

Is your RETURN ADDRESS completed on the reverse side?

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
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- 1.  Addressee's Address
- 2.  Restricted Delivery

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3. Article Addressed to:  
 Robert Stewart, S. V.P.  
 Piney Point Phosphates  
 13300 US Hwy 41 North  
 Palmetto, FL 34221

4a. Article Number  
 P 265 659 278

4b. Service Type  
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6. Signature: (Addressee or Agent)  
 X *Susan L. Jack*

PS Form 3811, December 1994

Domestic Return Receipt

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P 265 659 278

US Postal Service  
**Receipt for Certified Mail**  
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Post Office, State, & ZIP Code	<i>Palmetto, FL</i>
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	<i>1-9-98</i>
<i>0810002-004-AC</i> <i>PSO-FL-242</i>	

PS Form 3800, April 1995



**KOOGLER & ASSOCIATES**  
**ENVIRONMENTAL SERVICES**  
4014 NW THIRTEENTH STREET  
GAINESVILLE, FLORIDA 32609  
352/377-5822 ■ FAX/377-7158

KA 527-97-02

January 6, 1998

**RECEIVED**

**JAN 07 1998**

**BUREAU OF  
AIR REGULATION**

Mr. A. A. Linero, P.E.  
Florida Department of  
Environmental Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Subj: Piney Point Phosphates, Inc.  
Manatee County  
FDEP File No. 0810002-004-AC  
Existing Sulfuric Acid Plant Project

Dear Mr. Linero:

This is a brief response to your letter of December 19, 1997, and the EPA Region IV letter of December 15, 1997, attached thereto. As acknowledged in your letter, the comments from EPA are similar to comments in early Department correspondence. These comments have already been addressed in our letter to you dated December 26, 1997.

In response to the introductory paragraph of the EPA letter, and in particular the statement that there will be a significant net increase in the emissions of SO<sub>2</sub>, NO<sub>x</sub> and acid mist, I would like to restate our position on this matter. Our position, which is supported by Department Rule, is that the existing Piney Point sulfuric acid plant is a fully permitted plant which has been on cold standby for the past several years. As the plant has a valid permit, the re-start of the plant does not constitute an increase in the emissions of any air pollutant.

Regarding more substantive issues, EPA's statement that the replacement of pelletized catalyst with ring-type catalyst will "...likely result in a lower SO<sub>2</sub> emission rate..." is not correct. The use of the ring-type catalyst will reduce the pressure drop but the amount of catalyst, and hence the conversion activity associated with the catalyst, will not change. As a result, SO<sub>2</sub> emissions are not affected by the shape of the catalyst. This statement is based on the fact that the repairs that Piney Point will make on the existing plant are like-kind repairs and, as a result, the air flow rates through the plant will not change, nor will the sulfuric acid production rate change. As stated previously, the plant will be capable of operating at a lower pressure drop because of the change in catalyst geometry but this, in itself, will have no effect on production rate or SO<sub>2</sub> emissions.

Regarding the use of cesium-promoted catalyst, Piney Point Phosphates has agreed with Manatee County to use approximately 117,000 liters of cesium-promoted catalyst in the final stage of the converter. It should be pointed out that Piney Point Phosphates' agreement to use cesium-promoted catalyst was a good-faith effort to reach settlement with Manatee County. The use of the cesium catalyst is not based on a cost effectiveness analysis or on demonstrated proof of performance at other sulfur burning double absorption sulfuric acid plants.

Regarding the Centaur Technology referenced in the EPA letter, it was pointed out in our letter of December 26, 1997, that this technology could be cost effective for relatively small sulfuric acid plants but for a plant in the range of 2000 tons per day or larger, the process does not appear to be cost effective. This point aside, it must be recognized that the Centaur Technology has not been demonstrated in a commercially-operated sulfuric acid plant anywhere in the world at this point in time. It should also be recognized that, in the case of the existing Piney Point sulfuric acid plant, the plans are to repair the plant with like-kind components throughout, and the use of the Centaur Technology would not be consistent with these plans. Furthermore, the SO<sub>2</sub> emission rate guarantee of the Centaur process is identical to that of the double absorption process.

The final comment is related to the basis of the sulfuric acid mist emission limit. Piney Point Phosphates proposes to use a high-efficiency mist eliminator provided by Monsanto. The Monsanto performance guarantee for the mist eliminators is 0.15 pounds of acid mist per ton of acid produced.

I trust that this information and the information provided in our letter to you dated December 26, 1997, will adequately address all of the technical issues related to the review of the Piney Point permit application. If there should be additional questions, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

  
John B. Koogler, Ph.D., P.E.

JBK:mab

c: Mr. Ivan Nance, Piney Point  
Mr. Richard Moore, Admundsen & Moore





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW  
ATLANTA, GEORGIA 30303-8909

DEC 15 1997

**RECEIVED**

DEC 18 1997

BUREAU OF  
AIR REGULATION

4APT-ARB

Mr. Claire H. Fancy, P.E.  
Chief  
Bureau of Air Regulation  
Florida Department of Environmental  
Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

SUBJ: PSD Permit Application from Piney Point Phosphates, Inc.,  
Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of an application for a Prevention of Significant Deterioration (PSD) permit for the startup of the existing sulfuric acid plant at the above referenced facility. The application was submitted by a letter dated November 3, 1997, from Mr. Al Linero. The sulfuric acid plant has not been in operation since 1992, and repairs will be made to the plant before startup. No increase in the previous production rate of 2,000 tons/day of 100 percent sulfuric acid is proposed. The proposed repair project will result in a significant net increase in the emissions of SO<sub>2</sub>, NO<sub>x</sub>, and sulfuric acid mist. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

Based on the applicant's best available control technology (BACT) analysis, SO<sub>2</sub> emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. The proposed emission limits are equivalent to the New Source Performance Standards (NSPS) Subpart H emission limits of 4 lb SO<sub>2</sub> and 0.15 lb sulfuric acid mist per ton of 100 percent sulfuric acid produced.

Although previous BACT determinations for double absorption sulfuric acid plants have resulted in selection of the NSPS limits, Piney Point Phosphates should further evaluate the feasibility of achieving lower emission rates. As indicated in the application, recent improvements in plant design and catalyst performance have enabled sulfur burning double absorption sulfuric acid plants to operate at higher production rates and still comply with an SO<sub>2</sub> emission rate of 4.0 lb/ton acid produced. The application indicates that in order to maximize sulfuric acid production, the

sulfur feed rate to the sulfur burner is typically increased until either the sulfuric acid production rate limited by the permit is reached or the SO<sub>2</sub> emission rate limited by the permit is reached. This implies that industry improvements in plant and catalyst design could reduce SO<sub>2</sub> emission rates, provided the sulfuric acid production rates are controlled. Piney Point Phosphates plans to replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. These changes would likely result in a lower SO<sub>2</sub> emission rate, provided the sulfuric acid production rate is not increased. Piney Point Phosphates should provide information concerning the expected maximum sulfuric acid production capacity of the refurbished plant, as compared with the maximum capacity of the existing plant, and the expected effect on SO<sub>2</sub> emissions. Consideration should also be given to the replacement of all pelletized catalyst with ring catalyst in Converter 1 and the associated effect on the SO<sub>2</sub> emission rate.

*No increase in activity therefore no increase in production*

We recommend that Piney Point Phosphates further evaluate the use of cesium-promoted catalyst in Converter 2. Although cesium-promoted catalyst may have not previously been applied in a sulfur burning double absorption process, the catalyst has been applied in similar double absorption processes, as indicated in the application. The application does not include information to indicate that the use of cesium catalyst is not a feasible option for further reducing SO<sub>2</sub> emissions.

*MPA has seen this*

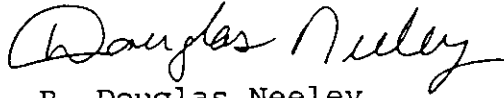
An important part of the BACT review process is the identification of new control technologies which may be applied to the new or modified emission source. The BACT analysis should consider control technologies applied to similar source categories and gas streams, and innovative control technologies. One such control technology, as described in the State's November 17, 1997, letter, is the use of the Centaur Technology which uses activated carbon, which has both adsorptive and catalytic properties, to oxidize SO<sub>2</sub> to H<sub>2</sub>SO<sub>4</sub>. Use of the Centaur Technology, instead of the second converter at Piney Point Phosphates, may be a viable option for a reduction in SO<sub>2</sub> emissions.

*Not requiring part of new plant*

The basis of the sulfuric acid mist emission limit (0.15 lb/ton acid produced) should be provided by the applicant. Test data and documentation from the vendor should be provided to verify the performance of the mist eliminator proposed for the plant.

Thank you for the opportunity to review and comment on the application package. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

A handwritten signature in cursive script that reads "Douglas Neeley".

R. Douglas Neeley

Chief

Air and Radiation Technology  
Branch

Air, Pesticides, and Toxics  
Management Division



KOOGLER & ASSOCIATES

ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET  
GAINESVILLE, FLORIDA 32609  
352/377-5822 ■ FAX/377-7158

KA 527-97-02

December 30, 1997

**RECEIVED**

**JAN 06 1998**

**BUREAU OF  
AIR REGULATION**

Mr. Cleve Holladay  
Florida Department of  
Environmental Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Subject: Manatee County - AP  
Piney Point Phosphates, Inc.  
PSD Permit Application for  
Existing Sulfuric Acid Plant

Dear Mr. Holladay:

This is a follow up to your telephone conversation with Pradeep Raval regarding the above referenced project.

You had requested information on the air dispersion modeling and a revised regional haze analysis to include all the sulfur dioxide emissions from the plant for the Class I area. As you are aware, this issue has been addressed in the permit application. In our opinion, the requested information is not required for the technical evaluation of the proposed project. However, the requested information has been sent to you by E-Mail in order to address the issues.

Also, an updated process flow diagram has been enclosed for your files. Please substitute this for Attachment 1 in our letter dated 12-26-97.

As the technical evaluation of this project is complete, we look forward to FDEP's prompt issuance of the draft permit. If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

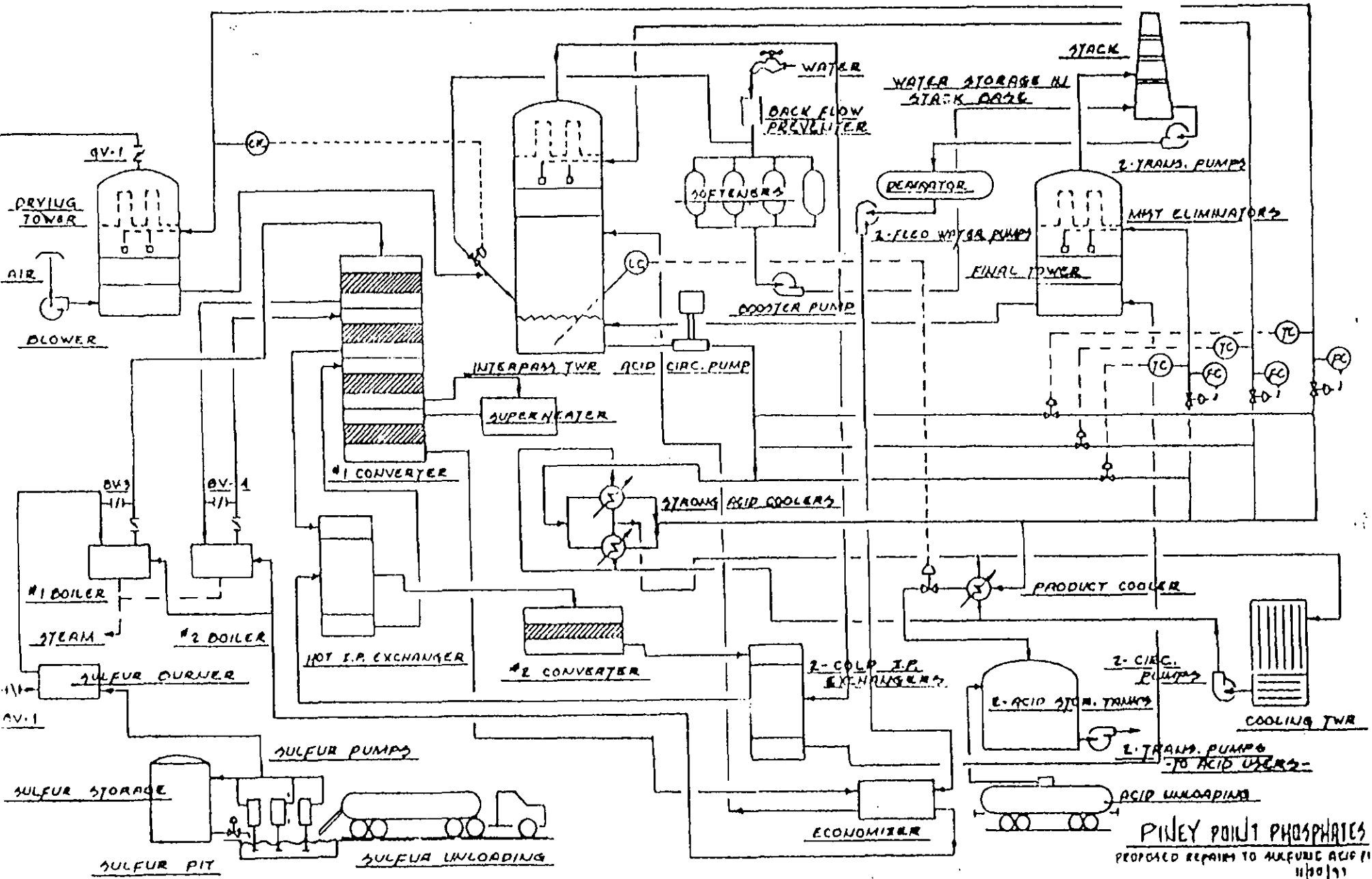
JBK:par  
encl.

c: Ivan Nance, PPP

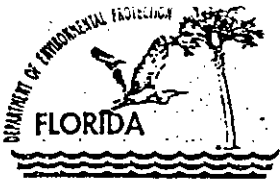
ATTACHMENT 1  
UPDATED PROCESS FLOW DIAGRAM







**PINEY POINT PHOSPHATES**  
 PROPOSED REPAIRS TO SULFURIC ACID PLANT  
 11/30/91



# Department of Environmental Protection

Lawton Chiles  
Governor

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

Virginia B. Wetherell  
Secretary

FOR IMMEDIATE RELEASE:  
December 30, 1997

CONTACT: Sam Zamani,  
Vishwas Sathe, 813/744-6100 x138

## DEP TO LAUNCH COMPREHENSIVE INVESTIGATION OF MULBERRY INC. PHOSPHATE SPILL

TALLAHASSEE -- The Florida Department of Environmental Protection (DEP) coordinated a meeting of agencies responding to the December 7, 1997, Mulberry Phosphates, Inc. spill to initiate a comprehensive damage assessment of the entire river system. In addition to DEP, the Florida Game & Fresh Water Commission, Southwest Florida Water Management District (SWFWMD), Hillsborough County Environmental Protection Commission, US Environmental Protection Agency, National Oceanic & Atmospheric Administration and US Department of the Interior Fish & Wildlife Service will study the river system to determine the short and long term effects of the phosphate spill that entered Skinned Sapling Creek and the North Prong of the Alafia River.

In response to Mulberry Phosphates, Inc.'s notification of the spill at their Polk county facility, DEP's Phosphate Management program conducted a site inspection. The inspection revealed that the spill occurred when a portion of an impoundment within the phosphogypsum stack system failed, causing the discharge of approximately 50 to 60 million gallons of acidic process wastewater.

A warning letter was issued to the company by DEP detailing the violations of rules and regulations, as well as requiring the company to investigate the affected river system to determine the environmental impacts. Simultaneously, DEP initiated an independent investigation. The department also contacted neighboring phosphate companies, the City of Lakeland and the SWFWMD requesting an increase in the amount of treated wastewater and stormwater discharge to help dilute the effects of the spill. DEP collected water quality data from several locations which indicated that the impacts from the spill had extended downstream of the site and into the marine reach of the Alafia River in Hillsborough county.

Regulatory agencies from local, state and federal levels responded to this spill. On December 17, the agencies met at the DEP office in Tampa to review the spill incident and to initiate a comprehensive damage assessment of the entire river system. In addition, Mulberry Phosphates, Inc. has been required to have the operations of the plant reviewed and monitored by a qualified independent consultant to insure the integrity of the gypsum stack impoundments. The facility will be required to perform all necessary remedial measures. The company will also be subject to enforcement action upon the completion of this investigation.

###  
"Protect, Conserve and Manage Florida's Environment and Natural Resources"

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KOOGLER & ASSOCIATES

ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET  
GAINESVILLE, FLORIDA 32609  
352/377-5822 • FAX/377-7158

KA 527-97-02

December 26, 1997

**RECEIVED**

DEC 30 1997

**BUREAU OF  
AIR REGULATION**

Mr. A. A. Linero  
Florida Department of  
Environmental Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Subject: Manatee County - AP  
Piney Point Phosphates, Inc.  
PSD Permit Application for  
Existing Sulfuric Acid Plant

Dear Mr. Linero:

This is in response to your letters dated November 7, 17, 26 and December 9, 1997, requesting additional information on the above referenced project. Your questions are addressed in the order they were raised.

1. We do not waive the requirement for items listed in the Facility Supplementary Information. This includes basic flow diagrams which specifically reflect the existing and planned configuration. We agree that much of the information is actually in our files on the facility and we will access it in our review. However, this specific application should stand on its own and the information should be more easily accessible to anyone other than our staff who wishes to inspect it.

RESPONSE:

The process flow diagrams for the sulfuric acid plant at Piney Point Phosphates (PPP), requested under Facility Supplemental Information Item 3, are presented in Attachment 1. It should be noted that the proposed plant repair project results in no change in the actual process flow.

Item 5 requests the identification of fugitive emissions associated with the sulfuric acid plant. It should be noted that fugitive emissions of sulfur dioxide (SO<sub>2</sub>), sulfuric acid mist (SAM) and nitrogen oxides (NO<sub>x</sub>) can occur during normal operations from the plant, as recognized by Department permits for many sulfuric acid plants, however, these fugitive emissions are not quantifiable. The fugitive emissions are minimized by proper plant maintenance.

2. The Best Available Control Technology Review was very instructive. Please submit an analysis of a scenario wherein certain plant components are designed (or "overdesigned") such that present production objectives are met and emission levels of 3.5 and 3.0 pounds sulfur dioxide per ton of sulfuric acid (averaged for periods longer than one day but less than thirty days) are maintained throughout the turn-around cycle of the plant.

RESPONSE:

It is not within the scope of the proposed plant repairs to over-design the existing plant. All components of the existing plant are designed for the existing permitted and operating capacity. While the scenario FDEP is requesting to be evaluated is not an option for the existing plant, it could be evaluated for a new plant.

3. Evaluate the scenario wherein the plant (if not overdesigned) must be de-rated to meet the above values throughout the same cycle. Include benefits such as less wear and tear as well as costs.

The scenario of de-rating the existing plant to lower the projected SO<sub>2</sub> emissions is discussed below.

The plant capacity, in tons per day of acid (tpd), at a SO<sub>2</sub> emission rate of 3.0 and 3.5, as opposed to 4 pounds per ton of sulfuric acid (lb/ton acid) cannot be estimated without a detailed analysis of contact time, plant temperatures and SO<sub>2</sub>/SO<sub>3</sub> vapor pressure equilibrium. This analysis is beyond the scope of this response. Based on input from Monsanto, the de-rating can be estimated as follows:

$$\text{Capacity @ 3.0} = 2000 \text{ tpd} \times 0.84 = 1680 \text{ tpd}$$

$$\text{Capacity @ 3.5} = 2000 \text{ tpd} \times 0.92 = 1840 \text{ tpd}$$

Estimated cost of acid lost versus SO<sub>2</sub> reduced:

For 3.0 lb/ton:

$$\begin{aligned} \text{SO}_2 \text{ Reduction} &= (4 \text{ lb/ton} \times 2000 \text{ tpd} \times \text{ton}/2000 \text{ lbs}) \\ &\quad - (3 \text{ lb/ton} \times 1680 \text{ tpd} \times \text{ton}/2000 \text{ lbs}) \\ &= 1.48 \text{ tpd} \end{aligned}$$

$$\begin{aligned} \text{Cost of Acid} &= (2000 - 1680) \text{ tpd} \times \$35/\text{ton} \\ &= \$11,200 \text{ per day} \end{aligned}$$



$$\begin{aligned} \text{Cost of Reduction} &= \$11,200 / 1.48 \text{ tpd SO}_2 \\ &= \$7570 \text{ per ton SO}_2 \end{aligned}$$

For 3.5 lb/ton:

$$\begin{aligned} \text{SO}_2 \text{ Reduction} &= (4 \text{ lb/ton} \times 2000 \text{ tpd} \times \text{ton}/2000 \text{ lbs}) \\ &\quad - (3.5 \text{ lb/ton} \times 1840 \text{ tpd} \times \text{ton}/2000 \text{ lbs}) \\ &= 0.78 \text{ tpd} \end{aligned}$$

$$\begin{aligned} \text{Cost of Acid} &= (2000 - 1840) \text{ tpd} \times \$35/\text{ton} \\ &= \$5600 \text{ per day} \end{aligned}$$

$$\begin{aligned} \text{Cost of Reduction} &= \$5600 / 0.78 \text{ tpd SO}_2 \\ &= \$7180 \text{ per ton SO}_2 \end{aligned}$$

It should be noted that there is no saving on wear and tear from plant derating.

Based on this analysis, the derating of the existing plant in order to reduce SO<sub>2</sub> emissions, is rejected as BACT.

4. ...Please evaluate separately and in combination, the costs and benefits of both additional catalyst replacement scenarios discussed above...(replacement of Type 210 and Type 11 vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure LP 120 and LP 110 ring catalyst and replacement of all pelletized VC catalyst in Converter 2 with LP 110 VC ring catalyst ... or cesium-promoted CS 110 catalyst.)

RESPONSE:

This issue was addressed in the application in sufficient detail to determine that additional sulfur dioxide emissions reduction could not be expected from the alternate use of cesium-promoted catalyst. Although the use of ring catalyst would be expected to reduce the pressure drop, it does not alter the SO<sub>2</sub> conversion rate.

5. ...Please provide the technical and cost evaluations of all the options described above to allow the Department to make a thorough BACT determination ..(Centaur Process and peroxide scrubbing).

RESPONSE:

Based on a telephone conversation with the manufacturer, it is our understanding that the Centaur process has the same SO<sub>2</sub> emissions guarantee as the double absorption process. There is, however, a cost difference. For small sulfuric acid plants, of around 1000 tons per day, the Centaur process results in a lower cost. For a plant the size of PPP's, the Centaur process would be more expensive than the double absorption process. Regardless of cost, at this time the Centaur process has not been demonstrated in commercial operation.

6. An assessment of the degree of overdesign (such as the typical 10-15%) that will be included in the proposed project at the existing plant, i.e. the ultimate maximum production capability of the refurbished plant.

RESPONSE:

No over-design is planned for the existing plant as part of this repair project. The existing and proposed capacity of the plant is reflected by the permitted rate.

7. A complete ambient air quality impact analysis for SO<sub>2</sub> and NO<sub>2</sub> for all averaging times. Modeling receptors should extend out to 20 km from the facility. This analysis should include a background monitored concentration and all applicable sources within 50 km of the facility.

RESPONSE:

Although not necessary for the technical evaluation of this project, additional modeling was conducted to satisfy FDEP's request. The results of the requested analyses indicate that the ambient air impacts from the SO<sub>2</sub> and NO<sub>x</sub> emitting units at PPP are well within the ambient air quality standards (see disk).

