P.O Drawer L.
Plant City, Florida 33564-9007
Telephone: 813/782-1591

CF Industries, Inc.
Plant City Phosphate Complex

February 19, 2004

Mr. Syed Arif
Bureau of Air Regulation,
Division of Air Resource Management
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: CF Industries, Inc., PSD Permit Application,
Modifications to "C" and "D" Sulfuric Acid Plants

Dear Mr. Arif:

CF Industries, Inc., submitted a PSD permit application to the Bureau of Air Regulation on January 19, 2004. The application requests authorization to modify the "C" and "D" Sulfuric Acid Plants at the Plant City Phosphate Complex for the purpose of increasing the permitted production rates of the two plants from 2,600 tons of sulfuric acid per day to 2,750 tons per day.

As stated in the PSD Report in the BACT analysis, Part B of the application, page 5-6, the economic analysis of emission limits lower than the proposed limit was to be submitted in the near future. That analysis has now been completed and is enclosed for your review. The Owner/Authorized Representative Statement and Professional Engineer Certification for this submittal are also enclosed.

Please feel free to address any questions to Tom Edwards (863-364-5608), Bob May (863-364-5603) or David Buff, P.E. (352-336-5600, extension 545).

Sincerely,

Herschel E. Morris

Herschel E. Morris
Vice President Phosphate Operations and
General Manager

cc: Gerald Kissel, Southwest District
Jerry Campbell, HCEPC
J.S. Alves, HGS

Owner/Authorized Representative Statement
Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   Herschel E. 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 E. Morris — Signature

   2/19/04 — 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: **32653-1500**
3. Professional Engineer Telephone Numbers...
   Telephone: **(352) 336 - 5600** ext. 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

2/18/04
Date

(seal)

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

PSD Application for the "C" and "D" Sulfuric Acid Plants
CF Industries, Inc.,
Plant City Phosphate Complex, Plant City, Florida

Economic Analysis for Best Available Control Technology Determination

The BACT Analysis provided with the permit application on January 19, 2004, included a review of the most recent BACT determinations from the EPA RACT/BACT/LAER Clearinghouse, and of alternative pollution control technologies. The review concluded that BACT consists of the double absorption process with the addition of cesium catalyst in the fourth pass of the converter. This technology allows operation of the plants at the proposed 24-hour SO_2 emission limit of 3.5 lbs. SO_2 per ton H_2SO_4 and a 3-hour limit of 3.85 lb/ton.

An analysis of the economic feasibility of emission rates lower than 3.5 lb/ton has been completed, based upon modeled data provided by the Monsanto Company. Two approaches were used to calculate the cost of a reduction of the emission limit from the proposed 3.5 lb SO_2/ton H_2SO_4 to 3.25 lb/ton and 3.00 lb/ton.

The first approach shown in Table 1, uses the Monsanto reduction in production rate necessary to meet the lower limits, and calculates the incremental cost of lost DAP product and lost co-generated power. The annual incremental difference in SO_2 emissions is divided by the value of the annual production losses to arrive at an incremental cost per ton of SO_2 emissions.

The second approach, shown in Table 2, uses the same reduced production calculation, but compares the cost of sulfuric acid purchased to make up the loss in sulfuric acid production with the cost of producing the sulfuric acid on-site. CF believes this is not an economically viable alternative due to the limited availability of sulfuric acid. Changes in metallurgical industry processes, the development of foreign phosphate industry, and transportation restraints have combined to significantly reduce economically priced sulfuric acid.

The results show that the cost per ton of reduced SO2 emission exceeds $11,500 at the 3.25 lb/ton limit, and $12,800 at the 3.00 lb/ton limit.

Table 1

CF Plant City Phosphate Complex Proposed Rate Increase Economic Analysis For SO_2 BACT Determination

Comparison Based on Incremental DAP Production

	Basis	Case 1	Case 2
Nominal Average Annual Production Rate (TPD 100% H_2SO_4)	2,600	2,500	2,375
Emission Rate (Lb SO_2/Ton H_2SO_4)	3.50	3.25	3.00
Annual Change in Production (TPY 100% H_2SO_4)*		(34,675)	(78,019)
Annual Change in SO_2 Emissions (TPY SO_2)*		(169)	(342)
Net Cost Incremental DAP Production** ($/Yr)		($1,726,553)	($3,884,745)
Cost of Lost Power Production** ($/Yr)		($254,515)	($572,658)
Total Cost ($/Year)		($1,981,068)	($4,457,403)
Cost To Reduce SO_2 Emissions ($/Ton SO_2)		**$11,719**	**$13,018**

Note: Single plant economics using Monsanto modeling memo date 1/14/04.

*Note: Assumes 95% operating factor.

