PSD APPLICATION FOR THE "B" SULFURIC ACID PLANT
CF INDUSTRIES, INC.
PLANT CITY PHOSPHATE COMPLEX
PLANT CITY, FLORIDA

Prepared For:

CF Industries, Inc.
10608 Paul Buchman Highway
Plant City, Florida 33565

Prepared By:

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

April 2005

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7 Copies – FDEP
2 Copies – CF Industries, Inc.
1 Copies – Golder Associates Inc.

APPLICATION – LONG FORM

Department of
Environmental Protection
Division of Air Resource Management
APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit for a proposed project:
- subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.

Air Operation Permit – Use this form to apply for:
- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

Air Construction Permit & Revised/Renewal Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **CF Industries, Inc.**
2. Site Name: **Plant City Phosphate Complex**
3. Facility Identification Number: **0570005**
4. Facility Location...:
   Street Address or Other Locator: **10608 Paul Buchman Highway**
   City: **Plant City** County: **Hillsborough** Zip Code: **33565**
5. Relocatable Facility? ☐ Yes ☒ No
6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Tom Edwards**
2. Application Contact Mailing Address...
   Organization/Firm: **CF Industries, Inc.**
   Street Address: **P.O. Box Drawer L**
   City: **Plant City** State: **FL** Zip Code: **33567-9007**
3. Application Contact Telephone Numbers...
   Telephone: **(813) 782-1591** ext. Fax: **(813) 788-9126**
4. Application Contact Email Address: **tedwards@cfifl.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	5-18-05
2. Project Number(s):	0570005-031-AC
3. PSD Number (if applicable):	PSD-FL-355
4. Siting Number (if applicable):	

APPLICATION INFORMATION

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

☒ Air construction permit.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.

☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☐ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Application to increase the production rate and modify the "B" Sulfuric Acid Plant. Refer to Part B for detailed description.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
003	"B" Sulfuric Acid Plant	AC1A	$7,500

Application Processing Fee

Check one: ☒ Attached - Amount: $ **$7,500** ☐ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1.	Owner/Authorized Representative Name : **Herschel Morris, Vice President Phosphate Operations/General Manager**
2.	Owner/Authorized Representative Mailing Address... Organization/Firm: **CF Industries, Inc.** Street Address: **P.O. Drawer L** City: **Plant City** State: **FL** Zip Code: **33564**
3.	Owner/Authorized Representative Telephone Numbers... Telephone: **(813) 782-1591** ext. Fax: **(813) 788-9126**
4.	Owner/Authorized Representative Email Address: **hmorris@cfifl.com**
5.	Owner/Authorized Representative Statement: *I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. 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 and all other requirements identified in this application to which the facility is subject. 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 the facility or any permitted emissions unit.* Herschel Morris — Signature 5/16/05 — Date

Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively. ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. ☐ The designated representative at an Acid Rain source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
5. Application Responsible Official Email Address:
6. Application Responsible Official Certification: I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. 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 and all other applicable requirements identified in this application to which the Title V source is subject. 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 the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application. Signature Date

APPLICATION INFORMATION

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**
3.	Professional Engineer Telephone Numbers... Telephone: **(352) 336-5600** ext.**545** Fax: **(352) 336-6603**
4.	Professional Engineer Email Address: **dbuff@golder.com**
5.	Professional Engineer 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.* *(3) If the purpose of this application is to obtain a Title V 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 plan and schedule is submitted with this application.* *(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, 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.* *(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal 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 (signature) 4/1/05 Signature Date (seal) PROFESSIONAL ENGINEER, STATE OF FLORIDA, DAVID A. BUFF, No. 19011

* Attach any exception to certification statement.
** Board of Professional Engineers Certificate of Authorization #00001670

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 388.00 North (km) 3116.00		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) 28/9/57 Longitude (DD/MM/SS) 82/8/27	
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 28	6. Facility SIC(s): 2874
7. Facility Comment : This is a phosphate fertilizer manufacturing facility producing sulfuric acid, phosphoric acid, diammonium phosphate (DAP) and monoammonium phosphate (MAP).			

Facility Contact

1. Facility Contact Name: Tom Edwards
2. Facility Contact Mailing Address... Organization/Firm: CF Industries, Inc. Street Address: P.O. Drawer L City: Plant City State: FL Zip Code: 33564-9007
3. Facility Contact Telephone Numbers: Telephone: (813) 782-1591 ext. Fax: (813) 788-9126
4. Facility Contact Email Address: tedwards@cfifl.com

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I. that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official Email Address:

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
Particulate Matter-Total (PM)	**A**	**N**
Fluoride (FL)	**B**	**N**
Sulfur Dioxide (SO_2)	**A**	**N**
Sulfuric Acid Mist (SAM)	**A**	**N**
Nitrogen Oxides (NO_x)	**A**	**N**
Particulate Matter (PM_{10})	**A**	**N**
Hydrogen Fluoride (H107)	**A**	**N**

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility Wide Cap [Y or N]? (all units)	3. Emissions Unit ID Nos. Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID:**PART B** ☐ Previously Submitted, Date:
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID:**CF-FI-C1** ☐ Previously Submitted, Date:
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date: **8/2003**

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: ☐ Attached, Document ID:_____ ☒ Not Applicable (existing permitted facility)
2.	Description of Proposed Construction or Modification: ☒ Attached, Document ID:**Part B**
3.	Rule Applicability Analysis: ☒ Attached, Document ID:**CF-FI-CC3**
4.	List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
6.	Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.): ☒ Attached, Document ID: **Part B** ☐ Not Applicable
7.	Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.): ☒ Attached, Document ID: **Part B** ☐ Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.): ☒ Attached, Document ID: **Part B** ☐ Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.): ☒ Attached, Document ID: **Part B** ☐ Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable

FACILITY INFORMATION

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)	

Additional Requirements for Title V Air Operation Permit Applications

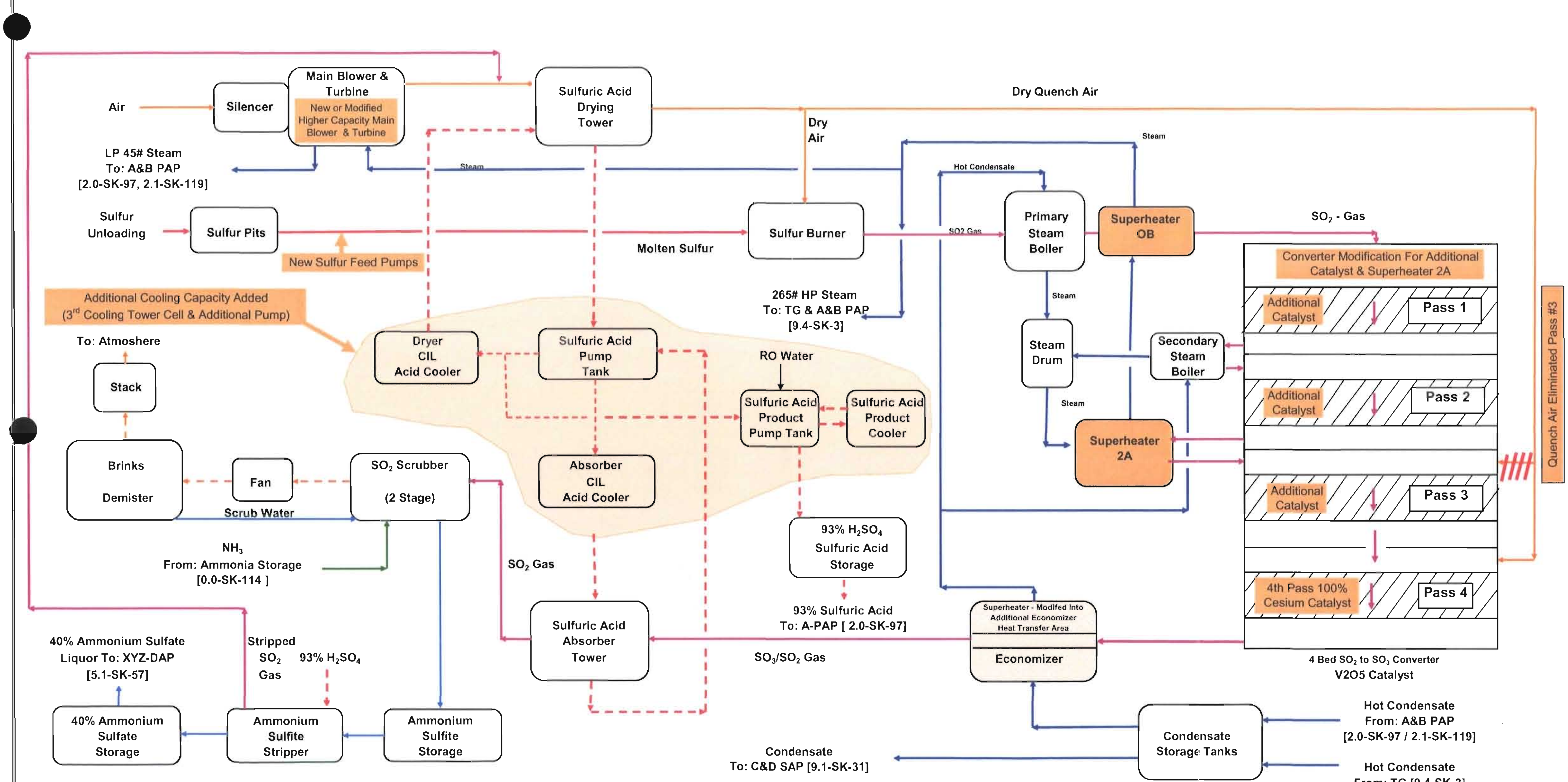
1.	List of Insignificant Activities (Required for initial/renewal applications only): ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)
2.	Identification of Applicable Requirements (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought): ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application with no change in applicable requirements)
3.	Compliance Report and Plan (Required for all initial/revision/renewal applications): ☐ Attached, Document ID:_____ Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.
4.	List of Equipment/Activities Regulated under Title VI (If applicable, required for initial/renewal applications only): ☐ Attached, Document ID:_____ ☐ Equipment/Activities On site but Not Required to be Individually Listed ☐ Not Applicable
5.	Verification of Risk Management Plan Submission to EPA (If applicable, required for initial/renewal applications only) : ☐ Attached, Document ID:_____ ☐ Not Applicable
6.	Requested Changes to Current Title V Air Operation Permit: ☐ Attached, Document ID:_____ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT CF-FI-C1

PROCESS FLOW DIAGRAM

Increased Sulfuric Acid Production B-SAP - Proposed Modifications



Legend		By	Date
Sulfuric Acid	Sulfur	Randy Charlot	8/28/01
Steam/Condensate	Ammonia	Randy Charlot	10/30/02
Process Gas SO_2/SO_3	Scrub Liquor	Randy Charlot	11/3/04
Air	Air + trace SO_2		
Other			

CF Industries, Inc.
Plant City Phosphate Complex
P.O. Drawer L
Plant City, Florida 33564
Phone: (813) 782-1591
Fax: (813) 788-9126

Title	DWR. NO
Attachment CF-FI-C1	
A&B Sulfuric Acid Plants & Ammonium Sulfate	
Process Block Flow Diagram	9.0-SK-86
Proposed B-SAP Upgrades	

90-SK-86.XLS

ATTACHMENT CF-FI-CC3

RULE APPLICABILITY ANALYSIS

ATTACHMENT CF-FI-CC3

RULE APPLICABILITY ANALYSIS

"B" Sulfuric Acid Plant – List of Applicable Rules

40 CFR 60.7 - NSPS – General Provisions – Notification & Recordkeeping
40 CFR 60.8 - NSPS – General Provisions – Performance Tests
40 CFR 60.11 - NSPS – General Provisions – Standards & Maintenance
40 CFR 60.12 - NSPS – Circumvention
40 CFR 60.13(a) – NSPS – Monitoring Requirements
40 CFR 60.13(b) – NSPS – Monitoring Requirements
40 CFR 60.13(c)(2) – NSPS – Monitoring Requirements
40 CFR 60.13(d)(1) – NSPS – Monitoring Requirements
40 CFR 60.13(e)(2) – NSPS – Monitoring Requirements
40 CFR 60.13(f) – NSPS – Monitoring Requirements
40 CFR 60.13(i) – NSPS – Monitoring Requirements
40 CFR 60.13(j) – NSPS – Monitoring Requirements
40 CFR 60.19 – NSPS – General Provisions – General Notification & Reporting
40 CFR 60.82 – NSPS Subpart H – SO_2 Standard
40 CFR 60.83 – NSPS Subpart H – Acid Mist Standard
40 CFR 60.84 – NSPS Subpart H – Emission Monitoring
40 CFR 60.85 – NSPS Subpart H – Test Methods & Procedures
62-204.800(8)(b)11. - Reference to NSPS
62-212.400 – PSD
62-296.402(2) – Sulfuric Acid Plants – New Plants
62-296.402(3) - Sulfuric Acid Plants – Test Methods
62-296.402(4) - Sulfuric Acid Plants – CEM Requirements
62-296.402(5) - Sulfuric Acid Plants – Quarterly Reporting
62-297.310 – General Compliance Test Requirements
62-297.520(2) – Continuous Monitor Performance Specifications – PS2

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ 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.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ 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.

2. Description of Emissions Unit Addressed in this Section:
   "B" Sulfuric Acid Plant (SAP)

3. Emissions Unit Identification Number: **003**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A			**28**	☐ Yes ☒ No

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
   There exists a potential for fugitive emissions of SO_2/NO_X/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

1. Control Equipment/Method(s) Description: **038 – Two-stage Ammonia Scrubber** **014 – Brink's demister**	
2. Control Device or Method Code(s): **038, 014**	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate: **1,600 TPD 100% H_2SO_4**	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **7** days/week **52** weeks/year **8,760** hours/year	
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **"B" SAP**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **110** feet	7. Exit Diameter: **5.0** feet
8. Exit Temperature: **83** °F	9. Actual Volumetric Flow Rate: **88,140** acfm	10. 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 Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: **Flow rate and temperature updated based on the last 2 years (2003 and 2004) of stack test data and maximum production rate of 1,600 TPD 100% H_2SO_4.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Industrial Processes; Chemical Manufacturing; Sulfuric Acid (Contact Process); Absorber @ 99.9% Conversion**		
2. Source Classification Code (SCC): **3-01-023-01**	3. SCC Units: **Tons 100% H_2SO_4 Produced**	
4. Maximum Hourly Rate: **66.67**	5. Maximum Annual Rate: **584,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **Maximum rates based on 1,600 TPD 100% H_2SO_4.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
SO_2	038		EL
SAM	014		EL
NO_X			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **266.7** lb/hour **1,022.0** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **3.5 lb/ton 100% H_2SO_4** Reference: **Proposed BACT (24-hour)**	7. Emissions Method Code: **0**

8. Calculation of Emissions:

3-hour Average: 4.0 lb/ton x 1,600 TPD x 1 day/24 hr = 266.67 lb/hr
24-hour Average: 3.5 lb/ton x 1,600 TPD x 1 day/24 hr = 233.33 lb/hr
Annual: 3.5 lb/ton x 1,600 TPD x 1 day/24 hr x 8,760 hr/yr x 1 ton/2,000 lb = 1,022.0 TPY

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
Potential hourly emissions represent 3-hour average (4.0 lb/ton). The 24-hour average emission rate is 3.5 lb/ton.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **4.0 lb/ton**	4. Equivalent Allowable Emissions: **266.7** lb/hour tons/year
5. Method of Compliance: **Annual stack test using EPA Method 8**	
6. Allowable Emissions Comment (Description of Operating Method): **Represents 3-hour average**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **3.5 lb/ton**	4. Equivalent Allowable Emissions: **233.3** lb/hour **1,022.0** tons/year
5. Method of Compliance: **Continuous SO_2 monitor**	
6. Allowable Emissions Comment (Description of Operating Method): **Represents 24-hour average**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SAM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 6.67 lb/hour 29.2 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.10 lb/ton 100% H_2SO_4 Reference: Proposed BACT Limit	7. Emissions Method Code: 0

8. Calculation of Emissions:

Hourly: 0.10 lb/ton x 1,600 TPD 1 day/24 hr = 6.67 lb/hr
Annual: 6.67 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 29.2 TPY

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.10 lb/ton**	4. Equivalent Allowable Emissions: **6.67** lb/hour **29.2** tons/year
5. Method of Compliance: **Annual stack test using EPA Method 8**	
6. Allowable Emissions Comment (Description of Operating Method): **Proposed BACT**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **NO_X**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **9.3** lb/hour **40.9** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.14 lb/ton 100% H_2SO_4** Reference: **Test Data**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **Hourly: 0.14 lb/ton x 1,600 TPD x 1 day/24 hr = 9.33 lb/hr** **Annual: 0.14 lb/ton x 1,600 TPD x 1 day/24 hr x 8,760 hr/yr x 1 ton/2,000 lb = 40.88 TPY**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: **Emission factor based on test data from similar plants.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **10** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual EPA Method 9 stack test**	
5. Visible Emissions Comment: **Permit No. 0570005-007-AV, Rules 62-296.402(1)(b)1, 62-204.800 (NSPS), F.A.C., and 40 CFR 60.83(a)(2).**	

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor 1of 3

1. Parameter Code: **EM**	2. Pollutant(s): **SO_2**
3. CMS Requirement: ☒ Rule ☐ Other	
4. Monitor Information... Manufacturer: **DuPont** Model Number: **460-002-901** Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **Permit No. 0570005-016-AV, 40 CFR 60.84, and Rule 62-296.402(4), F.A.C.**	

Continuous Monitoring System: Continuous Monitor 2of 3

1. Parameter Code: **Acid Production**	2. Pollutant(s):
3. CMS Requirement: ☒ Rule ☐ Other	
4. Monitor Information... Manufacturer: **Yokogawa AdMag** Model Number: **AE 100** Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **Rule 62-297.310(5)(b), F.A.C., and Permit No. 0570005-016-AV.**	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor 3 of 3

1. Parameter Code: **O_2**	2. Pollutant(s):
3. CMS Requirement: ☒ Rule ☐ Other	
4. Monitor Information... Manufacturer: **Yokogawa** Model Number: **ZR402 G**	Serial Number:
5. Installation Date:	6. Performance Specification Test Date: **02/27/04**
7. Continuous Monitor Comment: **NSPS Subpart H (40 CFR Part 60.84) and Permit No. 0570005-016-AV.**	

Continuous Monitoring System: Continuous Monitor _____ of _____

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

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: See CF-FI-C1 ☐ Previously Submitted, Date _____
2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: Part B ☐ Previously Submitted, Date _____
4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: CF-EU1-I4 ☐ Previously Submitted, Date _____ ☐ Not Applicable (construction application)
5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: CF-EU1-I5 ☐ Previously Submitted, Date _____ ☐ Not Applicable
6. Compliance Demonstration Reports/Records ☐ Attached, Document ID: _____ Test Date(s)/Pollutant(s) Tested: _____ ☐ Previously Submitted, Date: _____ Test Date(s)/Pollutant(s) Tested: _____ ☐ To be Submitted, Date (if known): _____ Test Date(s)/Pollutant(s) Tested: _____ ☒ Not Applicable Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7. Other Information Required by Rule or Statute ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☒ Attached, Document ID: **Part B** ☐ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☒ Attached, Document ID: **Part B** ☐ Not Applicable	
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: _____ ☐ Not Applicable	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: _____ ☐ Not Applicable	
3. Alternative Methods of Operation ☐ Attached, Document ID: _____ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: _____ ☐ Not Applicable	
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID: _____ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date: _____ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date: _____ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date: _____ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date: _____ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date: _____ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date: _____ ☐ Not Applicable	

Additional Requirements Comment

ATTACHMENT CF-EU1-I4

MEMORANDUM OF UNDERSTANDING REGARDING BEST OPERATIONAL START-UP PRACTICES FOR SULFURIC ACID PLANTS

ATTACHMENT CF-EU1-I4

MEMORANDUM OF UNDERSTANDING REGARDING BEST OPERATIONAL START-UP PRACTICES FOR SULFURIC ACID PLANTS (NOT FEDERALLY ENFORCEABLE)

These Sulfuric Acid Plant Best Operation Start-up Practices will be made available in the control room at all times.

1. Only one sulfuric acid plant at a facility should be started up and burning sulfur at a time. There are times when it will be acceptable for more than one sulfuric acid plant to be in the start-up mode at the same time, provided the following condition is met. It is not acceptable to initiate sulfur burning at one sulfuric acid plant when another plant at the same facility is emitting SO_2 at a rate in excess of the emission limits imposed by the permit or rule, as determined by the CEM's emission rates for the immediately preceding 20 minutes.

2. A plant start-up must be at the lowest practicable operating rate, not to exceed 70 percent of the designated operating rate, until the SO_2 monitor indicates compliance. Because production rate is difficult to measure during start-up, if a more appropriate indicator (such as blower pressure, furnace temperature, gas strength, blower speed, number of sulfur guns operating, etc.) can be documented, tested, and validated, the Department will accept this in lieu of directly documenting the operating rate. Implementation requires the development of a suitable list of surrogate parameters to demonstrate and document the reduced operating rate on a plant-by-plant basis. Documentation that the plant is conducting start-up at the reduced rate is the responsibility of the owner or operator.

3. Sulfuric acid plants are authorized to emit excess emissions from start-up for a period of three consecutive hours provided best operational practices, in accordance with this agreement, to minimize emissions are followed. No plant shall be operated (with sulfur as fuel) <u>out</u> of compliance for more than three consecutive hours of start-up. Thereafter, the plant shall be shut down. The plant shall be shut down (cease burning sulfur) if, as indicated by the continuous emission monitoring system, the plant is not in compliance within three hours of start-up. Restart may occur as soon as practicable following any needed repairs or adjustments, provided the corrective action is taken and properly documented.

4. Cold Start-up Procedures
   a. Converter
      (1) The inlet and outlet temperature at the first two masses of catalyst shall be sufficiently high to provide immediate ignition when SO_2 enters the masses. In no event shall the inlet temperature to the first mass be less than 800 degrees Fahrenheit (°F) or the outlet temperature to the first two masses be less than 700°F. These temperatures are the desired temperatures at the time the use of auxiliary fuel is terminated.
      (2) The gas stream entering the converter shall contain SO_2 at the level less than normal, and sufficiently low, to promote catalytic conversion to SO_3.
   b. Absorbing Towers

      The concentration, temperature, and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

5. Warm Restart
   a. Converter

      The inlet and outlet temperatures of the first two catalyst masses should be sufficiently high to ensure conversion. One of the following three conditions must be met:
      (1) The first two catalyst masses inlet and outlet temperatures must be at a minimum of 700°F; or
      (2) Two of the four inlet and outlet temperatures must be greater than or equal to 800°F; or
      (3) The inlet temperature of the first catalyst must be greater than or equal to 600°F and the outlet temperature greater than or equal to 800°F. Also, the inlet and outlet temperatures of the second catalyst must be greater than or equal to 700°F. Failure to meet one of the above conditions requires use of cold start-up procedures. To allow for technological improvements or individual plant conditions, alternative conditions will be considered by the Department in appropriate cases.
   b. Absorbing Towers

      The concentration, temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

ATTACHMENT CF-EU1-I5

CF INDUSTRIES, INC., PLANT CITY PHOSPHATE COMPLEX
"B" SULFURIC ACID PLANT

SULFURIC ACID MIST EMISSIONS PREVENTION PLAN

ATTACHMENT CF-EU1-I5
CF INDUSTRIES, INC., PLANT CITY PHOSPHATE COMPLEX
"B" SULFURIC ACID PLANT

SULFURIC ACID MIST EMISSIONS PREVENTION PLAN

Purpose

Develop an "Acid Mist Control Preventive Maintenance Plan" for the CF Industries, Inc., Plant City Phosphate Complex "B" Sulfuric Acid Plant to ensure mist emissions are maintained within allowable limits. U.S. EPA new source performance standards for sulfur burning sulfuric acid plants set sulfuric acid mist emission limits at 0.15 lb/ton sulfuric acid produced on a one-hour average, and a maximum opacity of 10%. CF Industries has proposed in the PSD application for this plant a sulfuric acid mist emission limit based on past performance of 6.67 lb/hr (0.10 lb/ton) and 29.2 tons per year (TPY).

Background

Sulfuric acid is produced in the "B" Sulfuric Acid Plant using elemental sulfur as the raw material. The sulfur is oxidized (burned in furnace) with dry air to produce sulfur dioxide. The sulfur dioxide is further oxidized (in the converter) to sulfur trioxide. The sulfur trioxide is absorbed (in the absorption tower) into concentrated (nominal 98.5%) sulfuric acid and reacted with free water contained in the acid to form sulfuric acid. The unconverted (residual) sulfur dioxide is removed from the gas to acceptable level in an ammonia-sulfur dioxide scrubbing tower where the sulfur dioxide is absorbed and reacted with ammonia and water to form an ammonium sulfite/bisulfite solution. The scrubbing system exit gas contains some moisture, ammonium sulfite/bisulfite particles, and sulfuric acid mist before being released to atmosphere via the stack.

Upstream of the scrubber, sulfuric acid mist particles are formed in the absorption tower. Large particles, above three microns, are produced from entrainment of liquid droplets from the absorber packing surface. These particles are easily removed in the ammonia-sulfur dioxide scrubbing tower. Small sulfuric acid particles (sulfuric acid mist – less than one micron) are produced by the rapid cooling and condensation of sulfuric acid vapor at the inlet section of the absorption tower by a phenomenon known as "fog formation". These mist particles will pass through the ammonia-sulfur dioxide scrubber relatively untouched and are removed in a Brownian Diffusion high efficiency mist eliminator.

Operational Practices

A number of operational practices can significantly reduce or eliminate generation of fine sulfuric acid mist particles in the absorption tower. The following operational procedures cover normal operating conditions but do not address startup conditions. Startup conditions are specified in Attachment CF-EU1-I4.

1. Drying Tower Operation

   Minimize the amount of water in the sulfuric trioxide gas stream entering the absorption tower by drying of the inlet air to the plant, minimizing acid carryover from the drying tower (decomposes to water and sulfur trioxide on heating), and detecting steam/water leaks (from boilers, superheaters, and economizers) into the gas stream.

   a. Drying Tower – Ensure Good Drying – Maintain sulfuric acid flow at the proper level, acid concentration to the drying tower above 97.5 percent, and acid inlet temperature to the tower below 170 degrees Fahrenheit (°F) to minimize the water partial pressure above the acid (water vapor in the gas leaving the tower); monitor acid concentration, temperature, acid circulating pump current (amps), and acid flow to the drying and absorption towers by instruments.

   b. Drying – Acid Carryover – Monitor the condition and performance of the drying tower entrainment separator to prevent sulfuric acid droplet carryover from the drying tower. Perform a *stick* test of the gas exit from the drying tower to monitor acid droplets in the gas stream on a regular basis – once per week minimum.

   c. Steam/Water Leaks – The economizer is the coldest area in the gas flow path ahead of the absorption tower, so any excessive water vapor in the gas will result in acid condensation in the economizer. Monitor gas side (casing) drains for condensed sulfuric acid on a regular basis – once per shift minimum. *Acid condensate* formation indicates excessive water vapor in the gas stream. When this occurs, further investigation to determine the source of the water entering the gas should follow. Check drying tower acid concentration, temperature, and acid flow. Perform a *stick* test for acid droplet carryover from the drying tower. Check steam equipment for leaks – check gas side vestibule blowdowns for indications of moisture.

2. Absorption Tower Operation

   Operate the absorption tower outside the fog formation region. Operate the absorption tower to maximize sulfur trioxide absorption by maintaining proper acid concentration, temperature, and flow.

   a. Operate Outside Fog Formation Region – Fog formation is dependent on the concentrations of sulfur trioxide, water, and sulfuric acid vapor in the gas stream and the partial pressure of sulfuric acid and water above the acid in the bottom, gas inlet area, of the absorption tower. Operate the plant at acid concentrations above 97.5 percent and at acid temperatures above 160°F to reduce or eliminate fog formation. Monitor the acid concentration and temperature in the control room.

   b. Maximize Sulfur Trioxide Absorption – Maintain sulfur trioxide absorption by maintaining the proper acid flow and acid concentration (above 97.5 percent) to the absorption tower. Monitor the acid circulating pump current (amps), acid flow, and concentration in the control room.

3. *High-Efficiency* Mist Eliminator

   Maintain the water spray wash to the high efficiency mist eliminator elements (water spray at the inlet to the mist eliminator vessel) to saturate the gas and prevent ammonium sulfite/bisulfite/sulfate solids build-up. Build-up could cause restriction (plugging) of the gas passages in the mist eliminator elements, increasing pressure drop and causing excessive particle emissions to the stack.

   a. Water Spray High Efficiency Mist Eliminator – A low mist eliminator gas pressure drops ensures wash spray is effectively saturating the gas and preventing solids build-up on the elements (solids build-up is a slow process). Monitor *high-efficiency mist eliminator's* fan discharge pressure and water flow to the mist eliminator in the control room. Water flow to the sprays is ensured by maintaining a level in the *high-efficiency mist eliminator's* basin and monitoring the pumped flow from the mist eliminator basin to the scrubber.

4. Stack Opacity

   Monitor the integrity of the high-efficiency mist eliminator system. Monitor stack appearance by visual operator inspection on a regular basis (once per shift minimum). High stack opacity may indicate a leak in one of the elements, element flange leak, element seal leg problem, or failure of the glass fiber bed in one or more elements. Optimize operational practices items 1-3 above to minimize mist entering the mist eliminator, until the plant can be shut down and the mist eliminator problem repaired.

Preventive Maintenance Practices

Maintenance inspection and testing during the plants regular maintenance outage (turnaround) ensures proper performance of the high-efficiency mist eliminator system for the next operating period.

During the turnaround the plant is purged, cooled, and inspected, and any required maintenance repairs or replacements are performed. All areas of the plant are inspected. Boilers are inspected and hydrostatically tested for water tightness; towers are inspected, including acid distribution, flow, acid cooling, and entrainment separators; acid pumps are inspected, rebuilt, or in many cases, replaced with a spare; instruments are inspected and calibrated; etc. The high-efficiency mist eliminator system is inspected and elements repaired or replaced as required.

Preventive maintenance tasks to be accomplished during the turnaround are as follows:

1. Inspect High Efficiency Mist Eliminator System – Inspection should include visual inspection of the elements, element-to-tubesheet flange connections, seal legs, and the inlet water spray system.
    a. Visually inspect each mist eliminator vessel and each element for unusual flow area, bulges in the element glass, loose flanges, flanges missing bolts or nuts, element wire failure, etc.
    b. Start inlet water spray and check the spray pattern and flow.
    c. Visually inspect element seal legs for damage.
2. Test System – Perform leak check of Element System – Use high intensity light in each element or use smoke generator (smoke bomb) to detect leaks in the mist eliminator system. Tighten flanges, repair seal legs, repair or replace any leaking or plugged elements as indicated and required.

PART B

PSD REPORT

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LIST OF ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standards
AQRV	air quality related values
acfm	actual cubic feet per minute
AFI	Animal Feed Ingredient
BACT	Best Available Control Technology
CAA	Clean Air Act
CFR	Code of Federal Regulations
CNWA	Chassahowitzka National Wildlife Area
CO	carbon monoxide
DAP	diammonium phosphate
DCP	dicalcium phosphate
DE	diatomaceous earth
dscfm	dry standard cubic feet per minute
EPA	U.S. Environmental Protection Agency
F	fluoride
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FGD	flue gas desulfurization
ft^2	square foot
ft^3	cubic foot
GEP	Good Engineering Practice
gpm	gallons per minute
gr/dscf	grains per dry standard cubic foot
GTSP	granular triple super phosphate
GPM	gallons per minute
H_2O	water
H_2S	hydrogen sulfide
H_2SO_4	sulfuric acid
hr/yr	hours per year
HSH	highest, second-highest

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LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

lb	pound
lb/hr	pounds per hour
lb/ton	pounds per ton
MAP	monoammonium phosphate
MCP	monocalcium phosphate
mg/m^3	milligrams per cubic meter
NO_2	nitrogen dioxide
NO_3	nitric oxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
NSR	new source review
NTU	number of transfer units
P_2O_5	phosphorous pentoxide
PAP	phosphoric acid plant
PA	phosphoric acid
PFS	phosphatic fertilizer solution
PM	particulate matter
PM_{10}	particulate matter less than or equal to 10 micrometers
PSD	prevention of significant deterioration
RACT	Reasonably Available Control Technology
RGCV	reactor-granulator-cooler-equipment vents
SAM	sulfuric acid mist
SiF_4	silicon tetrafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_4	sulfate
TPD	tons per day
TPH	tons per hour
TPY	tons per year
$\mu g/m^3$	micrograms per cubic meter
VOC	volatile organic compound

1.0 INTRODUCTION

CF Industries, Inc. (CF) is proposing to modify the "B" Sulfuric Acid Plant (SAP) at its Plant City Phosphate Complex located in Plant City, Florida. The proposed changes will include improvements to allow the B SAP to produce sulfuric acid (H_2SO_4) at a maximum production rate of 1,600 tons per day (TPD) of 100 percent H_2SO_4. Currently, the B SAP is permitted to produce sulfuric acid at a maximum rate of 1,300 TPD of 100-percent H_2SO_4.

Since the late 1980s, the production rate of phosphoric acid has exceeded the availability of sulfuric acid manufactured onsite at the Plant City Phosphate Complex. One reason is that the B SAP has not been able to attain the current permitted production rate of 1,300 TPD, 100-percent H_2SO_4. Therefore, in order to maximize fertilizer production, purchased sulfuric acid has been imported annually to make up the imbalance. However, the Plant City Complex can no longer purchase sulfuric acid at a reasonable cost. The cost of purchased sulfuric acid has increased, and diammonium phosphate (DAP) and monoammonium phosphate (MAP) cannot be economically manufactured from imported sulfuric acid.

As a result, CF is proposing several improvements to increase production capacity of the B SAP. The production rate increase will be accomplished through several plant improvements related to increasing air flow, increased process cooling, increasing catalyst loading, and utilizing high-efficiency cesium-promoted catalyst in the 4th pass of the converter.

Based on the potential increase in actual emissions of sulfur dioxide (SO_2) and sulfuric acid mist (SAM), the proposed project will constitute a major modification to a major stationary source, and thus trigger new source review (NSR) under the provisions of the prevention of significant deterioration (PSD) regulations.

For each pollutant subject to PSD review, the following analyses are required:

1. Ambient monitoring analysis, unless the net increase in emissions due to the modification causes impacts that are below specified significant impact levels;
2. Application of best available control technology (BACT) for each new or modified emissions unit;
3. Air quality impact analysis, unless the net increase in emissions due to the modification causes impacts which are below specified significant impact levels; and

4. Additional impact analyses (impact on soils, vegetation, visibility), including impacts on PSD Class I areas.

This PSD permit application addresses these requirements and is organized into six additional sections, followed by the appendices. A description of the project, including air emission sources and pollution control equipment, is presented in Section 2.0. A regulatory applicability analysis of the proposed project is presented in Section 3.0. An ambient air monitoring analysis is presented in Section 4.0. The BACT analysis is presented in Section 5.0. The air quality impact analysis and additional impact analyses are presented in Sections 6.0 and 7.0, respectively. Supporting documentation is presented in the appendices.

2.0 PROJECT DESCRIPTION

CF is proposing to modify its B SAP at the Plant City Phosphate Complex to increase the production capacity. The facility is currently operating under Permit No. 0570005-007-AV, issued May 20, 1998. The plant is located south of Zephyrhills and north of Plant City in northeastern Hillsborough County. A plot plan of the facility showing stack locations is presented in Figure 2-1. The following sections describe the project modifications to the B SAP in more detail.

2.1 GENERAL

The Plant City Phosphate Complex operates two Monsanto double-absorption sulfuric acid plants (C and D SAPs) and two Dorr-Oliver single-absorption sulfuric acid plants (A and B SAPs) permitted to produce approximately 8,100 TPD of sulfuric acid. The sulfuric acid is then reacted with phosphate rock to produce phosphoric acid, which in turn is used for DAP and MAP fertilizer production.

Since the late 1980s, the production rate of phosphoric acid at the Plant City Complex has exceeded the availability of onsite manufactured sulfuric acid. Therefore, in order to maximize fertilizer production, up to 316,000 tons per year (TPY) of purchased sulfuric acid has been imported annually to make up the imbalance.

One of the two Dorr-Oliver designed SAPs, the B SAP, was built in 1965 and is identical to the A SAP. The B SAP currently produces approximately 1,150 TPD of 100-percent H_2SO_4. The B SAP is currently permitted to produce 1,300 TPD of 100-percent H_2SO_4. The plant historically has not attained this maximum permitted rate.

The B SAP utilizes single-absorption technology. In the B SAP, molten sulfur is combusted with dry air in the sulfur furnace. The resulting SO_2 gas is catalytically converted (further oxidized) to sulfur trioxide (SO_3) in a 4-bed converter tower. SO_3 is then absorbed in an approximately 98-percent H_2SO_4 stream to form a more concentrated acid in a single-stage absorption tower (final stage of production). Heat generated by the chemical reactions in the sulfur furnace and the 4-bed converter tower is recovered to operate two boilers and an economizer. The process results in emissions of SO_2 and SAM, as well as a small amount of NO_x (nitrogen oxides). Refer to Attachment CF-EU1-I1 in the application form for a flow diagram of the process.

2.2 PROPOSED MODIFICATIONS

The Plant City Complex can no longer purchase sulfuric acid at a reasonable cost. In order to alleviate this problem, CF is proposing to increase the sulfuric acid production capabilities of the B SAP to 1,600 TPD H_2SO_4. The production rate increase will be accomplished through several plant improvements relating to increasing air flow, increased process cooling, increasing catalyst loading, and utilizing high-efficiency cesium-promoted catalyst in the fourth pass of the converter. The specific construction items in the scope of the project include:

- The existing main blower wheel and turbine will be modified or replaced in order to increase plant air flow.
- The existing superheater-economizer will be modified to improve heat transfer.
- In order to accommodate the increased rates, the existing sulfur feed pumps will be replaced with larger capacity pumps.
- The existing converter will be modified to maximize catalyst loading on all passes of the converter.
- The quench air injected after pass 2 will be eliminated. A new superheater will be installed between pass 2 and pass 3 to replace the process gas cooling lost with the removal of quench air.
- A new superheater will be installed after the primary boiler to provide additional cooling capacity. This will facilitate a 15-percent bypass around the boiler and result in a pressure drop savings.
- The No. 4 catalyst bed will be replaced with cesium catalyst. The cesium catalyst is necessary to reduce ammonium sulfate production at the higher sulfuric acid production rates.
- The packing in the Absorption Tower will be replaced with a new design low-pressure drop packing.
- A third cell will be added to the existing cross flow cooling tower. The new cell will increase the existing cooling water system capacity from 10,000 to 15,000 gallons per minute. An additional cooling tower pump will be added, and the existing pumps will be upgraded.

2.2.1 POLLUTION CONTROL EQUIPMENT AND AIR EMISSIONS

SO_2 and SAM emissions are controlled by a two-stage ammonia scrubber and a Brink's demister. The current SO_2 emission limits for the B SAP are 10 pounds per ton (lb/ton), 100 percent H_2SO_4, 303.3 pounds per hour (lb/hr) (hourly average), 238.3 lb/hr (consecutive 12-month average), and 1,003 TPY (consecutive 12-month average). The current SAM emission limits are 0.15 lb/ton of 100 percent H_2SO_4, 1.43 lb/hr (hourly average), 0.83 lb/hr (consecutive 12-month average), and 3.49 TPY (consecutive 12-month average). There is currently no NO_x emission limit.

As part of the proposed project, CF is proposing to reduce permitted SO_2 emissions to 4.0 lb/ton 100 percent H_2SO_4 as a 3-hour average and 3.5 lb/ton as a 24-hour average. These emission rates represent current BACT emission levels.

To achieve the proposed lower SO_2 emission limits of 4.0 lb/ton H_2SO_4 (3-hour average) and 3.5 lb/ton (24-hour average) for the B SAP, CF will need to implement changes to the B SAP. The primary change includes incorporation of cesium catalyst into the fourth pass of the converter, which will increase conversion efficiency while increasing the sulfuric acid production rate. Higher conversion efficiency will allow the B SAP to increase production rates by increasing burner SO_2 concentrations, while at the same time lowering stack SO_2 emissions.

CF is proposing a SAM emission limit of 0.10 lb/ton of 100% H_2SO_4. No new technology will be necessary to meet this limit. The proposed emission limit represents current BACT emission levels.

The current and proposed allowable emission rates for the B SAP are summarized in Table 2-1. The table includes the existing permitted allowable emission rates and the proposed maximum emission rates for SO_2, SAM, and NO_x. The current actual average emissions for 2002 and 2003 from the B SAP are presented in Table 2-2. Refer to Table 2-3 for supportive information.

2.2.2 STACK DATA

Current and future stack geometry and operating data are presented in Table 2-4 for the B SAP. The stack will not be physically modified as part of the proposed project.

2.3 EFFECTS ON OTHER EMISSION UNITS

Due to the proposed modification to the existing B SAP, several other emission units may potentially be affected (i.e., increased production rates or actual emission rates). The following sections describe the other emission units at CF and the potential to be affected by the proposed modifications.

2.3.1 MOLTEN SULFUR HANDLING SYSTEM

The Molten Sulfur Handling System supplies molten sulfur to the SAPs for the production of H_2SO_4. Although the potential amount of H_2SO_4 produced at the B SAP is increasing as part of this project, the Molten Sulfur Handling System is not considered to be affected by the proposed project. CF recently submitted a separate PSD application (C and D SAPs PSD submitted January 2004) to increase the maximum potential molten sulfur throughput from 930,750 TPY to 965,388 TPY as a result of the potential increase in H_2SO_4 production increase at the C and D SAPs. A PSD preconstruction permit was issued for the project on June 1, 2004 (Permit No. 0570005-019-AC/PSD-FL-339). The project is currently under construction. The maximum rate of 965,388 TPY for the Molten Sulfur Handling System contained in the recent PSD permit is the rate needed to support the potential increase in production rate at the B SAP as well. Since the maximum permitted molten sulfur throughput rate will not be increasing, and since the Molten Sulfur Handling System has recently undergone PSD review in a separate application with this maximum rate, the Molten Sulfur Handling System is not considered to be affected by the proposed project.

It is noted that the C and D SAP PSD Permit No. 0570005-019-AC/PSD-FL-339 failed to include the revised throughput for the molten sulfur handling facility. Also, the most recently revised Title V permit (No. 0570005-007-AV) still has the old molten sulfur throughput rate in Section H.1, which is quoted below:

H.1. *Capacity.*

A. *The molten sulfur throughput (defined as sulfur unloaded) for the molten sulfur storage and handling facility shall not exceed 930,750 tons per every consecutive 365 day period. (This is based on maximum daily sulfuric acid production of 7,800 TPD of 100% sulfuric acid covered under separate permits).*

B. *The daily molten sulfur throughput for the molten sulfur storage and handling facility shall not exceed 5,200 tons per day.*

Therefore, it is requested that either Permit No. 0570005-019-AC/PSD-FL-339 be amended to reflect the revised throughput rate, or the "B" SAP permit be issued to include the revised rate.

Suggested wording is provided below:

<u>Capacity</u>

A. *The molten sulfur throughput (defined as sulfur unloaded) for the molten sulfur storage and handling facility shall not exceed 965,388 tons per every consecutive 12-month period. (This is based on maximum daily sulfuric acid production of 8,400 TPD of 100-percent sulfuric acid covered under separate permits).*

B. *The daily molten sulfur throughput for the molten sulfur storage and handling facility shall not exceed 5,200 tons per day.*

2.3.2 TRUCK TRAFFIC

Trucks are used to import molten sulfur and purchased sulfuric acid. However, since the potential sulfuric acid production will be increasing as part of the proposed project, CF will purchase less sulfuric acid in the future. Therefore, fewer trucks will be driven onsite to import purchased sulfuric acid. Furthermore, the potential amount (965,388 TPY) of molten sulfur is not increasing, and therefore there will not be an increase in trucks driven onsite for the delivery of molten sulfur. Therefore, the total truck traffic at the CF Plant City Phosphate Complex will decrease due to the proposed project.

2.3.3 PHOSPHORIC ACID PLANTS AND MAP/DAP PLANTS

As described above, the proposed increase in H_2SO_4 production due to the CF project will replace purchased acid. As a result, increased phosphoric acid or MAP/DAP production in downstream units will not occur due to the proposed project.

In summary, phosphoric acid and MAP/DAP production at the Plant City facility is not dependent on the amount of H_2SO_4 manufactured onsite. Production rates will continue to be dictated by market conditions and CF may import H_2SO_4 to the facility in the future, as conditions warrant, to meet market demands.

Table 2-1. Summary of Current and Proposed Permitted Emission Rates for the B Sulfuric Acid Plant, CF Industries, Plant City

Pollutant & Averaging Time	Current Permit Limits[a]				Proposed Permit Limits[d]			
	Production Rate	Emission Rates			Production Rate	Emission Rates		
	(TPD)	(lb/ton H_2SO_4)	(lb/hr)	(TPY)	(TPD)	(lb/ton H_2SO_4)	(lb/hr)	(TPY)
	1,300				1,600			
SO_2								
Hourly		10	303.3	--		--	--	--
3-Hour		--	--	--		4.0	266.7	--
24-Hour		--	--	--		3.5	233.3	--
Annual		--	238.3 [b]	1,003 [b]		--	--	1,022.0
SAM								
Hourly		0.15	1.43	--		0.10	6.67	--
Annual		--	0.83 [b]	3.49 [b]		--	--	29.2
NO_x								
Annual		[c]	[c]	[c]		0.14	9.33	40.88

[a] Based on Title V Permit No. 0570005-007-AV.

[b] Limits are based on a consecutive 12-month average.

[c] There is currently no permit limit for NO_x.

[d] Based on proposed BACT limits.

Table 2-2. Summary of Past Actual Emission Rates for the B Sulfuric Acid Plant, CF Industries, Plant City

Pollutant	Past Actual Emission Rates (TPY)	(lb/hr)	(g/s)
SO_2			
3-Hour	--	250.0 [a]	31.50
24-Hour	--	195.0 [b]	24.57
Annual	661.3 [c]	--	19.02
SAM			
Hourly	--	0.44 [d]	0.06
Annual	1.87 [c]	--	0.05
NO_x			
Annual	7.70 [c]	--	0.23 [d]

[a] Based on the maximum 3-hour average emissions from CEM data dated 6/19/03.
[b] Based on the maximum 24-hour average emissions from CEM data dated 5/7/04.
[c] Refer to Table 2-3 for derivation of past actual annual emission rates.
[d] Based on the actual annual emissions and actual operating hours for 2003 and 2004.

Table 2-3. Summary of the Past Actual Annual Emission Rates for the B Sulfuric Acid Plant, CF Industries, Plant City

Year	Operating Hours	Production Rate (TPY 100% H_2SO_4)	Annual Emissions (TPY) SO_2	SAM	NO_x
2003	8,298	354,845 [a]	605.01 [a]	1.72 [a]	7.10 [b]
2004	8,678	414,979 [c]	717.65 [c]	2.01 [d]	8.30 [b]
2-Year Average	8,488	--	661.33	1.87	7.70

[a] From the 2003 Annual Operating Report.

[b] Calculated based on the actual annual production rate and 8/25/93 stack test (0.04 lb/ton).

[c] Based on 2004 CEM data.

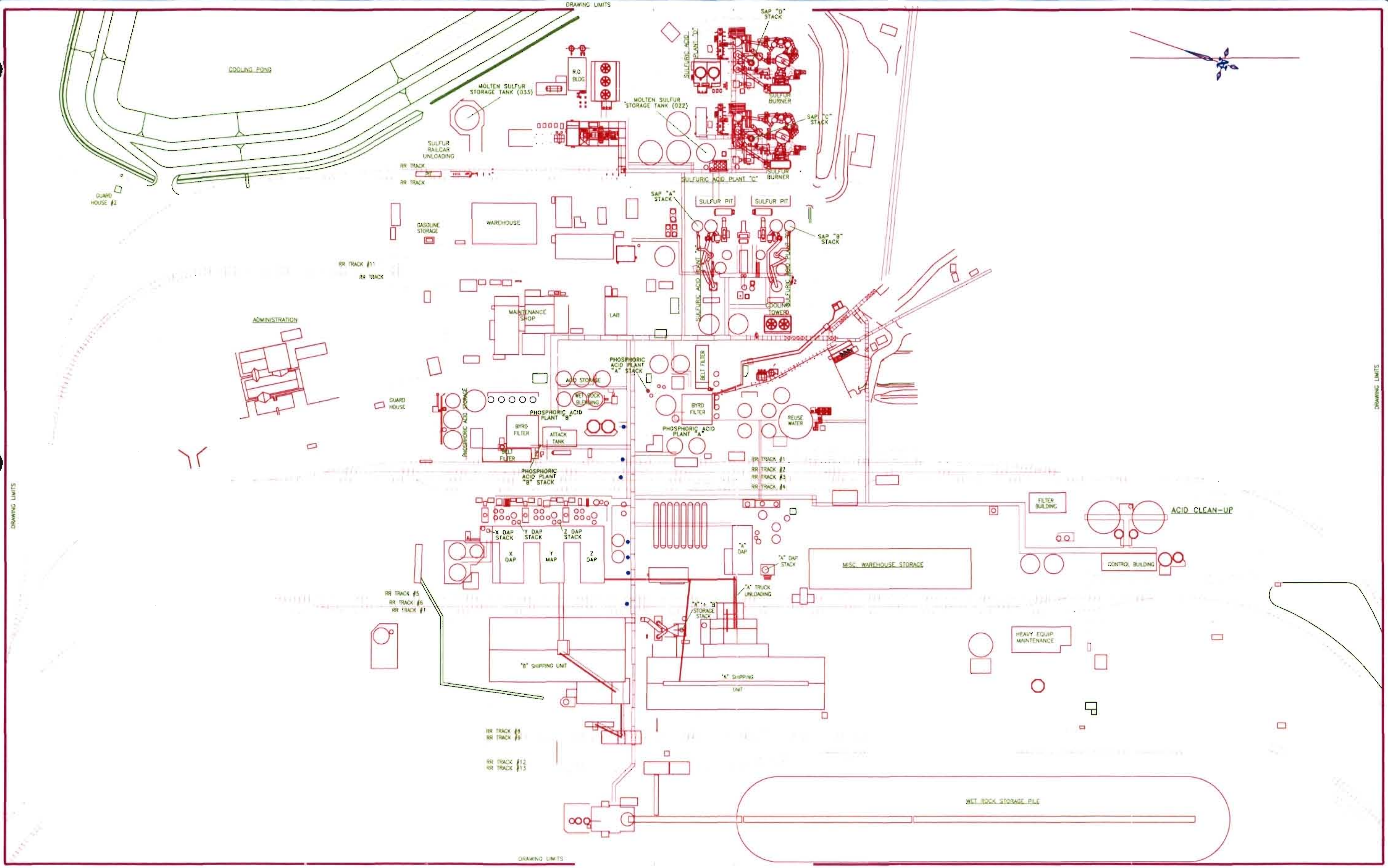
[d] Based on annual H_2SO_4 production rate from 2004 CEM data and SAM emission factor (0.0097 lb/ton) obtained from compliance test data dated 1/13/04.

Table 2-4. Summary of Stack and Operating Parameters and Locations Used in the Significant Impact Modeling Analysis, CF Industries, Plant City

		Relative Location [a]				Stack and Operating Parameters								
		X		Y		Height		Diameter		Flow Rate	Exit Temperature		Velocity	
Emission Unit	ISCST3 ID	ft	m	ft	m	ft	m	ft	m	(acfm)	°F	K	ft/s	m/s
Current Operations														
"B" SAP [b]	SAPBC	-171.6	-52.3	-157.1	-47.9	110	33.53	5.0	1.52	80,950	83	302	68.7	20.94
Future Operations														
"B" SAP [b]	SAPBF	-171.6	-52.3	-157.1	-47.9	110	33.53	5.0	1.52	88,140	83	302	74.8	22.80

[a] Relative to the C SAP stack, true north.

[b] Stack and operating parameters and locations provided in Table 2-4.



For instructions for color plot setup see i:\design\scheds\desi_org.or2

REV. BY	REV. DATE	REV. NO.	REVISION DESCRIPTION
RTN	6/20/96	0	Was dwg no. 0.0-A-011, Changed no., border, & created color plot
			Added AREAS I, II, III, & IV
RTN	10/18/96	1	Corrected offsite images south of Area I & @ Guard House #2
RTN	9/17/97	2	Added RO as built - modified Area I Battery Limits
MWJ	3/04/02	3	General Revisions

JOB NO.	N/A	FILE NAME	D00ZA001
DWG. STATUS	AS BUILT	DWG. BY	CFI
PLOT SCALE	1200	DWG. DATE	6/19/96
PLOT DATE	4/04/02	DWG. SCALE	1" = 100'

CF Industries, Inc.
PLANT CITY PHOSPHATE COMPLEX

AREA LOCATION

FIGURE 2-1 – FACILITY PLOT PLAN

DRAWING NO. D-00-ZA-001 REV. NO. 3

3.0 AIR QUALITY REVIEW REQUIREMENTS

Federal and state air regulatory requirements for a major new or modified source of air pollution are discussed in Sections 3.1 through 3.4. The applicability of these regulations to the proposed CF modification is presented in Section 3.5. These regulations must be satisfied before the proposed project can be approved.

3.1 NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS (AAQS)

The existing applicable national and Florida Ambient Air Quality Standards (AAQS) are presented in Table 3-1. Primary national AAQS were promulgated to protect the public health, and secondary national AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

Florida has adopted state AAQS in Rule 62-204.240, Florida Administrative Code (F.A.C.). These standards are the same as the national AAQS, except in the case of SO_2. For SO_2, Florida has adopted the former 24-hour secondary standard of 260 micrograms per cubic meter ($\mu g/m^3$) and former annual average secondary standard of 60 $\mu g/m^3$.

3.2 PSD REQUIREMENTS

3.2.1 GENERAL REQUIREMENTS

Under federal and state of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a pre-construction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by the U.S. Environmental Protection Agency (EPA). Therefore, PSD approval authority has been granted to the Florida Department of Environmental Protection (FDEP).

A "major facility" is defined as any one of 28 named source categories that have the potential to emit 100 TPY, or more, or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment. Once a new source is determined to be a "major facility" for a particular pollutant, any pollutant emitted in amounts greater than the PSD significant emission rates is subject to PSD review. For an existing source for which a modification is proposed, the modification is subject to PSD review if the net increase in emissions due to the modification is greater than the PSD significant emission rates. The PSD significant emission rates are shown in Table 3-2.

The EPA class designation and allowable PSD increments are presented in Table 3-1. The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or have an impact. Three classifications are designated based on criteria established in the 1990 CAA Amendments. Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres and national parks larger than 6,000 acres) or as Class II (all areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. The state of Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2 increments.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 Code of Federal Regulations (CFR) 52.21, Prevention of Significant Deterioration of Air Quality. The state of Florida has adopted PSD regulations that are equivalent to the federal PSD regulations (Rule 62-212.400, F.A.C.). Major facilities and major modifications are required to undergo the following analyses related to PSD for each pollutant emitted in significant amounts:

1. Control technology review;
2. Source impact analysis;
3. Air quality analysis (monitoring);
4. Source information; and
5. Additional impact analyses.

In addition to these analyses, a new facility must also be reviewed with respect to Good Engineering Practice (GEP) stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 CONTROL TECHNOLOGY REVIEW

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that Best Available Control Technology (BACT) be applied to control emissions from the source. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility exceeds the significant emission rate (see Table 3-2).

BACT is defined in 40 CFR 52.21(b)(12), as:

> *An emissions limitation (including a visible emission standard) based on the maximum degree of reduction of each pollutant subject to regulation under the Act which would be emitted by any proposed major stationary source of major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determination is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant, which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice, or operation and shall provide for compliance by means, which achieve equivalent results.*

BACT was promulgated within the framework of the PSD requirements in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's *Guidelines for Determining Best Available Control Technology (BACT)* (EPA, 1978) and in the PSD *Workshop Manual* (EPA, 1980). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with New Source Performance Standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment by balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

3.2.3 SOURCE IMPACT ANALYSIS

A source impact analysis must be performed for a proposed major source or major modification subject to PSD review and for each pollutant for which the increase in emissions exceeds the PSD significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication *Guideline on Air Quality Models* (EPA, 1980).

To address compliance with AAQS and PSD Class II increments, a source impact analysis must be performed for the criteria pollutants. However, this analysis is not required for a specific pollutant if the net increase in impacts as a result of the new source or modification is below significant impact levels, as presented in Table 3-1. The significant impact levels are threshold levels that are used to determine the level of air impact analyses needed for the project. If the new or modified source's impacts are predicted to be less than significant, then the source's impacts are assumed not to have a significant adverse effect on air quality and additional modeling with other sources is not required. However, if the source's impacts are predicted to be greater than the significant impact levels, additional modeling with other sources is required to demonstrate compliance with AAQS and PSD increments.

