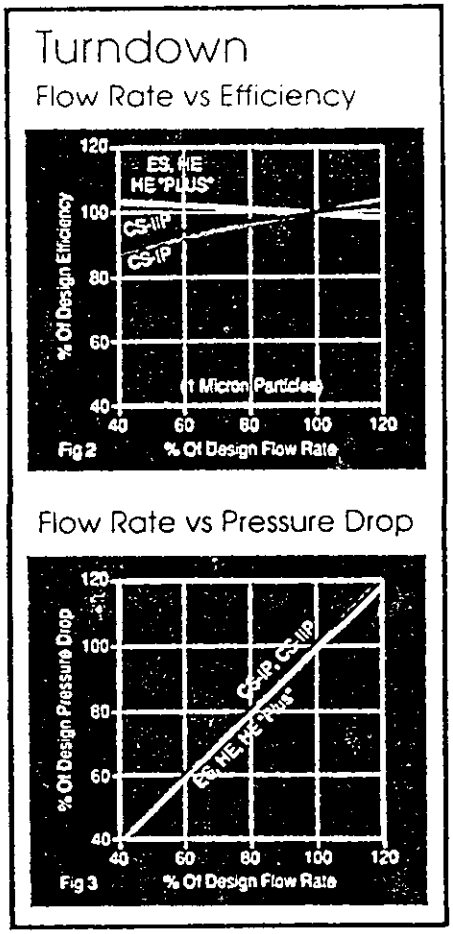
Performance Summary

Model	Brownian Products			Impaction Products			
	ES Energy Saver	HE High Efficiency	HE "Plus" High Efficiency	CS-IP Cost Saver I	CS-IIP Cost Saver II	HP High Performance	HV High Velocity
Mist Collection Mechanisms	Impaction, Interception + Brownian Movement			Impaction, Interception Only			
Reentrainment Control	Yes	No	Yes	Yes	Yes	No	No
Efficiency on Mist & Particles >3 Micron	Approximately Equal to 100%						
Efficiency on Mist & Particles <3 Micron	92 to 99.95%			50 - 95%* (0.5µ - 3µ)	70 - 99%* (0.5µ - 3µ)	70 to 99%* (0.5µ - 3µ)	50 - 97%* (0.5µ - 3µ)
Pressure Drop (inches w.c.)	4 to 20			4 to 5	7 to 9	10	8 to 12

* At 1.8 Particle Specific Gravity

Performance Comparison





For the high efficiency Brownian Movement based products, (HE, HE "PLUS", and ES), collection efficiency actually increases with reduced flow rate.

For the impaction based products, (CS-IP, CS-IIP, HV), collection efficiency especially on small particles decreases with reduced flow rate. (Fig 2)

For all element types, pressure drop is linearly proportional to flow rate. (Fig 3)

Note: Data shown is expected performance based on particle specific gravity of 1.8.

APPENDIX D

Table D-1. SO2 Screening Analysis for the AAQS and PSD Class II Inventories for Cargill - Riverview Facility (alphebetized listing)

Facility Name	UTM Coordinates (km) E	UTM Coordinates (km) N	Relative to Cargill Riverview Facility X (km)	Y (km)	Distance (km)	Direction (degrees)	Screening Emission Threshold (TPY)(a)	Maximum Allowable Emissions (TPY)	Included in AAQS and/or PSD Class II Modeling Analysis?
Adams Packing Aurburndale	421.1	3104.2	58.2	21.7	62.1	70	1102	94	NO
Alcoma Packing	451.6	3085.5	88.7	3.0	88.8	88	1635	327	NO
American Orange Corp.	429.8	3047.3	66.9	-35.2	75.6	118	1372	198	NO
Auburndale Cogen (b)	420.8	3103.3	57.9	20.8	61.5	70	1090	222	NO
Borden Hillsborough (b)	394.6	3069.6	31.7	-12.9	34.2	112	544	(225)	NO
Borden Polk (b)	414.5	3109.0	51.6	26.5	58.0	63	1020	(184)	NO
Cargill Citro-America	447.9	3068.3	85.0	-14.2	86.2	99	1584	223	NO
Cargill/Seminole Fertilizer Bartow (b)	409.8	3087.0	46.9	4.5	47.1	85	802	5,000	YES
Central Florida Power	416.2	3069.2	53.3	-13.3	54.9	104	959	38	NO
CF Industries Bartow Bonnie Mine Road(b)	408.4	3082.4	45.5	-0.1	45.5	90	770	4,982	YES
Citrus Hill	447.9	3068.3	85.0	-14.2	86.2	99	1584	411	NO
City of Wauchula	418.4	3047.0	55.5	-35.5	65.9	123	1178	180	NO
CLM/Pacific Chloride	361.8	3088.3	-1.1	5.8	5.9	349	SIA	731	YES
Coca Cola Auburndale	421.6	3103.7	58.7	21.2	62.4	70	1108	709	NO
Consolidated Minerals Plant City	393.8	3096.3	30.9	13.8	33.8	66	537	809	YES
Dolime(b)	404.8	3069.5	41.9	-13.0	43.9	107	737	-355	NO
Estech/Swift (b)	411.5	3074.2	48.6	-8.3	49.3	100	846	(4,853)	PSD Only
Farmland Industries Green Bay (b)	410.3	3079.7	47.4	-2.8	47.5	93	810	5,116	YES
Florida Crushed Stone (b)	360.0	3162.5	-2.9	80.0	80.1	358	1461	3,532	PSD Only
FPC - Bartow	342.4	3082.6	-20.5	0.1	20.5	270	270	62,618	YES
FPC - Higgins	336.5	3098.4	-26.4	15.9	30.8	301	476	19,619	YES
FPC - Intercession City (b)	446.3	3126.0	83.4	43.5	94.1	62	1741	17,667	PSD Only
FPC - Polk (b)	414.3	3073.9	51.4	-8.6	52.1	99	902	859	NO
FPC Bayboro	338.8	3071.3	-24.1	-11.2	26.6	245	392	6876	YES
FPL - Manatee	367.2	3054.1	4.3	-28.4	28.7	171	434	83,351	YES
FPL-Avon Park	451.4	3050.5	88.5	-32.0	94.1	110	1742	67	NO
Gardinier Fort Meade	415.3	3063.3	52.4	-19.2	55.8	110	976	1,173	YES
Geologic Recovery	401.8	3085.8	38.9	3.3	39.0	85	641	98	NO
Gold Bond Building Products	347.3	3082.7	-15.6	0.2	15.6	271	172	367	YES
Gulf Coast Lead	364.0	3093.5	1.1	11.0	11.1	6	81	1,498	YES
Hillsborough RRF	368.2	3092.7	5.3	10.2	11.5	27	90	1,029	YES
IMC Agrico Chem - Noralyn Mine Road	414.7	3080.3	51.8	-2.2	51.8	92	897	505	NO
IMC Agrico Chem- New Wales (b)	396.6	3078.9	33.7	-3.6	33.9	96	538	13,921	YES
IMC Agrico/Conserve (b) - Nichols	398.4	3084.2	35.5	1.7	35.5	87	571	1,593	YES
IMC Fertilizer - Prairie	402.9	3087.0	40.0	4.5	40.3	84	665	109	NO
IMC-Agrico Chem - Pierce (b)	404.1	3079.0	41.2	-3.5	41.3	95	687	(1,645)	PSD Only
IMC-Agrico Chem - S. Pierce (b)	407.5	3071.3	44.6	-11.2	46.0	104	780	4,811	YES
Imperial Phosphate	404.8	3069.5	41.9	-13.0	43.9	107	737	275	NO
Imperial Phosphate (Brewer)(b)	404.8	3069.5	41.9	-13.0	43.9	107	737	275	NO
Imperial/Pavex Corp - W Bartow	413.0	3086.2	50.1	3.7	50.2	86	865	75	NO

Table D-1. SO2 Screening Analysis for the AAQS and PSD Class II Inventories for Cargill - Riverview Facility (alphebetized listing)

Facility Name	UTM Coordinates (km) E	UTM Coordinates (km) N	Relative to Cargill Riverview Facility X (km)	Y (km)	Distance (km)	Direction (degrees)	Screening Emission Threshold (TPY)(a)	Maximum Allowable Emissions (TPY)	Included in AAQS and/or PSD Class II Modeling Analysis?
Kaplan Industries	418.3	3079.3	55.4	-3.2	55.5	93	970	398	NO
Lafarge Corp.	357.7	3090.6	-5.2	8.1	9.6	327	53	20,293	YES
Laidlaw Env. Services	424.7	3091.9	61.8	9.4	62.5	81	1110	240	NO
Lakeland City Power Larsen (b)	409.2	3102.8	46.3	20.3	50.5	66	871	5,024	YES
Lakeland City Power McIntosh (b)	408.5	3105.8	45.6	23.3	51.2	63	884	30,567	YES
Macasphalt Winter Haven	423.1	3101.5	60.2	19.0	63.1	72	1123	48	NO
Mobil Electrophosphate (b)	405.6	3079.4	42.7	-3.1	42.8	359	716	(1,441)	PSD Only
Mobil Mining - Big Four Mine (b)	394.8	3067.7	31.9	-14.8	35.2	115	563	589	YES
Mobil Mining -Nichols (b)	398.4	3085.3	35.5	2.8	35.6	85	572	2,304	YES
Mulberry Cogeneration (b)	413.6	3080.6	50.7	-1.9	50.7	92	875	464	NO
Mulberry Phosphates (Royster) (b)	406.8	3085.1	43.9	2.6	44.0	87	740	2,013	YES
Orange Co.	418.7	3083.6	55.8	1.1	55.8	89	976	26	NO
Owens-Brockway	423.4	3102.8	60.5	20.3	63.8	71	1136	120	NO
Pinellas RRF (b)	335.2	3084.1	-27.7	1.6	27.7	273	415	2300	YES
Piney Point (b)	348.7	3057.3	-14.2	-25.2	28.9	209	439	1,279	YES
Ridge Cogeneration (b)	416.7	3100.4	53.8	17.9	56.7	72	994	480	NO
Seminole Electric Hardee Unit 3	405.0	3057.7	42.1	-24.8	48.9	121	837	952	YES
SFE Processing	421.7	3104.2	58.8	21.7	62.7	70	1114	188	NO
Sulphur Terminals Tampa	358.0	3090.0	-4.9	7.5	9.0	327	39	210	YES
Sulphuric Acid Trading Company	349.0	3081.5	-13.9	-1.0	13.9	266	139	156	YES
Tampa McKay Bay RTE	360.0	3091.9	-2.9	9.4	9.8	343	57	745	YES
TECO - Big Bend (b)	361.9	3075.0	-1.0	-7.5	7.6	188	11	237,854	YES
TECO - Gannon	360.0	3087.5	-2.9	5.0	5.8	330	SIA	93,265	YES
TECO - Hookers Point	358.0	3091.0	-4.9	8.5	9.8	330	56	13524	YES
TECO - Polk Power Station (b)	402.5	3067.4	39.6	-15.1	42.4	111	707	2,010	YES
TPS Hardee Station (295 MW) (b)	404.8	3057.3	41.9	-25.2	48.9	121	838	2,412	YES
Tropicana Products	346.8	3040.9	-16.1	-41.6	44.6	201	752	137	NO
U.S. Agri-Chemicals Ft. Meade (b)	416.0	3069.0	53.1	-13.5	54.8	46	956	3,438	YES
US-Agri Chemicals Bartow (b)	413.2	3086.3	50.3	3.8	50.4	86	869	(1,579)	PSD Only

Note: All facilities with a total maximum allowable SO2 emissions of more than 20 TPY

(a) Screening emissions threshold is 20 x [Distance (km) to facility -7 km], based on North Carolina Screening Method. A significant impact distance of 7 km was assumed for including competing SO2 facilities into the inventory.

(b) Indicates PSD sources at this facility
Cartill- Riverview facility UTM coordinates (km): 362.9 3082.5
Screening area is 57 km from the proposed facility.

(c) Sources within 7 km of the Cargill Riverview site are modeled without regard to the screening criteria.