8. Based on the information obtained from the AAQS analysis, provide an update of the additional impacts analyses. These analyses address the impacts on soils, vegetation and visibility, and the impacts on air quality related values (AQRV) in the PSD Class I Chassahowitzka National Wilderness Area.

RESPONSE:

The results of the requested analyses indicate that the ambient air impacts from the SO<sub>2</sub> and NO<sub>x</sub> emitting units at PPP are well within the ambient air quality standards. As there is no change in the ambient air impacts assessed, a re-evaluation of the additional impact analyses previously submitted is not required.

9. Comments from Manatee County (by RTP)...

RESPONSE:

The issues raised by Manatee County have been resolved through an agreement signed by applicant and Manatee County. It is our understanding that FDEP has a copy of that agreement. Therefore, the issues are not addressed herein.

10. Comments from NPS (similar in substance to FDEP and Manatee County comments)...

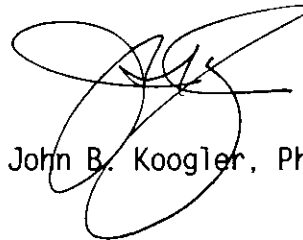
RESPONSE:

The substantive issues raised by NPS have been resolved through an agreement signed by applicant and Manatee County and are, therefore, not addressed in greater detail herein.

As the technical evaluation of this project is complete, we look forward to FDEP's prompt issuance of the draft permit. If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOUGLER & ASSOCIATES



John B. Koogler, Ph.D., P.E.

JBK:par  
encl.

c: Ivan Nance, PPP



**ATTACHMENT 1**  
**PROCESS FLOW DIAGRAMS**





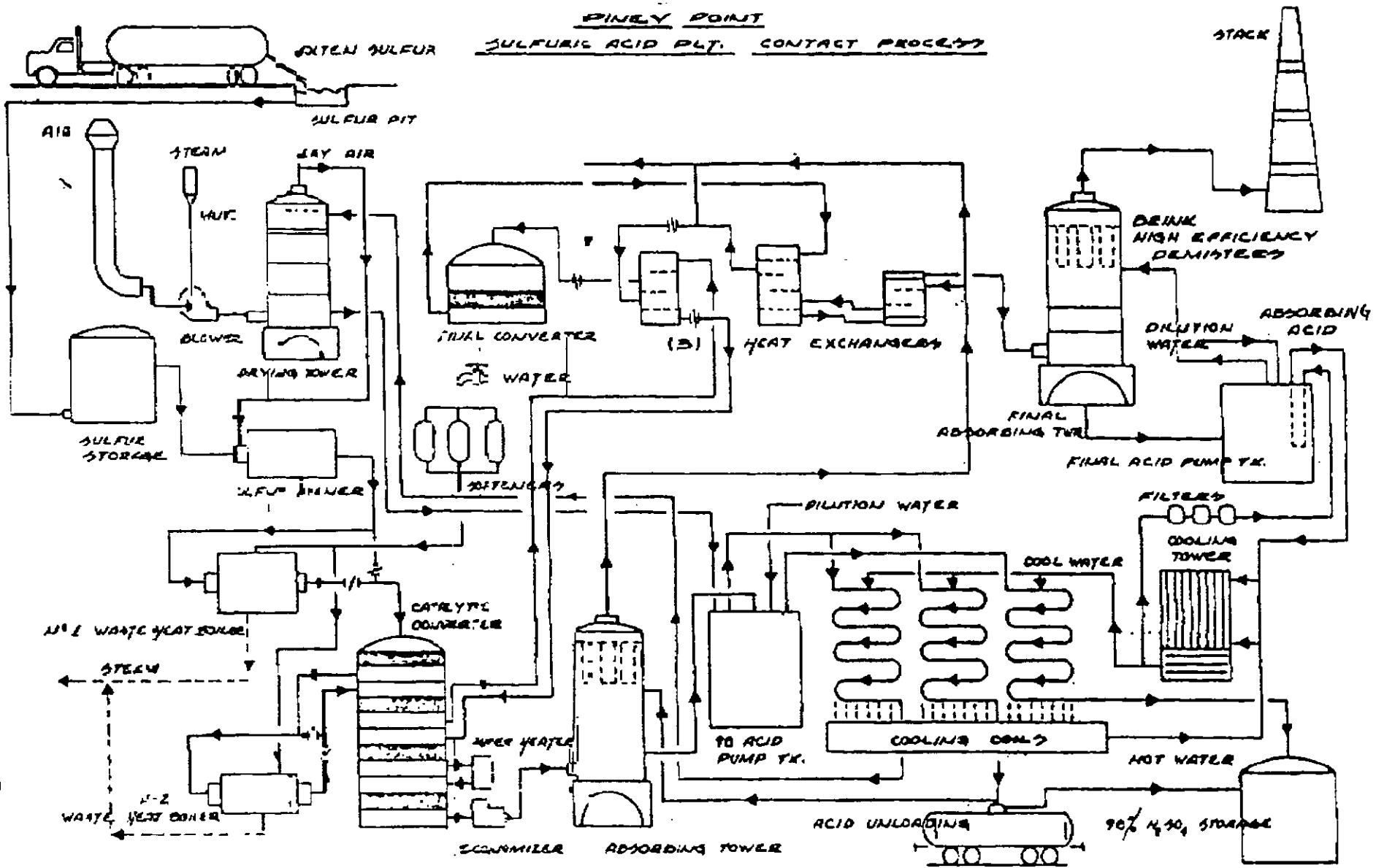
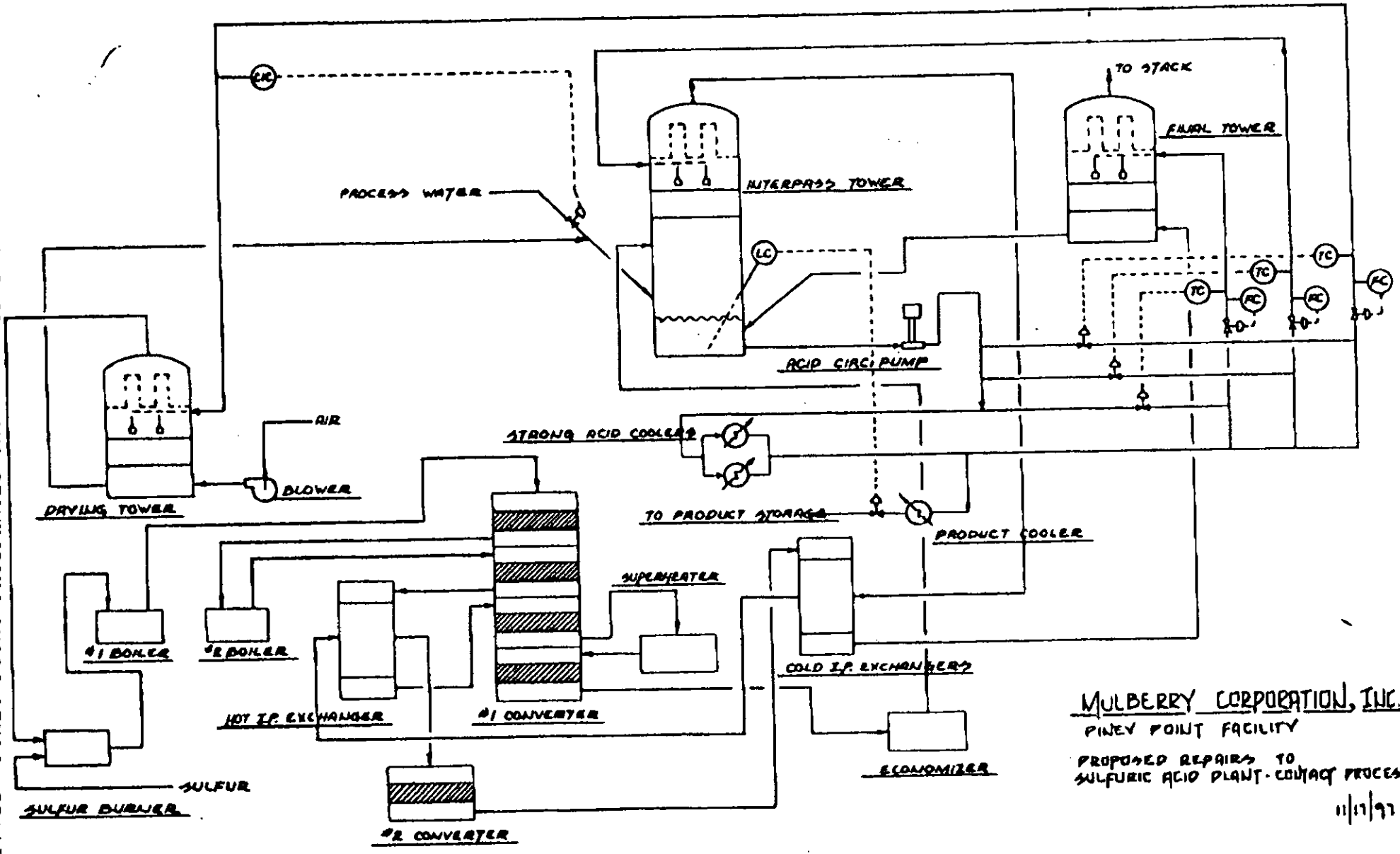


FIGURE 1

11-17-97 17:35 PINEY POINT FERTILIZERS INC ID#941725050000 P. 04



**MULBERRY CORPORATION, INC.**  
**PINEY POINT FACILITY**

PROPOSED REPAIRS TO  
 SULFURIC ACID PLANT - CONTACT PROCESS

11/1/97

THIS DISK CONTAINS SULFUR DIOXIDE (SO2), AND NITROGEN DIOXIDE (NOX) MODELING FILES FOR THE PINEY POINT PHOSPHATES PLANT IN MANATEE COUNTY, FLORIDA.

THE FOLLOWING FILES CONTAIN ISCST3 MODELING OF:  
SIA FOR CHASSAHOWITZKA NWR PSD CLASS I AREA,  
FLORIDA AMBIENT AIR QUALITY STANDARD (FAAQS), AND  
BUILDING DOWNWASH, BUILDING PROFILE INPUT PROGRAM (BPIP)  
THE EXE FILES ARE IN SELF EXTRACTING ARCHIVE FORMAT.

SO2 ASI ANALYSIS OF CHASSAHOWITZKA NWR PSD CLASS I AND FAAQS:  
SO2 EXE 288,763 12-25-97

FAAQS CULPABILITY FOR OCCURRENCES OF STANDARD VIOLATION  
CUL5-YR WK1 7,488 12-25-97 6:55p (IN LOTUS FORMAT)

NOX ASI ANALYSIS OF CHASSAHOWITZKA NWR PSD CLASS I AND CLASS 2 AREA:  
NOX EXE 109,923 12-25-97 AND:

PNY-BPIP EXE 20,752 12-25-97 BUILDING DOWNWASH CALCULATIONS

TO UNARCHIVE THESE FILES COPY THEM TO A HARD DISK DRIVE AND TYPE THE FILE NAME. FOR EXAMPLE TO UNARCHIVE THE SO2 ASI CLASS 2 ISCST3 OUTPUT FILES, TYPE "SO2" AND PRESS ENTER. THE FILES WILL AUTOMATICALLY UNARCHIVE TO THE HARD DISK DRIVE. THESE ARCHIVED FILES CONTAIN THE MODELING AND ANALYSIS FILES IN ASCII FORMAT DESCRIBED AS FOLLOWS:

SO2 MODELING FILES FOR THE CHASSAHOWITZKA NWR PSD CLASS 1, FAAQS ARE PROVIDED:

C1PNY87	OUT	54,571	12-05-97	PSD CLASS 1 ASI FOR 1987
C1PNY88	OUT	54,571	12-05-97	PSD CLASS 1 ASI FOR 1988
C1PNY89	OUT	54,571	12-05-97	PSD CLASS 1 ASI FOR 1989
C1PNY90	OUT	54,571	12-05-97	PSD CLASS 1 ASI FOR 1990
C1PNY91	OUT	54,571	12-05-97	PSD CLASS 1 ASI FOR 1991

SO2AQS87	OUT	268,602	12-09-97	FAAQS FOR 1987
SO2AQS88	OUT	268,602	12-09-97	FAAQS FOR 1988
SO2AQS89	OUT	268,602	12-09-97	FAAQS FOR 1989
SO2AQS90	OUT	268,602	12-09-97	FAAQS FOR 1990
SO2AQS91	OUT	268,602	12-09-97	FAAQS FOR 1991

NOX MODELING FILES FOR THE CHASSAHOWITZKA NWR PSD CLASS 1, SIGNIFICANT IMPACT ANALYSIS (SIA) & FAAQS ARE PROVIDED:

C1NOX87	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1987
C1NOX88	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1988
C1NOX89	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1989
C1NOX90	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1990
C1NOX91	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1991

C1PNY87	OUT	54,571	12-05-97	FAAQS FOR 1987
C1PNY88	OUT	54,571	12-05-97	FAAQS FOR 1988
C1PNY89	OUT	54,571	12-05-97	FAAQS FOR 1989
C1PNY90	OUT	54,571	12-05-97	FAAQS FOR 1990
C1PNY91	OUT	54,571	12-05-97	FAAQS FOR 1991

THERE ARE RECEPTORS AT 100 METER INTERVALS ALONG THE PROPERTY LINE, DISCRETE POLAR RECEPTORS FROM 700 METERS TO 1100 METERS AND POLAR RECEPTORS AT 1200, 1500, 1750, 2000, 2500, 5000, 7500, 10000, 11000, 12000, 13000, 14000, 15000, 16000, 17000, 18000, 19000 & 20000 METERS. POLAR RECEPTORS ARE CENTERED AT X=315, Y=260 THE APPROXIMATE GEOMETRIC CENTER OF THE FACILITY.

BUILDING INPUT PROFILE PROGRAM (BPIP) FILES USED IN MODELING ARE PROVIDED:  
PINY-BPI INP 1,782 12-09-97 INPUT FOR SO2 & NOX SOURCES  
PINY-BPI OUT 4,867 12-09-97 OUTPUT FOR SO2 & NOX SOURCES  
PINY-BPI SUM 80,726 12-09-97 SUMMARY FOR SO2 & NOX SOURCES

IF I MAY PROVIDE ADDITIONAL FILES, OR CLARIFICATION PLEASE CONTACT ME.

MARK KOLETZKE, P.E.  
KOOGLER AND ASSOCIATES  
(352) 377-5822  
KOOGLER@WORLDNET.ATT.NET  
DECEMBER 25, 1997



# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

December 19, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President  
Operations and Administration  
Piney Point Phosphates, Inc.  
13300 U.S. Highway North  
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC  
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

Attached are some additional comments from the U.S. EPA which they sent for our consideration. They are similar to comments previously sent to you from the Department which are being addressed by Koogler and Associates.

Also attached is some information from Haldor Topsoe indicating that they have a new cesium-promoted catalyst which maintains higher activity at all operating temperatures. This augments the information regarding Monsanto's cesium promoted catalyst. We are expecting similar information from BASF which we will send you soon.

If you have any questions regarding this matter, please call me at (850)488-1344.

Sincerely,

A. A. Linero, P.E.  
Administrator  
New Source Review Section

AAL/kt

cc: B. Thomas, SWD  
K. Collins, Manatee Co.  
J. Koogler, K&A

*"Protect, Conserve and Manage Florida's Environment and Natural Resources"*



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW  
ATLANTA, GEORGIA 30303-8909

DEC 15 1997

**RECEIVED**

DEC 18 1997

BUREAU OF  
AIR REGULATION

4APT-ARB

Mr. Claire H. Fancy, P.E.  
Chief  
Bureau of Air Regulation  
Florida Department of Environmental  
Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

SUBJ: PSD Permit Application from Piney Point Phosphates, Inc.,  
Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of an application for a Prevention of Significant Deterioration (PSD) permit for the startup of the existing sulfuric acid plant at the above referenced facility. The application was submitted by a letter dated November 3, 1997, from Mr. Al Linero. The sulfuric acid plant has not been in operation since 1992, and repairs will be made to the plant before startup. No increase in the previous production rate of 2,000 tons/day of 100 percent sulfuric acid is proposed. The proposed repair project will result in a significant net increase in the emissions of SO<sub>2</sub>, NO<sub>x</sub>, and sulfuric acid mist. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

Based on the applicant's best available control technology (BACT) analysis, SO<sub>2</sub> emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. The proposed emission limits are equivalent to the New Source Performance Standards (NSPS) Subpart H emission limits of 4 lb SO<sub>2</sub> and 0.15 lb sulfuric acid mist per ton of 100 percent sulfuric acid produced.

Although previous BACT determinations for double absorption sulfuric acid plants have resulted in selection of the NSPS limits, Piney Point Phosphates should further evaluate the feasibility of achieving lower emission rates. As indicated in the application, recent improvements in plant design and catalyst performance have enabled sulfur burning double absorption sulfuric acid plants to operate at higher production rates and still comply with an SO<sub>2</sub> emission rate of 4.0 lb/ton acid produced. The application indicates that in order to maximize sulfuric acid production, the

sulfur feed rate to the sulfur burner is typically increased either the sulfuric acid production rate limited by the permit is reached or the SO<sub>2</sub> emission rate limited by the permit is reached. This implies that industry improvements in plant and catalyst design could reduce SO<sub>2</sub> emission rates, provided the sulfuric acid production rates are controlled. Piney Point Phosphates plans to replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. These changes would likely result in a lower SO<sub>2</sub> emission rate, provided the sulfuric acid production rate is not increased. Piney Point Phosphates should provide information concerning the expected maximum sulfuric acid production capacity of the refurbished plant, as compared with the maximum capacity of the existing plant, and the expected effect on SO<sub>2</sub> emissions. Consideration should also be given to the replacement of all pelletized catalyst with ring catalyst in Converter 1 and the associated effect on the SO<sub>2</sub> emission rate.

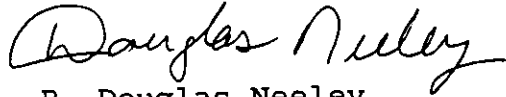
We recommend that Piney Point Phosphates further evaluate the use of cesium-promoted catalyst in Converter 2. Although cesium-promoted catalyst may have not previously been applied in a sulfur burning double absorption process, the catalyst has been applied in similar double absorption processes, as indicated in the application. The application does not include information to indicate that the use of cesium catalyst is not a feasible option for further reducing SO<sub>2</sub> emissions.

An important part of the BACT review process is the identification of new control technologies which may be applied to the new or modified emission source. The BACT analysis should consider control technologies applied to similar source categories and gas streams, and innovative control technologies. One such control technology, as described in the State's November 17, 1997, letter, is the use of the Centaur Technology which uses activated carbon, which has both adsorptive and catalytic properties, to oxidize SO<sub>2</sub> to H<sub>2</sub>SO<sub>4</sub>. Use of the Centaur Technology, instead of the second converter at Piney Point Phosphates, may be a viable option for a reduction in SO<sub>2</sub> emissions.

The basis of the sulfuric acid mist emission limit (0.15 lb/ton acid produced) should be provided by the applicant. Test data and documentation from the vendor should be provided to verify the performance of the mist eliminator proposed for the plant.

Thank you for the opportunity to review and comment on the application package. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,



R. Douglas Neeley  
Chief  
Air and Radiation Technology  
Branch  
Air, Pesticides, and Toxics  
Management Division



# Sulphuric Acid Catalyst VK69

## New Options for Double-Absorption Plants

Since the introduction of the first VK38 catalyst more than 50 years ago, the VK Series has represented Topsøe's heritage and commitment to quality and innovation.

The introduction of the first caesium-promoted vanadium catalyst, VK58, in the late 1980's meant a tremendous step forward in reducing tail-gas emissions from *single*-absorption sulphuric acid plants through operation at hitherto unseen low temperatures.

Other application areas of caesium-promoted catalysts include:

- Handling of strong, oxygen-rich SO<sub>2</sub> gases
- Significant reduction in SO<sub>2</sub> emissions during start-up
- Savings in start-up time and extended autothermal restart time limits
- Overcoming plant constraints

### VK69

In 1996 Topsøe introduced VK69, a newly developed caesium-promoted catalyst, optimized for operation in the last pass of *double*-absorption sulphuric acid plants. At these conditions VK69 shows a very significant activity advantage compared to regular catalysts.

### Features and Benefits

The improvement in activity has been brought about through physical as well as chemical changes compared to Topsøe's well-known VK58 caesium-promoted catalyst.

VK69, 9-mm mini-Daisy alongside 10-mm rings and 12-mm Daisy

### Support

VK69 is manufactured by a special extrusion process resulting in a highly porous catalyst.

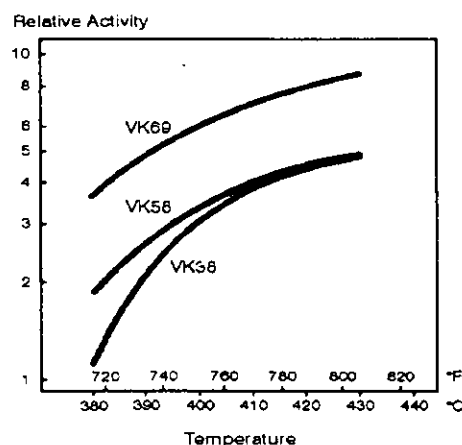
### Shape

In gases with low concentrations of sulphur dioxide the rate of oxidation of sulphur dioxide is impeded by intra-particle diffusion. The size and shape of the catalyst particles are hence important for the efficiency of the catalyst.

Topsøe's new 9-mm mini-Daisy shape proves 20 % more efficient compared with smooth 10-mm rings without compromising a low pressure drop.

### Chemical Composition

VK69 combines an increased vanadium content with a revised composition of the active phase. Caesium is used to stabilize the vanadium in its active state at low operating temperatures.



### Outstanding Activity

The revised support material, the optimum chemical composition, and the mini-Daisy shape together result in a 2-3 times higher activity for VK69 compared to other vanadium catalysts.

### Improved Performance

The very high activity of VK69 offers significant performance improvements in terms of:

- Emissions from existing plants can be cut in half without increasing the catalyst volume
- Increased production rate by using higher-strength SO<sub>2</sub> gas without increasing emissions or plant pressure drop



# VK69 - Proven Performance

## Reduction of SO<sub>2</sub> Emissions

In a large 3:1 double-absorption plant burning elemental sulphur, VK69 replaced conventional catalyst in the final pass. The table provides the performance of the fourth bed before and after installation of VK69. It is observed that even at a slightly increased acid production rate the SO<sub>2</sub> emission has been reduced by more than 60% to below 100 ppm in the stack.

Catalyst loading in the 4th bed		97,000 litres conventional catalyst	90,600 litres VK69
Acid production rate	MTPD	1460	1490
	STPD	1608	1641
4th bed inlet temperature	°C	440	389
	°F	824	733
Overall conversion, %		99.79	99.92
SO <sub>2</sub> in stack gas, ppm		215	80

## Capacity Expansion

An increase in acid production rate may often be achieved through an increase in gas flow rate as well as in feed gas SO<sub>2</sub> strength. To maintain the overall conversion efficiency using conventional catalysts, a larger catalyst volume is required. The higher gas flow rate and the increased catalyst volume both contribute to a significant increase in plant pressure drop.

The table shows performance data before and after installation of VK69 in the last pass of a 2:1 double-absorption plant feeding on off-gas from metal-ore roasting. A 14% capacity increase has been achieved solely through an increase in feed-gas SO<sub>2</sub> strength. Even though the oxygen-to-sulphur dioxide ratio is much less favourable this has occurred without increasing the SO<sub>2</sub> emission level. The inlet temperature of 375°C (707°F) is remarkable.