EPA has proposed significant impact levels for Class I areas as follows:

SO_2	3-hour	1 μg/m^3
	24-hour	0.2 μg/m^3
	Annual	0.1 μg/m^3
PM_{10}	24-hour	0.3 μg/m^3
	Annual	0.2 μg/m^3
NO_2	Annual	0.1 μg/m^3

Although these levels have not been officially promulgated as part of the PSD review process and may not be binding for states in performing PSD review, the proposed levels serve as a guideline in assessing a source's impact in a Class I area. The EPA action to incorporate Class I significant impact levels in the PSD process is part of implementing the NSR provisions of the 1990 CAA Amendments. Because the process of developing the regulations will be lengthy, EPA believes that the proposed rules concerning the significant impact levels is appropriate to assist states in implementing the PSD permit process.

Various lengths of record for meteorological data can be used for impact analysis. A 5-year period is normally used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The meteorological data are selected based on an evaluation of measured weather data from a nearby weather station that represents weather conditions at the project site. The criteria used in this evaluation include determining the distance of the project site to the weather station; comparing topographical and land use features between the locations; and determining availability of necessary weather parameters.

The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is important because short-term AAQS specify that the standard should not be exceeded at any location more than once per year. If fewer than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, baseline concentration means the ambient concentration level that exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975 for SO_2 and PM_{10} concentrations, or February 8, 1988 for NO_2 concentrations, but that were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and, therefore, affect PSD increment consumption:

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975 for SO_2 and PM_{10} concentrations, and after February 8, 1988 for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975 in the cases of SO_2 and PM_{10}, and February 8, 1988 in the case of NO_2;
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application; and
3. The trigger date, which is August 7, 1977 for SO_2 and PM_{10}, and February 8, 1988 for NO_2.

3.2.4 AIR QUALITY MONITORING REQUIREMENTS

In accordance with requirements of 40 CFR 52.21(m), any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Ambient air monitoring for a period of up to 1 year generally is appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA, 1987a).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that FDEP may exempt a proposed major stationary facility or major modification from the monitoring requirements, with respect to a particular pollutant, if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels presented in Table 3-2.

3.2.5 SOURCE INFORMATION/GEP STACK HEIGHT

Source information must be provided to adequately describe the proposed project. The general type of information required for this project is presented in Section 2.0.

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds Good Engineering Practice (GEP) or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). The FDEP has adopted identical regulations (Rule 62-210.550, F.A.C.). GEP stack height is defined as the highest of:

1. 65 meters (m); or
2. A height established by applying the formula:

$$Hg = H + 1.5L$$

where: Hg = GEP stack height,

H = Height of the structure or nearby structure, and

L = Lesser dimension (height or projected width) of nearby structure(s); or

3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula.

3.2.6 ADDITIONAL IMPACT ANALYSIS

In addition to air quality impact analyses, federal and state of Florida regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21(o) and Rule 62-212.400, F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.3 NONATTAINMENT RULES

Based on the current nonattainment provisions, all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review. A new major facility is required to undergo this review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant.

3.4 EMISSION STANDARDS

3.4.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the CAA Amendments of 1977, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

Federal NSPS exist for facilities producing sulfuric acid (40 CFR 60, Subpart H). The NSPS apply to all facilities constructed or modified after August 17, 1971. Subpart H regulates SO_2 and SAM emissions from sulfuric acid plants.

3.4.2 FLORIDA RULES

The emission limitations of Rule 62-296.402(2) F.A.C., pertain to SO_2 and SAM emissions from sulfuric acid plants.

3.5 SOURCE APPLICABILITY

3.5.1 AREA CLASSIFICATION

The project site is located in Hillsborough County, which has been designated by EPA and FDEP as an attainment or maintenance area for all criteria pollutants. Hillsborough County and surrounding counties are designated as PSD Class II areas for all criteria pollutants. The site is located about 69 km from a PSD Class I area (Chassahowitzka National Wilderness Area).

3.5.2 PSD REVIEW

Pollutant Applicability

The CF Plant City 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 exceed 100 TPY). Therefore, PSD review is required for any pollutant for which the increase in emissions due to the modification is greater than the PSD significant emission rates (see Table 3-2).

The net increase in emissions due to the proposed modification at the facility is shown in Table 3-3. The future potential emissions are based on information from Section 2.0. The past actual emissions for all affected sources are presented in Tables 2-2 and 2-3. As shown, the net increase in emissions exceeds the PSD significant emission rates for SO_2 and SAM. As a result, PSD review applies for these pollutants.

Source Impact Analysis

A source impact analysis was performed for SO_2 and SAM emissions resulting from the proposed modification. This analysis is presented in Section 6.0.

Ambient Monitoring

Based on the increase in emissions from the proposed modification (see Table 3-3), a pre-construction ambient monitoring analysis is required for SO_2 and SAM and monitoring data are required to be submitted as part of the application. However, if the net increase in impacts of a pollutant is less than the applicable *de minimis* monitoring concentration, then an exemption from submittal of pre-construction ambient monitoring data may be obtained [40 CFR 52.21(i)(8)]. In addition, if EPA has not established an acceptable ambient monitoring method for the pollutant, monitoring is not required.

As shown in Table 3-3, the proposed modification's SO_2 impacts are predicted to be below the applicable *de minimis* monitoring concentration for SO_2. As such, an exemption from submittal of pre-construction monitoring data is requested. However, ambient SO_2 monitoring data are provided to estimate non-modeled background concentrations for the modeling analysis. The monitoring data are presented in Section 4.0.

No air monitoring data are presented for SAM, since neither a *de minimis* monitoring level nor an AAQS has been established for this pollutant.

GEP Stack Height Impact Analysis

No existing stacks at the CF facility currently exceed the *de minimis* GEP stack height of 213 feet. In addition, no new stacks are proposed as part of this project. Therefore, the proposed modification will comply with the GEP stack height regulations.

3.5.3 EMISSION STANDARDS

New Source Performance Standards

Subpart H applies to sulfuric acid production plants constructed or modified after August 17, 1971. Since the B SAP produces sulfuric acid and was constructed before August 17, 1971, it is not currently subject to NSPS requirements. However, since the B SAP will be modified after this date, due to the proposed project, it will become subject to NSPS requirements.

The applicable NSPS for sulfuric acid plants (40 CFR 60.82) is 4 lb/ton, 100-percent H_2SO_4 for SO_2 and 0.15 lb/ton, 100-percent H_2SO_4 for SAM. The proposed SO_2 and SAM emission limits will comply with the applicable NSPS limits for the B SAP at CF.

State of Florida Standards

The applicable State of Florida SO_2 and SAM emissions limits for new sulfuric acid plants [Rule 62-296.402(2)] is 4 lb/ton, 100-percent H_2SO_4 of SO_2 and 0.15 lb/ton, 100-percent H_2SO_4 of SAM. The B SAP will comply with the Florida standards contained in Rule 62-296.402(2).

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significant Impact Levels ($\mu g/m^3$)

Pollutant	Averaging Time	AAQS National Primary Standard	AAQS National Secondary Standard	AAQS State of Florida	PSD Increments Class I	PSD Increments Class II	Class II Significant Impact Levels[d]
Particulate Matter[a] (PM_{10})	Annual Arithmetic Mean	50	50	50	4	17	1
	24-Hour Maximum[b]	150[b]	150[b]	150[b]	8	30	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum[e]	365[b]	NA	260[b]	5	91	5
	3-Hour Maximum[b]	NA	1,300[b]	1,300[b]	25	512	25
Carbon Monoxide	8-Hour Maximum[b]	10,000[b]	10,000[b]	10,000[b]	NA	NA	500
	1-Hour Maximum[b]	40,000[b]	40,000[b]	40,000[b]	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone[a]	1-Hour Maximum	235[c]	235[c]	235[c]	NA	NA	NA
	1-Hour Maximum	235	235	NA	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

Note: NA = Not applicable, i.e., no standard exists.
PM_{10} = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.

[a] On July 18, 1997, EPA promulgated revised AAQS for particulate matter and ozone. For particulate matter, $PM_{2.5}$ standards were introduced with a 24-hour standard of 65 $\mu g/m^3$ (3-year average of 98th percentile) and an annual standard of 15 $\mu g/m^3$ (3-year average at community monitors). Implementation of these standards are expected soon. The ozone standard was modified to be 0.08 ppm for 8-hour average; achieved when 3-year average of 99th percentile is 0.08 ppm or less. FDEP has not yet adopted these standards.

[b] Short-term maximum concentrations are not to be exceeded more than once per year except for the PM_{10} AAQS (these do not apply to significant impact levels). The PM_{10} 24-hour AAQS is attained when the expected number of days per year with a 24-hour concentration above 150 $\mu g/m^3$ is equal to or less than 1. For modeling purposes, compliance is based on the sixth highest 24-hour average value over a 5 year period.

[c] Achieved when the expected number of days per year with concentrations above the standard is fewer than 1.

[d] Maximum concentrations.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978; 40 CFR 50; 40 CFR 52.21; Rule 62-204, F.A.C.

Table 3-2. PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	De Minimis Monitoring Concentration[a] ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM(TSP)]	NSPS	25	NA
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
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
Mercury	NESHAP	0.1	0.25, 24-hour
Asbestos	NESHAP	0.007	NM
Vinyl Chloride	NESHAP	1	15, 24-hour
MWC Organics	NSPS	$3.5x10^{-6}$	NM
MWC Metals	NSPS	15	NM
MWC Acid Gases	NSPS	40	NM
MSW Landfill Gases	NSPS	50	NM

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

NA = Not applicable.
NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
$\mu g/m^3$ = micrograms per cubic meter.
MWC = Municipal waste combustor
MSW = Municipal solid waste

[a] Short-term concentrations are not to be exceeded.
[b] No de minimis concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.

Sources: 40 CFR 52.21.
Rule 62-212.400

Table 3-3. PSD Applicability Analysis for the B SAP Project, CF Industries, Plant City

Source Description	Pollutant Emission Rate (TPY)								
	SO_2	NO_x	CO	PM	PM_{10}	VOC	TRS	SAM	Fluoride
Potential Emissions From Modified/Affected Sources[a]									
B Sulfuric Acid Plant	1,022.00	40.88	--	--	--	--	--	29.20	--
Total Potential Emissions	**1,022.00**	**40.88**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**29.20**	**0.00**
Past Actual Emissions from Current Operations[b]									
B Sulfuric Acid Plant	661.30	7.70	--	--	--	--	--	1.87	--
Total Past Actual Emission Rates	**661.30**	**7.70**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.87**	**0.00**
TOTAL CHANGE DUE TO PROPOSED PROJECT	**360.7**	**33.18**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**27.33**	**0.00**
Contemporaneous Emission Changes									
C and D Sulfuric Acid Plants PSD (1/04)	[c]	[c]	**0.00**	**1.43**	**1.43**	**0.92**	**0.48**	[c]	**0.00**
Total Contemporaneous Emission Changes	**0.00**	**0.00**	**0.00**	**1.43**	**1.43**	**0.92**	**0.48**	**0.00**	**0.00**
TOTAL NET CHANGE	**360.7**	**33.2**	**0.0**	**1.4**	**1.4**	**0.9**	**0.5**	**27.33**	**0.0**
PSD SIGNIFICANT EMISSION RATE	40	40	100	25	15	40	10	7	3
PSD REVIEW TRIGGERED?	Yes	No	No	No	No	No	No	Yes	No

Footnotes:

[a] Refer to Table 2-1 for future potential emission calculations.

[b] Refer to Table 2-2 for past actual emissions. Based on average actual emissions for 2003 and 2004.

[c] Denotes that PSD review was triggered, therefore all previous contemporaneous emission changes are wiped clean.

Table 3-4. Predicted Impacts Due to the Proposed Project Compared to Ambient Monitoring *De Minimis* Levels

Pollutant	Averaging Time	Maximum Concentration[a] ($\mu g/m^3$)	*De Minimis* Monitoring Concentration ($\mu g/m^3$)	Ambient Monitoring Review Applies?
Sulfur Dioxide	24-hour	10.4	13	No

[a] Highest concentration from significant impact analysis (see Section 6.0).
Note: NA = Not Applicable

4.0 AMBIENT MONITORING ANALYSIS

4.1 MONITORING REQUIREMENTS

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(5)(f), F.A.C., any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-1). As discussed in Section 3.1, SO_2 and SAM require an air quality analysis to meet PSD pre-construction monitoring requirements for the proposed CF modification.

Ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (1987).

An exemption from the pre-construction ambient monitoring requirements is also available if certain criteria are met. If the predicted increase in ambient concentrations due to the proposed modification is less than specified *de minimis* concentrations, then the modification can be exempted from the pre-construction air monitoring requirements for that pollutant.

The PSD *de minimis* monitoring concentration for SO_2 is 13 $\mu g/m^3$, 24-hour average. The predicted increase in SO_2 concentrations due to the proposed modification only are presented in Section 6.0 and in Table 3-4. Since the maximum predicted increase in SO_2 impacts due to the proposed modification (10.4 $\mu g/m^3$, 24-hour average) is less than the *de minimis* monitoring concentration level of 13 $\mu g/m^3$, 24-hour average, a pre-construction air monitoring analysis is not required for these pollutants. As such, an exemption from submittal of pre-construction monitoring data is requested. However, ambient SO_2 monitoring data are provided to estimate non-modeled background concentrations for the modeling analysis.

4.2 SO_2 AMBIENT MONITORING ANALYSIS

Presented in Table 4-1 is a summary of the existing ambient SO_2 data for monitors located in the vicinity of CF's Plant City facility. Data are presented for 2002, 2003, and 2004. As shown, five SO_2 monitors were operational in the vicinity of the Plant City facility during this period. Three of these stations are located in Hillsborough County and two of these are located in Polk County.

The monitors show that all of the ambient SO_2 concentrations were below the AAQS of 1,300 $\mu g/m^3$, maximum 3-hour average, 260 $\mu g/m^3$, maximum 24-hour average, and 60 $\mu g/m^3$, annual average. For purposes of an ambient SO_2 background concentration for use in the modeling analysis, the highest of the second-highest 24-hour and the highest annual average concentrations occurring over the three-year period from the Plant City Raider Place monitoring station, the closest monitor to the Plant City facility, were selected. These concentrations are 21 and 7.6 $\mu g/m^3$ for the 24-hour and annual averages, respectively. This monitor is likely impacted by several existing point sources that are already included explicitly in the modeling dispersion analysis. As a result, these background concentrations are conservatively high.

Table 4-1. Summary of SO_2 Monitoring Data Collected near CF Industries, Plant City Phosphate Complex

County	Station ID	Monitor Location	Distance From CF Plant City (km)	Year	Number of Observations	Reported Concentration (ug/m^3) Highest 24-Hour	Second-Highest 24-Hour	Highest 3-Hour	Second-Highest 3-Hour	Annual
Hillsborough	12-057-4004	Plant City, One Raider Place	19	2004	6,483	16	13	61	59	5.3
				2003	8,672	24	21	92	71	5.5
				2002	8,696	37	21	113	86	7.6
Polk	12-105-2006	Mulberry, NW 4th Circle	35	2003	3,965	26	24	118	81	11.5
				2002	8,729	39	26	181	107	10.2
Polk	12-105-0010	Mulberry, Anderson Road	36	2004	6,358	43	37	114	106	10.6
				2003	8,282	45	39	118	89	13.1
				2002	8,612	29	26	123	97	10.0
Hillsborough	12-057-0095	Tampa, 5012 Causeway Blvd.	37	2004	6,446	11	11	53	45	5.3
				2003	8,697	47	31	197	186	7.6
				2002	8,477	50	47	283	249	9.4
Hillsborough	12-057-1035	Tampa, Davis Island	41	2004	6,450	37	35	194	114	10.6
				2003	8,718	58	47	139	128	14.7
				2002	8,634	68	63	288	215	17.3

Source: FDEP Quick Look Report, 2003 through 2002.
EPA Air Data Monitor Value Report, 2004.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

5.1 REQUIREMENTS

The 1977 CAA Amendments established requirements for the approval of pre-construction permit applications under the PSD program. As discussed in Section 3.2.2, one of these requirements is that BACT be installed for applicable pollutants. BACT determinations must be made on a case-by-case basis considering technical, economic, energy, and environmental impacts for various BACT alternatives. To bring consistency to the BACT process, the EPA developed the "top-down" approach to BACT determinations.

The first step in a top-down BACT analysis is to determine, for each applicable pollutant, the most stringent control alternative available for a similar source or source category. If it can be shown that this level of control is not feasible on the basis of technical, economic, energy, or environmental impacts for the source in question, then the next most stringent level of control is identified and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any technical, economic, energy, or environmental consideration.

In the case of the proposed project, SO_2 and SAM emissions require a BACT analysis. The B SAP is being modified as part of this project, and therefore is subject to BACT. The BACT analysis is presented in the following sections.

5.2 SULFUR DIOXIDE

5.2.1 PROPOSED CONTROL TECHNOLOGY

The B SAP utilizes single absorption technology. In the B SAP, molten sulfur is combusted with dry air in the sulfur furnace. The resulting SO_2 gas is catalytically converted (further oxidized) to sulfur trioxide (SO_3) in a 4-bed converter tower. SO_3 is then absorbed in an approximately 98-percent H_2SO_4 stream to form a more concentrated acid in a single stage absorption tower (final stage of production). Heat generated by the chemical reactions in the sulfur furnace and the 4-bed converter tower is recovered to operate two boilers, and an economizer.

The B SAP currently utilizes a two-stage ammonia scrubber to control SO_2 emissions. The B SAP will be upgraded by incorporating cesium catalyst into the 4th pass of the converter. Cesium catalyst is similar to the traditional vanadium catalyst except that cesium salts are added to lower the activation temperature and increase SO_2 conversion efficiency. Higher conversion efficiency allows the plants to increase production rates by increasing burner SO_2 concentrations while at the same time lowering stack SO_2 emissions.

The proposed BACT for SO_2 is the continued use of the two-stage ammonia scrubber. The proposed BACT emission limit for SO_2 is 3.5 lb/ton, 100-percent H_2SO_4 as a 24-hour average.

On a 3-hour average, the proposed BACT emission rate is 4.0 lb/ton, 100-percent H_2SO_4, which is the NSPS limit. This higher 3-hour average emission rate is necessary to account for plant process fluctuations and variability.

5.2.2 BACT ANALYSIS

Previous BACT Determinations

A review was performed of previous SO_2 BACT determinations for sulfuric acid plants listed in the RACT/BACT/LAER Clearinghouse on EPA's web page. A summary of these BACT determinations is presented in Table 5-1. Only determinations issued within the last 10 years are shown.

Previous BACT determinations have ranged from 3.5 lb/ton to 4.0 lb/ton, 100-percent H_2SO_4. All of these determinations were for double absorption sulfuric acid plants. The determinations reflective of the lower end of this range were based on a 24-hour averaging time.

Control Technology Feasibility

The technically feasible SO_2 controls for the B SAP are shown in Table 5-2. As shown, there are six types of feasible SO_2 abatement methods. Each available technique is listed with its associated efficiency estimate, identified as feasible or infeasible, and ranked based on control efficiency.

Potential Control Method Descriptions

Sorbent Injection

Sorbent injection has been used on boilers and involves the injection of a dry sorbent into the furnace, economizer, or in the flue gas duct after the preheater where the temperature is about 300 degrees Fahrenheit (°F). In furnace injection, a finely grained sorbent limestone ($CaCO_3$) or hydrated lime [$Ca(OH)_2$] is distributed quickly and evenly over the entire cross section in the upper part of the furnace in a location where the temperature is in the range of 1,380 to 2,280°F. The sorbent reacts with SO_2 and O_2 to form $CaSO_4$. $CaSO_4$ is then captured in a particulate control device together with unused sorbent and fly ash. Temperatures over 2,280°F result in sintering of the surface on the sorbent, destroying the structure of the pores and reducing the active surface area.

In an economizer sorbent injection system, hydrated lime is injected into the flue gas stream near the economizer zone where the temperature is in the range of 570 to 1,200°F. At this temperature, SO_2 reacts with the sorbent to form $CaSO_3$.

In duct sorbent injection the aim is to distribute the sorbent evenly in the flue gas duct after the air preheater, where the temperature is about 300°F. At the same time, the flue gas is humidified with water. As with the furnace and economizer designs, the end products are collected in a particulate control device.

There are many factors that influence the performance of a duct sorbent injection process. These include sorbent reactivity, quantity of injected sorbent, relative humidity of the flue gas, gas and solids residence time in the duct, and quantity of recycled, unreacted sorbent from the particulate control device. The most efficient way of achieving good conditions is to establish a dedicated reaction chamber.

Although demonstrated on boilers, sorbent injection has never been used at a sulfuric acid plant to control SO_2. Nor is there a suitable injection location that would not interfere with the H_2SO_4 recovery process. Therefore, since this is not a proven technique for SO_2 control from a sulfuric acid plant, this technique was not considered further.

Process Modification

The most common process modification control technique applied to sulfuric acid plants is the double-absorption process. In the double-absorption process, SO_2 is formed in the furnace (sulfur burner). The SO_2 is then converted to SO_3 gas in the primary converter stages and is sent to an interpass absorber where most of the SO_3 is removed to form H_2SO_4. The remaining unconverted SO_2 is forwarded to the final stages in the converter to convert much of the remaining SO_2 by oxidation to SO_3, whence it is sent to the final absorber for removal of the remaining SO_3. There are no byproducts or waste scrubbing materials created, only additional sulfuric acid.

SO_2 to SO_3 conversion efficiencies of 99.7 percent and higher are achievable, whereas most single-absorption plants have SO_2 conversion efficiencies ranging from only 95 to 98 percent.

Furthermore, double-absorption permits higher converter inlet SO_2 concentrations than are used in single-absorption plants because the final conversion stages effectively remove any residual sulfur dioxide from the interpass absorber. This type of SO_2 control would require a new converter and a second absorbing tower, to achieve the necessary conversion with the double-absorption process.

Gas Absorption/Wet Scrubbers

Absorption is a mass transfer operation in which one or more soluble components of a gas mixture are dissolved in a liquid that has low volatility under the process conditions. The pollutant diffuses from the gas into the liquid when the liquid contains less than the equilibrium concentration of the gaseous component. The difference between the actual and the equilibrium concentration provides the driving force for absorption. Devices that are based on absorption principles include wet scrubbers such as packed towers, plate columns, venturi scrubbers, and spray chambers. Specific applications of these technologies to sulfuric acid plants are described below.

In cases where very low SO_2 emissions limits are required (i.e., substantially lower than NSPS limits), tail-gas scrubbing in addition to the double-absorption system have been employed. Hydrogen peroxide scrubbing has been employed at sulfuric acid plants. In addition, ammonia scrubbing has been employed at some single-absorption sulfuric acid plants (such as at CF's A and B SAPs).

In hydrogen peroxide scrubbing, dilute sulfuric acid and hydrogen peroxide are circulated over a packed bed countercurrent to the stream of SO_2 containing tail-gas. SO_2 is absorbed in the solution where a rapid, high-yield reaction takes place to produce H_2SO_4. The acid produced in the scrubber becomes part of the plant's total production by blending with high-strength acid in the drying or absorbing towers. Thus, there is no by-product or purge stream to dispose of with this process. Although this technique has been applied to sulfuric acid plants, the high cost of hydrogen peroxide makes this technique economically infeasible.

The ammonia scrubbing process uses anhydrous ammonia (NH_3) and water makeup in a 2-stage scrubbing system to remove SO_2 from acid plant tail gas. Excess ammonium sulfite-bisulfite solution is reacted with sulfuric acid in a stripper to evolve SO_2 gas and produce an ammonium sulfate byproduct solution. The SO_2 is returned to the sulfuric acid plant while the solution is recycled to the MAP/DAP fertilizer production units.

As of 1979, one new plant (two units) and a new unit added to an existing plant were known to employ an ammonia scrubbing system for tail gas SO_2 emissions control. Ammonia scrubbing is the type of SO_2 control that is employed at CF's B SAP.

Molecular sieves are also known as Zeolite traps. Zeolites are naturally occurring rock composed of aluminum, silicon, and oxygen. Zeolite has a natural porosity because it has a crystal structure with windows, cages, and supercages. These internal voids, when engineered to have specific opening size ranges, can trap and hold a variety of molecules which enter the structural matrix. The trapped molecules are held in the cavities by physical and chemical bonding. Zeolites possess properties of attrition resistance, temperature stability, inertness to regeneration techniques, and uniform pore size which make them ideal absorbents. However, they lack the ability to catalyze the oxidation of SO_2 to SO_3 and, thus, cannot desulfurize flue-gases at normal operating temperatures.

Flue Gas Desulfurization

The processes that transform gaseous SO_2 from flue gas to primarily solid sulfur compounds that are collected for safe disposal or beneficial use are referred to as flue gas desulfurization (FGD) processes. Although similar in concept, these processes are characterized as wet or dry, and they differ as to the sorbents used and byproducts produced. Several FGD systems are described below.

Spray dryer FGD is one of the principal methods of SO_2 control used today. Calcium oxide (quick lime) mixed with water produces a calcium hydroxide slurry, which is injected into a spray dryer where it is dried by the hot flue gas and reacts with the gas to remove SO_2. The dry product is collected both at the bottom of the spray tower and in the downstream particulate removal device where more SO_2 may be removed. Pilot testing has indicated that SO_2 removal of 80-90 percent is possible, and over 90 percent removal is possible under certain conditions. However, a fabric filter may have to be added to maintain particulate emission standards. Since this option would require an additional particulate control device, this would be more expensive than the wet scrubbing options. Use of spray dryer FGD in a sulfuric acid plant has not been demonstrated.

The dual alkali SO_2 removal system is a regenerative process designed for disposal of wastes in a solid/slurry form. The process consists of three basic steps: gas scrubbing, a reactor system, and solids dewatering. The scrubbing system utilizes a sodium hydroxide and sodium sulfite solution. Upon absorption of SO_2 in the scrubber, a solution of sodium bisulfite and sodium sulfite is produced. The scrubber effluent containing the dissolved sodium salts is reacted outside the scrubber with lime or limestone to produce a precipitate of calcium salts containing calcium sulfate. The precipitate slurry from the reactor system is dewatered and the solids are deposed of in a landfill. The liquid fraction containing soluble salts is recirculated back to the absorber. Dual alkali systems can achieve efficiencies of 90 to 95 percent.

Wet FGD systems using lime or limestone scrubbing are very popular in the U.S. and are the predominant SO_2 control technology used by the utilities industry, for example. Other wet FGDs include forced or inhibited oxidation and magnesium-enhanced lime FGD. These systems create solid and liquid waste streams, which must be treated before disposal. SO_2 control efficiencies for wet limestone FGD range from 50 to 98 percent, depending on the type of device and design, with an average of 90 percent.

A significant impediment to applying a wet 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 a wet FGD as a control technology. In the PSD permits issued to Cargill Riverview and Piney Point Phosphates in recent years, 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.

Oxidation

SO_2 oxidation with activated carbon is an alternative to double-absorption technology that has been applied to sulfuric acid plants for SO_2 control. In this process, the dry gas leaving the final absorbing tower is humidified then passed through a reactor filled with activated carbon. The activated carbon oxidizes the SO_2 to sulfuric acid, which is retained in the pores of the carbon. Clean but wet tail-gas is discharged to the stack. Periodically, the carbon bed is regenerated by flushing with water. This produces a weak sulfuric acid stream that can be recycled back to the contact plant as dilution water.

One application of this technology is the Centaur process, which uses low-temperature wet carbon catalysis/adsorption in place of the standard final pass and absorption tower. The Centaur process has been demonstrated on a pilot scale at a sulfur burning plant. Emissions as low as 1 lb SO_2 per ton of acid are theoretically possible. However, the process has not yet been optimized and might result in a separate excess weak H_2SO_4 stream (beyond plant water makeup needs), which might require treatment and disposal. Process optimization and building wastewater treatment facilities would delay expansion of the plant. Also, the high cost involved in building, maintenance, and operation of the wastewater treatment facility makes it a less favorable option.

EPA Review of 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 of the sulfuric acid plants built in the United States since 1971 have used the double-absorption process. However, the double-absorption system requires that the plant be constructed for this type of system, and the B SAP is an existing single-absorption plant. Ammonia scrubbing is an effective SO_2 control technique.

5.2.3 ECONOMIC ANALYSIS

To achieve SO_2 emissions below those proposed for the B SAP single-absorption system, conversion from a single-absorption plant to a double-absorption plant or a different type of tail-gas scrubbing would be required. Even though double-absorption has been generally accepted as the best available control technology for new plants, according to the Air Pollution Engineering Manual, converting an existing plant to double-absorption is rarely justified economically. To convert a single-absorption plant to a double-absorption plant, another converter and absorbing tower will have to be added on the tail end of the single absorption plant, which would add considerable capital and operating costs to the present system. The tail-gas scrubbing systems can all achieve the same level of SO_2 control efficiency, and ammonia scrubbing is already employed at CF's B SAP.

To evaluate the cost-effectiveness of converting a single-absorption plant to a double-absorption plant, cost estimates for a converter and absorbing tower were developed. The complete system includes a converter, absorption tower, ancillary equipment, and all installation costs. A capital cost quote by DuPont for two double-absorption plants at Plant City for the price of $16.2 million was used in the analysis. Based on economies of scale, the capital cost to construct only one double-absorption plant on the B SAP was estimated at $10 million. The cost quote was given in 1996, which was converted to 2004 dollars using the U.S. Department of Labor Bureau of Labor Statistics Producer Price Index for Chemical Manufacturing Industry. Also, the cost quote, which was for

1,300 TPD of H_2SO_4 production, was escalated for a 1,600-TPY production capacity. These factors resulted in a capital cost of $14.6 million.

Annual operating costs were developed considering the annualized capital recovery cost and other direct and indirect operating costs, which are based on standard cost factors and engineering estimates. Capital recovery costs are based on an interest rate of 7 percent and a 20-year equipment life. The cost analysis is presented in Table 5-3.

Baseline SO_2 emissions, for the purpose of determining the cost-effectiveness of adding a converter and absorption tower, is based on the proposed allowable SO_2 emissions of 3.5 pounds per ton (lb/ton) of H_2SO_4 produced, which can be achieved by the current single-absorption configuration and the ammonia scrubber control technology. Baseline annual emissions also reflect a production capacity factor. The production capacity factor is the ratio of average actual annual production for 2003 to 2004 and the maximum production capacity (i.e., 1,300 TPD of 100-percent H_2SO_4 at 365 days/yr). If the plant is converted to a double-absorption plant, an SO_2 emission rate of 3.5 lb/ton H_2SO_4 can be achieved without the ammonia scrubber. Assuming an SO_2 removal efficiency of 90 percent, the ammonia scrubber will further reduce the SO_2 emission rate to 0.35 lb/ton H_2SO_4, which is a reduction of 746.1 TPY.

Based on the annualized cost of converting the existing single-absorption plant to a double-absorption plant of $3,050,000 and an additional SO_2 removal of 746.1 TPY, the resulting cost-effectiveness is $4,092 per ton of SO_2 removed. This cost is considered to be unreasonable and infeasible for CF's B SAP.

5.2.4 ENVIRONMENTAL IMPACTS

As shown in Tables 6-12 through 6-15, the maximum predicted SO_2 impacts for the proposed project are below the AAQS and PSD increments. Additional SO_2 control would result in an insignificant reduction of ambient impacts that are already below AAQS and PSD increments.

Some of the technically feasible control techniques have a negative environmental impact due to waste streams created or additional water or energy demands. For instance, SO_2 oxidation can create an excess weak H_2SO_4 stream and requires additional water for flushing of the carbon bed for regeneration. The primary environmental concern of using the wet scrubbing system is the process wastewater or waste sludge which is generated. These waste streams require proper treatment and disposal.

In a single-absorption process sulfuric acid plant, there are no byproducts or waste scrubbing materials produced. Therefore, there is very little environmental impact. The B SAP has a tail gas SO_2 control technology consisting of an ammonia scrubbing system, which produces an ammonium sulfate byproduct solution. The solution is used for the production of phosphate fertilizers and the liquid ammonium sulfate is sent to the MAP/DAP plants. However, the MAP/DAP plants cannot accommodate further increases in ammonium sulfate solution. As a result, any further increase in tail gas SO_2 scrubbing would negatively impact MAP/DAP product quality. Therefore, the excess would create a liquid ammonium sulfate stream, which must be disposed of.

5.2.5 SUMMARY

The proposed BACT for SO_2 for the B SAP is the current single-absorption system with the ammonia scrubber. The proposed annual and 24-hour SO_2 limit is 3.5 lb/ton, 100-percent H_2SO_4, and the proposed 3-hour SO_2 limit is 4.0 lb/ton, 100-percent H_2SO_4. This is consistent with recent BACT determinations at existing plants.

The proposed limit of 3.5 lb/ton on a 24-hour basis is already much more restrictive than the current limit of 10 lb/ton H_2SO_4. CF is required to operate the SAP with some margin or safety factor to compensate for plant variability and upsets to ensure that the emission limit is not exceeded. Thus, a higher 3-hour limit is needed to account for these fluctuations in emissions.

CF's proposed BACT of single-absorption process with ammonia scrubbing tail gas SO_2 control technology is reasonable, based on previous BACT determinations and the high cost of converting the single-absorption to a double-absorption process. Double-absorption has been generally accepted as the BACT for a new plant, but as shown in Table 5-3, it is not cost-effective to convert the existing single-absorption to a double-absorption process. Also, the proposed SO_2 emission limits, with its current single-absorption system with the ammonia scrubber, are consistent with the BACT emission limits of double-absorption plants.

5.3 SULFURIC ACID MIST

5.3.1 PROPOSED CONTROL TECHNOLOGY

CF is proposing the continued use of the Brink's demister to control sulfuric acid mist emissions at the B SAP. The proposed emission limit for the B SAP is 0.10 lb/ton, 100-percent H_2SO_4 produced. The sulfuric acid mist emissions prevention plan to ensure mist emissions are maintained within allowable limits is presented in Attachment CF-EU1-I5.

5.3.2 BACT ANALYSIS

Previous BACT Determinations

As part of the BACT analysis, a review was performed of previous SAM BACT determinations for sulfuric acid plants listed in the RACT/BACT/LAER Clearinghouse on EPA's web page. A summary of the BACT determinations for SAM emissions from sulfuric acid plants is presented in Table 5-4. The SAM emission limits range from 0.10 to 0.15 lb/ton H_2SO_4. All of the previous BACT determinations have been based on mist eliminators.

Control Technology Feasibility

The only known technically feasible add-on SAM controls for sulfuric acid plants are mist eliminators. There are several types of mist eliminators, including conventional packed fiber mist eliminators or demister pads, impaction based mist eliminators, and Brownian-type mist eliminators. These are described in more detail below.

Potential Control Method Descriptions

As previously stated, mist eliminators are the only known add-on SAM controls for sulfuric acid plants. The different types of mist eliminators include the conventional packed fiber mist eliminator or demister pads, impaction based mist eliminators, and Brownian-type mist eliminators.

Acid mist removal from sulfuric acid plant tail gases is accomplished almost exclusively with packed fiber mist eliminators or demister pads. Although a small portion of the SO_3 that leaves the final absorber will be absorbed in fiber mist eliminators and demister pads, SO_3 emission control depends primarily on proper plant operation. A successful packed fiber tubular mist eliminator using treated glass fibers was developed in 1959, known as the Brinks mist eliminator. These devices capture particles using a combination of three different mechanisms: interception, impaction, and Brownian motion. Each mechanism operates most efficiently for a particular particle size. Together, they provide overall collection efficiencies that can exceed 99 percent depending on the inlet mist loading.

Demister pads are mesh pads designed to capture larger mist particles by the interception and impaction mechanisms. Sometimes a coalescing pad is used ahead of the demister pad to provide higher collection efficiency. Demister pads, with or without a coalescer section, are not able to collect submicron particles as efficiently as packed fiber demisters. Successful use of demister pads requires careful control of plant operating parameters to minimize internal mist formation.

Alternatives to the conventional mist eliminator are impaction based devices and Brownian-type devices. The Monsanto CS-type eliminator is an impaction-based product which is stated to remove approximately 100 percent of particles above 3 microns in diameter, and 50 to 95 percent of particles between 0.5 and 3 microns. In order to implement this type of control device, the final tower of a sulfuric acid plant would need to be modified (enlarged) at a considerable expense.

The Brownian-type mist eliminator is much more expensive that the impaction type. To implement this type of control device, the tower would also have to be modified to accommodate the larger size requirements, structural support, etc.

Economic Analysis

Alternative SAM controls are not economically feasible since the use of a different type of mist eliminator would result in very high capital costs since the towers would have to be modified considerably. Furthermore, a significant reduction in SAM emissions would not be achieved by employing an alternative type of mist eliminator, since current actual emissions are already low.

5.3.3 SUMMARY

The proposed BACT for SAM emissions is the use of the existing Brink's demister in the B SAP. The proposed emission limit is 0.10 lb/ton H_2SO_4. This proposed emission limit is reasonable based on previous BACT determinations, and is consistent with currently established BACT, based on recent PSD permits.

A summary of the SAM emissions compliance test data for the B SAP from the last 5 years is presented in Table 5-5. The average for the last 5 years for the B SAP is 0.012 lb/ton H_2SO_4 produced, while the maximum compliance test result was 0.017 lb/ton H_2SO_4 produced. This demonstrates that the mist eliminators are achieving low SAM emission rates.

However, the increased production rate associated with the B SAP may lead to higher SAM emissions compared to historical emission rates. Therefore, a higher SAM emission limit, equal to the lowest BACT determination to date, is proposed as BACT for the B SAP.

In summary, the use of mist eliminators is consistent with all other previous BACT determinations and is reasonable based on current performance and economics.

Table 5-1. Summary of BACT Determinations for Sulfur Dioxide Emissions from Sulfuric Acid Plants

Company Name	State	Permit No./RBLC ID	Permit Issue Date	Throughput	Emission Limit	Control Equipment
CF INDUSTRIES, INC.--PLANT CITY	FL	PSD-FL-339	6/1/2004	2,750 TPD	3.85 LB/TON (3-hr)	DOUBLE ABSORPTION & MIST ELIMINATORS
					3.5 LB/TON (24-hr)	
PCS PHOSPHATE COMPANY	NC	NC-0088	9/24/2003	1,850 TPD	4.0 LB/TON	DOUBLE ABSORPTION CATALYST
IMC PHOSPHATES--NEW WALES	FL	FL-0253	7/12/2002	3,400 TPD	4.0 LB/TON (3-hr)	DOUBLE ABSORPTION SYSTEM
					3.5 LB/TON (24-hr)	
PCS PHOSPHATE COMPANY	NC	NC-0099	7/14/2000	2,000 TPD	4.0 LB/TON	DOUBLE ABSORPTION
CARGILL FERTILIZER	FL	0570008-036-AC/PSD-FL-315	11/21/2001	3,400 TPD	4 LB/TON (3-hr)	DOUBLE ABSORPTION SYSTEM
					3.5 LB/TON (24-hr)	
US AGRI-CHEMICALS CORP.	FL	PSD-FL-278/FL-0237	2/6/2001	3,000 TPD	3.5 LB/TON (24-hr)	DOUBLE ABSORPTION & MIST ELIMINATORS
CARGILL FERTILIZER--RIVERVIEW	FL	0570008-014-AV	4/28/1999	2,700 TPD	4 LB/TON (3-hr)	DOUBLE ABSORPTION
					3.5 LB/TON (24-hr)	DOUBLE ABSORPTION
FARMLAND HYDRO, L. P. (NOW CARGILL GREEN BAY)	FL	1050053-019-AC/FL-0129	3/8/1999	2,750 TPD	3.5 LB/TON (24-hr)	DOUBLE ABSORPTION SCRUBBER/MIST ELIMINATOR
CARGILL FERTILIZER	FL	FL-0197	10/16/1998	3,200 TPD	3.5 LB/TON (24-hr)	DOUBLE ABSORPTION PROCESS
FARMLAND HYDRO, L. P. (NOW CARGILL GREEN BAY)	FL	1050053-019-AC	7/15/1998	250 TPD	401 LB/HR	DOUBLE ABSORPTION SCRUBBER/MIST ELIMINATOR
PINEY POINT PHOSPHATES INC.	FL	FL-0194	2/17/1998	2,000 TPD	4 LB/TON (3-hr)	DOUBLE ABSORPTION
					3.5 LB/TON (48-hr)	DOUBLE ABSORPTION
CARGILL FERTILIZER	FL	AC53-271436/PSD-FL-229	3/7/1995	3,200 TPD	4 LB/TON	DOUBLE ABSORPTION CATALYST /MIST ELIMINATORS

Reference: RACT/BACT/LAER Clearinghouse on EPA's Webpage, 2004.

Table 5-2. SO_2 Control Technology Feasibility Analysis for the B Sulfuric Acid Plant, CF Industries, Plant City

SO_2 Abatement Method	Technique Now Available	Estimated Efficiency	Feasible and Demonstrated? (Y/N)	Rank Based on Control Efficiency	Employed by the B SAP? (Y/N)
Sorbent Injection	Sorbent Furnace Injection	50%	N	5	N
	Sorbent Economiser Injection	50%	N	5	N
	Sorbent Duct Injection	80%	N	4	N
Process Modification	Double-Absorption System	>99.7%	Y	1	N
Gas Absorption/Wet Scrubbers	Ammonia Scrubbing	>90%	Y	3	Y
	Hydrogen Peroxide Scrubbing	>90%	Y	3	N
	Molecular Sieves	>90%	Y	3	N
Flue Gas Desulfurization	Sodium Sulfite-Bisulfite Scrubbing	>90%	Y	3	N
	Lime or Calcium Oxide Spray Dryers	80 - 90%	Y	4	N
	Wet Limestone FGD	50 - 98%	Y	2	N
Oxidation	SO_2 Oxidation with Activated Carbon	>90%	Y	3	N

Table 5-3. Cost Effectiveness of Double Absorption SAP, CF Industries "B" SAP

Cost Items	Cost Factors[a]	Cost ($)
DIRECT CAPITAL COSTS (DCC):		
Purchased Equipment Cost (PEC)		
Converter + Absorption Tower	Engineering Estimate	14,600,000
Instruments and Controls	Included	0
Freight	Included	0
Taxes	6% Sales Tax	876,000
Total PEC:		15,476,000
Direct Installation Costs		
Foundation and Structure Support	Included	0
Handling & Erection	Included	0
Electrical	Included	0
Piping	Included	0
Insulation for ductwork	Included	0
Painting	Included	0
Total Direct Installation Costs		0
Total DCC (PEC + Direct Installation):		15,476,000
INDIRECT CAPITAL COSTS (ICC):		
Engineering	2% of PEC (for excluded items)	309,520
Construction and field expenses	2% of PEC (for excluded items)	309,520
Contractor Fees	2% of PEC (for excluded items)	309,520
Startup	1% of PEC	154,760
Performance test +	1% of PEC	154,760
Contingencies (retrofit cost)	15% of PEC	2,321,400
Total ICC:		3,559,480
TOTAL CAPITAL INVESTMENT (TCI):	DCC + ICC	19,035,480
DIRECT OPERATING COSTS (DOC):		
(1) Operating Labor		
Operator	21 hours/week, $16/hr, 52 weeks/yr	17,472
Supervisor	15% of operator cost	2,621
(2) Maintenance	Engineering estimate, 1% PEC	154,760
(3) Replacement Parts	Engineering estimate, 1% PEC	154,760
(4) Electricity - Operating	$0.06/kWh, 8760 hr/yr	60,000
Total DOC:		389,613
INDIRECT OPERATING COSTS (IOC):		
Overhead	60% of oper. labor & maintenance	104,912
Property Taxes	1% of total capital investment	190,355
Insurance	1% of total capital investment	190,355
Administration	2% of total capital investment	380,710
Total IOC:		866,331
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.0944 times TCI (20 yrs @ 7%)	1,796,949
ANNUALIZED COSTS (AC):	DOC + IOC + CRC	3,052,893
FUTURE MAXIMUM SO_2 EMISSIONS (TPY) :	3.5 lb/ton H_2SO_4; 1600 ton H_2SO_4/day	1,022.0
H_2SO_4 PRODUCTION CAPACITY FACTOR[b]:		0.81
BASELINE SO_2 EMISSIONS (TPY) :	Future SO_2 Emissions x Capacity Factor	829.0
MAXIMUM SO_2 EMISSIONS (TPY) :	90% reduction	82.9
REDUCTION IN SO_2 EMISSONS (TPY):		746.1
COST EFFECTIVENESS:	$ per ton of SO_2 Removed	4,092

Footnotes:

[a] Unless otherwise specified, factors and cost estimates reflect OAQPS Cost Manual, Section 3, Sixth edition.

[b] Production capacity factor is based on the average capacity factor determined from actual annual production during 2003 to 2004.

Table 5-4. Summary of BACT Determinations for Sulfuric Acid Mist Emissions from Sulfuric Acid Plants

Company Name	State	Permit No./RBLC ID	Permit Issue Date	Throughput	Emission Limits	Control Equipment
CF INDUSTRIES, INC.--PLANT CITY	FL	PSD-FL-339	6/1/2004	2,750 TPD	0.10 LB/TON	MIST ELIMINATORS
PCS PHOSPHATE COMPANY	NC	NC-0088	9/24/2003	1,850 TPD	0.10 LB/TON	VERTICAL TUBE MIST ELIMINATORS
IMC PHOSPHATES--NEW WALES	FL	FL-0253	7/12/2002	3,400 TPD	0.10 LB/TON	MIST ELIMINATORS
CARGILL FERTILIZER	FL	0570008-036-AC/PSD-FL-315	11/21/2001	3,400 TPD	0.10 LB/TON	MIST ELIMINATORS
US AGRI-CHEMICALS CORP.	FL	PSD-FL-278/FL-0237	2/6/2001	3,000 TPD	0.12 LB/TON	MIST ELIMINATORS
PCS PHOSPHATE COMPANY	NC	NC-0099	7/14/2000	2,000 TPD	0.15 LB/TON	FIBERGLASS PACKED MIST ELIMINATORS & MESH PAD INSTALLED ON FINAL ABSORPTION TOWER
CARGILL FERTILIZER	FL	0570008-014-AV	4/28/1999	2,700 TPD	0.15 LB/TON	MIST ELIMINATORS
FARMLAND HYDRO, L. P. (NOW CARGILL GREEN BAY)	FL	1050053-019-AC/FL-0129	3/8/1999	2,750 TPD	0.15 LB/TON	MIST ELIMINATORS
CARGILL FERTILIZER	FL	FL-0197	10/16/1998	3,200 TPD	0.12 LB/TON	MIST ELIMINATORS (IMPACTION OR BROWNIAN DIFFUSION)
FARMLAND HYDRO, L. P. (NOW CARGILL GREEN BAY)	FL	1050053-019-AC	7/15/1998	250 TPD	17.2 LB/HR	MIST ELIMINATORS
PINEY POINT PHOSPHATES INC	FL	FL-0194	2/17/1998	2,000 TPD	0.15 LB/TON	MIST ELIMINATORS (BROWNIAN DIFFUSION)
CARGILL FERTILIZER	FL	AC53-271436 / PSD-FL/229	3/7/1995	3,200 TPD	0.15 LB/TON	MIST ELIMINATORS

Reference: RACT/BACT/LAER Clearinghouse on EPA's Webpage, 2004.

Table 5-5. Summary of SAM Emissions Test Data for the B Sulfuric Acid Plant, CF Industries, Plant City

	SAM Emissions	
Date	lb/hr	lb/ton
1/13/2004	0.46	0.010
2/11/03 - 2/12/03	0.43	0.010
2/5/2002	0.58	0.013
11/9/2001	0.42	0.009
1/30/2001	0.74	0.017
Average =	**0.52**	**0.012**

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 GENERAL APPROACH

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's restricted boundaries.

Generally, if the facility undergoing the modification is within 200 kilometers of a PSD Class I area, then a significant impact analysis is also performed to evaluate the impact due to the project alone at the PSD Class I area. Because the Chassahowitzka National Wilderness Area (CNWA) is a PSD Class I area that is located within 200 km of the proposed project, the maximum predicted impacts at the CNWA are compared to EPA's proposed significant impact levels for PSD Class I areas. These recommended levels have never been promulgated as rules, but are the currently accepted criteria for determining whether a proposed project will incur a significant impact on a PSD Class I area.

If the project-only impacts are above the significant impact levels in the vicinity of the facility, then two additional and more detailed air modeling analyses are required. The first analysis demonstrates compliance with federal and Florida ambient air quality standards (AAQS), and the second analysis demonstrates compliance with allowable PSD Class II increments.

If the project-only impacts at the PSD Class I area are above the proposed EPA PSD Class I significant impact levels, then an analysis is performed to demonstrate compliance with allowable PSD Class I impacts at the PSD Class I area. The proposed project's maximum emission increases are also evaluated at the PSD Class I area to support the air quality related values (AQRV) analysis, which includes an evaluation of regional haze degradation.

6.2 SIGNIFICANT IMPACT ANALYSIS

FDEP policies stipulate that the highest annual average and highest short-term concentrations are to be compared to the applicable significant impact levels both in the vicinity of the project and at the PSD Class I area. To develop the maximum short-term and annual 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. Based on the screening modeling analysis results in the vicinity of the project, additional modeling refinements are performed, if necessary, to obtain the maximum concentration with a receptor grid spacing of 100 meters (m) or less.

6.3 AAQS AND PSD CLASS II ANALYSES

For each pollutant for which a significant impact is predicted in the vicinity of the project, AAQS and PSD Class II analyses are required. The AAQS analysis is a cumulative source analysis that evaluates whether the post-project concentrations from all sources will comply with the AAQS. All sources include the post-project source configuration at the project site, the impacts from other nearby facility sources, plus a background concentration to account for sources not included in the modeling analysis.

The PSD Class II analysis is a cumulative source analysis that evaluates whether the post-project PSD increment concentrations for all increment-affecting sources will comply with the allowable PSD Class II increments. This includes the post-project PSD increment-affecting sources at the project site, plus the impacts from all nearby PSD increment-affecting sources at other facilities.

Generally, when using 5 years of meteorological data for the analysis, the highest annual and the highest, second-highest (HSH) short-term (i.e., 24 hours or less) concentrations are compared to the applicable AAQS and allowable PSD increments. [Note that, for determining compliance with the 24-hour AAQS for particulate matter, the sixth highest predicted concentration in 5 years (i.e., H6H), instead of the HSH, is used to compare to the applicable 24-hour AAQS.]

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.

The HSH approach is consistent with AAQS and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

6.4 PSD CLASS I ANALYSIS

For each pollutant for which a significant impact is predicted at the PSD Class I area, a PSD Class I analysis is required. The PSD Class I analysis is a cumulative source analysis that evaluates whether the post-project PSD increment concentrations for all increment-affecting sources within the impact distance of the PSD Class I area will comply with the allowable PSD Class I increments. This includes the post-project PSD increment-affecting sources at the project site, plus the impacts from all PSD increment-affecting sources at other facilities that are within the impact distance of the PSD Class I area.

6.5 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 02035) dispersion model (EPA, 2002) was used to evaluate the pollutant impacts due to the proposed project in areas within 50 km of the CF Plant City facility. This model is maintained by the EPA on its Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network (TTN). A listing of ISCST3 model features is presented in Table 6-1. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological data (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. These areas are referred to as simple terrain. The model can also be applied in areas where the terrain exceeds the stack heights. These areas are referred to as complex terrain.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The ISCST3 model can be executed in the rural or urban land use mode. The land use mode affects stability, dispersion coefficients, wind speed profiles, and mixing heights. Land use can be characterized based on a scheme recommended by EPA (Auer, 1978). If more than 50 percent land use within a 3-km radius around a project site is classified as industrial or commercial, or high-density residential, then the urban option should be selected. Otherwise, the rural option is appropriate. Based on the land use within a 3-km radius of the CF plant site, the rural dispersion coefficients were used in the modeling analysis. Also, since the terrain around the facility is flat to gently rolling, the simple terrain feature of the model was selected.

The ISCST3 model was used to provide maximum concentrations for the annual, 24-, 8-, 3-, and 1-hour averaging times.

For predicting maximum impacts at the CNWA PSD Class I area, the California Puff (CALPUFF) modeling system was used. CALPUFF, Version 5.5 (EPA, 2002), is a Lagrangian puff model that is recommended by the FDEP, in coordination with the Federal Land Manager (FLM) for the CNWA, for predicting pollutant impacts at PSD Class I areas that are beyond 50 km from a project site. A listing of CALPUFF model features is presented in Table 6-2.

6.6 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 the Tampa International Airport in Tampa, Florida, and at Ruskin, Florida, respectively. The 5-year period of meteorological data was from 1991 through 1995. The NWS stations at Tampa and Ruskin are located approximately 45 and 58 km, respectively, west-southwest and south-southwest, respectively, of the CF Plant City site. The surface meteorological data from Tampa are considered to be representative of the project site because both the project site and the weather stations are located in similar climatological areas in west central Florida. They are, therefore, expected to experience similar weather conditions, such as frontal passages and sea-breeze fronts.

During preliminary telephone discussions with the FLM, it was indicated that the use of only 1 year of CALMET meteorological data would no longer be acceptable for a refined CALPUFF modeling analysis, and that multiple years of CALMET data should be used. If the CALMET meteorological data are created using only National Weather Service (NWS) data, then a minimum of 5 years of meteorological data are required. If the NWS data are merged with mesoscale meteorological data (i.e., either MM4 or MM5), the analysis should include a minimum of 3 years of meteorological data. For this project, a refined CALPUFF analysis was performed with mesoscale meteorological data for the following 3 years: 1990 with 80-km MM4 data, 1992 with 80-km MM5 data, and 1996 with 36-km MM5 data. A more detailed discussion of the CALMET wind fields used for the CALPUFF modeling analysis is provided in Appendix A.

6.7 EMISSION INVENTORY

6.7.1 SIGNIFICANT IMPACT ANALYSIS

The current actual and future maximum short-term and annual SO_2 and SAM emission rates for the B SAP that was used in the significant impact analysis are presented in Table 6-3. Stack and operating parameters for the B SAP are presented in Table 2-4, Section 2.0. Current actual short-term SO_2 emission rates were based on continuous emission monitoring (CEM) data. The current short-term SAM emission rate is based on actual 2003 and 2004 emissions averaged over 2003 and 2004 actual hours of operation. Current annual SO_2 and SAM emission rates were based on the average of the 2003 emissions presented in the annual operating reports (AORs) submitted to FDEP and 2004 CEM data. Future maximum SO_2 and SAM emissions were based on the proposed BACT emissions limits (see Table 2-1). Stack and operating data were obtained from previous modeling analyses, and flow rate and temperature were updated based on the last two years of stack test data. All sources were modeled at locations that are relative to the "C" SAP stack location.

6.7.2 AAQS AND PSD CLASS II ANALYSES

Future SO_2 emission rates and stack and operating parameters for all future CF sources that were used in the AAQS and PSD Class II increment analyses are presented in Tables 6-4 and 6-5, respectively. These emission rates and stack and operating parameters were obtained from the C and D SAP PSD application (January 2004).

A listing of background SO_2 sources and their locations relative to the CF Plant City facility is provided in Table 6-6. Facilities located within the SIA were modeled explicity (considered to be the modeling area). Facilities within the SIA plus 50 km were considered to be in the screening area. All facilities in the screening area were evaluated using the North Carolina screening technique. Based on this technique, facilities whose annual (i.e., TPY) emissions are less than the threshold quantity, Q, are eliminated from the modeling analysis. Q is equal to 20 x (D-SIA), where D is the distance in km from the facility to CF, Plant City and SIA is the distance of the proposed project's significant impact area (6.0 km). The SO_2 emitting facilties that were not eliminated in the screening analysis are included in the AAQS and/or PSD Class II analyses.

A detailed listing of the SO_2 background source data that were used for the AAQS and/or PSD Class II increment analyses are presented in Appendix B.

Non-CF Plant City SO_2 source data were obtained from FDEP and were supplemented with current and historical information obtained from Golder.

6.7.3 CF PLANT CITY PSD BASELINE INVENTORY (1974)

A summary of CF's SO_2 sources for the PSD baseline year (1974) is provided in Table 6-7 and the basis of emission calculation is presented in Appendix C. These sources were used along with CF's future SO_2 sources from Table 6-4 and 6-5 to determine the PSD increment consumption concentrations at the PSD Class I area after completion of the proposed project.

6.7.4 PSD CLASS I ANALYSIS

The proposed project's SO_2 impacts were predicted to not exceed the significant impact level at the CNWA PSD Class I area. Therefore, a PSD Class I increment consumption analysis was not required for SO_2. However, the proposed project's emissions of SO_2 were evaluated at the Class I area to support the air quality related values (AQRV) analysis. Also, emissions of SAM and NO_x were evaluated at the Class I area in support of the regional haze analysis, and emissions of SO_2 and SAM were evaluated at the Class I area in support of the sulfur deposition analysis. The AQRV, regional haze, and sulfur deposition analyses are presented in Section 7.0.

6.8 RECEPTOR LOCATIONS

6.8.1 SITE VICINITY

The screening receptor grid used for the site vicinity was comprised of Cartesian receptors and consisted of the following:

- Property boundary receptors, spaced at 50-m intervals;
- Receptors from the property boundary out to 2.0 km, spaced at 100-m intervals;
- Receptors from 2 to 3 km, spaced at 150-m intervals; and
- Receptors from 3 to 5 km, spaced at 500-m intervals.