Source: KBN, 1994, Golder Associates, 1998

Table D-2. Summary of Individual Source Emission and Operating Parameters for the SO2 AAQS Modeling Analysis

APIS Number	Facility Name	Facility Location UTM E,N (km) Relative X,Y (m) ^a		APIS Src #		Stack Height (ft)	Stack Height (m)	Stack Diam. (ft)	Stack Diam. (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum SO2 Emissions (lb/hr)	Maximum SO2 Emissions (TPY)	Maximum SO2 Emissions (g/s)
40HIL290008	Cargill Fertilizer - Riverview	362 9	3082.5	–		126 0	38 4	8.0	2.44	46.56	14.19	125.3	325	30 4	133	3 83
		0	0	55	^b	132.5	40.4	7 0	2.13	52 72	16.07	109.1	316	20.3	89	2.56
				41		40 0	12.2	1.7	0 51	41 08	12.52	119.9	322	1.7	7	0 21
				04	^b	150 0	45 7	7.5	2.29	56.14	17.11	154 1	341	533 3	2336	67.2
				05	^b	150 0	45.7	8 0	2 44	40 94	12 48	150.5	339	416 7	1825	52 5
				06	^b	150.0	45 7	9 0	2.74	41.54	12.66	170.3	350	533 3	2336	67.2
					^b	136 0	41 5	6.0	1 83	56	17.07	150 5	339	47.0	206	5 92
					^b	136 0	41.5	6 0	1 83	50 1	15.27	150 5	339	47.0	206	5.92
						91 0	27.7	2.5	0 76	64 5	19 66	164 9	347	6 6	29	0 83
						91.0	27.7	2 5	0.76	64.5	19 66	164 9	347	6 6	29	0 83
					^b	91 0	27.7	3.0	0 91	47.15	14 37	164.9	347	6 6	29	0 83
													TOTAL	1649 4	7225	207.83
40TPA530046	Cargill Fertilizer - Bartow	409 8	3087.0	21		132.0	40 2	7 0	2.13	86 6	26.40	110	316 3	0.5	2	0 06
		46900	4500	12,32,33	^b	200 0	61.0	6.8	2.06	62.0	18 90	180	355 4	1141.0	4998	143.77
													TOTAL	1141.5	5000	143 83
40TPA530052	C F. Industries Bartow	408 4	3082 4	05	^b	206 0	62 8	7.0	2 13	35 7	10 88	190	361 0	400 0	1752	50 40
	Bonnie Mine Rd	45500	-100	06	^b	206 0	62.8	7.0	2.13	23.9	7.28	206	370 0	400 0	1752	50 40
				–		36 0	11 0	2.5	0.76	44.1	13 45	600	588 6	4 1	18	0 52
				–	^b	220.1	67 1	8 5	2 59	32 4	9 87	172	351.0	333 3	1460	42 00
													TOTAL	1137.5	4982	143.32
	CLM/Pacific Chloride	361 8	3088 3	–		20.0	6 1	2 0	0 61	65 6	19 99	215	375 0	166 8	731	21 02
		-1100	5800													
40HIL290075	Consolidated Minerals	393 8	3096.3	20		20 0	6 1	1.2	0.37	66 3	20 21	630	605 4	1 0	4	0.13
	Plant City	30900	13800	22		152.0	46 3	5 8	1 77	39 8	12.13	80	299 8	91 8	402	11 57
				24		152.0	46 3	5 8	1 77	36 6	11.16	72	295 4	91 8	402	11.57
													TOTAL	184.6	809	23 26
40TPA530053	Farmland Industries	410 3	3079 5	03,04	^b	100 0	30 5	7.5	2 29	39 4	12 02	179	355 0	700 0	3066	88 20
	Green Bay Plant	47400	-3000	05	^b	150 0	45 7	8 0	2.44	44 0	13.42	179	355 0	466.7	2044	58 80
				-	^b	40 0	12.2	2 0	0.61	8 8	2.67	199	366 0	1.3	6	0.16
													TOTAL	1167 9	5116	147 2
40PNL520011	FPC - Bartow	342.4	3082.6	01		300.0	91.4	9.0	2.74	119 0	36.27	312	428.7	3558.0	15584	448 31
		-20500	100	02		300 0	91 4	9 0	2.74	102 0	31 09	305	424 8	3558 0	15584	448 31
				03		300.0	91.4	11.0	3 35	113.0	34.44	275	408 2	5635.0	24681	710 01
				04		30 0	9.1	3.0	0.91	17.0	5.18	515	541.5	14.4	63	1.81
				05		45 0	13 7	17.3	5 27	73 0	22.25	930	772 0	569 2	2493	71.72
				06		45 0	13 7	17.3	5 27	73 0	22 25	930	772 0	569.2	2493	71.72
				08		45.0	13.7	17.3	5.27	73 0	22.25	930	772 0	392.5	1719	49 46
													TOTAL	14296 3	62618	1801.33
40PNL520013	FPC - Bayboro	338 8	3071.3	01-04		40 0	12.2	22.9	5.89	21.5	6.54	900	755 4	1569 8	6876	197 8
		-24100	-11200													
40PNL520012	FPC - Higgins	336.5	3098 4	01		173.7	52.9	12.5	3.81	30.0	9.14	325	435 9	1496.0	6552	188.50
		-26400	15900	02		173 7	52 9	12 5	3 81	30 0	9.14	314	429 8	1375 0	6023	173 25
				03		173.7	52.9	12 5	3 81	22 0	6.71	302	423 2	1408 0	6167	177 41
				04		55.0	16 8	15.1	4 60	372 0	113.39	850	727.6	33 4	146	4 21
				05		55.0	16 8	15.1	4 60	372 0	113.39	850	727.6	44.7	196	5.63
				06		55 0	16.8	15.1	4.60	372 0	113 39	850	727.6	7.6	33	0 96
				07		53.0	16 2	15.1	4 60	372 0	113.39	850	727.6	114 6	502	14 44
													TOTAL	4479 3	19619	564 39

Table D-2. Summary of Individual Source Emission and Operating Parameters for the SO2 AAQS Modeling Analysis

APIS Number	Facility Name	Facility Location UTM E,N (km) Relative X,Y (m) ^a		APIS Src #		Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
	FPC Polk County Site	414.3	3073.9	–	^b	113.0	34.4	13.5	4.11	133.0	40.54	260	400.0	98.0	429	12.35
		51400	-8600	–	^b	113.0	34.4	13.5	4.10	133.0	40.54	260	400.0	98.0	429	12.35
													TOTAL	196.0	859	24.70
40MAN41001	FPL - Manatee	367.2	3054.1	01		475.0	^c 144.8	26.2	7.99	56.0	17.07	307	425.9	9515.0	41676	1198.89
		4300	-28400	02		475.0	^c 144.8	26.2	7.99	56.0	17.07	307	425.9	9515.0	41676	1198.89
													TOTAL	19030.0	83351	2397.78
40TPA530044	Gardinier/Fort Meade	415.3	3063.3	01		63.0	19.2	9.5	2.90	23.0	7.01	62	290.0	267.9	1173	33.76
		52400	-19200													
40HIL290028	Gold Bond Building Products	347.3	3082.7	21		42.0	12.8	1.1	0.34	59.2	18.04	350	449.8	0.01	0.0438	0.00126
		-15600	200	22		42.0	12.8	1.1	0.34	62.0	18.90	350	449.8	0.01	0.0438	0.00126
				23		42.0	12.8	1.1	0.34	50.4	15.36	350	449.8	0.01	0.0438	0.00126
				24		42.0	12.8	1.1	0.34	61.7	18.81	350	449.8	0.01	0.0438	0.00126
				28		42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	5.07	22.2066	0.63882
				29		42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	5.07	22.2066	0.63882
				30		42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	2.11	9.2418	0.26586
				31		42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	5.07	22.2066	0.63882
				34		47.0	14.3	2.5	0.76	67.9	20.70	309	427.0	27.3	119.574	3.44
				36		64.0	19.5	3.5	1.07	40.9	12.47	185	358.2	12.17	53.3046	1.53
				47		35.0	10.7	2.8	0.85	65.0	19.81	300	422.0	27	118.26	3.40
													TOTAL	83.8	367	10.56
40HIL290057	Gulf Coast Lead	364.0	3093.5	01		150.0	45.7	2.0	0.61	123.3	37.59	160	344.3	384.2	1498	48.41
		1100	11000													
40HIL290261	Hillsborough County RRF	368.2	3092.7	–		220.0	67.1	11.5	3.51	55.0	16.76	430	494.3	234.9	1029	29.6
		5300	10200													
40TPA530057	IMC Agrico/Conserve	398.4	3084.2	05	^b	150.0	45.7	7.5	2.29	33.8	10.30	174	352.0	333.3	1460	42.00
	Nichols	35500	1700	12		81.0	24.7	7.5	2.29	12.4	3.78	130	327.6	26.5	116	3.34
				15		27.0	8.2	2.0	0.61	45.1	13.75	500	533.2	1.4	6	0.17
				16		39.0	11.9	3.2	0.98	29.2	8.90	500	533.2	2.6	11	0.33
													TOTAL	363.8	1593	45.83
40TPA530059	IMC Agrico- New Wales	396.6	3078.9	02	^b	199.9	61.0	8.5	2.60	50.2	15.31	170	350.0	1500.0	6570	189.00
		33700	-3600	09		133.0	40.5	7.0	2.13	49.8	15.18	105	313.6	3.4	15	0.43
				13		95.0	29.0	5.6	1.71	56.1	17.10	556	564.1	569.4	2494	71.74
				27		172.0	52.4	7.9	2.40	43.0	13.10	127	326.0	1.6	7	0.20
				42	^b	199.1	60.7	8.5	2.60	50.2	15.31	170	350.0	1000.0	4380	126.00
				44	^b	120.0	36.6	6.0	1.83	66.1	20.15	115	319.1	44.0	193	5.54
				45		171.0	52.1	6.0	1.83	58.9	17.97	110	316.3	21.9	96	2.76
				46	^b	171.8	52.4	4.6	1.40	51.8	15.80	106	314.0	38.1	167	4.80
													TOTAL	3178.3	13921	400.47
40TPA530055	IMC Agrico -S Pierce	407.5	3071.3	01		35.0	10.7	4.8	1.46	51.7	15.76	430	494.3	63.5	278	8.00
		44600	-11200	04	^b	145.0	44.2	9.0	2.74	48.5	14.79	170	350.0	500.0	2190	63.00
				05	^b	145.0	44.2	9.0	2.74	48.5	14.79	170	350.0	500.0	2190	63.00
				10	^b	125.0	38.1	10.2	3.10	47.9	14.60	131	328.0	35.0	153	4.41
													TOTAL	1098.5	4811	138.41
40HIL290018	Lafarge Corp	357.7	3090.6	29		146.0	44.5	8.0	2.44	132.0	40.24	431	494.8	4633.0	20293	583.76
		-5200	8100													

Table D-2. Summary of Individual Source Emission and Operating Parameters for the SO2 AAQS Modeling Analysis

