State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee

To: _____ Loctn.: _____
To: _____ Loctn.: _____
To: _____ Loctn.: _____
From: _____ Date: _____

TO: Jacob D. Varn

FROM: Steve Smallwood MK for SS

DATE: March 28, 1980

SUBJECT: BACT Determination - Diammonium Phosphate Plant, Gardinier Inc., Hillsborough County

Facility: A 50 ton per hour diammonium phosphate (DAP) plant. The plant will produce DAP fertilizer from anhydrous ammonia, phosphoric acid and sulfuric acid using a No. 6 oil fired dryer, screens, mills, cooler, reactor and granulator. Estimated potential emission of pollutants subject to the BACT rule are:

Particulate	2,110 tons/year

BACT Determination Requested by the Applicant:

Total Fluorides	0.06 lb. fluorides per ton of equivalent P_2O_5 Feed

Date of Receipt of a Complete BACT Application:

February 6, 1980

Date of Publication in the Florida Administrative Weekly:

March 28, 1980

Date of Publication in a Newspaper of General Circulation:

April 2, 1980 Tampa Tribune

Study Group Members:

Thomas Davis, DER South Florida District, Ft. Myers;
Pepe De Castro, DER Bureau of Wastewater Management and Grants, Tallahassee;
Johnny Cole, DER St. Johns River District, Jacksonville;
Robert Garrett, DER Southwest District, Tampa;
Joseph Griffiths, Hillsborough County Pollution Control, Tampa;
Willard Hanks, DER Bureau of Air Quality Management, Tallahassee;

Study Group Recommendations:

	Particulate lb/ton P_2O_5
Thomas Davis	0.50 (0.015 gr/scf)
Pepe de Castro	0.62 (0.02 gr/scf)
Johnny Cole	0.43 (10 lb/hr)
Robert Garrett	0.33 (0.15 lb/ton DAP)
Joseph Griffiths	0.93 (0.03 gr/scf)
Willard Hanks	0.43 (0.20 lb/TDAP)

BACT Determination by Florida Department of Environmental Regulation:

Pollutant	Maximum Emission
Particulate	10 lb/hr and 0.5 lb/Ton of P_2O_5

Justification of DER Determination:

Particulate: The applicant's proposed design can meet the $\frac{0.5 \text{ lb}}{\text{Ton } P_2O_5 \text{ Feed}}$ and $\frac{10 \text{ lb}}{\text{hr}}$ emission limitation selected as representative of Best Available Control Technology.

Details of the Analysis May be Obtained by Contacting:

Victoria Martinez, BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

Recommendation from: Bureau of Air Quality Management

By: Martin Kahel for
Steve Smallwood

Date: March 31, 1980

Approved by: Jacob D. Varn
Jacob D. Varn

Date: 31st March 1980

SS:jr
attachment

5.29.2

GARDINIER INC

Post Office Box 3269 • Tampa, Florida 33601 • Telephone 813 - 677 - 9111 • TWX 810 - 876 - 0648 • Telex - 52666 • Cable - Gardinphos

September 12, 1980

Mr. Joe Griffiths
Air Engineering
Hillsborough County Environmental Protection Commission
1900 9th Avenue
Tampa, Florida 33605

Subject: Letter to Mr. Rudy Cabina dated August 27, 1980 - "Ambient Total Suspended Particulate Violation" (copy attached)

Dear Mr. Griffiths:

As discussed, this will answer some of your questions. On the two days HCEPC obtained high results on total suspended particulates at the sampler east of Gardinier on May 3rd and July 14th, 1980, there were no unusual operations at the East Tampa Plant.

All units were operating normally and there was no record of any upset conditions. In addition, no trucks of phosphate rock were unloaded. A normal number of railcars were unloaded. Gardinier could find no reason for an elevated concentration of particulates.