The modeling origin of the receptor grid was the C SAP stack location, and all source and receptor locations are relative to this location. A plot of the property boundary receptors and building locations are presented in Figures 6-1 and 6-2, respectively.

6.8.2 CLASS I AREA

Maximum SO_2 and SAM concentrations were predicted at the CNWA with the CALPUFF model using 58 discrete receptors located along the border of the CNWA PSD Class I area. Impacts for the proposed project only were compared to the proposed EPA PSD Class I significance levels for SO_2, the regional haze degradation criteria of 5 percent, and the sulfur deposition criteria of 0.01 kg/ha/yr. The SAM impacts were used to assess the proposed project's impacts on the CNWA AQRVs. A listing of the Class I receptors is provided in Table 6-8.

6.9 BUILDING DOWNWASH EFFECTS

All significant building structures within CF's existing plant area were determined by a site plot plan. The plot plan of the CF site was presented in Section 2.0 (Figure 2-1). A total of 18 building structures were evaluated. All structures were processed in 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 6-9. Detailed listing of direction-specific building data used in the air modeling analysis is provided in Appendix D.

6.10 MODEL RESULTS

6.10.1 SIGNIFICANT IMPACT ANALYSIS

A summary of the maximum predicted SO_2 concentrations due to the proposed project only, from the significant impact screening analysis, is presented in Table 6-10. The results from the refined modeling analysis are presented and compared to the significant impact levels in Table 6-11. The maximum predicted concentrations due to the project are above the significant impact levels only for SO_2 for the 24-hour and annual averaging times. As a result, detailed modeling analyses were performed for SO_2.

6.10.2 AAQS ANALYSIS

A summary of the maximum 24-hour and annual average SO_2 concentrations predicted for all sources for the screening analysis is presented in Table 6-12. Based on the screening analysis results, no additional modeling was required since receptor spacing was 100 meters (m) at the location of the maximum predicted impacts.

The results of the modeling analysis for comparison to the AAQS are presented in Table 6-13. The maximum predicted total 24-hour and annual average SO_2 concentrations are 240 and 53 $\mu g/m^3$, respectively, which are below the AAQS of 260 and 60 $\mu g/m^3$, respectively. These maximum concentrations include the appropriate background concentrations discussed in Section 4.0.

6.10.3 PSD CLASS II INCREMENT ANALYSIS

A summary of the maximum 24-hour and annual average SO_2 PSD increment consumption concentrations predicted for all sources for the screening analysis is presented in Table 6-14. Based on the screening analysis results, no additional modeling was required since receptor spacing was 100 m at the location of the maximum predicted impacts.

The results of the modeling analysis for comparison to the PSD Class II increments are presented in Table 6-15. The maximum predicted total 24-hour and annual average SO_2 PSD increment consumption concentrations are 26.1 and less than 0.0 µg/m³, respectively, which are below the PSD Class II increments of 91 and 20 µg/m³, respectively.

6.10.4 SAM IMPACT ANALYSIS

The maximum predicted SAM concentrations for the annual, 24-, 8-, 3-, and 1-hour averaging times due to the proposed project are presented in Table 6-16. There are no AAQS or PSD increments for SAM concentrations. However, SAM impacts are required for the additional impact analysis. At the site vicinity, the maximum predicted annual, 24-, 8-, 3-, and 1-hour SAM concentrations are 0.19, 2.2, 4.3, 6.8, and 13.2 µg/m³, respectively.

6.10.5 PSD CLASS I ANALYSIS

The maximum SO_2 concentrations predicted for the proposed project only at the CNWA PSD Class I area are compared to the EPA's proposed PSD Class I significance levels in Table 6-17. The SO_2 impacts were predicted to be below the significant impact levels for all averaging times. Therefore, a full PSD Class I increment analysis was not performed for SO_2.

The results of the SO_2 and SAM modeling analysis in support of the AQRV, regional haze, and sulfur deposition analyses are presented in Section 7.0.

Table 6-1. Major Features of the ISCST3 Model

ISCST3 Model Features[a]
• 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.

References:

Bowers, J.F., J.R. Bjorklund and C.S. Cheney. 1979. Industrial Source Complex (ISC) Dispersion Model User's Guide. Volume I, EPA-450/4-79-030; Volume II. EPA-450/4-79-031. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

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Huber, A.H. 1977. Incorporating Building/Terrain Wake Effects on Stack Effluents. Preprint Volume for the Joint Conference on Applications of Air Pollution Meteorology, American Meteorological Society, Boston, Massachusetts.

Huber, A.H. and W.H. Snyder. 1976. Building Wake Effects on Short Stack Effluents. Preprint Volume for the Third Symposium on Atmospheric Diffusion and Air Quality, American Meteorological Society, Boston, Massachusetts.

Pasquill, F. 1976. Atmospheric Dispersion Parameters in Gaussian Plume Modeling - Part II. Possible Requirements for Change in the Turner Workbook Values. EPA-600/4-76-030b, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

Schulman, L.L. and J.S. Scire. 1980. Buoyant Line and Point Source (BLP) Dispersion Model User's Guide. Document P-7304B, Environmental Research and Technology, Inc., Concord, MA.

Table 6-1
Water Supply Options
Osprey Energy Center

SOURCES	SITE		RESOURCE		REGULATORY		ENGINEERING/COST	
	Opportunity	Constraint	Opportunity	Constraint	Opportunity	Constraint	Opportunity	Constraint
Groundwater Upper Floridan Aquifer (Base Case)	Available.	None with respect to water quantity.	Sufficient quantity available conditions in vicinity of site.	None	Impact on other users; environmental constraints.	None, if regulatory requirements are met. Lengthy process for obtaining permit.	Accessible by drill rig; well installation required, pumps/hardware required, APT recommended.	Three wells proposed, any two achieve project requirements. The maximum total cost for this alternative (3 wells) is estimated as $0.5M.
Groundwater Upper Floridan Aquifer Combined With Reclaimed Water From City of Auburndale	Available.	None with respect to quantity. Reclaimed water has lower quality.	Groundwater is available at site. Reclaimed water needs to be conveyed to the site via piping. (approximately 1 mile)	No apparent constraints for GW withdrawal. No infrastructure for delivery of reclaimed water.	A good alternative for meeting permitting requirements. Good for water conservation plan.	No apparent constraints Chapter 62-610 F.A.C. requirements (High Disinfection) for reclaimed water.	Groundwater is accessible by drilling. Reclaimed water is accessible by piping	See above. Reclaimed water needs to be delivered at the site. Piping cost is $250,000. UV system upgrading cost is $500,000. Total cost $1,240,000.
Surface Water	None.	Available from Lakes Lena (0.5 miles) and Ariana (1 mile)	Available.	May not be able to withdraw at minimum flow Poorer water quality than potable.	Apparent permitting fatal flaws.	No permit may be granted Lakes are headwater for Peace River.	Accessible by public R.O.W. in distances shown under site category.	Water quality varies with season. Total cost $300,000.
Groundwater Surficial Aquifer System	Available.	Insufficient yield (50,000 gpd/well, max).	Available.	Insufficient yield.	No apparent permitting concerns.	Potential impact on wetland and surface water bodies.	Accessible by drill rig; well installation required, pumps/hardware required, aquifer performance tests (APTs) recommended.	Limited room on site to construct multiple wells (95 wells estimated at 50,000 gpd each 4.788 mgd peak).
Lower Floridan Aquifer (Brackish Water)	Available.	None.	Available.	Water quality is poor.	None.	Pretreatment reject water will require disposal. Difficult to permit deep injection well.	Accessible by drill rig; well installation required, pumps/hardware required, APT recommended.	Three wells (2 operating at a time) to achieve 4.788 mgd estimated peak. The average cost for design, permitting and installation of wells is $700,000. Pilot study, engineering design, permitting installation of the deep well injection is high ($3,900,000).
Municipal Water City of Auburndale	None.	Available from a 12" main along the southern property line.	Available.	Economic constraints Limits by the City.	No apparent permitting fatal flaws.	City's obligation to reserve resources for future development.	Available at the property boundary. Good quality.	Connection fee and impact fee by the city
Reclaimed Water From Winter Haven and Auburndale	None.	No infrastructure to deliver reclaimed water to the site. Site is 10.8 miles from Winter Haven's WWTP.	Available.	No infrastructure Water quality is questionable Winter Haven's WWTP requires upgrades.	Using reclaimed water (i.e. reuse) is encouraged by SWFWMD.	Chapter 62-610 F.A.C. requirements. (High Disinfection) Mixing wastewater from two sources is not well received.	Design and installation of a pipeline.	Permitting for piping system. Difficulties in piping installation. High cost of piping system ($6.1M). Disposal of pretreatment reject is high ($3.9M). Total initial cost $10.0M (not including ROW access, etc.)

Notes:
mgd: million gallons per day
$1.2M: 1.2 million dollars
APT: Aquifer performance test
F.A.C.: Florida Administrative Code
SWFWMD: Southwest Florida Water Management District
gpd: gallons per day
Estimated Costs do not include the operation and maintenance costs.

Table 6-2. Major Features of the CALPUFF Model, Version 5.5

CALPUFF Model Features
• Source types: Point, line (including buoyancy effects), volume, area (buoyant, non-buoyant)
• Non-steady-state emissions and meteorological conditions (time-dependent source and emission data; gridded 3-dimensional wind and temperature fields; spatially-variable fields of mixing heights, friction velocity, precipitation, Monin-Obukhov length; vertically and horizontally-varying turbulence and dispersion rates; time-dependent source and emission data for point, area, and volume sources; temporal or wind-dependent scaling factors for emission rates)
• Efficient sampling function (integrated puff formulation; elongated puff (slug) formation)
• Dispersion coefficient options (Pasquill-Gifford (PG) values for rural areas; McElroy-Pooler values (MP) for urban areas; CTDM values for neutral/stable; direct measurements or estimated values)
• Vertical wind shear (puff splitting; differential advection and dispersion)
• Plume rise (buoyant and momentum rise; stack-tip effects; building downwash effects; partial plume penetration above mixing layer)
• Building downwash effects (Huber-Snyder method; Schulman-Scire method)
• Complex terrain effects (steering effects in CALMET wind field; puff height adjustments using ISC model method or plume path coefficient; enhanced vertical dispersion used in CTDMPLUS)
• Subgrid scale complex terrain (CTSG option) (CTDM flow module; dividing streamline as in CTDMPLUS)
• Dry deposition (gases and particles; options for diurnal cycle per pollutant, space and time variations with a resistance model, or none)
• Overwater and coastal interaction effects (overwater boundary layer parameters; abrupt change in meteorological conditions, plume dispersion at coastal boundary; fumigation; option to use Thermal Internal Boundary Layers (TIBL) into coastal grid cells)
• Chemical transformation options (Pseudo-first-order chemical mechanisms for SO_2, SO_4, HNO_3, and NO_3; Pseudo-first-order chemical mechanisms for SO_2, SO_4, NO, NO_2, HNO_3, and NO_3 (RIVAD/ARM3 method); user-specified diurnal cycles of transformation rates; no chemical conversions)
• Wet removal (scavenging coefficient approach; removal rate as a function of precipitation intensity and type)
• Graphical user interface
• Interface utilities (scan ISCST3 and AUSPLUME meteorological data files for problems; translate ISCST3 and AUSPLUME input files to CALPUFF input files

Note: CALPUFF = California Puff Model

Source: EPA, 2001.

Table 6-3. Summary of Emission Rates Used in the Significant Impact Modeling Analysis, CF Industries, Plant City

Pollutant & Averaging Time	Current Operations				Future Operations[a]				
	Production Rate				Production Rate	Emission Rates			
	(TPD)	(lb/hr)	(TPY)	(g/s)	(TPD)	(lb/ton)[b]	(lb/hr)	(TPY)	(g/s)
	1,300				1,600				
SO_2									
1, 3, and 8-Hour		250 [c]	--	31.5		4.0	266.7	--	33.6
24-Hour		195 [c]	--	24.6		3.5	233.3	--	29.4
Annual		--	661.3 [c]	19.0 [c]		--	--	1,022.0	29.4
SAM									
1, 3, 8, and 24-Hour		0.44 [c]	--	0.055		0.10	6.67	--	0.84
Annual		--	1.87 [c]	0.054 [c]		--	--	29.2	0.84
NO_x									
Annual		--	7.70 [c]	0.23 [c]		0.14	--	40.88	1.18

[a] Refer to Table 2-1.

[b] Pound per ton of H_2SO_4 production.

[c] Based on past actual emission rates shown in Table 2-2.

Table 6-4. Summary of SO_2 Emission Rates from all Future CF Industries, Plant City Phosphate Complex Sources Used in the Modeling Analyses

Source	EU ID	SO_2 Emission Rate 3-Hour lb/hr	3-Hour g/s	24-Hour lb/hr	24-Hour g/s	Annual TPY	Annual g/s
Johnston Scotch Marine Type Boiler [a]	001	46.86	5.90	46.86	5.90	9.37	0.27
A SAP [b]	002	303.3	38.22	303.3	38.22	1,003.00	28.85
B SAP	003	266.7	33.60	233.3	29.40	1,022.00	29.40
C SAP [a]	007	441.15	55.58	401.04	50.53	1,756.56	50.53
D SAP [a]	008	441.15	55.58	401.04	50.53	1,756.56	50.53
A DAP/MAP Plant Dryer [a]	010	13.86	1.75	13.86	1.75	60.71	1.75
Z DAP/MAP Plant Dryer [a]	011	20.79	2.62	20.79	2.62	91.05	2.62
X DAP/MAP/GTSP Plant Dryer [a]	012	24.17	3.05	24.17	3.05	105.86	3.05
Y DAP/MAP/GTSP Plant Dryer [a]	013	24.07	3.03	24.07	3.03	105.44	3.03
Molten Sulfur Storage and Handling System: [a]							
--Storage Tank (022)	022	0.13	0.017	0.13	0.017	0.57	0.017
--Storage Tank (033)	033	0.13	0.017	0.13	0.017	0.57	0.017
--Truck Pit A	023	0.13	0.017	0.13	0.017	0.57	0.017
--Truck Pit B	024	0.13	0.017	0.13	0.017	0.57	0.017
--Railcar Unloading Pit		0.13	0.017	0.13	0.017	0.57	0.017
Total--Molten Sulfur Storage & Handling System		**0.66**	**0.083**	**0.66**	**0.083**	**2.87**	**0.083**

[a] Based on information presented in the *PSD Application for the C and D Sulfuric Acid Plants, CF Industries, Inc., Plant City Phosphate Complex*, Golder Associates Inc., January 2004 (0337620).

[b] Based on Title V Permit No. 0570005-007-AV.

Table 6-5. Summary of Stack and Operating Parameters and Locations for All Future CF Industries, Plant City Phosphate Complex Sources Used in the SO_2 Modeling Analyses

		Relative Location [a]				Stack and Operating Parameters								
		X		Y		Height		Diameter		Flow Rate	Exit Temperature		Velocity	
Emission Unit	ISCST3 ID	ft	m	ft	m	ft	m	ft	m	(acfm)	°F	K	ft/s	m/s
Johnson Scotch Boiler	JSMTB	-405.4	-123.56	85.9	26.17	25	7.62	3.5	1.07	35,566	550	561	61.6	18.78
"A" SAP	SAPA	-244.4	-74.5	58.5	17.82	110	33.53	5.0	1.52	85,500	85	303	72.6	22.12
"B" SAP	SAPB	-171.6	-52.3	-157.1	-47.87	110	33.53	5.0	1.52	88,140	83	302	74.8	22.80
"C" SAP	SAPC	0.0	0.00	0.0	0.00	199	60.66	8.0	2.44	140,700	158	302	46.7	14.22
"D" SAP	SAPD	174.3	53.12	58.9	17.94	199	60.66	8.0	2.44	145,600	161	345	48.3	14.71
"A" DAP/MAP Plant	ADMP	-991.6	-302.23	-368.2	-112.22	80	24.38	10.0	3.05	173,300	137	331	36.8	11.21
"Z" DAP/MAP Plant	ZDMP	-1042.8	-317.86	150.6	45.9	136	41.45	9.0	2.74	169,800	140	333	44.5	13.56
"X" DAP/MAP/GTSP Plant	XDMGP	-1118.7	-340.99	310.3	94.57	136	41.45	9.0	2.74	193,700	134	330	50.7	15.47
"Y" DAP/MAP/GTSP Plant	YDMGP	-1074.8	-327.59	245.1	74.71	136	41.45	9.0	2.74	203,400	135	330	53.3	16.24
Molten Sulfur Storage and Handling System:														
--Storage Tank (022)[b]	MSTK22	-67.27	-20.50	95.4	29.09	38	11.58	2.0	0.61	[e]	212	373.2	-	0.01
--Storage Tank (033)[c]	MSTK33	-204.76	-62.41	654.2	199.39	41	12.50	-	-	[e]	-	-	-	-
--Truck Pit A[b]	MSTPTA	-171.72	-52.34	35.4	10.78	12	3.66	0.67	0.20	[e]	212	373.2	-	0.01
--Truck Pit B[b]	MSTPTB	-125.94	-38.39	-95.5	-29.11	12	3.66	0.67	0.20	[e]	212	373.2	-	0.01
--Railcar Unloading Pit[d]	MSRCUP	-332.32	-101.29	696.5	212.29	0	0.00	-	-	[e]	-	-	-	-

[a] Relative to the C SAP stack, true north.

[b] Source has a rain cap. Modeled with a velocity of 0.01 m/s.

[c] Modeled as a 16.4 x 16.4 m square area source, based on the physical dimensions of the tank.

[d] Modeled as a 3.5 x 19 m area square, based on the physical dimensions of the pit.

[c] Ventilation rate is 30 dscfm.

Table 6-6. Summary of Facilities with SO_2 Emission Sources in the Vicinity of CF Industries, Plant City Phosphate Complex

Facility ID	Facility Name	Facility Location East (km)	Facility Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	SO_2 Emissions Rate (TPY)	Emissions Threshold (Q) [(Dist. - SIA) X 20] [b]	Included in Modeling Analysis?[c] AAQS	Included in Modeling Analysis?[c] PSD Class I and II
Modeling Area [f]											
570005	CF INDUSTRIES, INC., PLANT CITY	388.0	3,116.0	0.0	0.0	NA	0.0	7,520.6	SIA	Yes	Yes
Screening Area [f]											
0570438	FLORIDA GAS TRANSMISSION COMPANY	391.9	3,106.6	3.9	-9.4	157	10.2	5.1	84	No	No
0570370	PARADISE, INC.	388.5	3,099.0	0.5	-17.0	178	17.0	18.6	220	No	No
0570296	INTERNATIONAL PETROLEUM CORP	389.0	3,098.0	1.0	-18.0	177	18.0	111.2	241	No	No
0570320	DART CONTAINER CORPORATION OF FLORIDA	384.9	3,098.2	-3.1	-17.8	190	18.1	0.1	241	No	No
0570076	DELTA ASPHALT	372.1	3,105.4	-15.9	-10.6	236	19.1 [d]	82.1	262	No	No
0570249	ALCOA EXTRUSIONS	385.6	3,097.0	-2.4	-19.0	187	19.2	30.2	263	No	No
0570075	CORONET INDUSTRIES, INC.	393.8	3,096.3	5.8	-19.7	164	20.5	1,160.7	291	Yes	No
0570409	CONIGLIO CONSTRUCTION AND DEMOLITION DEB	368.9	3,104.2	-19.1	-11.8	238	22.5 [d]	1.2	329	No	No
1050004	LAKELAND ELECTRIC - MCINTOSH POWER PLANT	409.0	3,106.2	21.0	-9.8	115	23.2	35,366.8	343	Yes	Yes
1010071	PASCO COGEN LIMITED	385.1	3,139.0	-2.9	23.0	353	23.2	21.0	344	No	No
0570180	FECP/CAST CRETE DIVISION	371.9	3,099.2	-16.1	-16.8	224	23.3	15.0	345	No	No
0570459	BAUSCH&LOMB PHARMACEUTICALS	366.4	3,105.8	-21.6	-10.3	245	23.9	0.1	358	No	No
1050003	LAKELAND ELECTRIC - LARSON POWER PLANT	408.9	3,102.5	20.9	-13.5	123	24.9	12,119.4	378	Yes	Yes
0570460	JAMES HARDIE BUILDING PRODUCTS INC,	387.1	3,089.5	-0.9	-26.5	182	26.5	0.2	410	No	No
7770380	KEARNEY DEVELOPMENT COMPANY	370.0	3,094.8	-18.0	-21.2	220	27.8 [d]	1.6	437	No	No
1050100	SHELL EPOXY RESINS LLC	410.7	3,098.9	22.7	-17.1	127	28.4	83.7	448	No	No
0570006	YUENGLING BREWING CO.	362.0	3,103.2	-26.0	-12.8	244	29.0	14.5	460	No	Yes
7770420	SOUTHERN CRUSHING SERVICES, INC.	364.2	3,098.1	-23.8	-17.9	233	29.8	0.6	476	No	No
0570261	HILLSBOROUGH RESOURCE RECOVERY FAC.	368.2	3,092.7	-19.8	-23.3	220	30.6	770.9	492	Yes	Yes
0570003	CF INDUSTRIES, INC.	362.8	3,098.4	-25.2	-17.6	235	30.7	15.5	495	No	No
0571151	WEYERHAEUSER COMPANY	362.8	3,098.3	-25.2	-17.7	235	30.8	0.2	496	No	No
0570163	GRIFFIN INDUSTRIES	364.1	3,096.4	-23.9	-19.6	231	30.9	2.0	498	No	No
0570119	GULF COAST METALS	364.7	3,093.6	-23.3	-22.4	226	32.3	0.1	526	No	No
1050047	AGRIFOS, L.L.C. - NICHOLS	398.7	3,085.3	10.7	-30.7	161	32.5	2,219.2	530	Yes	Yes
1050056	IMC PHOSPHATES COMPANY - PRAIRIE	402.9	3,087.0	14.9	-29.0	153	32.6	419.1	532	No	No
7771101	WOODRUFF AND SONS INC	364.3	3,093.2	-23.7	-22.8	226	32.9	0.4	538	No	No
0570057	GULF COAST RECYCLING, INC.	364.0	3,093.5	-24.0	-22.5	227	32.9	1,015.0	538	Yes	No
0570061	TAMPA ARMATURE WORKS	365.6	3,091.7	-22.4	-24.3	223	33.0 [d]	0.5	541	No	No
0570321	MANTUA MANUFACTURING CO.	364.7	3,092.5	-23.3	-23.5	225	33.1	1.6	542	No	No
1050182	GEOLOGIC RECOVERY SYSTEMS	401.8	3,085.8	13.8	-30.2	155	33.2	99.8	544	No	No
1050057	IMC PHOSPHATES COMPANY - NICHOLS	398.4	3,084.2	10.4	-31.8	162	33.5	2,065.7	549	Yes	Yes
0571205	STOROPACK, INC.	363.4	3,093.2	-24.6	-22.8	227	33.5	0.0	551	No	No
7775052	WOODRUFF & SONS, INC.	363.6	3,092.3	-24.4	-23.7	226	34.0	0.4	560	No	No
7775053	WOODRUFF & SONS, INC.	363.6	3,092.3	-24.4	-23.7	226	34.0	0.4	560	No	No
7775054	WOODRUFF & SONS, INC.	363.6	3,092.3	-24.4	-23.7	226	34.0	0.3	560	No	No
1050263	POLK CORRECTIONAL INSTITUTION	423.0	3,118.2	35.0	2.2	86	35.1	41.9	581	No	No
1050221	AUBURNDALE POWER PARTNERS, LP	420.8	3,103.3	32.8	-12.7	111	35.2	598.0	583	Yes	Yes
1050298	POLK COUNTY SOLID WASTE DIVISION	418.9	3,098.5	30.9	-17.5	119	35.5	13.5	589	No	No
1050037	SFE CITRUS PROCESSORS, L.P., LTD	421.7	3,104.2	33.7	-11.8	109	35.7	188.8	594	No	No
1050023	CUTRALE CITRUS JUICES USA,INC	421.6	3,103.7	33.6	-12.3	110	35.8	1,693.0	596	Yes	Yes
0570077	VERLITE COMPANY	360.2	3,093.0	-27.8	-23.0	230	36.1	5.0	602	No	No
1050048	CARGILL MULBERRY	406.8	3,085.1	18.8	-30.9	149	36.2	1,705.6	603	Yes	Yes

Table 6-6. Summary of Facilities with SO_2 Emission Sources in the Vicinity of CF Industries, Plant City Phosphate Complex

Facility ID	Facility Name	Facility Location East (km)	Facility Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	SO_2 Emissions Rate (TPY)	Emissions Threshold (Q) [(Dist. - SIA) X 20] [b]	Included in Modeling Analysis?[c] AAQS	Included in Modeling Analysis?[c] PSD Class I and II
1050097	CUSTOM CHEMICALS CORPORATION	408.0	3,085.5	20.0	-30.5	147	36.5	58.9	609	No	No
0570461	BLACKLIDGE EMULSIONS INCORPORATED	359.5	3,093.2	-28.5	-22.8	231	36.5	0.0	610	No	No
0570127	CITY OF TAMPA, MCKAY BAY	360.2	3,092.2	-27.8	-23.8	229	36.6	1,460.9	612	Yes	Yes
1050046	CARGILL FERTILIZER, INC. - BARTOW	409.8	3,086.6	21.8	-29.4	143	36.6	6,101.8	612	Yes	Yes
0570054	SCRAP-ALL, INC.	359.4	3,093.1	-28.6	-22.9	231	36.6	1.0	613	No	No
0570442	GULF MARINE REPAIR CORPORATION	360.3	3,091.9	-27.7	-24.1	229	36.7 [d]	8.4	614	No	No
0570029	NITRAM, INC.	362.5	3,089.0	-25.5	-27.0	223	37.1	0.7	623	No	No
1050059	IMC PHOSPHATES COMPANY- NEW WALES	396.7	3,079.4	8.7	-36.6	167	37.6	14,607.8	632	Yes	Yes
1050007	OWENS-BROCKWAY GLASS CONTAINER INC.	423.4	3,102.8	35.4	-13.2	110	37.8	118.2	636	No	No
0570021	INTERNATIONAL SHIP REPAIR & MARINE SERV.	358.0	3,092.8	-30.0	-23.3	232	37.9 [d]	5.9	639	No	No
0570022	MARATHON ASHLAND PETROLEUM LLC	362.2	3,087.2	-25.8	-28.8	222	38.7	0.0	653	No	No
1050146	PAVEX CORPORATION	413.0	3,086.2	25.0	-29.8	140	38.9	75.0	658	No	No
0570038	TECO - HOOKERS POINT	358.0	3,091.0	-30.0	-25.0	230	39.1	13,519.4	661	Yes	No
1050052	CF INDUSTRIES, INC. - BARTOW	408.3	3,082.5	20.3	-33.5	149	39.2	1,827.0	663	Yes	Yes
0571209	APAC-FLORIDA, INC.	359.9	3,088.1	-28.1	-27.9	225	39.6	57.6	673	No	No
0530017	E.R. JAHNA INDUSTRIES, INC.	386.7	3,155.8	-1.3	39.8	358	39.8	8.4	676	No	No
0570040	TECO - GANNON	360.1	3,087.5	-27.9	-28.5	224	39.9	123,874.5	678	Yes	No
0570089	ST.JOSEPHS HOSPITAL	353.3	3,095.9	-34.7	-20.1	240	40.1	12.3	682	No	No
0571217	SEA 3 OF FLORIDA, INC.	360.1	3,087.1	-27.9	-28.9	224	40.2	0.4	683	No	No
0570041	FLORIDA HEALTH SCIENCES CTR. INC	356.4	3,091.0	-31.6	-25.0	232	40.3	58.6	686	No	No
0570286	TAMPA BAY SHIPBUILDING & REPAIR CO.	358.0	3,089.0	-30.0	-27.0	228	40.4	12.0	687	No	No
0570408	PRODICA LLC	358.4	3,088.4	-29.6	-27.6	227	40.5	7.3	689	No	No
1050090	FLORIDA DISTILLERS	428.0	3,108.1	40.0	-7.9	101	40.8	17.2	695	No	No
0570008	CARGILL FERTILIZER, INC.--RIVERVIEW	362.9	3,082.5	-25.1	-33.5	217	41.9	6,079.0	717	Yes	Yes
1050053	CARGILL GREEN BAY	409.5	3,080.1	21.5	-35.9	149	41.8	6,895.9	717	Yes	Yes
1050216	RIDGE GENERATING STATION, L.P.	427.0	3,100.3	39.0	-15.7	112	42.0	284.7	721	No	No
1010028	OVERSTREET PAVING CO	355.9	3,143.7	-32.1	27.7	311	42.4	113.4	728	No	No
1050217	POLK POWER PARTNERS, L.P.	413.6	3,080.6	25.6	-35.4	144	43.7	436.9	754	No	No
1050231	ORANGE COGENERATION L.P.	418.7	3,083.0	30.7	-33.0	137	45.1	11.0	781	No	No
1010056	PASCO COUNTY RESOURCE RECOVERY	348.8	3,138.8	-39.2	22.8	300	45.3	412.5	786	No	No
0530357	D.A.B. CONSTRUCTORS INC	358.5	3,151.3	-29.5	35.3	320	46.0	14.0	800	No	No
1010373	IPS AVON PARK CORP.	347.0	3,139.0	-41.0	23.0	299	47.0	165.9	820	No	No
1050209	FLORIDA TREATT, INC.	434.8	3,109.2	46.8	-6.8	98	47.3	2.7	826	No	No
0571242	NATIONAL GYPSUM - APOLLO BEACH	363.3	3,075.6	-24.7	-40.4	211	47.4	86.1	827	No	No
1010041	APAC - FLORIDA, INC. -TAMPA DIVISIONON	340.7	3,119.5	-47.3	3.5	274	47.4	157.7	829	No	No
1010027	R.E. PURCELL CONST. CO., INC.	340.6	3,119.2	-47.4	3.2	274	47.5	28.0	830	No	No
PRPSD	BIG BEND TRANSFER CO. L.L.C.	361.1	3,076.2	-26.9	-39.8	214	48.0	15.6	841	No	No
0530004	CITRUS SERVICE, INC.	364.2	3,158.3	-23.8	42.3	331	48.5	137.2	851	No	No
0570039	TECO - BIG BEND	361.9	3,075.0	-26.1	-41.0	212	48.6	846,626.0	852	Yes	Yes
1050055	IMC PHOSPHATES COMPANY - SO. PIERCE	407.5	3,071.4	19.5	-44.6	156	48.7	4,682.6	854	Yes	Yes
0570141	US AIR FORCE (MACDILL AFB)	353.5	3,081.5	-34.5	-34.5	225	48.8	8.9	856	No	No
1050234	FPC - HINES	414.3	3,073.9	26.3	-42.1	148	49.7	184.0	873	No	No
1050233	TECO - POLK POWER STATION	402.5	3,067.4	14.5	-48.7	163	50.8	2,890.5	895	Yes	Yes
0570028	NATIONAL GYPSUM COMPANY	348.8	3,082.7	-39.2	-33.3	230	51.4	347.0	908	No	No
0530040	APAC - FLORIDA, INC. - TAMPA DIVISION	360.0	3,162.0	-28.0	46.0	329	53.8	90.6	957	No	No
0530021	FLORIDA CRUSHED STONE CO., INC.	360.0	3,162.5	-28.0	46.5	329	54.3	3,696.6	966	Yes	Yes

Table 6-6. Summary of Facilities with SO_2 Emission Sources in the Vicinity of CF Industries, Plant City Phosphate Complex

Facility ID	Facility Name	Facility Location East (km)	Facility Location North (km)	Relative Location [a] X (km)	Relative Location [a] Y (km)	Relative Location [a] Direction (deg.)	Relative Location [a] Distance (km)	SO_2 Emissions Rate (TPY)	Emissions Threshold (Q) [(Dist. - SIA) X 20] [b]	Included in Modeling Analysis? [c] AAQS	Included in Modeling Analysis? [c] PSD Class I and II
0530032	CENTRAL POWER & LIME, INC.	360.0	3,162.5	-28.0	46.5	329	54.3	8,563.7	966	Yes	Yes
1030012	FPC - HIGGINS	336.5	3,098.4	-51.5	-17.6	251	54.4	24,803.7	968	Yes	No
1050223	FPC - TIGER BAY	416.3	3,069.3	28.3	-46.7	149	54.6	21.3	972	No	No
1050026	ALCOA ALUMINA AND CHEMICALS, L.L.C.	416.8	3,069.5	28.8	-46.5	148	54.7	93.3	974	No	No
1050051	U.S. AGRI-CHEMICALS CORP. - FT. MEADE	416.0	3,069.0	28.0	-47.0	149	54.7	4,405.5	974	Yes	Yes
0530351	GRUBBS CONSTRUCTION COMPANY	359.8	3,163.0	-28.2	47.0	329	54.8	41.2	976	No	No
Beyond Screening Area Out to 100 km [f]											
1030011	FLORIDA POWER CORP., BARTOW [e]	342.4	3,082.6	-45.6	-33.4	234	56.5	63,539.2	1,010	Yes	Yes
1030473	GULF CENTRAL CREMATORY, INC.	337.1	3,085.6	-50.9	-30.4	239	59.3	0.7	1,066	No	No
1050002	CITRUS WORLD, INC. [e]	441.0	3,087.3	53.0	-28.7	118	60.3	3,982.3	1,085	Yes	Yes
0490015	HARDEE POWER PARTNERS,LTD [e]	404.8	3,057.4	16.8	-58.6	164	61.0	9,693.7	1,099	Yes	Yes
1030132	COOPER COIL COATING, INC.	334.0	3,086.9	-54.0	-29.1	242	61.4	0.1	1,107	No	No
1030117	PINELLAS CO. RESOURCE RECOVERY FAC. [e]	335.2	3,084.1	-52.8	-31.9	239	61.7	3,044.1	1,114	Yes	Yes
1030147	SONNY GLASBRENNER, INC.	334.3	3,085.6	-53.7	-30.4	240	61.7	2.8	1,114	No	No
7770262	ANGELO'S RECYCLED MATERIALS	333.9	3,084.8	-54.1	-31.2	240	62.5	2.8	1,129	No	No
1030288	BAYCARE SERVICES INC	333.1	3,084.4	-54.9	-31.6	240	63.3	0.1	1,147	No	No
0570171	SPEEDLING, INC.	354.1	3,062.2	-33.9	-53.8	212	63.6	30.7	1,152	No	No
1010017	FPC - ANCLOTE [e]	324.4	3,118.7	-63.6	2.7	272	63.7	118,214.4	1,153	Yes	Yes
1030127	METAL CULVERTS	329.1	3,089.1	-58.9	-26.9	245	64.8	9.1	1,175	No	No
0810010	FLORIDA POWER & LIGHT - MANATEE PLANT [e]	367.3	3,054.2	-20.8	-61.8	199	65.2	83,351.4	1,185	Yes	Yes
1030443	LORAD CHEMICAL CORPORATION	336.5	3,074.2	-51.5	-41.8	231	66.3	1.7	1,207	No	No
1030013	FPC - BAYBORO [e]	338.8	3,071.3	-49.2	-44.7	228	66.5	6,848.0	1,209	Yes	Yes
1030026	OVERSTREET PAVING COMPANY, INC.	326.2	3,086.9	-61.8	-29.1	245	68.3	34.2	1,246	No	No
0810067	ATLAS-TRANSOIL, INC.	349.7	3,058.0	-38.3	-58.0	213	69.5	99.9	1,271	No	No
0810001	COASTAL FUELS MARKETING, INC.	348.0	3,057.7	-40.0	-58.3	214	70.7	102.4	1,294	No	No
0810024	FLORIDA POWER & LIGHT - PMS	347.5	3,056.6	-40.5	-59.4	214	71.9	97.3	1,318	No	No
0490043	IPS AVON PARK CORPORATION	408.8	3,044.5	20.8	-71.5	164	74.5	221.2	1,369	No	No
0810007	TROPICANA PRODUCTS, INC.	346.8	3,040.9	-41.2	-75.1	209	85.7	242.0	1,593	No	No

[a] The Proposed Project is located at UTM Coordinates: East 388.0 km; North 3116.0 km

[b] The significant impact area (SIA) determined by modeling equals: 6.0 km

[c] All facilities with emissions of less than 1 TPY were excluded from the modeling.

[d] No source stack and operating parameters; therefore, these sources were not modeled.

[e] Large emissions source (>1,000 TPY) included in modeling analysis that is located outside of the modeling area (SIA + 50 km).

[f] "Modeling Area" is the area in which the Project is predicted to have a significant impact. EPA recommends that all sources within this area be modeled.
"Screening Area" is the area that is 50 km beyond the modeling area. EPA recommends that sources be modeled that are expected to have a significant impact in the modeling area.
"Beyond Screening Area out to 120 km" is the area beyond the screening area and out to 120 km in which only large sources are included in the modeling.

Table 6-7. SO_2 Baseline (1974) Emissions and Stack and Operating Parameters, CF Industries, Plant City (PM/PM_{10} emissions and sources included although not included in this analysis)

Emission Unit	Unit ID	Model ID	Ref.	Stack Locations (m) X	Stack Locations (m) Y	Stack Parameters: Height ft	Height m	Diameter ft	Diameter m	Operating Parameters: Temperature °F	Temperature K	Flow (acfm)	Velocity ft/s	Velocity m/s	Baseline Emissions (lb/hr) PM/PM_{10}	Baseline Emissions (lb/hr) SO_2 (a)
"A" DAP Plant	010	ADAP	1	-302.2	-112.2	100	30.48	10.0	3.05	128	326	126,200	26.8	8.16	4.04	18.42
"X" DAP/MAP/GTSP Plant	012	XDMGP	2	-341.0	94.6	125	38.10	7.3	2.23	110	316	175,000	69.7	21.24	5.08	27.43
"Y" GTSP Plant	013	YGTSP	3	-327.6	74.7	125	38.10	7.3	2.23	110	316	112,400	44.8	13.64	5.08	18.34
"Z" DAP/GTSP Plant	011	ZDGP	2	-317.9	45.9	125	38.10	7.3	2.23	110	316	175,000	69.7	21.24	5.08	18.34
"A" and "B" Storage Buildings and Shipping Facilities	014	ABSTO	4	-365.0	-66.9	85.5	26.06	9.0	2.74	80	300	175,000	45.8	13.97	2.61	--
"A" Shipping Baghouse	015	ASBAG	5	(g)	(g)	90	27.43	1.7	0.52	110	316	8,500	62.4	19.02	0.42	--
"B" Shipping Baghouse	016	BSBAG	5	(g)	(g)	35	10.67	2.0	0.61	120	322	10,000	53.1	16.17	0.42	--
"B" Truck Loading	018	BTLOD	6												0.32	--
"B" Railcar Loading	019	BRLOD	6												0.32	--
"A" Sulfuric Acid Plant with Ammonia Scrubber	002	SAPA	7	-74.5	17.8	80	24.38	5.0	1.52	98	310	73,300	62.2	18.96	--	416.7
"B" Sulfuric Acid Plant with Ammonia Scrubber	003	SAPB	7	-52.3	-47.9	80	24.38	5.0	1.52	96	309	80,600	68.4	20.85	--	416.7
"C" Sulfuric Acid Plant Double Absorption	007	SAPC	8	0.0	0.0	199	60.66	8.0	2.44	150	339	103,900	34.5	10.50	--	250.0
"D" Sulfuric Acid Plant Double Absorption	008	SAPD	9	53.1	17.9	199	60.66	8.0	2.44	150	339	83,600	27.7	8.45	--	250.0
Sulfur Storage and Handling (b)	--	PITSTANK	10	--	--	--	--	--	--	--	--	--	--	--	0.08	0.33
-A Sulfur Truck Pit	023	PITSTANK	10	-52.3	10.8	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	--	--
-B Sulfur Truck Pit	024	PITSTANK	10	-38.4	-29.1	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	--	--
-Storage Tank (022)	022	PITSTANK	10	-20.5	29.1	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	--	--
Rock Unloading and Storage Bag Collector	025	RUSBC1	11	(g)	(g)	20	6.10	3.5	1.07	100	311	36,000	62.4	19.01	1.54	--
Product Reclaim Bag Collector	(c)	RUSBC2	12	(g)	(g)	3	1	1.1	1.07	120	322	10,100	(e)	(e)	0.36	--
"X,Y,Z" Rock Hopper Bag Collectors (d)	028	RBBC	13	(g)	(g)	119	36.27	1.0	0.30	120	322	2,120	45.0	13.71	0.23	--
ROP/MGTSP Manufacturing	--	RMMAN	14	-272.1	-135.3	135	41.15	6.5	1.98	87	304	67,500	33.9	10.33	0.08	14.11

References:
1. Stack parameters and emissions are from a construction permit application for "A" DAP dated May 30, 1974 and emissions test data (12/3/75)..
2. Stack parameters and emissions are from a construction permit application for the "X", "Y", and "Z" facilities dated May 30, 1974 and emissions test data (12/19/76).
3. Based on permit application (1/20/76) and emissions test report (1/2/76).
4. Based on application for renewal of operating permit for "A" and "B" Storage Buildings and associated shipping facilities dated April 6, 1979.
5. Based on construction permit application for Granular Storage and Shipping dated May 30, 1974. Application is for "A" Shipping Baghouse. Since the baghouses in the "A" and "B" Shipping unit are the same, "B" Shipping Baghouse is assumed to have the same emissions as "A" Shipping Baghouse. Stack parameters for "B" Shipping assumed the same as current.
6. Based on an emission factor of 0.0024 lb/ton product and 3,150 TPD product (DAP and GTSP) from operation permit application for "B" Storage and Shipping dated 1/21/76. Assumed to be fugitive emissions from transferring of product therefore no height, diameter or flow rate is associated with these sources.
7. Stack parameters and PM emissions based on emissions test data for "A" SAP (12/14/75) and "B" SAP (12/13/75). SO_2 emissions based on 1973 air construction permit to reduce SO_2 from 10 lb/ton. Compliance required by 7/1/75. No actual test data prior to modifications available, therefore 10 lb/ton limit assumed at 1,000 TPD for each plant.
8. Stack parameters and PM emissions based on operation permit application (11/6/75) and stack test data (10/1/75) for the "C" Sulfuric Acid Plant. SO_2 emissions based on 5/30/74 application and 11/11/75 operating permit application. Startup of plants was after 1/6/75. Based on each the plant operating at 1,500 TPD H_2SO_4 at 4 lb SO_2/ton.
9. Stack parameters and PM emissions based on operation permit application (11/6/75) and stack test data (10/2/75) for the "D" Sulfuric Acid Plant. SO_2 emissions based on 5/30/74 application and 11/11/75 operating permit application. Startup of plants as after 1/6/75. Based on each plant operating at 1,500 TPD H_2SO_4 and 4 lb SO_2/ton.
10. Based on construction permit application (6/28/89) and Title V application June 14, 1996. All 3 sources were modeled as one large area source. PM emissions were based on hourly emission rate from construction permit application. SO_2 emissions were based on the hourly input from the construction permit application and the emission factor used in the Title V application.
11. Based on construction permit application (12/10/90). This was the first permit application that was completed for this emission unit.
12. Based on construction permit application for the Product Reclaim Bag Collector application dated December 10, 1990. Stack parameters assumed the same as current.
13. Based on construction permit application for the X, Y, and Z Rock Hopper Bag Collector dated (December 12, 1990).
14. Based on operating permit application for ROP/MGTSP manufacturing dated January 20, 1976.

Footnotes:
(a) SO_2 emissions for "A" DAP/MAP Plant, "X" DAP/MAP/GTSP, "Y" DAP/MAP/GTSP Plant, "Z" DAP/MAP Plant and ROP/GTSP Manufacturing are based on AP-42 emission factors and total fuel purchased in 1974. See Table C-1.
(b) Emission Units 022, 023, 024 and 033 were combined into one equivalent source.
(c) The bag collector in the 72% Rock Unloading and Storage Bag Collector was moved in 1982 to the Product Reclaim Handling System and is now considered part of Emission Unit 026.
(d) The three bag collectors (Emission Units 027, 028, and 029) were combined into one equivalent source.
(e) Horizontal discharge, modeled with velocity of 0.1 m/s.
(f) The sulfur storage and handling system was modeled as one area source with dimensions of 85 m x 50 m.
(g) These parameters are part of the PM baseline inventory. These parameters were not used in the SO_2 modeling analysis, since these are not SO_2 sources. These parameters will be included in the PM modeling analysis.

Table 6-8. Receptors Used in the Modeling Analysis for the PSD Class I Area of the Chassahowitzka NWA

	UTM Coordinates, Zone 17	
Receptor No.	East (km)	North (km)
1	337.5	3,166.0
2	338.3	3,166.0
3	339.1	3,166.0
4	339.9	3,166.0
5	336.7	3,167.0
6	339.9	3,166.9
7	335.9	3,167.9
8	339.9	3,167.8
9	335.9	3,168.8
10	339.9	3,168.8
11	336.7	3,169.7
12	340.0	3,169.7
13	336.7	3,170.6
14	340.0	3,170.6
15	336.7	3,171.6
16	340.0	3,171.5
17	336.7	3,172.5
18	337.6	3,172.5
19	338.4	3,172.5
20	339.2	3,172.5
21	340.0	3,172.4
22	340.8	3,173.4
23	340.8	3,174.3
24	341.6	3,174.3
25	335.1	3,175.3
26	336.0	3,175.3
27	336.8	3,175.3
28	337.6	3,175.2
29	338.4	3,175.2
30	340.8	3,175.2
31	341.7	3,175.2
32	342.5	3,175.2
33	334.3	3,176.2
34	338.4	3,176.2
35	342.5	3,176.1
36	333.5	3,177.2
37	338.4	3,177.1
38	331.9	3,178.1
39	332.7	3,178.1
40	333.6	3,178.1
41	338.4	3,178.0
42	333.6	3,179.0
43	338.5	3,178.9
44	334.4	3,179.9
45	338.5	3,179.9
46	339.28	3179.84
47	334.41	3180.83
48	338.48	3180.77
49	334.42	3181.75
50	338.49	3181.7
51	334.43	3182.68
52	338.5	3182.62
53	334.45	3183.6
54	335.26	3183.59
55	336.07	3183.58
56	336.89	3183.57
57	337.7	3183.56
58	338.52	3183.54

Table 6-9. Building/Structure Dimensions Used in the Air Dispersion Modeling Analysis, CF Industries, Plant City

Building / Structure	Building Dimensions					
	Height		Length		Width	
	ft	m	ft	m	ft	m
Uranium Control Room	22.0	6.7	135.0	41.1	42.6	13.0
Uranium Clarifier No. 1	22.6	6.9	80.0 [a]	24.4	-	-
Uranium Clarifier No. 2	22.6	6.9	80.0 [a]	24.4	-	-
Uranium Storage Tank 1	66.0	20.1	49.0 [a]	14.9	-	-
Uranium Storage Tank 2	66.0	20.1	49.0 [a]	14.9	-	-
Uranium Belt Filter	75.0	22.9	90.0	27.4	48.0	14.6
ROP Maintenance Warehouse	60.0	18.3	99.0	30.2	400.0	121.9
Cogeneration Building	66.0	20.1	142.0	43.3	79.0	24.1
A DAP Granulation	93.0	28.3	121.0	36.9	51.0	15.5
XYZ DAP Granulation	127.0	38.7	140.0	42.7	277.0	84.4
A Shipping Warehouse	67.0	20.4	130.0	39.6	440.0	134.1
B Shipping Warehouse	87.0	26.5	159.0	48.5	337.0	102.7
93' Screening Building	93.0	28.3	41.0	12.5	67.0	20.4
A PAP Belt Filter	65.0	19.8	92.0	28.0	33.0	10.1
B PAP Belt Filter	96.0	29.3	32.0	9.8	123.0	37.5
A PAP Byrd Filter	71.0	21.6	75.0	22.9	75.0	22.9
B PAP Byrd Filter	86.5	26.4	80.0	24.4	80.0	24.4
Molten Sulfur Storage Tank 022	30.0	9.1	49.0 [a]	14.9	-	-

[a] Indicates a tank diameter.

Source: CF Industries, 2003.

Table 6-10. Maximum Predicted Pollutant Impacts for the Proposed Project - Significant Impact Screening Analysis, CF Industries, Plant City

Pollutant/ Averaging Time	Concentration[a] ($\mu g/m^3$)	Receptor Location[b] X (m)	Receptor Location[b] Y (m)	Time Period (YYMMDDHH)
SO_2				
Annual	2.30	-1,438	-642	91123124
	2.16	-1,413	-787	92123124
	1.98	-1,363	-1,079	93123124
	2.15	-1,372	-1,030	94123124
	1.82	-914	573	95123124
Highest 24-Hour	10.39	-1,505	-253	91020324
	9.92	-1,413	-787	92022124
	10.31	-1,347	-1,176	93031924
	8.51	-1,313	-1,370	94120124
	7.60	300	1,000	95042324
Highest 3-Hour	15.62	-1,538	-59	91061124
	19.13	-1,255	-1,710	92082406
	13.89	-1,488	-350	93052621
	14.43	-600	1,000	94032724
	16.03	-1,000	700	95070724

Note: YYMMDDHH = Year, Month, Day, Hour Ending

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

Table 6-11. Maximum Predicted Pollutant Impacts for the Proposed Project Compared to EPA PSD Class II Significant Impact Levels, Refined Analysis, CF Industries, Plant City

Pollutant/ Averaging Time	Concentration[a] ($\mu g/m^3$)	Receptor Location [b] X (m)	Receptor Location [b] Y (m)	Time Period (YYMMDDHH)	EPA Significant Impact Level ($\mu g/m^3$)
SO_2					
Annual	2.30	-1,438	-642	91123124	1
Highest 24-Hour	10.39	-1,505	-253	91020324	5
Highest 3-Hour	19.13	-1255	-1710	92082406	25

Note: YYMMDDHH = Year, Month, Day, Hour Ending

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

Table 6-12. Maximum Predicted SO_2 Impacts after Completion of the Proposed Project--
AAQS Screening Analysis, CF Industries, Plant City

Averaging Time	Concentration[a] (µg/m³)	Receptor Location[b] X (m)	Receptor Location[b] Y (m)	Time Period (YYMMDDHH)
Highest Annual	45.3	-1438	-642	91123124
	41.6	-1413	-787	92123124
	39.2	-1405	-836	93123124
	41.3	-1405	-836	94123124
	37.9	-1413	-787	95123124
HSH 24-Hour	219.4	-1012	573	91071624
	202.6	-1061	573	92041924
	211.6	-378	573	93080624
	189.7	-1330	-1,273	94111524
	209.2	-1000	600	95072724

Note: YYMMDDHH = Year, Month, Day, Hour Ending
HSH = Highest, Second-Highest

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

Table 6-13. Maximum Predicted SO_2 Impacts for All Sources Compared to the AAQS, CF Industries, Plant City

	Concentration (µg/m³) [a]			Receptor Location [b]			Florida
		Modeled		X	Y	Time Period	AAQS
Averaging Time	Total	Source	Background	(m)	(m)	(YYMMDDHH)	(µg/m³)
Highest Annual	52.9	45.3	7.6	-1438	-642	91123124	60
	49.2	41.6	7.6	-1413	-787	92123124	
	48.9	41.3	7.6	-1405	-836	94123124	
HSH 24-Hour	240.4	219.4	21.0	-1012	573	91071624	260
	223.6	202.6	21.0	-1061	573	92041924	
	232.6	211.6	21.0	-378	573	93080624	
	230.2	209.2	21.0	-1000	600	95072724	

Note: YYMMDDHH = Year, Month, Day, Hour Ending
HSH = Highest, Second-Highest

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

Table 6-14. Maximum Predicted SO_2 Pollutant Impacts after Completion of the Proposed Project--
PSD Class II Screening Analysis, CF Industries, Plant City

Averaging Time	Concentration [a] (μg/m^3)	Receptor Location [b] X (m)	Receptor Location [b] Y (m)	Time Period (YYMMDDHH)
Highest Annual	0	c	c	91123124
	0	c	c	92123124
	0	c	c	93123124
	0	c	c	94123124
	0	c	c	95123124
HSH 24-Hour	26.1	-865.6	573	91070724
	20.4	-865.6	573	92081824
	19.9	3500	-4000	93050224
	15.7	5000	-4500	94041024
	16.7	5000	-3000	95011324

Note: YYMMDDHH = Year, Month, Day, Hour Ending
HSH = Highest, Second-Highest

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

[c] Concentrations were predicted to be less than 0.0 μg/m^3 at all receptors.

Table 6-15. Maximum Predicted SO_2 Pollutant Impacts Compared to the PSD Class II Increments, CF Industries, Plant City

Averaging Time	Concentration [a] (µg/m³)	Receptor Location [b] X (m)	Receptor Location [b] Y (m)	Time Period (YYMMDDHH)	PSD Class II Increment (µg/m³)
Highest Annual	0	[c]	[c]	[c]	20
HSH 24-Hour	26.1	-865.6	573	91070724	91

Note: YYMMDDHH = Year, Month, Day, Hour Ending
HSH = Highest, Second-Highest

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

[c] Concentrations were predicted to be less than 0.0 µg/m³ at all receptors.

Table 6-16. Maximum Predicted SAM Impacts for the Proposed Project in the Site Vicinity, CF Industries, Plant City

Pollutant/ Averaging Time	Concentration [a] (μg/m³)	Receptor Location [b] X (m)	Receptor Location [b] Y (m)	Time Period (YYMMDDHH)
Annual	0.19	-1,438	-642	91123124
	0.18	-1,413	-787	92123124
	0.16	-1,363	-1,079	93123124
	0.18	-1,380	-982	94123124
	0.15	-914	573	95123124
Highest 24-Hour	2.18	-1,505	-253	91020324
	2.10	-1,413	-787	92022124
	1.88	-1,347	-1,176	93031924
	1.77	-1,413	-787	94090624
	1.60	-622	573	95052924
Highest 8-Hour	3.83	-232	573	91051716
	3.58	-476	573	92020416
	4.25	-1,402	573	93090816
	3.88	-524	573	94070816
	3.42	0	1,100	95123124
Highest 3-Hour	6.26	-232	573	91051715
	6.84	-232	573	92062412
	5.94	-622	573	93012412
	6.61	18	585	94062509
	6.01	-378	573	95011115
Highest 1-Hour	10.28	-1,571	136	91052406
	10.30	-1,158	573	92012809
	9.96	-1,110	573	93052906
	13.23	-100	700	94072408
	10.77	-1,347	-1,176	95100617

Note: YYMMDDHH = Year, Month, Day, Hour Ending

[a] Based on 5-year surface and upper air meteorological data for 1991 to 1995 from the National Weather Service Stations in Tampa and Ruskin, respectively.

[b] Relative to C Sulfuric Acid Plant stack.

Table 6-17. Summary of Maximum Pollutant Concentrations Predicted for the Project Only Compared to the EPA Class I Significant Impact Levels, CF Industries, Plant City

Pollutant/ Averaging Time	Year	Maximum Concentration[a] (μg/m³)	EPA Class I Significant Impact Levels (μg/m³)
SO_2			
Annual	1990	0.008	0.1
	1992	0.009	
	1996	0.010	
24-Hour	1990	0.083	0.2
	1992	0.079	
	1996	0.088	
3-Hour	1990	0.13	1.0
	1992	0.21	
	1996	0.19	

[a] Highest predicted impact with the CALPUFF model and Central Florida CALMET Domain, 1990, 1992, and 1996.