APIS Number	Facility Name	Facility Location UTM E,N (km) Relative X,Y (m) ^a		APIS Src #		Stack Height (ft)	Stack Height (m)	Stack Diam (ft)	Stack Diam (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum SO2 Emissions (lb/hr)	Maximum SO2 Emissions (TPY)	Maximum SO2 Emissions (g/s)
40TPA530003	Lakeland City Power Larsen	409 2	3102 8	01		165 0	50 3	10 0	3 05	18 0	5 49	320	433 0	740 5	3243	93 3
		46300	20300	02		165 0	50.3	10 0	3 05	21 0	6 40	340	444 0	3 2	14	0 4
				03		165 0	50.3	10 0	3 05	21 0	6 40	340	444 0	22 2	97	2 8
				04		165 0	50 3	10 0	3 05	22 0	6.71	340	444 0	148 4	650	18 7
				06		32 0	9 8	5 0	1.52	561.9	171.30	800	700 0	1 6	7	0 2
				07		32 0	9 8	5 0	1.52	561.9	171 30	800	700 0	0 08	0 3	0 01
				–	^b	100 0	30 5	19 0	5.79	92 6	28 22	950	783 2	231.0	1012	29 11
													TOTAL	1147 0	5024	144.52
40TPA530004	Lakeland City Power Mcintosh	408 5	3105 8	01		150 0	45 7	9 0	2 74	78 0	23 77	295	419 3	2797.9	12255	352 54
		45600	23300	02		20 0	6 1	2 6	0.79	77.0	23 47	715	652.6	11 6	51	1 47
				03		20 0	6 1	2.6	0.79	77.0	23 47	715	652 6	11 6	51	1.46
				04		36 0	11.0	9.2	2 80	1 0	0 30	965	791 5	66 0	289	8 32
				05		156 0	47 6	10 4	3 17	69 0	21 03	265	402.6	203.7	892	25 67
				06	^b	250 0	76 2	16 0	4 88	107.0	32 61	170	350 0	3888 0	17029	500.10
													TOTAL	6978 8	30567	889 55
40TPA530047	Mobil Mining Nichols	398 4	3085 3	01		80 0	24 4	7.5	2 29	41.5	12 65	160	344 3	255.5	1119	32 20
		35500	2800	02		80 0	24 4	7.5	2 29	41.5	12 65	160	344 3	251.0	1099	31.63
				04	^b	85 0	25 9	7 5	2 29	52 8	16 10	150	338.7	19 4	85	2 44
													TOTAL	525 9	2304	66 27
40HIL290102	Mobil Mining Big Four Mine (AMAX)	394 85	3069.8	01	^b	100 0	30.5	6.0	1.82	23 8	7 26	141	333 7	129.8	568	16 35
		31950	-12730													
		394 80	3067.7	–	^b	24 8	7.6	1.3	0 41	26 9	8 20	449	505 0	73 8	323	0.60
		31900	-14780										TOTAL	129 8	892	16 35
40TPA530048	Mulberry Phosphates (Royster)	406 8	3085.1	02	^b	200.0	61 0	7.0	2.13	32.5	9 90	200	366 5	283 3	1241	35 70
		43900	2600	05		102 0	31.1	8 8	2 68	26 8	8 17	110	316 5	73 8	323	9 30
				09		45 0	13 7	3 7	1.13	8 4	2 56	80	299 8	102.4	449	12 91
													TOTAL	459 5	2013	57.90
40PNL520117	Pinellas Co. RRF	335 2	3084.1	03		161.0	49.1	9.0	2 74	88 0	26 81	450	505.4	525.0	2300	66 15
		-27700	1600													
	Piney Point	348 7	3057 3	–		200 0	61.0	7.7	2 36	26 5	8 08	170	349 8	292.1	1279	36 8
		-14200	-25200													
–	Seminole Electric Hardee 3	405 0	3057.7	–		90	27.4	19 0	5 79	46 2	14 09	285	413.7	217 5	952	27.4
		42100	-24800													
40HIL290099	Sulfuric Acid Trading Company	349 0	3081.5	01,02		25 0	7.6	1 7	0 52	15 0	4 57	405	480 4	35.7	156	4 50
		-13900	-1000													
40HIL290082	Sulfur Terminals Co	358 0	3090 0	01		30 0	9.1	1 8	0 55	17.7	5 39	660	622 0	48 0	210	6 05
		-4900	7500													
	Tampa City McKay Bay WTE	360.0	3091.9	01-04		150 0	45 7	4 264	1 3	69 86	21.3	440	500	170 2	745	21.44
		-2900	9400													
40HIL290039	TECO - Big Bend ^d	361 9	3075 0	01,02		499 0	152 1	24 0	7.32	116 0	35 34	300	422 0	42000 0	–	5292 00
		-1000	-7500											33333 4	146000	–
				03		499 0	152.1	24 0	7 32	51 2	15.61	292	417 6	21000 0	–	2646 00
														16666.7	73000	–
				04	^b	499 0	152.1	24 0	7 32	78 3	23 87	156	342 2	3550 8	15552	447 40
				CT2		75 0	22 9	16.7	5.10	116 2	35 40	928	770 9	329 8	1445	60 50
				CT3		75 0	22 9	16.7	5 10	116 2	35 40	928	770 9	329 8	1445	60 50
				CT1		35 0	10 7	11 2	3 40	91.9	28 00	1010	816 5	94.2	413	11.00
													TOTAL	67304 6	237854	8517 40

Table D-2 Summary of Individual Source Emission and Operating Parameters for the SO2 AAQS Modeling Analysis

APIS Number	Facility Name	Facility Location UTM E,N (km) Relative X,Y (m) ^a		APIS Src #		Stack Height (ft)	(m)	Stack Diam (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
40HIL290040	TECO - Gannon ^e	360 0	3087.5	01		306 0	93 3	10 4	3.17	79 0	24.08	309	427 0	3017 0	–	380.14
		-2900	5000											–	9669	–
				02		306 0	93 3	10 4	3.17	79 0	24 08	309	427.0	3017.0	–	380 14
														–	9669	–
				03		306 0	93 3	11.0	3 35	99 0	30.18	300	422 0	3838.0	–	483 59
														–	12301	–
				04		306 0	93 3	10 0	3 05	72 0	21.95	329	438.2	4502 0	–	567 25
														–	14429	–
				05		306 0	93 3	10 8	3 29	123 7	37.70	288	415 4	5482.0	–	690 73
														–	17570	–
				06		306 0	93 3	17.5	5 33	77.0	23 47	292	417 6	9115.0	–	1148 49
														–	29214	–
				07		35 0	10.7	11 0	3 35	16 4	5 00	1010	816 5	94 4	413	11 89
													TOTAL	29065 4	93265	3662 2
40HIL290038	TECO - Hookers Point	358 0	3091 0	01		280 0	85 3	11.3	3 44	20 0	6.10	295	419 3	328 0	1437	41.33
		-4900	8500	02		280 0	85 3	11 3	3 44	18 0	5 49	329	438 2	328 0	1437	41.33
				03		280 0	85 3	12 0	3 66	26 0	7 93	322	434 3	452.7	1983	57 05
				04		280 0	85 3	12 0	3 66	24 0	7 32	300	422.0	452 0	1980	56 95
				05		280 0	85 3	11.3	3 44	36 0	10.98	347	448 2	671.0	2939	84.55
				06		280 0	85 3	9 4	2 87	73 0	22 26	322	434 3	856 0	3749	107.86
													TOTAL	3087.7	13524	389 06
NA	TECO - Polk Power Station	402 50	3067.35	–	^b	20 0	6.1	3 0	0 90	43 0	13 10	500	533 0	2 6	11	0 33
		39600	-15150	–	^b	150 0	45 7	19 0	5 80	55 1	16 79	260	400.0	394 2	1727	49 67
				–	^b	199 0	60.7	3 5	1 07	30 0	9.14	1400	######	62.1	272	7 82
													TOTAL	458 9	2010	57 82
40TPA250015	TPS - Hardee Power Station (295 MW)	404 8	3057 3	01	^b	90 0	27.4	14.5	4 42	80 0	24 38	253	396.0	734 4	804 ^f	92 53
		41900	-25200	02	^b	90 0	27 4	14 5	4 42	80 0	24 38	253	396 0	734.4	804 ^f	92 53
				03	^b	75 1	22 9	16 0	4 88	103 0	31 39	953	785 0	734 4	804 ^f	92.53
														2203.1	2412	277 59
40TPA530051	US AgriChem - Fort Meade	416 0	3069.0	06		70 0	21.3	3 7	1.13	49 1	14 97	400	477 6	51.0	224	6 43
		53100	-13500	16	^b	175 0	53 4	8 5	2 59	32 9	10 04	180	355 4	367.0	1607	46.24
				17	^b	175 0	53.4	8.5	2.59	32 9	10 04	180	355.4	367.0	1607	46 24
													TOTAL	785 0	3438	98 91

Notes:

^a Cargill Riverview Facility location is (East, North UTM location (km) are 362.9, 3082 5)

^b SO2 PSD increment consuming source

^c GEP stack ht Actual stack height is 499 feet

^d TECO Big Bend units 1,2,3 are subject to a 3-hour limit of 31.5 tons per hour for all 3 units, and a 24-hour and annual limit of 25 tons per hour for all 3 units The higher rate is applicable for the 3-hour impacts Maximum impacts were predicted using the maximum emission rate, lb/hr

^e TECO Gannon Units 1 through 6 have short term and annual emission rates Maximum impacts were predicted using the maximum emission rate, lb/hr.

^f TPS Hardee is limited to 25% annual capacity by permit The TPY reflects 25% of hourly emission rate over the entre year.

Cargill Riverview Facility Location 362 9 3082.5

Table D-3. Summary of Modeling Parameters for the SO2 AAQS Modeling Analysis.

APIS Number	Facility Name	Facility Location Relative X,Y (m)		ISCST ID		APIS Src #	Stack Height (ft)	Stack Height (m)	Stack Diam. (ft)	Stack Diam. (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum SO2 (g/s)
40HIL290008	Cargill Fertilizer - Riverview	-520.9	22.9	CGRVGTSP		--	125.98	38.4	8.0	2.44	46.555	14.19	125.33	325	3.83
		-520.9	-96.1	CGRVDAP5	^a	55	132.55	40.4	7.0	2.13	52.723	16.07	109.13	316	2.56
		-481.9	11.9	CGRVSSF		41	40.026	12.2	1.7	0.51	41.076	12.52	119.93	322	0.21
		-18.9	-129	CGRVCAP7	^a	04	150	45.7	7.5	2.29	56.135	17.11	154.13	341	67.2
		78	-28	CGRVCAP8	^a	05	150	45.7	8.0	2.44	40.945	12.48	150.53	339	52.5
		0	0	CGRVCAP9	^a	06	150	45.7	9.0	2.74	41.535	12.66	170.33	350	67.2
		-358	126	CGRVAFI1	^a		136	41.5	6.0	1.83	56.004	17.07	150.53	339	5.92
		-358	126	CGRVAFI2	^a		136	41.5	6.0	1.83	50.098	15.27	150.53	339	5.92
		-499	152	CGRVRK05			91	27.7	2.5	0.76	64.501	19.66	164.93	347	0.83
		-499	158	CGRVRK09			91	27.7	2.5	0.76	64.501	19.66	164.93	347	0.83
		-499	148	CGRVRK07	^a		91	27.7	3.0	0.91	47.146	14.37	164.93	347	0.83
40TPA530046	Cargill Fertilizer - Bartow	46900	4500	CGBRT21		21	132.0	40.2	7.0	2.13	86.6	26.40	110	316.5	0.06
				CGBRTC3	^a	12,32,33	200.0	61.0	6.8	2.06	62.0	18.90	179	355.0	143.77
40TPA530052	C.F. Industries Bartow Bonnie Mine Rd	45500	-100	CFBON05	^a	05	206.0	62.8	7.0	2.13	35.7	10.88	190	361.0	50.40
				CFBON06	^a	06	206.0	62.8	7.0	2.13	23.9	7.28	206	370.0	50.40
				CFBONAA		--	36.0	11.0	2.5	0.76	44.1	13.45	600	588.6	0.52
				CFBONAB	^a	--	220.1	67.1	8.5	2.59	32.4	9.87	172	351.0	42.00
				CFBONAC	^a	--	119.42	36.4	7.0	2.13	52.9	16.11	151	339.0	3.97
	CLM/Pacific Chloride	-1100	5800	CLMPACCL		--	20.0	6.1	2.0	0.61	65.6	19.99	215	375.0	21.02
40HIL290075	Consolidated Minerals Plant City	30900	13800	CONMN20		20	20.0	6.1	1.2	0.37	66.3	20.21	630	605.4	0.13
						22	152.0	46.3	5.8	1.77	39.8	12.13	80	299.8	11.57
						24	152.0	46.3	5.8	1.77	36.6	11.16	72	295.4	11.57
		30900	13800	CONMNC2		22,24	152.0	46.3	5.8	1.77	36.6	11.16	72	295.4	23.14
40TPA530053	Farmland Industries Green Bay Plant	47400	-3000	FARMLC2	^a	03,04	100.0	30.5	7.5	2.29	39.4	12.02	179	355.0	88.36
				FARML05	^a	05	150.0	45.7	8.0	2.44	44.0	13.42	179	355.0	58.80
40PNL520011	FPC - Bartow					01	300.0	91.4	9.0	2.74	119.0	36.27	312	428.7	448.31
						02	300.0	91.4	9.0	2.74	102.0	31.09	305	424.8	448.31
		-20500	100	FPCBTC2A		01,02	300.0	91.4	9.0	2.74	102.0	31.09	305	424.8	896.62
				FPCBT03		03	300.0	91.4	11.0	3.35	113.0	34.44	275	408.2	710.01
				FPCBT04		04	30.0	9.1	3.0	0.91	17.0	5.18	515	541.5	1.81
						05	45.0	13.7	17.3	5.27	73.0	22.25	930	772.0	71.72
						06	45.0	13.7	17.3	5.27	73.0	22.25	930	772.0	71.72
						08	45.0	13.7	17.3	5.27	73.0	22.25	930	772.0	49.46
		-20500	100	FPCBTC3B		05,06,08	45.0	13.7	17.3	5.27	73.0	22.25	930	772.0	192.89
40PNL520013	FPC - Bayboro	-24100	-11200	BAYBORC4		01-04	40.0	12.2	22.9	5.89	21.5	6.54	900	755.4	197.8
40PNL520012	FPC - Higgins					01	173.7	52.9	12.5	3.81	30.0	9.14	325	435.9	188.50
						02	173.7	52.9	12.5	3.81	30.0	9.14	314	429.8	173.25
		-26400	15900	FPCHGC2		01,02	173.7	52.9	12.5	3.81	30.0	9.14	314	429.8	361.75
		-26400	15900	FPCHG03		03	173.7	52.9	12.5	3.81	22.0	6.71	302	423.2	177.41
						04	55.0	16.8	15.1	4.60	372.0	113.39	850	727.6	4.21

Table D-3. Summary of Modeling Parameters for the SO2 AAQS Modeling Analysis.