		Before installation of VK69	After installation of VK69
Acid production	MTPD	280	318
	STPD	308	350
Feed gas SO <sub>2</sub> strength, %		7.9	9.3
Feed gas flow rate	Nm <sup>3</sup> /hr	33,900	32,500
	SCFM	21,100	20,200
O <sub>2</sub> /SO <sub>2</sub> ratio		2.1	1.7
3rd pass inlet temperature	°C	402	375
	°F	756	707
SO <sub>2</sub> in stack gas, ppm		310	312

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Telefax: + 973 536797

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- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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Robert Stewart  
Avery Point Phosphates  
13300 US Hwy North  
Palmetto, FL 34221

4a. Article Number

P 265 659 270

4b. Service Type

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- Express Mail  Insured
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7. Date of Delivery

12/23/97

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8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)

*Robert Stewart*

PS Form 3811, December 1994

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Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
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Postmark or Date	12-19-97
CS10002-004-AE	

PS Form 3800, April 1995



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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DEC 18 1997

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DEC 18 1997

BUREAU OF  
AIR REGULATION

4APT-ARB

Mr. Claire H. Fancy, P.E.  
Chief  
Bureau of Air Regulation  
Florida Department of Environmental  
Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

SUBJ: PSD Permit Application from Piney Point Phosphates, Inc.,  
Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of an application for a Prevention of Significant Deterioration (PSD) permit for the startup of the existing sulfuric acid plant at the above referenced facility. The application was submitted by a letter dated November 3, 1997, from Mr. Al Linero. The sulfuric acid plant has not been in operation since 1992, and repairs will be made to the plant before startup. No increase in the previous production rate of 2,000 tons/day of 100 percent sulfuric acid is proposed. The proposed repair project will result in a significant net increase in the emissions of SO<sub>2</sub>, NO<sub>x</sub>, and sulfuric acid mist. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

Based on the applicant's best available control technology (BACT) analysis, SO<sub>2</sub> emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. The proposed emission limits are equivalent to the New Source Performance Standards (NSPS) Subpart H emission limits of 4 lb SO<sub>2</sub> and 0.15 lb sulfuric acid mist per ton of 100 percent sulfuric acid produced.

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sulfur feed rate to the sulfur burner is typically increased until either the sulfuric acid production rate limited by the permit is reached or the SO<sub>2</sub> emission rate limited by the permit is reached. This implies that industry improvements in plant and catalyst design could reduce SO<sub>2</sub> emission rates, provided the sulfuric acid production rates are controlled. Piney Point Phosphates plans to replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. These changes would likely result in a lower SO<sub>2</sub> emission rate, provided the sulfuric acid production rate is not increased. Piney Point Phosphates should provide information concerning the expected maximum sulfuric acid production capacity of the refurbished plant, as compared with the maximum capacity of the existing plant, and the expected effect on SO<sub>2</sub> emissions. Consideration should also be given to the replacement of all pelletized catalyst with ring catalyst in Converter 1 and the associated effect on the SO<sub>2</sub> emission rate.

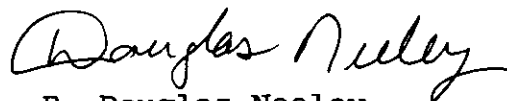
We recommend that Piney Point Phosphates further evaluate the use of cesium-promoted catalyst in Converter 2. Although cesium-promoted catalyst may have not previously been applied in a sulfur burning double absorption process, the catalyst has been applied in similar double absorption processes, as indicated in the application. The application does not include information to indicate that the use of cesium catalyst is not a feasible option for further reducing SO<sub>2</sub> emissions.

An important part of the BACT review process is the identification of new control technologies which may be applied to the new or modified emission source. The BACT analysis should consider control technologies applied to similar source categories and gas streams, and innovative control technologies. One such control technology, as described in the State's November 17, 1997, letter, is the use of the Centaur Technology which uses activated carbon, which has both adsorptive and catalytic properties, to oxidize SO<sub>2</sub> to H<sub>2</sub>SO<sub>4</sub>. Use of the Centaur Technology, instead of the second converter at Piney Point Phosphates, may be a viable option for a reduction in SO<sub>2</sub> emissions.

The basis of the sulfuric acid mist emission limit (0.15 lb/ton acid produced) should be provided by the applicant. Test data and documentation from the vendor should be provided to verify the performance of the mist eliminator proposed for the plant.

Thank you for the opportunity to review and comment on the application package. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

A handwritten signature in cursive script that reads "Douglas Neeley". The signature is written in black ink and is positioned above the typed name.

R. Douglas Neeley  
Chief  
Air and Radiation Technology  
Branch  
Air, Pesticides, and Toxics  
Management Division



IN REPLY REFER TO:

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

1875 Century Boulevard  
Atlanta, Georgia 30345

December 15, 1997


Mr. C. H. Fancy  
Chief, Bureau of Air Regulation  
Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road, MS 48  
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application for the refurbishment of the Piney Point Phosphates sulfuric acid plant in Manatee County. The plant is located 109 km south of Chassahowitzka Wilderness Area, a Class I air quality area, administered by the Fish and Wildlife Service. The technical review comments from our Air Quality Branch are enclosed.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have any questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

  
for Sam D. Hamilton  
Regional Director

Enclosures

**RECEIVED**

DEC 24 1997

BUREAU OF  
AIR REGULATION

**Technical Review of Prevention of Significant Deterioration  
Permit Application for Piney Point Phosphates, Inc.'s  
Proposed Refurbishment of a Sulfuric Acid Plant  
Manatee County, Florida**

by

**Air Quality Branch, Fish and Wildlife Service - Denver**

Piney Point Phosphates, Inc. (PPP) is proposing to refurbish its sulfuric acid plant in Manatee County, Florida. The plant, which has not been in operation since 1992, is located 109 km south of Chassahowitzka Wilderness, a Class I air quality area administered by the U.S. Fish and Wildlife Service. The refurbished plant will emit significant amounts (see table below) of sulfur dioxide (SO<sub>2</sub>), sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) mist, and nitrogen oxides (NO<sub>x</sub>).

<b>POLLUTANT</b>	<b>EMISSIONS INCREASE (TPY)</b>
SO <sub>2</sub>	1460
H <sub>2</sub> SO <sub>4</sub> Mist	54.8
NO <sub>x</sub>	43.8

We find the application to be incomplete. Specifically, the Class I increment analysis, the air quality related values analysis, and the best available control technology analysis are incomplete. Our reasons are stated below.

**Class I Increment Analysis**

PPP predicted that the maximum impact to the Class I SO<sub>2</sub> and NO<sub>x</sub> increments from this project would be zero. This result is unlikely if PPP had modeled their proposed emissions increases (see table above). We ask that PPP explain what emissions values were used in the modeling analysis and that PPP provide their rationale for using those values.

**Air Quality Related Values (AQRV) Analysis**

PPP did not perform an analysis to assess potential impacts to visibility in Chassahowitzka Wilderness, stating that because the maximum predicted impacts were less than significant, no impacts on Class I AQRVs would be expected. This is incorrect. As we have stated in the past, the AQRV analysis is independent of the Class I increment analysis. A source may have an adverse impact on AQRVs even though its predicted impacts are less than the significant impact levels used to assess increment contribution. We therefore ask that PPP conduct a regional haze analysis, considering both their SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> emissions from the project. A background visual range of 65 km should be used in the analysis. The applicant may choose to use a screening model (e.g., ISC) or a more refined model (e.g., Mesopuff or Calpuff). If predicted impacts are less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If predicted impacts are greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including proposed emissions and all other



increment-consuming sources. If the cumulative analysis predicts impacts less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If cumulative impacts are greater than 1.0 deciview, significant haze impacts are possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the frequency, magnitude, and duration of impacts.

We agree that the potential for impacts to Class I AQRVs other than visibility is low.

### **Best Available Control Technology (BACT) Analysis**

**Sulfur Dioxide:** PPP proposes to control SO<sub>2</sub> emissions from the acid plant by the dual absorption process to a level of 4.0 pounds SO<sub>2</sub> per ton (lb SO<sub>2</sub>/ton) of 100 percent acid produced. This emission level is equal to that adopted by the Environmental Protection Agency (EPA) in 1971 as the New Source Performance Standard (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H). However, it should be noted that more than 12 years have elapsed since the NSPS was last reviewed, and 26 years since it was promulgated. Furthermore, according to EPA policy, the NSPS is merely the minimum level of control that is acceptable as a floor for a proper, "top-down" BACT analysis; the top, or beginning point of the BACT analysis should represent the most stringent level of control feasible. And, recent permit actions indicate that levels of control more stringent than the NSPS are feasible. For example, a recent permit drafted for Mississippi Phosphates Corporation (MPC) by the State of Mississippi Department of Environmental Quality (MDEQ) proposes a limit of 3.25 lb SO<sub>2</sub>/ton. In developing that draft permit, MDEQ relied upon letters from MPC to MDEQ (dated 9/26/97) in which MPC stated that use of 1995 and 1996 test data "results in a calculated SO<sub>2</sub> emission limit of 3.02 lbs/ton." In an August 28, 1997, letter to MDEQ, MPC requested a permit limit of 3.16 lb SO<sub>2</sub>/ton. Subsequently, MPC proposed meeting a limit of 3.25 lb SO<sub>2</sub>/ton. Unless it can be shown that there are extenuating circumstances that make PPP unable to meet the same limit as MPC, it is reasonable to expect that PPP perform at least as well.

Following are specific comments concerning the application:

1. The data presented in Figure 4-1 for SO<sub>2</sub> emissions per ton of sulfuric acid produced does not match presumably similar data presented in Appendix D. While the graph shown in Figure 4-1 indicates a rapid, steady increase in emissions per ton, the tabulated data in Appendix D shows a steady, low emission rate until a plant shutdown. After the shutdown, emissions jump by over 50% and climb to double the pre-shutdown level. In addition to the apparent discrepancy in data sets, the radical increase in SO<sub>2</sub> emissions following the plant shutdown raises a question as whether the shutdown and the emissions increase are related. Please explain the discrepancy in the data sets and the emissions increase after shutdown.
2. PPP notes that acid production is constrained by permit limits either on production or emissions. Figures 4-1 and 4-2 illustrate that, as SO<sub>2</sub> emissions approach their limit, production is curtailed by as much as 200 tons per day (TPD), and 100 TPD on the average over the 18 month operating cycle (equivalent to a 54,000 ton loss). If sulfuric acid is

worth \$28-\$42 per ton and is in short supply in Florida, as stated in the application, this represents a gross loss of \$1.5-2.3 million, and a net loss of over \$1 million (at PPP's \$20/ton production cost).

3. Table 4-1, Cost Analysis of an Interim Plant Turnaround for Catalyst Screening and Partial Replacement:
  - Since catalyst replacement and waste disposal costs after a 9-month turnaround should be half of the same costs after an 18-month turnaround, there should be no additional annual cost for these items associated with the shorter turnaround.
  - If PPP is willing to allow acid production to be limited by emissions such that it loses 54,000 tons production and over \$1 million during an 18-month period, why is it necessary to spend almost \$0.5 million to supply 17,000 tons of acid during an 8.5 day turnaround?
4. Table 4-2, Cost Analysis of Ammonia Scrubbing to reduce SO<sub>2</sub> Emissions from a 2000 TPD Sulfuric Acid Plant:
  - Capital costs are totally unsubstantiated. Indirect Costs were incorrectly estimated as a percentage of total Direct Costs, rather than Purchased Equipment Costs (as recommended by the EPA Control Cost Manual).
  - Operating Labor time appears excessive (2 hr/day vs. EPA recommended 1.5 hr/day). Other Direct Annual Costs are totally unsubstantiated. Inclusion of downtime costs is not typically allowed.
  - The Capital Recovery Factor is inflated due to use of short (10 year vs. EPA recommended 15 year) equipment life and excessive interest rate (11% vs. EPA recommended 7%). This alone results in a 55% overestimation of annualized control costs.

**Sulfuric Acid Mist:** PPP proposes to control H<sub>2</sub>SO<sub>4</sub> emissions from the acid plant by using high efficiency mist eliminators. The use of high efficiency acid mist eliminators is the predominant control strategy chosen for new or modified sulfuric acid plants regulated under the NSPS and we agree that this control strategy represents BACT for the PPP plant. The mist eliminators will control H<sub>2</sub>SO<sub>4</sub> mist emissions to a level below 0.15 lb/ton of 100 percent acid produced. This level is the NSPS for H<sub>2</sub>SO<sub>4</sub> emissions from new or modified sulfuric acid plants. However, as with the NSPS for SO<sub>2</sub> emissions from sulfuric acid plants (see above), not only is the NSPS for H<sub>2</sub>SO<sub>4</sub> out-of-date, it is also unsupported by existing test data. Analysis of the data contained in the EPA's 1992 Sulfuric Acid Background Report (for its AP-42, *Compilation of Air Pollutant Emission Factors*) shows a mean of 0.108 lb H<sub>2</sub>SO<sub>4</sub> emitted per ton of acid produced (Table 1.a). (Note: The AP-42 controlled emission factor is 0.128 lb H<sub>2</sub>SO<sub>4</sub> /ton of acid produced.) Furthermore, the average is unduly influenced by a few very high values (see Figure 1). This results in a mean that is more than twice the median. If the eight high "outlier" values from one plant are eliminated, the average emission rate drops to 0.061 lb/ton, and there is 95% likelihood that emissions will not exceed 0.076 lb/ton (Table 1.b).

The feasibility of lower acid mist limits is further supported by a look at tests conducted at MPC (Figure 2). An inspection of the data clearly shows the difference in the two types of mist eliminators used there. Plant 2 uses a Brink type ES (Energy Saver) mist eliminator marketed by the Enviro-Chem Systems division of Monsanto. It must be noted that this is not

one of the "high efficiency Brink Mist Eliminators" described in the BACT portion of the original permit. Plant 3 uses type HE (High Efficiency) mist eliminators from the same manufacturer. Even at its worst, the high efficiency mist eliminator can achieve 0.08 lb/ton. Therefore, we recommend that BACT represent a limit of not more than 0.08 lb/ton.

Finally, because FDEP has compiled extensive stack test data on emissions of SO<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub> mist, and NO<sub>x</sub> from various sulfuric acid plants, we suggest that FDEP perform a statistical analysis of that data to provide additional information regarding the emissions from these plants.

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

Table 1.a.

H2SO4 Test Results

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008
53	16	1	0.494
54		2	0.301
55		3	0.417
56		4	0.541
57		5	0.358
58		6	0.609
59		7	0.419
60		8	0.201

Count = 60  
 Average = 0.108  
 Median = 0.045  
 Mode = 0.014  
 S.D. = 0.141  
 95% CI = 0.036 +/- 0.108

Emission Factor @ 95% 0.073 <EF< 0.144

Table 1.b.

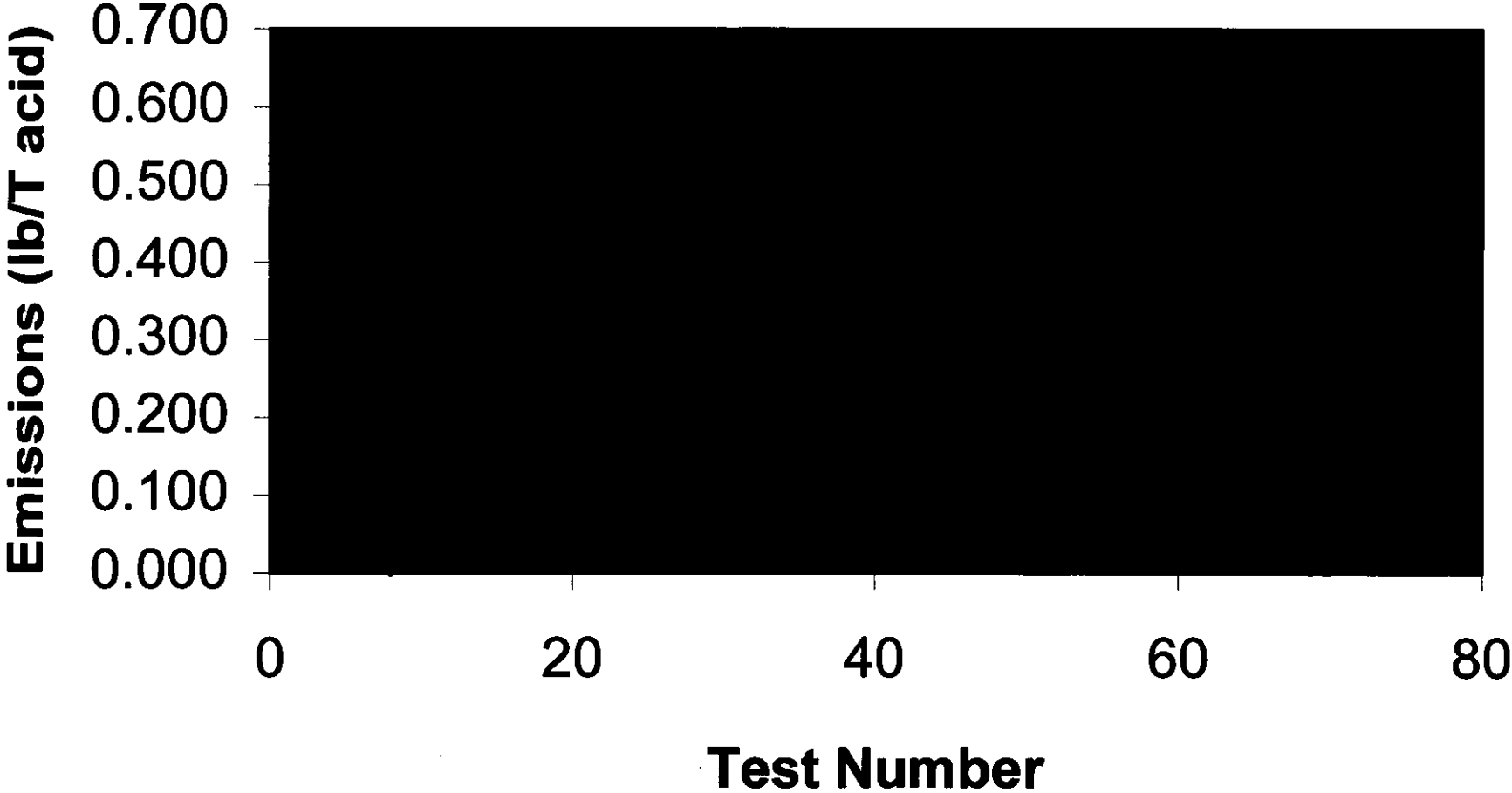
H2SO4 Test Results Minus Outliers

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008

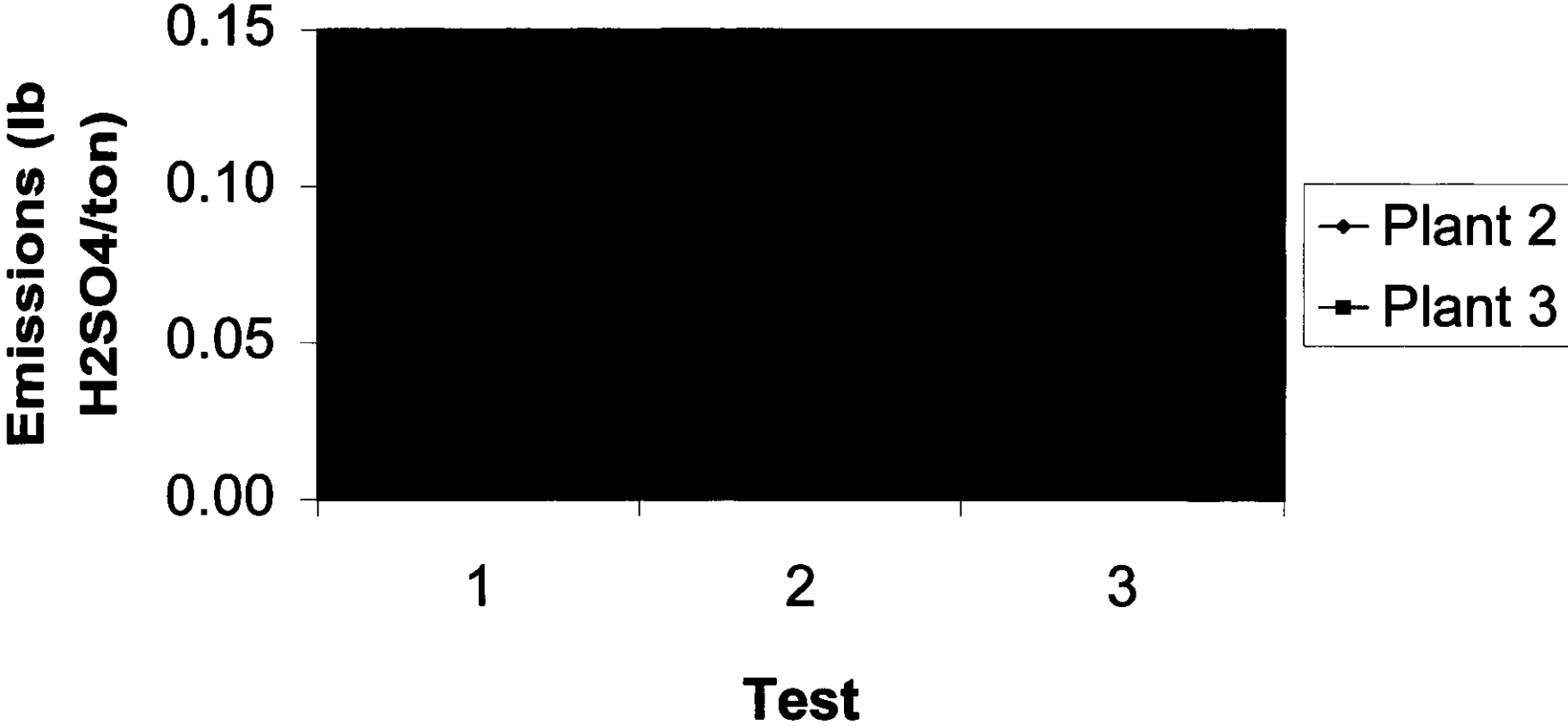
Count = 52  
 Average = 0.061  
 Median = 0.034  
 Mode = 0.014  
 S.D. = 0.057  
 95% CI = 0.015 +/- 0.061

Emission Factor @ 95% 0.045 <EF< 0.076

**FIG. 1.--SULFURIC ACID MIST**



**Fig. 2--Mississippi Phosphate Sulfuric  
Acid Emissions**



LANDERS & PARSONS, P.A.

ATTORNEYS AT LAW

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TELEPHONE (850) 681-0311  
TELECOPY (850) 224-5595

MEMORANDUM

HAND DELIVERY

TO: Jeff Brown  
Al Linero

FROM: David S. Dee

DATE: December 15, 1997

RE: Draft Settlement Agreement Concerning  
Piney Point Phosphates, Inc.

---

Enclosed for your review is a draft Settlement Agreement between Piney Point Phosphates, Inc., and Manatee County. This draft Settlement Agreement will be presented to the Board of County Commissioners of Manatee County at a special meeting beginning at 9:00 AM on Thursday, December 18, 1997. Please call me at your earliest convenience if you have any significant questions or concerns about the terms of the proposed Settlement Agreement.

Thank you for your prompt consideration of this issue.

cc: Clair Fancy  
Howard Rhodes  
Jeff Steinsnyder

**RECEIVED**

DEC 15 1997

BUREAU OF  
AIR REGULATION



SETTLEMENT AGREEMENT

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This Settlement Agreement ("Agreement") is made by and between Piney Point Phosphates, Inc. ("Piney Point"), and Manatee County ("County") on this \_\_\_ day of December, 1997.

Recitals

WHEREAS:

A. Piney Point owns a fertilizer manufacturing facility ("Facility") that is located in Manatee County, Florida. The Facility includes an existing sulfuric acid plant ("Existing Plant"), a diammonium phosphate plant ("DAP Plant"), and other related structures and processes.