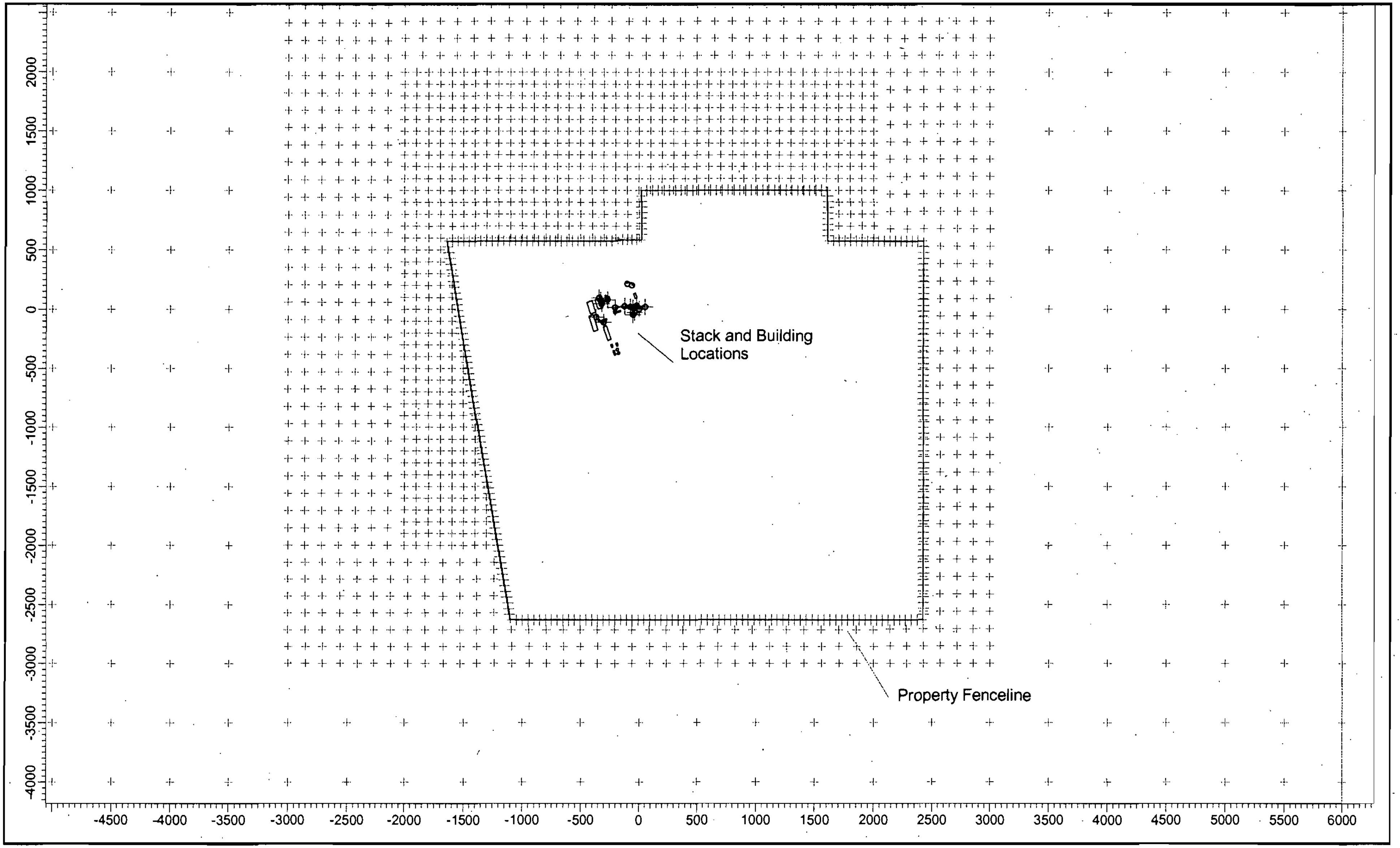


Figure 6-1.
Off-site and Fenceline Receptor Locations, CF Industries, Plant City

Golder Associates

Source: Golder, 2005.

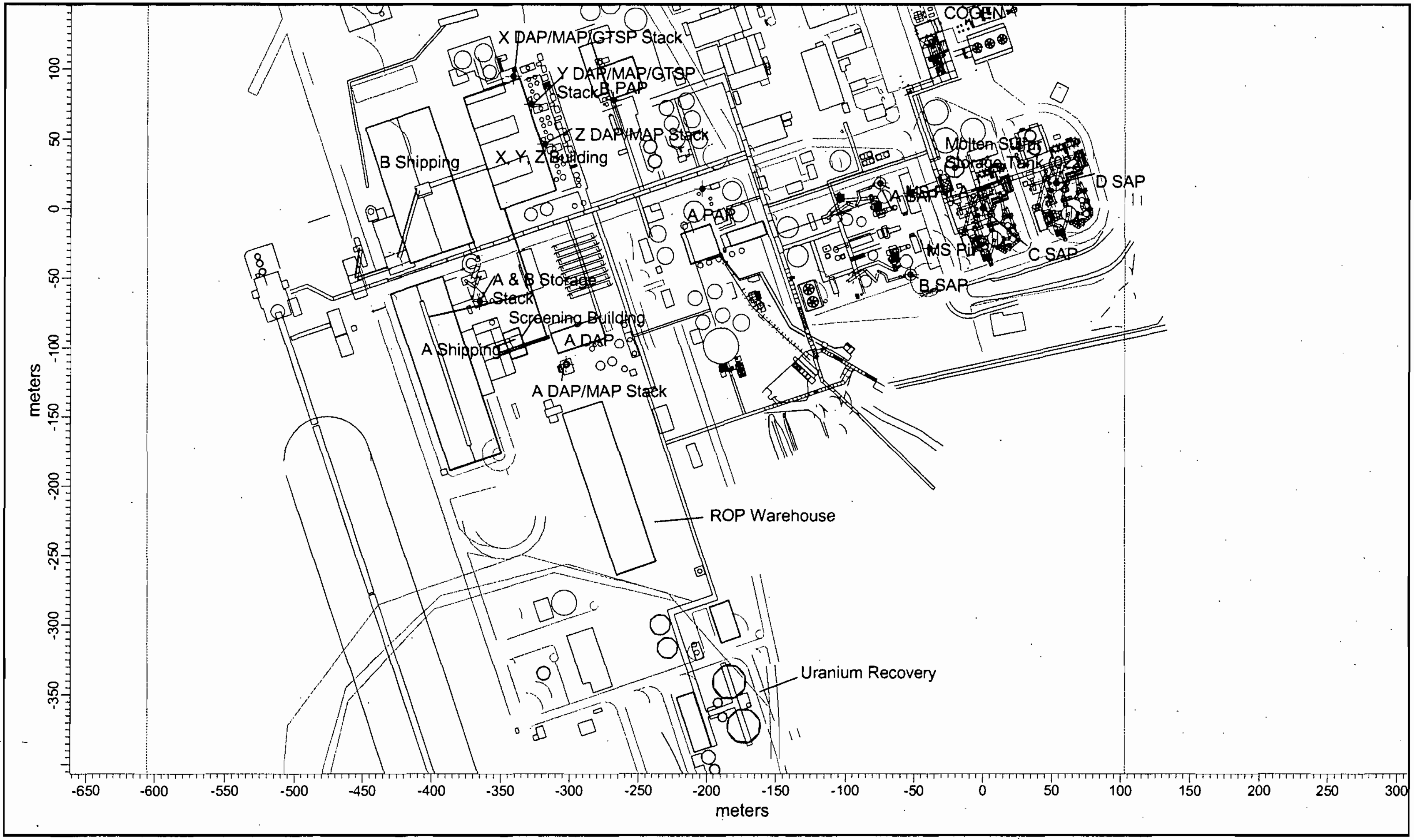


Figure 6-2.
Building and Stack Locations, CF Industries, Plant City

Source: Golder, 2005.

Golder Associates

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 INTRODUCTION

CF is proposing to modify its existing facility in Plant City, Florida. The facility is subject to the PSD new source review requirements for SO_2 and SAM. The additional impact analysis and the Class I area analysis addresses these pollutants.

The analysis addresses the potential impacts on vegetation, soils, and wildlife of the surrounding area and the nearest Class I area due to CF's proposed modification. The nearest Class I area is the CNWA, located approximately 69 km north-northwest of the CF 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 area, the proposed project will not cause any significant adverse effects due to the predicted low impacts upon these areas.

7.2 SOIL, VEGETATION, AND AQRV ANALYSIS METHODOLOGY

In the foregoing analysis, the maximum air quality impacts predicted to occur in the vicinity of the CF plant and in the Class I area due to the increase in emissions are used. These impacts are summarized in Section 6.0 and Table 7-1, based on the modeling described in Section 6.0.

The analysis involved predicting worst-case maximum short- and long-term concentrations of pollutants in the vicinity of the plant and in the Class I areas and comparing the maximum predicted concentrations to lowest observed effect levels for AQRVs or analogous organisms. In conducting the assessment, several assumptions were made as to how pollutants interact with the different matrices, i.e., vegetation, soils, wildlife, and aquatic environment.

A screening approach was used to evaluate potential effects by comparison of the maximum predicted ambient concentrations of air pollutants of concern with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted which specifically addressed the effects of air contaminants on plant species reported to occur in the vicinity of the plant and the Class I area. It was recognized that effects threshold information is not available for all species found in the CNWA, although studies have been performed on a few of the common species and on other similar species which can be used as models.

7.3 IMPACTS TO SOILS AND VEGETATION IN THE VICINITY OF THE CF PLANT

According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the CF facility emitting at maximum rates are predicted to be below the AAQS and PSD Class II Increments for SO_2. Therefore, the project's impacts on soils, vegetation, and wildlife in the project's vicinity are also not expected to be significant. In addition, no visibility impairment in the vicinity of CF is expected, because no new emission sources are proposed for this project.

7.3.1 IMPACTS TO SOILS

According to the USDA Soil Survey of Hillsborough County (1989), the CF Plant City site and vicinity are dominated by four soil series (Appendix X, Soil Survey): Basinger, Holopaw and Samsula soils, depressional (Soil type 5), Arents, nearly level (4), Gypsum land (20), and Myakka fine sand (29). These soils are generally described in the Soil Survey as follows:

Basinger, Holopaw, and Samsula soils, depressional (5): This soil series is characteristic of swamps and depressions within flatwoods. In most areas, these soils have been left in natural vegetation, consisting of cypress, wetland hardwoods, and hydrophytic grasses, such as maidencane and cutgrass. In the highly organic surface layers, the soil pH ranges from 3.6 to 7.3, classified as extremely acidic to neutral.

Arents, nearly level (4): Arents consist of nearly level, heterogeneous soil material that has been excavated, reworked, and reshaped by earthmoving equipment. This soil series is found near urban centers, phosphate mining operations, major highways, and landfills. In most areas, the soil in these areas has been left idle or is used for homesites, recreation, and urban development. Due to the heterogeneous nature of the soil material, the soil reaction pH is highly variable.

Gypsum land (20): This soil series is used to describe moderately to very steep mounds of gypsum, a product of acid manufacturing plants that are associated with phosphate-mining operations. The soil surface is generally very unstable, erodes easily, and does not support vegetation due to limiting factors of acidity and compaction. The soil reaction pH is not presented within the Hillsborough County Soil Survey, although the series is described as acidic.

Myakka fine sand (29): This soil series is nearly level and poorly drained, typically found on broad plains in flatwoods. In most areas, this soil is used for native pasture or cultivated crops, though it is also used for improved pasture, citrus crops, or urban development. Water control systems and frequent applications of fertilizer and lime are generally needed to improve soil quality for cultivated crops. The natural vegetation consists of longleaf pine and slash pine with an understory of gallberry, running oak, saw palmetto, and wax myrtle. The soil pH ranges from 3.6 to 6.5, classified as extremely to slightly acidic.

Depressional soil series in the vicinity of the project area are poorly drained and have high organic matter content, which provides high cation exchange capacity and bulk density. These factors increase the buffering capacity of the soil, which ameliorates the effects of acidic atmospheric inputs.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level concentrations of SO_2 and SAM projected from the proposed project's emissions precludes any significant impact on soils.

7.3.2 IMPACTS TO VEGETATION

Vegetative communities in the vicinity of the Plant City facility include wet pine flatwoods and former pasture lands interspersed with cypress and mixed forested wetlands. CF Industries is restoring native Florida vegetation on 1900 acres of former pasture land immediately east and south of the Plant City Phosphate Complex. The forested floodplain of the Blackwater Creek is located approximately 1 mile south of the Plant City 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. Refer to Tables 7-2 and 7-3 for SO_2 effect levels for various plant species and sensitivity groupings of vegetation.

The maximum annual and 3-hour SO_2 concentrations (refer to Table 6-11) predicted in the vicinity of the CF Plant City facility due to the proposed project (2.3 and 19.1 $\mu g/m^3$, respectively) represent levels that are lower than those known to cause damage to the majority of test species.

The maximum predicted 24-hour SO_2 concentration of 10.4 $\mu g/m^3$ due to the project only (refer to Table 6-11) is below the significant impact level, and should therefore not damage sensitive species. 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 closest SO_2 monitor in the area, the maximum measured 24-hour concentration for 2002 to 2004 is 37 $\mu g/m^3$. The modeled 24-hour concentration is about 28 percent of the maximum measured 24-hour concentration. This demonstrates the conservatism of the modeling.

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 less than concentrations that could potentially damage SO_2-sensitive plants. Again, it is important to realize that this modeled concentration represents a worst-case scenario. These actual levels pose minimal threats to area vegetation.

The increase in SO_2 concentrations due to the modification only, presented in Table 6-11, are low (2.3 $\mu g/m^3$, annual average and 10.4 $\mu g/m^3$, 24-hr average) and well below any threshold effect level.

Acidic precipitation or acid rain is coupled to the emissions of SO_2.. SO_2 is oxidized in the atmosphere and dissolved in rain forming SAM, which falls as acidic precipitation. Concentration data are not available, but SAM has yielded necrotic spotting on the upper surface of leaves (Middleton, et al., 1950). It has been known that exposure to caustic or acidic compound concentration of 8,200 $\mu g/m^3$ for 1 to 2 days can cause necrotic spotting on the upper surface of leaves. The maximum predicted 24-hour SAM concentration (refer to Table 6-16) due to the project of 2.2 $\mu g/m^3$ is well below the injury threshold concentration.

7.4 IMPACTS UPON VISIBILITY IN THE VICINITY OF CF

No new emission sources will be created by the proposed CF modification. The proposed project at the B SAP will not change any stack characteristics, nor add any new stacks. All of these sources are in compliance with opacity regulations and should remain in compliance after the modification. As a result, no adverse impacts upon visibility are expected.

7.5 IMPACTS DUE TO ASSOCIATED DIRECT GROWTH

7.5.1 INTRODUCTION

Rule 62-212.400(3)(h)(5), F.A.C., states that an application must include information relating to the air quality impacts of, and the nature and extent of all general, residential, commercial, industrial and other growth which has occurred since August 7, 1977, in the area the facility or modification would affect. This growth analysis considers air quality impacts due to emissions resulting from the industrial, commercial, and residential growth associated with the proposed modifications to the CF Industries Plant City Phosphate Complex. This information is consistent with the EPA Guidance related to this requirement in the *Draft New Source Review Workshop Manual* (EPA, 1990).

In general, there has been minimal growth in the Plant City Phosphate Complex area since 1977. The site is located in northeast Hillsborough County, near the Pasco County border. Hillsborough County is surrounded by Manatee County to the south, Polk County to the east, Pasco County to the north, and Pinellas County to the west. Hillsborough County has the fourth largest population in Florida, just below 1 million. The county consists of 1,051 square miles of land area.

The modification will increase potential sulfuric acid production rates at the facility. The majority of construction activities associated with the proposed modification will occur over a 1-month period, requiring an average of approximately 20 workers during that time. Recent permanent workforce reductions at the plant have compensated for this temporary increase, reducing the workforce from over 470 to about 450 employees.

It is anticipated that many of the construction personnel will commute to the site. The increase in workers will only be temporary, since CF will not employ any additional operational workers after the completion of the proposed modification to the B SAP. Therefore, while there would be a small temporary increase in vehicular traffic in the area, the effect on air quality levels would be minimal and not above levels that existed prior to the workforce reductions.

There are also expected to be no air quality impacts due to associated commercial and industrial growth given the location of the existing Plant City Phosphate Complex. The existing commercial and industrial infrastructure should be adequate to provide any support services that the proposed modification might require and would not increase with the operation of the modified B SAP.

The following discussion presents general trends in residential, commercial, industrial, and other growth that has occurred since August 7, 1977, in Hillsborough County. As such, the discussion presents information available from a variety of sources (i.e., Florida Statistical Abstract, FDEP, etc.) that characterize Hillsborough County as a whole.

7.5.2 RESIDENTIAL GROWTH

Population and Household Trends

As an indicator of residential growth, the trend in the population and number of household units in Hillsborough County since 1970 are shown in Figure 7-1. The county experienced a 65 percent increase in population for the years 1977 through 2000. During this period, there was an increase in population of about 393,000. Similarly, the number of households in the county increased by about 176,000, or 82 percent, since 1977.

Growth Associated with the Operation of the Project

Since no additional operational workers will be needed at the modified B SAP, no residential growth due to the proposed modification is expected.

7.5.3 COMMERCIAL GROWTH

Retail Trade and Wholesale Trade

As an indicator of commercial growth in Hillsborough County, the trends in the number of commercial facilities and employees involved in retail and wholesale trade are presented in Figure 7-2. The retail trade sector comprises establishments engaged in retailing merchandise. The retailing process is the final step in the distribution of merchandise. Retailers are therefore organized to sell merchandise in small quantities to the general public. The wholesale trade sector comprises establishments engaged in wholesaling merchandise. This sector includes merchant wholesalers who buy and own the goods they sell; manufacturers' sales branches and offices that sell products manufactured domestically by their own company; and agents and brokers who collect a commission or fee for arranging the sale of merchandise owned by others.

Since 1977, retail trade has increased by about 1,800 establishments and 46,000 employees or 65 and 103 percent, respectively. For the same period, wholesale trade has increased by 1,400 establishments and 16,000 employees, or 109 and 80 percent, respectively.

Labor Force

The trend in the labor force in Hillsborough County since 1977 is shown in Figure 7-3. Between 1977 and 2000, approximately 276,000 persons were added to the available work force, for an increase of 113 percent.

Tourism

Another indicator of commercial growth in Hillsborough County is the tourism industry. As an indicator of tourism growth in the county, the trend in the number of hotels and motels and the number of units at the hotels and motels are presented in Figure 7-4.

This industry comprises establishments primarily engaged in marketing and promoting communities and facilities to businesses and leisure travelers through a range of activities, such as assisting organizations in locating meeting and convention sites; providing travel information on area attractions, lodging accommodations, restaurants; providing maps; and organizing group tours of local historical, recreational, and cultural attractions.

Between 1978 and 2000, there was a decrease of 3 percent in the number of hotels and motels. However, the number of units at those establishments increased by 90 percent during that same time period.

Transportation

As an indicator of transportation growth, the trend in the number of vehicle miles traveled (VMT) by motor vehicles on major roadways in Hillsborough County is presented in Figure 7-5. Between 1977 and 2002, there was an increase of about 14,200,000 VMT, or 77 percent, on major roadways in the county.

Growth Associated with the Operation of the Project

The existing commercial and transportation infrastructure should be adequate to provide any support services that might be required during construction and operation of the modified B SAP. The workforce needed to operate the modified B SAP represents a small fraction of the labor force present in the immediate and surrounding areas and will not increase as a result of this project.

7.5.4 INDUSTRIAL GROWTH

Manufacturing and Agricultural Industries

As an indicator of industrial growth, the trend in the number of employees in the manufacturing industry in Hillsborough County since 1977 is shown in Figure 7-6. As shown, the manufacturing industry experienced an increase of 6,200 employees or 19 percent from 1977 through 2000.

As another indicator of industrial growth, the trend in the number of employees in the agricultural industry in Hillsborough County since 1977 is also shown in Figure 7-6. As shown, the agricultural industry experienced an increase of 6,200 employees or 656 percent from 1977 through 2000.

Electrical Power Generation

Existing electrical generating plants in Hillsborough County include the following:

- Tampa Electric Company's (TECO) Plants:
  - TECO Big Bend,
  - TECO Hookers Point, and
  - TECO Gannon.
- Hillsborough County Resource Recovery Facility.
- Mackay Bay Facility.

Together, these power plants have an electrical nameplate generating capacity of over 30,000 MW.

As an indicator of electrical utility growth, the electrical nameplate generating capacity in Hillsborough County since 1977 is shown in Figure 7-7. As shown, there has been minimal change in electrical utility growth since 1977.

Due to CF's ability to internally generate electricity, the proposed project will result in a net increase in electricity sent to the local power grid.

Growth Associated with the Operation of the Project

Since the PSD baseline date of August 7, 1977, there have not been any major facilities built within a 20 km radius of the Plant City Phosphate Complex. Based on the locations of nearby air emission sources (refer to Table 6-7), there has not been a concentration of industrial and commercial growth in the viecinity of the Plant City Phosphate Complex.

7.5.5 AIR QUALITY DISCUSSION

Air Emissions and Spatial Distribution of Major Facilities

Based on actual emissions reported for 1999 by EPA on its AIRSdata website, total emissions from the facilities with SO_2 emissions sources in the vicinity of the Plant City Phosphate Complex in Hillsborough County are as follows:

- SO_2: 161,868 TPY
- PM_{10} 6,651 TPY
- NO_x: 63,804 TPY
- CO: 2,710 TPY
- VOC: 2,344 TPY

Air Emissions from Mobile Sources

The trends in the air emissions of CO, VOC, and NO_x from mobile sources in Hillsborough County are presented in Figure 7-8. Between 1977 and 2002, there were significant decreases in these emissions. The decrease in CO, VOC, NO_x emissions were about 1,022, 112, and 35 tons per day, respectively, which represent decreases from 1977 emissions of 60, 64, and 28 percent, respectively.

Air Monitoring Data

Hillsborough County is classified as attainment or maintenance for all criteria pollutants. Air quality monitoring data have been collected in Hillsborough County primarily in the western portion of the county. For this evaluation, the air quality monitoring data collected at the monitoring stations nearest to the Plant City Phosphate Complex were used to assess air quality trends since 1977. Air quality monitoring data were based on the following monitoring stations:

- SO_2 concentrations – Tampa, Plant City, and Mulberry (Polk County).

Data collected from these stations are considered to be generally representative of air quality in Hillsborough County. Because these monitoring stations are generally located in more industrialized areas than the Plant City Phosphate Complex, the reported concentrations are likely to be somewhat higher than that experienced at the site.

These data indicate that the maximum air quality concentrations currently measured in the region comply with, and are well below, the applicable AAQS. These monitoring stations are located in areas where the highest concentrations of a measured pollutant are expected due to the combined effect of emissions from stationary and mobile sources, as well as the effects of meteorology. Therefore, the ambient concentrations in areas not monitored should have pollutant concentrations less than the monitored concentrations from these sites.

SO_2 Concentrations

The trends in the annual, 24-hour, and 3-hour average SO_2 concentrations measured in Hillsborough County since 1977 are presented in Figures 7-9 through 7-11, respectively. As shown in these figures, measured SO_2 concentrations have been, and continue to be, well below the AAQS.

Air Quality Associated with the Operation of the Project

The air quality data measured in the region of the Plant City facility indicate that the maximum air quality concentrations are well below and comply with the AAQS. Also, based on the trends presented of these maximum concentrations, the air quality has generally improved in the region since the baseline date of August 7, 1977. Because the maximum concentrations for the proposed modification to the Plant City Phosphate Complex are predicted to be below the AAQS for SO_2, air quality concentrations in the region are expected to remain below and comply with the AAQS after completion of the proposed modification.

7.6 IMPACTS UPON PSD CLASS I AREAS

7.6.1 IDENTIFICATION OF AQRVS AND METHODOLOGY

The CF facility is located about 69 km from the PSD Class I area of the CNWA. Other PSD Class I areas are located more than 200 km from the Site. An AQRV analysis was conducted to assess the potential risk to AQRVs of the CNWA due to the proposed emissions from the CF project. The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

> *All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.*
>
> *Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register, 1978).*

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the CNWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the CNWA.

Vegetation type AQRVs and their representative species types have been defined by the U.S. Fish and Wildlife as:

- Marshlands – black needlerush, saw grass, salt grass, and salt marsh cordgrass
- Marsh Islands – cabbage palm and eastern red cedar
- Estuarine Habitat – black needlerush, salt marsh cordgrass, and wax myrtle
- Hardwood Swamp – red maple, red bay, sweet bay, and cabbage palm
- Upland Forests – live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto
- Mangrove Swamp – red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and water birds, shorebirds, reptiles, and mammals.

The maximum pollutant concentrations due to the CF project's emissions predicted at the PSD Class I area of the CNWA are presented in Table 7-1. These results are based on using the CALPUFF model (see Appendix A).

Similar to the evaluation performed in Section 7.2, a screening approach was used that compared the maximum ambient concentration of air pollutants of concern due to the project's emissions at the PSD Class I area of the CNWA with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted that specifically addressed the effects of air contaminants on plant species reported to occur in the CNWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the CNWA, although studies have been performed on a few of the common species and on other similar species that can be used as indicators of effects.

7.6.2 IMPACTS TO SOILS

For soils, the potential and hypothesized effects of atmospheric deposition include:

- Increased soil acidification;
- Alteration in cation exchange;
- Loss of base cations; and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

According to the U.S. Department of Agriculture (USDA) Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the CNWA. These include Aripeka fine sand, Aripeka-Okeelanta-Lauderhill, Hallendale-Rock outcrop, Homosassa mucky fine sandy loam, Lacoochee, Okeelanta mucks, Okeelanta-Lauderdale-Terra Ceia mucks, Rock outcrop-Homosassa-Lacoochee, and Weekiwachee-Durbin mucks (Porter, 1996). The majority of the soil complexes found in the CNWA are inundated by tidal waters, contain a relatively high organic matter content, and have high buffering capacities based on their CEC, base saturation, and bulk density. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity. Therefore, they would be relatively insensitive to atmospheric inputs. However, Terra Ceia, Okeelanta, and Lauderdale freshwater mucks are present along the eastern border of the CNWA, and may be more sensitive to atmospheric sulfur deposition (Porter, 1996). Although not tidally influenced, these freshwater mucks are highly organic and therefore have a relatively high intrinsic buffering capacity.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level concentrations of contaminants projected for the CNWA from the proposed project's emissions precludes any significant impact on soils.

7.6.3 IMPACTS TO VEGETATION

In general, the effects of air pollutants on vegetation occur primarily from SO_2, nitrogen dioxide (NO_2), ozone, and PM. Effects from minor air contaminants, such as fluoride (F), chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides, have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury", as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis. Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure. For purposes of this analysis, it was assumed that 100 percent of each air contaminant of concern is accessible to the plants.

Injury to vegetation from exposure to various levels or air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below that which results in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation. This is a conservative approach.

The concentrations of the pollutants, duration of exposure and frequency of exposures influence the response of vegetation and wildlife to atmospheric pollutants. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentration which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

SO_2

Sulfur is an essential plant nutrient usually taken up as sulfate ions by the roots from the soil solution. When sulfur dioxide in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic. They interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Wellburn, 1976). However, within the leaf, sulfite is oxidized to sulfate ions, which can then be used by the plant as a nutrient. Small amounts of sulfite may be oxidized before they prove harmful.

SO_2 gas at sufficiently elevated levels has long been known to cause injury to plants. Acute SO_2 injury usually develops within a few hours or days of exposure, and symptoms include marginal, flecked, and/or intercostal necrotic areas that 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 SO_2 in the CNWA average 1.3 $\mu g/m^3$, with a maximum 24-hour average concentration of 14.5 $\mu g/m^3$ (IMPROVE, 2002). Observed SO_2 effect levels for several plant species and plant sensitivity groupings are presented in Tables 7-2 and 7-3, respectively.

Many studies have been conducted to determine the effects of high-concentration, short-term SO_2 exposure on natural community vegetation. Sensitive plants include ragweed, legumes, blackberry, southern pine, and red and black oak. These species are injured by exposure to 3-hour average SO_2 concentrations of 790 to 1,570 $\mu g/m^3$. Intermediate plants include locust and sweetgum. These species are injured by exposure to 3-hour average SO_2 concentrations of 1,570 to 2,100 $\mu g/m^3$. Resistant species (injured at concentrations above 2,100 $\mu g/m^3$ for 3 hours) include white oak and dogwood (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 μg/m^3 SO_2 for 8 hours were not visibly damaged. This finding supports the levels cited by other researchers on the effects of SO_2 on vegetation. A corroborative study (McLaughlin and Lee, 1974) demonstrated that approximately 20 percent of a cross-section of plants ranging from sensitive to tolerant was visibly injured at 3-hour average SO_2 concentrations of 920 μg/m^3.

Jack pine seedlings exposed to SO_2 concentrations of 470 to 520 μg/m^3 for 24 hours demonstrated inhibition of foliar lipid synthesis; however, this inhibition was reversible (Malhotra and Kahn, 1978). Black oak exposed to 1,310 μg/m^3 SO_2 for 24 hours per day for 1 week demonstrated a 48 percent reduction in photosynthesis (Carlson, 1979).

Two lichen species indigenous to Florida exhibited signs of SO_2 damage in the form of decreased biomass gain and photosynthetic rate as well as membrane leakage when exposed to concentrations of 200 to 400 μg/m^3 for 6 hours/week for 10 weeks (Hart et al., 1988).

The maximum 24-hour average SO_2 concentration increase that is predicted for the CF project at the Class I area is 0.088 μg/m^3. When added to the average background concentration of 1.3 μg/m^3, the total SO_2 impact is 1.388 μg/m^3. When added to the maximum 24-hour average background concentration of 14.5 μg/m^3 at the CNWA, the maximum worst-case total SO_2 concentration is 14.6 μg/m^3, which is much lower than those known to cause damage to test species. The maximum 24-hour average SO_2 concentrations predicted for the project at the Class I area are less than 1 to 7 percent of those that caused damage to the most sensitive lichens. The modeled annual incremental increase in SO_2 adds slightly to background levels of this gas and poses only a minimal threat to area vegetation.

Sulfuric Acid Mist

Acidic precipitation or acid rain is coupled to SO_2 emissions mainly formed during the burning of fossil fuels. This pollutant is oxidized in the atmosphere and dissolves in rain forming sulfuric acid mist which falls as acidic precipitation (Ravera, 1989). Although concentration data are not available, sulfuric acid mist has been reported to yield necrotic spotting on the upper surfaces of leaves (Middleton *et al.*, 1950).

No significant adverse effects on vegetation are expected from the project's emissions because SO_2 concentrations, which lead directly to the formation of sulfuric acid mist concentrations, are predicted to be well below levels which have been documented as negatively affecting vegetation. During the last decade, much attention has been focused on acid rain. Acidic deposition is an ecosystem-level problem that affects vegetation because of some alterations of soil conditions such as increased leaching of essential base cations or elevated concentrations of aluminum in the soil water (Goldstein *et al.*, 1985). Although effects of acid rain in eastern North America have been well published and publicized, detrimental effects of acid rain on Florida vegetation are lacking documentation.

Summary

In summary, the phytotoxic effects from the CF project's emissions are minimal. It is important to note that the emissions were conservatively modeled with the assumption that 100 percent was available for plant uptake. This is rarely the case in a natural ecosystem.

7.6.4 IMPACTS TO WILDLIFE

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the NAAQS. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (e.g., particulate contamination) and acute effects (e.g., injury to health) have been observed (Newman, 1981).

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary ambient air quality standards. Physiological and behavioral effects have been observed in experimental animals at or below these standards.

For impacts on wildlife, the lowest threshold values of SO_2, which are reported to cause physiological changes are shown in Table 7-4. These values are orders of magnitude larger than maximum concentrations predicted for the CF project for the Class I area. No effects on wildlife AQRVs from SO_2 are expected. The proposed project's contribution to cumulative impacts is negligible.

7.7 IMPACTS UPON VISIBILITY

7.7.1 INTRODUCTION

The CAA Amendments of 1977 provide for implementation of guidelines to prevent visibility impairment in mandatory Class I areas. The guidelines are intended to protect the aesthetic quality of these pristine areas from reduction in visual range and atmospheric discoloration due to various pollutants. Sources of air pollution can cause visible plumes if emissions of PM_{10} and NO_x are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background (e.g., the sky or a terrain feature, such as a mountain). PSD Class I areas, such as national parks and wilderness areas, are afforded special visibility protection designed to prevent plume visual impacts to observers within a Class I area.

Visibility is an AQRV for the Chassahowitzka NWA. Visibility can take the form of plume blight for nearby areas or regional haze for long distances (e.g., distances beyond 50 km). Because the Chassahowitzka NWA is more than 50 km from the CF Plant City facility, the potential change in visibility is analyzed as regional haze.

Currently, there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and FLM of Class I areas that are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the IWAQM Phase 2 report; and
- *Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Phase I Report,* USFS, NPS, USFWS (December, 2000), referred to as the FLAG document.

The methods and assumptions recommended in these documents were used to assess visibility impairment due to the project.

Analysis Methodology

Based on the FLAG document, current regional haze guidelines characterize a change in visibility by the change in the light-extinction coefficient (b_{ext}). The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change. An index that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and
b_{extb} is the background extinction coefficient.

The purpose of the visibility analysis is to calculate the extinction at each receptor for each day (24-hour period) of the year due to the proposed project. The criteria to determine if the project's impacts are potentially significant are based on a change in extinction of 5 percent or greater for any day of the year.

Processing of visibility impairment for this study was performed with the CALPUFF model (see Appendix A) and the CALPUFF post-processing programs POSTUTIL and CALPOST. The analysis was conducted in accordance with the most recent guidance from the FLAG report (December 2000). The CALPUFF postprocessor model CALPOST is used to calculate the combined visibility effects from the different pollutants that are emitted from the Project. Daily background extinction coefficients are calculated on an hour-by-hour basis using hourly relative humidity data from CALMET and hygroscopic and non-hygroscopic extinction components specified in the FLAG document. For the Class I area evaluated, the hygroscopic and non-hygroscopic components are 0.9 and 8.5 inverse megameters (Mm^{-1}). CALPOST then predicts the percent extinction change for each day of the year.

Emission Inventory

Based on recommendations of the FLAG Phase I Summary Report (12/2000), the regional haze analysis considered only the maximum 24-hour increase in emissions due to the proposed CF modification. The emission rates and source parameters for the affected sources are presented in Chapter 6.0.

Building Wake Effects

The air modeling analysis included the same building structure dimensions to account for the effects of building-induced downwash as was used in the ISCST3 modeling analysis. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and were included in the CALPUFF model.

Receptor Locations

Receptors for the refined analysis included 58 discrete receptors located at the boundary of the Chassahowitzka PSD Class I area. These receptors are part of the receptor data developed by the FLM for this area.

Background Extinction Coefficients and Relative Humidity

The regional haze analysis was performed using the latest regulatory guidance as provided in the Federal Land Manager's Air Quality Related Values Workgroup (FLAG) Phase I report. Using the hourly meteorological and relative humidity data used with the CALPUFF model, the daily change is background extinction is computed. The hygroscopic and dry non-hygroscopic components used for calculating the daily background extinction coefficients for the CNWA were obtained from the FLAG report. For this analysis, the hygroscopic and dry non-hygroscopic values were 0.9 and 8.5 inverse megameters (Mm-1), respectively.

Meteorological Data

Three years of CALMET wind field data was used for a domain that covers all of central Florida. The years of data are 1990, 1992, and 1996. A detailed description of the data used to develop the wind domains is presented in Appendix A.

Chemical Transformation

The air modeling analysis included all chemical transformation processes that occur for the emitted species.

Results

The visibility modeling results are presented in Table 7-5. The maximum predicted 24-hour change in background extinction coefficient is 2.43 percent. As this percentage is well below the criteria value of 5 percent, it is concluded that the proposed project will not adversely impact the background visibility levels at the CNWA PSD Class I area.

7.7.2 SULFUR DEPOSITION

As part of the AQRV analyses, total sulfur (S) deposition rates were predicted at the Chassahowitzka NWA Class I area. The deposition analysis threshold is based on the annual averaging period. The total sulfur deposition is estimated in units of kilogram per hectare per year (kg/ha/yr). The CALPUFF model is used to predict wet and dry deposition fluxes of various oxides of these elements.

For S deposition, the species include:

- SO_2, wet and dry deposition; and
- SO_4, wet and dry deposition.

The CALPUFF model produces results in units of $\mu g/m^2/s$. The modeled deposition rates are then converted to S deposition in kg/ha, by using a multiplier equal to the ratio of the molecular weights of the substances (IWAQM Phase II report Section 3.3).

The deposition analysis threshold (DAT) for sulfur of 0.01 kg/ha/yr was provided by the U.S. Fish and Wildlife Service (January 2002). A DAT is the additional amount of S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. The maximum S deposition predicted for the proposed CF project is, therefore, compared to this DAT or significant impact level.

The maximum predicted S deposition predicted for the Project in the PSD Class I area of the Chassahowitzka NWA is summarized in Table 7-6. The maximum S deposition rate for the project is predicted to be 0.0079 kg/ha/yr, which below the DAT of 0.01 kg/ha/yr. Therefore, the project's emissions are not expected to have a significant adverse effect on S deposition at the Class I area.

Table 7-1. Summary of Maximum Pollutant Concentrations Predicted for the Project Only at the PSD Class I Area of the Chassahowitzka NWA

Pollutant/ Averaging Time	Maximum Concentration[a] ($\mu g/m^3$) 1990	1992	1996
SO_2			
Annual	0.008	0.009	0.010
24-Hour	0.083	0.079	0.088
8-Hour	0.21	0.22	0.25
3-Hour	0.13	0.21	0.19
1-Hour	0.18	0.52	0.33
SAM			
Annual	0.0016	0.0017	0.0019
24-Hour	0.021	0.020	0.021
8-Hour	0.05	0.04	0.05
3-Hour	0.06	0.07	0.07
1-Hour	0.09	0.09	0.09

[a] Highest Predicted with CALPUFF model and Central Florida CALMET Domain, 1990, 1992, and 1996.

Table 7-2. SO_2 Effect Levels for Various Plant Species

Plant Species	Observed Effect Level ($\mu g/m^3$)	Exposure (Time)	Reference
Sensitive to tolerant	920 (20 percent displayed visible injury)	3 hours	McLaughlin and Lee, 1974
Lichens	200-400	6 hr/wk for 10 weeks	Hart *et al.*, 1988
Cypress, slash pine, live oak, mangrove	1,300	8 hours	Woltz and Howe, 1981
Jack pine seedlings	470-520	24 hours	Malhotra and Kahn, 1978
Black oak	1,310	Continuously for 1 week	Carlson, 1979

Table 7-3. Sensitivity Groupings of Vegetation Based Upon Visible Injury at Different SO_2 Exposures[a]

Sensitivity Grouping	SO_2 Concentration 1-Hour	SO_2 Concentration 3-Hour	Plants
Sensitive	1,310 - 2,620 $\mu g/m^3$ (0.5 - 1.0 ppm)	790 - 1,570 $\mu g/m^3$ (0.3 - 0.6 ppm)	Ragweeds Legumes Blackberry Southern pines Red and black oaks White ash Sumacs
Intermediate	2,620 - 5,240 $\mu g/m^3$ (1.0 - 2.0 ppm)	1,570 - 2,100 $\mu g/m^3$ (0.6 - 0.8 ppm)	Maples Locust Sweetgum Cherry Elms Tuliptree Many crop and garden species
Resistant	>5,240 $\mu g/m^3$ (>2.0 ppm)	>2,100 $\mu g/m^3$ (>0.8 ppm)	White oaks Potato Upland cotton Corn Dogwood Peach

[a] Based on observations over a 20-year period of visible injury occurring on over 120 species growing in the vicinities of coal-fired power plants in the southeastern United States.

Source: EPA, 1982a.

Table 7-4. Examples of Reported Wildlife Effects of Sulfur Dioxide at Concentrations below National Secondary Ambient Air Quality Standards

Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Respiratory stress in guinea pigs	427 to 854	1 hour
Respiratory stress in rats	267	7 hours/day; 5 days/ week for 10 weeks
Decreased abundance in deer mice	13 to 157	Continually for 5 months

Source: Newman and Schreiber, 1988.

Table 7-5. Maximum 24-hour Visibility Impairment Predicted for the Proposed Project at the PSD Class I Area of the Chassahowitzka NWA, CF Industries, Plant City

Ranking	Visibility Impairment (%) [a]			Project Only Visibility Impairment Criteria (%)
	1990	1992	1996	
Highest	2.09	2.25	2.43	5.0

[a] Highest predicted values with the CALPUFF model and Central Florida CALMET Domain, 1990, 1992, and 1996.

Table 7-6. Maximum Total Sulfur Annual Deposition Predicted for the Proposed Project at the PSD Class I Area of the Chassahowitzka NWA, CF Industries, Plant City

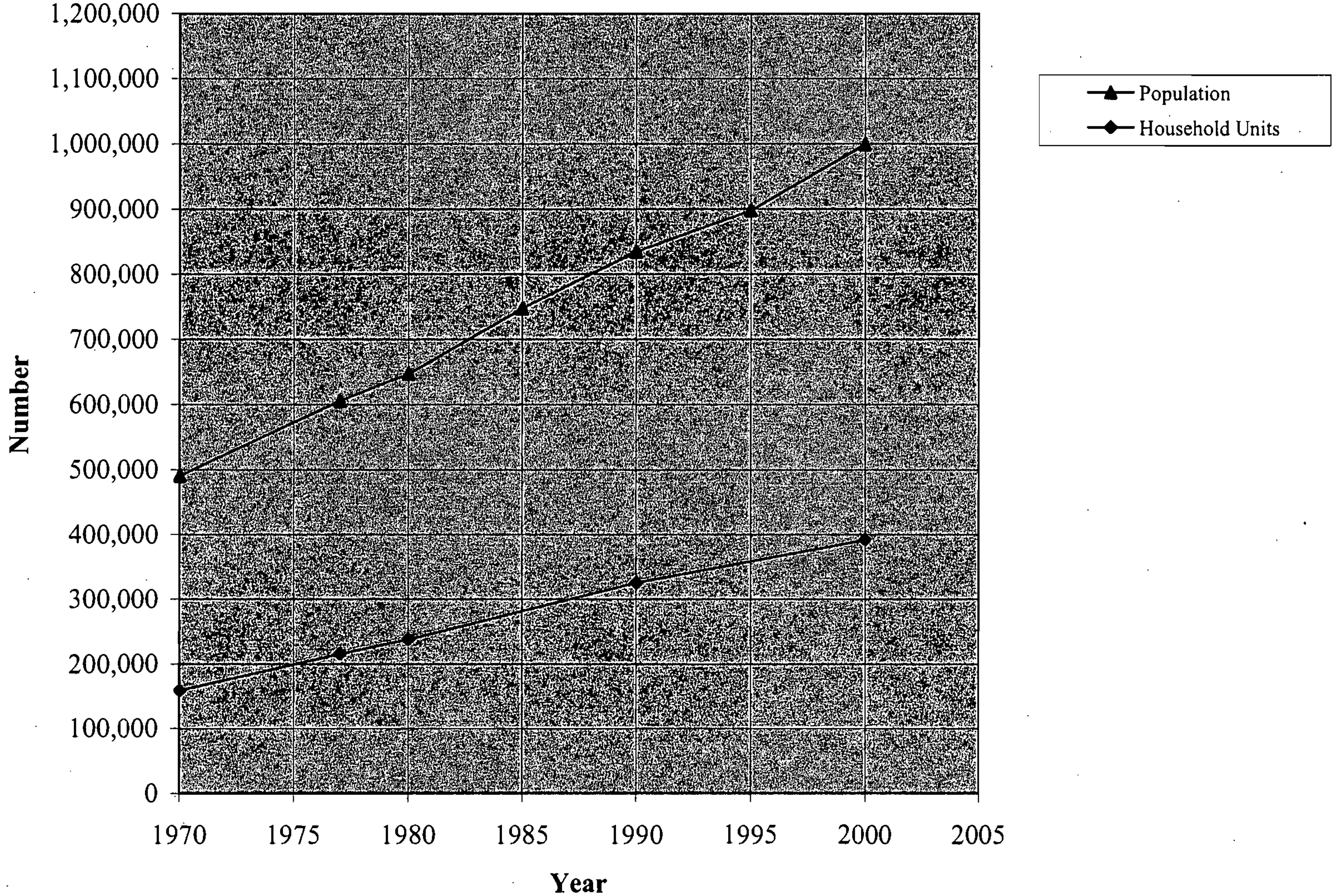
Species	Total Deposition (Wet & Dry)						Deposition Analysis Threshold [b]
	1990		1992		1996		
	($g/m^2/s$)	(kg/ha/yr)[a]	($g/m^2/s$)	(kg/ha/yr)[a]	($g/m^2/s$)	(kg/ha/yr)[a]	(kg/ha/yr)
Sulfur (S) Deposition	2.06E-11	0.0065	2.52E-11	0.0079	2.40E-11	0.0076	0.01

[a] Conversion factor is used to convert $g/m^2/s$ to kg/hectare (ha)/yr with the following units:

$g/m^2/s$	x	0.001	kg/g
	x	10,000	m^2/hectare
	x	3,600	sec/hr
	x	8,760	hr/yr = kg/ha/yr
	or		
$g/m^2/s$	x	3.154E+08	= kg/ha/yr

[b] Deposition analysis thresholds (DAT) for nitrogen and sulfur deposition provided by the U.S. Fish and Wildlife Service, January 2002. A DAT is the additional amount of S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant.

Figure 7-1. Population and Household Unit Trends in Hillsborough County



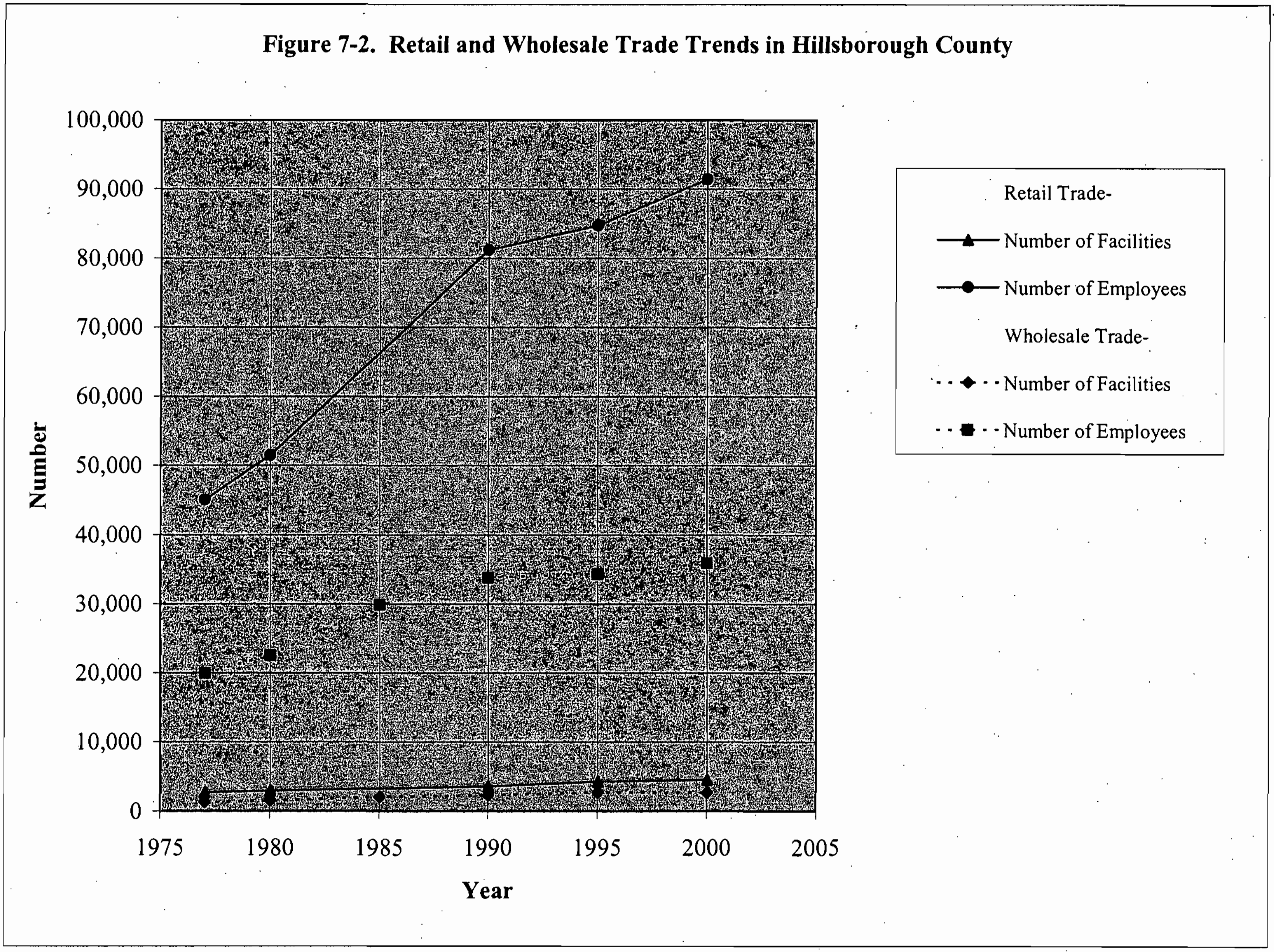


Figure 7-2. Retail and Wholesale Trade Trends in Hillsborough County
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Number
1975
1980
1985
1990
1995
2000
2005
Year
Retail Trade-
Number of Facilities
Number of Employees
Wholesale Trade-
Number of Facilities
Number of Employees

Figure 7-3. Labor Force Trend in Hillsborough County

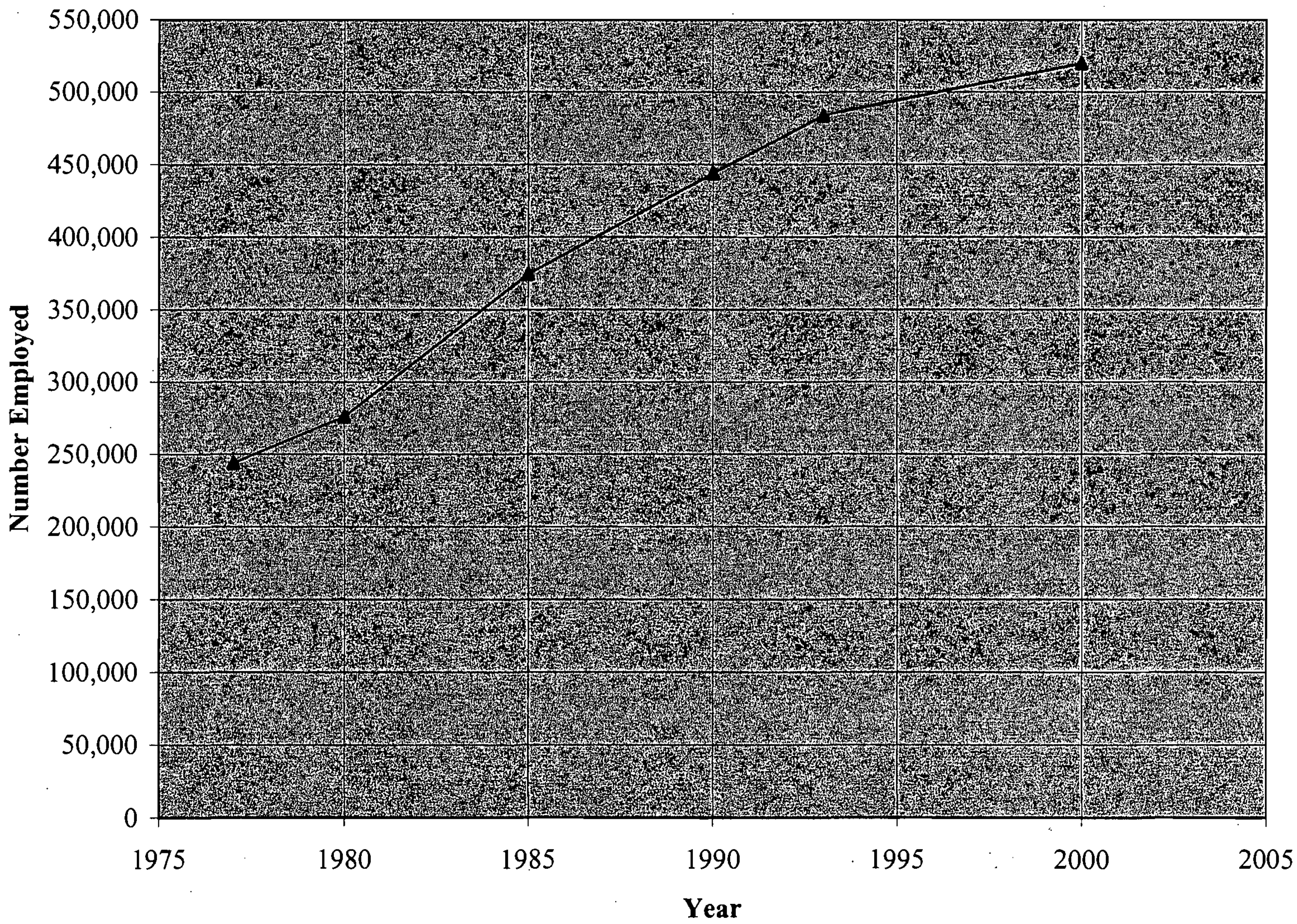


Figure 7-4. Hotel and Motel Trend in Hillsborough County

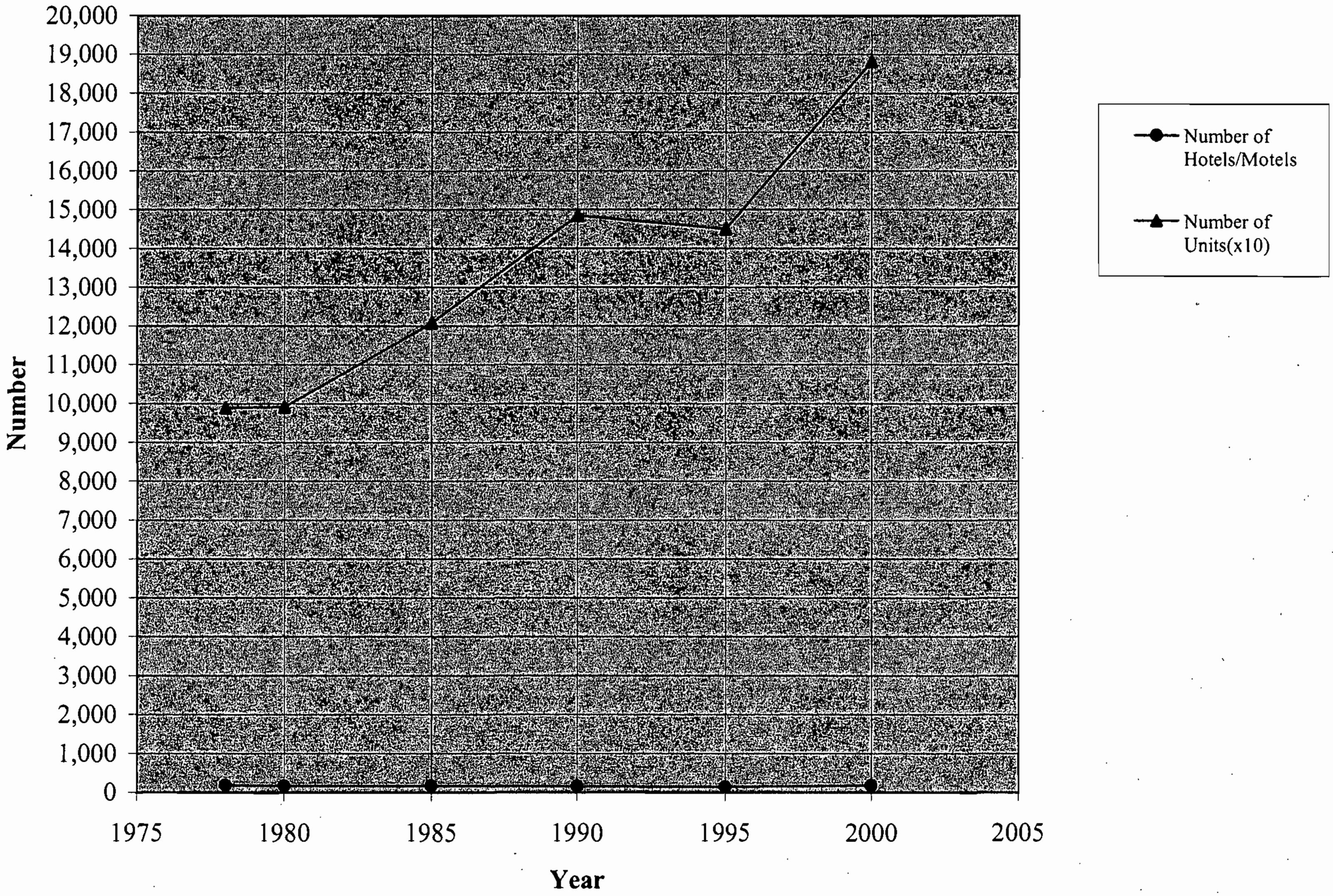


Figure 7-5. Vehicle Miles Traveled (VMT) Estimates for Motor Vehicles in Hillsborough County