APIS Number	Facility Name	Facility Location Relative X,Y (m)		ISCST ID		APIS Src #	Stack Height (ft)	Stack Height (m)	Stack Diam. (ft)	Stack Diam. (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum SO2 (g/s)
						05	55.0	16.8	15.1	4.60	372.0	113.39	850	727.6	5.63
						06	55.0	16.8	15.1	4.60	372.0	113.39	850	727.6	0.96
		-26400	15900	FPCHGC3		04,05,06	55.0	16.8	15.1	4.60	372.0	113.39	850	727.6	10.80
		-26400	15900	FPCHG07		07	53.0	16.2	15.1	4.60	372.0	113.39	850	727.6	14.44
	FPC Polk County Site					--	113.0	34.4	13.5	4.11	133.0	40.54	260	400.0	12.35
						--	113.0	34.4	13.5	4.10	133.0	40.54	260	400.0	12.35
		51400	-8600	FPCPKC2	^a		113.0	34.4	13.5	4.10	133.0	40.54	260	400.0	24.70
40MAN410010	FPL - Manatee					01	475.0	144.8	26.2	8.00	56.0	17.07	307	425.9	1198.89
						02	475.0	144.8	26.2	8.00	56.0	17.07	307	425.9	1198.89
		4300	-28400	FPLMNC2		01,02	475.0	144.8	26.2	8.00	56.0	17.07	307	425.9	2397.78
40TPA530044	Gardinier/Fort Meade	52400	-19200	GARDN01		01	63.0	19.2	9.5	2.90	23.0	7.01	62	290.0	33.76
40HIL290028	Gold Bond Building Products					21	42.0	12.8	1.1	0.34	59.2	18.04	350	449.8	0.00126
						22	42.0	12.8	1.1	0.34	62.0	18.90	350	449.8	0.00126
						23	42.0	12.8	1.1	0.34	50.4	15.36	350	449.8	0.00126
						24	42.0	12.8	1.1	0.34	61.7	18.81	350	449.8	0.00126
						28	42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	0.64
						29	42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	0.64
						30	42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	0.27
						31	42.0	12.8	1.1	0.34	71.9	21.92	350	449.8	0.64
		-15600	200	GLDBDC8		21-31	42.0	12.8	1.1	0.34	50.4	15.36	350	449.8	2.19
		-15600	200	GLDBD34		34	47.0	14.3	2.5	0.76	67.9	20.70	309	427.0	3.44
		-15600	200	GLDBD36		36	64.0	19.5	3.5	1.07	40.9	12.47	185	358.2	1.53
		-15600	200	GLDBD47		47	35.0	10.7	2.8	0.85	65.0	19.81	300	422.0	3.40
40HIL290057	Gulf Coast Lead	1100	11000	GLEAD01		01	150.0	45.7	2.0	0.61	123.3	37.59	160	344.3	48.41
40HIL290261	Hillsborough County RRF	5300	10200	HILRFC3		--	220.0	67.1	11.5	3.51	55.0	16.76	430	494.3	22.17
40TPA530057	IMC Agrico/Conserve Nichols	35500	1700	IANIC05	^a	05	150.0	45.7	7.5	2.29	33.8	10.30	174	352.0	42.00
				IANIC12		12	81.0	24.7	7.5	2.29	12.4	3.78	130	327.6	3.34
				IANIC15		15	27.0	8.2	2.0	0.61	45.1	13.75	500	533.2	0.17
				IANIC16		16	39.0	11.9	3.2	0.98	29.2	8.90	500	533.2	0.32
40TPA530059	IMC Agrico- New Wales					02	199.9	61.0	8.5	2.60	50.2	15.31	170	350.0	189.00
						42	199.1	60.7	8.5	2.60	50.2	15.31	170	350.0	126.00
		33700	-3600	IAWALC2	^a	02,42	199.1	60.7	8.5	2.60	50.2	15.31	170	350.0	315.00
				IAWAL09		09	133.0	40.5	7.0	2.13	49.8	15.18	105	313.6	0.43
				IAWAL13		13	95.0	29.0	5.6	1.71	56.1	17.10	556	564.1	71.74
				IAWAL27	^a	27	172.0	52.4	7.9	2.40	43.0	13.10	127	326.0	0.20
				IAWAL44	^a	44	120.0	36.6	6.0	1.83	66.1	20.15	115	319.1	5.54
				IAWAL45		45	171.0	52.1	6.0	1.83	58.9	17.97	110	316.3	2.76
				IAWAL46	^a	46	171.8	52.4	4.6	1.40	51.8	15.80	106	314.0	4.80
40TPA530055	IMC Agrico -S. Pierce	44600	-11200	IASOU01		01	35.0	10.7	4.8	1.46	51.7	15.76	430	494.3	8.00
						04	145.0	44.2	9.0	2.74	48.5	14.79	170	350.0	63.00
						05	145.0	44.2	9.0	2.74	48.5	14.79	170	350.0	63.00

Table D-3. Summary of Modeling Parameters for the SO2 AAQS Modeling Analysis.

APIS Number	Facility Name	Facility Location Relative X,Y (m)		ISCST ID		APIS Src #	Stack Height (ft)	Stack Height (m)	Stack Diam. (ft)	Stack Diam. (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum SO2 (g/s)
		44600	-11200	IASOUC2	[a]	04,05	145.0	44.2	9.0	2.74	46.5	14.79	170	350.0	126.00
		44600	-11200	IASOU10	[a]	10	125.0	38.1	10.2	3.10	47.9	14.60	130	328.0	4.41
40HIL290018	Lafarge Corp.	-5200	8100	LAFRG29		29	146.0	44.5	8.0	2.44	132.0	40.24	431	494.8	583.76
40TPA530003	Lakeland City Power Larsen	46300	20300	LAKLR01		01	165.0	50.3	10.0	3.05	18.0	5.49	320	433.0	93.30
						02	165.0	50.3	10.0	3.05	21.0	6.40	340	444.0	0.40
						03	165.0	50.3	10.0	3.05	21.0	6.40	340	444.0	2.80
						04	165.0	50.3	10.0	3.05	22.0	6.71	340	444.0	18.70
		46300	20300	LAKLRC3		02,03,04	165.0	50.3	10.0	3.05	21.0	6.40	340	444.0	21.90
						06	32.0	9.8	5.0	1.52	561.9	171.30	800	700.0	0.20
						07	32.0	9.8	5.0	1.52	561.9	171.30	800	700.0	0.01
		46300	20300	LAKLRC2		06,07	32.0	9.8	5.0	1.52	561.9	171.30	800	700.0	0.21
		46300	20300	LAKLRAA	[a]	--	100.0	30.5	19.0	5.79	92.6	28.22	950	783.2	29.11
40TPA530004	Lakeland City Power McIntosh	45600	23300	LAKMC01		01	150.0	45.7	9.0	2.74	78.0	23.77	295	419.3	352.54
						02	20.0	6.1	2.6	0.79	77.0	23.47	715	652.6	1.47
						03	20.0	6.1	2.6	0.79	77.0	23.47	715	652.6	1.46
				LAKMCC2		02,03	20.0	6.1	2.6	0.79	77.0	23.47	715	652.6	2.93
				LAKMC04		04	36.0	11.0	9.2	2.80	1.0	0.30	985	791.5	8.32
				LAKMC05		05	156.0	47.6	10.4	3.17	69.0	21.03	265	402.6	25.67
				LAKMC06	[a]	06	250.0	76.2	16.0	4.88	107.0	32.61	170	350.0	500.10
40TPA530047	Mobil Mining & Minerals Nichols					01	80.0	24.4	7.5	2.29	41.5	12.65	160	344.3	32.20
						02	80.0	24.4	7.5	2.29	41.5	12.65	160	344.3	31.63
		35500	2800	MBNICC2		01,02	80.0	24.4	7.5	2.29	41.5	12.65	160	344.3	63.82
				MBNIC04	[a]	04	85.0	25.9	7.5	2.29	52.8	16.10	150	338.7	2.44
40HIL290102	Mobil Mining Big Four Mine (AMAX)	31950	-12730	MBL#401	[a]	01	100.0	30.5	6.0	1.82	23.8	7.26	142	334.0	16.35
		31900	-14780	MBL#4AA	[a]	--	24.8	7.6	1.3	0.41	26.9	8.20	449	505.0	0.60
40TPA530048	Mulberry Phosphates (Royster)	43900	2600	MLPHS02	[a]	02	200.0	61.0	7.0	2.13	32.5	9.90	200	366.5	35.70
				MLPHS05		05	102.0	31.1	8.8	2.68	26.8	8.17	110	316.5	9.30
				MLPHS09		09	45.0	13.7	3.7	1.13	8.4	2.56	80	299.8	12.91
40PNL520117	Pinellas Co. RRF	-27700	1600	PINEL03		03	161.0	49.1	9.0	2.74	88.0	26.81	450	505.4	66.15
--	Piney Point	-14200	-25200	PINEYPT		--	200.0	61.0	7.7	2.36	26.5	8.08	170	349.8	36.80
--	Seminole Electric Hardee 3	42100	-24800	HARDEE3		--	90	27.4	19.0	5.79	46.2	14.09	285	413.7	27.4
40HIL290099	Sulfuric Acid Trading Company	-13900	-1000	SLTRDC2		01,02	25.0	7.6	1.7	0.52	15.0	4.57	405	480.4	4.50
40HIL290082	Sulfur Terminals	-4900	7500	SULFT01		01	30.0	9.1	1.8	0.55	17.7	5.39	660	622.0	6.05
	Tampa City McKay Bay WTE	-2900	9400	MCKAYC4		01-04	150.0	45.7	4.264	1.3	69.864	21.3	440	500	21.44

Table D-3. Summary of Modeling Parameters for the SO2 AAQS Modeling Analysis.

APIS Number	Facility Name	Facility Location Relative X,Y (m)		ISCST ID		APIS Src #	Stack Height (ft)	Stack Height (m)	Stack Diam. (ft)	Stack Diam. (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum SO2 (g/s)
40HIL290039	TECO - Big Bend	-1000	-7500	TECBBC2A		01,02	499.0	152.1	24.0	7.32	116.0	35.34	300	422.0	5292.00
				TECBB03		03	499.0	152.1	24.0	7.32	51.2	15.61	292	417.6	2646.00
				TECBB04	^a	04	499.0	152.1	24.0	7.32	78.3	23.87	156	342.0	447.40
						05	75.0	22.9	16.7	5.10	116.2	35.40	928	770.9	60.50
						06	75.0	22.9	16.7	5.10	116.2	35.40	928	770.9	60.50
				TECBBC23		05,06	75.0	22.9	16.7	5.10	116.2	35.40	928	770.9	121.00
				TECBBCT1		07	35.0	10.7	11.2	3.40	91.9	28.00	1010	816.5	11.00
40HIL290040	TECO - Gannon					01	306.0	93.3	10.4	3.17	79.0	24.08	309	427.0	380.14
						02	306.0	93.3	10.4	3.17	79.0	24.08	309	427.0	380.14
		-2900	5000	TECGNC2		01,02	306.0	93.3	10.4	3.17	79.0	24.08	309	427.0	760.28
				TECGN03		03	306.0	93.3	11.0	3.35	99.0	30.18	300	422.0	483.59
				TECGN04		04	306.0	93.3	10.0	3.05	72.0	21.95	329	438.2	567.25
				TECGN05		05	306.0	93.3	10.8	3.29	123.7	37.70	288	415.4	690.73
				TECGN06		06	306.0	93.3	17.5	5.33	77.0	23.47	292	417.6	1148.49
				TECGN07		07	35.0	10.7	11.0	3.35	16.4	5.00	1010	816.5	11.89
40HIL290038	TECO - Hookers Point					01	280.0	85.3	11.3	3.44	20.0	6.10	295	419.3	41.33
						02	280.0	85.3	11.3	3.44	18.0	5.49	329	438.2	41.33
		-4900	8500	TECHKC2A		01,02	280.0	85.3	11.3	3.44	18.0	5.49	295	419.3	82.66
						03	280.0	85.3	12.0	3.66	26.0	7.93	322	434.3	57.05
						04	280.0	85.3	12.0	3.66	24.0	7.32	300	422.0	56.95
				TECHKC2B		03,04	280.0	85.3	12.0	3.66	24.0	7.32	300	422.0	114.00
				TECHK05		05	280.0	85.3	11.3	3.44	36.0	10.98	347	448.2	84.55
				TECHK06		06	280.0	85.3	9.4	2.87	73.0	22.26	322	434.3	107.86
NA	TECO - Polk Power Station	39600	-15150	TECPKAA	^a	--	20.0	6.1	3.0	0.90	43.0	13.10	500	533.0	0.33
				TECPKAB	^a	--	150.0	45.7	19.0	5.80	55.1	16.79	260	400.0	49.67
				TECPKAC	^a	--	199.0	60.7	3.5	1.07	30.0	9.14	1400	1033.0	7.82
40TPA250015	TPS - Hardee Power Station	41900	-25200	HRDEX01	^a	01	90.0	27.4	14.5	4.42	80.0	24.38	253	396.0	92.53
				HRDEX02	^a	02	90.0	27.4	14.5	4.42	80.0	24.38	253	396.0	92.53
				HRDEX03	^a	03	75.1	22.9	16.0	4.88	103.0	31.39	953	785.0	92.53
40TPA530051	US AgriChem - Fort Meade	53100	-13500	UAFTM06		06	70.0	21.3	3.7	1.13	49.1	14.97	400	477.6	6.43
						16	175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	46.24
						17	175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	46.24
		53100	-13500	UAFTMC2	^a	16,17	175.0	53.3	8.5	2.59	32.9	10.04	180	355.4	92.48

Notes: Stacks at the same facilitywith the same diameter and height and similar velocity and temperature were combined to a single stack. The velocity and temperature for the combined stack are set equal to the lowest velocity and temperature among the individual stacks being combined.