B. Piney Point is preparing to resume commercial operation at the Existing Plant and the Facility. Piney Point also wants to build and operate a new sulfuric acid plant ("New Plant") at the Facility.

C. Manatee County is a political subdivision of the State of Florida. The County is governed by a Board of County Commissioners ("Board").

D. Piney Point and Manatee County want to ensure that Piney Point's activities at the Facility are conducted in compliance with all applicable laws, especially those laws that are designed to protect human health and the environment. Piney Point and Manatee County want the Facility to be operated in a

manner that is protective of the environment, the residents of Manatee County, and Piney Point's employees.

E. Piney Point and Manatee County now want to resolve their differences, without further litigation.

THEREFORE, in consideration of the promises and covenants contained herein, Piney Point and Manatee County agree that they shall comply with and be bound by the terms and conditions of this Settlement Agreement, as set forth below:

**Restart of Existing Plant**

1. Piney Point has filed an application with the Florida Department of Environmental Protection ("DEP" or "Department") for a construction permit to modify and restart the Existing Plant. Upon execution of this Agreement by the Board, Piney Point shall request the Department to issue a construction permit ("the Permit") for the Existing Plant, consistent with this Agreement, as follows:

(a) The sulfur dioxide emissions limit in the Permit shall be reduced by 12.5% to 3.5 pounds of sulfur dioxide per ton of 100% sulfuric acid produced or 291.7 pounds of sulfur dioxide per hour, whichever is less. Compliance with this emission limit shall be determined by using a 48-hour rolling average. Three hour averages shall not exceed 4.0 pounds of sulfur dioxide per ton of 100% sulfuric acid produced. These emissions limits may be exceeded only under the conditions provided in DEP Rule 62-

210.700, Florida Administrative Code ("F.A.C."). Exceedances that meet the requirements of DEP Rule 62-210.700, F.A.C., and are caused by temporary operational upsets, plant start-ups or other conditions, shall not be used when calculating the 48-hour rolling average or three hour average.

(b) Compliance with the sulfur dioxide emission limits shall be demonstrated by using the data collected with a continuous emissions monitoring system (CEMS). The CEMS equipment shall be installed, calibrated, certified, maintained, operated and used in accordance with 40 C.F.R. 60, Appendices B and F. Unless the CEMS is inoperable, the CEMS shall be operated and shall record sulfur dioxide emissions data during all operating hours, including periods of start-up, shut-down, load change, and malfunction.

(c) Piney Point shall install cesium-promoted catalyst in the final pass of the Existing Plant (approximately 115,000 liters). The cesium-promoted catalyst shall be used for at least one turnaround cycle, or approximately two years, whichever is longer.

(d) High efficiency mist eliminators shall be installed, maintained and operated at the Existing Plant.

(e) The provisions of the Memorandum of Understanding issued by the DEP on November 21, 1989 shall be added to the Operating Permit as permit conditions. A copy of DEP's Memorandum of Understanding is attached hereto as Exhibit "A".

(f) Each calendar quarter Piney Point shall provide Manatee County with copies of all of the: (i) compliance calculation worksheets for the sulfur dioxide emissions from the Existing Plant; (ii) the hourly CEMS data; and (iii) supporting information necessary to demonstrate compliance with the emissions limitations in the Permit.

(g) The other conditions of the Permit do not need to be changed, unless changes are necessary to make the Permit consistent with the requirements of this Agreement.

2. Manatee County shall not object to the issuance of the Permit, provided the Permit is consistent with the provisions of this Agreement.

3. If DEP issues a Permit that is consistent with the provisions of this Agreement, Manatee County promptly shall withdraw its verified complaint against DEP.

4. Subject to the other provisions of this Agreement, Manatee County shall not object to the repair and restart of the Existing Plant, provided that: (a) DEP issues a Permit that is consistent with the provisions of this Agreement; (b) the repairs do not increase the capacity of the Existing Plant to levels that are greater than 2,000 tons per day of 100% sulfuric acid; (c) the repairs do not increase the emissions from the Existing Plant to levels that are greater than the limits set forth in Paragraph 1, above; (d) Piney Point uses its best efforts to ensure that the Facility is fully and completely repaired, in accordance with the best practices of the industry, to provide safe and reliable

operations in the future; (e) Piney Point complies with any County ordinances (e.g., building codes) that are applicable to the repair and restart of the Existing Plant; and (f) Piney Point fully complies with all of the provisions of this Agreement.

**BACT Determination and Permit Conditions for New Plant**

5. Piney Point has submitted an application to DEP for a permit to construct the New Plant ("Construction Permit") and DEP has prepared a draft Construction Permit (DEP Permit No. AC41-173305; PSD-FL-144).

6. The Best Available Control Technology ("BACT") determination for the New Plant shall be based upon a comprehensive BACT analysis, which shall be performed by Piney Point in accordance with current U.S. Environmental Protection Agency ("EPA") guidance and in consultation with the County. The BACT determination for the New Plant shall consider information generated from the operation of the Existing Plant, including data on the performance of the cesium catalyst, and shall be subject to approval by DEP.

7. Piney Point shall ask DEP to set the emissions limit for sulfur dioxide emissions from the New Plant at a level no greater than 3.5 pounds per ton of acid produced.

8. Piney Point shall use high efficiency mist eliminators or better technology to reduce the New Plant's emissions of sulfuric acid mist.

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9. After Piney Point and Manatee County sign this Agreement, Piney Point and Manatee County promptly shall request the Administrative Law Judge to hold DOAH Case No. 95-5795 in abeyance while Piney Point and Manatee County attempt to resolve their mutual concerns about the BACT determination and the proposed permit conditions for the New Plant.

10. If Manatee County concurs with the BACT determination and the proposed conditions in DEP's draft Construction Permit for the New Plant, Manatee County shall not object to the issuance of the Construction Permit and shall voluntarily dismiss the County's petition in DOAH Case No. 95-5796.

11. Piney Point shall permanently shut down and cease operating the Existing Plant when the New Plant commences commercial operations.

**Safety Programs**

12. Piney Point shall use its best efforts to protect the safety of its employees and the residents of Manatee County. Piney Point shall comply with all of the local, state and federal safety regulations that are applicable to Piney Point's activities at the Facility.

13. Piney Point already has established the safety programs that are described in Exhibit "B", which is attached hereto and incorporated herein by reference. Piney Point shall continue to implement and improve its existing safety programs for the

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Facility. Piney Point shall accelerate the implementation of the safety programs that are required by this Agreement.

14. Piney Point shall implement a Risk Management Program that complies with the regulations established by the United States Environmental Protection Agency ("EPA") in 40 C.F.R. Part 68, when Piney Point resumes operations of the Facility. The processes at the Existing Plant and Facility must comply with the requirements in 40 C.F.R. Part 68 for Program 3.

15. Before Piney Point resumes operations at the Facility, Piney Point shall meet with representatives of Manatee County's emergency response and emergency services department to discuss Piney Point's plans for complying with the EPA regulations in 40 C.F.R. Part 68. If the County's representatives recommend the installation of a public alarm system around the perimeter of Piney Point's Facility, then Piney Point will work diligently to comply promptly with the County's recommendation. Any such alarm shall be under the exclusive control of Piney Point.

16. Some of the EPA requirements in 40 C.F.R. Part 68 are being challenged in pending litigation. If the validity of the EPA requirements has not been conclusively established before Piney Point performs its "Worst case Risk Analysis" and "Alternative Risk Analyses" for the Facility, Piney Point may use the best information that is available to Piney Point at that time, even if Piney Point's approach is not consistent with the requirements of 40 C.F.R. Part 68. Piney Point shall modify its

analyses, if necessary, to comply with the EPA regulations in effect after the EPA litigation is completed.

17. Piney Point shall inspect and maintain the mechanical integrity of the Facility's equipment in accordance with the applicable provisions of the EPA regulations contained in 40 C.F.R. Part 68. In addition, Piney Point will inspect and maintain the mechanical integrity of the Facility's equipment in accordance with the best management practices required under all applicable federal, state and local regulations. These inspections shall be performed daily, weekly, monthly, quarterly and annually, as required under the applicable regulations. All inspections shall be performed by qualified personnel. Any deficiencies in the Facility's equipment shall be corrected immediately to ensure the safe operations of the Facility.

**Inspections by Manatee County**

18. To assure Manatee County that Piney Point is complying with all of the applicable safety and environmental regulations, Piney Point agrees to the following conditions:

(a) Manatee County's building inspectors shall have access to the Facility to confirm that the Facility is in compliance with the County's Building and Technical Codes and applicable ordinances. Manatee County shall provide reasonable notice to Piney Point before Manatee County's building inspectors visit the Facility.



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(b) Manatee County's environmental compliance officials shall have access to the Facility to confirm that the Facility is in compliance with the applicable environmental laws and regulations. Manatee County shall provide reasonable notice to Piney Point before Manatee County's environmental compliance officials visit the Facility.

(c) Manatee County shall be advised by Piney Point as soon as Piney Point has knowledge of any scheduled or unscheduled visit by a representative of DEP, EPA, or the Occupational Safety and Health Administration ("OSHA"). Manatee County recognizes that Piney Point cannot control the timing of inspections by DEP, EPA or OSHA.

(d) Whenever the Facility is visited by DEP, EPA or OSHA, Manatee County shall be allowed to have one or two qualified observers accompany the agency inspectors during their visit to the Facility.

(e) Manatee County shall provide Piney Point with a list of the County representatives that are qualified to attend the inspections by DEP, EPA or OSHA. The County may update the list from time-to-time, as necessary. Unless requested by the inspecting agency, no other persons or County representatives are authorized by this Agreement to accompany the agencies during their inspections to the Facility.

(f) Whenever a representative of Manatee County visits the Facility, the County's representative shall comply with Piney Point's safety regulations and shall follow all reasonable

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instructions provided by Piney Point while on Piney Point's property. Piney Point shall provide a copy of its safety regulations to the County so that the County's representatives may review the safety regulations before visiting the Facility.

(g) Piney Point and Manatee County promptly shall provide each other with any report, test result or other information that is received from any agency concerning an inspection of the Facility.

(h) If Manatee County wishes to collect any samples at the Facility, Manatee County shall split the samples with Piney Point, if requested, and promptly shall provide Piney Point with the results of any tests performed on the samples.

(i) During inspections of the Facility, Manatee County's representatives shall notify Piney Point's escort before they take any photographs of the Facility. In this fashion, the County's representative shall give Piney Point's representative an opportunity to view the conditions or area at the Facility that is the subject of the photograph. If Manatee County takes any photograph of the Facility, Manatee County promptly shall provide a copy of the photograph to Piney Point. However, Manatee County shall not take photographs of any equipment or processes reasonably designated by Piney Point as proprietary and confidential. Photographs shall be taken only for authorized regulatory purposes.

(j) Piney Point and Manatee County shall work together in a cooperative manner to ensure and confirm that Piney Point is

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complying with all local, state, and federal regulations. If requested, Piney Point shall provide a tour of the Facility once each year for the Board of County Commissioners or the Board's designees.

Reporting to Manatee County

19. Piney Point shall provide Manatee County with a copy of any report or document that Piney Point is required to provide to any state or federal agency, (unless such documents are confidential under state or federal law), including but not limited to: (a) routine reports to DEP or EPA concerning the Facility's stack tests, air emissions, surface water discharges, or other discharges; (b) reports concerning excess emissions, upset conditions or emergencies at the Facility; (c) reports and other information that are required under the provisions of 40 C.F.R. Part 68 or Paragraph 14, above; and (d) reports or other information that must be submitted to DEP pursuant to Paragraph 1, above. These reports and other materials shall be provided to Manatee County at the same time that they are provided to the state or federal agency. Should Piney Point determine that a report or portion thereof is confidential, Piney Point shall take steps to redact the confidential information, or if this is not possible, notify the County of the report and Piney Point's reasons for not providing it to the County. These reports and other materials shall be submitted to the Director of the Manatee

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County Department of Environmental Management, P. O. Box 1000,  
Bradenton, Florida 34206-1000.

20. Piney Point immediately shall notify Manatee County if there is an accident, malfunction or other event at the Facility that poses a threat to human health or the environment in the areas located adjacent to Piney Point's Facility. Manatee County recognizes that, under such circumstances, Piney Point may be required by law to provide notice to certain local, state, or federal agencies before Piney Point provides notice to Manatee County. Minor exceedances authorized under DEP Rule 62-210.700, F.A.C., are not subject to the notification requirements contained in this paragraph.

Land Use and Zoning

21. In the past, Piney Point's predecessor obtained zoning, land use and other approvals from Manatee County for the construction and operation of the Existing Plant. More recently, Piney Point provided Manatee County with preliminary plot plans and other documents which identify the repairs and maintenance improvements that will be made to the Existing Plant before Piney Point resumes operations of the Facility. Within 30 days after the effective date of this Agreement, Piney Point shall revise and update the site plan for the Existing Plant to show the proposed repairs and maintenance improvements, consistent with the preliminary plans provided to Manatee County, and shall submit the revised plot plan to Manatee County for its records.

Thereafter, the revised plot plan shall be used and enforced by the County when processing Piney Point's applications for building permits for the proposed repairs and improvements to the Existing Plant.

22. Piney Point's plans to construct and operate the New Plant shall be subject to review and approval by Manatee County in accordance with the applicable provisions of the County ordinances in effect at the time such plans are submitted to the County.

23. If Piney Point proposes changes to the revised site plan for the Existing Plant or if Piney Point proposes changes to the site plan for the Facility, and such changes would be subject to review and approval by Manatee County under the applicable provisions of the County's ordinances, then Piney Point shall comply with the applicable County ordinances in effect at the time the plans for such changes are submitted to the County.

#### Pending Appeal

24. Piney Point has filed an appeal of DEP's final order regarding Piney Point's plan to restart the Existing Plant. Promptly after the execution of this Agreement by Manatee County and Piney Point, Manatee County and Piney Point shall file a joint motion requesting the District Court of Appeal to abate the appeal (DCA Case No. 97-3828) until DEP takes final agency action concerning Piney Point's application for the Permit authorizing the modification and restart of the Existing Plant. If DEP

issues the Permit with conditions and limitations that are consistent with the terms of this Agreement, Piney Point shall dismiss the appeal in DCA Case No. 97-3828 at such time as the Permit is final and unappealable.

**Miscellaneous**

25. This Agreement shall become effective when it is approved by the Board of County Commissioners at a duly noticed meeting and signed by the Board's Chairperson.

26. This Agreement constitutes the entire agreement and understanding of the parties as to all matters addressed or referred to herein. This Agreement supersedes all prior and contemporaneous agreements, understandings, representations, and warranties, whether oral or written, relating to such matters.

27. This Agreement may be amended only by a written instrument specifically referring to this Agreement and executed with the same formalities as this Agreement.

28. This Agreement shall be binding upon and shall inure to the benefit of the parties, their successors and assigns.

29. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. Any action to interpret or enforce this Agreement shall be brought and maintained in the State of Florida. Venue shall be in Manatee County, Florida.

30. Except as otherwise specifically provided in this Agreement, the parties retain all of their rights and remedies at

law and in equity, including but not limited to their right to obtain specific performance and injunctive relief to enforce the terms of this Agreement. If either party commences an action or proceeding to enforce the provisions of this Agreement, the court in its discretion may award reasonable attorneys' fees and costs to the prevailing party.

31. By executing this Agreement, Manatee County and Piney Point permanently release, waive and discharge (collectively "release") any and all claims, causes of action, and damages (collectively "claims"), known or unknown, that either party may have against the other, provided such claims are based upon or arise from facts, events or actions occurring prior to the effective date of this Agreement, and concern or relate to the permits or approvals needed for the commencement of operations at the Existing Plant or New Plant. For the purposes of the release contained in this paragraph, "Manatee County" and "Piney Point" are defined broadly to include the parties and their officers, elected officials, employees, consultants, attorneys, and all other agents serving for or on behalf of the parties, individually and collectively. For the purposes of this release, "claims" shall include but not be limited to those causes of action that are based upon a temporary or permanent taking of property rights, or violations of equal protection, or violations of civil rights.

32. Except as provided in Paragraph 30, above, Manatee County and Piney Point each shall pay all of their own costs,

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fees and expenses (collectively "Costs"), including but not limited to those Costs that: (a) have been incurred in DOAH Case No. 95-5795 or are associated with the New Plant; (b) have been incurred as a result of the parties' disagreement about the legal requirements governing the restart and operation of the Facility; and (c) are incurred in the future when the parties perform their respective obligations under this Agreement.

33. No delay or failure to exercise a right under this Agreement shall impair such right or be construed to be a waiver thereof, but such right may be exercised from time to time and as often as deemed expedient. The failure of Piney Point or the County at any time to require performance by the other party of any term in this Agreement shall in no way affect the right of Piney Point or the County thereafter to enforce same; nor shall waiver by Piney Point or the County of any breach of any term of this Agreement be taken or held to be a waiver of any succeeding breach of such term or as a waiver of any term itself. To be effective, any waiver must be in writing and signed by the party granting the waiver. Any waiver shall be limited to the particular right so waived and shall not be deemed to waive any other right under this Agreement.

34. Piney Point represents that: (a) it is a corporation duly organized under the laws of the State of Florida or qualified to do business in the State of Florida; (b) this Agreement has been duly authorized, executed and delivered in the



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State of Florida; and (c) Piney Point has the ability and authority to perform its obligations under this Agreement.

35. It is agreed between the parties hereto that no provision of this Agreement is intended to create any third-party beneficiaries hereunder, or to authorize anyone not a party to this Agreement to maintain an action pursuant to the terms or provisions of this Agreement.

36. If any provision of this Agreement is held to be void or invalid by a court of competent jurisdiction, that provision shall be deemed severable from the remainder of the Agreement and shall not affect any other provision of this Agreement. If a provision of this Agreement is deemed invalid due to its scope or breadth, that provision shall be enforced and deemed valid within the scope or breadth permitted by law.

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IN WITNESS WHEREOF, this Agreement has been duly executed by Piney Point Phosphates, Inc., and Manatee County on the dates set forth below.

PINEY POINT PHOSPHATES, INC.

By: \_\_\_\_\_  
Robert C. Stewart  
Senior Vice President

Signed, sealed and delivered  
in the presence of:

\_\_\_\_\_  
Witness Signature

\_\_\_\_\_  
Witness Signature

\_\_\_\_\_  
Print Witness Name

\_\_\_\_\_  
Print Witness Name

STATE OF FLORIDA  
COUNTY OF

The foregoing Settlement Agreement was acknowledged before me this \_\_\_ day of December, 1997, by Robert C. Stewart, as the Senior Vice President of Piney Point Phosphates, Inc., on behalf of the corporation. He/She is personally known to me or has produced \_\_\_\_\_ as identification.

\_\_\_\_\_  
Notary Public - State of Florida

Print Name: \_\_\_\_\_  
Commission Number: \_\_\_\_\_  
Commission Expiration Date: \_\_\_\_\_

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MANATEE COUNTY BOARD OF COUNTY  
COMMISSIONERS

By: \_\_\_\_\_  
Patricia Glass, Chair  
Board of County Commissioners

ATTEST:

Dated: \_\_\_\_\_

\_\_\_\_\_  
R. B. Shore, Clerk of Court

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EXHIBIT "A" TO SETTLEMENT AGREEMENT  
BETWEEN PINEY POINT PHOSPHATES, INC.  
AND MANATEE COUNTY

Best Operational Start-Up Practices  
For Sulfuric Acid Plants

BEST OPERATIONAL START-UP PRACTICES  
FOR SULFURIC ACID PLANTS

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<sub>2</sub> at a rate in excess of the emission limits imposed by the permit or rule, as determined by the CEMS 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<sub>2</sub> 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) out of compliance for more than three consecutive hours. 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<sub>2</sub> enters the masses. In no event shall the inlet temperature to the first mass be less than 800°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  $\text{SO}_2$  at a level less than normal, and sufficiently low to promote catalytic conversion to  $\text{SO}_3$ .

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  $\text{H}_2\text{SO}_4$ .

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  $700^\circ\text{F}$ ; or

(2) Two of the four inlet and outlet temperatures must be greater than or equal to  $800^\circ\text{F}$ ; or

(3) The inlet temperature of the first catalyst must be greater than or equal to  $600^\circ\text{F}$  and the outlet temperature greater than or equal to  $800^\circ\text{F}$ . Also, the inlet and outlet temperatures of the second catalyst must be greater than or equal to  $700^\circ\text{F}$ .

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  $\text{H}_2\text{SO}_4$ .

EXHIBIT "B" TO SETTLEMENT AGREEMENT  
BETWEEN PINEY POINT PHOSPHATES, INC.  
AND MANATEE COUNTY

Safety Program for Piney Point Phosphates, Inc.

SAFETY PROGRAM FOR PINEY POINT  
PHOSPHATES, INC.

This document describes the safety program that is used by Piney Point Phosphates, Inc., at its fertilizer manufacturing facility in Manatee County, Florida. This document supplements the provisions of the Settlement Agreement dated December \_\_\_\_, 1997 between Piney Point Phosphates, Inc., and Manatee County.

1. Piney Point shall have a professionally trained Safety Superintendent who shall be primarily responsible for Piney Point's safety policies and training programs at the Facility. The Safety Superintendent shall report to Piney Point's Safety Director, who in turn shall report to the Senior Management (e.g., Senior Vice President) of the Company. The Safety Department shall have appropriate authority over safety issues at the Facility. The Safety Department and Piney Point's Senior Management shall work together closely to ensure that Piney Point's Safety Policy is followed at all times.
  
2. Piney Point shall appoint an in-house Safety Committee that shall meet at least once each month to discuss safety issues affecting the Facility. At a minimum, the Safety Committee shall include members selected from the various operating departments within the Company. The Safety Committee shall be under the direction of the Safety Superintendent and shall perform the following tasks:
  - a. The Committee shall perform announced and unannounced inspections of the Facility to ensure that the facility is in compliance with all applicable safety laws and regulations, as well as company requirements and best management practices concerning safety;
  - b. The Committee shall plan, develop and present formal training programs for each employee on a monthly basis;
  - c. The Safety Committee shall oversee bi-weekly safety meetings between Piney Point's employees and their direct supervisors; and
  - d. The Safety Committee shall respond to the Company's Senior Management each month about the Company's safety program. The committee will present recommendations for improvements of any potential problems or shortcomings of these programs and recommend any corrective actions needed.



3. The Safety Superintendent and the Safety Committee shall thoroughly investigate every accident, injury and near miss that occurs at the Facility. For such events, a report shall be presented to Piney Point's management concerning the event, the probable cause of the event, and the appropriate response or remedy by Piney Point.
4. All of Piney Point's employees and outside contractors shall have training and experience appropriate for their job responsibilities. As applicable, the Company's employees and contractors shall be trained in the following areas:
  - The operation of forklifts, payloaders, cranes, Highreach cranes, Gantry cranes and other mobile equipment'
  - How to comply with Scaffolding Standards;
  - Control of Hazardous Energy Lockout and Tagout procedures (e.g., steam, electricity, liquids, etc.);
  - How to comply with Confined Spaces Permit Entry (e.g., tanks and vessels);
  - The operation of hand tools, power tools, and other hand-held equipment;
  - The use of personal protective equipment, including hard hats, eye protection, hand protection, acid suits, face shields, goggles, respirators, and hearing protection;
  - Hazard Communication and D.O.T. Requirements;
  - Welding and Burning Standards;
  - Fire Protection Standards;
  - Electrical Standards;
  - Walking and Working Surfaces Standards (e.g., platforms, ladders, etc., as to use, construction and location);
  - Machinery and Machine Guarding Requirements;
  - Line Breaking Procedure and Permitting;
  - First Aid/C.P.R. and Bloodborne Pathogen Training (Hepatitis & AIDS exposure prevention);

- Fall Protection Standards;
  - Evacuation and Trenching Standards;
  - Hazard Incident training;
  - Radioactive Materials training;
5. Piney Point shall comply with all OSHA Process Safety Management Requirements for Highly Hazardous Chemicals, including the requirements concerning:
- Employee Participation;
  - Process Safety Information;
  - Operating Procedures;
  - Process Hazard Analysis;
  - Training/Refresher Training;
  - Contractor Training (including general and site specific training);
  - Pre-Startup Safety Review;
  - Mechanical Integrity (tank and equipment testing);
  - Hot Work Permit;
  - Management of Change (in any process or material of construction);
  - Incident Investigation;
  - Emergency Planning and Response;
  - Compliance Audits;
  - Control of Contractors' Entrance and Exit of Facility
6. When hiring new employees at the Facility, Piney Point shall consider the person's awareness of and knowledge about safety and environmental issues, together with the person's work skills.
7. With regard to each new employee, Piney Point shall:
- a. Perform a complete physical examination of the individual;

- b. Perform drug testing or screening for substance abuse;
  - c. Ensure that the person has received at least 8 hours of basic safety training; and
  - d. When appropriate, provide up to 1 week of additional training in the specific areas of the individual's job responsibilities.
8. The Company shall solicit safety suggestions from its employees and provide appropriate awards for those suggestions that materially benefit the Company's Safety Program. Each safety suggestion shall be evaluated by the Company's Safety Committee.