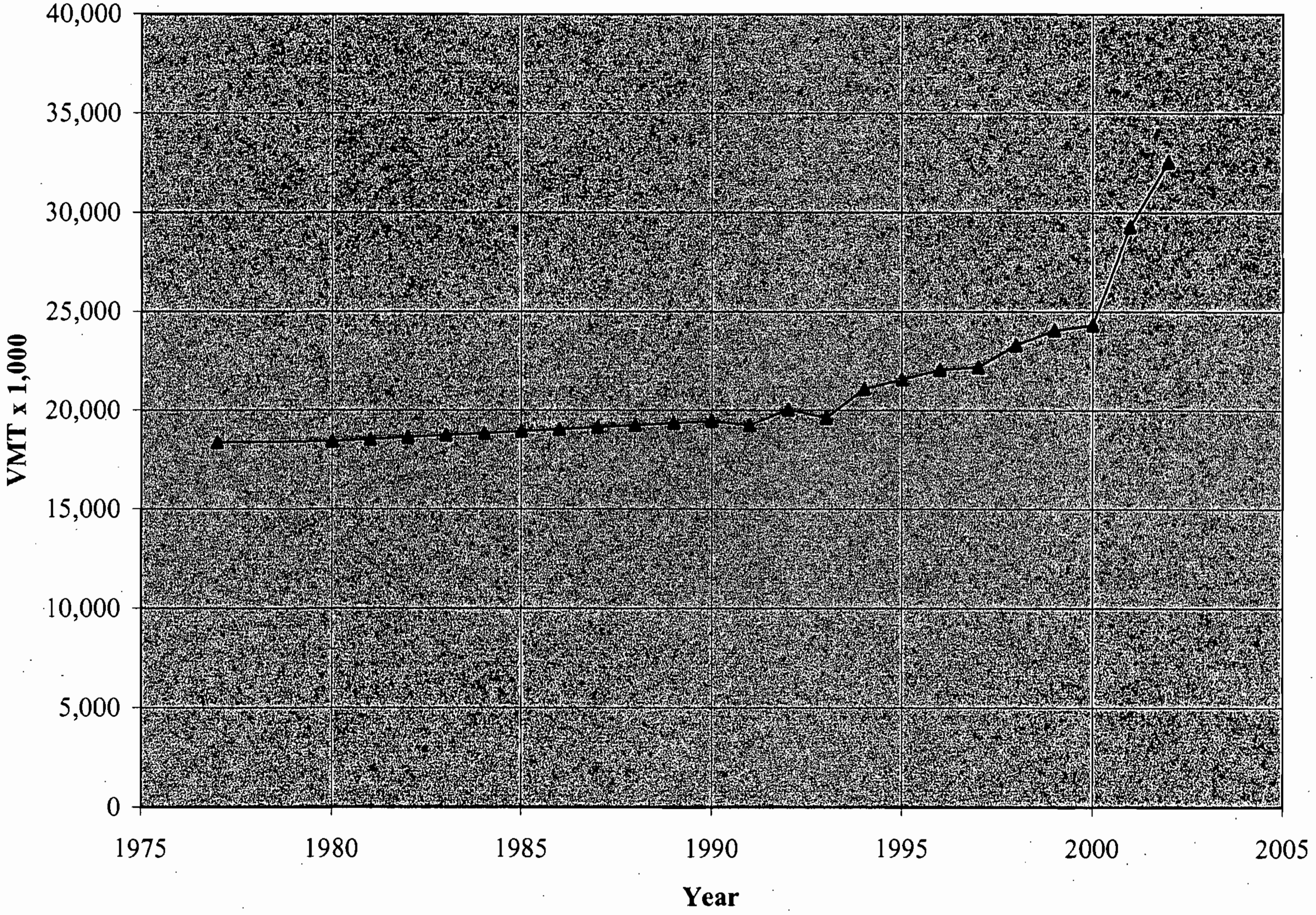


Figure 7-6. Manufacturing and Agriculture Trends in Hillsborough County

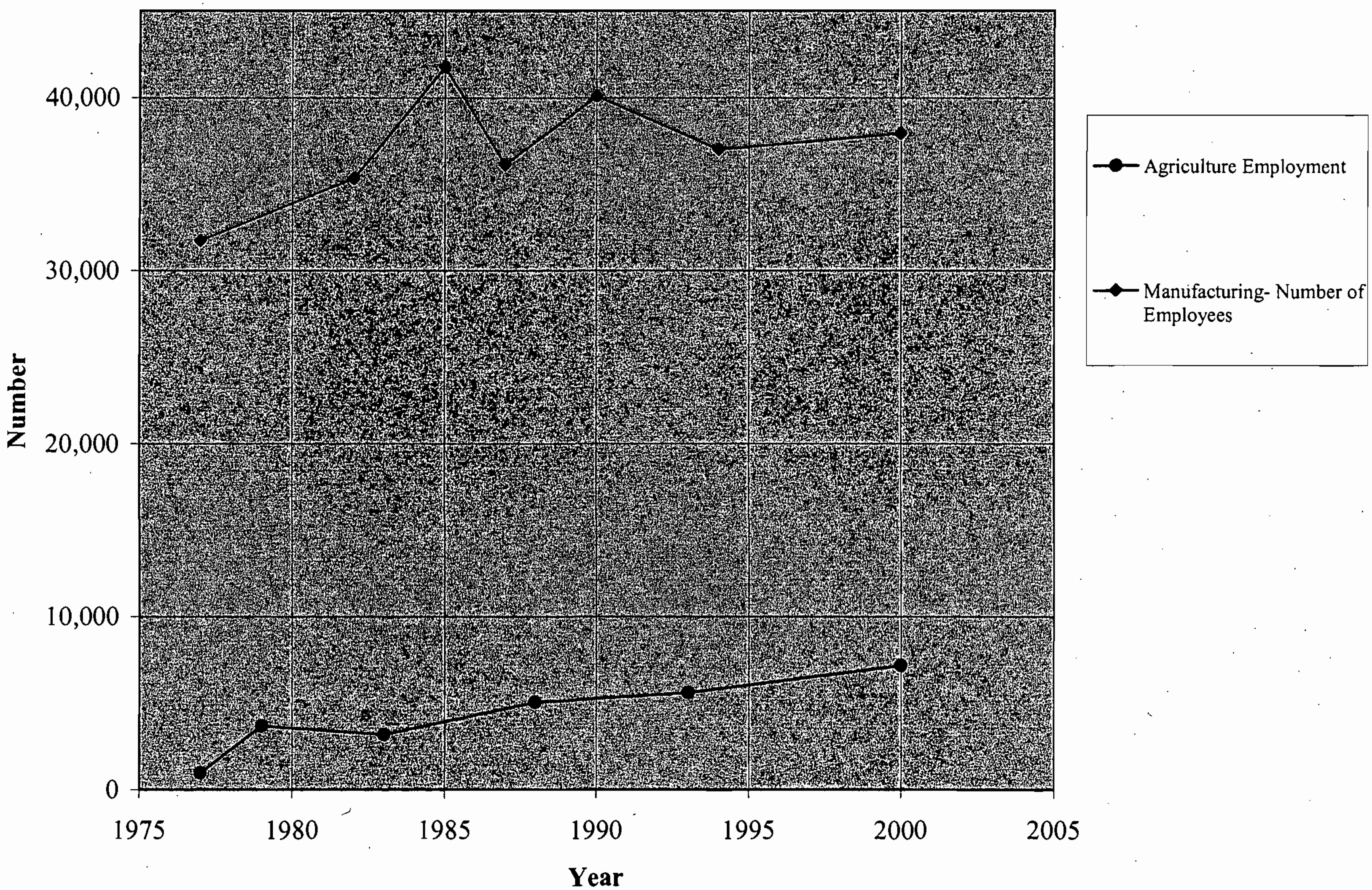


Figure 7-7. Electrical Utility Power Generation Capacity in Hillsborough County

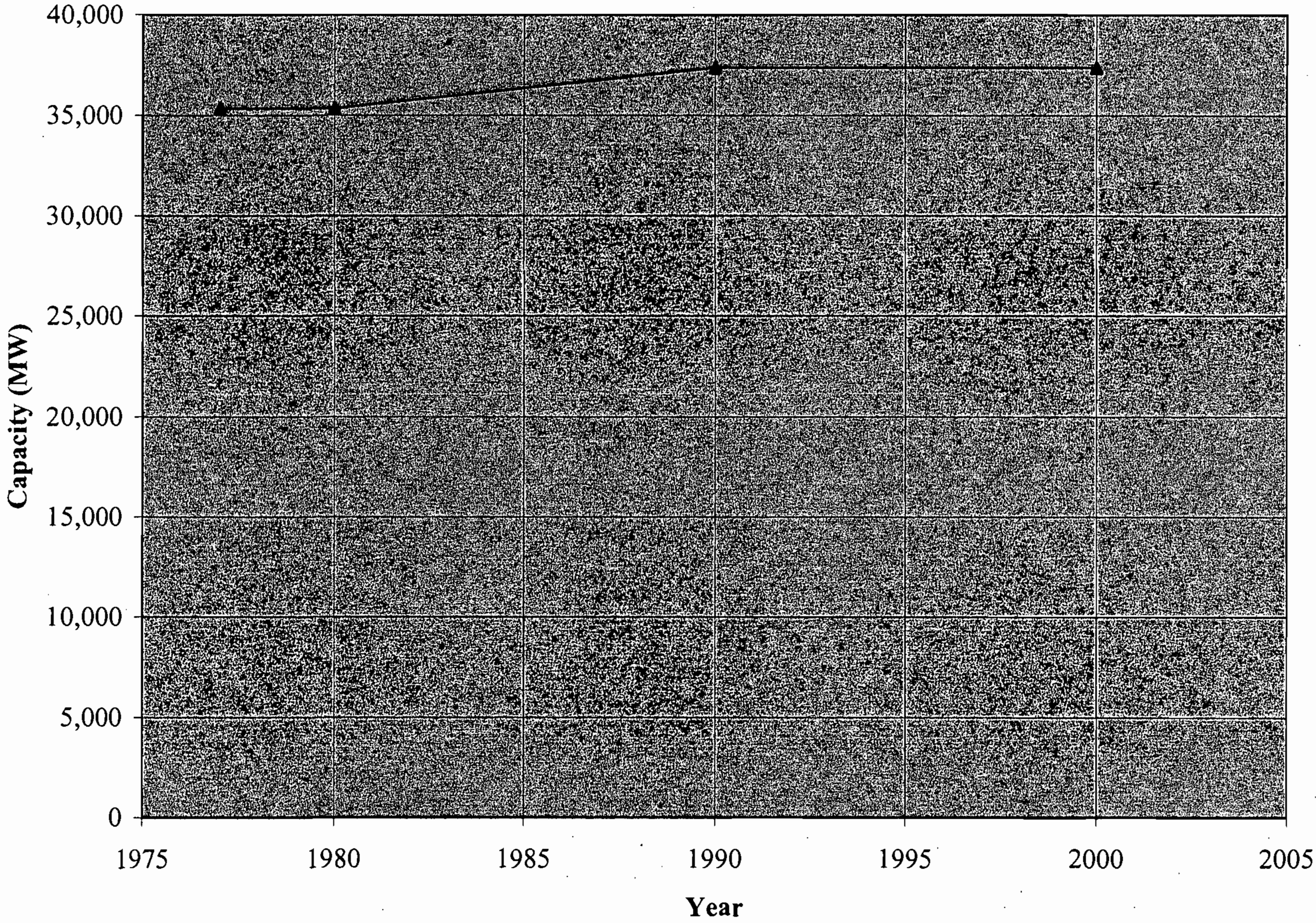


Figure 7-8. Mobile Source Emissions (Tons per Day) of CO, VOC, and NO_x in Hillsborough County

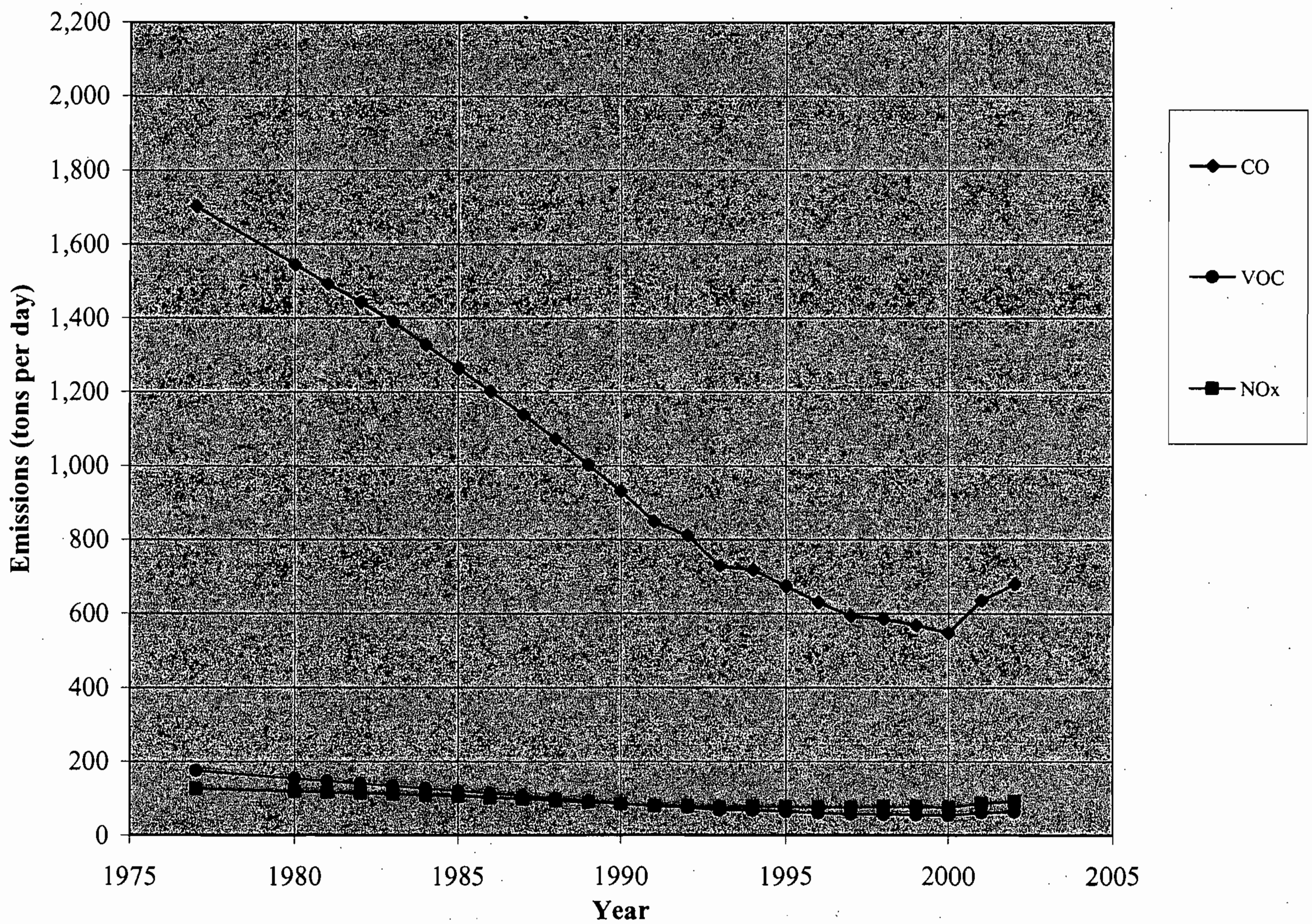


Figure 7-9. Measured Annual Average Sulfur Dioxide Concentrations from 1982 to 2002 - Hillsborough County

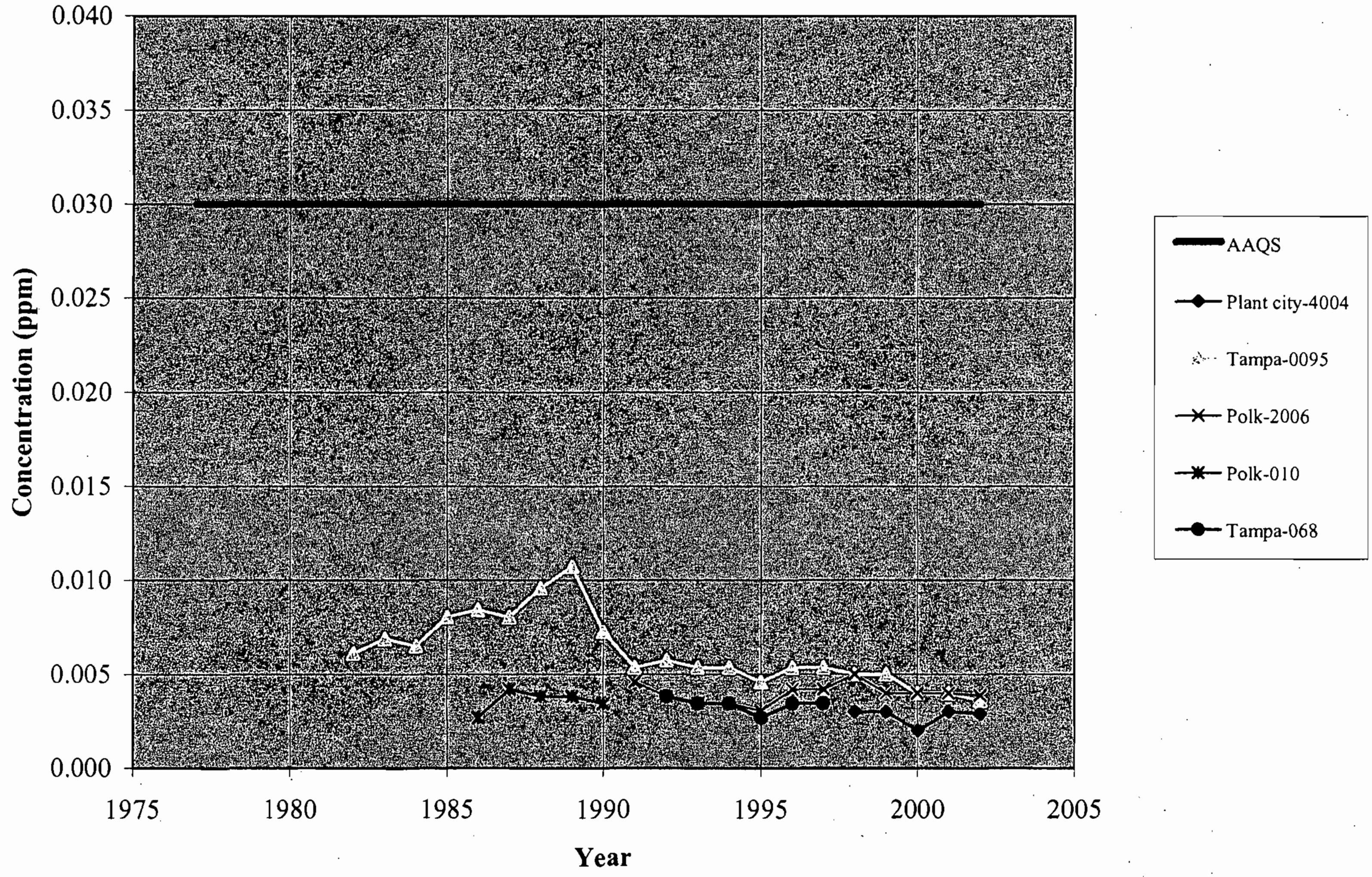


Figure 7-10. Measured 24-Hour Average Sulfur Dioxide Concentrations (2nd Highest Values) from 1982 to 2002 - Hillsborogh County

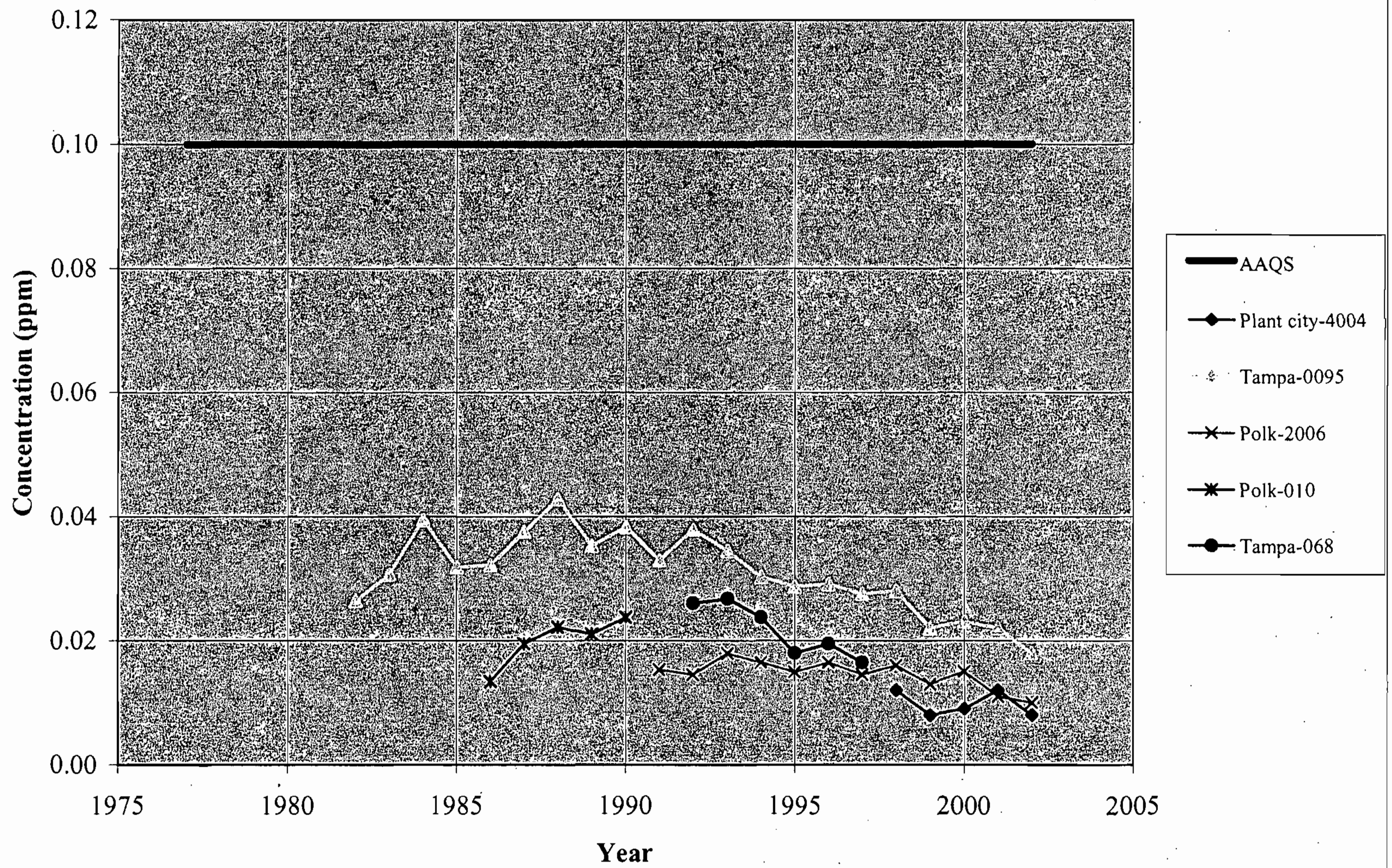
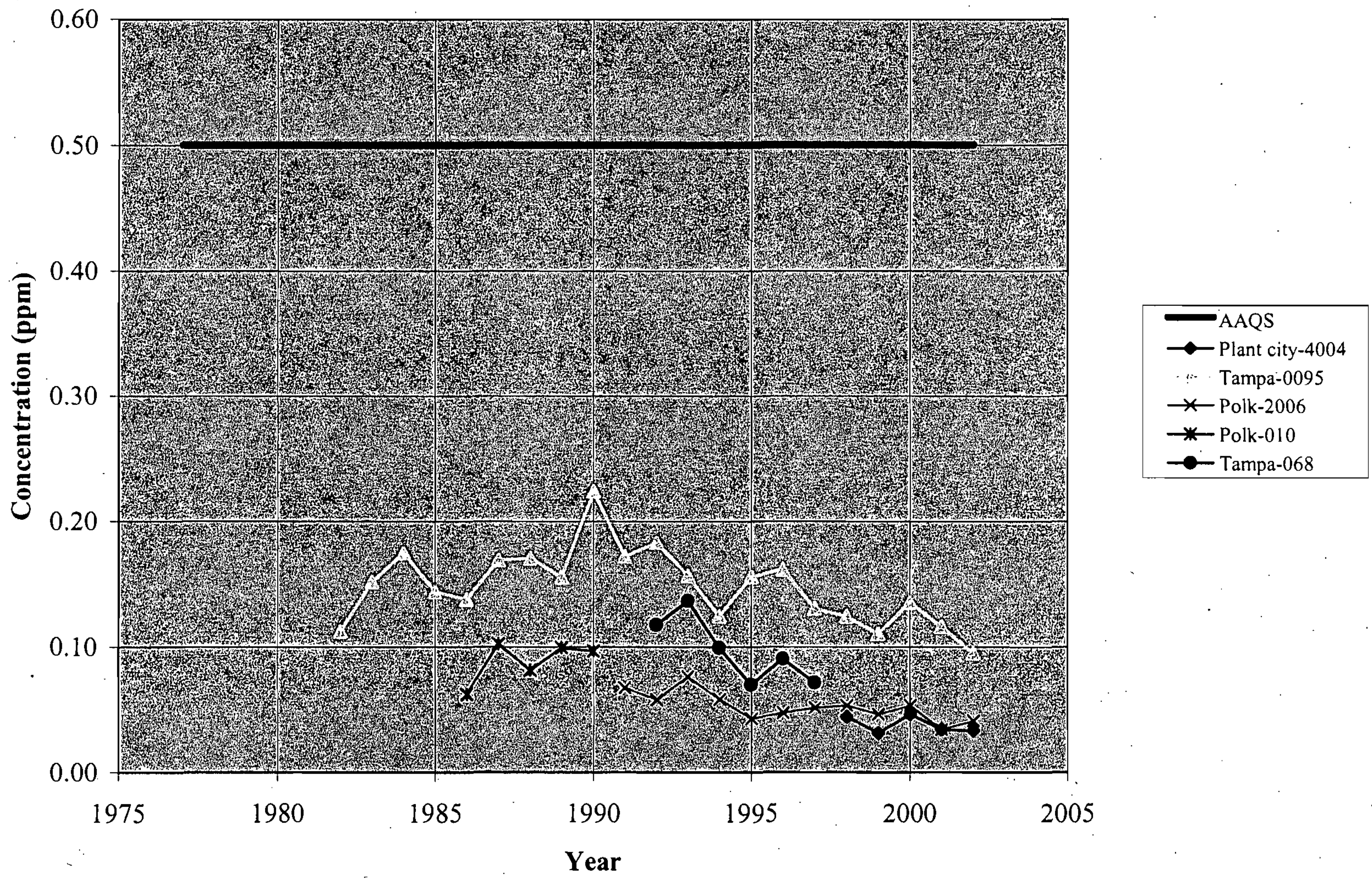


Figure 7-11. Measured 3-Hour Average Sulfur Dioxide Concentrations (2nd Highest Values) from 1982 to 2002 - Hillsborough County



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APPENDIX A

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

APPENDIX A

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

1.1 INTRODUCTION

As part of the new source review requirements under Prevention of Significant Deterioration (PSD) regulations, new sources are required to address air quality impacts at PSD Class I areas. As part of the PSD analysis report submitted to the Florida Department of Environmental Protection (FDEP), the air quality impacts due to the potential emissions of the proposed B SAP modification are required to be addressed at the PSD Class I area of the Chassahowitzka National Wildlife Area (NWA). The Chassahowitzka NWA is located approximately 69 km northwest of the facility site and is the only PSD Class I area located within 200 km of the project site.

The evaluation of air quality impacts are not only concerned with determining compliance with PSD Class I increments but also assessing a source's impact on Air Quality Related Values (AQRVs), such as regional haze. Further, compliance with PSD Class I increments can be evaluated by determining if the source's impacts are less than the proposed U.S. Environmental Protection Agency (EPA) Class I significant impact levels. The significant impact levels are threshold levels that are used to determine the type of air impact analyses needed for the facility. If the new source's impacts are predicted to be less than significant, then the source's impacts are assumed not to have a significant adverse affect on air quality and additional modeling with other sources is not required. However, if the source's impacts are predicted to be greater than the significant impact levels, additional modeling with other sources is required to demonstrate compliance with Class I increments.

Currently, there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and Federal Land Managers (FLM) of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the IWAQM Phase 2 report.
- *Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Phase I Report,* USFS, NPS, USFWS (12/00), referred to as the FLAG document.

For the proposed project, air quality analyses were performed that assess the facility's impacts in the PSD Class I area of the Chassahowitzka NWA using the refined modeling approach from the IWAQM Phase 2 report for:

- Significant impact analysis;
- Regional haze analysis; and
- Total sulfur and nitrogen deposition.

The refined analysis approach was used instead of the screening analysis approach, since the air quality impacts are based on generally more realistic assumptions, including more detailed meteorological data, and are estimated at locations at the Class I area.

1.2 GENERAL AIR MODELING APPROACH

The general modeling approach was based on using the long-range transport model, California Puff model (CALPUFF, Version 5.711a). At distances beyond 50 km, the ISCST3 model is considered to over-predict air quality impacts, because it is a steady-state model. At those distances, the CALPUFF model is recommended for use. The FLM have requested that air quality impacts, such as for regional haze, for a source located more than 50 km from a Class I area be predicted using the CALPUFF model. FDEP has also recommended that the CALPUFF model be used to assess if the source has a significant impact at a Class I area located beyond 50 km from the source. As a result, a significant impact and regional haze analyses were performed using the CALPUFF model to assess the facility's impacts at the Chassahowitzka NWA.

The methods and assumptions used in the CALPUFF model were based on the latest recommendations for a refined analysis as presented in the IWAQM Phase 2 Summary Report and the FLAG documents.

A regional haze analysis was performed to determine the affect that the facility's emissions will have on background regional haze levels at the Chassahowitzka NWA. In the regional haze analysis, the change in visual range, as calculated by a deciview change, was estimated for the facility in accordance with the IWAQM recommendations. Based on those recommendations, the CALPUFF model is used to predict the maximum 24-hour average sulfate (SO_4), nitrate (NO_3), and fine particulate (PM_{10}) concentrations as well as ammonium sulfate [$(NH_4)_2SO_4$] and ammonium nitrate

(NH_4NO_3) concentrations. The change in visibility due to a source, estimated as a percentage, is then calculated based on the change from background data.

The following sections present the methods and assumptions used to assess the refined significant impact and regional haze analyses performed for the proposed project. The results of these analyses are presented in Sections 6.0 and 7.0 of the report.

1.3 MODEL SELECTION AND SETTINGS

The CALPUFF air modeling system was used to assess the proposed project's impacts at the PSD Class I area for comparison to the PSD Class I significant impact levels and to the regional haze visibility criteria. CALPUFF is a non-steady state Lagrangian Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The CALPUFF meteorological and geophysical data preprocessor (CALMET, Version 5.53a), a preprocessor to CALPUFF, is a diagnostic meteorological model that produces a three-dimensional field of wind and temperature and a two-dimensional field of other meteorological parameters. CALMET was designed to process raw meteorological, terrain, and land-use databases to be used in the air modeling analysis. The CALPUFF modeling system uses a number of FORTRAN preprocessor programs that extract data from large databases and converts the data into formats suitable for input to CALMET. The processed data produced from CALMET was input to CALPUFF to assess the pollutant-specific impact. Both CALMET and CALPUFF were used in a manner that is recommended by the IWAQM Phase 2 and FLAG reports.

1.3.1 CALPUFF MODEL APPROACHES AND SETTINGS

The IWAQM has recommended approaches for performing Phase 2 refined modeling analyses that are presented in Table A-1. These approaches involve use of meteorological data, selection of receptors and dispersion conditions, and processing of model output.

The specific settings used in the CALPUFF model are presented in Table A-2.

1.3.2 EMISSION INVENTORY AND BUILDING WAKE EFFECTS

The CALPUFF model included the facility's emissions, stack, and operating data, as well as building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input

Program (BPIP), Version 04112, and were included in the CALPUFF model input. Section 6.0 of the PSD report presents a listing of the facility's emissions and structures included in the analysis.

1.4 RECEPTOR LOCATIONS

For the refined analyses, pollutant concentrations were predicted at 58 discrete receptors located at the boundary of the Chassahowitzka NWA. These receptors are part of the receptor data developed by the FLM for this area.

1.5 METEOROLOGICAL DATA

1.5.1 REFINED ANALYSIS

CALMET was used to develop the gridded parameter fields required for the refined modeling analyses. The follow sections discuss the specific data used and processed in the CALMET model.

1.5.2 CALMET SETTINGS

The CALMET settings contained in Table A-3 were used for the refined modeling analysis. All input data files needed for CALMET were developed by Golder, with the exception of the upper air and sea surface meteorological data files, which were developed by FDEP.

1.5.3 MODELING DOMAIN

A rectangular modeling domain extending 448 km in the east-west (x) direction and 684 km in the north-south (y) direction was used for the refined modeling analysis. The southwest corner of the domain is the origin and is located at 26.25 degrees north, latitude, and 85.0 degrees west, longitude (east and north UTM coordinates of 77 and 2966.0 km, respectively, zone 17 equivalent). This location is in the Gulf of Mexico approximately 250 km west of Naples, Florida. For the processing of meteorological and geophysical data, the domain contains 112 grid cells in the x-direction and 171 grid cells in the y-direction. The domain grid resolution is 4 km. The air modeling analysis was performed in the UTM coordinate system, Zone 17.

1.5.4 MESOSCALE MODEL – GENERATION 4 (MM4/5) DATA

Pennsylvania State University, in conjunction with the NCAR Assessment Laboratory, developed the MM4 and MM5 data sets, a prognostic wind field or "guess" field, for the United States. The hourly meteorological variables used to create these datasets (wind, temperature, dew point depression, and geopotential height for eight standard levels and up to 15 significant levels) are extensive and are available for 1990, 1992, and 1996. The analysis used the MM4 and MM5 data to initialize the CALMET wind field. The MM4 and MM5 data available for 1990 and 1992, respectively, have a horizontal spacing of 80 km and are used to simulate atmospheric variables within the modeling domain. The MM5 data are also available for 1996, and have a horizontal spacing of 36 km.

The 1990 MM4 subset domain and 1992 MM5 subset domain consist of an 11- x 14-cell rectangle, with an 80-km grid resolution, extending from the MM4/5 grid points (46,8) to (56,21). These data were processed to create an MM4/5.DAT file for input to the CALMET model. The 1996 MM5 subset domain consisted of a 21- x 25-cell rectangle, with a 36-km grid resolution, extending from the MM5 grid points (117,23) to (137,47).

The MM4 and MM5 data used in the CALMET, although advanced, lacks the fine detail of specific temporal and spatial meteorological variables and geophysical data. These variables were processed into the appropriate format and introduced into the CALMET model through the additional data files obtained from the following sources.

1.5.5 SURFACE DATA STATIONS AND PROCESSING

A summary of the surface and sea-surface station information and locations are presented in Table A-4. The surface station data processed for the CALPUFF analyses consisted of data from up to sixteen NWS stations or Federal Aviation Administration (FAA) Flight Service stations for:

- Tampa, Jacksonville, Daytona Beach, Tallahassee, Vero Beach, Fort Myers, Orlando, Pensacola, and Gainesville in Florida;
- Columbus, Macon, Savannah, Augusta, Athens, and Atlanta in Georgia; and
- Charleston in South Carolina.

The surface station parameters include wind speed, wind direction, cloud ceiling height, opaque cloud cover, dry bulb temperature, relative humidity, station pressure, and a precipitation code that is based on current weather conditions. The surface station data were processed into a SURF.DAT file format for CALMET input.

Because the modeling domain extends largely over water, up to ten sea surface stations were incorporated into the analysis for each of the years evaluated. Data were obtained from available C-Man stations and NOAA buoys. These data were processed into an over-water surface station format (i.e., SEA*.DAT) for input to CALMET. The over-water station data include wind direction, wind speed, and air temperature.

1.5.6 UPPER AIR DATA STATIONS AND PROCESSING

A summary of the upper air station information and locations are presented in Table A-4. Upper air data from the following NWS stations, based on the availability of the upper air data, were used in the modeling analysis:

- Waycross, Georgia (1990, 1992);
- Athens, Georgia (1990, 1992);
- Charleston, South Carolina (1990, 1992, 1996);
- Cape Canaveral (1996)
- Miami (1996)
- Apalachicola, Florida (1990);
- Ruskin, Florida (1990, 1992, 1996);
- Tallahassee, Florida (1992, 1996);
- West Palm Beach (1990, 1992)
- Jacksonville, Florida (1996); and
- Peachtree City, Georgia (1996).

1.5.7 PRECIPITATION DATA STATIONS AND PROCESSING

Precipitation data were processed from a network of hourly precipitation data files collected from primary and secondary NWS precipitation-recording stations located within the latitude and longitudinal limits of the modeling domain. Data for up to 82 stations in Alabama, Georgia, and Florida were obtained in NCDC TD-3240 variable format and converted into a fixed-length format. The utility programs PXTRACT and PMERGE were then used to process the data into the format for the PRECIP.DAT file that is used by CALMET.

1.5.8 GEOPHYSICAL DATA PROCESSING

Terrain elevations for each grid cell of the modeling domain were obtained from 1-degree Digital Elevation Model (DEM) files obtained from the U.S. Geographical Survey (USGS) Internet website. The DEM data was extracted for the modeling domain grid using the utility program TERREL. Land use data were also extracted from 1-degree USGS files and processed using the utility programs CTGCOMP and CTGPROC. Both the terrain and land use files were combined into a GEO.DAT file for input to CALMET with the MAKEGEO utility program.

Table A-1. Refined Modeling Analyses Recommendations[a]

Model Input/Output	Description
Meteorology	Use CALMET (minimum 6 to 10 layers in the vertical; top layer must extend above the maximum mixing depth expected); horizontal domain extends 50 to 80 km beyond outer receptors and sources being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; obtain regulatory concurrence on coverage.
Dispersion	1. CALPUFF with default dispersion settings. 2. Use MESOPUFF II chemistry with wet and dry deposition. 3. Define background values for ozone and ammonia for area.
Processing	1. For PSD increments: use highest, second-highest 3-hour and 24-hour average SO_2 concentrations; highest, second-highest 24-hour average PM_{10} concentrations; and highest annual average SO_2, PM_{10}, or NO_x concentrations. 2. For haze: process, on a 24-hour basis, compute the source extinction from the maximum increase in emissions of SO_2, NO_x, and PM_{10}; compute the daily relative humidity factor [f(RH)], provided from an external disk file; and compute the maximum percent change in extinction using the FLM supplied background extinction data in the FLAG document. 3. For deposition: compute dry and wet fluxes of nitrogen and sulfur emissions on an annual average basis and adjust concentrations using the molecular weight ratios provided in the FLAG document. Compute total sulfur and nitrogen deposition. 4. For significant impact analysis: use highest annual and highest short-term averaging time concentrations for SO_2, NO_x, or PM_{10}.

[a] IWAQM Phase II report (12/98) and FLAG document (12/00)

Table A-2. CALPUFF Model Settings

Parameter	Setting
Pollutant Species	SO_2, SO_4, NO_x, HNO_3, NO_3, PM_{10}
Chemical Transformation	MESOPUFF II scheme, hourly ozone data
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	CALMET
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG /MP coefficients, rural mode, ISC building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration file including output species for SO_4, NO_3, PM_{10}, SO_2, and NO_x; process for visibility change using Method 2 and FLAG background extinctions
Model Processing	For haze: highest predicted 24-hour extinction change (%) for the year For deposition: annual average deposition rate For significant impact analysis: highest predicted annual and highest short-term averaging time concentrations for SO_2, NO_x, and PM_{10}.
Maximum Relative Humidity	95%
Background Values	Ozone: 50 ppb; Ammonia: 1 ppb

Table A-3. CALMET Settings

Parameter	Setting
Horizontal Grid Dimensions	448 by 684 km, 4 km grid resolution
Vertical Grid	10 layers
Weather Station Data Inputs	Surface, upper air, and precipitation stations
Wind model options	Diagnostic wind model, no kinematic effects
Prognostic wind field model	1990 MM4 and 1992 data, 80 km resolution; 1996 MM5 data, 36 km resolution; used for wind field initialization
Output	Binary hourly grid pattern for meteorological data file for CALPUFF input

Table A-4. Surface and Upper Air Stations Used in the North Central Florida – South Georgia Domain

			UTM Coordinates			
Station Name	**Station Symbol**	**WBAN Number**	**Easting (km)**	**Northing (km)**	**UTM Zone**	**Anemometer Height (m)**
Surface Stations						
Tampa, FL	TPA	12842	349.195	3094.289	17	10
Jacksonville, FL	JAX	13889	432.809	3374.192	17	10
Daytona Beach, FL	DAB	12834	495.118	3228.056	17	10
Tallahassee, FL	TLH	93805	176.408[a]	3365.835	16	10
Fort Myers. F L	FMY	12835	413.644	2940.405	17	10
Orlando, FL	MCO	12815	468.942	3146.889	17	10
Pensacola, FL	PNS	13899	-95.740[a]	3386.714	16	10
Vero Beach, FL	VRB	12843	557.487	3058.363	17	10
Columbus, GA	CSG	93842	128.871[a]	3604.422	16	10
Charleston, SC	CHS	13880	590.422	3640.405	17	10
Macon, GA	MCN	3813	251.562	3620.929	17	10
Savannah, GA	SAV	3822	481.120	3554.985	17	10
Gainesville, FL	GNV	12816	377.390	3284.126	17	10
Augusta, GA	AGS	3820	410.024	3692.184	17	10
Athens, GA	AHN	13873	285.867	3758.824	17	10
Atlanta, GA	ATL	13874	181.588[a]	3728.434	16	10
Sea Surface Stations						
Venice, FL	VENF1	-	356.24	2995.05	17	-
Cape Canaveral, FL	41009	-	380.25	3152.87	17	-
Tampa West, FL	42036	-	156.41[a]	3158.73	16	-
Cedar Key, FL	CDRF1	-	302.52	3225.20	17	-
Cape San Blas, FL	CSBF1	-	77.89[a]	3290.18	16	-
Folly Island, SC	FBIS1	-	604.09	3616.38	17	-
Keaton Beach, FL	KTNF1	-	249.71	3301.66	17	-
Lake Worth, FL	LKWF1	-	596.57	2943.61	17	-
Savannah, GA	SVLS1	-	530.24	3534.94	17	-
St. Augustine, FL	SAUF1	-	474.89	3303.30	17	-
Upper Air Stations						
Ruskin, FL	TPA	12842	361.961	3064.616	17	NA
Waycross, GA	AYS	13861	366.674	3457.945	17	NA
Athens, GA	AHN	13873	285.866	3758.824	17	NA
Charleston, SC	CHS	13880	590.421	3640.405	17	NA
Cape Canaveral	XMR	12868	544.048	3150.459	17	NA
Miami – FIU	MFL	92803	562.181	2847.983	17	NA
Apalachicola, FL	AQQ	12832	109.807[a]	3295.816	16	NA
Tallahassee, FL	TLH	93805	176.407[a]	3365.835	16	NA
Jacksonville, FL	JAX	13889	432.808	3374.192	17	NA
Peachtree, GA	FFC	53819	155.637[a]	3696.207	16	NA

[a] Equivalent coordinates for Zone 17.

Table A-5. Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name	Station Number	UTM Coordinate Easting (km)	UTM Coordinate Northing (km)	Zone
Belle Glade Hrcn Gt 4	80616	528.190	2953.034	17
Branford	80975	315.606	3315.955	17
Brooksville 7 SSW	81048	358.029	3149.545	17
Canal Point Gate 5	81271	536.428	2971.514	17
Daytona Beach WSO AP	82158	494.165	3227.413	17
Deland 1 SSE	82229	470.780	3209.660	17
Fort Myers FAA/AP	83186	413.992	2940.710	17
Gainesville 11 WNW	83322	355.411	3284.205	17
Inglis 3 E	84273	342.631	3211.652	17
Lakeland	84797	409.871	3099.178	17
Lisbon	85076	423.594	3193.256	17
Lynne	85237	409.255	3230.295	17
Marineland	85391	479.193	3282.030	17
Melbourne WSO	85612	534.381	3109.967	17
Moore Haven Lock 1	85895	491.608	2967.803	17
Orlando Wso McCoy	86628	468.169	3145.102	17
Ortona Lock 2	86657	470.174	2962.267	17
Parrish	86880	366.986	3054.394	17
Port Mayaca S L Canal	87293	538.044	2984.440	17
Saint Leo	87851	376.483	3135.086	17
St Lucie New Lock 1	87859	571.042	2999.353	17
St Petersburg	87886	339.608	3071.991	17
Tampa Wscmo AP	88788	348.478	3093.670	17
Venice	89176	357.593	2998.178	17
Venus	89184	467.266	3001.224	17
Vero Beach 4 W	89219	554.268	3056.498	17
West Palm Beach Int AP	89525	589.611	2951.627	17

APPENDIX B

SO_2 PSD CLASS I INVENTORY – DETAIL SOURCE INFORMATION

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility ID	EU ID	Facility Name / Emission Unit Description	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)	Temperature (°F)	Temperature (K)	Velocity (ft/s)	Velocity (m/s)	24-Hour Emission Rate (lb/hr)	24-Hour Emission Rate (g/s)	3-Hour Emission Rate (lb/hr)	3-Hour Emission Rate (g/s)	PSD [a] Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0570075		CORONET INDUSTRIES, INC. (formerly Consolidated Minerals, Plant City)																		
	3	DEFLUORINATING KILN #2	CORN3	5800	-19700	152	46.3	5.8	1.77	110	316	64.0	19.5	188.42	23.74	188.42	23.74	B	Yes	No
	19	BOILER DEFLUOR. PLANT	CORN19	5800	-19700	25	7.6	1.3	0.40	450	505	50.0	15.2	4.26	0.54	4.26	0.54	B	Yes	No
	20	BOILER DEFLUOR. PLANT	CORN20	5800	-19700	20	6.1	1.2	0.37	630	605	66.0	20.1	2.13	0.27	2.13	0.27	B	Yes	No
	22	FLUID BED REACTOR #1	CORN22	5800	-19700	152	46.3	5.8	1.77	110	316	64.0	19.5	68.48	8.63	68.48	8.63	B	Yes	No
	24	FLUID BED REACTOR #2	CORN24	5800	-19700	152	46.3	5.8	1.77	110	316	64.0	19.5	68.48	8.63	68.48	8.63	B	Yes	No
1050004		LAKELAND ELECTRIC - MCINTOSH POWER PLANT																		
	1	McIntosh Unit 1	MCINT1	21000	-9800	150	45.7	9.0	2.74	277	409	81.2	24.7	2,612.50	329.18	2,612.50	329.18	B	Yes	No
	2	McIntosh Unit 2	MCINT2	21000	-9800	20	6.1	2.6	0.79	715	653	77.0	23.5	14.30	1.80	14.30	1.80	B	Yes	No
	3	McIntosh Unit 3	MCINT3	21000	-9800	20	6.1	2.6	0.79	715	653	77.0	23.5	14.30	1.80	14.30	1.80	B	Yes	No
	4	Gas Turbine Peaking Unit 1	MCINT4	21000	-9800	35	10.7	13.5	4.11	900	755	79.5	24.2	164.70	20.75	164.70	20.75	B	Yes	No
	5	McIntosh Unit 2	MCINT5	21000	-9800	157	47.9	10.5	3.20	277	409	73.2	22.3	892.00	112.39	892.00	112.39	B	Yes	No
	6	McIntosh Unit 3	MCINT6	21000	-9800	250	76.2	18.0	5.49	167	348	82.6	25.2	4,368.00	550.37	4,368.00	550.37	C	Yes	Yes
	28	CT UNIT 5	MCINT28	21000	-9800	85	25.9	28.0	8.53	1095	864	82.7	25.2	126.70	15.96	126.70	15.96	C	Yes	Yes
1050003		LAKELAND ELECTRIC - LARSEN POWER PLANT																		
	3	Steam Generator # 6	LARS3	20900	-13500	165	50.3	10.0	3.05	340	444	21.0	6.4	841.20	105.99	841.20	105.99	B	Yes	No
	4	Steam Generator # 7	LARS4	20900	-13500	165	50.3	10.0	3.05	340	444	22.0	6.7	1,643.00	207.02	1,643.00	207.02	B	Yes	No
	5	Peaking Gas Turbine # 3	LARS5	20900	-13500	31	9.4	11.8	3.60	800	700	101.0	30.8	106.20	13.38	106.20	13.38	B	Yes	No
	6	Peaking Gas Turbine # 2	LARS6	20900	-13500	31	9.4	11.8	3.60	800	700	101.0	30.8	106.20	13.38	106.20	13.38	B	Yes	No
	7	Peaking Gas Turbine # 1	LARPWR7	20900	-13500	31	9	11.8	3.60	800	700	101	30.8	106.2	13.38	106.20	13.38	B	Yes	No
	8	Combined Cycle CT	LARS8	20900	-13500	155	47.2	16.0	4.88	481	523	85.7	26.1	211.40	26.64	211.40	26.64	C	Yes	Yes
0570006		YUENGLING BREWING CO.																		
	1	2 Natural gas boilers	YNGBREW1	-26000	-12800	90	27.4	6.5	1.98	275	408	7.0	2.1	9.00	1.13	3.30	0.42	C	Yes	Yes
0570261		HILLSBOROUGH CTY. RESOURCE RECOVERY FAC.																		
	1	MWC & Aux Burner #1	HILLSRC1	-19800	-23300	220	67.1	5.1	1.55	290	416	72.5	22.1	58.67	7.39	58.67	7.39	C	Yes	Yes
	2	MWC & Aux Burner #2	HILLSRC2	-19800	-23300	220	67.1	5.1	1.55	290	416	72.5	22.1	58.67	7.39	58.67	7.39	C	Yes	Yes
	3	MWC & Aux Burner #3	HILLSRC3	-19800	-23300	220	67.1	5.1	1.55	290	416	72.5	22.1	58.67	7.39	58.67	7.39	C	Yes	Yes
1050047		AGRIFOS, L.L.C. - NICHOLS (formerly Mobil Mining & Minerals Nichols)																		
	1	ROCK DRYER NO. 1	AGRINK1	10700	-30700	80	24.4	7.5	2.29	160	344	41.0	12.5	255.52	32.20	255.52	32.20	B	Yes	No
	2	ROCK DRYER NO. 2	AGRINK2	10700	-30700	80	24.4	7.5	2.29	160	344	41.0	12.5	251.00	31.63	251.00	31.63	B	Yes	No
		Expanding Source	AGRINK3	10700	-30700	93	28.4	3.6	1.10	152	340	63.1	19.2	-110.32	-13.90	-110.32	-13.90	E	No	Yes
		Expanding Source	AGRINK4	10700	-30700	13	4.0	2.6	0.79	480	522	5.9	1.8	-6.90	-0.87	-6.90	-0.87	E	No	Yes
0570057		GULF COAST RECYCLING, INC.																		
	1	BLAST FURNACE	GULFRCY1	-24000	-22500	150	45.7	2.0	0.61	160	344	54.8	16.7	374.00	47.12	374.00	47.12	B	Yes	No

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility ID	Facility Name / EU ID	Emission Unit Description	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)	Temperature (°F)	Temperature (K)	Velocity (ft/s)	Velocity (m/s)	24-Hour Emission Rate (lb/hr)	24-Hour Emission Rate (g/s)	3-Hour Emission Rate (lb/hr)	3-Hour Emission Rate (g/s)	PSD [a] Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
1050057	IMC PHOSPHATES COMPANY - NICHOLS	(formerly IMC Agrico/Conserve)																		
	5	SAP NO. 1 PSD	AGRNK5	10400	-31800	150	45.7	7.5	2.29	170	350	33.0	10.1	416.80	52.52	416.80	52.52	C	Yes	Yes
	12	Phosphate Rock Dryer	AGRNK12	10400	-31800	81	24.7	7.5	2.29	130	328	12.0	3.7	26.49	3.34	26.49	3.34	B	Yes	No
	15	North Auxiliary Boiler	AGRNK15	10400	-31800	27	8.2	2.0	0.61	500	533	45.0	13.7	25.74	3.24	25.74	3.24	B	Yes	No
	16	South Auxiliary Boiler	AGRNK16	10400	-31800	39	11.9	3.2	0.98	500	533	29.0	8.8	2.59	0.33	2.59	0.33	B	Yes	No
		Expanding Source	AGRNK1	10400	-31800	100	30.5	5.9	1.80	95	308	62.0	18.9	-121.0	-15.2	-121.00	-15.25	E	No	Yes
		Expanding Source	AGRNK2	10400	-31800	80	24.4	5.0	1.52	151	339	42.3	12.9	-30.2	-3.81	-30.20	-3.81	E	No	Yes
1050221	AUBURNDALE POWER PARTNERS, LP																			
	1	Combustion Turbine System(Phase II, Acid Rain Unit)	AUBCT1	32800	-12700	160	48.8	18.0	5.49	203	368	55.0	16.8	40.00	5.040	40.00	5.04	C	Yes	Yes
	1	Combustion Turbine System(Phase II, Acid Rain Unit)	AUBCT2	32800	-12700	160	48.8	18.0	5.49	203	368	55.0	16.8	70.00	8.820	70.00	8.82	C	Yes	Yes
1050023	CUTRALE CITRUS JUICES USA,INC																			
	1	CITRUS FEED MILL DRYER	CUTR1	33600	-12300	93	28.3	3.5	1.07	140	333	55.0	16.8	186.00	23.44	186.00	23.44	B	Yes	No
	3	PEEL DRYER	CUTR3	33600	-12300	100	30.5	3.2	0.98	161	345	49.0	14.9	186.00	23.44	186.00	23.44	C	Yes	Yes
	8	COGEN #1	CUTR8	33600	-12300	40	12.2	4.0	1.22	323	435	60.0	18.3	170.80	21.52	170.80	21.52	C	Yes	Yes
	9	COGEN #2	CUTR9	33600	-12300	40	12.2	4.0	1.22	330	439	66.0	20.1	26.00	3.28	26.00	3.28	C	Yes	Yes
1050048	CARGILL MULBERRY (FORMERLY MULBERRY PHOSPHATES, INC.)																			
	2	SAP 2	MULPHS2	18800	-30900	200	61.0	7.0	2.13	200	366	32.0	9.8	283.33	35.70	283.33	35.70	C	Yes	Yes
	5	MAP/DAP PLANT (expanding source)	MULPHS5	18800	-30900	102	31.1	8.8	2.68	110	316	26.0	7.9	-73.79	-9.30	-73.79	-9.30	E	No	Yes
	9	BOILER	MULPHS9	18800	-30900	45	13.7	3.7	1.13	80	300	8.0	2.4	102.44	12.91	102.44	12.91	B	Yes	No
	1	Expanding Source	MULPHSX	18800	-30900	168	51.2	7.0	2.13	181	356	37.5	11.4	-2,044.40	-257.59	-2,044.40	-257.59	E	No	Yes
0570127	CITY OF TAMPA, MCKAY BAY																			
	103	MWC & Aux Burner No. 1	MCKY103	-27800	-23790	201	61.3	4.2	1.28	289	416	73.3	22.3	40.87	5.15	40.87	5.15	C	Yes	Yes
	104	MWC & Aux Burner No. 2	MCKY104	-27800	-23790	201	61.3	4.2	1.28	289	416	73.3	22.3	40.87	5.15	40.87	5.15	C	Yes	Yes
	105	MWC & Aux Burner No. 3	MCKY105	-27800	-23790	201	61.3	4.2	1.28	289	416	73.3	22.3	40.87	5.15	40.87	5.15	C	Yes	Yes
	106	MWC & Aux Burner No. 4	MCKY106	-27800	-23790	201	61.3	4.2	1.28	289	416	73.3	22.3	40.87	5.15	40.87	5.15	C	Yes	Yes
1050046	CARGILL FERTILIZER - BARTOW																			
	1	NO.3 FERTILIZER PLANT	CARBAR1	21800	-29400	141	43.0	7.5	2.29	160	344	79.0	24.1	76.90	9.69	76.90	9.69	C	Yes	Yes
	12	No. 4 SAP	CARBAR12	21800	-29400	200	61.0	6.8	2.07	180	355	61.0	18.6	433.30	54.60	433.30	54.60	C	Yes	Yes
	21	NO.4 FERTILIZER PLANT	CARBAR21	21800	-29400	140	42.7	11.0	3.35	132	329	42.1	12.8	102.53	12.92	102.53	12.92	B	Yes	No
	32	No. 6 SAP	CARBAR32	21800	-29400	200	61.0	6.8	2.07	180	355	61.0	18.6	433.30	54.60	433.30	54.60	C	Yes	Yes
	33	No. 5 SAP	CARBAR33	21800	-29400	200	61.0	6.8	2.07	180	355	61.0	18.6	433.30	54.60	433.30	54.60	C	Yes	Yes
	51	Boiler	CARBAR51	21800	-29400	31	9.4	3.5	1.07	410	483	20.0	6.1	165.17	20.81	165.17	20.81	C	Yes	Yes