APPENDIX E

Table E-1. Summary of Modeling Parameters for the SO2 PSD Class II Modeling Analysis.

APIS Number	Facility Name	Facility Location UTM E, N (km)		ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
40HIL290008	Cargill Fertilizer - Riverview	362.9	3082.5	CGRVDAP5	55	133	40.4	7.0	2.13	52.723	16.07	109.13	316	20.31746	88.99048	2.56
		362.9	3082.5	CGRVCAP7	04	150	45.7	6.3	1.91	80.84	24.64	154.13	341	466.66667	2044	58.8
		362.9	3082.5	CGRVCAP8		150	45.7	8.0	2.44	43.898	13.38	150.53	339	416.66667	1825	52.5
		362.9	3082.5	CGRVCAP9	06	150	45.7	9.0	2.74	41.535	12.66	170.33	350	533.33333	2336	67.2
		362.9	3082.5	CGRVAFI1		136	41.5	6.0	1.83	56.004	17.07	150.53	339	46.964127	205.7905	5.92
		362.9	3082.5	CGRVAFI2		136	41.5	6.0	1.83	50.098	15.27	150.53	339	46.964127	205.7905	5.92
		362.9	3082.5	CGRVRK07		91	27.7	3.0	0.91	47.146	14.37	164.93	347	6.5873016	28.85238	0.83
		362.9	3082.5	CGRVCP46		74	22.6	5.0	1.52	22.966	7.00	193.73	363	-1488.889	-6521.333	-187.6
		362.9	3082.5	CGRVCP7B		150	45.7	7.5	2.29	30.184	9.20	179.33	355	-575.0794	-2518.848	-72.46
		362.9	3082.5	CGRVCP8B		150	45.7	8.0	2.44	27.493	8.38	150.53	339	-743.4127	-3256.148	-93.67
		362.9	3082.5	CGRVCP9B		150	45.7	9.0	2.74	33.793	10.30	170.33	350	-433.3333	-1898	-54.6
40TPA530046	Cargill Fertilizer - Bartow	409.8	3087	CGBRTC3	12,32,33	200.0	61.0	6.8	2.06	62.0	18.90	179	355.0	1141.0	4998	143.77
40TPA530052	C.F. Industries Bartow Bonnie Mine Rd	408.4	3082.4	CFBON05	05	206.0	62.8	7.0	2.13	35.7	10.88	190	361.0	400.0	1752	50.40
		408.4	3082.4	CFBON06	06	206.0	62.8	7.0	2.13	23.9	7.28	206	370.0	400.0	1752	50.40
		408.4	3082.4	CFBONAB	--	220.1	67.1	8.5	2.59	32.4	9.87	172	351.0	333.3	1460	42.00
		408.4	3082.4	CFBONAC	--	119.42	36.4	7.0	2.13	52.9	16.11	151	339.0	31.5	138	3.97
		408.4	3082.4	CFBON1		100.0	30.5	4.5	1.37	40.0	12.20	170	350.0	-483.3	-2117	-60.90
		408.4	3082.4	CFBON2		100.0	30.5	5.5	1.68	34.0	10.37	170	350.0	-875.0	-3833	-110.25
		408.4	3082.4	CFBON3		100.0	30.5	9.0	2.74	14.0	4.27	196	364.0	-850.0	-3723	-107.10
		408.4	3082.4	CFBON4		100.0	30.5	7.0	2.13	26.0	7.93	185	358.0	-1387.5	-6077	-174.83
						206.0	62.8	7.0	2.13	35.0	10.67	185	358.0	-1800.0	-7884	-226.80
						206.0	62.8	7.0	2.13	34.0	10.37	187	359.0	-1350.0	-5913	-170.10
		408.4	3082.4	CFBON56		206.0	62.8	7.0	2.13	34.0	10.37	187	359.0	-3150	-13797	-396.9
	CLM/Pacific Chloride	361.8	3088.3	CLMPACCL	--	98.4	30.0	2.0	0.61	65.6	20.00	215	375.0	166.8	731	21.02
	Estech/Swift Polk	411.5	3074.2	ESTDRY1		60.0	18.3	9.7	2.95	27.8	8.47	151	339.0	-190.0	-832	-23.94
		411.5	3074.2	ESTDRY2		61.5	18.8	9.7	2.95	16.6	5.06	152	340.0	-181.0	-793	-22.80
		411.5	3074.2	ESTSAP		101.0	30.8	7.0	2.13	12.8	3.90	185	358.0	-737.1	-3228	-92.87
40TPA530053	Farmland Industries Green Bay Plant	410.3	3079.5	FARMLC2	03,04	100.0	30.5	7.5	2.29	39.4	12.02	179	355.0	701.3	3072	88.36
		410.3	3079.5	FARML05	05	150.0	45.7	8.0	2.44	44.0	13.42	179	355.0	466.7	2044	58.80
		410.3	3079.5	FARML12		100.0	30.5	4.5	1.37	66.2	20.18	100	311.0	-666.5	-2919	-83.98
40TPA270021	FL Crushed Stone Kiln 1	360.0	3162.5	FCS1		320.0	97.5	21.3	6.48	54.6	16.63	323	435.0	806.3	3532	101.60
	FPC Polk County Site				--	113.0	34.4	13.5	4.11	133.0	40.54	260	400.0	98.0	429	12.35
					--	113.0	34.4	13.5	4.10	133.0	40.54	260	400.0	98.0	429	12.35
		414.3	3073.9	FPCPKC2		113.0	34.4	13.5	4.10	133.0	40.54	260	400.0			24.70
NA	General Portland Cement #4	358.0	3090.6	GPCEM4B		118.0	36.0	9.0	2.74	57.8	17.61	450	505.2			-62.99
NA	General Portland Cement #5	358.0	3090.6	GPCEM5B		149.0	45.4	12.5	3.81	19.0	5.80	430	494.1			-69.30
40HIL290261	Hillsborough County RRF	368.2	3092.7	HILRFC3	--	220.0	67.1	11.5	3.51	55.0	16.76	430	494.3			22.17
40TPA530057	IMC Agrico/Conserve Nichols	398.4	3084.2	IANIC05	05	150.0	45.7	7.5	2.29	33.8	10.30	174	352.0	333.3	1460	42.00
		398.4	3084.2	IANIC		100.0	30.5	5.9	1.80	62.0	18.90	95	308.0			-15.20
		398.4	3084.2	IANICDRY		80.0	24.4	5.0	1.52	42.3	12.90	151	339.0			-3.88
40TPA530059	IMC Agrico- New Wales				02	199.9	61.0	8.5	2.60	50.2	15.31	170	350.0	1500.0	6570	189.00
					42	199.1	60.7	8.528	2.6	50.217	15.31	170.33	350	1000.0	4380	126
		396.6	3078.9	IAWALC2	02,42	199.1	60.7	8.5	2.60	50.2	15.31	170	350.0			315.00
		396.6	3078.9	IAWAL27	27	172.0	52.4	7.9	2.40	43.0	13.10	127	326.0	1.6	7	0.20
		396.6	3078.9	IAWAL44	44	120.0	36.6	6.0	1.83	66.1	20.15	115	319.1	44.0	193	5.54
		396.6	3078.9	IAWAL46	46	171.8	52.4	4.6	1.40	51.8	15.80	106	314.0	38.1	167	4.80
		396.6	3078.9	IAWALDY		69.0	21.0	7.0	2.13	61.0	18.60	165	347.0			-34.27

Table E-1. Summary of Modeling Parameters for the SO2 PSD Class II Modeling Analysis.