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# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

December 1, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President  
Operations and Administration  
Piney Point Phosphates, Inc.  
13300 US Highway North  
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC  
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

Attached is some additional information provided for our consideration by RTP Associates relevant to the subject application. Feel free to submit any comments regarding this material.

If you have any questions, please call me at (850)488-1344.

Sincerely,

A. A. Linero, P.E. Administrator  
New Source Review Section

AAL/aal

Enclosures

cc: Bill Thomas, SWD  
Karen Collins, Manatee County

Is your RETURN ADDRESS completed on the reverse side?

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece. Do not attach to the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- 1.  Addressee's Address
- 2.  Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  
 Mr. Robert Stewart  
 Piney Point Phosphates  
 13300 US Hwy North  
 Palmetto, FL 34221

4a. Article Number  
 P265 659 258

4b. Service Type  
 Registered  Certified  
 Express Mail  Insured  
 Return Receipt for Merchandise  COD

7. Date of Delivery  
 12/4/97

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)

*X* Susan Yack

PS Form 3811, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 258

US Postal Service  
**Receipt for Certified Mail**  
 No Insurance Coverage Provided.  
 Do not use for International Mail (See reverse)

Sent to		R. Stewart
Street Number		Piney Point
Post Office, State, & ZIP Code		Palmetto, FL
Postage	\$	
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt Showing to Whom & Date Delivered		
Return Receipt Showing to Whom, Date, & Addressee's Address		
TOTAL Postage & Fees	\$	
Postmark or Date		12-2-97 ?

PS Form 3800, April 1995

## MEMORANDUM

TO: Mr. A. A. Linero, P.E.  
FROM: Michael J. Hober and Donald F. Elias  
DATE: November 26, 1997  
SUBJECT: Control Cost Estimates for the Piney Point Phosphate PSD Application

RECEIVED  
DEC 04 1997  
BUREAU OF  
AIR REGULATION

Attached are calculation sheets for two separate cases estimating a cost per ton of sulfur dioxide (SO<sub>2</sub>) removed (\$/ton) for different potential scenarios at the Piney Point Phosphates facility. Case 1 estimates potential emissions savings from overdesign of the new plant (i.e., plant designed for 2700 tons of 100% H<sub>2</sub>SO<sub>4</sub> per day [ton/day] and operated at 2000 tons/day). Case 2 utilizes the Mulberry facility data provided in the PSD application for the existing plant to estimate SO<sub>2</sub> reductions if SO<sub>2</sub> plant emissions (i.e., catalyst degradation) were gradually increased over time rather than constant at the permit level. Further explanation of each case is presented below to match with the attached sheets.

#### Case 1 - Facility Overdesign

According to the data supplied by Piney Point Phosphates, sulfuric acid facilities are designed for a set production rate and operators maximize their operation of the plant until they reach the permit limits for acid production or SO<sub>2</sub> emission. Case 1 analyzes the \$/ton of SO<sub>2</sub> removed for building a 2700 ton/day sulfuric acid plant and operating at 2000 tons/day. It is then assumed that SO<sub>2</sub> emissions can be maintained at either 2.0 or 2.5 lbs SO<sub>2</sub> per ton of acid (lb/ton) produced. This assumption is confirmed by data from U.S. Agri-Chemicals from 1990 to 1996 and by data from Piney Point from 1988 and 1989. The two scenarios presented utilize cost data presented in the March 5, 1997 letter from Robert C. Stewart of Piney Point Phosphates, Inc. to Dr. Richard Garrity of the FDEP Southwest District Office. This letter notes on page 4 that the cost of a new 2700 ton/day plant has risen to over \$60 million (assumed to be \$62 million) from about \$44 million in 1989. Also, in the same letter on page 7, two costs are provided for a replacement 2000 ton/day plant, which are \$46.5 million (Mr. Hartman) and \$42 million (Monsanto). Both of these are used for comparison.

As shown in the attached calculations, operating an oversized plant (2700 ton/day) at 2000 ton/day, with SO<sub>2</sub> emissions reduced from 3.95 lb/ton to lower levels (2.0 and 2.5 lb/ton), results in costs that range from about \$2050/ton to \$3550/ton of SO<sub>2</sub> removed.

RE: Piney Point Phosphates  
November 26, 1997  
Page 2

The increase in cost of 40% between a 2000 ton/day plant and a 2700 ton/day plant (an increase in production of 35%) as presented by Piney Point Phosphates appears excessive. The calculations show two common engineering methods used to escalate a capital project's cost. The first method is the "Sixth-Tenth's" rule which shows that escalating the cost of \$46.5 million for a 2000 ton/day plant to 2700 tons/day would be approximately \$55.7 million. The second method incorporates General Construction Cost Index factors published monthly in the Engineering News Record (ENR) which shows that the increased cost of a 2700 ton/day plant over time would be \$55.2 million. Both methods indicate that Piney Point Phosphates' estimate of over \$60 million in 1997 dollars for a 2700 ton/day plant appears to be excessive.

Use of a capital cost of \$55.5 million for a 2700 ton/day plant operating at 2000 ton/day with SO<sub>2</sub> emissions of 2.0 to 2.5 lb/ton (versus 3.95 lb/ton for an 2000 ton/day plant with a capital cost of \$44.25 million) would give costs for reducing SO<sub>2</sub> emissions of about \$1500/ton (2.0 lb/ton) to \$2000/ton (2.5 lb/ton). Thus, consideration of lower capital costs for constructing an oversized plant (2700 tons/day) would significantly reduce the \$/ton of SO<sub>2</sub> removed costs for operations at 2000 tons/day.

It is also useful to determine how the cost of reducing emissions would affect the cost of acid production. In Appendix D of the October 31, 1997 application, data from Mulberry Phosphates, Inc. was presented and summarized. The data showed that the facility averaged 1599 tons/day of acid produced during the first nine months after a turnaround and 1558 tons/day of acid produced over an 18-month period without a 9-month turnaround. The cost of a nine-month turnaround in an 18-month cycle provided by Piney Point Phosphates in Table 4-1 of the permit application was \$649,300. It appears that the costs presented in Table 4-1 are high and, more importantly, do not account for the benefit of increased acid production with a turnaround. When the data are scaled to a 2000 ton/day plant, it appears that the increased acid production with a 9-month turnaround would be 26,578 tons in an 18-month period. Assuming a minimum value of \$20 per ton as claimed by Piney Point Phosphates in Table 4-1, the benefit of the increased production would be \$531,560. Thus, the real cost for the 9-month turnaround would be \$0.11 per ton of acid produced when based on the net cost of the turnaround (\$649,300 - \$531,560). This value is expected to be overly conservative. If the increased acid production allowed Piney Point Phosphates to either sell acid or avoid purchasing acid at market prices (\$35/ton according to Piney Point Phosphates), the benefit to Piney Point Phosphates for a 9-month turnaround would be \$930,230, which exceeds the cost of the turnaround. This is detailed in the attached calculations.

RE: Piney Point Phosphates  
November 26, 1997  
Page 3

### Case 2 - Gradual Catalyst Degradation

The table presented as Case 2 compares the monthly average SO<sub>2</sub> emission and H<sub>2</sub>SO<sub>4</sub> production values for the Mulberry facility (columns II and III) included in the PSD application, with values resulting from an assumed linear degradation of the catalyst. Columns IV and VI of the table show calculated linear increased SO<sub>2</sub> emissions (per ton of H<sub>2</sub>SO<sub>4</sub> produced) compared to calculated linear decreased production of H<sub>2</sub>SO<sub>4</sub>. Columns V and VII present the differential amounts of SO<sub>2</sub> emissions and acid production between the theoretical estimate and the actual Mulberry Station data. The differential SO<sub>2</sub> emissions results in assumed tons of emissions saved. The differential production of acid is the assumed production penalty (or if negative (-) surplus) resulting from lower SO<sub>2</sub> emissions. Columns VIII through XI present the same analysis as columns IV through VII, except these assume a nine-month turnaround is performed with resultant lower SO<sub>2</sub> emissions and higher production capability. Conservative end point values were taken from the Mulberry data and used for the linearization assessment. These conservative end points most likely overestimate the production penalty amounts. The calculation of \$/ton of SO<sub>2</sub> removed utilized the differential cost of acid (\$15.00 per ton) referenced in Table 4-1 of the PSD application. Also, the cost of \$649,300 for catalyst changeout referenced in Table 4-1 was included in the \$/ton of SO<sub>2</sub> removed calculation to conservatively estimate costs for the scenario with a nine-month turnaround. These analyses result in \$/ton of SO<sub>2</sub> removed values of \$1282/ton for the 18-month turnaround scenario and \$1201/ton for the 9-month turnaround scenario. The interesting point of the analysis is that costs are lower on a \$/ton of SO<sub>2</sub> removed basis when there is an additional turnaround. The lower cost is associated with significantly lower SO<sub>2</sub> emissions overall and substantially increased H<sub>2</sub>SO<sub>4</sub> production rates overall.

These analyses demonstrate that it is possible to optimize the plant's operations to maximize production while minimizing emissions. By comparison, the data presented in Appendix D of the October 31, 1997 application maximizes both production and emissions.

Should you have questions or need additional information, please feel free to contact either Michael J. Hober or Donald F. Elias at 732/968-9600.

cc: C. Fancy  
B. Beals  
G. Worley  
E. Porter  
D. Shepherd  
G. McCutchen  
W. Vatauk  
W. Corbin  
Project File: LPPPP



**CALCULATIONS OF COSTS FOR  
CASE 1 - FACILITY OVERDESIGN**

**Givens:**

- 1) Capital cost of new 2700 ton/day sulfuric acid plant = \$62,000,000 (per Piney Point)
- 2) Capital cost of new 2000 ton/day sulfuric acid plant = \$46,500,000 (per Hartman) or \$42,000,000 (per Monsanto)
- 3) Amortization period of 20 years and interest rate of 7% (based on USEPA Control Cost Manual) gives an annual cost factor = 0.094

**Calculations:**

a) Capital Cost for 2700 ton/day plant	\$62,000,000	\$62,000,000
Capital Cost for 2000 ton/day plant	<u>-46,500,000</u>	<u>-42,000,000</u>
Capital Cost Difference between 2700 and 2000 ton/day plant	\$15,500,000	\$20,000,000
Annual Cost Factor	<u>x 0.094</u>	<u>x 0.094</u>
Annual Capital Cost for building a 2700 ton/day plant and operating at 2000 tons/day	\$1,457,000	\$1,880,000

- b) Annual SO<sub>2</sub> emissions for 2000 ton/day plant with SO<sub>2</sub> emissions of 3.95 lb/ton (i.e., slightly less than NSPS limit):

$$\frac{2000 \text{ tons acid}}{\text{day}} \times \frac{3.95 \text{ lbs } SO_2}{\text{ton acid}} \times \frac{365 \text{ days}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \frac{1441.75 \text{ tons } SO_2}{\text{year}}$$

- c) Annual SO<sub>2</sub> emissions for 2700 ton/day plant producing 2000 ton/day with SO<sub>2</sub> emissions of 2.0 and 2.5 lb/ton:

$$\frac{2000 \text{ tons acid}}{\text{day}} \times \frac{2.0 \text{ lbs } SO_2}{\text{ton acid}} \times \frac{365 \text{ day}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \frac{730 \text{ tons } SO_2}{\text{year}}$$

$$\frac{2000 \text{ tons acid}}{\text{day}} \times \frac{2.5 \text{ lbs } SO_2}{\text{ton acid}} \times \frac{365 \text{ days}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \frac{912.5 \text{ tons } SO_2}{\text{year}}$$

## Calculations

## Page 2

- d) Tons/year of SO<sub>2</sub> removed for 2.0 lb/ton = 1442 - 730 = 712 tons/year of SO<sub>2</sub>  
 Tons/year of SO<sub>2</sub> removed for 2.5 lb/ton = 1442 - 913 = 529 tons/year of SO<sub>2</sub>
- e) Cost (\$/ton) of removed SO<sub>2</sub> for building a 2700 ton/day plant at \$62 million and operating at 2000 ton/day versus a 2000 ton/day plant costing \$46.5 million:
- @ 2.0 lbs SO<sub>2</sub>/ton H<sub>2</sub>SO<sub>4</sub> = (\$1,457,000)/(712) = \$2046/ton SO<sub>2</sub> removed  
 @ 2.5 lbs SO<sub>2</sub>/ton H<sub>2</sub>SO<sub>4</sub> = (\$1,457,000)/(529) = \$2754/ton SO<sub>2</sub> removed
- f) Cost (\$/ton) of removed SO<sub>2</sub> for building a 2700 ton/day plant at \$62 million and operating at 2000 ton/day versus a 2000 ton/day plant costing \$42 million:
- @ 2.0 lbs SO<sub>2</sub>/ton H<sub>2</sub>SO<sub>4</sub> = (\$1,880,000)/(712) = \$2640/ton SO<sub>2</sub> removed  
 @ 2.5 lbs SO<sub>2</sub>/ton H<sub>2</sub>SO<sub>4</sub> = (\$1,880,000)/(529) = \$3554/ton SO<sub>2</sub> removed

## OTHER METHODS FOR CALCULATING THE COST OF A 2700 TON/DAY FACILITY:

- g) "Six-Tenths" Rule:

$$\$46.5 \text{ million for a 2000 tpd plant (per Hartman)} \times \left(\frac{2700}{2000}\right)^{0.6} = \$55.7 \text{ million}$$

- h) Engineering News Review (ENR):

- Construction Cost Index for October, 1989 = 4658
- Construction Cost Index for October, 1997 = 5848
- Construction Cost Escalation Factor =  $\frac{5848}{4658} = 1.255$
- Escalated Construction Costs from 1989 to 1997 =  
 $\$44 \text{ million} \times 1.255 = \$55,220,000$

## Calculations

Page 3

## CALCULATIONS OF NET COST BENEFIT OF INCREASED ACID PRODUCTION DUE TO 9-MONTH TURNAROUND:

**Givens:**

- 1) Average daily acid production with a 9-month turnaround = 1599 tons acid/day  
Average daily acid production with an 18-month turnaround = 1558 tons acid/day
- 2) Cost of producing sulfuric acid = \$20 per ton  
Cost of purchasing sulfuric acid = \$35 per ton
- 3) Days in 18-month period = 551 days

**Calculations:**

- a)  $1599 \text{ tons acid/day} \times 551 \text{ days} = 881,049 \text{ tons acid with 9-month turnaround}$   
 $1558 \text{ tons acid/day} \times 551 \text{ days} = \underline{858,458 \text{ tons acid with 18-month turnaround}}$   
 $22,591 \text{ tons acid increased production}$   
for a 1700 ton/day plant
- b) Scaling the 18-month production rate and increase for a 2000 ton/day plant with a 9-month turnaround gives the following:

$$881,049 \text{ tons} \times \frac{2000 \text{ tons/day}}{1700 \text{ tons/day}} = 1,036,528 \text{ tons acid}$$

= total amount of acid produced in 18 months with  
2000 ton/day plant using 9-month turnaround

$$22,591 \text{ tons} \times \frac{2000 \text{ tons/day}}{1700 \text{ tons/day}} = 26,578 \text{ tons acid}$$

= increased production for 9-month turnaround

- c) Net cost benefit of 9-month turnaround for cost of producing acid is:

$$26,578 \text{ tons acid} \times \$20 \text{ per ton} = \$531,560 \text{ (benefit for additional acid produced)}$$

$$\frac{(\$649,300 - \$531,560)}{1,036,528 \text{ tons of acid}} = \$0.114/\text{ton of acid (additional cost of producing acid)}$$

Calculations

Page 4

d) Net cost benefit of 9-month turnaround for cost of purchasing or selling acid is:

$$26,578 \text{ tons acid} \times \$35 \text{ per ton} = \$930,230$$

**CASE 2 - GRADUAL CATALYST DEGRADATION**

Col. I	Col. II	Col. III	Col. IV	Col. V	Col. VI	Col. VII	Col. VIII	Col. IX	Col. X	Col. XI
Mulberry Station Monthly Data			Assuming Linear Catalyst Degradation				Assuming Linear Catalyst degradation and a 9 Month Catalyst Changeout			
Month	SO2 Monthly Av. Emissions (lb/ton) AVG	H2SO4 Production (ton/day) AVG	SO2 Theo. emission rate (lb/ton) AVG	Net SO2 Reduction tons M. Total	Theo H2SO4 Production Rate (tons/day) AVG	Reduction in H2SO4 Production M. Total	SO2 Theo. emission rate (lb/ton) AVG	Net SO2 Reduction tons M. Total	Theo H2SO4 Production Rate (tons/day) AVG	Reduction in H2SO4 Production M. Total
12/95	1.53	1545	1.47	0.731	1546	(-11)	1.47	0.731	1546	(-11)
1/96	3.18	1613	1.56	39.591	1541	2146	1.56	39.591	1541	2146
2/96	3.73	1625	1.67	48.415	1534	2643	1.67	48.415	1534	2643
3/96	3.71	1622	1.79	48.420	1527	2959	1.79	48.420	1527	2959
4/96	3.65	1613	1.91	40.825	1520	2703	1.91	40.825	1520	2703
5/96	3.90	1604	2.03	46.626	1512	2831	2.03	46.626	1512	2831
6/96	3.74	1577	2.15	37.960	1505	2159	2.15	37.960	1505	2159
7/96	3.75	1577	2.27	35.486	1498	2386	2.27	35.486	1498	2386
8/96	3.70	1590	2.40	29.166	1490	2800	2.40	29.166	1490	2800
9/96	3.48	1571	2.51	21.702	1483	2475	1.51	43.586	1544	764
10/96	3.91	1580	2.63	29.348	1476	3020	1.63	52.426	1537	1247
11/96	3.88	1546	2.75	26.373	1468	2331	1.75	49.737	1530	497
12/96	3.92	1519	2.87	24.701	1461	1801	1.87	48.425	1522	(-94)
01/97	3.95	1517	3.00	22.562	1454	1974	1.99	46.257	1515	79
02/97	4.01	1533	3.11	19.012	1447	2412	2.11	40.632	1508	701
03/97	3.96	1527	3.23	17.356	1440	2692	2.22	41.193	1501	796
04/97	3.95	1469	3.35	12.886	1432	1049	2.34	34.339	1494	(-724)
05/97	3.97	1490	3.47	11.578	1425	2026	2.46	34.852	1486	131
06/97	3.49	1424	3.59	1.461	1418	179	2.58	19.534	1479	(-1655)
07/97	3.62	1407	3.71	0.314	1411	(-109)	2.70	19.577	1472	(-1943)
08/97	3.73	1391	3.83	1.417	1403	(-377)	2.82	17.936	1464	(-2211)
09/97	3.91	1540	3.95	0.349	1396	4022	2.94	20.981	1457	2310
AVGs.	3.73	1540	2.72		1470		2.11		1507	
Net Totals				516		44,112		797		20,514

- 1) Net production loss with turnaround at end of period (tons): 44,112
- Net reduction in tons SO2: 516.282
- Cost in dollars per ton SO2 reduction<sup>1</sup>: \$1,282
  
- 2) Net production loss with 9 month turnaround (tons): 20,514
- Net reduction in tons SO2: 796.695
- Cost in dollars per ton SO2 reduction<sup>2</sup>: \$1,201

<sup>1</sup> Assumes a differential cost of \$15/ton for lost H2SO4 production  
<sup>2</sup> Includes Piney Point calculated cost of \$649,300 for catalyst changeout



# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

November 26, 1997

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

Mr. Robert Stewart, Sr. Vice President  
Operations and Administration  
Piney Point Phosphates, Inc.  
13300 US Highway North  
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC  
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

We have finished our completeness review of your application to modify the existing sulfuric acid plant in Palmetto. In addition to the requests we previously sent you please provide the following information:

1. An assessment of the degree of overdesign (such as the typical 10-15%) that will be included in the proposed project at the existing plant; i.e. the ultimate maximum production capability of the refurbished plant.
2. A complete ambient air quality impact analysis for SO<sub>2</sub> and NO<sub>2</sub> for all averaging times. Modeling receptors should extend out to 20 km from the facility. This analysis should include a background monitored concentration and all applicable sources within 50 km of the facility.
3. Based on the information obtained from the AAQS analysis, provide an update of the additional impacts analyses. These analyses address the impacts on soils, vegetation and visibility, and the impacts on air quality related values (AQRV) in the PSD Class I Chassahowitzka National Wilderness Area.

Attached are comments from Manatee County and the National Park Service (NPS) which they have asked us to consider in our analysis. We invite your review of their comments. It is our understanding that additional comments will be provided by NPS and EPA Region 4. These will be forwarded to you as soon as we receive them.

Although the application is incomplete, we are continuing our technical review. This will allow us to process it in a timely manner once we receive your responses. If you have any questions regarding the modeling, please call Cleve Holladay. Please call me regarding any other issues. Our telephone number is 850/488-1344.

Sincerely,

A. A. Linero, P.E. Administrator  
New Source Review Section

AAL/aal

Enclosures

cc: Brian Beals, EPA  
John Bunyak, NPS  
Bill Thomas, SWD  
Karen Collins, Manatee County  
Ivan Nance, PPPI  
John Koogler, P.E., K&A

*"Protect, Conserve and Manage Florida's Environment and Natural Resources"*

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- Addressee's Address
- Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  
 Mr. Robert Stewart  
 Operations & Administration  
 Piney Point Phosphates  
 13300 US Hwy N.  
 Palmetto Fl 34221

4a. Article Number: P 265 659 257  
 4b. Service Type:  
 Registered  
 Express Mail  
 Return Receipt for Merchandise  
 Certified  
 Insured  
 COD

5. Received By: (Print Name) 34221  
 6. Signature: (Addressee or Agent)  
 X [Signature]

7. Date of Delivery: 12/11/97  
 8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 257

US Postal Service  
**Receipt for Certified Mail**  
 No Insurance Coverage Provided.  
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Sent to	Robert Stewart
Street & Number	Piney Point
Post Office, State, & ZIP Code	Palmetto, FL
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	0010002-004-AC

PS Form 3800, April 1995



# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

November 26, 1997

## CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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Operations and Administration  
Piney Point Phosphates, Inc.  
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Attached are comments from Manatee County and the National Park Service (NPS) which they have asked us to consider in our analysis. We invite your review of their comments. It is our understanding that additional comments will be provided by NPS and EPA Region 4. These will be forwarded to you as soon as we receive them.