**Note: Uses January 2004 incremental cost basis.

Table 2

CF Plant City Phosphate Complex Proposed Rate Increase Economic Analysis For SO_2 BACT Determination

Comparison Based on Purchased VS Produced Sulfuric Acid

	Basis	Case 1	Case 2
Nominal Average Annual Production Rate (TPD 100% H_2SO_4)	2,600	2,500	2,375
Emission Rate (Lb SO_2/Ton H_2SO_4)	3.50	3.25	3.00
Annual Change in Production (TPY 100% H_2SO_4)*		(34,675)	(78,019)
Annual Change in SO_2 Emissions (TPY SO_2)*		(169)	(342)
Net Cost Purchased VS Produced H_2SO_4** ($/Yr)		($1,694,914)	($3,813,557)
Cost of Lost Power Production** ($/Yr)		($254,515)	($572,658)
Total Cost ($/Year)		($1,949,429)	($4,386,214)
Cost To Reduce SO_2 Emissions ($/Ton SO_2)		**$11,532**	**$12,810**

Note: Single plant economics using Monsanto modeling memo date 1/14/04.

*Note: Assumes 95% operating factor.

**Note: Uses incremental production cost and delivered industrial rate sulfuric acid cost for January 2004.

ENVIRO-CHEM SYSTEMS

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January 14, 2004

Mr. Randy Charlot
CF Industries, Inc.
P.O. Drawer "L"
Plant City, FL 33565

Subject: C or D Plant SO2 Emissions

Dear Randy:

Using the catalyst loadings as noted below, the following SO2 emissions can be obtained by varying the C or D plant rate:

EMISSIONS	PLANT RATE
4.0 #/ton	2700 STPD
3.5 #/ton	2600 STPD
3.25 #/ton	2500 STPD
3.0 #/ton	2375 STPD

The calculations above are just for the converter/catalyst system and assume the rest of the plant can deliver/handle the various production rates. The following catalyst loadings were used in the simulation:

Pass 1: 70K liters and 85% activity
Pass 2: 78K liters and 85% activity
Pass 3: 94.4K liters and 90% activity
Pass 4: 158.8K liters new SCX-2000 super cesium catalyst

Please let me know if you need any additional information.

Sincerely,

John R. Horne

/jd

APPENDIX 5

COST ANALYSIS OF AMMONIA SCRUBBERS

Table 1. Cost Effectiveness of Ammonia Scrubbing FGD for SO_2 and H_2SO_4 Control on C & D Sulfuric Acid Plants, CF Industries, Plant City

	Cost Items	Cost Factors[a]	Cost for C & D SAPs ($)
DIRECT CAPITAL COSTS (DCC):			
	Purchased Equipment Cost (PEC)		
A)	Absorber + packing + auxiliary equipment	Based on A & B SAPs: 100,000 SCFM [b]	16,000,000
B)	New blower	100,000 SCFM providing 30"	500,000
C)	Mist eliminator	~50 candles	600,000
D)	Instrumentation	10% of B + C	110,000
E)	Taxes	Florida sales tax, 6% of B + C	66,000
F)	Freight	5% of B + C	55,000
	Total PEC:		17,331,000
	Direct Installation		
	Items Excluded From Vendor Quote:		
	Ductwork for blower	200 ft @ $500/ft	100,000
	Liquid waste piping	100 ft @ $300/ft	30,000
	Foundations	12% of PEC (A & B SAPs did not require foundations)	2,079,720
	Water/air/electrical supply & piping	10% of B+C+D+E+F	133,100
	Thermal insulation and lagging	lump	75,000
	Total Direct Installation:		2,417,820
Total DCC (PEC + Direct Installation):			19,748,820
INDIRECT CAPITAL COSTS (ICC):			
	Engineering	2% of PEC for B-F (for items not in vendor quote)	26,620
	Construction and field expenses	5% of PEC for B-F (for items not in vendor quote)	66,550
	Contractor Fees	5% of PEC for B-F (for items not in vendor quote)	66,550
	Startup	1% of PEC for B-F	13,310
	Performance test	1% of PEC for B-F	13,310
	Contingencies	25% of PEC (for retrofit installation)	4,332,750
Total DCC:			4,519,090
TOTAL CAPITAL INVESTMENT (TCI):		DCC + ICC	24,267,910
DIRECT OPERATING COSTS (DOC):			
(1)	Operating Labor		
	Operator	0.5 hr/shift, $16/hr, 8760 hrs/yr	8,760
	Supervisor	15% of operator cost	1,314
(2)	Maintenance		
	Labor	0.5 hr/shift, $16/hr, 8760 hrs/yr	8,760
	Materials	100% of maintenance labor	8,760
(3)	Operating Materials		
	Ammonia	1 gal/min; $215/ton	272,421
(4)	Electricity	800 KW, $0.03/KW-hr	210,240
(5)	Liquid Waste Disposal	Not acccounted for	0
Total DOC:			510,255
INDIRECT OPERATING COSTS (IOC):			
	Overhead	60% of total labor & materials costs	180,009
	Property Taxes	1% of total capital investment	242,679
	Insurance	1% of total capital investment	242,679
	Administration	2% of total capital investment	485,358
Total IOC:			1,150,725
CAPITAL RECOVERY COSTS (CRC):		CRF of 0.0944 times TCI (20 yrs @ 7%)	2,290,891
ANNUALIZED COSTS (AC):		DOC + IOC + CRC	3,951,871

Footnotes:

[a] Unless otherwise specified, factors and cost estimates reflect OAQPS Cost Manual, Section 5, Fifth edition.

[b] Based on actual costs of ammonia scrubbers on A & B SAPs ($1.8 million each), adjusted for higher gas flow rate and 2004 dollars.