APIS Number	Facility Name	Facility Location UTM E, N (km)		ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
		396 6	3078.9	IAWAL		200.1	61.0	8.5	2.60	46.9	14 28	170	350.0			-146 00
NA	IMC-Agrico Pierce	404.1	3079 0	IAPRC12		80.0	24.4	5 0	1.52	42.5	12.94	151	339.0			-24.32
		404.1	3079	IAPRC34		80.0	24.4	8.0	2 43	61.7	18.82	151	339.0			-23 00
40TPA530055	IMC Agrico -S. Pierce				04	145.0	44.2	9.0	2.74	48.5	14.79	170	350.0	500.0	2190	63.00
					05	145 0	44.2	9.0	2.74	48.5	14.79	170	350.0	500.0	2190	63.00
		407.5	3071.3	IASOUC2	04,05	145 0	44 2	9.0	2.74	48 5	14.79	170	350.0			126.00
		407.5	3071.3	IASOUC2B		150 0	45 7	5 2	1.60	86.6	26.40	170	350.0			-75.60
		407.5	3071.3	IASOU10	10	125.0	38.1	10.2	3.10	47.9	14.60	130	328.0	35.0	153	4.41
40TPA530080	Imperial Phosphates (Brewer)	404 8	3069 5	IMPRLX		90.0	27.4	7.5	2.29	50.0	15.25	151	339.0			-19.26
40TPA530003	Lakeland City Power Larsen	409.2	3102.8	LAKLRAA	--	100.0	30 5	19.0	5 79	92.6	28.22	950	783.2	231.0	1012	29.11
40TPA530004	Lakeland City Power McIntosh	408.5	3105.8	LAKMC06	06	250 0	76 2	16.0	4.88	107 0	32.61	170	350.0	3888.0	17029	500.10
40TPA530060	Mobil Electrophos Division	405.6	3079.4	MOBELE1		24.0	7.3	3.0	0.91	10 6	3.23	376	464.0			-6.53
		405.6	3079 4	MOBELE2		20 0	6 1	3.0	0.91	25 3	7.71	376	464.0			-10.05
		405.6	3079 4	MOBELE3		60 0	18 3	6 0	1.83	22.3	6.79	170	350.0			-21.81
		405.6	3079 4	MOBELE4		84.0	25.6	7.0	2.13	22.9	6.97	91	306.0			-7.11
		405.6	3079 4	MOBELE5		60 0	18.3	2.3	0.70	75.0	22.87	120	322.0			-3.17
		405.6	3079.4	MOBELE6		96 0	29.3	7.0	2.13	28.0	8.52	106	314.0			-47.25
40TPA530047	Mobil Mining & Minerals Nichols	398.4	3085.3	MBNIC04	04	85.0	25.9	7.5	2.29	52.8	16.10	150	338.7	19.4	85	2.44
		398.4	3085.3	MBNIC1		93.2	28.4	3.6	1.09	63.1	19.24	152	340.0			-13.89
		398.4	3085.3	MBNIC2		13.0	4.0	2.6	0.80	5.9	1.80	480	522.0			-0.87
40HIL290102	Mobil Mining Big Four Mine (AMAX)	394.85	3069.77	MBL#401	01	100 0	30 5	6 0	1.82	23.8	7.26	142	334.0	129.8	568	16 35
		394.85	3069.77	MBL#4AA	--	24.8	7 6	1.3	0.41	26.9	8.20	449	505.0	4.8	21	0.60
40TPA530048	Mulberry Phosphates (Royster)	406.8	3085 1	MLPHS02	02	200.0	61.0	7.0	2.13	32.5	9 90	200	366.5	283.3	1241	35.70
		406.8	3085 1	MULPHS1		167.3	51.0	7.0	2.13	32.5	9.90	181	356 0			-257.60
40PNL520117	Pinellas Co. RRF	335.2	3084.1	PINEL03	03	161.0	49.1	9 0	2.74	88.0	26 81	450	505.4			66.15
--	Seminole Electric Hardee 3	405	3057.7	HARDEE3	--	90	27.4	19.0	5.79	46.2	14.09	285	413.7			27.4
40PNL520042	Stauffer Shutdown	325.6	3116.7	STAUFR1		24.0	7.3	3.0	0.91	10.6	3.23	376	464.0			-4.86
		325.6	3116.7	STAUFR2		60.0	18.3	2.3	0.70	75.0	22.87	120	322.0			-1.50
		325.6	3116.7	STAUFR3		160.8	49 0	3.9	1.20	11.8	3.60	143	335.0			-50.93
		325.6	3116.7	STAUFR4		84.0	25 6	7.0	2.13	22.9	6.97	91	306.0			-7.36
		325.6	3116.7	STAUFR5		84.0	25.6	3 0	0.91	22.9	6.97	120	322.0			-0.45
	Tampa City McKay Bay WTE	360	3091.9	MCKAYC4	01-04	150.0	45 7	4.264	1.3	69.864	21.3	440	500			21 44
40HIL290039	TECO - Big Bend	361.9	3075	TECBB04	04	499.0	152.1	24.0	7.32	78.3	23 87	127	325 9	5190 0	22732	
	(24-HR)	361.9	3075	TECBB03		490.0	149.4	24.0	7.32	47.0	14.33	293	418.0			-1218.00
	(24-HR)	361.9	3075	TECBB12		490.0	149.4	24 0	7.32	94.0	28.65	300	422.0			-2436.00
NA	TECO - Polk Power Station	402.5	3067.35	TECPKAA	--	20.0	6.1	3.0	0.90	43.0	13.10	500	533.0	2.6	11	0.33
		402.5	3067.35	TECPKAB	--	150.0	45.7	19 0	5 80	55 1	16.79	260	400.0	394.2	1727	49.67
		402.5	3067.35	TECPKAC	--	199.0	60.7	3.5	1.07	30.0	9.14	1400	1033.0	62.1	272	7.82
40TPA250015	TPS - Hardee Power Station	404.8	3057.3	HRDEX01	01	90.0	27.4	14.5	4 42	80.0	24.38	253	396.0	734.4	3217	92.53
		404 8	3057.3	HRDEX02	02	90.0	27.4	14.5	4 42	80.0	24.38	253	396.0	734.4	3217	92.53
		404 8	3057.3	HRDEX03	03	75.1	22.9	16.0	4.88	103.0	31.39	953	785.0	734.4	3217	92.53
														2203 1	9650	
40TPA530051	US AgriChem - Fort Meade				16	175.0	53.3	8.5	2.59	32.9	10.04	180	355 4	367.0	1607	46.24
					17	175.0	53 3	8 5	2.59	32.9	10 04	180	355.4	367.0	1607	46.24
		416	3069	UAFTMC2	16,17	175 0	53.3	8.5	2.59	32.9	10.04	180	355.4			92.48
	H2SO4 X	416.0	3069.0	UAFTMX		95 0	29.0	9.9	3.02	22.2	6.77	106	314.0			-78.80

Table E-1. Summary of Modeling Parameters for the SO2 PSD Class II Modeling Analysis.

APIS Number	Facility Name	Facility Location UTM E, N (km)		ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
	GTSP	416.0	3069.0	UAFTMGT		93.0	28.3	5.0	1.52	57.7	17.60	134	330.0			-18.27
40TPA530050	US Agri-Chem Bartow	413.2	3086.3	UAGBAR1		51.8	15.8	6.0	1.83	32.8	10.01	138	332.0			-3.41
		413.2	3086.3	UAGBAR2		95.0	29.0	7.0	2.12	24.6	7.50	89	305.0			-42.00

Notes: Stacks at the same facility with the same diameter and height and similar velocity and temperature were combined to a single stack. The velocity and temperature for the combined stack are set equal to the lowest velocity and temperature among the individual stacks being combined.

Cargill Riverview UTM Location

Table E-1A. Additional PSD Sources For Use with PSD CLASS II Sources in PSD Class I Analysis

40TPA270024	Asphalt Pavers 3	359.9	3162.4	ASPHALT3		40.0	12.2	4.5	1.37	34.7	10.58	219	377.0			2.25
40TPA270015	Asphalt Pavers 4	361.4	3168.4	ASPHALT4		28.0	8.5	3.5	1.08	35.9	10.95	184	357.4			2.25
40TPA530221	Auburndale Cogeneration	420.8	3103.3	AUBURN		160.1	48.8	18.0	5.50	46.9	14.30	280	411.0			6.40
NA	Borden Hillsborough	394.6	3069.6	BORDHIL		100.0	30.5	6.0	1.82	48.5	14.79	160	344.0			-6.48
NA	Borden Polk	414.5	3109.0	BORDPLK		56.0	17.1	7.7	2.34	27.1	8.26	140	333.0			-5.29
40HIL290005	CF Industries Zephyrhills															
	--	388.0	3116.0	CFZEP1		110.0	33.5	4.9	1.50	64.0	19.50	109	316.0			88.20
	Proposed D					198.0	60.4	8.0	2.44	58.3	17.77	176	353.0			54.60
	Proposed C					198.0	60.4	8.0	2.44	58.3	17.77	176	353.0			54.60
		388.0	3116.0	CFZEP		198.0	60.4	8.0	2.44	58.3	17.77	176	353.0			109.2
	Baseline C					198.0	60.4	8.0	2.44	53.8	16.40	176	353.0			-50.40
	Baseline D					198.0	60.4	8.0	2.44	53.8	16.40	176	353.0			-50.40
		388.0	3116.0	CFZEPB		198.0	60.4	8.0	2.44	53.8	16.40	176	353.0			-100.8
	--	388.0	3116.0	CFZEP2		61.7	18.8	5.0	1.52	61.7	18.80	109	316.0			-105.0
40TPA510066	Couch Const-Zephyrhills (Asphalt)	390.3	3129.4	COUCHZEP		20.0	6.1	4.5	1.38	68.9	21.00	300	422.0			3.54
40TPA510041	Couch Const-Odessa (Asphalt)	340.7	3119.5	COUCHODE		30.0	9.1	4.6	1.40	73.2	22.30	325	436.0			7.25
	Dris Paving (Asphalt)	340.6	3119.2	DRIS		40.0	12.2	10.0	3.05	21.2	6.47	151	339.0			0.23
NA	Dolime															
	Dryers	404.8	3069.5	DOLIMEDR		90.0	27.4	5.0	1.52	67.8	20.67	140	333.0			-5.68
	Boilers	404.8	3069.5	DOLIMEBL		90.0	27.4	2.0	0.61	23.8	7.25	430	494.1			-4.52
NA	Evans Packing	383.3	3135.8	EVANS		40.4	12.3	1.3	0.40	30.2	9.20	379	466.2			0.20
40TPA270017	E R Jahna (Lime Dryer)	386.7	3155.8	ERJAHNA		35.0	10.7	6.0	1.83	29.5	8.99	129	327.0			0.82
NA	FDOC Boiler #3	382.2	3166.1	FDOC		30.0	9.1	2.0	0.61	15.0	4.57	401	478.0			2.99
40TPA270010	FL Mining and Materials Kiln	356.2	3169.9	FMM		105.0	32.0	14.0	4.27	32.5	9.90	250	394.3			1.45
40TPA090004	FPC - Crystal River															
	Crystal River 1	334.2	3204.5	CRYRIV1B		498.7	152.0	15.0	4.57	138.1	42.10	300	422.0			-314.0
	Crystal River 2	334.2	3204.5	CRYRIV2B		502.0	153.0	16.0	4.88	138.1	42.10	300	422.0			-1859.0
	Crystal River 4					584.6	178.2	25.5	7.77	68.9	21.00	253	396.0			1008.8
	Crystal River 5					584.6	178.2	25.5	7.77	68.9	21.00	253	396.0			1008.8

APIS Number	Facility Name	Facility Location UTM E, N (km)		ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
		334.2	3204.5	CRYRIV45		584.6	178.2	25.5	7.77	68.9	21.00	253	396.0			2017.6
30ORL640028	FPC Debary	467.5	3197.2	DEBARY		50.0	15.2	13.8	4.21	184.4	56.21	1016	819.8			466.4
30ORL490014	FPC Intercession City															
0	4 CTs 7EA	446.3	3126.0	FPCIN07		50.0	15.2	13.8	4.21	184.4	56.21	1016	819.8			124.4
0	2 CTs 7FA	446.3	3126.0	FPCIN08		50.0	15.2	23.1	7.04	105.2	32.07	1126	880.8			110.4
NA	Hospital Corp of America															
	Boiler #1					36.0	11.0	1.0	0.31	13.1	4.00	500	533.0			0.08
	Boiler #2					36.0	11.0	1.0	0.31	13.1	4.00	500	533.0			0.08
		333.4	3141.0	HCOA12		36.0	11.0	1.0	0.31	13.1	4.00	500	533.0			0.16
NA	Kissimmee Utilities	447.7	3127.9	KISSUT		40.0	12.2	10.0	3.05	95.5	29.10	718	654.0			29.4
30ORL490001	Kissimmee Utilites Exist	460.1	3129.3	KISSEX		60.0	18.3	12.0	3.66	124.7	38.00	300	422.0			32.1
NA	Lake Cogen	434.0	3198.8	LAKECOGN		100.0	30.5	11.0	3.35	56.2	17.13	232	384.3			5.04
40TPA530047	Mobil Mining & Minerals Nichols															
0	Rock Surge Dryer	398.4	3085.3	MBNIC04		85.0	25.9	7.5	2.29	52.8	16.10	150	338.7			2.44
	Boiler	398.4	3085.3	MBNIC1		93.2	28.4	3.6	1.09	63.1	19.24	152	340.0			-13.9
	Boiler	398.4	3085.3	MBNIC2		13.0	4.0	2.6	0.80	5.9	1.80	480	522.0			-0.87
NA	Mulberry Cogeneration															
	CT	413.6	3080.6	MULCNAA		125.0	38.1	15.0	4.57	61.9	18.87	219	377.0			12.7
	Duct Burner	413.6	3080.6	MULCNAB		125.0	38.1	6.5	1.98	30.5	9.31	300	422.0			0.65
NA	New Pt Richey Hospital															
	Boiler #1					36.0	11.0	1.0	0.31	12.7	3.88	520	544.0			0.06
	Boiler #2					36.0	11.0	1.0	0.31	12.7	3.88	520	544.0			0.03
		331.2	3124.5	NEWPTR12		36.0	11.0	1.0	0.31	12.7	3.88	520	544.0			0.09
NA	Oman Construction	359.8	3164.9	OMAN		25.0	7.6	6.0	1.83	20.6	6.29	165	347.0			2.09
30ORL480137	Orlando Utilities Commission - Stanton															
	Unit 1	483.5	3150.6	OUC1		550.0	167.6	19.0	5.80	70.9	21.60	127	325.7			601.0
	Unit 2 (24-hour)	483.5	3150.6	OUC2		550.0	167.6	19.0	5.80	77.1	23.50	124	324.2			91.8
40TPA510028	Overstreet Paving	355.9	3143.7	OVERST		30.0	9.1	4.3	1.30	52.5	16.00	275	408.0			3.67
40TPA510056	Pasco Cty RRF	347.1	3139.2	PASCORRF		275.0	83.8	10.0	3.05	51.0	15.54	250	394.3			14.1
NA	Pasco Cogen	385.6	3139.0	PASCOGN		100.0	30.5	11.0	3.35	56.2	17.13	232	384.3			5.04
30ORL48109	Reedy Creek Energy Services- EPCOT															
	Generator 1					17.0	5.2	1.8	0.55	144.8	44.12	650	616.5			1.83
	Generator 2					17.0	5.2	1.8	0.55	144.8	44.12	650	616.5			1.83
		442.0	3139.0	EPCOT12		17.0	5.2	1.8	0.55	144.8	44.12	650	616.5			3.66
30ORL480110	Reedy Creek Energy Services	443.1	3144.3	REEDY		65.0	19.8	11.2	3.41	51.0	15.56	285	413.7			0.15
NA	Ridge Cogeneration	416.7	3100.4	RIDGE		325.0	99.1	10.0	3.05	47.6	14.50	170	350.0			13.8