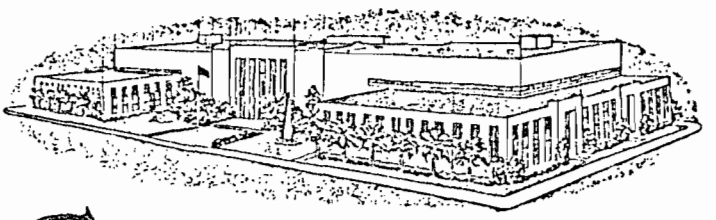
As you know, there have been a large number of trucks hauling dirt on Riverview Drive this year. We do not know the traffic on those dates, however, as your microscopic study showed "... large amounts of phosphatic material...", Gardinier would like to know the normal ratio of phosphatic materials to other particulates and the ratio on those dates. We realize this is not an easy determination, however, any information along this line could prove helpful later.

You mentioned that fugitive dust was the probable main contribution from Gardinier. We have been trying to control this as well as possible and will make a concerted effort to improve. However, since April 1979, Gardinier has been trying to obtain permits to make modifications in the plant which would greatly reduce particulate emissions, especially fugitive emissions. Both HCEPC and the Florida DE have been helpful in this, however, there are still some roadblocks and red tape fro other agencies not resolved. When completed, these modifications should make a significant difference in the local sampler if Gardinier is a major contributor.

Very truly yours,

A.E. Morrison, Manager
Environmental Services

AEM:rw
Enclosure
cc: Mr. Cabina
Mr. Rhodes
Mr. Steve Smallwood
Mr. Dan Williams



ROGER P. STEWART
DIRECTOR

1900 - 9th AVE.
TAMPA, FLORIDA 33605

TELEPHONE (813) 272-59

D-File

COUNTY of HILLSBOROUGH
Tampa, Florida 33601

C.C.: Morrison
Please respon
to Joe Duffe
for me

Ken
9/

August 27, 1980

Rudy J. Cabina, Vice President
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Dear Mr. Cabina:

This letter is to inform you of the second exceedance of the 24 hour air quality standard for total suspended particulates of 150 ug/m^3 measured by the Hillsborough County Environmental Protection Commission hi vol sampler located due east of your facility.

Attached is a list of the wind speed and direction for the two dates. You will notice that on May 3, 1980 the wind was out of the east for half the day and out of the west for half of the day; since we do not use directional hi vols we depend on microscopy to indicate what is the major dust contributor. For May 3, 1980 there were large amounts of phosphatic material present.

The wind direction for July 14, 1980 is predominantly from the west and microscopic analysis also reveals large amounts of phosphatic material present on the filter.

The law states that the highest second highest number shall constitute a violation of the applicable standard, in this case, the twenty four hour standard.

The value for May 3, 1980 was 161 ug/m^3, and the value for July 14, 1980 was 158 ug/m^3. The arithmetic mean for the past seven months is 76.0 ug/m3, while the geometric mean would be slightly less ($\approx$70.0 ug/m3) this indicates that the annual average of 60 ug/m3 will also be exceeded.

This data will serve to confirm the probable impact Gardinier, Inc. has on part of the non-attainment area.

Please check operating logs for the dates mentioned and respond as to any problems that may have occurred during these periods, and specifically state which processes were in operation these dates, either for the whole day or part of the day.

It is apparent that the major problem of particulates contributed by the Gardinier plant has to do with fugitive dust from roads within the plant and material buildup around ductwork, vents, baghouses, unloading points, etc. and that if more attention is not given to these areas there will be more violations in the future resulting in appropriate enforcement action.

Your assistance in cleaning up the air is appreciated.