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility ID	Facility Name		ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)	Temperature (°F)	Temperature (K)	Velocity (ft/s)	Velocity (m/s)	24-Hour Emission Rate (lb/hr)	24-Hour Emission Rate (g/s)	3-Hour Emission Rate (lb/hr)	3-Hour Emission Rate (g/s)	PSD [a] Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
	EU ID	Emission Unit Description																		
1050059	IMC PHOSPHATES COMPANY - NEW WALES																			
	2	SAP No. 1	IMCWAL2	8700	-36600	200	61.0	8.5	2.59	170	350	50.0	15.2	483.30	60.90	483.30	60.90	B	Yes	No
	3	SAP No. 2	IMCWAL3	8700	-36600	200	61.0	8.5	2.59	170	350	50.0	15.2	483.30	60.90	483.30	60.90	B	Yes	No
	4	SAP No. 3	IMCWAL4	8700	-36600	200	61.0	8.5	2.59	170	350	50.0	15.2	483.30	60.90	483.30	60.90	B	Yes	No
	9	DAP Plant No. 1	IMCWAL9	8700	-36600	133	40.5	7.0	2.13	105	314	49.0	14.9	74.60	9.40	74.60	9.40	B	Yes	No
	13	Auxiliary Boiler	IMCWAL13	8700	-36600	85	25.9	3.0	0.91	555	564	193.3	58.9	569.00	71.69	569.00	71.69	B	Yes	No
	27	AFI Plant	IMCWAL27	8700	-36600	172	52.4	8.0	2.44	130	328	66.3	20.2	18.30	2.31	18.30	2.31	B	Yes	No
	36	Kilns, Dryer, Blending Op.	IMCWAL36	8700	-36600	172	52.4	4.5	1.37	105	314	52.0	15.8	192.00	24.19	192.00	24.19	B	Yes	No
	42	SAP No. 4	IMCWAL42	8700	-36600	199	60.7	8.5	2.59	170	350	50.0	15.2	483.30	60.90	483.30	60.90	B	Yes	No
	44	SAP No. 5	IMCWAL44	8700	-36600	199	60.7	8.5	2.59	170	350	50.0	15.2	483.30	60.90	483.30	60.90	B	Yes	No
	45	DAP Plant No 2 - East Train	IMCWAL45	8700	-36600	171	52.1	6.0	1.83	110	316	58.0	17.7	22.00	2.77	22.00	2.77	B	Yes	No
	46	DAP Plant No 2 - West Train	IMCWAL46	8700	-36600	171	52.1	6.0	1.83	110	316	58.0	17.7	22.00	2.77	22.00	2.77	B	Yes	No
	60	Molten Storage Tank	IMCWAL60	8700	-36600	40	12.2	2.0	0.61	240	389	0.4	0.1	0.50	0.06	0.50	0.06	B	Yes	No
	62	Molten Storage Tank	IMCWAL62	8700	-36600	40	12.2	2.0	0.61	240	389	0.4	0.1	0.50	0.06	0.50	0.06	B	Yes	No
	63	Unloading Sulfur Pit	IMCWAL63	8700	-36600	40	12.2	2.0	0.61	240	389	0.4	0.1	0.30	0.04	0.30	0.04	B	Yes	No
	64	Unloading Sulfur Pit	IMCWAL64	8700	-36600	40	12.2	2.0	0.61	240	389	0.4	0.1	0.10	0.01	0.10	0.01	B	Yes	No
	65	Unloading Sulfur Pit	IMCWAL65	8700	-36600	40	12.2	2.0	0.61	240	389	0.4	0.1	0.30	0.04	0.30	0.04	B	Yes	No
	66	Sulfur Transfer Pit	IMCWAL66	8700	-36600	40	12.2	2.0	0.61	240	389	0.4	0.1	0.10	0.01	0.10	0.01	B	Yes	No
	68	Unloading Sulfur Pit	IMCWAL68	8700	-36600	25	7.6	0.1	0.03	90	305	0.1	0.03 [b]	0.30	0.04	0.30	0.04	B	Yes	No
	69	Unloading Sulfur Pit	IMCWAL69	8700	-36600	25	7.6	0.1	0.03	90	305	0.1	0.03 [b]	0.10	0.01	0.10	0.01	B	Yes	No
	74	Multifos C Kiln	IMCWAL74	8700	-36600	172	52.4	4.5	1.37	105	314	70.2	21.4	8.70	1.10	8.70	1.10	B	Yes	No
	78	GRANULAR MAP PLANT	IMCWAL78	8700	-36600	133	40.5	6.0	1.83	145	336	109.6	33.4	13.72	1.73	13.72	1.73	B	Yes	No
		Expanding Source	IMCWAL0	8700	-36600	69	21.0	7.0	2.13	165	347	61.0	18.6	-272.0	-34.27	-271.98	-34.27	E	No	Yes
		Expanding Source	IMCWAL1	8700	-36600	200	61.0	8.5	2.59	170	350	42.9	13.1	-1158.7	-146.00	-1,158.73	-146.00	E	No	Yes
0570038	TECO - HOOKERS POINT																			
	1	Boiler #1	TECOHK1	-30000	-25000	280	85.3	11.3	3.44	356	453	82.0	25.0	327.80	41.3	327.80	41.30	B	Yes	No
	2	Boiler #2	TECOHK2	-30000	-25000	280	85.3	11.3	3.44	356	453	82.0	25.0	327.80	41.3	327.80	41.30	B	Yes	No
	3	Boiler #3	TECOHK3	-30000	-25000	280	85.3	12.0	3.66	341	445	62.7	19.1	452.10	57.0	452.10	56.96	B	Yes	No
	4	Boiler #4	TECOHK4	-30000	-25000	280	85.3	12.0	3.66	341	445	62.7	19.1	452.10	57.0	452.10	56.96	B	Yes	No
	5	Boiler #5	TECOHK5	-30000	-25000	280	85.3	11.3	3.44	356	453	82.0	25.0	671.00	84.5	671.00	84.55	B	Yes	No
	6	Boiler #6	TECOHK6	-30000	-25000	280	85.3	9.4	2.87	329	438	75.2	22.9	855.80	107.8	855.80	107.83	B	Yes	No
1050052	CF INDUSTRIES, INC. - BARTOW		(Bonnie Mine Road)																	
	6	SAP NO.6	CFIBAR6	20300	-33500	206	62.8	7.0	2.13	140	333	21.0	6.4	400.00	50.40	400.00	50.40	C	Yes	Yes
	21	BOILER NO. 1	CFIBAR21	20300	-33500	36	11.0	2.5	0.76	600	589	44.0	13.4	16.80	2.12	16.80	2.12	B	Yes	No
	1	Expanding Source	CFIBARX1	20300	-33500	100	30.5	4.5	1.37	170	350	40.0	12.2	-483	-61	-483.30	-60.90	E	No	Yes
	2	Expanding Source	CFIBARX2	20300	-33500	100	30.5	5.5	1.68	170	350	34.0	10.4	-875	-110	-875.00	-110.25	E	No	Yes
	3	Expanding Source	CFIBARX3	20300	-33500	100	30.5	9.0	2.74	196	364	14.0	4.3	-850	-107	-850.00	-107.10	E	No	Yes
	4	Expanding Source	CFIBARX4	20300	-33500	100	30.5	7.0	2.13	185	358	26.0	7.9	-1,388	-175	-1,387.50	-174.83	E	No	Yes
	5	Expanding Source	CFIBARX5	20300	-33500	206	62.8	7.0	2.13	185	358	35.0	10.7	-1,800	-227	-1,800.00	-226.80	E	No	Yes
	6	Expanding Source	CFIBARX6	20300	-33500	206	62.8	7.0	2.13	187	359	34.0	10.4	-1,350	-170	-1,350.00	-170.10	E	No	Yes

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility ID	Facility Name / EU ID	Emission Unit Description	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)	Temperature (°F)	Temperature (K)	Velocity (ft/s)	Velocity (m/s)	24-Hour Emission Rate (lb/hr)	24-Hour Emission Rate (g/s)	3-Hour Emission Rate (lb/hr)	3-Hour Emission Rate (g/s)	PSD [a] Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0570040	TECO - GANNON																			
	1	UNIT #1 STEAM GENERATOR	TECOGN1	-27900	-28500	315	96.0	10.0	3.05	276.53	409	124.4	37.9	2,137	269.3	2,137.00	269.26	B	Yes	No
	2	125MW BOILER	TECOGN2	-27900	-28500	315	96.0	10.0	3.05	298.67	421	126.3	38.5	2,137	269.3	2,137.00	269.26	B	Yes	No
	3	UNIT #3 BOILER	TECOGN3	-27900	-28500	315	96.0	10.6	3.23	271.49	406	113.5	34.6	2,718	342.5	2,718.00	342.47	B	Yes	No
	4	UNIT#4-BOILER	TECOGN4	-27900	-28500	315	96.0	10.0	3.05	289.13	416	97.1	29.6	3,189	401.8	3,189.00	401.81	B	Yes	No
	5	UNIT #5 BOILER	TECOGN5	-27900	-28500	315	96.0	14.6	4.45	292.73	418	166.5	50.7	3,883	489.3	3,883.00	489.26	B	Yes	No
	6	UNIT #6 BOILER WITH ESP	TECOGN6	-27900	-28500	315	96.0	17.6	5.36	260.33	400	109.2	33.3	6,457	813.6	6,457.00	813.58	B	Yes	No
	7	14 MW GAS TURBINE	TECOGN7	-27900	-28500	35	10.7	11.0	3.35	1010	816	92.6	28.2	10.96	1.4	10.96	1.38	B	Yes	No
0570008	CARGILL FERTILIZER, INC.--RIVERVIEW																			
		MOLTEN SULFUR PITS 7, 8, AND 9	CRPITS	-25100	-33500	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	0.13	0.016	0.13	0.02	C	Yes	Yes
		MOLTEN SULFUR TANKS 1, 2, AND 3/TRUCK LOADING	CRTKTL	-25100	-33500	33	10.1	0.8	0.25	110	316	20.5	6.24	3.34	0.42	3.34	0.42	C	Yes	Yes
	4	NO. 7 SULFURIC ACID PLANT	CR7SAP	-25100	-33500	150	45.7	7.5	2.29	152	340	41.5	12.64	466.70	58.8	533.30	67.20	C	Yes	Yes
	5	NO. 8 SULFURIC ACID PLANT	CR8SAP	-25100	-33500	150	45.7	8.0	2.44	165	347	42.9	13.08	393.75	49.6	450.00	56.70	C	Yes	Yes
	6	NO. 9 SULFURIC ACID PLANT	CR9SAP	-25100	-33500	150	45.7	9.0	2.74	155	341	44.8	13.66	495.83	62.5	566.67	71.40	C	Yes	Yes
	100	NO. 5 ROCK MILL	CR5RKML	-25100	-33500	91	27.7	2.5	0.76	166	348	122.6	37.36	6.59	0.8	6.59	0.83	C	Yes	Yes
	106	NO. 7 ROCK MILL	CR7RKML	-25100	-33500	91	27.7	3.0	0.91	165	347	47.2	14.37	6.59	0.8	6.59	0.83	C	Yes	Yes
	101	NO. 9 ROCK MILL	CR9RKML	-25100	-33500	91	27.7	2.5	0.76	162	345	106.5	32.46	6.59	0.8	6.59	0.83	C	Yes	Yes
	7	NO. 6 GRANULATION PLANT DRYER STACK	CR6GRAN	-25100	-33500	162	49.4	8.5	2.59	164	346	58.7	17.89	40.57	5.1	40.57	5.11	C	Yes	Yes
		AFI PLANT NO. 1	CRAFI1	-25100	-33500	136	41.5	6.0	1.83	150	339	64.5	19.66	25.36	3.2	25.36	3.20	C	Yes	Yes
		AFI PLANT NO. 2	CRAFI2	-25100	-33500	155	47.2	6.0	1.83	150	339	64.5	19.66	38.04	4.8	38.04	4.79	C	Yes	Yes
	55	NO. 5 GRANULATION PLANT-DRYER/COOLER STACK	CR5GRAN	-25100	-33500	133	40.5	7.0	2.13	110	316	67.6	20.59	12.58	1.585	12.58	1.59	C	Yes	Yes
	22,23,24	NOS. 3 AND 4 MAP PLANTS, SOUTH COOLER	CR34MAP	-25100	-33500	133	40.5	7.0	2.13	142	334	71.5	21.78	0.0030	0.00038	0.0030	0.00038	C	Yes	Yes
		Ammonia Plant (Expanding Source)	AMMPLTB	-25100	-33500	60	18.3	8.3	2.5	600	589	22.7	6.93	-32.80	-4.13	-32.80	-4.13	E	No	Yes
		Sodium Silicofluoride/Sodium Fluoride Plant (Expanding Source)	SSFSFPB	-25100	-33500	28	8.5	2.5	0.76	95	308	11.6	3.55	-0.20	-0.03	-0.20	-0.03	E	No	Yes
		No. 10 KVS Mill (Expanding Source)	10KVSMB	-25100	-33500	87	26.5	1.7	0.52	118	321	59.8	18.24	-0.020	-0.0025	-0.020	-0.0025	E	No	Yes
		No. 12 KVS Mill (Expanding Source)	12KVSMB	-25100	-33500	71	21.6	1.6	0.49	135	330	68.5	20.87	-0.040	-0.0050	-0.040	-0.0050	E	No	Yes
		No. 7 Oil-Fired Concentrator (Expanding Source)	7OFCONB	-25100	-33500	78	23.8	6.0	1.83	165	347	17.2	5.24	-41.40	-5.22	-41.40	-5.22	E	No	Yes
		No. 8 Oil-Fired Concentrator (Expanding Source)	8OFCONB	-25100	-33500	78	23.8	6.0	1.83	159	344	16.7	5.10	-39.70	-5.00	-39.70	-5.00	E	No	Yes
		GTSP Plant (Expanding Source)	GTSPAPB	-25100	-33500	126	38.4	8.0	2.44	129	327	34.9	10.65	-71.40	-9.00	-71.40	-9.00	E	No	Yes
		No. 5 and No. 9 Mills Bag Filter (Expanding Source)	RKML59B	-25100	-33500	66	20.1	2.0	0.61	115	319	58.3	17.75	-0.010	-0.0013	-0.010	-0.0013	E	No	Yes
		No. 3 Continuous Triple Dryer (Expanding Source)	3CONTDB	-25100	-33500	68	20.7	3.5	1.07	115	319	45.8	13.96	-22.80	-2.87	-22.80	-2.87	E	No	Yes
		No. 4 Continuous Triple Dryer (Expanding Source)	4CONTDB	-25100	-33500	68	20.7	3.5	1.07	134	330	61.8	18.85	-23.20	-2.92	-23.20	-2.92	E	No	Yes
		Molten Sulfur Handling- Pits 7 & 8 (Expanding Source)	MSPTSB	-25100	-33500	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]	-0.080	-0.010	-0.080	-0.010	E	No	Yes
		Molten Sulfur Handling- Pits 4,5, & 6 (Expanding Source)	PTS456B	-25100	-33500	[e]	[e]	[e]	[e]	[e]	[e]	[e]	[e]	-0.13	-0.02	-0.13	-0.02	E	No	Yes
		Molten Sulfur Handling- Tanks (Expanding Source)	MSTKTLB	-25100	-33500	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	-2.12	-0.27	-2.12	-0.27	E	No	Yes
		No. 4 Sulfuric Acid Plant (Expanding Source)	NO4SAPB	-25100	-33500	80	24.4	4.7	1.43	194	363	20.4	6.23	-282.00	-35.53	-282.00	-35.53	E	No	Yes
		No. 5 Sulfuric Acid Plant (Expanding Source)	NO5SAPB	-25100	-33500	74	22.6	5.3	1.62	189	360	25.3	7.72	-480.00	-60.48	-480.00	-60.48	E	No	Yes
		No. 6 Sulfuric Acid Plant (Expanding Source)	NO6SAPB	-25100	-33500	72	21.9	5.9	1.80	189	360	31.3	9.53	-688.00	-86.69	-688.00	-86.69	E	No	Yes
		No. 7 Sulfuric Acid Plant (Expanding Source)	NO7SAPB	-25100	-33500	92	28.0	9.4	2.87	183	357	22.3	6.80	-1,503.00	-189.38	-1,503.00	-189.38	E	No	Yes
		No. 8 Sulfuric Acid Plant (Expanding Source)	NO8SAPB	-25100	-33500	96	29.3	10.7	3.26	174	352	24.2	7.37	-1,679.00	-211.55	-1,679.00	-211.55	E	No	Yes

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility	Facility Name		ISCST3	Relative Location		Stack and Operating Parameters								24-Hour Emission Rate		3-Hour Emission Rate		PSD [a] Consuming (C), Expanding (E),	Modeled in	
				East	North	Height		Diameter		Temperature		Velocity								
ID	EU ID	Emission Unit Description	ID Name	(m)	(m)	(ft)	(m)	(ft)	(m)	(°F)	(K)	(ft/s)	(m/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	or Baseline (B)	AAQS	Class II
#REF!	CARGILL FERTILIZER, INC. - GREEN BAY (FORMERLY FARMLAND HYDRO, L.P.)																			
	4	SAP #4	FARM4	21500	-35900	100	30.5	7.5	2.29	180	355	39.6	12.1	350.00	44.10	350.00	44.10	C	Yes	Yes
	5	SAP #5	FARM5	21500	-35900	150	45.7	8.0	2.44	180	355	44.1	13.4	466.70	58.80	466.70	58.80	C	Yes	Yes
	7	South AP Plant--Stack A	FARM7	21500	-35900	130	39.5	8.0	2.44	97	309	49.7	15.2	3.16	0.40	3.16	0.40	C	Yes	Yes
	29	NORTH MAP/DAP PLANT--MAIN STACK	FARM29	21500	-35900	128	39.0	8.0	2.44	113	318	50.7	15.5	2.63	0.33	2.63	0.33	C	Yes	Yes
	34	MOLTEN SULFUR PIT	FARM34	21500	-35900	10	3.0	0.8	0.24	200	366	54.0	16.5	0.70	0.09	0.70	0.09	C	Yes	Yes
	38	No. 6 SAP	FARM38	21500	-35900	150	45.7	9.0	2.74	180	355	34.8	10.6	401.00	50.53	401.00	50.53	C	Yes	Yes
		SAP # 1 (Expanding Source)	FRMSAP1	21500	-35900	100	30.5	7.0	2.13	169	349	18.9	5.8	-493	-62.10	-493	-62.10	E	No	Yes
		SAP # 2 (Expanding Source)	FRMSAP2	21500	-35900	100	30.5	7.0	2.13	171	350	18.8	5.7	-533	-67.13	-533	-67.13	E	No	Yes
		SAP # 3 (Expanding Source)	FRMSAP3	21500	-35900	100	30.5	7.5	2.29	162	345	30.3	9.2	-653	-82.23	-653	-82.23	E	No	Yes
0570039	TECO - BIG BEND																			
	1,2	1 & 2 Gen.3-Hour Emissions	TECOBB12	-26100	-41000	490	149.4	24.0	7.32	300	422	116.0	35.4	42,000	5,292	42,000.00	5,292.00	B	Yes	No
	3	3 Gen. 3-Hour Emissions	TECOBB3	-26100	-41000	490	149.4	24.0	7.32	292	418	51.2	15.6	21,000	2,646	21,000.00	2,646.00	B	Yes	No
	1,2	1 & 2 Gen. 24-Hour Emissions	TECOBB12	-26100	-41000	490	149.4	24.0	7.32	300	422	116.0	35.4	32,937	4,150	32,936.51	4,150.00	B	Yes	No
	3	3 Gen. 24-Hour Emissions	TECOBB3	-26100	-41000	490	149.4	24.0	7.32	292	418	51.2	15.6	17,063	2,150	17,063.00	2,149.94	B	Yes	No
	4	UNIT #4 BOILER W/ESP	TECOBB4	-26100	-41000	490	149.4	24.0	7.32	127	326	78.3	23.9	3,576	451	3,576.00	450.58	C	Yes	Yes
	5	Gas Turbine No. 2:	TECOBB5	-26100	-41000	75	22.9	14.0	4.27	928	771	61.0	18.6	314	40	314.00	39.56	B	Yes	No
	6	Gas Turbine No. 3:	TECOBB6	-26100	-41000	75	22.9	14.0	4.27	928	771	61.0	18.6	314	40	314.00	39.56	B	Yes	No
	7	GAS TURBINE #1	TECOBB7	-26100	-41000	35	10.7	11.0	3.36	1010	816	91.9	28.0	90	11	90.00	11.34	B	Yes	No
	1,2	Steam Generators 1 & 2 Baseline	TCBB12B	-26100	-41000	490	149.4	24.0	7.32	300	422	94.0	28.7	-19,333	-2,436	-19,333.33	-2,436.00	E	No	Yes
	3	Steam Generator 3 Baseline	TCBB3B	-26100	-41000	490	149.4	24.0	7.32	293	418	47.0	14.3	-9,667	-1,218	-9,666.67	-1,218.00	E	No	Yes
1050055	IMC-AGRICO CO.- SOUTH PIERCE																			
	1	Auxiliary Boiler	IMCSPR1	19500	-44600	35	10.7	4.8	1.46	430	494	51.0	15.5	63.5	8.00	63.50	8.00	B	Yes	No
	4	SAP No. 10	IMCSPR4	19500	-44600	144	43.9	9.0	2.74	170	350	41.1	12.5	450.0	56.70	450.00	56.70	C	Yes	Yes
	5	SAP No. 11	IMCSPR5	19500	-44600	144	43.9	9.0	2.74	170	350	41.1	12.5	450.0	56.70	450.00	56.70	C	Yes	Yes
		Combined Expanding Sources	IMCPIER6	19500	-44600	144	43.9	5.2	1.58	170	350	86.6	26.4	-600.0	-75.6	-600.00	-75.60	E	No	Yes
1050233	TECO - POLK POWER STATION																			
	1	Combined cycle CT	TECOPK1	14450	-48650	150	45.7	19.0	5.79	340	444	75.8	23.1	518.00	65.27	518.00	65.27	C	Yes	Yes
	3	120 MMBtu/HR AuxBlr	TECOPK3	14450	-48650	75	22.9	3.7	1.13	375	464	50.0	15.2	96.00	12.10	96.00	12.10	C	Yes	Yes
	4	Sulfuric Acid Plant	TECOPK4	14450	-48650	199	60.7	2.5	0.76	180	355	60.0	18.3	35.60	4.49	35.60	4.49	C	Yes	Yes
	9	Simple Cycle CT	TECOPK9	14450	-48650	114	34.7	29.0	8.84	1117	876	60.2	18.3	9.20	1.16	9.20	1.16	C	Yes	Yes
	10	Simple Cycle CT	TECOPK10	14450	-48650	114	34.7	29.0	8.84	1117	876	60.2	18.3	9.20	1.16	9.20	1.16	C	Yes	Yes

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility ID	Facility Name / EU ID Emission Unit Description	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)	Temperature (°F)	Temperature (K)	Velocity (ft/s)	Velocity (m/s)	24-Hour Emission Rate (lb/hr)	24-Hour Emission Rate (g/s)	3-Hour Emission Rate (lb/hr)	3-Hour Emission Rate (g/s)	PSD [a] Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0530021	FLORIDA CRUSHED STONE CO., INC.																		
	18 POWER PLANT	FLCRSH18	-28000	46500	320	97.5	16.0	4.88	300	422	69.6	21.2	770.00	97.020	770.00	97.02	C	Yes	Yes
	20 BCP: Kiln, Clinker Cooler, Raw Mill, & Dryer with Baghouse	FLCRSH20	-28000	46500	300	91.4	16.0	4.88	220	378	47.0	14.3	50.00	6.300	50.00	6.30	C	Yes	Yes
	26 KILN #2 SYSTEM: preheater/precalciner, cooler,dyer,raw mill	FLCRSH26	-28000	46500	320	97.5	14.0	4.27	258	399	33.8	10.3	24.00	3.024	24.00	3.02	C	Yes	Yes
0530032	CENTRAL POWER & LIME, INC.																		
	9 CEMENT KILN, CLINKER COOLER, RAW MILL & DRYER	CPL09	-28000	46500	300	91.4	16.0	4.88	226	381	47.0	14.3	1,040.10	131.053	1,040.10	131.05	B	Yes	No
	14 POWER PLANT	CPL14	-28000	46500	320	97.5	16.0	4.88	250	394	69.6	21.2	781.00	98.406	781.00	98.41	B	Yes	No
1030012	FPC - HIGGINS																		
	1 FFFSG-SG 1	FPCHIG1	-51500	-17600	174	53.0	12.5	3.81	312	429	27.0	8.2	1,507.0	189.9	1,507.00	189.88	B	Yes	No
	2 FFFSG-SG 2	FPCHIG2	-51500	-17600	174	53.0	12.5	3.81	310	428	27.0	8.2	1,438.3	181.2	1,438.30	181.23	B	Yes	No
	3 FFFSG-SG 3	FPCHIG3	-51500	-17600	174	53.0	12.5	3.81	301	423	24.0	7.3	1,507.0	189.9	1,507.00	189.88	B	Yes	No
	4 CTP 1	FPCHIG4	-51500	-17600	55	16.8	15.1	4.60	850	728	93.1	28.4	286.30	36.07	286.30	36.07	B	Yes	No
	5 CTP 2	FPCHIG5	-51500	-17600	56	17.1	15.1	4.60	850	728	93.1	28.4	286.30	36.07	286.30	36.07	B	Yes	No
	6 CTP 3	FPCHIG6	-51500	-17600	55	16.8	15.1	4.60	850	728	93.1	28.4	319.10	40.21	319.10	40.21	B	Yes	No
	7 CTP 4	FPCHIG7	-51500	-17600	55	16.8	15.1	4.60	850	728	93.1	28.4	319.10	40.21	319.10	40.21	B	Yes	No
1050051	U.S. AGRI-CHEMICALS - FT. MEADE																		
	6 AUXILIARY BOILER	USAGFM6	28000	-47000	70	21.3	3.7	1.13	400	478	49	14.9	51.00	6.43	51.00	6.43	B	Yes	No
	16 SAP #1	USAGFM16	28000	-47000	175	53.3	8.5	2.59	180	355	32	9.8	500.00	63.00	500.00	63.00	C	Yes	Yes
	17 SAP #2	USAGFM17	28000	-47000	175	53.3	8.5	2.59	180	355	32	9.8	500.00	63.00	500.00	63.00	C	Yes	Yes
	28 MOLTEN SULFUR TANK	USAGFM28	28000	-47000	6	1.8	0.3	0.09	270	405	344	104.9	0.49	0.06	0.49	0.06	C	Yes	Yes
	29 MOLTEN SULFUR TANK	USAGFM29	28000	-47000	6	1.8	0.3	0.09	260	400	157	47.9	0.23	0.03	0.23	0.03	C	Yes	Yes
	Expanding Source	USAGFM0	28000	-47000	95	29	9.9	3.02	106	314	23	6.9	-625.4	-78.80	-625.40	-78.80	E	No	Yes
	Expanding Source	USAGFM1	28000	-47000	93	28	5.0	1.52	134	330	58	17.6	-145.0	-18.27	-145.00	-18.27	E	No	Yes
1030011	FPC - BARTOW																		
	1 No.1 Unit	FPCBART1	-45600	-33400	300	91.4	9.0	2.74	312	429	119.0	36.3	3,355.00	422.73	3,355.00	422.73	B	Yes	No
	2 No.2 Unit	FPCBART2	-45600	-33400	300	91.4	9.0	2.74	305	425	102.0	31.1	3,622.00	456.37	3,622.00	456.37	B	Yes	No
	3 No.3 Unit	FPCBART3	-45600	-33400	300	91.4	11.0	3.35	275	408	113.0	34.4	6,080.00	766.1	6,080.00	766.08	B	Yes	No
	4 Boiler	FPCBART4	-45600	-33400	30	9.1	3.0	0.91	515	541	17.0	5.2	7.80	0.98	7.80	0.98	B	Yes	No
	5 GT Peaking Unit #P-1	FPCBART5	-45600	-33400	45	13.7	17.9	5.46	930	772	69.1	21.1	360.57	45.4	360.57	45.43	B	Yes	No
	6 GT Peaking Unit #P-2	FPCBART6	-45600	-33400	45	13.7	17.9	5.46	930	772	69.1	21.1	360.57	45.4	360.57	45.43	B	Yes	No
	7 GT Peaking Unit #P-3	FPCBART7	-45600	-33400	45	13.7	17.9	5.46	930	772	69.1	21.1	360.57	45.4	360.57	45.43	B	Yes	No
	8 GT Peaking Unit #P-4	FPCBART8	-45600	-33400	45	13.7	17.9	5.46	930	772	69.1	21.1	360.57	45.4	360.57	45.43	B	Yes	No
1050002	CITRUS WORLD, INC.																		
	1 CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #2	CITWOR1	53000	-28700	75	22.9	4.7	1.43	195	364	49.0	14.9	188.40	23.738	188.40	23.74	B	Yes	No
	3 ERIE CITY KEYSTONE BOILER #3 USING NAT GAS AND #6 OIL	CITWOR3	53000	-28700	40	12.2	3.7	1.12	450	505	59.9	18.3	178.04	22.433	178.04	22.43	B	Yes	No
	4 ERIE CITY KEYSTONE BOILER #2 USING NAT GAS AND #6 OIL	CITWOR4	53000	-28700	40	12.2	3.7	1.12	450	505	60.5	18.4	180.24	22.710	180.24	22.71	B	Yes	No
	7 CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #1	CITWOR7	53000	-28700	75	22.9	3.2	0.97	150	339	49.7	15.1	94.20	11.869	94.20	11.87	B	Yes	No
	13 CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #3	CITWOR13	53000	-28700	75	22.9	4.6	1.40	150	339	33.1	10.1	188.40	23.738	188.40	23.74	B	Yes	No
	17 ERIE CITY KEYSTONE BOILER #1 USING NAT GAS AND #6 OIL	CITWOR17	53000	-28700	40	12.2	3.7	1.12	450	505	25.3	7.7	75.05	9.456	75.05	9.46	B	Yes	No

Table B-1. Detailed Information for SO_2 Sources Included in the Air Modeling Analysis

Facility ID	EU ID	Facility Name / Emission Unit Description	ISCST3 ID Name	Relative Location East (m)	Relative Location North (m)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)	Temperature (°F)	Temperature (K)	Velocity (ft/s)	Velocity (m/s)	24-Hour Emission Rate (lb/hr)	24-Hour Emission Rate (g/s)	3-Hour Emission Rate (lb/hr)	3-Hour Emission Rate (g/s)	PSD[a] Consuming (C), Expanding (E), or Baseline (B)	Modeled in AAQS	Modeled in Class II
0490015		HARDEE POWER PARTNERS, LTD																		
	1	CT 1A W\HRSG	HARDE1	16800	-58600	90	27.4	14.5	4.42	236	386	77.5	23.6	734.40	92.53	734.40	92.53	C	Yes	Yes
	2	CT 2A W\HRSG	HARDE2	16800	-58600	90	27.4	14.5	4.42	245	391	75.8	23.1	734.40	92.53	734.40	92.53	C	Yes	Yes
	3	Simple cycle CT 2A	HARDE3	16800	-58600	75	22.9	17.9	5.46	986	803	94.3	28.7	734.40	92.53	734.40	92.53	C	Yes	Yes
	5	Unit 2B - 75 MW gas turbine	HARDE5	16800	-58600	85	25.9	14.8	4.51	999	810	142.0	43.3	5.30	0.67	5.30	0.67	C	Yes	Yes
1030117		PINELLAS CO. RESOURCE RECOVERY FACILITY																		
	1	Waste Combustor & Aux burners-Unit #1	PINRCY1	-52800	-31900	161	49.1	7.8	2.38	449	505	88.0	26.8	170.00	21.4	170.00	21.42	C	Yes	Yes
	3	Waste Combustor & Aux burners-Unit #2	PINRCY3	-52800	-31900	165	50.3	9.0	2.74	450	505	90.0	27.4	525.00	66.2	525.00	66.15	C	Yes	Yes
1010017		FPC - ANCLOTE POWER PLANT																		
	1	TURBINE GEN. UNIT NO. 1	FPCANC1	-63600	2700	499	152.1	24.0	7.32	320	433	62.0	18.9	13,652.1	1,720.2	13,652.10	1,720.16	B	Yes	No
	2	TURBINE GEN. UNIT NO. 2	FPCANC2	-63600	2700	499	152.1	24.0	7.32	320	433	62.0	18.9	13,338	774.3	13,337.50	1,680.53	B	Yes	No
0810010		FLORIDA POWER & LIGHT MANATEE PLANT																		
	1	GENERATOR 1	FPLMAN1	-20750	-61850	475	152	26.2	7.99	325	436	82.5	25.1	9,515.0	1,198.9	9,515.00	1,198.89	B	Yes	No
	2	GENERATOR 2	FPLMAN2	-20750	-61850	475	152	26.2	7.99	325	436	82.5	25.1	9,515.0	1,198.9	9,515.00	1,198.89	B	Yes	No
1030013		FPC - BAYBORO																		
	1	CT Peaking Unit # 1	FPCBAY1	-49200	-44700	40	12.2	22.9	6.98	900	755	21.0	6.4	390.90	49.3	390.90	49.25	B	Yes	No
	2	CT Peaking Unit # 2	FPCBAY2	-49200	-44700	40	12.2	22.9	6.98	900	755	21.0	6.4	390.90	49.3	390.90	49.25	B	Yes	No
	3	CT Peaking Unit # 3	FPCBAY3	-49200	-44700	40	12.2	22.9	6.98	900	755	21.0	6.4	390.90	49.3	390.90	49.25	B	Yes	No
	4	CT Peaking Unit # 4	FPCBAY4	-49200	-44700	40	12.2	22.9	6.98	900	755	21.0	6.4	390.90	49.3	390.90	49.25	B	Yes	No
0810002		PINEY POINT PHOSPHATES, INC.																		
	1	SAP 1	PINPT1	-38350	-58660	200	61.0	7.8	2.38	147	337	33.5	10.2	-291.70	-36.75	-291.70	-36.75	E	No	Yes
	11	BOILER	PINPT11	-38350	-58660	30	9.1	4.0	1.22	550	561	25.2	7.7	-9.60	-1.21	-9.60	-1.21	E	No	Yes

[a] Comsuming (C) sources are sources that were constructed or modified after the PSD baseline date. Baseline (B) sources are sources that were constructed prior to the baseline date and have not been modified since the baseline date. Expanding (E) sources are sources that have shutdown or have been modified since the baseline date.

[b] Velocity of 0.1 ft/s assumed

[c, d, e, f] Modeled as volume sources. Dimensions are based on methods presented in accordance with ISCST3 User's Manual, and are as follows:

	Physical Dimensions (ft) Height (H)	Width (W)	Model Dimensions (ft) Height (H or H/2)	Sigma Y (W/4.3)	Sigma Z (H/2.15)
c	8.0	210.0	8.0	48.8	3.72
d	8.0	210.0	8.0	48.8	3.72
e	8.0	210.0	8.0	48.8	3.72
f	36.0	125.0	36.0	29	16.7

APPENDIX C

BASIS OF 1974 BASELINE (SO_2) EMISSION CALCULATIONS

Table C-1. SO_2 PSD Baseline (1974-1975) Emissions, CF Industries

Emission Unit	Emission Factor [a] (lb/10^3 gal)	Activity Factor [b] (10^3 gal/yr)	Annual Emissions (TPY)	Hourly Emissions [c] (lb/hr)
"A" DAP/MAP Plant	392.5	411.11	80.68	18.42
"X" DAP/MAP/GTSP Plant	392.5	612.30	120.16	27.43
"Y" DAP/MAP/GTSP Plant	392.5	409.37	80.34	18.34
"Z" DAP/MAP Plant	392.5	409.37	80.34	18.34
ROP/MGTSP Manufacturing	392.5	314.90	61.80	14.11

Footnotes:

[a] SO_2 emission factor for No. 5 fuel oil combustion, AP-42, Table 1.3-1 (9/98). Assumes that sulfur content of the No. 5 fuel oil is 2.5%.

[b] Based on estimated fuel usage for 1974. See Table C-2.

[c] Based on 8,760 hours per year.

Table C-2. Estimated Fuel Usage for 1974, CF Industries

Emission Unit	Fuel Usage as Given in Applications	Fuel Usage (a) (gal/hr)	% of Total	Estimated Fuel Usage (b) (gal/yr)
ADAP	4,700 gal/day	195.83	14.53	411,107
X-Train	7,000 gal/day	291.67	21.65	612,304
Y-Train	1,560 lb/hr	195	14.47	409,365
Z-Train	1,560 lb/hr	195	14.47	409,365
Riley Stoker	320 gal/hr	320	23.75	671,778
ROP/MGTSP	3,600 gal/day	150	11.13	314,896
	TOTAL	1,347.5	100	2,828,814

Notes:
(a) Converted from number given in applications. Used a density of 8 lb/gal.
(b) Based on total fuel purchases for calendar year 1974 for the entire facility (2,828,814 gal).

APPENDIX D

BPIP INPUT AND OUTPUT FILES WITH SOURCE, BUILDINGS, AND RECEPTOR LOCATIONS

BUILDING DIMENSIONS
(BPIP INPUT FILE)

```
 'D:\PROJECTS\CF-IND\bpip\CF1.bpv'
'ST'
'Meters'  1.00000000
'UTMN'  0.0000
18
'UCONTROL'  1           0.000
    4           6.710
              -322.880         -262.890
              -309.900         -262.890
              -309.900         -304.050
              -322.880         -304.050
'URCLAR2'  1           0.000
    8           6.890
              -282.992         -285.363
              -274.209         -288.939
              -270.633         -297.722
              -274.209         -306.177
              -282.992         -310.081
              -291.447         -306.177
              -295.351         -297.722
              -291.447         -288.939
'URCLAR1'  1           0.000
    8           6.890
              -282.990         -252.130
              -274.130         -255.610
              -270.640         -264.160
              -274.130         -273.020
              -282.990         -276.510
              -291.540         -273.020
              -295.020         -264.160
              -291.540         -255.610
'USTOR1'  1           0.000
    8          20.120
              -317.502         -201.946
              -312.232         -204.121
              -310.058         -209.390
              -312.232         -214.659
              -317.502         -216.834
              -323.084         -214.659
              -324.945         -209.390
              -323.084         -204.121
'BLDG5'  1           0.000
    8          20.120
              -317.820         -219.210
              -312.430         -221.420
              -309.900         -226.800
              -312.430         -232.500
              -317.820         -234.720
              -323.200         -232.500
              -325.730         -226.800
              -323.200         -221.420
'ROPWH'  1           0.000
    4          18.290
              -336.180          -43.180
              -306.100          -43.180
              -306.100         -165.070
              -336.180         -165.070
'ASHIPWH'  1           0.000
    4          20.420
              -426.720           79.020
              -387.150           79.020
              -387.150          -55.210
              -426.720          -55.210
'BSHIPWH'  1           0.000
    4          26.520
```

```
               -406.140          197.740
               -357.710          197.740
               -357.710           95.160
               -406.140           95.160
'XYZGRAN'  1            0.000
    4          38.710
               -331.750          195.520
               -289.010          195.520
               -289.010          110.990
               -331.750          110.990
'ADAPGRAN'  1            0.000
    4          28.350
               -325.410           14.750
               -288.690           14.750
               -288.690           -0.760
               -325.410           -0.760
'BPAPBELT'  1            0.000
    4          29.260
               -241.200          203.120
               -231.390          203.120
               -231.390          165.760
               -241.200          165.760
'BPAPBYRD'  1            0.000
    4          26.360
               -230.750          184.440
               -206.380          184.440
               -206.380          160.380
               -230.750          160.380
'APAPBYRD'  1            0.000
    4          21.640
               -213.340           52.420
               -190.550           52.420
               -190.550           29.630
               -213.340           29.630
'APAPBELT'  1            0.000
    4          19.810
               -181.680           42.290
               -153.510           42.290
               -153.510           32.160
               -181.680           32.160
'SCREENIN'  1            0.000
    4          28.350
               -358.970           26.460
               -346.620           26.460
               -346.620            6.200
               -358.970            6.200
'COGEN'  1            0.000
    4          20.120
               -147.810           78.700
               -104.440           78.700
               -104.440           54.640
               -147.810           54.640
'UBLTFILT'  1            0.000
    4          22.860
               -279.190         -208.760
               -264.630         -208.760
               -264.630         -236.300
               -279.190         -236.300
'TANK022'  1            0.000
    8           9.140
                -10.350           41.510
                 -5.190           39.280
                 -2.880           34.120
                 -5.190           28.890
                -10.350           26.660
```

	-15.580	28.890		
	-17.820	34.120		
	-15.580	39.280		
14				
'SAPC'	0.000	60.660	0.000	0.000
'SAPD'	0.000	60.660	56.070	-0.000
'SAPA'	0.000	33.530	-64.860	40.710
'SAPB'	0.000	33.530	-64.860	-28.620
'ADMP'	0.000	24.380	-322.250	-9.630
'ZDMP'	0.000	41.450	-286.470	145.180
'YDMGP'	0.000	41.450	-286.470	175.580
'XDMGP'	0.000	41.450	-292.810	198.690
'ABSTOR'	0.000	20.000	-367.200	53.370
'APAP'	0.000	20.000	-188.020	78.380
'BPAP'	0.000	20.000	-229.170	159.430
'MSTPTA'	0.000	3.660	-46.140	26.960
'MSTPTB'	0.000	3.660	-45.680	-15.300
'MSTK22'	0.000	11.580	-10.120	34.120

BUILDING DIMENSIONS
(BPIP OUTPUT FILE)

DATE : 11/20/ 3
TIME : 15:49:34
D:\PROJECTS\CF-IND\bpip\CF1.bpv

============================
BPIP PROCESSING INFORMATION:
============================

The ST flag has been set for processing for an ISCST2 run.

Inputs entered in Meters will be converted to meters using a conversion factor of 1.0000. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

D:\PROJECTS\CF-IND\bpip\CF1.bpv

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
SAPC	60.66	0.00	22.85	65.00
SAPD	60.66	N/A	0.00	65.00
SAPA	33.53	0.00	50.30	65.00
SAPB	33.53	0.00	50.30	65.00
ADMP	24.38	0.00	96.77	96.77
ZDMP	41.45	0.00	96.77	96.77
YDMGP	41.45	0.00	96.77	96.77
XDMGP	41.45	0.00	96.77	96.77
ABSTOR	20.00	0.00	96.77	96.77
APAP	20.00	0.00	96.77	96.77
BPAP	20.00	0.00	96.77	96.77
MSTPTA	3.66	0.00	50.30	65.00
MSTPTB	3.66	0.00	50.30	65.00
MSTK22	11.58	0.00	50.30	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

DATE : 11/20/ 3
TIME : 15:49:34

D:\PROJECTS\CF-IND\bpip\CF1.bpv

BPIP output is in meters

SO BUILDHGT SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPC	9.14	9.14	9.14	9.14	0.00	0.00
SO BUILDHGT SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPC	14.28	13.92	14.65	14.94	0.00	0.00
SO BUILDWID SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPC	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPC	0.00	0.00	0.00	0.00	0.00	0.00

SO BUILDHGT SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPD	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPD	0.00	0.00	0.00	0.00	0.00	0.00

SO BUILDHGT SAPA	0.00	0.00	0.00	0.00	0.00	19.81
SO BUILDHGT SAPA	19.81	20.12	20.12	20.12	20.12	20.12
SO BUILDHGT SAPA	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPA	0.00	0.00	0.00	0.00	0.00	19.81
SO BUILDHGT SAPA	19.81	0.00	0.00	0.00	20.12	20.12
SO BUILDHGT SAPA	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPA	0.00	0.00	0.00	0.00	0.00	31.63
SO BUILDWID SAPA	23.32	30.32	36.66	41.91	45.88	48.45
SO BUILDWID SAPA	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPA	0.00	0.00	0.00	0.00	0.00	44.51
SO BUILDWID SAPA	46.39	0.00	0.00	0.00	45.88	48.45
SO BUILDWID SAPA	0.00	0.00	0.00	0.00	0.00	0.00

SO BUILDHGT SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPB	0.00	0.00	19.81	19.81	19.81	20.12
SO BUILDHGT SAPB	20.12	20.12	0.00	0.00	0.00	0.00
SO BUILDHGT SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPB	0.00	0.00	81.33	66.88	84.59	48.45
SO BUILDWID SAPB	49.56	49.15	0.00	0.00	0.00	0.00
SO BUILDWID SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPB	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID SAPB	0.00	0.00	0.00	0.00	0.00	0.00

SO BUILDHGT ADMP	28.35	28.35	28.35	28.35	28.35	28.35
SO BUILDHGT ADMP	28.35	28.35	28.35	28.35	28.35	28.35
SO BUILDHGT ADMP	28.35	28.35	38.71	38.71	38.71	38.71
SO BUILDHGT ADMP	28.35	28.35	28.35	28.35	28.35	28.35
SO BUILDHGT ADMP	28.35	28.35	28.35	28.35	28.35	28.35
SO BUILDHGT ADMP	28.35	28.35	28.35	28.35	28.35	28.35
SO BUILDWID ADMP	39.66	38.36	35.90	32.35	50.93	40.51
SO BUILDWID ADMP	16.37	23.72	30.59	31.22	35.05	37.81
SO BUILDWID ADMP	39.43	39.85	58.53	44.71	54.98	67.54
SO BUILDWID ADMP	39.66	38.36	35.90	32.35	50.93	40.51
SO BUILDWID ADMP	16.37	23.72	30.59	31.22	35.05	37.81
SO BUILDWID ADMP	39.43	39.85	39.05	37.07	38.64	39.75

SO BUILDHGT ZDMP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT ZDMP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT ZDMP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT ZDMP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT ZDMP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT ZDMP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDWID ZDMP	78.04	86.18	91.69	94.43	94.29	91.28
SO BUILDWID ZDMP	85.51	90.00	93.76	94.67	92.71	87.92
SO BUILDWID ZDMP	80.47	70.57	58.53	44.71	54.98	67.54
SO BUILDWID ZDMP	78.04	86.18	91.69	94.43	94.29	91.28
SO BUILDWID ZDMP	85.51	90.00	93.76	94.67	92.71	87.92
SO BUILDWID ZDMP	80.47	70.57	58.53	44.71	54.98	67.54

SO BUILDHGT YDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT YDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT YDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT YDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT YDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT YDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDWID YDMGP	78.04	86.18	91.69	94.43	94.29	91.28
SO BUILDWID YDMGP	85.51	90.00	93.76	94.67	92.71	87.92
SO BUILDWID YDMGP	80.47	70.57	58.53	44.71	54.98	67.54
SO BUILDWID YDMGP	78.04	86.18	91.69	94.43	94.29	91.28
SO BUILDWID YDMGP	85.51	90.00	93.76	94.67	92.71	87.92
SO BUILDWID YDMGP	80.47	70.57	58.53	44.71	54.98	67.54

SO BUILDHGT XDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT XDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT XDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT XDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT XDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDHGT XDMGP	38.71	38.71	38.71	38.71	38.71	38.71
SO BUILDWID XDMGP	78.04	86.18	91.69	94.43	94.29	91.28
SO BUILDWID XDMGP	85.51	90.00	93.76	94.67	92.71	87.92
SO BUILDWID XDMGP	80.47	70.57	58.53	44.71	54.98	67.54
SO BUILDWID XDMGP	78.04	86.18	91.69	94.43	94.29	91.28
SO BUILDWID XDMGP	85.51	90.00	93.76	94.67	92.71	87.92
SO BUILDWID XDMGP	80.47	70.57	58.53	44.71	54.98	67.54

SO BUILDHGT ABSTOR	38.71	38.71	38.71	38.71	20.42	20.42
SO BUILDHGT ABSTOR	20.42	20.42	28.35	28.35	28.35	28.35
SO BUILDHGT ABSTOR	28.35	28.35	28.35	28.35	38.71	38.71
SO BUILDHGT ABSTOR	38.71	38.71	38.71	38.71	20.42	20.42
SO BUILDHGT ABSTOR	20.42	20.42	28.35	28.35	28.35	28.35
SO BUILDHGT ABSTOR	28.35	28.35	28.35	28.35	38.71	38.71
SO BUILDWID ABSTOR	78.04	86.18	91.69	94.43	139.43	139.39
SO BUILDWID ABSTOR	135.12	138.66	30.59	31.22	50.58	37.81
SO BUILDWID ABSTOR	39.43	68.57	70.59	70.46	54.98	67.54

```
SO BUILDWID ABSTOR      78.04    86.18    91.69    94.43   139.43   139.39
SO BUILDWID ABSTOR     135.12   138.66    30.59    31.22    35.05    37.81
SO BUILDWID ABSTOR      39.43    68.57    70.59    70.46    54.98    67.54

SO BUILDHGT APAP        21.64    21.64    28.35    28.35    28.35    20.12
SO BUILDHGT APAP        20.12    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT APAP        29.26    26.36    26.36    21.64    21.64    21.64
SO BUILDHGT APAP        21.64    21.64    21.64    21.64     0.00    20.12
SO BUILDHGT APAP        20.12    20.12    20.12    20.12    20.12    19.81
SO BUILDHGT APAP        19.81    19.81    21.64    21.64    21.64    21.64
SO BUILDWID APAP        30.93    32.03    35.90    32.35    50.93    32.12
SO BUILDWID APAP        25.07    90.00    93.76    94.67    92.71    87.92
SO BUILDWID APAP        27.81    31.46    28.63    23.32    25.96    28.88
SO BUILDWID APAP        30.93    32.03    32.16    31.32     0.00    32.12
SO BUILDWID APAP        25.07    30.32    36.67    41.91    45.88    27.84
SO BUILDWID APAP        29.33    29.92    26.83    23.32    25.96    28.88

SO BUILDHGT BPAP        29.26    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT BPAP        38.71    38.71    38.71    38.71    38.71    29.26
SO BUILDHGT BPAP        29.26    26.36    26.36    26.36    26.36    26.36
SO BUILDHGT BPAP        29.26    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT BPAP        38.71    38.71    38.71    38.71    38.71    29.26
SO BUILDHGT BPAP        29.26    26.36    26.36    26.36    26.36    26.36
SO BUILDWID BPAP        26.53    86.18    91.69    94.43    94.29    91.28
SO BUILDWID BPAP        85.51    90.00    93.76    94.67    92.71    32.04
SO BUILDWID BPAP        27.81    31.46    28.63    35.25    27.71    30.79
SO BUILDWID BPAP        26.53    86.18    91.69    94.43    94.29    91.28
SO BUILDWID BPAP        85.51    90.00    93.76    94.67    92.71    32.04
SO BUILDWID BPAP        27.81    31.46    28.63    35.25    27.71    30.79

SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTA      19.81    19.81    20.12    20.12    20.12    20.12
SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     9.14     9.14
SO BUILDHGT MSTPTA       9.14     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA      46.39    57.64    36.67    41.91    45.88    48.45
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00    13.83    14.56
SO BUILDWID MSTPTA      14.85     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00    19.81    19.81    20.12    20.12
SO BUILDHGT MSTPTB      20.12     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00    68.81    77.88    45.88    48.45
SO BUILDWID MSTPTB      49.56     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22      19.81    20.12    20.12    20.12     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
```

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SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDWID MSTK22      14.10    14.60    14.66    14.28    13.83    14.56
SO BUILDWID MSTK22      46.39    30.32    36.67    41.91    14.60    14.66
SO BUILDWID MSTK22      14.28    13.92    14.65    14.94    14.77    14.15
SO BUILDWID MSTK22      14.10    14.60    14.66    14.28    13.83    14.56
SO BUILDWID MSTK22      14.85    14.68    14.07    14.10    14.60    14.66
SO BUILDWID MSTK22      14.28    13.92    14.65    14.94    14.77    14.15
```

APPENDIX E

ISCST3 MODEL SUMMARY AND EXAMPLE INPUT FILES

EXAMPLE ISCST3 INPUT FILE
SIGNIFICANT IMPACT ANALYSIS
3-HOUR AVERAGE SO_2 IMPACTS

```
CO STARTING
   TITLEONE 1991 CF Industries, Significant Impact Analysis, SO2,   3/10/05
   TITLETWO 3-Hour Emissions, TAMPA MET DATA 1991-1995
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 3
   POLLUTID SO2
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
**
** SOURCE   DESCRIPTION
** -------  --------------------------------
** SAPB     B SAP STACK

SO STARTING
** MODELING ORIGIN IS C SAP STACK, ALL COORDINATES ARE WRT TN
** Source Location **
**        Source ID - Type - X Coord. Y Coord.
**                             (m)       (m)
   LOCATION SAPBc     POINT  -52.295  -47.866
   LOCATION SAPBf     POINT  -52.295  -47.866

** ----------------------------------------------------
** Point Source Parameters **
**
**                  ER     SH      ST      SV      SD
**                 (g/s)   (m)     (K)    (m/s)    (m)
** ----------------------------------------------------
   SRCPARAM SAPBc  -31.50  33.53   302.    20.94    1.52
   SRCPARAM SAPBf   33.60  33.53   302.    22.80    1.52


   BUILDHGT SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT SAPBc        0.00     0.00    19.81    19.81    19.81    20.12
   BUILDHGT SAPBc       20.12    20.12     0.00     0.00     0.00     0.00
   BUILDHGT SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBc        0.00     0.00    81.33    77.88    84.59    48.45
   BUILDWID SAPBc       49.56    49.15     0.00     0.00     0.00     0.00
   BUILDWID SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBc        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBc        0.00     0.00     0.00     0.00     0.00     0.00

   BUILDHGT SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT SAPBf        0.00     0.00    19.81    19.81    19.81    20.12
   BUILDHGT SAPBf       20.12    20.12     0.00     0.00     0.00     0.00
   BUILDHGT SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBf        0.00     0.00    81.33    77.88    84.59    48.45
   BUILDWID SAPBf       49.56    49.15     0.00     0.00     0.00     0.00
   BUILDWID SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBf        0.00     0.00     0.00     0.00     0.00     0.00
   BUILDWID SAPBf        0.00     0.00     0.00     0.00     0.00     0.00


   SRCGROUP ALL
SO FINISHED
```

```
**
****************************************
** ISCST3 Receptor Pathway
****************************************
**
**
RE STARTING
** Restricted Property Line Receptors, 50 m spacing
   DISCCART 18.20 585.20
   DISCCART -182.90 585.20
   DISCCART -182.90 573.00
   DISCCART -1645.90 573.00
   DISCCART -1097.30 -2633.50
   DISCCART 2426.20 -2633.50
   DISCCART 2426.20 573.00
   DISCCART 1609.30 573.00
   DISCCART 1609.30 999.70
   DISCCART 18.30 999.70
   DISCCART -22.02 585.20
   DISCCART -62.24 585.20
   DISCCART -102.46 585.20
   DISCCART -142.68 585.20
   DISCCART -231.67 573.00
   DISCCART -280.43 573.00
   DISCCART -329.20 573.00
   DISCCART -377.97 573.00
   DISCCART -426.73 573.00
   DISCCART -475.50 573.00
   DISCCART -524.27 573.00
   DISCCART -573.03 573.00
   DISCCART -621.80 573.00
   DISCCART -670.57 573.00
   DISCCART -719.33 573.00
   DISCCART -768.10 573.00
   DISCCART -816.87 573.00
   DISCCART -865.63 573.00
   DISCCART -914.40 573.00
   DISCCART -963.17 573.00
   DISCCART -1011.93 573.00
   DISCCART -1060.70 573.00
   DISCCART -1109.47 573.00
   DISCCART -1158.23 573.00
   DISCCART -1207.00 573.00
   DISCCART -1255.77 573.00
   DISCCART -1304.53 573.00
   DISCCART -1353.30 573.00
   DISCCART -1402.07 573.00
   DISCCART -1450.83 573.00
   DISCCART -1499.60 573.00
   DISCCART -1548.37 573.00
   DISCCART -1597.13 573.00
   DISCCART -1637.59 524.42
   DISCCART -1629.28 475.83
   DISCCART -1620.96 427.25
   DISCCART -1612.65 378.67
   DISCCART -1604.34 330.08
   DISCCART -1596.03 281.50
   DISCCART -1587.72 232.92
   DISCCART -1579.40 184.33
   DISCCART -1571.09 135.75
   DISCCART -1562.78 87.17
   DISCCART -1554.47 38.58
   DISCCART -1546.15 -10.00
   DISCCART -1537.84 -58.58
   DISCCART -1529.53 -107.17
```

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DISCCART -1521.22 -155.75
DISCCART -1512.91 -204.33
DISCCART -1504.59 -252.92
DISCCART -1496.28 -301.50
DISCCART -1487.97 -350.08
DISCCART -1479.66 -398.67
DISCCART -1471.35 -447.25
DISCCART -1463.03 -495.83
DISCCART -1454.72 -544.42
DISCCART -1446.41 -593.00
DISCCART -1438.10 -641.58
DISCCART -1429.78 -690.17
DISCCART -1421.47 -738.75
DISCCART -1413.16 -787.33
DISCCART -1404.85 -835.92
DISCCART -1396.54 -884.50
DISCCART -1388.22 -933.08
DISCCART -1379.91 -981.67
DISCCART -1371.60 -1030.25
DISCCART -1363.29 -1078.83
DISCCART -1354.98 -1127.42
DISCCART -1346.66 -1176.00
DISCCART -1338.35 -1224.58
DISCCART -1330.04 -1273.17
DISCCART -1321.73 -1321.75
DISCCART -1313.42 -1370.33
DISCCART -1305.10 -1418.92
DISCCART -1296.79 -1467.50
DISCCART -1288.48 -1516.08
DISCCART -1280.17 -1564.67
DISCCART -1271.85 -1613.25
DISCCART -1263.54 -1661.83
DISCCART -1255.23 -1710.42
DISCCART -1246.92 -1759.00
DISCCART -1238.61 -1807.58
DISCCART -1230.29 -1856.17
DISCCART -1221.98 -1904.75
DISCCART -1213.67 -1953.33
DISCCART -1205.36 -2001.92
DISCCART -1197.05 -2050.50
DISCCART -1188.73 -2099.08
DISCCART -1180.42 -2147.67
DISCCART -1172.11 -2196.25
DISCCART -1163.80 -2244.83
DISCCART -1155.48 -2293.42
DISCCART -1147.17 -2342.00
DISCCART -1138.86 -2390.58
DISCCART -1130.55 -2439.17
DISCCART -1122.24 -2487.75
DISCCART -1113.92 -2536.33
DISCCART -1105.61 -2584.92
DISCCART -1047.67 -2633.50
DISCCART -998.05 -2633.50
DISCCART -948.42 -2633.50
DISCCART -898.79 -2633.50
DISCCART -849.17 -2633.50
DISCCART -799.54 -2633.50
DISCCART -749.91 -2633.50
DISCCART -700.29 -2633.50
DISCCART -650.66 -2633.50
DISCCART -601.03 -2633.50
DISCCART -551.41 -2633.50
DISCCART -501.78 -2633.50
DISCCART -452.15 -2633.50
DISCCART -402.53 -2633.50
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DISCCART -352.90 -2633.50
DISCCART -303.27 -2633.50
DISCCART -253.65 -2633.50
DISCCART -204.02 -2633.50
DISCCART -154.39 -2633.50
DISCCART -104.76 -2633.50
DISCCART -55.14 -2633.50
DISCCART -5.51 -2633.50
DISCCART 44.12 -2633.50
DISCCART 93.74 -2633.50
DISCCART 143.37 -2633.50
DISCCART 193.00 -2633.50
DISCCART 242.62 -2633.50
DISCCART 292.25 -2633.50
DISCCART 341.88 -2633.50
DISCCART 391.50 -2633.50
DISCCART 441.13 -2633.50
DISCCART 490.76 -2633.50
DISCCART 540.38 -2633.50
DISCCART 590.01 -2633.50
DISCCART 639.64 -2633.50
DISCCART 689.26 -2633.50
DISCCART 738.89 -2633.50
DISCCART 788.52 -2633.50
DISCCART 838.14 -2633.50
DISCCART 887.77 -2633.50
DISCCART 937.40 -2633.50
DISCCART 987.02 -2633.50
DISCCART 1036.65 -2633.50
DISCCART 1086.28 -2633.50
DISCCART 1135.90 -2633.50
DISCCART 1185.53 -2633.50
DISCCART 1235.16 -2633.50
DISCCART 1284.78 -2633.50
DISCCART 1334.41 -2633.50
DISCCART 1384.04 -2633.50
DISCCART 1433.66 -2633.50
DISCCART 1483.29 -2633.50
DISCCART 1532.92 -2633.50
DISCCART 1582.55 -2633.50
DISCCART 1632.17 -2633.50
DISCCART 1681.80 -2633.50
DISCCART 1731.43 -2633.50
DISCCART 1781.05 -2633.50
DISCCART 1830.68 -2633.50
DISCCART 1880.31 -2633.50
DISCCART 1929.93 -2633.50
DISCCART 1979.56 -2633.50
DISCCART 2029.19 -2633.50
DISCCART 2078.81 -2633.50
DISCCART 2128.44 -2633.50
DISCCART 2178.07 -2633.50
DISCCART 2227.69 -2633.50
DISCCART 2277.32 -2633.50
DISCCART 2326.95 -2633.50
DISCCART 2376.57 -2633.50
DISCCART 2426.20 -2584.17
DISCCART 2426.20 -2534.84
DISCCART 2426.20 -2485.51
DISCCART 2426.20 -2436.18
DISCCART 2426.20 -2386.85
DISCCART 2426.20 -2337.52
DISCCART 2426.20 -2288.18
DISCCART 2426.20 -2238.85
DISCCART 2426.20 -2189.52
```