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Sincerely,

A. A. Liñero, P.E. Administrator  
New Source Review Section

AAL/aal

### Enclosures

cc: Brian Beals, EPA  
John Bunyak, NPS  
Bill Thomas, SWD  
Karen Collins, Manatee County  
Ivan Nance, PPPI  
John Koogler, P.E., K&A

*"Protect, Conserve and Manage Florida's Environment and Natural Resources"*



1. Cesium catalyst

Jennie Freeman



2. low pressure modern ■



**ENVIRONMENTAL ASSOCIATES INC.**

AIR • WATER • SOLID WASTE CONSULTANTS

• 22 East • Green Brook, New Jersey 08812

• (732) 968-9600

**LETTER OF TRANSMITTAL**

TO Mr. Al Linero  
FDEP- Bureau of Air Regulation  
111 South Magnolia, Suite 4  
Tallahassee, FL 32301

Date: 11-21-97 Proj. ID: LPPPP

WE ARE SENDING YOU:  Attached  Under separate cover  
 VIA:  1st Class Mail  Federal Express  Hand Delivery  Other \_\_\_\_\_  
 THE FOLLOWING ITEMS: a.m. delivery

Copies	Date	No.	Description
1	11-21-97		Manatee County Comments on October 31st Piney Point Phosphates Air Permit Application
1			DRAFT Copy of PSD Permit for Mississippi Phosphates Corp.

THESE ARE TRANSMITTED AS CHECKED BELOW:

For approval       For review and comment       Resubmit \_\_\_ copies for approval  
 For your use       Copies returned after loan       For signature  
 As requested       Returned for corrections

REMARKS Al,  
Here are the Manatee County comments on the  
October 31 Piney Point Phosphates application. Hope they  
help. Have a Happy Thanksgiving!  
You

COPY TO: \_\_\_\_\_ SIGNED: Ronald L. Linn

If enclosures are not as noted, kindly notify us at once.



# RTP ENVIRONMENTAL ASSOCIATES INC.®

AIR · WATER · SOLID WASTE CONSULTANTS

239 U.S. Highway 22 East  
 Green Brook, New Jersey 08812-1909  
 (rtpnj@rtp-environmental.com)

(732) 968-9600  
 Fax: (732) 968-9603

November 21, 1997

**RECEIVED**

NOV 24 1997

Mr. A. A. Linero, P.E.  
 Florida Dept. of Environmental Protection  
 2600 Blair Stone Road  
 Tallahassee, FL 32399-2400

BUREAU OF  
 AIR REGULATION

Re: Manatee Co. Comments on October 31st Piney Point Phosphates Air Permit Application

Dear Mr. Linero:

We have received the October 31, 1997 PSD permit application for rehabilitation and reactivation of the existing 2000 ton/day sulfuric acid plant at Piney Point Phosphates, Inc. (PPPI). The Manatee County Attorney's Office and Environmental Management Department would like to offer the following comments:

- (1) In Section 4.0 on page 19, the application states that *"In a typical plant with a double absorption system, the sulfur dioxide in the tail gas is approximately 4 pounds per ton of acid produced and the acid mist is approximately 0.15 pounds per ton of acid produced."* Since these emission levels are the New Source Performance Standards (NSPS) levels which are not to be exceeded, typical actual emissions must obviously be less. Compliance tests in the Department's Southwest District files for similar facilities show typical emission levels significantly less than NSPS limits for some plants. For example, the two U.S. Agri-Chemicals Corporation facilities in Bartow from 1990 to 1996 had the following emissions during recent compliance stack tests (production rate repermitted from 2200 to 3000 tons/day on July 10, 1995):

	Date	-----lb SO <sub>2</sub> /ton-----				-----lb SAM/ton-----				Prod. tons/day
		Run1	Run2	Run3	Avg.	Run1	Run2	Run3	Avg.	
SAP#1	11/19/96	2.03	2.01	2.04	2.03	0.046	0.041	0.038	0.042	2153
	12/06/95	1.78	1.75	1.66	1.73	0.025	0.024	0.024	0.024	2130
	04/03/95	2.39	2.36	2.31	2.36	0.032	0.031	0.028	0.030	2358
	11/29/94	1.78	1.83	1.90	1.84	0.042	0.031	0.026	0.033	1970
	??/??/93	----- 1993 stack test report not in permit files -----								
	11/13/92	1.85	1.85	1.85	1.85	0.054	0.052	0.062	0.056	2043
	11/12/91	2.56	2.57	2.51	2.55	0.036	0.040	0.038	0.038	2294
	09/20/90	1.71	1.66	1.74	1.70	0.025	0.033	0.030	0.029	2038
SAP#2	11/20/96	2.32	2.22	2.14	2.23	0.042	0.057	0.041	0.047	2222
	12/05/95	2.41	2.37	2.35	2.38	0.023	0.023	0.017	0.021	2258
	11/30/94	2.83	2.78	2.78	2.80	0.033	0.035	0.036	0.035	2364
	12/08/93	2.37	2.24	2.33	2.31	0.047	0.043	0.043	0.044	2178
	11/11/92	2.92	2.86	2.87	2.88	0.024	0.015	0.042	0.027	2260
	11/14/91	2.77	2.73	2.80	2.77	0.046	0.049	0.048	0.048	2077
	09/18/90	2.52	2.42	2.52	2.49	0.056	0.053	0.056	0.055	2152

Mr. A. A. Linero, P.E.  
November 21, 1997  
Page 2

From these data, it appears that emissions significantly lower than NSPS limits can be consistently achieved at sulfuric acid plants with throughputs around 2000 tons/day.

- (2) Only control technologies included in the 1985 NSPS review document (EPA-450/3-85-012) were considered in detail in the BACT analysis for SO<sub>2</sub> and SAM as noted in Section 4.2 on the bottom of page 20. The 1990 USEPA Draft New Source Review Workshop Manual requires that all available control technologies be evaluated: *"The control alternatives should include not only existing controls for the source category in question, but also (through technology transfer) controls applied to similar source categories and gas streams, and innovative control technologies."* Please evaluate other types of control technologies, such as scrubbers using hydrogen peroxide or sodium sulfite (Wellman-Lord process), which could be used for control of acid gas emissions at sulfuric acid plants as described in the 1990 Air & Waste Management Association's Air Pollution Engineering Manual.

These other scrubbing technologies were discussed only briefly in Section 4.2.1.4 on page 29. The application states that sodium sulfite *"...scrubbing is not considered a demonstrated control alternative."* For other scrubbing liquors, it is stated that *"Without going through a detailed cost analysis to evaluate these scrubbing technologies, it can be stated that the capital investment cost and many of the direct and indirect annual costs will be very similar to the costs incurred with ammonia scrubbing. Because of the higher chemical costs and/or waste disposal costs, these other technologies are expected to be more costly than ammonia scrubbing."*

Scrubbing with hydrogen peroxide has the advantage of generating no by-product or purge streams since the H<sub>2</sub>SO<sub>4</sub> generated can be returned to the process. Since the hydrogen peroxide scrubbing technology can be licensed from Monsanto, the vendor of the sulfuric acid plant, please have Monsanto provide cost estimates, certified by a professional engineer, on such scrubbing systems and their control efficiencies.

In addition, we have obtained a capital equipment quote from a nationally known air pollution control equipment vendor of less than \$1 million to fabricate and install a fluidized bed limestone scrubber system to provide up to 95% control of SO<sub>2</sub> emissions for the flow characteristics given in the Permit Application. This option was not considered or evaluated in the BACT analyses contained in the Permit Application.

- (3) In Section 4.2.1.1 on page 22, it is stated that *"in an effort to optimize plant performance, most plants in the fertilizer industry tend to run at SO<sub>2</sub> emission levels close to the permitted rate."* On pages 22 and 23, recent improvements in plant design, operating changes, and catalyst performance are discussed. These changes, as noted on page 23, *"...have allowed sulfur burning sulfuric acid plants to operate much more efficiently (i.e., produce more acid) and still operate in compliance with the NSPS limit"*

Mr. A. A. Linero, P.E.

November 21, 1997

Page 3

*for sulfur dioxide of 4.0 pounds per ton of acid. Further on page 23, the application states that "If maximum sulfuric acid production is the motive of the operator, as will be the case with PPP, ...[t]he sulfur feed rate to the burner will then be increased until either the sulfuric acid production rate limited by permit is reached or the sulfur dioxide emission rate limited by permit is reached."*

Please quantify the advantages/disadvantages for the plant to operate at lower lb/ton rates. Also, these statements appear to suggest that improvements in sulfuric acid plant and catalyst designs could have reduced lb/ton SO<sub>2</sub> emissions had production limits before any such improvements been maintained. This hypothesis is supported by the significant number of sulfuric acid plants in Florida which have been re-permitted at higher production rates during the past decade without major equipment modifications. Please provide detailed information, including costs, for designing and/or operating a plant which will consistently achieve SO<sub>2</sub> emission rates less than 3.0 and 3.5 lbs/ton.

- (4) In Section 4.2.1.1 on page 24, it is stated that *"...immediately after turnaround the sulfur dioxide emissions are in the range of 3.25 pounds per ton of acid produced and approach 4.0 pounds per ton of acid (daily average) within approximately two months after turnaround."* This is in direct contradiction to information provided by USEPA in the NSPS Review document (EPA-450/3-85-012) in which USEPA evaluated emissions data from numerous sulfuric acid plants. USEPA cited the example of an 1800 ton/day dual-absorption facility that showed initial SO<sub>2</sub> emissions of 0.93 lbs/ton, gradually increasing to 2.95 lbs/ton after 19 months and 3.2 lbs/ton after 30 months. This and similar data from other facilities led USEPA to the conclusion that *"Thus, even though a large percentage of the compliance test results are significantly less than the NSPS of 4 lbs/ton, it appears that SO<sub>2</sub> emissions tend to rise towards the control limit as the plant and catalyst age."*

The current catalyst activity information in the most recent permit application also contradicts information provided by Pradeep Raval to John Reynolds for this project (see attached February 1, 1996 memorandum), which shows SO<sub>2</sub> emissions of 2.7 lb/ton after turnaround, increasing relatively linearly to 3.7 lb/ton after 18 months. Also, information obtained from Farmland Hydro (also attached) shows SO<sub>2</sub> emissions increasing linearly from about 2.0 lb/ton after a turnaround to around 3 lb/ton about two to three months before the next turnaround. This inconsistency has serious implications with regards to the cost analyses for additional plant turnarounds as presented in Table 4-1. Please justify with data from Piney Point, if possible, the assumption that very little SO<sub>2</sub> reduction occurs with plant turnaround.

As noted above, the Mulberry facility data presented in Appendix D does not conform to previous information provided on catalyst degradation and plant performance. This would lead one to believe that the catalyst is being over-saturated at the Mulberry

Mr. A. A. Linero, P.E.

November 21, 1997

Page 4

facility and the optimum production of acid relative to SO<sub>2</sub> emissions at the Mulberry facility lies somewhere between 1545 and 1613 tons/day (on average). If the Mulberry facility were to have been operated at slightly lower production rates consistent with previous information (i.e., SO<sub>2</sub> emissions linearly increase and acid production linearly decreases over time between turnarounds), calculations based on the Mulberry data show that SO<sub>2</sub> emissions could have been reduced by 516 tons over the 21.5 month period with an H<sub>2</sub>SO<sub>4</sub> production loss of 44,112 tons -- a cost of \$661,680 (at \$15/ton differential cost). This would result in a control cost of \$1282/ton of SO<sub>2</sub> as compared to operating the Mulberry facility at the maximum production rate allowed by the NSPS emission limit. Adding one additional turnaround during the 21.5 month period would have reduced SO<sub>2</sub> emissions by 797 tons with an H<sub>2</sub>SO<sub>4</sub> production loss of 20,514 tons -- a cost of \$307,710 (again, at \$15/ton differential cost). Because of the savings accrued by the extra H<sub>2</sub>SO<sub>4</sub> production due to the additional turnaround, the control cost is only \$1200/ton of SO<sub>2</sub> as compared to operating the Mulberry facility at the maximum production rate allowed by the NSPS emission limit. This includes the additional cost of \$649,300 given by PPPI for the turnaround cycle.

- (5) Figures 4-1 and 4-2 do not appear to directly correlate to data presented in Appendix D. Were the data "smoothed" or averaged? Please explain how and why they were manipulated. Also, please explain why daily production exceeded the permitted production limit of 1700 tons/day during 26 days of the dataset and what enforcement actions resulted.
- (6) Table 4-1 presents the projected costs to replace facility catalysts (turnaround) on a nine month schedule. Please provide the following information:
  - (a) You provide an auxiliary steam cost by an auxiliary boiler of 1,350 gal/hour fuel at 24 hours/day. Please provide the steam requirements for the phosphoric acid and diammonium phosphate plants and detail whether continuous firing of the boiler is necessary.
  - (b) What percent of the daily output of the sulfuric acid (2000 ton/day) is utilized for the fertilizer plant?
  - (c) Does the phosphoric acid/diammonium phosphate plant have regular maintenance intervals that can be coincided with the additional downtime of the sulfuric acid plant? What are typical turnaround times for these facilities?
  - (d) Is it not true that water treatments would be necessary for the process steam regardless if generated in a boiler or in the sulfuric acid plant? If so, why are additional costs added to Table 4-1?
  - (e) The costs in Table 4-1 project facility costs for an additional nine-month plant turnaround. The text indicates that the only positive benefit is approximately 25 tons of SO<sub>2</sub> emissions per year. Based on the data provided in Appendix D, it appears that the facility would experience a significant H<sub>2</sub>SO<sub>4</sub> production increase that would partially offset the cost of the turnaround. Based on this data, the

Mr. A. A. Linero, P.E.

November 21, 1997

Page 5

Mulberry facility would have produced an additional 22,591 tons of sulfuric acid in 18 months with a nine-month turnaround. Given that the data were collected when the facility was operating under Air Operating Permit number AO53-198769 with a limitation of 1700 tons/day of 100% sulfuric acid, the additional production would need to be scaled relative to the 2000 tons/day Piney Point facility. Therefore, the expected increase in production at the Piney Point facility would be 26,578 tons, resulting in an offsetting benefit of \$531,560 for an  $H_2SO_4$  cost of \$20 per ton. If you assume a cost of \$35 per ton (the average cost of purchased acid), the cost benefit would be \$930,230. Please incorporate these benefits in your BACT figures. The calculations for the \$20 per ton figure are attached.

- (f) Table 4-1 includes a cost differential of \$255,000 to purchase 2000 tons/day of sulfuric acid over the 8.5 day turnaround.
- (i) Does the phosphoric acid/diammonium phosphate plant fully utilize 2000 tons/day of 100% sulfuric acid? If so, please provide production data to demonstrate this.
  - (ii) Wouldn't it be more cost effective to install storage vessel(s) to store excess sulfuric acid prior to shutdown than purchase material on the open market? If not, please provide a cost analysis amortized over the appropriate number of years demonstrating that the costs of storage tanks would be significantly more than \$255,000 every nine months during the same period.
  - (iii) Wouldn't the current two-5000 ton acid storage tanks be available for use during turnaround? Therefore, you would not need a full 8.5 days of replacement acid as these tanks could be refilled with excess acid as available or at least at favorable pricing.
- (7) Why does the data presented in Appendix D, dated from December 20, 1995 through January 2, 1996, have significantly lower lb/ton values than the rest of the data set? What occurred on January 3, 1996 that doubled  $SO_2$  emissions (on average)?
- (8) As mentioned in comment (4) above, the data presented in Appendix D does not demonstrate the expected gradual increase in  $SO_2$  emissions per ton of  $H_2SO_4$  produced as the catalyst degrades. As noted in comment (7) above, low initial  $SO_2$  emissions (1.53 lbs/ton on average) were observed for a 13-day period immediately after the plant turnaround, but abruptly increased by a factor of 2 (3.18 lbs/ton on average) after a shutdown of one day.  $SO_2$  emissions then averaged between 3.5-4.0 lbs/ton for the remainder of the 18-month data period regardless of the production output of the facility.  $SO_2$  emissions are expected to be directly proportional to the ability of the catalyst to convert  $SO_2$  to  $SO_3$ . Over-saturating the catalyst with  $SO_2$  may slightly increase production of  $H_2SO_4$ , but at a cost of nearly 2 to 2.5 times the emissions of  $SO_2$ . Please provide the following:

Mr. A. A. Linero, P.E.

November 21, 1997

Page 6

- (a) What is the theoretical limit of SO<sub>2</sub> conversion in the catalyst system?
  - (b) What is the projected H<sub>2</sub>SO<sub>4</sub> production at the theoretical SO<sub>2</sub> limit?
  - (c) What is the typical SO<sub>2</sub> concentration fed to the catalyst, and what is the ratio to the theoretical limit?
  - (d) Can the facility vary the inlet SO<sub>2</sub> concentration to the catalyst?
  - (e) Please provide corresponding inlet SO<sub>2</sub> concentrations to the catalyst for the data period in Appendix D.
  - (f) What are the costs involved in operating the plant at closer to the theoretical limit of SO<sub>2</sub>?
  - (g) What are the costs in number 4 (above) relative to the expected decrease in SO<sub>2</sub> emissions?
  - (h) Is it possible to optimize H<sub>2</sub>SO<sub>4</sub> production relative to SO<sub>2</sub> emissions (i.e., maximize production relative to minimum emissions)? If not, please provide detailed analyses demonstrating why.
- (9) In Section 4.2.1.1 on pages 24-25, the application states that a nine-month turnaround would result in a reduction of 38 tons of SO<sub>2</sub>. However, a value of 25 tons per year was used to determine the cost effectiveness of such an additional turnaround. This is not correct. The total increase in cost for the additional turnaround is relative to an 18-month period, thus, the total tons removed over that period should be used. Therefore, the value of 38 tons should have been used in the analysis instead of 25 tons. In addition, while reviewing the data summary at the end of Appendix D, it appears that the actual tons of SO<sub>2</sub> removed is 45 tons. The analysis by PPPI did not account for days the facility did not operate (268 days of operation the first nine months and 539 days of total operation in 18 months). Once again, scaling this value relative to a 2000 ton/day facility versus the 1700 ton/day Mulberry facility from which the data is derived increases the value to 53 tons. Therefore, even using the data contained in Appendix D, the BACT analysis should utilize 53 tons instead of 25 tons.
- (10) In Section 4.2.1.3 on pages 27-28, the application states that the by-product of an ammonia scrubber (a 20% solution of ammonia sulfate) has the potential to be incorporated directly into either the phosphoric acid plant or the diammonium phosphate plant. It is concluded that the ammonium sulfate must be wasted because it cannot be incorporated into the diammonium phosphate plant without further consideration of the phosphoric acid plant.
- (a) Please provide further detailed analyses of why the ammonium sulfate solution cannot be incorporated directly into the diammonium phosphate plant and quantify the effect on the fertilizer nitrogen and P<sub>2</sub>O<sub>5</sub> contents.
  - (b) Please provide further detailed analyses of why the ammonium sulfate solution cannot be incorporated directly into the phosphoric acid plant and quantify the effect on production and P<sub>2</sub>O<sub>5</sub> loss.



Mr. A. A. Linero, P.E.  
November 21, 1997  
Page 7

- (c) Also, it is our understanding that Mr. Len Friedman has a patent on a process to allow such waste to be used at the facility. Please provide any information on the use of such a process at the subject facility.
- (11) Please provide vendor quotes or other verifiable information that an ammonia scrubber system would cost \$3.5 million and achieve a control efficiency of only 50% as assumed in Section 4.2.1.3 on page 28 (also see comment (2) above). Provide detailed cost analyses on costs for waste disposal, waste treatment, and utilities as shown on Table 4-2. Also, the capital recovery costs in Table 4-2 should be revised for 20 years at 7% interest as recommended by recent USEPA guidance.
- (12) Please provide any data supporting the statement that the sulfuric acid plant reliability would be reduced as a result of an add-on scrubber.
- (13) The modeling analyses in Section 5.0 on pages 41-44 illustrate modeling analyses where netting analyses are performed by comparing existing potential emissions to future potential emissions (hence all impacts are zero). This conflicts with USEPA modeling guidance in that existing actual emissions are to be considered in such a netting analysis (see attached January 10, 1990 letter from USEPA Region IV and May 24, 1995 letter from the Department concerning the proposed 2700 ton/day sulfuric acid plant at the same facility). Therefore, please provide a modeling analysis consistent with the facility netting analysis in Section 3.1.

If you have any questions, please feel free to contact me at (732) 968-9600.

Sincerely,

RTP ENVIRONMENTAL ASSOCIATES, INC.®



Donald F. Elias  
Principal

cc: C.Fancy  
J.Steinsnyder, Esq.  
D.Deer, Esq.  
K.Collins-Fleming  
M.Hober  
W.Corbin  
LPPPP Proj.File

CALCULATIONS - PINEY POINT PHOSPHATES

Based on data provided in Appendix D and the text of *Report in Support of a PSD Permit Application for Piney Point Phosphates, Inc.*, the following information was utilized to calculate the production increase resulting from a nine-month turnaround.