APPENDIX F

LISTING OF SO_2 AAQS EXCEEDANCES
1987 - 1991

24-HOUR AND 3-HOUR

ISCST3 (97363): 1987 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS 4/23/98

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT NOCMPL

All 24hr values 7246

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 246.0

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

87

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	87050124	868.24091	4924.03857	0.00	0.00	265.83878
24	ALL	87050124	-868.24115	4924.03857	0.00	0.00	272.38904
24	ALL	87050124	-0.00024	5000.00000	0.00	0.00	276.89078
24	ALL	87062324	-2394.14136	6577.84766	0.00	0.00	250.51350
24	ALL	87102224	1000.00006	-1732.05078	0.00	0.00	277.85556
24	ALL	87102224	1250.00000	-2165.06348	0.00	0.00	273.71158
24	ALL	87102224	1500.00000	-2598.07617	0.00	0.00	262.68253
24	ALL	87102224	550.00000	-952.62793	0.00	0.00	246.77216
24	ALL	87102224	750.00000	-1299.03809	0.00	0.00	268.95956

ISCST3 (97363): 1988 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS 4/23/98

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT NOCMPL

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 246.0

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	88041424	-0.00024	5000.00000	0.00	0.00	254.92296
24	ALL	88042124	-868.24115	4924.03857	0.00	0.00	274.18060
24	ALL	88042124	-0.00024	5000.00000	0.00	0.00	278.05521
24	ALL	88051124	-0.00029	6000.00000	0.00	0.00	274.89221
24	ALL	88082124	167.57050	950.33948	0.00	0.00	259.59183
24	ALL	88082124	191.01300	1083.28857	0.00	0.00	251.25648
24	ALL	88082124	275.32620	756.45258	0.00	0.00	247.11812

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ISCST3 (97363): 1989 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 246.0
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	89022324	684.04034	-1879.38513	0.00	0.00	252.16460
24	ALL	89022324	855.05042	-2349.23145	0.00	0.00	252.51178
24	ALL	89022324	1026.06055	-2819.07788	0.00	0.00	248.56377
24	ALL	89022324	347.29639	-1969.61548	0.00	0.00	277.72192
24	ALL	89022324	434.12051	-2462.01929	0.00	0.00	277.82394
24	ALL	89022324	520.94458	-2954.42310	0.00	0.00	270.90347
24	ALL	89022324	694.59277	-3939.23096	0.00	0.00	247.66437
24	ALL	89022324	260.47229	-1477.21167	0.00	0.00	263.59183
24	ALL	89040624	-2598.07617	-1499.99976	0.00	0.00	247.79501
24	ALL	89040624	-2349.23145	-855.05017	0.00	0.00	251.10091
24	ALL	89040624	-2819.07788	-1026.06018	0.00	0.00	257.81000
24	ALL	89040624	-2462.01929	-434.12033	0.00	0.00	269.04868
24	ALL	89040624	-2954.42334	-520.94440	0.00	0.00	266.50507
24	ALL	89040624	-2500.00000	0.00003	0.00	0.00	281.47522
24	ALL	89040624	-3000.00000	0.00004	0.00	0.00	281.20984
24	ALL	89040624	-2462.01929	434.12039	0.00	0.00	281.57025
24	ALL	89040624	-2954.42334	520.94446	0.00	0.00	306.99686
24	ALL	89040624	-2349.23169	855.05023	0.00	0.00	257.71027
24	ALL	89040624	-2819.07788	1026.06030	0.00	0.00	335.23737
24	ALL	89040624	-2598.07617	1499.99976	0.00	0.00	317.71097
24	ALL	89040624	-3064.17798	2571.15015	0.00	0.00	292.66379
24	ALL	89040624	0.00003	-1100.00000	0.00	0.00	251.44524
24	ALL	89040924	-2394.14136	6577.84766	0.00	0.00	306.02405
24	ALL	89040924	275.32620	756.45258	0.00	0.00	248.03110
24	ALL	89050224	1000.00006	-1732.05078	0.00	0.00	270.30255
24	ALL	89050224	1250.00000	-2165.06348	0.00	0.00	255.45216
24	ALL	89050224	-1000.00006	1732.05066	0.00	0.00	280.04532
24	ALL	89050224	-1250.00012	2165.06323	0.00	0.00	298.43008
24	ALL	89050224	-1500.00012	2598.07593	0.00	0.00	314.71463
24	ALL	89050224	-2000.00012	3464.10132	0.00	0.00	295.72742
24	ALL	89050224	321.39380	-383.02222	0.00	0.00	246.55345
24	ALL	89050224	514.23010	-612.83557	0.00	0.00	267.77689
24	ALL	89050224	707.06641	-842.64886	0.00	0.00	260.53812
24	ALL	89050224	250.00002	-433.01270	0.00	0.00	254.47902
24	ALL	89050224	400.00000	-692.82031	0.00	0.00	312.75659
24	ALL	89050224	550.00000	-952.62793	0.00	0.00	312.44986
24	ALL	89050224	750.00000	-1299.03809	0.00	0.00	291.56448
24	ALL	89050224	273.61612	-751.75409	0.00	0.00	295.37924
24	ALL	89050224	376.22217	-1033.66187	0.00	0.00	289.34503
24	ALL	89050224	513.03027	-1409.53894	0.00	0.00	251.77870
24	ALL	89050224	138.91856	-787.84619	0.00	0.00	266.63901
24	ALL	89050224	191.01302	-1083.28857	0.00	0.00	266.48843
24	ALL	89050224	-1000.00006	1732.05078	0.00	0.00	280.04532
24	ALL	89050224	-630.34320	1731.85352	0.00	0.00	246.69551
24	ALL	89051124	-2819.07788	1026.06030	0.00	0.00	260.43365
24	ALL	89051124	-2598.07617	1499.99976	0.00	0.00	286.51471
24	ALL	89051124	-2298.13330	1928.36255	0.00	0.00	247.57976
24	ALL	89051124	-3064.17798	2571.15015	0.00	0.00	247.40797
24	ALL	89051124	-2571.15063	3064.17725	0.00	0.00	275.55905
24	ALL	89060924	167.57050	950.33948	0.00	0.00	250.53090
24	ALL	89062224	-3500.00024	6062.17725	0.00	0.00	289.08109
24	ALL	89070424	347.29639	-1969.61548	0.00	0.00	254.04967

8 9

24 ALL	89070424	-855.05029	-2349.23145	0.00	0.00	250.96454
24 ALL	89070424	-999.99994	-1732.05078	0.00	0.00	268.30255
24 ALL	89070424	-1249.99988	-2165.06348	0.00	0.00	251.38702
24 ALL	89070424	-1285.57520	-1532.08899	0.00	0.00	278.11057
24 ALL	89070424	-1532.08887	-1285.57495	0.00	0.00	273.77951
24 ALL	89070424	-1732.05078	-999.99982	0.00	0.00	265.30481
24 ALL	89070424	-1879.38525	-684.04016	0.00	0.00	261.13547
24 ALL	89070424	-1969.61548	-347.29626	0.00	0.00	267.48129
24 ALL	89070424	-2000.00000	0.00002	0.00	0.00	288.62317
24 ALL	89070424	-1969.61548	347.29630	0.00	0.00	325.24554
24 ALL	89070424	-1879.38525	684.04016	0.00	0.00	366.23856
24 ALL	89070424	-2349.23169	855.05023	0.00	0.00	260.77692
24 ALL	89070424	-1732.05090	999.99982	0.00	0.00	378.11880
24 ALL	89070424	-2165.06348	1249.99976	0.00	0.00	366.18008
24 ALL	89070424	-1532.08899	1285.57507	0.00	0.00	319.64124
24 ALL	89070424	-1915.11121	1606.96875	0.00	0.00	406.67581
24 ALL	89070424	-2298.13330	1928.36255	0.00	0.00	390.64883
24 ALL	89070424	-1285.57532	1532.08862	0.00	0.00	251.61618
24 ALL	89070424	-1606.96912	1915.11084	0.00	0.00	301.92737
24 ALL	89070424	-1928.36292	2298.13306	0.00	0.00	375.65808
24 ALL	89070424	-2571.15063	3064.17725	0.00	0.00	349.99866
24 ALL	89070424	400.00000	-692.82031	0.00	0.00	249.97610
24 ALL	89070424	171.01009	-469.84631	0.00	0.00	277.15619
24 ALL	89070424	273.61612	-751.75409	0.00	0.00	345.24658
24 ALL	89070424	376.22217	-1033.66187	0.00	0.00	317.90799
24 ALL	89070424	513.03027	-1409.53894	0.00	0.00	277.90738
24 ALL	89070424	86.82410	-492.40387	0.00	0.00	264.85898
24 ALL	89070424	138.91856	-787.84619	0.00	0.00	325.95804
24 ALL	89070424	191.01302	-1083.28857	0.00	0.00	318.16086
24 ALL	89070424	260.47229	-1477.21167	0.00	0.00	286.00256
24 ALL	89070424	0.00002	-800.00000	0.00	0.00	246.40340
24 ALL	89070424	-964.18140	-1149.06665	0.00	0.00	268.15866
24 ALL	89070424	-992.79358	-833.05280	0.00	0.00	268.90576
24 ALL	89070424	-1149.06665	-964.18146	0.00	0.00	288.99625
24 ALL	89070424	-1309.43042	-756.00006	0.00	0.00	304.78528
24 ALL	89070424	-1403.90076	-510.97815	0.00	0.00	315.86368
24 ALL	89070424	-1409.53894	-513.03027	0.00	0.00	316.07498
24 ALL	89070424	-1003.51910	-176.94753	0.00	0.00	256.23450
24 ALL	89070424	-1083.28857	-191.01303	0.00	0.00	270.90222
24 ALL	89070424	-1477.21167	-260.47232	0.00	0.00	326.32098
24 ALL	89070424	-1064.00000	-0.00004	0.00	0.00	261.93576
24 ALL	89070424	-1100.00000	-0.00004	0.00	0.00	268.66257
24 ALL	89070424	-1500.00000	-0.00005	0.00	0.00	333.92007
24 ALL	89070424	-1133.51367	199.86900	0.00	0.00	268.91711
24 ALL	89070424	-1477.21167	260.47220	0.00	0.00	333.37363
24 ALL	89070424	-1217.84167	443.25806	0.00	0.00	278.65048
24 ALL	89070424	-1409.53894	513.03015	0.00	0.00	317.73724
24 ALL	89070424	-1230.62207	710.49994	0.00	0.00	273.03870
24 ALL	89070424	-1299.03809	749.99994	0.00	0.00	286.87231
24 ALL	89070424	-1243.29016	1043.24426	0.00	0.00	260.98734
24 ALL	89070424	-1261.14941	1502.97913	0.00	0.00	248.60864
24 ALL	89072524	-4330.12695	2499.99951	0.00	0.00	256.90164
24 ALL	89081724	-0.00024	5000.00000	0.00	0.00	273.92505
24 ALL	89091824	-4924.03857	-868.24066	0.00	0.00	269.48712
24 ALL	89091824	-5000.00000	0.00006	0.00	0.00	248.77679
24 ALL	89091924	-3758.77051	1368.08032	0.00	0.00	260.17883
24 ALL	89091924	-3464.10181	1999.99963	0.00	0.00	278.18430
24 ALL	89100224	-1915.11121	1606.96875	0.00	0.00	250.71373
24 ALL	89100324	-1915.11121	1606.96875	0.00	0.00	248.69804
24 ALL	89100324	-1928.36292	2298.13306	0.00	0.00	250.81647

24 ALL	89110524	-5196.15234	2999.99951	0.00	0.00	256.01242

ISCST3 (97363): 1990 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 246.0
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

VE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	90040124	-0.00029	6000.00000	0.00	0.00	285.01526
24	ALL	90060624	694.59271	3939.23096	0.00	0.00	251.87030
24	ALL	90060624	-0.00019	4000.00000	0.00	0.00	258.30206
24	ALL	90062024	-0.00024	5000.00000	0.00	0.00	279.99994
24	ALL	90071924	-5362.31152	4499.51270	0.00	0.00	328.83105
24	ALL	90072024	-1041.88940	5908.84619	0.00	0.00	257.41208
24	ALL	90072924	-3856.72583	4596.26611	0.00	0.00	281.99185
24	ALL	90080724	-1368.08069	3758.77026	0.00	0.00	253.90921
24	ALL	90081924	-434.12057	2462.01929	0.00	0.00	255.78992
24	ALL	90111624	-6062.17773	3499.99951	0.00	0.00	255.03024