DISCCART	2426.20	-2140.19
DISCCART	2426.20	-2090.86
DISCCART	2426.20	-2041.53
DISCCART	2426.20	-1992.20
DISCCART	2426.20	-1942.87
DISCCART	2426.20	-1893.54
DISCCART	2426.20	-1844.21
DISCCART	2426.20	-1794.88
DISCCART	2426.20	-1745.55
DISCCART	2426.20	-1696.22
DISCCART	2426.20	-1646.88
DISCCART	2426.20	-1597.55
DISCCART	2426.20	-1548.22
DISCCART	2426.20	-1498.89
DISCCART	2426.20	-1449.56
DISCCART	2426.20	-1400.23
DISCCART	2426.20	-1350.90
DISCCART	2426.20	-1301.57
DISCCART	2426.20	-1252.24
DISCCART	2426.20	-1202.91
DISCCART	2426.20	-1153.58
DISCCART	2426.20	-1104.25
DISCCART	2426.20	-1054.92
DISCCART	2426.20	-1005.58
DISCCART	2426.20	-956.25
DISCCART	2426.20	-906.92
DISCCART	2426.20	-857.59
DISCCART	2426.20	-808.26
DISCCART	2426.20	-758.93
DISCCART	2426.20	-709.60
DISCCART	2426.20	-660.27
DISCCART	2426.20	-610.94
DISCCART	2426.20	-561.61
DISCCART	2426.20	-512.28
DISCCART	2426.20	-462.95
DISCCART	2426.20	-413.62
DISCCART	2426.20	-364.28
DISCCART	2426.20	-314.95
DISCCART	2426.20	-265.62
DISCCART	2426.20	-216.29
DISCCART	2426.20	-166.96
DISCCART	2426.20	-117.63
DISCCART	2426.20	-68.30
DISCCART	2426.20	-18.97
DISCCART	2426.20	30.36
DISCCART	2426.20	79.69
DISCCART	2426.20	129.02
DISCCART	2426.20	178.35
DISCCART	2426.20	227.68
DISCCART	2426.20	277.02
DISCCART	2426.20	326.35
DISCCART	2426.20	375.68
DISCCART	2426.20	425.01
DISCCART	2426.20	474.34
DISCCART	2426.20	523.67
DISCCART	2378.15	573.00
DISCCART	2330.09	573.00
DISCCART	2282.04	573.00
DISCCART	2233.99	573.00
DISCCART	2185.94	573.00
DISCCART	2137.88	573.00
DISCCART	2089.83	573.00
DISCCART	2041.78	573.00
DISCCART	1993.72	573.00
DISCCART	1945.67	573.00

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   DISCCART 1897.62 573.00
   DISCCART 1849.56 573.00
   DISCCART 1801.51 573.00
   DISCCART 1753.46 573.00
   DISCCART 1705.41 573.00
   DISCCART 1657.35 573.00
   DISCCART 1609.30 620.41
   DISCCART 1609.30 667.82
   DISCCART 1609.30 715.23
   DISCCART 1609.30 762.64
   DISCCART 1609.30 810.06
   DISCCART 1609.30 857.47
   DISCCART 1609.30 904.88
   DISCCART 1609.30 952.29
   DISCCART 1559.58 999.70
   DISCCART 1509.86 999.70
   DISCCART 1460.14 999.70
   DISCCART 1410.42 999.70
   DISCCART 1360.71 999.70
   DISCCART 1310.99 999.70
   DISCCART 1261.27 999.70
   DISCCART 1211.55 999.70
   DISCCART 1161.83 999.70
   DISCCART 1112.11 999.70
   DISCCART 1062.39 999.70
   DISCCART 1012.67 999.70
   DISCCART 962.96 999.70
   DISCCART 913.24 999.70
   DISCCART 863.52 999.70
   DISCCART 813.80 999.70
   DISCCART 764.08 999.70
   DISCCART 714.36 999.70
   DISCCART 664.64 999.70
   DISCCART 614.92 999.70
   DISCCART 565.21 999.70
   DISCCART 515.49 999.70
   DISCCART 465.77 999.70
   DISCCART 416.05 999.70
   DISCCART 366.33 999.70
   DISCCART 316.61 999.70
   DISCCART 266.89 999.70
   DISCCART 217.17 999.70
   DISCCART 167.46 999.70
   DISCCART 117.74 999.70
   DISCCART 68.02 999.70
   DISCCART 18.29 953.64
   DISCCART 18.28 907.59
   DISCCART 18.27 861.53
   DISCCART 18.26 815.48
   DISCCART 18.24 769.42
   DISCCART 18.23 723.37
   DISCCART 18.22 677.31
   DISCCART 18.21 631.26
** Receptors from Property Line to 2.0 km
   DISCCART -2000.00 -2000.00
   DISCCART -2000.00 -1900.00
   .
   .
   .
   .
   DISCCART 2000.00 1000.00
   DISCCART 2000.00 1100.00
   DISCCART 2000.00 1200.00
   DISCCART 2000.00 1300.00
   DISCCART 2000.00 1400.00
```

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   DISCCART 2000.00 1500.00
   DISCCART 2000.00 1600.00
   DISCCART 2000.00 1700.00
   DISCCART 2000.00 1800.00
   DISCCART 2000.00 1900.00
   DISCCART 2000.00 2000.00
** Receptors from 2 km to 3 km, 150 m spacing
   DISCCART -2000.00 2142.86
   DISCCART -2000.00 2285.71
   DISCCART -2000.00 2428.57
   DISCCART -2000.00 2571.43
   DISCCART -2000.00 2714.29
   DISCCART -2000.00 2857.14
   DISCCART -2000.00 3000.00
   .
   .
   .
   .
   DISCCART -3000.00 1088.24
   DISCCART -3000.00 1235.29
   DISCCART -3000.00 1382.35
   DISCCART -3000.00 1529.41
   DISCCART -3000.00 1676.47
   DISCCART -3000.00 1823.53
   DISCCART -3000.00 1970.59
   DISCCART -3000.00 2117.65
   DISCCART -3000.00 2264.71
   DISCCART -3000.00 2411.76
   DISCCART -3000.00 2558.82
   DISCCART -3000.00 2705.88
   DISCCART -3000.00 2852.94
   DISCCART -3000.00 3000.00
** Receptors from 3 km to 5 km, 0.5 m spacing
   DISCCART -3000.00 3500.00
   DISCCART -3000.00 4000.00
   DISCCART -3000.00 4500.00
   DISCCART -3000.00 5000.00
   DISCCART -2500.00 3500.00
   DISCCART -2500.00 4000.00
   .
   .
   .
   .
   DISCCART -5000.00 500.00
   DISCCART -5000.00 1000.00
   DISCCART -5000.00 1500.00
   DISCCART -5000.00 2000.00
   DISCCART -5000.00 2500.00
   DISCCART -5000.00 3000.00
   DISCCART -5000.00 3500.00
   DISCCART -5000.00 4000.00
   DISCCART -5000.00 4500.00
   DISCCART -5000.00 5000.00
RE FINISHED
**
****************************************
** ISCST3 Meteorology Pathway
****************************************
**
**
ME STARTING
   INPUTFIL C:\MET\tpatpa91.met
   ANEMHGHT 22 FEET
   SURFDATA 12842 1991 TAMPA/INT'L_ARPT
   UAIRDATA 12842 1991 TAMPA/INT'L_ARPT
```

```
ME FINISHED
**
***************************************
** ISCST3 Output Pathway
***************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST
OU FINISHED
```

EXAMPLE ISCST3 INPUT FILE
AAQS ANALYSIS
24-HOUR AVERAGE SO_2 IMPACTS

```
CO STARTING
   TITLEONE 1991 CF Industries, AAQS Screening Analysis, SO2,    3/16/05
   TITLETWO 24-Hour Emissions, TAMPA MET DATA 1991-1995
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 24
   POLLUTID SO2
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
SO STARTING
** Future CFI Sources:
** SAPC    - C SAP STACK
** SAPD    - D SAP STACK
** SAPA    - A SAP STACK
** SAPB    - B SAP STACK
** ADMP    - A DAP/MAP PLANT
** ZDMP    - Z DAP/MAP PLANT
** YDMGP   - Y DAP/MAP/GTSP PLANT
** XDMGP   - X DAP/MAP/GTSP PLANT
** MSTPTA - MOLTEN SULFUR TRUCK PIT A VENT
** MSTPTB - MOLTEN SULFUR TRUCK PIT B VENT
** MSTK22 - MOLTEN SULFUR STORAGE TANK 022
** MSTK33 - MOLTEN SULFUR STORAGE TANK 033 - AREA SOURCE
** MSRCUP - MOLTEN SULFUR RAILCAR UNLOADING - AREA SOURCE
** JOHNSTON - JOHNSTON SCOTCH MARINE TYPE BOILER


** Source ID - Type - X Coord. - Y Coord. **
** FUTURE SOURCES
   LOCATION JOHNSTON POINT -123.560   26.170
   LOCATION SAPA     POINT  -74.475   17.821
   LOCATION SAPB     POINT  -52.295  -47.866
   LOCATION SAPC     POINT    0.000    0.000
   LOCATION SAPD     POINT   53.123   17.938
   LOCATION ADMP     POINT -302.233 -112.218
   LOCATION ZDMP     POINT -317.860   45.903
   LOCATION XDMGP    POINT -340.986   94.573
   LOCATION YDMGP    POINT -327.586   74.705
   LOCATION MSTK22   POINT  -20.504   29.089
   LOCATION MSTK33   AREA   -62.410  199.390
   LOCATION MSTPTA   POINT  -52.340   10.782
   LOCATION MSTPTB   POINT  -38.385  -29.110
   LOCATION MSRCUP   AREA  -101.290  212.290
** Point Source Parameters **
**                  ER      SH       ST       SV      SD
**                 (g/s)    (m)      (K)    (m/s)     (m)
** ------------------------------------------------------
** FUTURE CFI SOURCES
   SRCPARAM JOHNSTON  5.90   7.62 561. 18.78 1.07
   SRCPARAM SAPA     38.22  33.53 303. 22.12 1.52
   SRCPARAM SAPB     29.40  33.53 302. 22.80 1.52
   SRCPARAM SAPC     50.53  60.66 343. 14.22 2.44
   SRCPARAM SAPD     50.53  60.66 345. 14.71 2.44
   SRCPARAM ADMP      1.75  24.38 331. 11.21 3.05
   SRCPARAM ZDMP      2.62  41.45 333. 13.56 2.74
   SRCPARAM XDMGP     3.05  41.45 330. 15.47 2.74
   SRCPARAM YDMGP     3.03  41.45 330. 16.24 2.74
** next three sources have rain caps: vel set to 0.01 m/s
   SRCPARAM MSTK22   0.017  11.58 373.2 0.01 0.61
   SRCPARAM MSTPTA   0.017   3.66 373.2 0.01 0.20
   SRCPARAM MSTPTB   0.017   3.66 373.2 0.01 0.20
```

```
** area source parameters
** CFI future area sources

**                  ER/Area     RH    X Side   Y Side   Angle   Init Sz
**                  (g/s/m2)    (m)     (m)     (m)      (deg)     (m)
**-----------------------------------------------------------------------
** Area = X*Y = 16.4^2 = 268.8 m2 (equivalent for tank with 9.25 m radius)
** ER = 0.017 g/s
   SRCPARAM MSTK33   6.324E-5 12.50  16.400   16.4      0.00   0.00

** Area = X*Y = 3.5 * 19 = 66.5 m2
** ER = 0.017 g/s
   SRCPARAM MSRCUP   2.556E-4  0.00   3.500   19.0   -18.66   0.00

** Future source Building Downwash **
SO BUILDHGT SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPC         9.14     9.14     9.14     9.14     0.00     0.00
SO BUILDHGT SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPC        14.28    13.92    14.65    14.94     0.00     0.00
SO BUILDWID SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPC         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPC         0.00     0.00     0.00     0.00     0.00     0.00


SO BUILDHGT SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPD         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPD         0.00     0.00     0.00     0.00     0.00     0.00


SO BUILDHGT SAPA         0.00     0.00     0.00     0.00     0.00    19.81
SO BUILDHGT SAPA        19.81    20.12    20.12    20.12    20.12    20.12
SO BUILDHGT SAPA         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPA         0.00     0.00     0.00     0.00     0.00    19.81
SO BUILDHGT SAPA        19.81     0.00     0.00     0.00    20.12    20.12
SO BUILDHGT SAPA         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPA         0.00     0.00     0.00     0.00     0.00    31.63
SO BUILDWID SAPA        23.32    30.32    36.67    41.91    45.88    48.45
SO BUILDWID SAPA         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPA         0.00     0.00     0.00     0.00     0.00    44.51
SO BUILDWID SAPA        46.39     0.00     0.00     0.00    45.88    48.45
SO BUILDWID SAPA         0.00     0.00     0.00     0.00     0.00     0.00


SO BUILDHGT SAPB         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPB         0.00     0.00    19.81    19.81    19.81    20.12
SO BUILDHGT SAPB        20.12    20.12     0.00     0.00     0.00     0.00
SO BUILDHGT SAPB         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPB         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPB         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPB         0.00     0.00     0.00     0.00     0.00     0.00
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SO BUILDWID SAPB        0.00     0.00    81.33    77.88    84.59    48.45
SO BUILDWID SAPB       49.56    49.15     0.00     0.00     0.00     0.00
SO BUILDWID SAPB        0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPB        0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPB        0.00     0.00     0.00     0.00     0.00     0.00


SO BUILDHGT ADMP       28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMP       28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMP       28.35    28.35    38.71    38.71    38.71    38.71
SO BUILDHGT ADMP       28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMP       28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMP       28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDWID ADMP       39.66    38.36    35.90    32.35    50.93    40.51
SO BUILDWID ADMP       16.37    23.72    30.59    31.22    35.05    37.81
SO BUILDWID ADMP       39.43    39.85    58.53    44.71    54.98    67.54
SO BUILDWID ADMP       39.66    38.36    35.90    32.35    50.93    40.51
SO BUILDWID ADMP       16.37    23.72    30.59    31.22    35.05    37.81
SO BUILDWID ADMP       39.43    39.85    39.05    37.07    38.64    39.75


SO BUILDHGT ZDMP       38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMP       38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMP       38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMP       38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMP       38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMP       38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDWID ZDMP       78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID ZDMP       85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID ZDMP       80.47    70.57    58.53    44.71    54.98    67.54
SO BUILDWID ZDMP       78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID ZDMP       85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID ZDMP       80.47    70.57    58.53    44.71    54.98    67.54


SO BUILDHGT YDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDWID YDMGP      78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID YDMGP      85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID YDMGP      80.47    70.57    58.53    44.71    54.98    67.54
SO BUILDWID YDMGP      78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID YDMGP      85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID YDMGP      80.47    70.57    58.53    44.71    54.98    67.54


SO BUILDHGT XDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGP      38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDWID XDMGP      78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID XDMGP      85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID XDMGP      80.47    70.57    58.53    44.71    54.98    67.54
SO BUILDWID XDMGP      78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID XDMGP      85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID XDMGP      80.47    70.57    58.53    44.71    54.98    67.54


SO BUILDHGT MSTPTA      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTA     19.81    19.81    20.12    20.12    20.12    20.12
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SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     9.14     9.14
SO BUILDHGT MSTPTA       9.14     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA      46.39    57.64    36.67    41.91    45.88    48.45
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00    13.83    14.56
SO BUILDWID MSTPTA      14.85     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTA       0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00    19.81    19.81    20.12    20.12
SO BUILDHGT MSTPTB      20.12     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00    68.81    77.88    45.88    48.45
SO BUILDWID MSTPTB      49.56     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID MSTPTB       0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22      19.81    20.12    20.12    20.12     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDHGT MSTK22       9.14     9.14     9.14     9.14     9.14     9.14
SO BUILDWID MSTK22      14.10    14.60    14.66    14.28    13.83    14.56
SO BUILDWID MSTK22      46.39    30.32    36.67    41.91    14.60    14.66
SO BUILDWID MSTK22      14.28    13.92    14.65    14.94    14.77    14.15
SO BUILDWID MSTK22      14.10    14.60    14.66    14.28    13.83    14.56
SO BUILDWID MSTK22      14.85    14.68    14.07    14.10    14.60    14.66
SO BUILDWID MSTK22      14.28    13.92    14.65    14.94    14.77    14.15

**SO2 INVENTORY SOURCES
**      CORONET INDUSTRIES, INC.
**      DEFLUORINATING KILN #2
SO LOCATION CORN3   POINT   5800    -19700  0.0
**      BOILER DEFLUOR. PLANT
SO LOCATION CORN19  POINT   5800    -19700  0.0
**      BOILER DEFLUOR. PLANT
SO LOCATION CORN20  POINT   5800    -19700  0.0
**      FLUID BED REACTOR #1
SO LOCATION CORN22  POINT   5800    -19700  0.0
**      FLUID BED REACTOR #2
SO LOCATION CORN24  POINT   5800    -19700  0.0

**     LAKELAND ELECTRIC - MCINTOSH POWER PLANT
**      McIntosh Unit 1
SO LOCATION MCINT1  POINT   21000   -9800   0.0
**      McIntosh Unit 2
SO LOCATION MCINT2  POINT   21000   -9800   0.0
**      McIntosh Unit 3
SO LOCATION MCINT3  POINT   21000   -9800   0.0
**      Gas Turbine Peaking Unit 1
SO LOCATION MCINT4  POINT   21000   -9800   0.0
**      McIntosh Unit 2
SO LOCATION MCINT5  POINT   21000   -9800   0.0
**      McIntosh Unit 3
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SO LOCATION MCINT6  POINT   21000   -9800   0.0
**          CT UNIT 5
SO LOCATION MCINT28 POINT   21000   -9800   0.0

**     LAKELAND ELECTRIC - LARSEN POWER PLANT
**      Steam Generator # 6
SO LOCATION LARS3   POINT   20900   -13500  0.0
**      Steam Generator # 7
SO LOCATION LARS4   POINT   20900   -13500  0.0
**      Peaking Gas Turbine # 3
SO LOCATION LARS5   POINT   20900   -13500  0.0
**      Peaking Gas Turbine # 2
SO LOCATION LARS6   POINT   20900   -13500  0.0
**      Peaking Gas Turbine # 1
SO LOCATION LARPWR7 POINT   20900   -13500  0.0
**      Combined Cycle CT
SO LOCATION LARS8   POINT   20900   -13500  0.0

**     YUENGLING BREWING CO.
**      2 Natural gas boilers
SO LOCATION YNGBREW1        POINT   -26000  -12800  0.0

**     HILLSBOROUGH CTY. RESOURCE RECOVERY FAC.
**      MWC & Aux Burner #1
SO LOCATION HILLSRC1        POINT   -19800  -23300  0.0
**      MWC & Aux Burner #2
SO LOCATION HILLSRC2        POINT   -19800  -23300  0.0
**      MWC & Aux Burner #3
SO LOCATION HILLSRC3        POINT   -19800  -23300  0.0

**     AGRIFOS, L.L.C. - NICHOLS
**       ROCK DRYER NO. 1
SO LOCATION AGRINK1 POINT   10700   -30700  0.0
**       ROCK DRYER NO. 2
SO LOCATION AGRINK2 POINT   10700   -30700  0.0

**      GULF COAST RECYCLING, INC.
**      BLAST FURNACE
SO LOCATION GULFRCY1        POINT   -24000  -22500  0.0

**     IMC PHOSPHATES COMPANY - NICHOLS
**      SAP NO. 1 PSD
SO LOCATION AGRNK5  POINT   10400   -31800  0.0
**      Phosphate Rock Dryer
SO LOCATION AGRNK12 POINT   10400   -31800  0.0
**      North Auxiliary Boiler
SO LOCATION AGRNK15 POINT   10400   -31800  0.0
**      South Auxiliary Boiler
SO LOCATION AGRNK16 POINT   10400   -31800  0.0

**      AUBURNDALE POWER PARTNERS, LP
**      Combustion Turbine System(Phase II, Acid Rain Unit)
SO LOCATION AUBCT1  POINT   32800   -12700  0.0
**      Combustion Turbine System(Phase II, Acid Rain Unit)
SO LOCATION AUBCT2  POINT   32800   -12700  0.0

**     CUTRALE CITRUS JUICES USA,INC
**      CITRUS FEED MILL DRYER
SO LOCATION CUTR1   POINT   33600   -12300  0.0
**      PEEL DRYER
SO LOCATION CUTR3   POINT   33600   -12300  0.0
**      COGEN #1
SO LOCATION CUTR8   POINT   33600   -12300  0.0
**      COGEN #2
SO LOCATION CUTR9   POINT   33600   -12300  0.0
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**     CARGILL MULBERRY (FORMERLY MULBERRY PHOSPHATES, INC.)
**       SAP 2
SO LOCATION MULPHS2 POINT   18800   -30900  0.0
**       BOILER
SO LOCATION MULPHS9 POINT   18800   -30900  0.0

**       CITY OF TAMPA, MCKAY BAY
**       MWC & Aux Burner No. 1
SO LOCATION MCKY103 POINT   -27800  -23790  0.0
**       MWC & Aux Burner No. 2
SO LOCATION MCKY104 POINT   -27800  -23790  0.0
**       MWC & Aux Burner No. 3
SO LOCATION MCKY105 POINT   -27800  -23790  0.0
**       MWC & Aux Burner No. 4
SO LOCATION MCKY106 POINT   -27800  -23790  0.0

**     CARGILL FERTILIZER - BARTOW
**       NO.3 FERTILIZER PLANT
SO LOCATION CARBAR1 POINT   21800   -29400  0.0
**       No. 4 SAP
SO LOCATION CARBAR12        POINT   21800   -29400  0.0
**       NO.4 FERTILIZER PLANT
SO LOCATION CARBAR21        POINT   21800   -29400  0.0
**       No. 6 SAP
SO LOCATION CARBAR32        POINT   21800   -29400  0.0
**       No. 5 SAP
SO LOCATION CARBAR33        POINT   21800   -29400  0.0
**       Boiler
SO LOCATION CARBAR51        POINT   21800   -29400  0.0

**     IMC PHOSPHATES COMPANY - NEW WALES
**       SAP No. 1
SO LOCATION IMCWAL2 POINT   8700    -36600  0.0
**       SAP No. 2
SO LOCATION IMCWAL3 POINT   8700    -36600  0.0
**       SAP No. 3
SO LOCATION IMCWAL4 POINT   8700    -36600  0.0
**       DAP Plant No. 1
SO LOCATION IMCWAL9 POINT   8700    -36600  0.0
**       Auxiliary Boiler
SO LOCATION IMCWAL13        POINT   8700    -36600  0.0
**       AFI Plant
SO LOCATION IMCWAL27        POINT   8700    -36600  0.0
**       Kilns, Dryer, Blending Op.
SO LOCATION IMCWAL36        POINT   8700    -36600  0.0
**       SAP No. 4
SO LOCATION IMCWAL42        POINT   8700    -36600  0.0
**       SAP No. 5
SO LOCATION IMCWAL44        POINT   8700    -36600  0.0
**       DAP Plant No 2 - East Train
SO LOCATION IMCWAL45        POINT   8700    -36600  0.0
**       DAP Plant No 2 - West Train
SO LOCATION IMCWAL46        POINT   8700    -36600  0.0
**       Molten Storage Tank
SO LOCATION IMCWAL60        POINT   8700    -36600  0.0
**       Molten Storage Tank
SO LOCATION IMCWAL62        POINT   8700    -36600  0.0
**       Unloading Sulfur Pit
SO LOCATION IMCWAL63        POINT   8700    -36600  0.0
**       Unloading Sulfur Pit
SO LOCATION IMCWAL64        POINT   8700    -36600  0.0
**       Unloading Sulfur Pit
SO LOCATION IMCWAL65        POINT   8700    -36600  0.0
**       Sulfur Transfer Pit
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SO LOCATION IMCWAL66        POINT   8700    -36600  0.0
**      Unloading Sulfur Pit
SO LOCATION IMCWAL68        POINT   8700    -36600  0.0
**      Unloading Sulfur Pit
SO LOCATION IMCWAL69        POINT   8700    -36600  0.0
**      Multifos C Kiln
SO LOCATION IMCWAL74        POINT   8700    -36600  0.0
**      GRANULAR MAP PLANT
SO LOCATION IMCWAL78        POINT   8700    -36600  0.0

**      TECO - HOOKERS POINT
**      Boiler #1
SO LOCATION TECOHK1 POINT   -30000  -25000  0.0
**      Boiler #2
SO LOCATION TECOHK2 POINT   -30000  -25000  0.0
**      Boiler #3
SO LOCATION TECOHK3 POINT   -30000  -25000  0.0
**      Boiler #4
SO LOCATION TECOHK4 POINT   -30000  -25000  0.0
**      Boiler #5
SO LOCATION TECOHK5 POINT   -30000  -25000  0.0
**      Boiler #6
SO LOCATION TECOHK6 POINT   -30000  -25000  0.0

**     CF INDUSTRIES, INC. - BARTOW
**      SAP NO.6
SO LOCATION CFIBAR6 POINT   20300   -33500  0.0
**      BOILER NO. 1
SO LOCATION CFIBAR21        POINT   20300   -33500  0.0

**      TECO - GANNON
**      UNIT #1 STEAM GENERATOR
SO LOCATION TECOGN1 POINT   -27900  -28500  0.0
**      125MW  BOILER
SO LOCATION TECOGN2 POINT   -27900  -28500  0.0
**      UNIT #3 BOILER
SO LOCATION TECOGN3 POINT   -27900  -28500  0.0
**      UNIT#4-BOILER
SO LOCATION TECOGN4 POINT   -27900  -28500  0.0
**      UNIT #5  BOILER
SO LOCATION TECOGN5 POINT   -27900  -28500  0.0
**      UNIT #6 BOILER WITH ESP
SO LOCATION TECOGN6 POINT   -27900  -28500  0.0
**      14 MW GAS TURBINE
SO LOCATION TECOGN7 POINT   -27900  -28500  0.0

**     CARGILL FERTILIZER, INC.--RIVERVIEW
**      MOLTEN SULFUR PITS 7, 8, AND 9
SO LOCATION CRPITS  POINT   -25100  -33500  0.0
**      MOLTEN SULFUR TANKS 1, 2, AND 3/TRUCK LOADING
SO LOCATION CRTKTL  POINT   -25100  -33500  0.0
**      NO. 7 SULFURIC ACID PLANT
SO LOCATION CR7SAP  POINT   -25100  -33500  0.0
**      NO. 8 SULFURIC ACID PLANT
SO LOCATION CR8SAP  POINT   -25100  -33500  0.0
**      NO. 9 SULFURIC ACID PLANT
SO LOCATION CR9SAP  POINT   -25100  -33500  0.0
**      NO. 5 ROCK MILL
SO LOCATION CR5RKML POINT   -25100  -33500  0.0
**      NO. 7 ROCK MILL
SO LOCATION CR7RKML POINT   -25100  -33500  0.0
**      NO. 9 ROCK MILL
SO LOCATION CR9RKML POINT   -25100  -33500  0.0
**      NO. 6 GRANULATION PLANT DRYER STACK
SO LOCATION CR6GRAN POINT   -25100  -33500  0.0
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**      AFI PLANT NO. 1
SO LOCATION CRAFI1  POINT   -25100  -33500  0.0
**      AFI PLANT NO. 2
SO LOCATION CRAFI2  POINT   -25100  -33500  0.0
**      NO. 5 GRANULATION PLANT-DRYER/COOLER STACK
SO LOCATION CR5GRAN POINT   -25100  -33500  0.0
**      NOS. 3 AND 4 MAP PLANTS, SOUTH COOLER
SO LOCATION CR34MAP POINT   -25100  -33500  0.0

**      CARGILL FERTILIZER, INC. - GREEN BAY (FORMERLY FARMLAND HYDRO, L.P.)
**      SAP #4
SO LOCATION FARM4   POINT   21500   -35900  0.0
**      SAP #5
SO LOCATION FARM5   POINT   21500   -35900  0.0
**      South AP Plant--Stack A
SO LOCATION FARM7   POINT   21500   -35900  0.0
**      NORTH MAP/DAP PLANT--MAIN STACK
SO LOCATION FARM29  POINT   21500   -35900  0.0
**      MOLTEN SULFUR PIT
SO LOCATION FARM34  POINT   21500   -35900  0.0
**      No. 6 SAP
SO LOCATION FARM38  POINT   21500   -35900  0.0

**      TECO - BIG BEND
**      1 & 2 Gen. 24-Hour Emissions
SO LOCATION TECOBB12        POINT   -26100  -41000  0.0
**      3 Gen. 24-Hour Emissions
SO LOCATION TECOBB3 POINT   -26100  -41000  0.0
**      UNIT #4 BOILER W/ESP
SO LOCATION TECOBB4 POINT   -26100  -41000  0.0
**      Gas Turbine No. 2:
SO LOCATION TECOBB5 POINT   -26100  -41000  0.0
**      Gas Turbine No. 3:
SO LOCATION TECOBB6 POINT   -26100  -41000  0.0
**      GAS TURBINE #1
SO LOCATION TECOBB7 POINT   -26100  -41000  0.0

**      IMC-AGRICO CO.- SOUTH PIERCE
**      Auxiliary Boiler
SO LOCATION IMCSPR1 POINT   19500   -44600  0.0
**      SAP No. 10
SO LOCATION IMCSPR4 POINT   19500   -44600  0.0
**      SAP No. 11
SO LOCATION IMCSPR5 POINT   19500   -44600  0.0

**      TECO - POLK POWER STATION
**      Combined cycle CT
SO LOCATION TECOPK1 POINT   14450   -48650  0.0
**      120 MMBtu/HR AuxBlr
SO LOCATION TECOPK3 POINT   14450   -48650  0.0
**      Sulfuric Acid Plant
SO LOCATION TECOPK4 POINT   14450   -48650  0.0
**      Simple Cycle CT
SO LOCATION TECOPK9 POINT   14450   -48650  0.0
**      Simple Cycle CT
SO LOCATION TECOPK10        POINT   14450   -48650  0.0

**     FLORIDA CRUSHED STONE CO., INC.
**      POWER PLANT
SO LOCATION FLCRSH18        POINT   -28000  46500   0.0
**      BCP: Kiln, Clinker Cooler, Raw Mill, & Dryer with Baghouse
SO LOCATION FLCRSH20        POINT   -28000  46500   0.0
**      KILN #2 SYSTEM: preheater/precalciner, cooler,dyer,raw mill
SO LOCATION FLCRSH26        POINT   -28000  46500   0.0
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**     CENTRAL POWER & LIME, INC.
**       CEMENT KILN, CLINKER COOLER, RAW MILL & DRYER
SO LOCATION CPL09   POINT   -28000  46500   0.0
**       POWER PLANT
SO LOCATION CPL14   POINT   -28000  46500   0.0

**     FPC - HIGGINS
**       FFFSG-SG 1
SO LOCATION FPCHIG1 POINT   -51500  -17600  0.0
**       FFFSG-SG 2
SO LOCATION FPCHIG2 POINT   -51500  -17600  0.0
**       FFFSG-SG 3
SO LOCATION FPCHIG3 POINT   -51500  -17600  0.0
**       CTP 1
SO LOCATION FPCHIG4 POINT   -51500  -17600  0.0
**       CTP 2
SO LOCATION FPCHIG5 POINT   -51500  -17600  0.0
**       CTP 3
SO LOCATION FPCHIG6 POINT   -51500  -17600  0.0
**       CTP 4
SO LOCATION FPCHIG7 POINT   -51500  -17600  0.0

**     U.S. AGRI-CHEMICALS - FT. MEADE
**       AUXILIARY BOILER
SO LOCATION USAGFM6 POINT   28000   -47000  0.0
**       SAP #1
SO LOCATION USAGFM16        POINT   28000   -47000  0.0
**       SAP #2
SO LOCATION USAGFM17        POINT   28000   -47000  0.0
**       MOLTEN SULFUR TANK
SO LOCATION USAGFM28        POINT   28000   -47000  0.0
**       MOLTEN SULFUR TANK
SO LOCATION USAGFM29        POINT   28000   -47000  0.0

**       FPC - BARTOW
**       No.1 Unit
SO LOCATION FPCBART1        POINT   -45600  -33400  0.0
**       No.2 Unit
SO LOCATION FPCBART2        POINT   -45600  -33400  0.0
**       No.3 Unit
SO LOCATION FPCBART3        POINT   -45600  -33400  0.0
**       Boiler
SO LOCATION FPCBART4        POINT   -45600  -33400  0.0
**       GT Peaking Unit #P-1
SO LOCATION FPCBART5        POINT   -45600  -33400  0.0
**       GT Peaking Unit #P-2
SO LOCATION FPCBART6        POINT   -45600  -33400  0.0
**       GT Peaking Unit #P-3
SO LOCATION FPCBART7        POINT   -45600  -33400  0.0
**       GT Peaking Unit #P-4
SO LOCATION FPCBART8        POINT   -45600  -33400  0.0

**     CITRUS WORLD, INC.
**       CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #2
SO LOCATION CITWOR1 POINT   53000   -28700  0.0
**       ERIE CITY KEYSTONE BOILER #3 USING NAT GAS AND #6 OIL
SO LOCATION CITWOR3 POINT   53000   -28700  0.0
**       ERIE CITY KEYSTONE BOILER #2 USING NAT GAS AND #6 OIL
SO LOCATION CITWOR4 POINT   53000   -28700  0.0
**       CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #1
SO LOCATION CITWOR7 POINT   53000   -28700  0.0
**       CITRUS PEEL DRYER WITH WASTE-HEAT EVAPORATOR #3
SO LOCATION CITWOR13        POINT   53000   -28700  0.0
**       ERIE CITY KEYSTONE BOILER #1 USING NAT GAS AND #6 OIL
SO LOCATION CITWOR17        POINT   53000   -28700  0.0
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**     HARDEE POWER PARTNERS, LTD
**      CT 1A W\HRSG
SO LOCATION HARDE1  POINT   16800   -58600  0.0
**      CT 2A W\HRSG
SO LOCATION HARDE2  POINT   16800   -58600  0.0
**      Simple cycle CT 2A
SO LOCATION HARDE3  POINT   16800   -58600  0.0
**      Unit 2B - 75 MW gas turbine
SO LOCATION HARDE5  POINT   16800   -58600  0.0

**     PINELLAS CO. RESOURCE RECOVERY FACILITY
**      Waste Combustor & Aux burners-Unit #1
SO LOCATION PINRCY1 POINT   -52800  -31900  0.0
**      Waste Combustor & Aux burners-Unit #2
SO LOCATION PINRCY3 POINT   -52800  -31900  0.0

**     FPC - ANCLOTE POWER PLANT
**      TURBINE GEN.  UNIT NO. 1
SO LOCATION FPCANC1 POINT   -63600  2700    0.0
**      TURBINE GEN.  UNIT NO. 2
SO LOCATION FPCANC2 POINT   -63600  2700    0.0

**     FLORIDA POWER & LIGHT MANATEE PLANT
**      GENERATOR 1
SO LOCATION FPLMAN1 POINT   -20750  -61850  0.0
**      GENERATOR 2
SO LOCATION FPLMAN2 POINT   -20750  -61850  0.0

**     FPC - BAYBORO
**      CT Peaking Unit # 1
SO LOCATION FPCBAY1 POINT   -49200  -44700  0.0
**      CT Peaking Unit # 2
SO LOCATION FPCBAY2 POINT   -49200  -44700  0.0
**      CT Peaking Unit # 3
SO LOCATION FPCBAY3 POINT   -49200  -44700  0.0
**      CT Peaking Unit # 4
SO LOCATION FPCBAY4 POINT   -49200  -44700  0.0

**             24-hr Q H        T        V       D
**     SRCID  (g/s)  (m)     (K)    (m/s)  (m)


**     CORONET INDUSTRIES, INC.
SO SRCPARAM CORN3   23.74   46.33   316     19.51   1.77
SO SRCPARAM CORN19  0.54    7.6     505     15.24   0.40
SO SRCPARAM CORN20  0.27    6.1     605     20.12   0.37
SO SRCPARAM CORN22  8.63    46.3    316     19.51   1.77
SO SRCPARAM CORN24  8.63    46.3    316     19.51   1.77

**     LAKELAND ELECTRIC - MCINTOSH POWER PLANT
SO SRCPARAM MCINT1  329.18  45.7    409     24.75   2.74
SO SRCPARAM MCINT2  1.80    6.1     653     23.47   0.79
SO SRCPARAM MCINT3  1.80    6.1     653     23.47   0.79
SO SRCPARAM MCINT4  20.75   10.7    755     24.23   4.11
SO SRCPARAM MCINT5  112.39  47.9    409     22.31   3.20
SO SRCPARAM MCINT6  550.37  76.2    348     25.18   5.49
SO SRCPARAM MCINT28 15.96   25.9    864     25.21   8.53

**     LAKELAND ELECTRIC - LARSEN POWER PLANT
SO SRCPARAM LARS3   105.99  50.3    444     6.40    3.05
SO SRCPARAM LARS4   207.02  50.3    444     6.71    3.05
SO SRCPARAM LARS5   13.38   9.4     700     30.78   3.60
SO SRCPARAM LARS6   13.38   9.4     700     30.78   3.60
SO SRCPARAM LARPWR7 13.38   9.4     700     30.78   3.60
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SO SRCPARAM LARS8    26.64   47.2    523     26.12   4.88

**     YUENGLING BREWING CO.
SO SRCPARAM YNGBREW1         1.13    27.4    408     2.13    1.98

**     HILLSBOROUGH CTY. RESOURCE RECOVERY FAC.
SO SRCPARAM HILLSRC1         7.39    67.1    416     22.10   1.55
SO SRCPARAM HILLSRC2         7.39    67.1    416     22.10   1.55
SO SRCPARAM HILLSRC3         7.39    67.1    416     22.10   1.55

**     AGRIFOS, L.L.C. - NICHOLS
SO SRCPARAM AGRINK1 32.20    24.4    344     12.50   2.29
SO SRCPARAM AGRINK2 31.63    24.4    344     12.50   2.29

**      GULF COAST RECYCLING, INC.
SO SRCPARAM GULFRCY1         47.12   45.7    344     16.70   0.61

**     IMC PHOSPHATES COMPANY - NICHOLS
SO SRCPARAM AGRNK5  52.52    45.7    350     10.06   2.29
SO SRCPARAM AGRNK12 3.34     24.7    328     3.66    2.29
SO SRCPARAM AGRNK15 3.24     8.2     533     13.72   0.61
SO SRCPARAM AGRNK16 0.33     11.9    533     8.84    0.98

**      AUBURNDALE POWER PARTNERS, LP
SO SRCPARAM AUBCT1  5.04     48.8    368     16.76   5.49
SO SRCPARAM AUBCT2  8.82     48.8    368     16.76   5.49

**     CUTRALE CITRUS JUICES USA,INC
SO SRCPARAM CUTR1   23.44    28.3    333     16.76   1.07
SO SRCPARAM CUTR3   23.44    30.5    345     14.94   0.98
SO SRCPARAM CUTR8   21.52    12.2    435     18.29   1.22
SO SRCPARAM CUTR9   3.28     12.2    439     20.12   1.22

**     CARGILL MULBERRY (FORMERLY MULBERRY PHOSPHATES, INC.)
SO SRCPARAM MULPHS2 35.70    61.0    366     9.75    2.13
SO SRCPARAM MULPHS9 12.91    13.7    300     2.44    1.13

**      CITY OF TAMPA, MCKAY BAY
SO SRCPARAM MCKY103 5.15     61.3    416     22.34   1.28
SO SRCPARAM MCKY104 5.15     61.3    416     22.34   1.28
SO SRCPARAM MCKY105 5.15     61.3    416     22.34   1.28
SO SRCPARAM MCKY106 5.15     61.3    416     22.34   1.28

**     CARGILL FERTILIZER - BARTOW
SO SRCPARAM CARBAR1          9.69    43.0    344     24.06   2.29
SO SRCPARAM CARBAR12         54.60   61.0    355     18.59   2.07
SO SRCPARAM CARBAR21         12.92   42.7    329     12.83   3.35
SO SRCPARAM CARBAR32         54.60   61.0    355     18.59   2.07
SO SRCPARAM CARBAR33         54.60   61.0    355     18.59   2.07
SO SRCPARAM CARBAR51         20.81   9.4     483     6.10    1.07

**     IMC PHOSPHATES COMPANY - NEW WALES
SO SRCPARAM IMCWAL2 60.90    61.0    350     15.24   2.59
SO SRCPARAM IMCWAL3 60.90    61.0    350     15.24   2.59
SO SRCPARAM IMCWAL4 60.90    61.0    350     15.24   2.59
SO SRCPARAM IMCWAL9 9.40     40.5    314     14.94   2.13
SO SRCPARAM IMCWAL13         71.69   25.9    564     58.92   0.91
SO SRCPARAM IMCWAL27         2.31    52.4    328     20.21   2.44
SO SRCPARAM IMCWAL36         24.19   52.4    314     15.85   1.37
SO SRCPARAM IMCWAL42         60.90   60.7    350     15.24   2.59
SO SRCPARAM IMCWAL44         60.90   60.7    350     15.24   2.59
SO SRCPARAM IMCWAL45         2.77    52.1    316     17.68   1.83
SO SRCPARAM IMCWAL46         2.77    52.1    316     17.68   1.83
SO SRCPARAM IMCWAL60         0.06    12.2    389     0.13    0.61
SO SRCPARAM IMCWAL62         0.06    12.2    389     0.13    0.61
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SO SRCPARAM IMCWAL63         0.04     12.2     389      0.13     0.61
SO SRCPARAM IMCWAL64         0.01     12.2     389      0.13     0.61
SO SRCPARAM IMCWAL65         0.04     12.2     389      0.13     0.61
SO SRCPARAM IMCWAL66         0.01     12.2     389      0.13     0.61
SO SRCPARAM IMCWAL68         0.04     7.6      305      0.03     0.03
SO SRCPARAM IMCWAL69         0.01     7.6      305      0.03     0.03
SO SRCPARAM IMCWAL74         1.10     52.4     314      21.40    1.37
SO SRCPARAM IMCWAL78         1.73     40.5     336      33.41    1.83

**       TECO - HOOKERS POINT
SO SRCPARAM TECOHK1 41.30    85.3     453      24.99    3.44
SO SRCPARAM TECOHK2 41.30    85.3     453      24.99    3.44
SO SRCPARAM TECOHK3 56.96    85.3     445      19.11    3.66
SO SRCPARAM TECOHK4 56.96    85.3     445      19.11    3.66
SO SRCPARAM TECOHK5 84.55    85.3     453      24.99    3.44
SO SRCPARAM TECOHK6 107.83   85.3     438      22.92    2.87

**     CF INDUSTRIES, INC. - BARTOW
SO SRCPARAM CFIBAR6 50.40    62.8     333      6.40     2.13
SO SRCPARAM CFIBAR21         2.12     11.0     589      13.41    0.76

**       TECO - GANNON
SO SRCPARAM TECOGN1 269.26   96.0     409      37.93    3.05
SO SRCPARAM TECOGN2 269.26   96.0     421      38.50    3.05
SO SRCPARAM TECOGN3 342.47   96.0     406      34.60    3.23
SO SRCPARAM TECOGN4 401.81   96.0     416      29.60    3.05
SO SRCPARAM TECOGN5 489.26   96.0     418      50.74    4.45
SO SRCPARAM TECOGN6 813.58   96.0     400      33.28    5.36
SO SRCPARAM TECOGN7 1.38     10.7     816      28.22    3.35

**     CARGILL FERTILIZER, INC.--RIVERVIEW
SO SRCPARAM CRPITS  0.02     0.0      409      37.93    0.00
SO SRCPARAM CRTKTL  0.42     0.0      409      37.93    0.00
SO SRCPARAM CR7SAP  58.80    0.0      409      37.93    0.00
SO SRCPARAM CR8SAP  49.61    0.0      409      37.93    0.00
SO SRCPARAM CR9SAP  62.47    0.0      409      37.93    0.00
SO SRCPARAM CR5RKML 0.83     0.0      409      37.93    0.00
SO SRCPARAM CR7RKML 0.83     0.0      409      37.93    0.00
SO SRCPARAM CR9RKML 0.83     0.0      409      37.93    0.00
SO SRCPARAM CR6GRAN 5.11     0.0      409      37.93    0.00
SO SRCPARAM CRAFI1  3.20     0.0      409      37.93    0.00
SO SRCPARAM CRAFI2  4.79     0.0      409      37.93    0.00
SO SRCPARAM CR5GRAN 1.59     0.0      409      37.93    0.00
SO SRCPARAM CR34MAP 0.00     0.0      409      37.93    0.00

**       CARGILL FERTILIZER, INC. - GREEN BAY (FORMERLY FARMLAND HYDRO, L.P.)
SO SRCPARAM FARM4   44.10    30.5     355      12.07    2.29
SO SRCPARAM FARM5   58.80    45.7     355      13.44    2.44
SO SRCPARAM FARM7   0.40     39.5     309      15.16    2.44
SO SRCPARAM FARM29  0.33     39.3     318      15.50    2.24
SO SRCPARAM FARM34  0.09     3.0      366      16.46    0.24
SO SRCPARAM FARM38  50.53    45.7     355      10.61    2.74

**       TECO - BIG BEND
SO SRCPARAM TECOBB12 4150.00 149.4     422      35.36    7.32
SO SRCPARAM TECOBB3 2149.94 149.4     418      15.61    7.32
SO SRCPARAM TECOBB4 450.58   149.4    326      23.87    7.32
SO SRCPARAM TECOBB5 39.56    22.9     771      18.59    4.27
SO SRCPARAM TECOBB6 39.56    22.9     771      18.59    4.27
SO SRCPARAM TECOBB7 11.34    10.7     816      28.01    3.36

**       IMC-AGRICO CO.- SOUTH PIERCE
SO SRCPARAM IMCSPR1 8.00     10.7     494      15.54    1.46
SO SRCPARAM IMCSPR4 56.70    43.9     350      12.53    2.74
SO SRCPARAM IMCSPR5 56.70    43.9     350      12.53    2.74
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**       TECO - POLK POWER STATION
SO SRCPARAM TECOPK1 65.27   45.7    444     23.10   5.79
SO SRCPARAM TECOPK3 12.10   22.9    464     15.23   1.13
SO SRCPARAM TECOPK4 4.49    60.7    355     18.29   0.76
SO SRCPARAM TECOPK9 1.16    34.7    876     18.35   8.84
SO SRCPARAM TECOPK10        1.16    34.7    876     18.35   8.84

**      FLORIDA CRUSHED STONE CO., INC.
SO SRCPARAM FLCRSH18        97.02   97.5    422     21.21   4.88
SO SRCPARAM FLCRSH20        6.30    91.4    378     14.33   4.88
SO SRCPARAM FLCRSH26        3.02    97.5    399     10.30   4.27

**      CENTRAL POWER & LIME, INC.
SO SRCPARAM CPL09   131.05  91.4    381     14.33   4.88
SO SRCPARAM CPL14   98.41   97.5    394     21.21   4.88

**      FPC - HIGGINS
SO SRCPARAM FPCHIG1 189.88  53.0    429     8.23    3.81
SO SRCPARAM FPCHIG2 181.23  53.0    428     8.23    3.81
SO SRCPARAM FPCHIG3 189.88  53.0    423     7.32    3.81
SO SRCPARAM FPCHIG4 36.07   16.8    728     28.38   4.60
SO SRCPARAM FPCHIG5 36.07   17.1    728     28.38   4.60
SO SRCPARAM FPCHIG6 40.21   16.8    728     28.38   4.60
SO SRCPARAM FPCHIG7 40.21   16.8    728     28.38   4.60

**      U.S. AGRI-CHEMICALS - FT. MEADE
SO SRCPARAM USAGFM6 6.43    21.3    478     14.94   1.13
SO SRCPARAM USAGFM16        63.00   53.3    355     9.75    2.59
SO SRCPARAM USAGFM17        63.00   53.3    355     9.75    2.59
SO SRCPARAM USAGFM28        0.06    1.8     405     104.85  0.09
SO SRCPARAM USAGFM29        0.03    1.8     400     47.85   0.09

**       FPC - BARTOW
SO SRCPARAM FPCBART1        422.73  91.4    429     36.27   2.74
SO SRCPARAM FPCBART2        456.37  91.4    425     31.09   2.74
SO SRCPARAM FPCBART3        766.08  91.4    408     34.44   3.35
SO SRCPARAM FPCBART4        0.98    9.1     541     5.18    0.91
SO SRCPARAM FPCBART5        45.43   13.7    772     21.06   5.46
SO SRCPARAM FPCBART6        45.43   13.7    772     21.06   5.46
SO SRCPARAM FPCBART7        45.43   13.7    772     21.06   5.46
SO SRCPARAM FPCBART8        45.43   13.7    772     21.06   5.46

**      CITRUS WORLD, INC.
SO SRCPARAM CITWOR1 23.74   22.9    364     14.94   1.43
SO SRCPARAM CITWOR3 22.43   12.2    505     18.26   1.12
SO SRCPARAM CITWOR4 22.71   12.2    505     18.44   1.12
SO SRCPARAM CITWOR7 11.87   22.9    339     15.15   0.97
SO SRCPARAM CITWOR13        23.74   22.9    339     10.09   1.40
SO SRCPARAM CITWOR17        9.46    12.2    505     7.71    1.12

**      HARDEE POWER PARTNERS, LTD
SO SRCPARAM HARDE1  92.53   27.4    386     23.62   4.42
SO SRCPARAM HARDE2  92.53   27.4    391     23.10   4.42
SO SRCPARAM HARDE3  92.53   22.9    803     28.74   5.46
SO SRCPARAM HARDE5  0.67    25.9    810     43.28   4.51

**      PINELLAS CO. RESOURCE RECOVERY FACILITY
SO SRCPARAM PINRCY1 21.42   49.1    505     26.82   2.38
SO SRCPARAM PINRCY3 66.15   50.3    505     27.43   2.74

**      FPC - ANCLOTE POWER PLANT
SO SRCPARAM FPCANC1 1720.16 152.1   433     18.90   7.32
SO SRCPARAM FPCANC2 774.33  152.1   433     18.90   7.32
```

```
**     FLORIDA POWER & LIGHT MANATEE PLANT
SO SRCPARAM FPLMAN1 1198.89 152.1   436     25.15   7.99
SO SRCPARAM FPLMAN2 1198.89 152.1   436     25.15   7.99

**     FPC - BAYBORO
SO SRCPARAM FPCBAY1 49.25   12.2    755     6.40    6.98
SO SRCPARAM FPCBAY2 49.25   12.2    755     6.40    6.98
SO SRCPARAM FPCBAY3 49.25   12.2    755     6.40    6.98
SO SRCPARAM FPCBAY4 49.25   12.2    755     6.40    6.98


   SRCGROUP ALL
SO FINISHED
**
***************************************
** ISCST3 Receptor Pathway
***************************************
**
**
RE STARTING
** Restricted Property Line Receptors, 50 m spacing
   DISCCART 18.20 585.20
   DISCCART -182.90 585.20
   DISCCART -182.90 573.00
   DISCCART -1645.90 573.00
   DISCCART -1097.30 -2633.50
   DISCCART 2426.20 -2633.50
   DISCCART 2426.20 573.00
   DISCCART 1609.30 573.00
   DISCCART 1609.30 999.70
   DISCCART 18.30 999.70
   DISCCART -22.02 585.20
   DISCCART -62.24 585.20
   DISCCART -102.46 585.20
   DISCCART -142.68 585.20
   DISCCART -231.67 573.00
   DISCCART -280.43 573.00
   DISCCART -329.20 573.00
   DISCCART -377.97 573.00
   DISCCART -426.73 573.00
   DISCCART -475.50 573.00
   DISCCART -524.27 573.00
   DISCCART -573.03 573.00
   DISCCART -621.80 573.00
   DISCCART -670.57 573.00
   DISCCART -719.33 573.00
   DISCCART -768.10 573.00
   DISCCART -816.87 573.00
   DISCCART -865.63 573.00
   DISCCART -914.40 573.00
   DISCCART -963.17 573.00
   DISCCART -1011.93 573.00
   DISCCART -1060.70 573.00
   DISCCART -1109.47 573.00
   DISCCART -1158.23 573.00
   DISCCART -1207.00 573.00
   DISCCART -1255.77 573.00
   DISCCART -1304.53 573.00
   DISCCART -1353.30 573.00
   DISCCART -1402.07 573.00
   DISCCART -1450.83 573.00
   DISCCART -1499.60 573.00
   DISCCART -1548.37 573.00
   DISCCART -1597.13 573.00
   DISCCART -1637.59 524.42
```

DISCCART -1629.28 475.83
DISCCART -1620.96 427.25
DISCCART -1612.65 378.67
DISCCART -1604.34 330.08
DISCCART -1596.03 281.50
DISCCART -1587.72 232.92
DISCCART -1579.40 184.33
DISCCART -1571.09 135.75
DISCCART -1562.78 87.17
DISCCART -1554.47 38.58
DISCCART -1546.15 -10.00
DISCCART -1537.84 -58.58
DISCCART -1529.53 -107.17
DISCCART -1521.22 -155.75
DISCCART -1512.91 -204.33
DISCCART -1504.59 -252.92
DISCCART -1496.28 -301.50
DISCCART -1487.97 -350.08
DISCCART -1479.66 -398.67
DISCCART -1471.35 -447.25
DISCCART -1463.03 -495.83
DISCCART -1454.72 -544.42
DISCCART -1446.41 -593.00
DISCCART -1438.10 -641.58
DISCCART -1429.78 -690.17
DISCCART -1421.47 -738.75
DISCCART -1413.16 -787.33
DISCCART -1404.85 -835.92
DISCCART -1396.54 -884.50
DISCCART -1388.22 -933.08
DISCCART -1379.91 -981.67
DISCCART -1371.60 -1030.25
DISCCART -1363.29 -1078.83
DISCCART -1354.98 -1127.42
DISCCART -1346.66 -1176.00
DISCCART -1338.35 -1224.58
DISCCART -1330.04 -1273.17
DISCCART -1321.73 -1321.75
DISCCART -1313.42 -1370.33
DISCCART -1305.10 -1418.92
DISCCART -1296.79 -1467.50
DISCCART -1288.48 -1516.08
DISCCART -1280.17 -1564.67
DISCCART -1271.85 -1613.25
DISCCART -1263.54 -1661.83
DISCCART -1255.23 -1710.42
DISCCART -1246.92 -1759.00
DISCCART -1238.61 -1807.58
DISCCART -1230.29 -1856.17
DISCCART -1221.98 -1904.75
DISCCART -1213.67 -1953.33
DISCCART -1205.36 -2001.92
DISCCART -1197.05 -2050.50
DISCCART -1188.73 -2099.08
DISCCART -1180.42 -2147.67
DISCCART -1172.11 -2196.25
DISCCART -1163.80 -2244.83
DISCCART -1155.48 -2293.42
DISCCART -1147.17 -2342.00
DISCCART -1138.86 -2390.58
DISCCART -1130.55 -2439.17
DISCCART -1122.24 -2487.75
DISCCART -1113.92 -2536.33
DISCCART -1105.61 -2584.92
DISCCART -1047.67 -2633.50