- (a) Initial nine-month data period = 275 days (Appendix D)
- (b) Average production during initial nine-month period = 1599 tons of acid per day (Appendix D)
- (c) 18-month data period = 551 days (Appendix D)
- (d) Average production during full 18-month period = 1558 tons of acid per day
- (e) Cost of producing H<sub>2</sub>SO<sub>4</sub> = \$20.00 per ton
- (f) Permitted production at Mulberry Phosphates, Inc. = 1700 tons of acid per day (AO53-198789)
- (g) Proposed production at Piney Point Phosphates = 2000 tons of acid per day

CALCULATIONS:

1. Additional Production Total:

$$\frac{1599 \text{ tons}}{\text{day}} \times 551 \text{ days} = 881,049 \text{ tons/18-month period}$$

$$\frac{1558 \text{ tons}}{\text{day}} \times 551 \text{ days} = 858,458 \text{ tons/18-month period}$$

---


$$\text{Difference} = 22,591 \text{ tons/18-month period}$$

2. Production Scale Up to Piney Point's Capability:

$$\frac{22,591 \text{ tons}}{1700 \text{ tons/day}} :: \frac{X}{2000 \text{ tons/day}}$$

$$X = 26,578 \text{ tons H}_2\text{SO}_4 \text{ produced}$$

3. Increased Revenue Calculation:

$$26,578 \text{ tons H}_2\text{SO}_4 \text{ at } \$20.00 \text{ per ton} = \$531,560$$

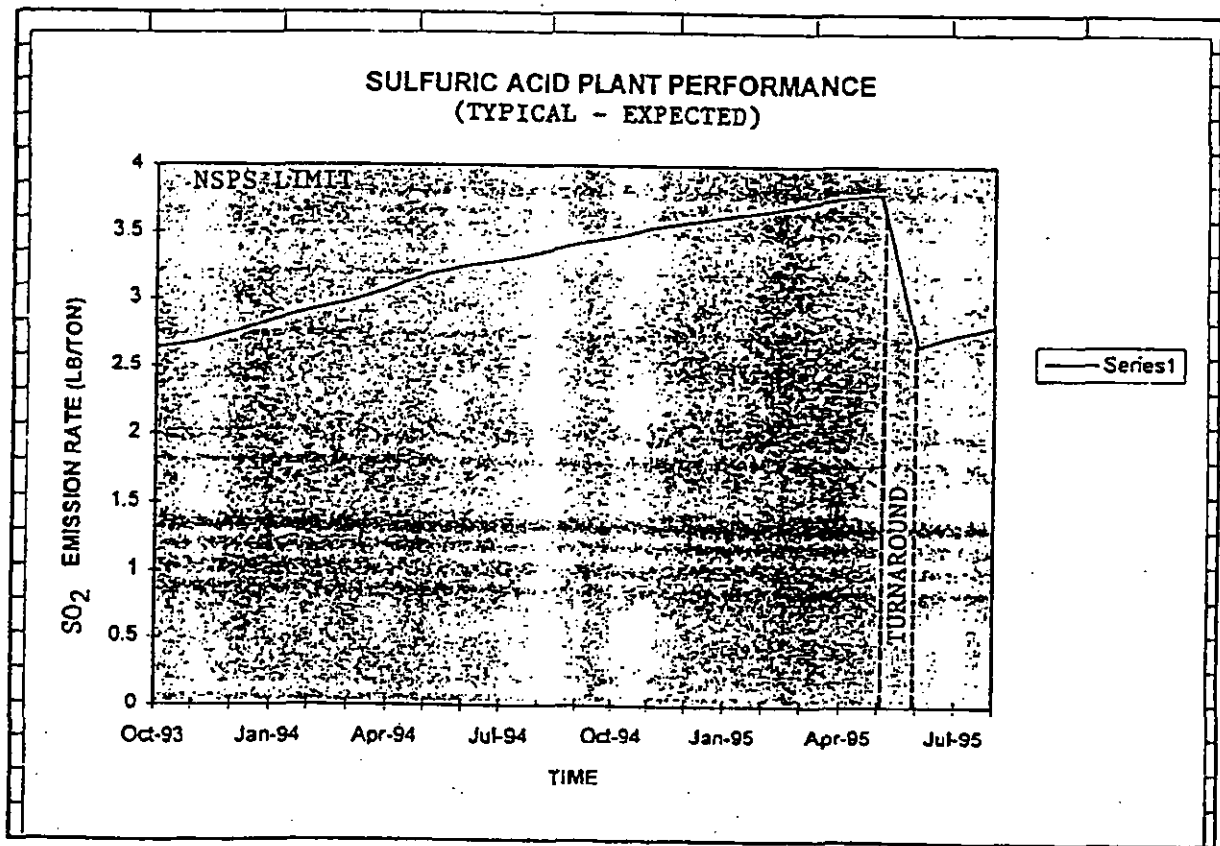
dep NB

MEMORANDUM

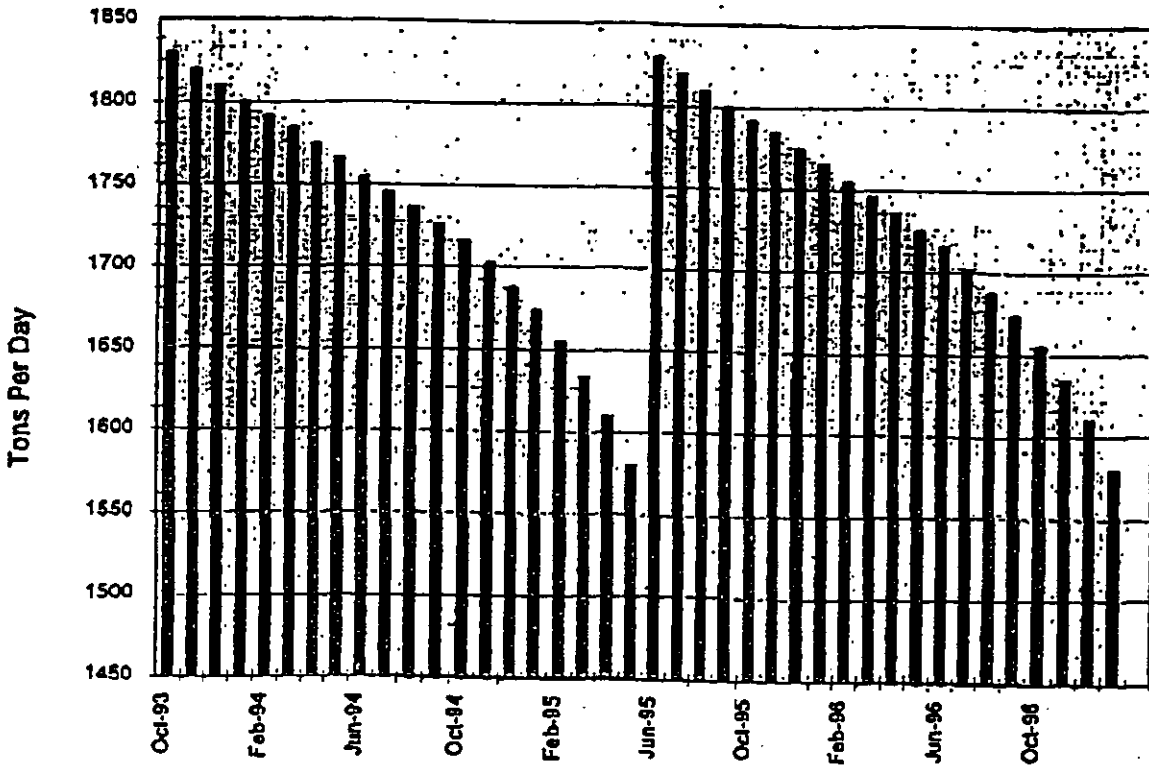
TO: John Reynolds, FDEP  
FROM: Pradeep Raval  
DATE: February 1, 1996  
SUBJECT: Sulfuric Acid Plant Performance Information

This is a follow up to our conversation yesterday regarding the variation in performance/emissions of a typical sulfuric acid plant relative to plant turnarounds. The attached graph shows the typical performance expected from a sulfuric acid plant.

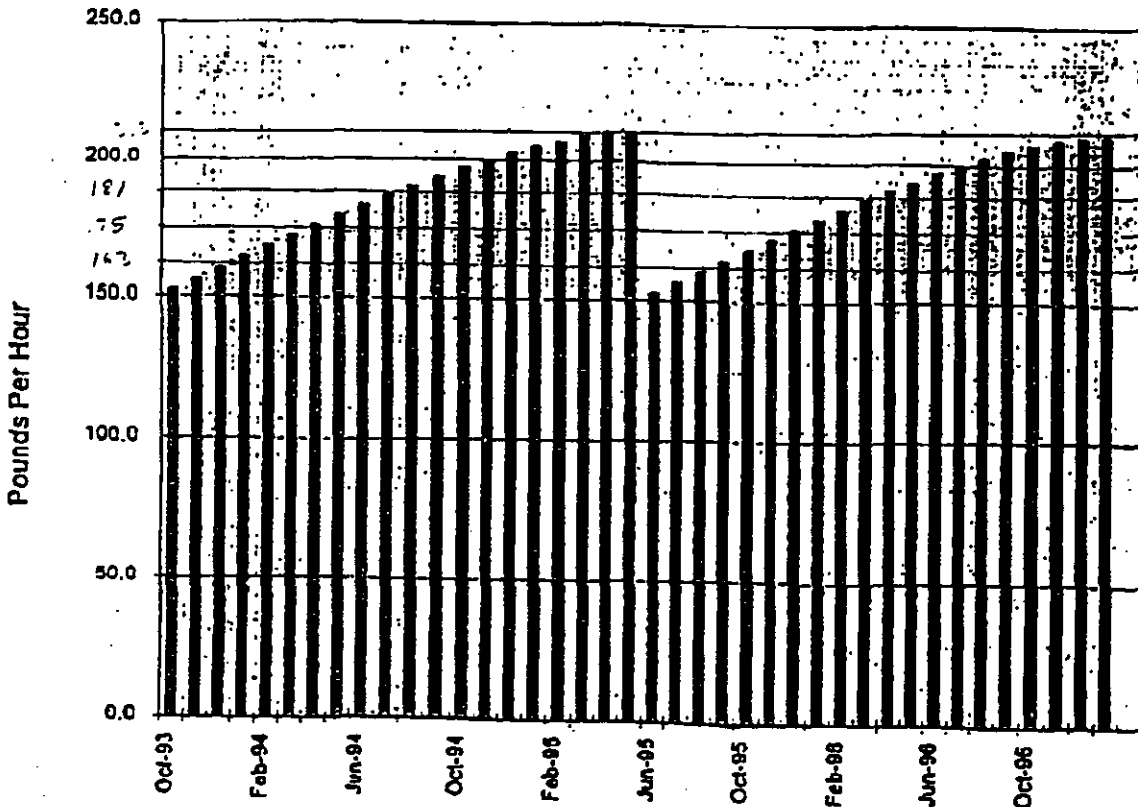
par.



TYPICAL SULFURIC ACID PLANT  
DAILY PRODUCTION OVER TIME (20 month TA schedule)



TYPICAL SULFURIC ACID PLANT  
SO2 EMISSIONS (20 month TA schedule)





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.  
ATLANTA, GEORGIA 30365

JAN 10 1990

4APT-APB-cdw

Ms. Patricia G. Adams  
Planner  
Bureau of Air Quality Management  
Florida Department of Environmental  
Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

RE: Royster Phosphates, Inc. (PSD-FL-144)

Dear Ms. Adams:

This is to acknowledge receipt of the permit application for the above referenced source, dated December 6, 1989. As discussed between Mr. Barry Andrews of FDER and Mr. Gregg Worley of my staff on January 8, 1990, we have the following comment.

In determining the "actual" emissions of the existing sulfuric acid plant, the maximum production rate and emission rates which occurred during the previous five years were used. The "actual" emissions, however, should be an average of the previous two years operating data unless another period is more representative. Therefore, it is likely that the actual emissions from the existing facility are in fact lower than the maximum numbers presented by the source. Consequently, the source may also be subject to PSD review for NO<sub>x</sub>. In any case the greater changes in emissions should be included in the modelling.

By letter dated December 14, 1989, we transmitted to your office a copy of the First Circuit Court of Appeals upholding the "actual-to-potential" applicability rules of the PSD requirements. Please refer to this ruling as a basis for our comments.

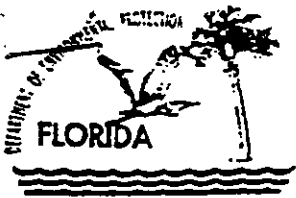
Thank you for the opportunity to review this package. Any questions or comments may be directed to Mr. Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

*Bruce P. Miller*

Bruce P. Miller, Chief  
Air Programs Branch  
Air, Pesticides, and Toxics  
Management Division

*J. Tillman*  
*K. Andrews*  
*C. Tiedge*  
*W. H. [unclear]*  
*HP/ET*



# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

May 24, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. F. Ivan Nance, Environmental/Technical Manager  
Piney Point Phosphates, Incorporated  
13300 U. S. Highway 41 North  
Palmetto, Florida 34221

Dear Mr. Nance:

Subject: Permit No. AC 41-173305 & PSD-FL-144

The Department has reviewed your application for a construction permit to replace the existing sulfuric acid plant with a new plant. We need more information in order to continue processing this application. Please complete the application by providing the information requested below:

1. Your response to the attached comments from the National Park Service.
2. The annual area of significant impact modeling should be based on the difference between the proposed emissions and the actual annual hourly emissions. Please redo the annual area of significant impact modeling using the correct inputs.

If you have any questions, please call John Reynolds, permit engineer, or Cleve Holladay, meteorologist, at 904-488-1344, or send your written comments to me at the above address.

Sincerely,

A. A. Linero, P.E.  
Administrator  
New Source Review Section

AL/ch/kt

Enclosure

cc: John B. Koogler, Koogler and Associates

OPTIONAL FORM 99 (7-90)

**FAX TRANSMITTAL**

# of pages **6**

To <i>Bill Corbin</i>	From <i>Don Shepherd</i>
Dept./Agency <i>RTP Assoc</i>	Phone # <i>303-969-2025</i>
Fax # <i>732-968-9698</i>	Fax # <i>303-969-2822</i>

NSN 7540-01-317-7368      5098-101      GENERAL SERVICES ADMINISTRATION

**STATE OF MISSISSIPPI  
AIR POLLUTION CONTROL  
PERMIT  
AND PREVENTION OF SIGNIFICANT  
DETERIORATION AUTHORITY  
TO CONSTRUCT AIR EMISSIONS EQUIPMENT  
THIS CERTIFIES THAT**

**Mississippi Phosphates Corporation  
601 Highway 611  
Pascagoula, Mississippi**

has been granted permission to construct air emissions equipment to comply with emission limitations, monitoring requirements and other conditions set forth herein. This permit is issued in accordance with the provisions of the Mississippi Air and Water Pollution Control Law (Section 49-17-1 et. seq., Mississippi Code of 1972), and the regulations and standards adopted and promulgated thereunder and under authority granted by the Environmental Protection Agency under 40 CFR 52.01 and 52.21.

Issuance Date: \_\_\_\_\_

**MISSISSIPPI ENVIRONMENTAL QUALITY PERMIT BOARD**

**MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY**

Permit No. **1280-00044**

**DRAFT**

Page 2 of 6  
Permit No. 1280-00044

**PART I  
GENERAL CONDITIONS**

1. Any activities not identified in the application are not authorized by this permit.
2. All air pollution control facilities shall be designed and constructed such as to allow proper operation and maintenance of the facilities.
3. The necessary facilities shall be constructed so that solids removed in the course of control of air emissions may be disposed of in a manner such as to prevent the solids from becoming windborne and to prevent the materials from entering State waters without the proper environmental permits.
4. The air pollution control facilities shall be constructed such that diversion from or bypass of collection and control facilities is not needed except as provided for in Regulation APC-S-1, "Air Emission Regulations for the Prevention, Abatement, and Control of Air Contaminants", Section 10.
5. The construction of facilities shall be performed in such a manner as to reduce both point source and fugitive dust emissions to a minimum.
6. The permittee shall allow the Mississippi Department of Environmental Quality Office of Pollution Control and the Mississippi Environmental Quality Permit Board and/or their representatives upon presentation of credentials:
  - a. To enter upon the permittee's premises where an air emission source is located or in which any records are required to be kept under the terms and conditions of this permit; and
  - b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any air emissions.
7. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to:
  - a. Violation of any terms or conditions of this permit.
  - b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts, or
  - c. A change in any condition that requires either a temporary or permanent reduction or elimination of authorized air emissions.



Page 3 of 6

Permit No. 1280-00044

8. Except for data determined to be confidential under the Mississippi Air & Water Pollution Control Law, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Mississippi Department of Environmental Quality Office of Pollution Control.
9. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
10. Nothing herein contained shall be construed as releasing the permittee from any liability for damage to persons or property by reason of the installation, maintenance, or operation of the air cleaning facility, or from compliance with the applicable statutes of the State, or with local laws, regulations, or ordinances.
11. This permit may only be transferred upon approval of the Mississippi Environmental Quality Permit Board.
12. This permit is for air pollution control purposes only.
13. Approval to construct will expire should construction not begin within eighteen (18) months of the issuance of this permit, or should construction be suspended for eighteen (18) months.
14. Prior to startup of air emissions equipment at this source, the permittee must submit certification that construction was completed in accordance with the approved plans and specifications.

Page 4 of 6  
Permit No. 1280-00044

**PART II**  
**EMISSION LIMITATIONS AND MONITORING REQUIREMENTS**

Beginning **ISSUANCE DATE**, the permittee is authorized to construct air emissions equipment for the emission of air contaminants from Emission Point AA-001, the No. 2 Sulfuric Acid Plant.

The air emissions equipment shall be constructed to comply with the emission limitations and monitoring requirements specified below.

**EMISSION LIMITATIONS**

<b>Sulfur Dioxide</b>	<b>3.25 lbs/ton, not to exceed 231.9 lbs/hr and 1015.6 tons/year, as determined by EPA Reference Method 8, 40 CFR 60, Appendix A.</b>
<b>Sulfuric Acid Mist</b>	<b>0.15 lbs/ton, not to exceed 10.7 lbs/hr and 46.88 tons/year, as determined by EPA Reference Method 8, 40 CFR 60, Appendix A.</b>
<b>Opacity</b>	<b>10% as determined by EPA Reference Method 9, 40 CFR 60, Appendix A.</b>

All test methods specified above shall be those versions, or their approved equivalents, which are in effect **ISSUANCE DATE**.

**MONITORING REQUIREMENTS**

The permittee shall install, calibrate and maintain a continuous monitoring system for the measurement of sulfur dioxide. A conversion factor shall be established for the purpose of converting monitoring data into units of the applicable standard. The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods and calculating the appropriate conversion factor for each eight-hour period.

Page 5 of 6

Permit No. 1280-00044

**PART II**  
**EMISSION LIMITATIONS AND MONITORING REQUIREMENTS**

Beginning **ISSUANCE DATE**, the permittee is authorized to construct air emissions equipment for the emission of air contaminants from Emission Point AA-017, the No. 3 Sulfuric Acid Plant.

The air emissions equipment shall be constructed to comply with the emission limitations and monitoring requirements specified below.

**EMISSION LIMITATIONS**

Sulfur Dioxide	3.25 lbs/ton, not to exceed 231.9 lbs/hr and 1015.6 tons/year, as determined by EPA Test Method 8, 40 CFR 60, Appendix A.
Sulfuric Acid Mist	0.15 lbs/ton, not to exceed 10.7 lbs/hr and 46.88 tons/year, as determined by EPA Test Method 8, 40 CFR 60, Appendix A.
Opacity	10% as determined by EPA Test Method 9, 40 CFR 60, Appendix A.

All test methods specified above shall be those versions, or their approved equivalents, which are in effect **ISSUANCE DATE**.

**MONITORING REQUIREMENTS**

The permittee shall install, calibrate and maintain a continuous monitoring system for the measurement of sulfur dioxide. A conversion factor shall be established for the purpose of converting monitoring data into units of the applicable standard. The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods and calculating the appropriate conversion factor for each eight-hour period.

Page 6 of 6  
Permit No. 1280-00044

**PART III  
OTHER REQUIREMENTS**

- 1) **The permittee is limited to a production total of 1,250,000 tons of sulfuric acid per rolling 365 day average.**
- 2) **The permittee shall maintain records showing the production rate for each day and for each consecutive 365-day period. All records shall be maintained on site by the permittee for a period of five (5) years following the date of such record.**
- 3) **The permittee shall submit semi-annual reports summarizing the total production rate for both sulfuric acid plant No. 2 and plant No. 3 for each consecutive 365-day period. The report shall be submitted no later than 30 days from the semi-annual periods ending June 30 and December 30.**
- 4) **For Emission Points AA-001 and AA-017, within 60 days of achieving the maximum production rate but no later than 180 days after the modifications, the permittee shall demonstrate compliance with the SO<sub>2</sub> and Sulfuric Acid Mist emission limitations by stack testing in accordance with EPA Reference Method 8 and submittal of a stack test report.**

**A pretest conference at least thirty (30) days prior to the scheduled test date is needed to ensure that all test methods and procedures are acceptable to the Office of Pollution Control. Also, the Office of Pollution Control must be notified prior to the scheduled test date. At least TEN (10) DAYS notice should be given so that an observer can be scheduled to witness the test.**

- 5) **The permittee shall submit excess emissions and monitoring systems performance reports and/or summary report form on a quarterly basis.**
- 6) **Emission Points AA-001 and AA-017, the No.2 and No. 3 Sulfuric Acid Plants, are subject to the New Source Performance Standards for Sulfuric Acid Plants as described in 40 CFR 60, Subpart H and the General Provisions as described in 40 CFR 60, Subpart A.**
- 7) **The permittee must provide in writing the date that the maximum production rates are reached. The dates must be provided no later than ten days after the actual date.**



**U.S. FISH & WILDLIFE SERVICE  
AIR QUALITY BRANCH**

P.O. BOX 25287, Denver, CO 80225-0287

**FACSIMILE COVER SHEET**

*Date: Nov. 24, 1997*

*Telephone: (303) 969-2617*

*Fax: (303) 969-2822*

*To: Al Linero*

*From: Ellen Porter*

*Subject: Piney Point Phosphates. Our BACT comments attached. If you have questions, please call Don Shepherd at (303) 969-2075.*

*Number of Pages: 8  
(Including this cover sheet)*

*Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80233*

**NOTE**

**To:** Al Linero

**From:** Don Shepherd, Air Resources Division, National Park Service

**Subject:** Piney Point Phosphates

**Date:** November 20, 1997

As a result of the rebuilding of the facility, proposed emissions from the acid plant would be: sulfur dioxide (SO<sub>2</sub>) 1460 tons per year (TPY); sulfuric acid mist (SAM) 54.8 TPY; and nitrogen oxides (NO<sub>x</sub>) 43.8 TPY.

**Control Technology Analysis**

**Sulfur Dioxide:** Sulfur dioxide emissions from the acid plant will be controlled by the dual absorption process. The dual absorption towers are proposed to control SO<sub>2</sub> emissions to a level of 4.0 pounds per ton (lb/ton) of 100 percent acid produced. This emission level is equal to that adopted by the Environmental Protection Agency (EPA) in 1971 as the New Source Performance Standard (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H). However, it should be noted that over 12 years have elapsed since the NSPS was last reviewed, and 26 years since it was promulgated. Furthermore, according to EPA policy, the NSPS is merely the minimum level of control that is acceptable as a floor for a proper, "top-down" BACT analysis; the top, or beginning point of the BACT analysis is to represent the most stringent level of control feasible. For example, a current draft permit proposed for issuance to Mississippi Phosphates Corporation (MPC) by the State of Mississippi Department of Environmental Quality (MDEQ) proposes a limit of 3.25 lb/ton. In developing that draft permit, MDEQ relied upon letters from MPC to MDEQ dated 9/26/97 in which MPC stated that use of 1995 and 1996 test data "results in a calculated SO<sub>2</sub> emission limit of 3.02 lbs./ton." Furthermore, the MPC letter to MDEQ dated 8/28/97 requested a permit limit of 3.16 lbs. SO<sub>2</sub>/ton. Eventually, MPC proposed meeting a limit of 3.25 lb SO<sub>2</sub>/ton for this modification to an existing plant. Unless it can be shown that there are extenuating circumstances that make PPP unable to meet the same limit as MPC, it is reasonable to expect that PPP perform at least as well.

Following are specific comments concerning the application:

1. The data presented in Figure 4-1 for SO<sub>2</sub> emissions per ton of sulfuric acid produced does not match presumably similar data presented in Appendix D. While inspection of the graph shown in Figure 4-1 indicates a rapid, steady increase in emissions/ton, the tabulated data in Appendix D shows a steady, low emission rate until a plant shut down. After the shut down emissions jump by over 50% and climb to double the pre-shut down level. In addition to the apparent discrepancy in data sets, the radical increase in SO<sub>2</sub> emissions following the plant shut down raises a question as whether the shut down and the emissions increase are related, and, just how good is this data?

2. PPP notes that acid production is constrained by permit limits either on production or emissions. Figures 4-1 and 4-2 illustrate that, as SO<sub>2</sub> emissions approach their limit, production is curtailed by as much as 200 tons per day (TPD), and 100 TPD on the average over the 18 month operating cycle (equivalent to a 54,000 ton loss). If sulfuric acid is worth \$28-\$42 per ton and is in short supply in Florida, as stated in the application, this represents a gross loss of \$1.5-2.3 million, and a net loss of over \$1 million (at PPP's \$20/ton production cost).
3. Table 4-1, Cost Analysis of an Interim Plant Turnaround for Catalyst Screening and Partial Replacement:
  - Since catalyst replacement and waste disposal costs after a 9-month turnaround should be half of the same costs after an 18-month turnaround, there should be no additional annual cost for these items associated with the shorter turnaround.
  - If PPP is willing to allow acid production to be limited by emissions such that it loses 54,000 tons production and over \$1 million during an 18-month campaign, why is it necessary to spend almost \$1/2 million to supply 17,000 tons of acid during an 8.5 day turnaround?
4. Table 4-2, Cost Analysis of Ammonia Scrubbing to reduce SO<sub>2</sub> Emissions from a 2000 TPD Sulfuric Acid Plant:
  - Capital costs are totally unsubstantiated. Indirect Costs were incorrectly estimated as a percentage of total Direct Costs, rather than Purchased Equipment Costs (as recommended by the EPA Control Cost Manual).
  - Operating Labor time appears excessive (2 hr/day vs. EPA recommended 1.5 hr/day). Other Direct Annual Costs are totally unsubstantiated. Inclusion of downtime costs is not typically allowed.
  - The Capital Recovery Factor is inflated due to use of short (10 yr vs. EPA recommended 15 yr) equipment life and excessive (11% vs. EPA recommended 7%) interest rate. This alone results in a 55% overestimation of annualized control costs.