ISCST3 (97363): 1991 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS 4/23/98

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT NOCMPL

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 246.0

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

VE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	91051524	-2394.14136	6577.84766	0.00	0.00	317.65750
24	ALL	91051624	-1215.53760	6893.65381	0.00	0.00	299.70721
24	ALL	91052424	-3500.00024	6062.17725	0.00	0.00	247.12402
24	ALL	91060124	868.24091	4924.03857	0.00	0.00	291.83746
24	ALL	91060124	-0.00024	5000.00000	0.00	0.00	302.95197
24	ALL	91060224	868.24091	4924.03857	0.00	0.00	316.45926
24	ALL	91060224	1710.10071	4698.46289	0.00	0.00	284.97501
24	ALL	91060224	-868.24115	4924.03857	0.00	0.00	262.92154
24	ALL	91060224	-0.00024	5000.00000	0.00	0.00	300.18741
24	ALL	91061124	-5362.31152	4499.51270	0.00	0.00	246.05025
24	ALL	91061624	-1041.88940	5908.84619	0.00	0.00	258.47971
24	ALL	91061624	-0.00029	6000.00000	0.00	0.00	259.93530
24	ALL	91062324	-4499.51367	5362.31055	0.00	0.00	282.95050
24	ALL	91071024	-868.24115	4924.03857	0.00	0.00	253.17935
24	ALL	91072624	-868.24115	4924.03857	0.00	0.00	273.69812
24	ALL	91080324	-0.00029	6000.00000	0.00	0.00	272.97101
24	ALL	91080424	-868.24115	4924.03857	0.00	0.00	265.56100
24	ALL	91080424	-0.00024	5000.00000	0.00	0.00	274.75842
24	ALL	91080424	-0.00029	6000.00000	0.00	0.00	267.86832
24	ALL	91080924	694.59271	3939.23096	0.00	0.00	266.85175
24	ALL	91080924	-0.00019	4000.00000	0.00	0.00	301.45587
24	ALL	91081224	1041.88904	5908.84668	0.00	0.00	258.09018
24	ALL	91090224	-6062.17773	3499.99951	0.00	0.00	327.74994
24	ALL	91090724	-4596.26660	3856.72510	0.00	0.00	268.69733

```
* ISCST3 (97363): 1987 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS  4/6/98
* MODELING OPTIONS USED:
*  CONC                        RURAL  FLAT          DFAULT                                  NOCMPL
*         MAXI-FILE FOR  3-HR VALUES >= A THRESHOLD OF    1240.
*         FOR SOURCE GROUP: ALL
*         FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)
*AVE   GRP      DATE           X             Y        ELEV     FLAG   AVERAGE CONC
*
*--- ------- -------- ------------ ------------ ------ ------ ------------
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* ISCST3 (97363): 1988 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS  4/6/98
* MODELING OPTIONS USED:
*  CONC                          RURAL  FLAT          DFAULT                                  NOCMPL
*         MAXI-FILE FOR  3-HR VALUES >= A THRESHOLD OF    1240.
*         FOR SOURCE GROUP: ALL
*         FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)
*AVE    GRP      DATE           X             Y        ELEV     FLAG   AVERAGE CONC
*--- -------- -------- ------------ ------------ ------- -------- ------------
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* ISCST3 (97363): 1989 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS 4/6/98
* MODELING OPTIONS USED:
* CONC RURAL FLAT DFAULT NOCMPL
* MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 1240.
* FOR SOURCE GROUP: ALL
* FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

*AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
3	ALL	89062212	-2052.12061	-5638.15576	0.00	0.00	1337.27454
3	ALL	89062212	-3500.00024	6062.17725	0.00	0.00	1417.45227
3	ALL	89071012	-3500.00024	6062.17725	0.00	0.00	1465.27942
3	ALL	89082712	-1710.10095	4698.46289	0.00	0.00	1399.32312

```
* ISCST3 (97363): 1990 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS  4/6/98
* MODELING OPTIONS USED:
*  CONC                        RURAL  FLAT          DFAULT                                  NOCMPL
*         MAXI-FILE FOR  3-HR VALUES >= A THRESHOLD OF    1240.
*         FOR SOURCE GROUP: ALL
*         FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)
*AVE   GRP      DATE           X             Y        ELEV    FLAG   AVERAGE CONC
*
*--- -------- -------- ------------ ------------ ------ ------ ------------
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* ISCST3 (97363): 1991 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION - SO2 AAQS  4/23/98
* MODELING OPTIONS USED:
*  CONC                        RURAL  FLAT          DFAULT                                                    NOCMPL
*         MAXI-FILE FOR  3-HR VALUES >= A THRESHOLD OF     1240.
*         FOR SOURCE GROUP: ALL
*         FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)
*AVE   GRP      DATE          X             Y         ELEV    FLAG   AVERAGE CONC
*
   3 ALL       91051612   -1215.53760   6893.65381    0.00    0.00    1270.14697
```

APPENDIX G

LISTING OF SO_2 PSD CLASS I EXCEEDANCES
1987 - 1991

24-HOUR AND 3-HOUR

SCST3 (97363): 1987 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98

* MODELING OPTIONS USED:

* CONC RURAL FLAT DFAULT NOCMPL

* MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.000

* FOR SOURCE GROUP: ALL

* FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

*AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	87052424	340300.00000	3165700.00000	0.00	0.00	5.29310
24	ALL	87110924	340300.00000	3165700.00000	0.00	0.00	5.29369
24	ALL	87120724	340300.00000	3165700.00000	0.00	0.00	5.32201
24	ALL	87120824	340300.00000	3169800.00000	0.00	0.00	5.22645
24	ALL	87120824	340700.00000	3171900.00000	0.00	0.00	5.25509
24	ALL	87121324	340300.00000	3165700.00000	0.00	0.00	6.68083
24	ALL	87121324	340300.00000	3167700.00000	0.00	0.00	6.91330
24	ALL	87121324	340300.00000	3169800.00000	0.00	0.00	8.01562
24	ALL	87121324	340700.00000	3171900.00000	0.00	0.00	7.68235

ISCST3 (97363): 1988 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.000
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	88010124	340300.00000	3169800.00000	0.00	0.00	6.05548
24	ALL	88010124	340700.00000	3171900.00000	0.00	0.00	6.71313
24	ALL	88010124	342000.00000	3174000.00000	0.00	0.00	6.39978
24	ALL	88010124	343000.00000	3176200.00000	0.00	0.00	6.12089
24	ALL	88020124	340700.00000	3171900.00000	0.00	0.00	5.38721
24	ALL	88022324	343700.00000	3178300.00000	0.00	0.00	5.83924
24	ALL	88022324	342400.00000	3180600.00000	0.00	0.00	6.16377
24	ALL	88081124	343700.00000	3178300.00000	0.00	0.00	5.93078
24	ALL	88081124	342400.00000	3180600.00000	0.00	0.00	6.36222
24	ALL	88081124	341100.00000	3183400.00000	0.00	0.00	6.77718
24	ALL	88081124	339000.00000	3183400.00000	0.00	0.00	5.84704

ISCST3 (97363): 1989 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT NOCMPL

MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.000

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC

ISCST3 (97363): 1990 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.000
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	90031124	340300.00000	3165700.00000	0.00	0.00	5.40362
24	ALL	90031124	340300.00000	3167700.00000	0.00	0.00	5.80156
24	ALL	90031124	340300.00000	3169800.00000	0.00	0.00	6.13373
24	ALL	90031124	340700.00000	3171900.00000	0.00	0.00	5.64638
24	ALL	90031224	340700.00000	3171900.00000	0.00	0.00	5.24937
24	ALL	90031224	342000.00000	3174000.00000	0.00	0.00	5.75430
24	ALL	90042624	343000.00000	3176200.00000	0.00	0.00	5.53028
24	ALL	90042624	343700.00000	3178300.00000	0.00	0.00	5.93406
24	ALL	90042624	342400.00000	3180600.00000	0.00	0.00	5.51467
24	ALL	90061324	340300.00000	3169800.00000	0.00	0.00	5.04939
24	ALL	90081024	340300.00000	3169800.00000	0.00	0.00	5.12240
24	ALL	90081024	340700.00000	3171900.00000	0.00	0.00	5.47916
24	ALL	90081424	340700.00000	3171900.00000	0.00	0.00	5.23627
24	ALL	90090124	340300.00000	3167700.00000	0.00	0.00	5.32486
24	ALL	90091024	342000.00000	3174000.00000	0.00	0.00	5.19480
24	ALL	90121424	340300.00000	3169800.00000	0.00	0.00	5.86894
24	ALL	90121424	340700.00000	3171900.00000	0.00	0.00	6.04589

ISCST3 (97363): 1991 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 24-HR VALUES >= A THRESHOLD OF 5.000
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
24	ALL	91020524	340700.00000	3171900.00000	0.00	0.00	5.19861
24	ALL	91020524	342000.00000	3174000.00000	0.00	0.00	5.69097
24	ALL	91020524	343700.00000	3178300.00000	0.00	0.00	5.09386
24	ALL	91020524	342400.00000	3180600.00000	0.00	0.00	5.03110
24	ALL	91052524	340300.00000	3165700.00000	0.00	0.00	5.57809
24	ALL	91052524	340300.00000	3167700.00000	0.00	0.00	6.51284
24	ALL	91052524	340300.00000	3169800.00000	0.00	0.00	5.87696
24	ALL	91072824	340300.00000	3165700.00000	0.00	0.00	5.32854
24	ALL	91111924	340300.00000	3165700.00000	0.00	0.00	5.96624
24	ALL	91111924	340300.00000	3167700.00000	0.00	0.00	6.93228
24	ALL	91111924	340300.00000	3169800.00000	0.00	0.00	5.85574

ISCST3 (97363): 1987 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98

MODELING OPTIONS USED:

CONC RURAL FLAT DFAULT NOCMPL

MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 25.00

FOR SOURCE GROUP: ALL

FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
3	ALL	87011003	341100.00000	3183400.00000	0.00	0.00	27.64691
3	ALL	87041503	340300.00000	3167700.00000	0.00	0.00	25.43626
3	ALL	87041503	340300.00000	3169800.00000	0.00	0.00	26.96387
3	ALL	87080203	340700.00000	3171900.00000	0.00	0.00	27.29302

* ISCST3 (97363): 1988 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
* MODELING OPTIONS USED:
* CONC RURAL FLAT DFAULT NOCMPL
* MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 25.00
* FOR SOURCE GROUP: ALL
* FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

*AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
3	ALL	88071103	343000.00000	3176200.00000	0.00	0.00	26.93986
3	ALL	88071103	343700.00000	3178300.00000	0.00	0.00	32.25808
3	ALL	88071103	342400.00000	3180600.00000	0.00	0.00	31.67683
3	ALL	88071103	341100.00000	3183400.00000	0.00	0.00	31.38951
3	ALL	88092606	340300.00000	3169800.00000	0.00	0.00	27.99853
3	ALL	88123103	342000.00000	3174000.00000	0.00	0.00	28.97346
3	ALL	88123103	343000.00000	3176200.00000	0.00	0.00	30.18037
3	ALL	88123103	339000.00000	3183400.00000	0.00	0.00	26.90746
3	ALL	88123103	336500.00000	3183400.00000	0.00	0.00	27.34075

ISCST3 (97363): 1989 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 25.00
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
3	ALL	89101424	340700.00000	3171900.00000	0.00	0.00	30.33987
3	ALL	89111506	343000.00000	3176200.00000	0.00	0.00	27.25160
3	ALL	89111506	339000.00000	3183400.00000	0.00	0.00	25.57652
3	ALL	89111506	336500.00000	3183400.00000	0.00	0.00	25.20629

' ISCST3 (97363): 1990 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
' MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 25.00
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
3	ALL	90121421	340700.00000	3171900.00000	0.00	0.00	26.66852
3	ALL	90121603	340700.00000	3171900.00000	0.00	0.00	26.01939

ISCST3 (97363): 1991 CARGILL RIVERVIEW H2SO4 NO 7 MODIFICATION- SO2 PSD CL1 4/23/98
MODELING OPTIONS USED:
CONC RURAL FLAT DFAULT NOCMPL
MAXI-FILE FOR 3-HR VALUES >= A THRESHOLD OF 25.00
FOR SOURCE GROUP: ALL
FORMAT: (1X,I3,1X,A8,1X,I8,2(1X,F13.5),2(1X,F7.2),1X,F13.5)

AVE	GRP	DATE	X	Y	ELEV	FLAG	AVERAGE CONC
3	ALL	91041803	341100.00000	3183400.00000	0.00	0.00	26.60021