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DISCCART -998.05 -2633.50
DISCCART -948.42 -2633.50
DISCCART -898.79 -2633.50
DISCCART -849.17 -2633.50
DISCCART -799.54 -2633.50
DISCCART -749.91 -2633.50
DISCCART -700.29 -2633.50
DISCCART -650.66 -2633.50
DISCCART -601.03 -2633.50
DISCCART -551.41 -2633.50
DISCCART -501.78 -2633.50
DISCCART -452.15 -2633.50
DISCCART -402.53 -2633.50
DISCCART -352.90 -2633.50
DISCCART -303.27 -2633.50
DISCCART -253.65 -2633.50
DISCCART -204.02 -2633.50
DISCCART -154.39 -2633.50
DISCCART -104.76 -2633.50
DISCCART -55.14 -2633.50
DISCCART -5.51 -2633.50
DISCCART 44.12 -2633.50
DISCCART 93.74 -2633.50
DISCCART 143.37 -2633.50
DISCCART 193.00 -2633.50
DISCCART 242.62 -2633.50
DISCCART 292.25 -2633.50
DISCCART 341.88 -2633.50
DISCCART 391.50 -2633.50
DISCCART 441.13 -2633.50
DISCCART 490.76 -2633.50
DISCCART 540.38 -2633.50
DISCCART 590.01 -2633.50
DISCCART 639.64 -2633.50
DISCCART 689.26 -2633.50
DISCCART 738.89 -2633.50
DISCCART 788.52 -2633.50
DISCCART 838.14 -2633.50
DISCCART 887.77 -2633.50
DISCCART 937.40 -2633.50
DISCCART 987.02 -2633.50
DISCCART 1036.65 -2633.50
DISCCART 1086.28 -2633.50
DISCCART 1135.90 -2633.50
DISCCART 1185.53 -2633.50
DISCCART 1235.16 -2633.50
DISCCART 1284.78 -2633.50
DISCCART 1334.41 -2633.50
DISCCART 1384.04 -2633.50
DISCCART 1433.66 -2633.50
DISCCART 1483.29 -2633.50
DISCCART 1532.92 -2633.50
DISCCART 1582.55 -2633.50
DISCCART 1632.17 -2633.50
DISCCART 1681.80 -2633.50
DISCCART 1731.43 -2633.50
DISCCART 1781.05 -2633.50
DISCCART 1830.68 -2633.50
DISCCART 1880.31 -2633.50
DISCCART 1929.93 -2633.50
DISCCART 1979.56 -2633.50
DISCCART 2029.19 -2633.50
DISCCART 2078.81 -2633.50
DISCCART 2128.44 -2633.50
DISCCART 2178.07 -2633.50
```

DISCCART 2227.69 -2633.50
DISCCART 2277.32 -2633.50
DISCCART 2326.95 -2633.50
DISCCART 2376.57 -2633.50
DISCCART 2426.20 -2584.17
DISCCART 2426.20 -2534.84
DISCCART 2426.20 -2485.51
DISCCART 2426.20 -2436.18
DISCCART 2426.20 -2386.85
DISCCART 2426.20 -2337.52
DISCCART 2426.20 -2288.18
DISCCART 2426.20 -2238.85
DISCCART 2426.20 -2189.52
DISCCART 2426.20 -2140.19
DISCCART 2426.20 -2090.86
DISCCART 2426.20 -2041.53
DISCCART 2426.20 -1992.20
DISCCART 2426.20 -1942.87
DISCCART 2426.20 -1893.54
DISCCART 2426.20 -1844.21
DISCCART 2426.20 -1794.88
DISCCART 2426.20 -1745.55
DISCCART 2426.20 -1696.22
DISCCART 2426.20 -1646.88
DISCCART 2426.20 -1597.55
DISCCART 2426.20 -1548.22
DISCCART 2426.20 -1498.89
DISCCART 2426.20 -1449.56
DISCCART 2426.20 -1400.23
DISCCART 2426.20 -1350.90
DISCCART 2426.20 -1301.57
DISCCART 2426.20 -1252.24
DISCCART 2426.20 -1202.91
DISCCART 2426.20 -1153.58
DISCCART 2426.20 -1104.25
DISCCART 2426.20 -1054.92
DISCCART 2426.20 -1005.58
DISCCART 2426.20 -956.25
DISCCART 2426.20 -906.92
DISCCART 2426.20 -857.59
DISCCART 2426.20 -808.26
DISCCART 2426.20 -758.93
DISCCART 2426.20 -709.60
DISCCART 2426.20 -660.27
DISCCART 2426.20 -610.94
DISCCART 2426.20 -561.61
DISCCART 2426.20 -512.28
DISCCART 2426.20 -462.95
DISCCART 2426.20 -413.62
DISCCART 2426.20 -364.28
DISCCART 2426.20 -314.95
DISCCART 2426.20 -265.62
DISCCART 2426.20 -216.29
DISCCART 2426.20 -166.96
DISCCART 2426.20 -117.63
DISCCART 2426.20 -68.30
DISCCART 2426.20 -18.97
DISCCART 2426.20 30.36
DISCCART 2426.20 79.69
DISCCART 2426.20 129.02
DISCCART 2426.20 178.35
DISCCART 2426.20 227.68
DISCCART 2426.20 277.02
DISCCART 2426.20 326.35
DISCCART 2426.20 375.68

DISCCART	2426.20	425.01
DISCCART	2426.20	474.34
DISCCART	2426.20	523.67
DISCCART	2378.15	573.00
DISCCART	2330.09	573.00
DISCCART	2282.04	573.00
DISCCART	2233.99	573.00
DISCCART	2185.94	573.00
DISCCART	2137.88	573.00
DISCCART	2089.83	573.00
DISCCART	2041.78	573.00
DISCCART	1993.72	573.00
DISCCART	1945.67	573.00
DISCCART	1897.62	573.00
DISCCART	1849.56	573.00
DISCCART	1801.51	573.00
DISCCART	1753.46	573.00
DISCCART	1705.41	573.00
DISCCART	1657.35	573.00
DISCCART	1609.30	620.41
DISCCART	1609.30	667.82
DISCCART	1609.30	715.23
DISCCART	1609.30	762.64
DISCCART	1609.30	810.06
DISCCART	1609.30	857.47
DISCCART	1609.30	904.88
DISCCART	1609.30	952.29
DISCCART	1559.58	999.70
DISCCART	1509.86	999.70
DISCCART	1460.14	999.70
DISCCART	1410.42	999.70
DISCCART	1360.71	999.70
DISCCART	1310.99	999.70
DISCCART	1261.27	999.70
DISCCART	1211.55	999.70
DISCCART	1161.83	999.70
DISCCART	1112.11	999.70
DISCCART	1062.39	999.70
DISCCART	1012.67	999.70
DISCCART	962.96	999.70
DISCCART	913.24	999.70
DISCCART	863.52	999.70
DISCCART	813.80	999.70
DISCCART	764.08	999.70
DISCCART	714.36	999.70
DISCCART	664.64	999.70
DISCCART	614.92	999.70
DISCCART	565.21	999.70
DISCCART	515.49	999.70
DISCCART	465.77	999.70
DISCCART	416.05	999.70
DISCCART	366.33	999.70
DISCCART	316.61	999.70
DISCCART	266.89	999.70
DISCCART	217.17	999.70
DISCCART	167.46	999.70
DISCCART	117.74	999.70
DISCCART	68.02	999.70
DISCCART	18.29	953.64
DISCCART	18.28	907.59
DISCCART	18.27	861.53
DISCCART	18.26	815.48
DISCCART	18.24	769.42
DISCCART	18.23	723.37
DISCCART	18.22	677.31

```
   DISCCART 18.21 631.26
** Receptors from Property Line to 2.0 km
   DISCCART -2000.00 -2000.00
   DISCCART -2000.00 -1900.00
   DISCCART -2000.00 -1800.00
   .
   .
   .
   DISCCART 2000.00 1800.00
   DISCCART 2000.00 1900.00
   DISCCART 2000.00 2000.00
** Receptors from 2 km to 3 km, 150 m spacing
   DISCCART -2000.00 2142.86
   DISCCART -2000.00 2285.71
   DISCCART -2000.00 2428.57
   .
   .
   .
   DISCCART -3000.00 2264.71
   DISCCART -3000.00 2411.76
   DISCCART -3000.00 2558.82
   DISCCART -3000.00 2705.88
   DISCCART -3000.00 2852.94
   DISCCART -3000.00 3000.00
** Receptors from 3 km to 5 km, 0.5 m spacing
   DISCCART -3000.00 3500.00
   DISCCART -3000.00 4000.00
   DISCCART -3000.00 4500.00
   DISCCART -3000.00 5000.00
   .
   .
   .
   DISCCART -5000.00 3500.00
   DISCCART -5000.00 4000.00
   DISCCART -5000.00 4500.00
   DISCCART -5000.00 5000.00
RE FINISHED
****************************************
** ISCST3 Meteorology Pathway
****************************************
**
**
ME STARTING
   INPUTFIL C:\MET\tpatpa91.met
   ANEMHGHT 22 FEET
   SURFDATA 12842 1991 TAMPA/INT'L_ARPT
   UAIRDATA 12842 1991 TAMPA/INT'L_ARPT
ME FINISHED
**
****************************************
** ISCST3 Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST SECOND
OU FINISHED
```

EXAMPLE ISCST3 INPUT FILE
PSD CLASS II INCREMENT ANALYSIS
24-HOUR AVERAGE SO_2 IMPACTS

```
CO STARTING
   TITLEONE 1991 CF Ind., PSD Class II Increment Screening Analysis, SO2,    3/16/05
   TITLETWO 24-Hour Emissions, TAMPA MET DATA 1991-1995
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 24
   POLLUTID SO2
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
SO STARTING
** Future CFI Sources:
** SAPC   - C SAP STACK
** SAPD   - D SAP STACK
** SAPA   - A SAP STACK
** SAPB   - B SAP STACK
** ADMP   - A DAP/MAP PLANT
** ZDMP   - Z DAP/MAP PLANT
** YDMGP  - Y DAP/MAP/GTSP PLANT
** XDMGP  - X DAP/MAP/GTSP PLANT
** MSTPTA - MOLTEN SULFUR TRUCK PIT A VENT
** MSTPTB - MOLTEN SULFUR TRUCK PIT B VENT
** MSTK22 - MOLTEN SULFUR STORAGE TANK 022
** MSTK33 - MOLTEN SULFUR STORAGE TANK 033 - AREA SOURCE
** MSRCUP - MOLTEN SULFUR RAILCAR UNLOADING - AREA SOURCE
** JOHNSTON - JOHNSTON SCOTCH MARINE TYPE BOILER

** CFI 1974 BASELINE SO2 SOURCES
** SAPCb  - C SAP STACK
** SAPDb  - D SAP STACK
** SAPAb  - A SAP STACK
** SAPBb  - B SAP STACK
** ADMPb  - A DAP/MAP PLANT
** ZDMPb  - Z DAP/MAP PLANT
** YDMGPb - Y DAP/MAP/GTSP PLANT
** XDMGPb - X DAP/MAP/GTSP PLANT
** RMMANb - ROP/MGTSP Manufacturing
** PITSTANK - MOLTEN SULFUR TRUCK PITS A AND B AND TANK 022 - AREA SOURCE


** Source ID - Type - X Coord. - Y Coord. **
** FUTURE SOURCES
   LOCATION JOHNSTON POINT -123.560   26.170
   LOCATION SAPA     POINT  -74.475   17.821
   LOCATION SAPB     POINT  -52.295  -47.866
   LOCATION SAPC     POINT    0.000    0.000
   LOCATION SAPD     POINT   53.123   17.938
   LOCATION ADMP     POINT -302.233 -112.218
   LOCATION ZDMP     POINT -317.860   45.903
   LOCATION XDMGP    POINT -340.986   94.573
   LOCATION YDMGP    POINT -327.586   74.705
   LOCATION MSTK22   POINT  -20.504   29.089
   LOCATION MSTK33   AREA   -62.410  199.390
   LOCATION MSTPTA   POINT  -52.340   10.782
   LOCATION MSTPTB   POINT  -38.385  -29.110
   LOCATION MSRCUP   AREA  -101.290  212.290

** 1974 BASELINE SOURCES
   LOCATION SAPCb   POINT    0.000    0.000
   LOCATION SAPDb   POINT   53.123   17.938
   LOCATION SAPAb   POINT  -74.475   17.821
```

```
   LOCATION SAPBb    POINT  -52.295  -47.866
   LOCATION ADMPb    POINT -302.233 -112.218
   LOCATION ZDMPb    POINT -317.860   45.903
   LOCATION YDMGPb   POINT -327.586   74.705
   LOCATION XDMGPb   POINT -340.986   94.573
   LOCATION RMMANb   POINT -272.050 -135.320
   LOCATION PITSTANK AREA  -37.620  -48.990

** Point Source Parameters **
**                  ER      SH       ST       SV      SD
**                 (g/s)    (m)      (K)    (m/s)     (m)
** ----------------------------------------------------------
** FUTURE CFI SOURCES
   SRCPARAM JOHNSTON  5.90   7.62 561. 18.78 1.07
   SRCPARAM SAPA     38.22  33.53 303. 22.12 1.52
   SRCPARAM SAPB     29.40  33.53 302. 22.80 1.52
   SRCPARAM SAPC     50.53  60.66 343. 14.22 2.44
   SRCPARAM SAPD     50.53  60.66 345. 14.71 2.44
   SRCPARAM ADMP      1.75  24.38 331. 11.21 3.05
   SRCPARAM ZDMP      2.62  41.45 333. 13.56 2.74
   SRCPARAM XDMGP     3.05  41.45 330. 15.47 2.74
   SRCPARAM YDMGP     3.03  41.45 330. 16.24 2.74
** next three sources have rain caps: vel set to 0.01 m/s
   SRCPARAM MSTK22   0.017  11.58 373.2 0.01 0.61
   SRCPARAM MSTPTA   0.017   3.66 373.2 0.01 0.20
   SRCPARAM MSTPTB   0.017   3.66 373.2 0.01 0.20

** CFI 1974 PSD BASELINE SOURCES
   SRCPARAM ADMPb  -2.32 30.48 326.  8.16 3.05
   SRCPARAM XDMGPb -3.46 38.10 316. 21.24 2.23
   SRCPARAM YDMGPb -2.31 38.10 316. 13.64 2.23
   SRCPARAM ZDMPb  -2.31 38.10 316. 21.24 2.23
   SRCPARAM SAPAb -52.50 24.38 310. 18.96 1.52
   SRCPARAM SAPBb -52.50 24.38 309. 20.85 1.52
   SRCPARAM SAPCb -31.50 60.66 339. 10.50 2.44
   SRCPARAM SAPDb -31.50 60.66 339.  8.45 2.44
   SRCPARAM RMMANb -1.78 41.15 304. 10.33 1.98

** area source parameters
** CFI future area sources

**                 ER/Area    RH   X Side  Y Side  Angle  Init Sz
**                 (g/s/m2)   (m)    (m)    (m)    (deg)    (m)
**---------------------------------------------------------------
** Area = X*Y = 16.4^2 = 268.8 m2 (equivalent for tank with 9.25 m radius)
** ER = 0.017 g/s
   SRCPARAM MSTK33   6.324E-5 12.50  16.400   16.4     0.00    0.00

** Area = X*Y = 3.5 * 19 = 66.5 m2
** ER = 0.017 g/s
   SRCPARAM MSRCUP   2.556E-4  0.00   3.500   19.0   -18.66    0.00

** CFI 1974 psd baseline area sources
**
** MOLTEN SULFUR STORAGE AND HANDLING AREA SOURCE FOR
**  SULFUR TRUCK PITS "A" AND "B", AND STORAGE TANK 022
** Area SourceS
**                 ER/Area    RH   X Side  Y Side  Angle  Init Sz
**                 (g/s/m2)   (m)    (m)    (m)    (deg)    (m)
**---------------------------------------------------------------
** Area = X*Y = 50 * 85 = 4250 m2
** ER = 0.0416 g/s
   SRCPARAM PITSTANK -9.78E-6 0.0 50.0 85.0 -18.658
```

```
** Future source Building Downwash **
SO BUILDHGT SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPC        9.14    9.14    9.14    9.14    0.00    0.00
SO BUILDHGT SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPC       14.28   13.92   14.65   14.94    0.00    0.00
SO BUILDWID SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPC        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPC        0.00    0.00    0.00    0.00    0.00    0.00


SO BUILDHGT SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPD        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPD        0.00    0.00    0.00    0.00    0.00    0.00


SO BUILDHGT SAPA        0.00    0.00    0.00    0.00    0.00   19.81
SO BUILDHGT SAPA       19.81   20.12   20.12   20.12   20.12   20.12
SO BUILDHGT SAPA        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPA        0.00    0.00    0.00    0.00    0.00   19.81
SO BUILDHGT SAPA       19.81    0.00    0.00    0.00   20.12   20.12
SO BUILDHGT SAPA        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPA        0.00    0.00    0.00    0.00    0.00   31.63
SO BUILDWID SAPA       23.32   30.32   36.67   41.91   45.88   48.45
SO BUILDWID SAPA        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPA        0.00    0.00    0.00    0.00    0.00   44.51
SO BUILDWID SAPA       46.39    0.00    0.00    0.00   45.88   48.45
SO BUILDWID SAPA        0.00    0.00    0.00    0.00    0.00    0.00


SO BUILDHGT SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPB        0.00    0.00   19.81   19.81   19.81   20.12
SO BUILDHGT SAPB       20.12   20.12    0.00    0.00    0.00    0.00
SO BUILDHGT SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPB        0.00    0.00   81.33   77.88   84.59   48.45
SO BUILDWID SAPB       49.56   49.15    0.00    0.00    0.00    0.00
SO BUILDWID SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPB        0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID SAPB        0.00    0.00    0.00    0.00    0.00    0.00


SO BUILDHGT ADMP       28.35   28.35   28.35   28.35   28.35   28.35
SO BUILDHGT ADMP       28.35   28.35   28.35   28.35   28.35   28.35
SO BUILDHGT ADMP       28.35   28.35   38.71   38.71   38.71   38.71
SO BUILDHGT ADMP       28.35   28.35   28.35   28.35   28.35   28.35
SO BUILDHGT ADMP       28.35   28.35   28.35   28.35   28.35   28.35
SO BUILDHGT ADMP       28.35   28.35   28.35   28.35   28.35   28.35
SO BUILDWID ADMP       39.66   38.36   35.90   32.35   50.93   40.51
SO BUILDWID ADMP       16.37   23.72   30.59   31.22   35.05   37.81
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SO BUILDWID ADMP        39.43   39.85   58.53   44.71   54.98   67.54
SO BUILDWID ADMP        39.66   38.36   35.90   32.35   50.93   40.51
SO BUILDWID ADMP        16.37   23.72   30.59   31.22   35.05   37.81
SO BUILDWID ADMP        39.43   39.85   39.05   37.07   38.64   39.75

SO BUILDHGT ZDMP        38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT ZDMP        38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT ZDMP        38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT ZDMP        38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT ZDMP        38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT ZDMP        38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDWID ZDMP        78.04   86.18   91.69   94.43   94.29   91.28
SO BUILDWID ZDMP        85.51   90.00   93.76   94.67   92.71   87.92
SO BUILDWID ZDMP        80.47   70.57   58.53   44.71   54.98   67.54
SO BUILDWID ZDMP        78.04   86.18   91.69   94.43   94.29   91.28
SO BUILDWID ZDMP        85.51   90.00   93.76   94.67   92.71   87.92
SO BUILDWID ZDMP        80.47   70.57   58.53   44.71   54.98   67.54

SO BUILDHGT YDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT YDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT YDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT YDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT YDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT YDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDWID YDMGP       78.04   86.18   91.69   94.43   94.29   91.28
SO BUILDWID YDMGP       85.51   90.00   93.76   94.67   92.71   87.92
SO BUILDWID YDMGP       80.47   70.57   58.53   44.71   54.98   67.54
SO BUILDWID YDMGP       78.04   86.18   91.69   94.43   94.29   91.28
SO BUILDWID YDMGP       85.51   90.00   93.76   94.67   92.71   87.92
SO BUILDWID YDMGP       80.47   70.57   58.53   44.71   54.98   67.54

SO BUILDHGT XDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT XDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT XDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT XDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT XDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDHGT XDMGP       38.71   38.71   38.71   38.71   38.71   38.71
SO BUILDWID XDMGP       78.04   86.18   91.69   94.43   94.29   91.28
SO BUILDWID XDMGP       85.51   90.00   93.76   94.67   92.71   87.92
SO BUILDWID XDMGP       80.47   70.57   58.53   44.71   54.98   67.54
SO BUILDWID XDMGP       78.04   86.18   91.69   94.43   94.29   91.28
SO BUILDWID XDMGP       85.51   90.00   93.76   94.67   92.71   87.92
SO BUILDWID XDMGP       80.47   70.57   58.53   44.71   54.98   67.54

SO BUILDHGT MSTPTA       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT MSTPTA      19.81   19.81   20.12   20.12   20.12   20.12
SO BUILDHGT MSTPTA       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT MSTPTA       0.00    0.00    0.00    0.00    9.14    9.14
SO BUILDHGT MSTPTA       9.14    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT MSTPTA       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID MSTPTA       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID MSTPTA      46.39   57.64   36.67   41.91   45.88   48.45
SO BUILDWID MSTPTA       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID MSTPTA       0.00    0.00    0.00    0.00   13.83   14.56
SO BUILDWID MSTPTA      14.85    0.00    0.00    0.00    0.00    0.00
SO BUILDWID MSTPTA       0.00    0.00    0.00    0.00    0.00    0.00

SO BUILDHGT MSTPTB       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT MSTPTB       0.00    0.00   19.81   19.81   20.12   20.12
SO BUILDHGT MSTPTB      20.12    0.00    0.00    0.00    0.00    0.00
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SO	BUILDHGT	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	MSTPTB	0.00	0.00	68.81	77.88	45.88	48.45
SO	BUILDWID	MSTPTB	49.56	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	MSTPTB	0.00	0.00	0.00	0.00	0.00	0.00

SO	BUILDHGT	MSTK22	9.14	9.14	9.14	9.14	9.14	9.14
SO	BUILDHGT	MSTK22	19.81	20.12	20.12	20.12	9.14	9.14
SO	BUILDHGT	MSTK22	9.14	9.14	9.14	9.14	9.14	9.14
SO	BUILDHGT	MSTK22	9.14	9.14	9.14	9.14	9.14	9.14
SO	BUILDHGT	MSTK22	9.14	9.14	9.14	9.14	9.14	9.14
SO	BUILDHGT	MSTK22	9.14	9.14	9.14	9.14	9.14	9.14
SO	BUILDWID	MSTK22	14.10	14.60	14.66	14.28	13.83	14.56
SO	BUILDWID	MSTK22	46.39	30.32	36.67	41.91	14.60	14.66
SO	BUILDWID	MSTK22	14.28	13.92	14.65	14.94	14.77	14.15
SO	BUILDWID	MSTK22	14.10	14.60	14.66	14.28	13.83	14.56
SO	BUILDWID	MSTK22	14.85	14.68	14.07	14.10	14.60	14.66
SO	BUILDWID	MSTK22	14.28	13.92	14.65	14.94	14.77	14.15

**1974 BASELINE DOWNWASH

SO	BUILDHGT	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPCB	9.14	9.14	9.14	9.14	0.00	0.00
SO	BUILDHGT	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPCB	14.28	13.92	14.65	14.94	0.00	0.00
SO	BUILDWID	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPCB	0.00	0.00	0.00	0.00	0.00	0.00

SO	BUILDHGT	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPDB	0.00	0.00	0.00	0.00	0.00	0.00

SO	BUILDHGT	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	SAPAB	0.00	0.00	0.00	0.00	0.00	0.00

```
SO BUILDHGT SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPBB      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID SAPBB      0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT ADMPB     28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMPB     28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMPB     28.35    28.35    38.71    38.71    38.71    38.71
SO BUILDHGT ADMPB     28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMPB     28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDHGT ADMPB     28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDWID ADMPB     39.66    38.36    35.90    32.35    50.93    40.51
SO BUILDWID ADMPB     16.37    23.72    30.59    31.22    35.05    37.81
SO BUILDWID ADMPB     39.43    39.85    58.53    44.71    54.98    67.54
SO BUILDWID ADMPB     39.66    38.36    35.90    32.35    50.93    40.51
SO BUILDWID ADMPB     16.37    23.72    30.59    31.22    35.05    37.81
SO BUILDWID ADMPB     39.43    39.85    39.05    37.07    38.64    39.75

SO BUILDHGT ZDMPB     38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMPB     38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMPB     38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMPB     38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMPB     38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT ZDMPB     38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDWID ZDMPB     78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID ZDMPB     85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID ZDMPB     80.47    70.57    58.53    44.71    54.98    67.54
SO BUILDWID ZDMPB     78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID ZDMPB     85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID ZDMPB     80.47    70.57    58.53    44.71    54.98    67.54

SO BUILDHGT YDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT YDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDWID YDMGPB    78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID YDMGPB    85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID YDMGPB    80.47    70.57    58.53    44.71    54.98    67.54
SO BUILDWID YDMGPB    78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID YDMGPB    85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID YDMGPB    80.47    70.57    58.53    44.71    54.98    67.54

SO BUILDHGT XDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDHGT XDMGPB    38.71    38.71    38.71    38.71    38.71    38.71
SO BUILDWID XDMGPB    78.04    86.18    91.69    94.43    94.29    91.28
```

```
SO BUILDWID XDMGPB     85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID XDMGPB     80.47    70.57    58.53    44.71    54.98    67.54
SO BUILDWID XDMGPB     78.04    86.18    91.69    94.43    94.29    91.28
SO BUILDWID XDMGPB     85.51    90.00    93.76    94.67    92.71    87.92
SO BUILDWID XDMGPB     80.47    70.57    58.53    44.71    54.98    67.54


SO BUILDHGT RMMANB     28.35    18.29    18.29    18.29    18.29    20.42
SO BUILDHGT RMMANB     20.42    20.42    20.42    28.35    28.35    28.35
SO BUILDHGT RMMANB     28.35    28.35    38.71    38.71    38.71    28.35
SO BUILDHGT RMMANB     28.35    18.29    18.29    18.29    18.29    20.42
SO BUILDHGT RMMANB     18.29    18.29    18.29    28.35    28.35    28.35
SO BUILDHGT RMMANB     28.35    28.35    28.35    28.35    28.35    28.35
SO BUILDWID RMMANB     39.66   123.27   131.38   135.49   135.49   139.39
SO BUILDWID RMMANB    135.12   138.66   139.84    41.21    50.58    37.81
SO BUILDWID RMMANB     39.43    39.85    58.53    44.71    54.98    39.75
SO BUILDWID RMMANB     39.66   123.27   131.38   135.49   135.49   251.74
SO BUILDWID RMMANB    123.27   129.59   134.79    41.21    50.58    37.81
SO BUILDWID RMMANB     39.43    39.85    39.05    37.07    38.64    39.75


**SO2 INVENTORY SOURCES
**      LAKELAND ELECTRIC - MCINTOSH POWER PLANT
**      McIntosh Unit 3
SO LOCATION MCINT6  POINT   21000   -9800   0.0
**      CT UNIT 5
SO LOCATION MCINT28 POINT   21000   -9800   0.0

**     LAKELAND ELECTRIC - LARSEN POWER PLANT
**      Combined Cycle CT
SO LOCATION LARS8   POINT   20900   -13500  0.0

**     YUENGLING BREWING CO.
**      2 Natural gas boilers
SO LOCATION YNGBREW1        POINT   -26000  -12800  0.0

**     HILLSBOROUGH CTY. RESOURCE RECOVERY FAC.
**      MWC & Aux Burner #1
SO LOCATION HILLSRC1        POINT   -19800  -23300  0.0
**      MWC & Aux Burner #2
SO LOCATION HILLSRC2        POINT   -19800  -23300  0.0
**      MWC & Aux Burner #3
SO LOCATION HILLSRC3        POINT   -19800  -23300  0.0

**     AGRIFOS, L.L.C. - NICHOLS
**      Expanding Source
SO LOCATION AGRINK3 POINT   10700   -30700  0.0
**      Expanding Source
SO LOCATION AGRINK4 POINT   10700   -30700  0.0

**     IMC PHOSPHATES COMPANY - NICHOLS
**      SAP NO. 1 PSD
SO LOCATION AGRNK5  POINT   10400   -31800  0.0
**      Expanding Source
SO LOCATION AGRNK1  POINT   10400   -31800  0.0
**      Expanding Source
SO LOCATION AGRNK2  POINT   10400   -31800  0.0

**      AUBURNDALE POWER PARTNERS, LP
**      Combustion Turbine System(Phase II, Acid Rain Unit)
SO LOCATION AUBCT1  POINT   32800   -12700  0.0
**      Combustion Turbine System(Phase II, Acid Rain Unit)
SO LOCATION AUBCT2  POINT   32800   -12700  0.0
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**     CUTRALE CITRUS JUICES USA,INC
**       PEEL DRYER
SO LOCATION CUTR3    POINT   33600    -12300  0.0
**       COGEN #1
SO LOCATION CUTR8    POINT   33600    -12300  0.0
**       COGEN #2
SO LOCATION CUTR9    POINT   33600    -12300  0.0

**     CARGILL MULBERRY (FORMERLY MULBERRY PHOSPHATES, INC.)
**       SAP 2
SO LOCATION MULPHS2 POINT   18800    -30900  0.0
**       MAP/DAP PLANT (expanding source)
SO LOCATION MULPHS5 POINT   18800    -30900  0.0
**       Expanding Source
SO LOCATION MULPHSX POINT   18800    -30900  0.0

**     CITY OF TAMPA, MCKAY BAY
**       MWC & Aux Burner No. 1
SO LOCATION MCKY103 POINT   -27800  -23790  0.0
**       MWC & Aux Burner No. 2
SO LOCATION MCKY104 POINT   -27800  -23790  0.0
**       MWC & Aux Burner No. 3
SO LOCATION MCKY105 POINT   -27800  -23790  0.0
**       MWC & Aux Burner No. 4
SO LOCATION MCKY106 POINT   -27800  -23790  0.0

**     CARGILL FERTILIZER - BARTOW
**       NO.3 FERTILIZER PLANT
SO LOCATION CARBAR1 POINT   21800    -29400  0.0
**       No. 4 SAP
SO LOCATION CARBAR12 POINT   21800    -29400  0.0
**       No. 6 SAP
SO LOCATION CARBAR32 POINT   21800    -29400  0.0
**       No. 5 SAP
SO LOCATION CARBAR33 POINT   21800    -29400  0.0
**       Boiler
SO LOCATION CARBAR51 POINT   21800    -29400  0.0

**     IMC PHOSPHATES COMPANY - NEW WALES
**       Expanding Source
SO LOCATION IMCWAL0 POINT   8700     -36600  0.0
**       Expanding Source
SO LOCATION IMCWAL1 POINT   8700     -36600  0.0

**       CF INDUSTRIES, INC. - BARTOW
**       SAP NO.6
SO LOCATION CFIBAR6 POINT   20300    -33500  0.0
**       Expanding Source
SO LOCATION CFIBARX1 POINT   20300    -33500  0.0
**       Expanding Source
SO LOCATION CFIBARX2 POINT   20300    -33500  0.0
**       Expanding Source
SO LOCATION CFIBARX3 POINT   20300    -33500  0.0
**       Expanding Source
SO LOCATION CFIBARX4 POINT   20300    -33500  0.0
**       Expanding Source
SO LOCATION CFIBARX5 POINT   20300    -33500  0.0
**       Expanding Source
SO LOCATION CFIBARX6 POINT   20300    -33500  0.0

**     CARGILL FERTILIZER, INC.--RIVERVIEW
**       MOLTEN SULFUR PITS 7, 8, AND 9
SO LOCATION CRPITS   POINT   -25100  -33500  0.0
**       MOLTEN SULFUR TANKS 1, 2, AND 3/TRUCK LOADING
SO LOCATION CRTKTL   POINT   -25100  -33500  0.0
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**      NO. 7 SULFURIC ACID PLANT
SO LOCATION CR7SAP  POINT   -25100  -33500  0.0
**      NO. 8 SULFURIC ACID PLANT
SO LOCATION CR8SAP  POINT   -25100  -33500  0.0
**      NO. 9 SULFURIC ACID PLANT
SO LOCATION CR9SAP  POINT   -25100  -33500  0.0
**      NO. 5 ROCK MILL
SO LOCATION CR5RKML POINT   -25100  -33500  0.0
**      NO. 7 ROCK MILL
SO LOCATION CR7RKML POINT   -25100  -33500  0.0
**      NO. 9 ROCK MILL
SO LOCATION CR9RKML POINT   -25100  -33500  0.0
**      NO. 6 GRANULATION PLANT DRYER STACK
SO LOCATION CR6GRAN POINT   -25100  -33500  0.0
**      AFI PLANT NO. 1
SO LOCATION CRAFI1  POINT   -25100  -33500  0.0
**      AFI PLANT NO. 2
SO LOCATION CRAFI2  POINT   -25100  -33500  0.0
**      NO. 5 GRANULATION PLANT-DRYER/COOLER STACK
SO LOCATION CR5GRAN POINT   -25100  -33500  0.0
**      NOS. 3 AND 4 MAP PLANTS, SOUTH COOLER
SO LOCATION CR34MAP POINT   -25100  -33500  0.0
**      Ammonia Plant (Expanding Source)
SO LOCATION AMMPLTB POINT   -25100  -33500  0.0
**      Sodium Silicofluoride/Sodium Fluoride Plant (Expanding Source)
SO LOCATION SSFSFPB POINT   -25100  -33500  0.0
**      No. 10 KVS Mill (Expanding Source)
SO LOCATION 10KVSMB POINT   -25100  -33500  0.0
**      No. 12 KVS Mill (Expanding Source)
SO LOCATION 12KVSMB POINT   -25100  -33500  0.0
**      No. 7 Oil-Fired Concentrator (Expanding Source)
SO LOCATION 7OFCONB POINT   -25100  -33500  0.0
**      No. 8 Oil-Fired Concentrator (Expanding Source)
SO LOCATION 8OFCONB POINT   -25100  -33500  0.0
**      GTSP Plant (Expanding Source)
SO LOCATION GTSPAPB POINT   -25100  -33500  0.0
**      No. 5 and No. 9 Mills Bag Filter (Expanding Source)
SO LOCATION RKML59B POINT   -25100  -33500  0.0
**      No. 3 Continuous Triple Dryer (Expanding Source)
SO LOCATION 3CONTDB POINT   -25100  -33500  0.0
**      No. 4 Continuous Triple Dryer (Expanding Source)
SO LOCATION 4CONTDB POINT   -25100  -33500  0.0
**      Molten Sulfur Handling- Pits 7 & 8 (Expanding Source)
SO LOCATION MSPTSB  POINT   -25100  -33500  0.0
**      Molten Sulfur Handling- Pits 4,5, & 6 (Expanding Source)
SO LOCATION PTS456B POINT   -25100  -33500  0.0
**      Molten Sulfur Handling- Tanks (Expanding Source)
SO LOCATION MSTKTLB POINT   -25100  -33500  0.0
**      No. 4 Sulfuric Acid Plant (Expanding Source)
SO LOCATION NO4SAPB POINT   -25100  -33500  0.0
**      No. 5 Sulfuric Acid Plant (Expanding Source)
SO LOCATION NO5SAPB POINT   -25100  -33500  0.0
**      No. 6 Sulfuric Acid Plant (Expanding Source)
SO LOCATION NO6SAPB POINT   -25100  -33500  0.0
**      No. 7 Sulfuric Acid Plant (Expanding Source)
SO LOCATION NO7SAPB POINT   -25100  -33500  0.0
**      No. 8 Sulfuric Acid Plant (Expanding Source)
SO LOCATION NO8SAPB POINT   -25100  -33500  0.0

**    CARGILL FERTILIZER, INC. - GREEN BAY (FORMERLY FARMLAND HYDRO, L.P.)
**      SAP #4
SO LOCATION FARM4   POINT   21500   -35900  0.0
**      SAP #5
SO LOCATION FARM5   POINT   21500   -35900  0.0
**      South AP Plant--Stack A
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SO LOCATION FARM7   POINT   21500   -35900  0.0
**      NORTH MAP/DAP PLANT--MAIN STACK
SO LOCATION FARM29  POINT   21500   -35900  0.0
**      MOLTEN SULFUR PIT
SO LOCATION FARM34  POINT   21500   -35900  0.0
**      No. 6 SAP
SO LOCATION FARM38  POINT   21500   -35900  0.0
**      SAP # 1 (Expanding Source)
SO LOCATION FRMSAP1 POINT   21500   -35900  0.0
**      SAP # 2 (Expanding Source)
SO LOCATION FRMSAP2 POINT   21500   -35900  0.0
**      SAP # 3 (Expanding Source)
SO LOCATION FRMSAP3 POINT   21500   -35900  0.0

**     TECO - BIG BEND
**      UNIT #4 BOILER W/ESP
SO LOCATION TECOBB4 POINT   -26100  -41000  0.0
**      Steam Generators 1 & 2 Baseline
SO LOCATION TCBB12B POINT   -26100  -41000  0.0
**      Steam Generator 3 Baseline
SO LOCATION TCBB3B  POINT   -26100  -41000  0.0

**     IMC-AGRICO CO.- SOUTH PIERCE
**      SAP No. 10
SO LOCATION IMCSPR4 POINT   19500   -44600  0.0
**      SAP No. 11
SO LOCATION IMCSPR5 POINT   19500   -44600  0.0
**      Combined Expanding Sources
SO LOCATION IMCPIER6        POINT   19500   -44600  0.0

**     TECO - POLK POWER STATION
**      Combined cycle CT
SO LOCATION TECOPK1 POINT   14450   -48650  0.0
**      120 MMBtu/HR AuxBlr
SO LOCATION TECOPK3 POINT   14450   -48650  0.0
**      Sulfuric Acid Plant
SO LOCATION TECOPK4 POINT   14450   -48650  0.0
**      Simple Cycle CT
SO LOCATION TECOPK9 POINT   14450   -48650  0.0
**      Simple Cycle CT
SO LOCATION TECOPK10        POINT   14450   -48650  0.0

**     FLORIDA CRUSHED STONE CO., INC.
**      POWER PLANT
SO LOCATION FLCRSH18        POINT   -28000  46500   0.0
**      BCP: Kiln, Clinker Cooler, Raw Mill, & Dryer with Baghouse
SO LOCATION FLCRSH20        POINT   -28000  46500   0.0
**      KILN #2 SYSTEM: preheater/precalciner, cooler,dyer,raw mill
SO LOCATION FLCRSH26        POINT   -28000  46500   0.0

**     U.S. AGRI-CHEMICALS - FT. MEADE
**      SAP #1
SO LOCATION USAGFM16        POINT   28000   -47000  0.0
**      SAP #2
SO LOCATION USAGFM17        POINT   28000   -47000  0.0
**      MOLTEN SULFUR TANK
SO LOCATION USAGFM28        POINT   28000   -47000  0.0
**      MOLTEN SULFUR TANK
SO LOCATION USAGFM29        POINT   28000   -47000  0.0
**      Expanding Source
SO LOCATION USAGFM0 POINT   28000   -47000  0.0
**      Expanding Source
SO LOCATION USAGFM1 POINT   28000   -47000  0.0

**     HARDEE POWER PARTNERS, LTD
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**      CT 1A W\HRSG
SO LOCATION HARDE1  POINT   16800    -58600  0.0
**      CT 2A W\HRSG
SO LOCATION HARDE2  POINT   16800    -58600  0.0
**      Simple cycle CT 2A
SO LOCATION HARDE3  POINT   16800    -58600  0.0
**      Unit 2B - 75 MW gas turbine
SO LOCATION HARDE5  POINT   16800    -58600  0.0

**     PINELLAS CO. RESOURCE RECOVERY FACILITY
**      Waste Combustor & Aux burners-Unit #1
SO LOCATION PINRCY1 POINT   -52800  -31900  0.0
**      Waste Combustor & Aux burners-Unit #2
SO LOCATION PINRCY3 POINT   -52800  -31900  0.0

**      PINEY POINT PHOSPHATES, INC.
**      SAP 1
SO LOCATION PINPT1  POINT   -38350  -58660  0.0
**      BOILER
SO LOCATION PINPT11 POINT   -38350  -58660  0.0


**              24-hr Q H       T       V       D
**      SRCID   (g/s)   (m)     (K)     (m/s)   (m)

**      LAKELAND ELECTRIC - MCINTOSH POWER PLANT
SO SRCPARAM MCINT6  550.37  76.2    348     25.18   5.49
SO SRCPARAM MCINT28 15.96   25.9    864     25.21   8.53

**     LAKELAND ELECTRIC - LARSEN POWER PLANT
SO SRCPARAM LARS8   26.64   47.2    523     26.12   4.88

**     YUENGLING BREWING CO.
SO SRCPARAM YNGBREW1        1.13    27.4    408     2.13    1.98

**     HILLSBOROUGH CTY. RESOURCE RECOVERY FAC.
SO SRCPARAM HILLSRC1        7.39    67.1    416     22.10   1.55
SO SRCPARAM HILLSRC2        7.39    67.1    416     22.10   1.55
SO SRCPARAM HILLSRC3        7.39    67.1    416     22.10   1.55

**     AGRIFOS, L.L.C. - NICHOLS
SO SRCPARAM AGRINK3 -13.90  28.4    340     19.23   1.10
SO SRCPARAM AGRINK4 -0.87   4.0     522     1.80    0.79

**     IMC PHOSPHATES COMPANY - NICHOLS
SO SRCPARAM AGRNK5  52.52   45.7    350     10.06   2.29
SO SRCPARAM AGRNK1  -15.25  30.5    308     18.90   1.80
SO SRCPARAM AGRNK2  -3.81   24.4    339     12.89   1.52

**     AUBURNDALE POWER PARTNERS, LP
SO SRCPARAM AUBCT1  5.04    48.8    368     16.76   5.49
SO SRCPARAM AUBCT2  8.82    48.8    368     16.76   5.49

**     CUTRALE CITRUS JUICES USA,INC
SO SRCPARAM CUTR3   23.44   30.5    345     14.94   0.98
SO SRCPARAM CUTR8   21.52   12.2    435     18.29   1.22
SO SRCPARAM CUTR9   3.28    12.2    439     20.12   1.22

**     CARGILL MULBERRY (FORMERLY MULBERRY PHOSPHATES, INC.)
SO SRCPARAM MULPHS2 35.70   61.0    366     9.75    2.13
SO SRCPARAM MULPHS5 -9.30   31.1    316     7.92    2.68
SO SRCPARAM MULPHSX -257.59 51.2    356     11.43   2.13

**     CITY OF TAMPA, MCKAY BAY
SO SRCPARAM MCKY103 5.15    61.3    416     22.34   1.28
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SO SRCPARAM MCKY104 5.15    61.3     416      22.34    1.28
SO SRCPARAM MCKY105 5.15    61.3     416      22.34    1.28
SO SRCPARAM MCKY106 5.15    61.3     416      22.34    1.28

**      CARGILL FERTILIZER - BARTOW
SO SRCPARAM CARBAR1 9.69    43.0     344      24.06    2.29
SO SRCPARAM CARBAR12        54.60    61.0     355      18.59    2.07
SO SRCPARAM CARBAR32        54.60    61.0     355      18.59    2.07
SO SRCPARAM CARBAR33        54.60    61.0     355      18.59    2.07
SO SRCPARAM CARBAR51        20.81    9.4      483      6.10     1.07

**      IMC PHOSPHATES COMPANY - NEW WALES
SO SRCPARAM IMCWAL0 -34.27  21.0     347      18.59    2.13
SO SRCPARAM IMCWAL1 -146.00 61.0     350      13.08    2.59

**      CF INDUSTRIES, INC. - BARTOW
SO SRCPARAM CFIBAR6 50.40   62.8     333      6.40     2.13
SO SRCPARAM CFIBARX1        -60.90   30.5     350      12.19    1.37
SO SRCPARAM CFIBARX2        -110.25  30.5     350      10.36    1.68
SO SRCPARAM CFIBARX3        -107.10  30.5     364      4.27     2.74
SO SRCPARAM CFIBARX4        -174.83  30.5     358      7.92     2.13
SO SRCPARAM CFIBARX5        -226.80  62.8     358      10.67    2.13
SO SRCPARAM CFIBARX6        -170.10  62.8     359      10.36    2.13

**      CARGILL FERTILIZER, INC.--RIVERVIEW
SO SRCPARAM CRPITS  0.02    0.0      409      37.93    0.00
SO SRCPARAM CRTKTL  0.42    0.0      409      37.93    0.00
SO SRCPARAM CR7SAP  58.80   0.0      409      37.93    0.00
SO SRCPARAM CR8SAP  49.61   0.0      409      37.93    0.00
SO SRCPARAM CR9SAP  62.47   0.0      409      37.93    0.00
SO SRCPARAM CR5RKML 0.83    0.0      409      37.93    0.00
SO SRCPARAM CR7RKML 0.83    0.0      409      37.93    0.00
SO SRCPARAM CR9RKML 0.83    0.0      409      37.93    0.00
SO SRCPARAM CR6GRAN 5.11    0.0      409      37.93    0.00
SO SRCPARAM CRAFI1  3.20    0.0      409      37.93    0.00
SO SRCPARAM CRAFI2  4.79    0.0      409      37.93    0.00
SO SRCPARAM CR5GRAN 1.59    0.0      409      37.93    0.00
SO SRCPARAM CR34MAP 0.00    0.0      409      37.93    0.00
SO SRCPARAM AMMPLTB -4.13   0.0      409      37.93    0.00
SO SRCPARAM SSFSFPB -0.03   0.0      409      37.93    0.00
SO SRCPARAM 10KVSMB 0.00    0.0      409      37.93    0.00
SO SRCPARAM 12KVSMB -0.01   0.0      409      37.93    0.00
SO SRCPARAM 7OFCONB -5.22   0.0      409      37.93    0.00
SO SRCPARAM 8OFCONB -5.00   0.0      409      37.93    0.00
SO SRCPARAM GTSPAPB -9.00   0.0      409      37.93    0.00
SO SRCPARAM RKML59B 0.00    0.0      409      37.93    0.00
SO SRCPARAM 3CONTDB -2.87   0.0      409      37.93    0.00
SO SRCPARAM 4CONTDB -2.92   0.0      409      37.93    0.00
SO SRCPARAM MSPTSB  -0.01   0.0      409      37.93    0.00
SO SRCPARAM PTS456B -0.02   0.0      409      37.93    0.00
SO SRCPARAM MSTKTLB -0.27   0.0      409      37.93    0.00
SO SRCPARAM NO4SAPB -35.53  0.0      409      37.93    0.00
SO SRCPARAM NO5SAPB -60.48  0.0      409      37.93    0.00
SO SRCPARAM NO6SAPB -86.69  0.0      409      37.93    0.00
SO SRCPARAM NO7SAPB -189.38 0.0      409      37.93    0.00
SO SRCPARAM NO8SAPB -211.55 0.0      409      37.93    0.00

**      CARGILL FERTILIZER, INC. - GREEN BAY (FORMERLY FARMLAND HYDRO, L.P.)
SO SRCPARAM FARM4   44.10   30.5     355      12.07    2.29
SO SRCPARAM FARM5   58.80   45.7     355      13.44    2.44
SO SRCPARAM FARM7   0.40    39.5     309      15.16    2.44
SO SRCPARAM FARM29  0.33    39.0     318      15.50    2.44
SO SRCPARAM FARM34  0.09    3.0      366      16.46    0.24
SO SRCPARAM FARM38  50.53   45.7     355      10.61    2.74
SO SRCPARAM FRMSAP1 -62.10  30.5     349      5.77     2.13
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SO SRCPARAM FRMSAP2 -67.13  30.5    350     5.74    2.13
SO SRCPARAM FRMSAP3 -82.23  30.5    345     9.24    2.29

**    TECO - BIG BEND
SO SRCPARAM TECOBB4 450.58  149.4   326     23.87   7.32
SO SRCPARAM TCBB12B -2436.00        149.4   422     28.65   7.32
SO SRCPARAM TCBB3B  -1218.00        149.4   418     14.33   7.32

**    IMC-AGRICO CO.- SOUTH PIERCE
SO SRCPARAM IMCSPR4 56.70   43.9    350     12.53   2.74
SO SRCPARAM IMCSPR5 56.70   43.9    350     12.53   2.74
SO SRCPARAM IMCPIER6        -75.60  43.9    350     26.40   1.58

**    TECO - POLK POWER STATION
SO SRCPARAM TECOPK1 65.27   45.7    444     23.10   5.79
SO SRCPARAM TECOPK3 12.10   22.9    464     15.23   1.13
SO SRCPARAM TECOPK4 4.49    60.7    355     18.29   0.76
SO SRCPARAM TECOPK9 1.16    34.7    876     18.35   8.84
SO SRCPARAM TECOPK10        1.16    34.7    876     18.35   8.84

**    FLORIDA CRUSHED STONE CO., INC.
SO SRCPARAM FLCRSH18        97.02   97.5    422     21.21   4.88
SO SRCPARAM FLCRSH20        6.30    91.4    378     14.33   4.88
SO SRCPARAM FLCRSH26        3.02    97.5    399     10.30   4.27

**    U.S. AGRI-CHEMICALS - FT. MEADE
SO SRCPARAM USAGFM16        63.00   53.3    355     9.75    2.59
SO SRCPARAM USAGFM17        63.00   53.3    355     9.75    2.59
SO SRCPARAM USAGFM28        0.06    1.8     405     104.85  0.09
SO SRCPARAM USAGFM29        0.03    1.8     400     47.85   0.09
SO SRCPARAM USAGFM0 -78.80  28.96   314     6.92    3.02
SO SRCPARAM USAGFM1 -18.27  28.35   330     17.59   1.52

**    HARDEE POWER PARTNERS, LTD
SO SRCPARAM HARDE1  92.53   27.4    386     23.62   4.42
SO SRCPARAM HARDE2  92.53   27.4    391     23.10   4.42
SO SRCPARAM HARDE3  92.53   22.9    803     28.74   5.46
SO SRCPARAM HARDE5  0.67    25.9    810     43.28   4.51

**    PINELLAS CO. RESOURCE RECOVERY FACILITY
SO SRCPARAM PINRCY1 21.42   49.1    505     26.82   2.38
SO SRCPARAM PINRCY3 66.15   50.3    505     27.43   2.74

**     PINEY POINT PHOSPHATES, INC.
SO SRCPARAM PINPT1  -36.75  61.0    337     10.21   2.38
SO SRCPARAM PINPT11 -1.21   9.1     561     7.68    1.22


   SRCGROUP ALL
SO FINISHED
**
*****************************************
** ISCST3 Receptor Pathway
*****************************************
**
**
RE STARTING
** Restricted Property Line Receptors, 50 m spacing
   DISCCART 18.20 585.20
   DISCCART -182.90 585.20
   .
   .
   .
   .
   .
```

```
   DISCCART -5000.00 4000.00
   DISCCART -5000.00 4500.00
   DISCCART -5000.00 5000.00
RE FINISHED
***************************************
** ISCST3 Meteorology Pathway
***************************************
**
**
ME STARTING
   INPUTFIL C:\MET\tpatpa91.met
   ANEMHGHT 22 FEET
   SURFDATA 12842 1991 TAMPA/INT'L_ARPT
   UAIRDATA 12842 1991 TAMPA/INT'L_ARPT
ME FINISHED
**
***************************************
** ISCST3 Output Pathway
***************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST SECOND
OU FINISHED
```

ISCST3 OUTPUT SUMMARY
AAQS ANALYSIS
24-HOUR AVERAGE SO_2 IMPACTS

ISCBOB3R RELEASE 00285

ISCST3 OUTPUT FILE NUMBER 1 :SO2AQ24.091
ISCST3 OUTPUT FILE NUMBER 2 :SO2AQ24.092
ISCST3 OUTPUT FILE NUMBER 3 :SO2AQ24.093
ISCST3 OUTPUT FILE NUMBER 4 :SO2AQ24.094
ISCST3 OUTPUT FILE NUMBER 5 :SO2AQ24.095
First title for last output file is: 1991 CF Industries, AAQS Screening Analysis, SO2, 3/16/05
Second title for last output file is: 24-Hour Emissions, TAMPA MET DATA 1991-1995

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: ALL					
HIGH 24-Hour					
	1991	269.971	-1512.9	-204.3	91020324
	1992	252.090	-1109.5	573.0	92092624
	1993	250.030	-1355.0	-1127.4	93031924
	1994	214.292	-475.5	573.0	94070824
	1995	225.557	-1060.7	573.0	95011324
HSH 24-Hour					
	1991	219.360	-1011.9	573.0	91071624
	1992	202.608	-1060.7	573.0	92041924
	1993	211.606	-378.0	573.0	93080624
	1994	189.652	-1330.0	-1273.2	94111524
	1995	209.216	-1000.0	600.0	95072724

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCST3 OUTPUT SUMMARY
AAQS ANALYSIS
ANNUAL AVERAGE SO_2 IMPACTS

ISCST3 OUTPUT FILE NUMBER 1 :SO2AQAN.091
ISCST3 OUTPUT FILE NUMBER 2 :SO2AQAN.092
ISCST3 OUTPUT FILE NUMBER 3 :SO2AQAN.093
ISCST3 OUTPUT FILE NUMBER 4 :SO2AQAN.094
ISCST3 OUTPUT FILE NUMBER 5 :SO2AQAN.095
First title for last output file is: 1991 CF Industries, AAQS Screening Analysis, SO2, 3/16/05
Second title for last output file is: Annual Emissions, TAMPA MET DATA 1991-1995

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: ALL					
Annual					
	1991	45.252	-1438.1	-641.6	91123124
	1992	41.588	-1413.2	-787.3	92123124
	1993	39.179	-1404.8	-835.9	93123124
	1994	41.263	-1404.8	-835.9	94123124
	1995	37.934	-1413.2	-787.3	95123124

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCST3 OUTPUT SUMMARY
PSD CLASS II INCREMENT ANALYSIS
24-HOUR AVERAGE SO_2 IMPACTS

ISCBOB3R RELEASE 00285

ISCST3 OUTPUT FILE NUMBER 1 :SO2PSD24.O91
ISCST3 OUTPUT FILE NUMBER 2 :SO2PSD24.O92
ISCST3 OUTPUT FILE NUMBER 3 :SO2PSD24.O93
ISCST3 OUTPUT FILE NUMBER 4 :SO2PSD24.O94
ISCST3 OUTPUT FILE NUMBER 5 :SO2PSD24.O95
First title for last output file is: 1991 CF Ind., PSD Class II Increment Screening Analysis, SO2, 3/16/05
Second title for last output file is: 24-Hour Emissions, TAMPA MET DATA 1991-1995

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	ALL				
HIGH 24-Hour					
	1991	27.420	-914.4	573.0	91021824
	1992	33.393	-865.6	573.0	92082024
	1993	22.357	5000.0	-5000.0	93050224
	1994	18.267	5000.0	-500.0	94070224
	1995	26.944	-1060.7	573.0	95090924
HSH 24-Hour					
	1991	26.148	-865.6	573.0	91070724
	1992	20.352	-865.6	573.0	92081824
	1993	19.946	3500.0	-4000.0	93050224
	1994	15.714	5000.0	-4500.0	94041024
	1995	16.725	5000.0	-3000.0	95011324

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCST3 OUTPUT SUMMARY
PSD CLASS II INCREMENT ANALYSIS
ANNUAL AVERAGE SO_2 IMPACTS

ISCBOB3R RELEASE 00285

ISCST3 OUTPUT FILE NUMBER 1 :SO2PSDAN.O91
ISCST3 OUTPUT FILE NUMBER 2 :SO2PSDAN.O92
ISCST3 OUTPUT FILE NUMBER 3 :SO2PSDAN.O93
ISCST3 OUTPUT FILE NUMBER 4 :SO2PSDAN.O94
ISCST3 OUTPUT FILE NUMBER 5 :SO2PSDAN.O95
First title for last output file is: 1991 CF Ind., PSD Class II Increment Screening Analysis, SO2, 3/16/05
Second title for last output file is: Annual Emissions, TAMPA MET DATA 1991-1995

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: ALL					
Annual					
	1991	0.000	0.	0.	91123124
	1992	0.000	0.	0.	92123124
	1993	0.000	0.	0.	93123124
	1994	0.000	0.	0.	94123124
	1995	0.000	0.	0.	95123124

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00