**Sulfuric Acid Mist:** PPP proposes to control H<sub>2</sub>SO<sub>4</sub> emissions from the acid plants by using high efficiency mist eliminators. These mist eliminators control acid mist emissions to a level below 0.15 lb/ton of 100 percent acid produced. This level is also the NSPS level EPA set for H<sub>2</sub>SO<sub>4</sub> emissions from new or modified sulfuric acid plants. We agree that the use of high efficiency mist eliminators is BACT to minimize H<sub>2</sub>SO<sub>4</sub> emissions from this sulfuric acid plant. Use of high efficiency acid mist eliminators is the predominant control strategy chosen for new or modified sulfuric acid plants regulated under the NSPS. In 1985, EPA also found that all 46 plants built since 1971 incorporate the use of high efficiency acid mist eliminators. However, as with the discussion of SO<sub>2</sub> controls, not only is the NSPS grossly out-of-date, it is not supported by existing test data. Analysis of the data contained in the EPA's 1992 Sulfuric Acid Background Report (for its AP-42, *Compilation of Air Pollutant Emission Factors*) shows a mean of 0.108 lbs emitted per ton produced (Table 1.a.). (The AP-42 controlled emission factor is 0.128 lb sulfuric acid mist /ton of acid produced.) Furthermore, the average is unduly influenced

by a few very high values (see Figure 1.). This results in a mean that is more than twice the median. If the eight high "outlier" values originating at one plant are eliminated, the average emission rate drops to 0.061 lb/ton, and there is 95% likelihood that emissions will not exceed 0.076 lb/ton (Table 1.b.).

The feasibility of lower acid mist limits is further supported by a look at tests conducted at MPC (Figure 2). An inspection of the data clearly shows the effect of the difference in the two types of mist eliminators used there. Plant 2 uses a Brink type ES (Energy Saver) mist eliminator marketed by the Enviro-Chem Systems division of Monsanto. It must be noted that this is not one of the "high efficiency Brink Mist Eliminators" described in the BACT portion of the original permit. Plant 3 uses type HE (High Efficiency) mist eliminators from the same manufacturer. Even at its worst, the high efficiency mist eliminator can achieve 0.08 lbs/ton.

NPS therefore recommends that BACT represent a limit of not more than 0.08 lb/ton.

Finally, in that FDEP has compiled extensive stack test data on emissions of SO<sub>2</sub>, SAM, and NO<sub>x</sub>, NPS suggests that FDEP perform a statistical analysis of that data to help shed additional light on the emissions from these sulfuric acid plants.



Table 1.a.

H2SO4 Test Results

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.008
9		3	0.038
10		4	0.038
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.049
18	6	1	0.078
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.181
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.064
36		4	0.028
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008
53	16	1	0.494
54		2	0.301
55		3	0.417
56		4	0.541
57		5	0.358
58		6	0.609
59		7	0.419
60		8	0.201

Handwritten note: 10/24/97 - 11/1/97 - 11/18/97

Handwritten note: 10/24/97 - 11/1/97 - 11/18/97

Count = 60  
Average = 0.108  
Median = 0.045  
Mode = 0.014  
S.D. = 0.141  
95% CI = 0.038 to 0.108

Emission Factor @ 95% 0.073 <EF< 0.144

Handwritten note at bottom: 11/24/97 - 11/24/97 - 11/24/97

# FIG. 1.--SULFURIC ACID MIST

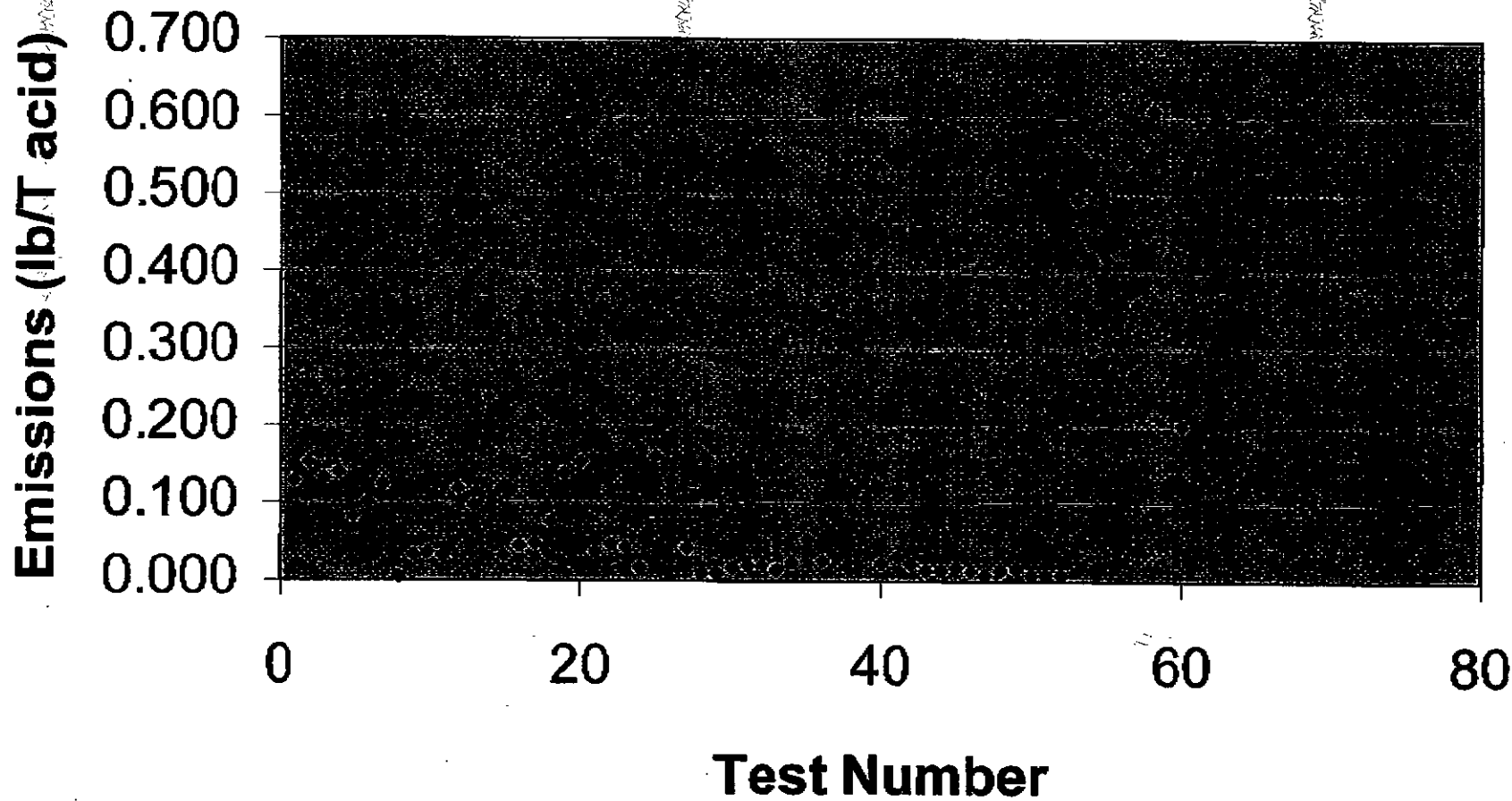


Table 1.b.

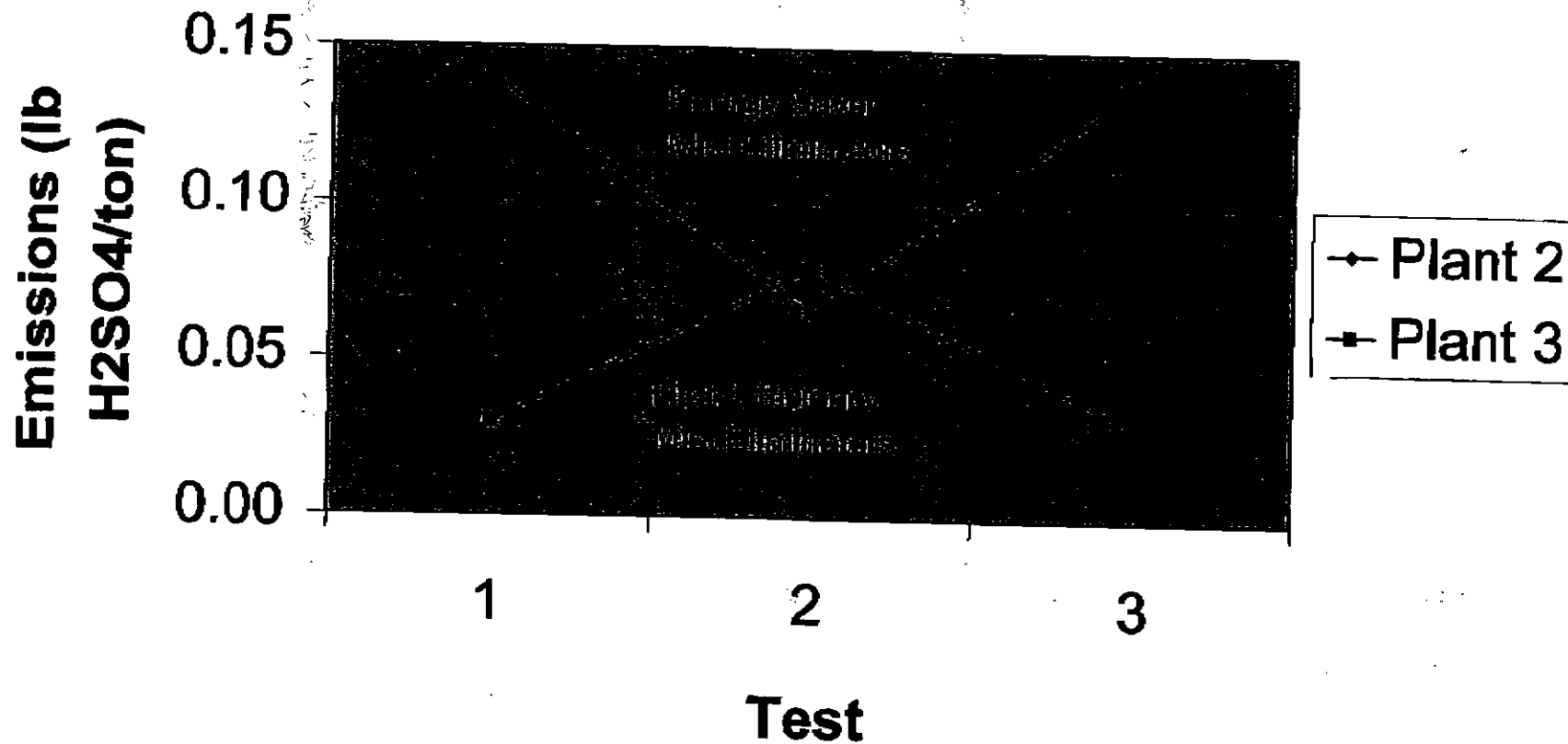
H2SO4 Test Results Minus Outliers

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.038
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.028
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.018
50		8	0.008
51		9	0.008
52		10	0.008

Count = 52  
 Average = 0.061  
 Median = 0.034  
 Mode = 0.014  
 S.D. = 0.057  
 95% CI = 0.016 +/- 0.061

Emission Factor @ 95% 0.045 <EF< 0.076

### Fig. 2--Mississippi Phosphate Sulfuric Acid Emissions





# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Virginia B. Wetherell  
Secretary

November 17, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President  
Operations and Administration  
Piney Point Phosphates, Inc.  
13300 US Highway North  
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC  
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

We are reviewing your application to modify the existing sulfuric acid plant in Palmetto. It will not be complete until we receive the information requested below as well as your response from a further request for additional information which we will send you on November 25. The next request will include any comments from the National Park Service, Manatee County, EPA, and our modeling experts.

We have, nevertheless, begun our technical review. Best Available Control Technology (BACT) was proposed in the application as 4 pounds of sulfur dioxide per ton of acid (lb SO<sub>2</sub>/ton) and 0.15 pounds of sulfuric acid mist (lb SAM/ton). The proposed values represent the New Source Performance Standards (NSPS) limits in force during the previous operation of the plant when it was permitted to produce 2000 tons per day (TPD) of sulfuric acid.

Other factors being equal, lower SO<sub>2</sub> emissions should result due to the planned replacement of degraded Type 210 and Type 11 vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure LP 120 and LP 110 VC ring catalyst and the planned replacement of all pelletized VC catalyst in Converter 2 with LP 110 VC ring catalyst. The old catalysts were introduced by Monsanto in 1925 and 1963, whereas the LP line was first produced in 1980. With the lower pressure drop and improved conversion, it may be possible to enhance production, maintain it longer and still achieve lower emissions.

Though costly, total replacement of all pelletized catalyst in Converter 1 with the LP line could also result in even more SO<sub>2</sub> reduction and production improvement. It might even be advisable in order to minimize potential blockage of the internal ring openings by remaining pellets.

Instead of replacing the catalyst in Converter 2 with LP 110 VC catalyst as planned, it can be replaced with a "cesium-promoted" VC catalyst such as CS-110. This allows significant reduction of the operating temperature in Pass 5. The CS line was introduced in 1989 and has been demonstrated at several double absorption plants. This provides another opportunity for reduced emissions, higher steam production, and possibly increased production despite the higher cost. Please evaluate separately and in combination, the costs and benefits of both additional catalyst replacement scenarios given above.

We do not recommend processes which result in by-products or wastes and do not expect Piney Point Phosphates Inc. (PPPI) to review them further. It appears that these processes are not generally competitive with those which result in production of additional acid.

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*Printed on recycled paper.*

Since both absorption towers will be replaced, there are process modifications which should be considered which also result in production of sulfuric acid. One example is the "Centaur SO<sub>2</sub> Removal Process" developed by Monsanto in conjunction with Calgon. Basically, Converter 2 can be replaced with a reactor containing highly activated carbon catalyst/adsorbent. Wet conversion occurs in the bed which retains the acid. The acid is released by sequential back-washing of bed sections. The catalyst can operate at very low temperatures. This can result in reduced pressure drop across the plant as well as lower heat waste, lower emissions, and possibly increased production. Besides elimination of the second converter and its catalyst, it would eliminate the need for the planned replacement of the final tower, some heat exchangers, and the economizer.

Other possibilities exist such as peroxide oxidation of SO<sub>2</sub> to sulfuric acid. Monsanto or another company may have developed such a process. The point is that potentially feasible options need to be considered whether or not they have actually been employed on sulfuric acid plants in Florida. Please provide the technical and cost evaluations of all the options described above to allow the Department to make a thorough BACT determination. We would appreciate review of our information request by your contractor, Monsanto Enviro-Chem.

The planned replacement of all towers and their mist eliminators ought to make it possible to decrease SAM emissions. The mist eliminators described appear to be very efficient and the plant does not produce oleum which would otherwise make it more difficult to achieve a lower rate than 0.15 lb SAM/ton.

We are conducting the present evaluation under the assumption that a second plant will not be operated while the existing plant is used. Both the PSD analysis submitted for modifying the existing plant and the one submitted for building a second plant include emissions estimates for only one plant at the site. This will ultimately need to be reconciled when Piney Point's final plans are known. If there is a simultaneous two-plant option, it cannot be implemented under the applications submitted to-date.

If you have any questions regarding this matter, please call me at 850/488-1344.

Sincerely,



A. A. Linero, P.E. Administrator,  
New Source Review Section

AAL/aal

cc: Brian Beals, EPA  
John Bunyak, NPS  
Bill Thomas, SWD  
Karen Collins, Manatee County  
Ivan Nance, PPPI  
John Koogler, P.E., K&A

Fold at line over top of envelope to the right of the return address

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**SENDER:**  
 ■ Complete items 1 and/or 2 for additional services.  
 ■ Complete items 3, 4a, and 4b.  
 ■ Print your name and address on the reverse of this form so that we can return this card to you.  
 ■ Attach this form to the front of the mailpiece, or on the back if space does not permit.  
 ■ Write "Return Receipt Requested" on the mailpiece below the article number.  
 ■ The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):  
 1.  Addressee's Address  
 2.  Restricted Delivery  
 Consult postmaster for fee.

3. Article Addressed to:  
 Mr. Robert Stewart  
 Piney Point Phosphates  
 13300 US Hwy North  
 Palmetto, FL 34221

4a. Article Number  
 P 265 659 490  
 4b. Service Type  
 Registered  Certified  
 Express Mail  Insured  
 Return Receipt for Merchandise  COD  
 7. Date of Delivery  
 11/19/97

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. PS

Thank you for using Return Receipt Service.

Receipt

P 265 659 490

US Postal Service  
**Receipt for Certified Mail**  
 No Insurance Coverage Provided.  
 Do not use for International Mail (See reverse)

Sent to	Robert Stewart
Street & Number	Piney Point Phos
Post Office, State, & ZIP Code	Palmetto FL
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	11-17-97
0810002-004-AC JAP plant	

PS Form 3800, April 1995



# Department of Environmental Protection

Lawton Chiles  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400  
November 7, 1997

Virginia B. Wetherell  
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Ivan Nance  
Corporate Environmental Manager  
Piney Point Phosphates, Inc.  
13300 US Highway 41 North  
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC (PSD-FL-242)  
Piney Point Sulfuric Acid Plant Project

Dear Mr. Nance:

We received your application on October 30, 1997 for an air construction permit to modify the existing sulfuric acid plant at Piney Point Phosphates in Palmetto, Manatee County. We are conducting a completeness review at this time. However, we understand that you wish to know of any information we may require to process this application as soon as we become aware of it. We are awaiting any comments from EPA, the National Park Service, Manatee County, and our District office as well as internal review by our review engineer and modeler/meteorologist assigned to this application. Additional Department comments will be provided to you by November 26. Any other comments will be forwarded to you as soon as we receive them. My own initial review of the application indicates that the following items need to be provided or clarified:

1. We do not waive the requirement for items listed in the Facility Supplementary Information. This includes basic process flow diagrams which specifically reflect the existing and planned configuration. We agree that much of the information is actually in our files on the facility and we will access it in our review. However this specific application should stand on its own and the information should be more easily accessible to anyone other than our staff who wishes inspect it.
2. The Best Available Control Technology Review was very instructive. Please submit an analysis of a scenario wherein certain plant components are designed (or "overdesigned") such that present production objectives are met and emission levels of 3.5 and 3.0 pounds of sulfur dioxide per ton of sulfuric acid (averaged for periods longer than one day but less than thirty days) are maintained throughout the turn-around cycle of the plant.
3. Evaluate the scenario wherein the plant (if not overdesigned) must be de-rated to meet the above values throughout the same cycle. Include benefits such as less wear and tear as well as costs.

We are continuing to process the application and will advise you as issues arise. If you have any questions regarding this matter, please call me or John Reynolds at (850)488-1344.

Sincerely,

A. A. Linero, P.E. Administrator  
New Source Review Section

AAL/aal

cc: Brian Beals, EPA  
John Bunyak, NPS  
Bill Thomas, SWD  
Karen Collins, Manatee County  
John Koogler, P.E.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"



Fold at line over top of envelope to the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

**SENDER**

- Complete items 1 and/or 2 for additional services.
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- Print your name and address on the reverse of this form so that we can return this card to you.
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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- 1.  Addressee's Address
- 2.  Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  
 Ivan Nance, CEM  
 Piney Point Phosphates  
 13300 US Hwy 41 N.  
 Palmetto, FL 34221

4a. Article Number  
 P 265 659 484

4b. Service Type  
 Registered  Certified  
 Express Mail  Insured  
 Return Receipt for Merchandise  COD

7. Date of Delivery  
 11/14/97

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Addressee or Agent)  
 x Susan Lick

PS Form 3811, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 484

US Postal Service  
**Receipt for Certified Mail**  
 No Insurance Coverage Provided.  
 Do not use for International Mail (See reverse)

Sent to Ivan Nance	
Street & Number Piney Pt.	
Post Office, State, & ZIP Code Palmetto, FL	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	11-12-97

PS Form 3800, April 1995

0810002-004 AG  
 PSD-FL-242



KOGLER & ASSOCIATES  
ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET  
GAINESVILLE, FLORIDA 32609  
352/377-5822 ■ FAX/377-7158

KA 527-97-02

October 22, 1997

Mr. A. A. Linero  
Florida Department of  
Environmental Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

RECEIVED  
MAIL ROOM  
OCT 30 97

Subject: Manatee County - AP  
Piney Point Phosphates, Inc.  
PSD Permit Application for  
Existing Sulfuric Acid Plant

Dear Mr. Linero:

Enclosed are eight (8) copies of an application for a PSD permit to start up the existing sulfuric acid plant at Piney Point Phosphates, in Manatee County, Florida.


Also enclosed is a check in the amount of \$7500 (PSD permit application processing fee) and a disk containing the air dispersion modeling output.

One copy of the application has been forwarded to Manatee County.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOGLER & ASSOCIATES

*for*   
John B. Koogler, Ph.D., P.E.

JBK:par  
encl.

c: Ivan Nance, PPP

**PINEY POINT PHOSPHATES, INC.**

General Disbursements  
13300 U.S. Hwy. 41 N.  
Palmetto, FL 34221-8662



FLORIDA DEPT. OF ENVIRONMENTAL

INVOICE	INV DATE	DUE DATE	INV AMOUNT	DISCOUNT	NET AMOUNT
106000	10/06/97	10/07/97	7,500.00	.00	7,500.00

REMITTANCE ADVICE	CHECK NO. 0804477	7,500.00	7,500.00
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DETACH BEFORE DEPOSITING

<b>PINEY POINT PHOSPHATES, INC.</b> General Disbursements 13300 U.S. Hwy. 41 N. Palmetto, FL 34221-8662	<b>ACCOUNTS PAYABLE CHECK</b>	<b>No 10804477</b>
	DATE 10/07/97	CHECK NUMBER 0804477
		63-600/631 8
PAY EXACTLY SEVEN THOUSAND FIVE HUNDRED AND NO/100		AMOUNT \$7,500.00
 039-008 6990 S. Florida Ave. Lakeland, Florida 33813		
Pay to the order of FLORIDA DEPT. OF ENVIRONMENTAL PROTECTION 2600 BLAIR STONE RD. TALLAHASSEE, FL 32399-2400		
		AUTHORIZED SIGNATURE

⑈804477⑈ ⑆063106006⑆

1391106193⑈

PINEY POINT



PHOSPHATES, INC.

CERTIFIED/RETURN RECEIPT  
NO. P 576 123 987

7 October 1997

**RECEIVED**

OCT 31 1997

BUREAU OF  
AIR REGULATION

RECEIVED  
MAIL ROOM  
OCT 30 97

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

Re: Piney Point Phosphates, Inc.;  
FDEP Permit No. A041-197112

Dear Sirs:

Find accompanying this transmittal letter an application for an air construction permit to modify the existing sulfuric acid plant at the Piney Point Phosphates, Inc. ("PPP") facility in Palmetto, Florida. Also find a check in the amount of \$7,500.00 submitted as the permit processing fee.

This application addresses those proposed repairs by PPP that have been reviewed by and discussed with the Department during the past months. For this reason PPP requests expedited review of the application. While PPP does not agree with the Department's position in this matter, the Company requests the permit without further delay due to the substantial expense already incurred in this matter.

Should further information or response be required, please contact our offices.

Very truly yours,

Ivan Nance  
Corporate Environmental Manager

/rmm  
Enclosures

cc: Dr. R. Garrity - FDEP Tampa  
Mr. B. Thomas - FDEP Tampa