Sincerely,

Joe Griffiths

Joe Griffiths
Air Engineering Department
Hillsborough County Environmental
Protection Commission

JG/fd

cc: Dan Williams
Steve Smallwood

Wind Data 45

BEST AVAILABLE COPY

May 3, 1980

0100	090	04	090	04	1300	250	10	370	0
0200	180	04	120	04	1400	260	09	020	0
0300	060	04	290	06	1500	280	09	070	0
0400	090	04	340	12	1600	290	13	070	0
0500	070	05	330	08	1700	280	11	090	0
0600	090	05	360	06	1800	310	10	090	0
0700	090	05	020	02	1900	330	09	140	0
0800	090	05	070	02	2000	320	07	100	0
0900	100	05	060	02	2100	330	06	280	1
1000	—	—	060	02	2200	010	04	240	1
1100	100	06	040	02	2300	020	07	220	1
1200	190	07	040	04	2400	360	04	270	1

July 14, 1980

0100	270	08	1300	270	11
0200	280	08	1400	270	12
0300	270	08	1500	270	09
0400	270	08	1600	280	09
0500	270	11	1700	280	07
0600	270	08	1800	270	08
0700	290	09	1900	260	09
0800	270	08	2000	250	08
0900	270	07	2100	280	07
1000	280	10	2200	320	07
1100	270	11	2300	020	06
1200	260	12	2400	190	08

12.17.63

GARDINIER INC.

Post Office Box 3269 • Tampa, Florida 33601 • Telephone 813 – 677 - 9111 • TWX 810 – 876 0648 • Telex - 52666 • Cable -

August 24, 1981

Chief, Air Facilities Branch
Air and Hazardous Materials Division
U.S. EPA, Region IV
345 Courtland Street
Atlanta, Georgia 30365

Subject: PSD-FL-026; Start-up Date, No. 5 DAP Plant, No. 7 Sulfuric Acid Plant

Dear Sirs:

On June 14, 1981, Gardinier notified you that the anticipated start-up date for its No. 5 DAP Plant would be during the week of August 17, 1981. Construction delays have been encountered and start-up now appears to be during the week of September 7, 1981.

Start-up of No. 7 Sulfuric Acid Plant is currently scheduled for the same week.

We will timely notify you after start-up of our schedule for performance testing.

Please contact me if you have any questions.

Very truly yours,

G. E. Wilkinson

GEW:rw
cc: Mr. R. J. Cabina
Mr. Steve Smallwood, FDER
Mr. R. Carpenter, HCEPC
Bob Barnett

GARDINIER INC.
P. O. BOX 3269 TAMPA, FLORIDA 33601

GIBSONTON FLA. AUG 24 '81 U.S. POSTAGE 18 ¢ PB METER PB 649108

Mr. Steve Smallwood
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

GARDINIER INC.

Post Office Box 3269 • Tampa, Florida 33601 • Telephone 813 - 677 - 9111 • TWX 810 - 876 - 0548 • Telex - 52666 • Cable - Gardinphos

RUDY J. CABINA
VICE PRESIDENT

October 15, 1984

Mr. Clair H. Fancy, P.E.
Deputy Chief, Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: No. 8 Sulfuric Acid Plant Modification

Dear Mr. Fancy:

In response to your letter of September 26, 1984, Gardinier agrees that the No. 8 Sulfuric Acid Plant, after modifications, must meet new source performance standards of 4 lb. SO_2 and 0.15 lb Acid Mist per ton of sulfuric acid produced. Accordingly, will you please amend the previously submitted application by substituting Pages 2, 3, 6 and the supplemental requirements enclosed?

Due to economic considerations, we desire to phase this process as follows:

First Modification:

A. Install the necessary gas ducting to permit parallel gas flows through the last two catalyst masses in the main converter. This would allow increased production by reducing the pressure drop (resistance to gas flow) throughout the system.

B. Install larger diameter export steam piping to handle additional steam production from the plant.

If the facility cannot achieve 4 lb/ton and 0.15 lb/ton at the desired 2200 STPD; operating at production rates as required to remain below those limits would be necessary until the next major overhaul.

Second Modification:

C. Install a superheater in parallel with the No. 1 Boiler. This would reduce gas side pressure drop through this section of the plant and also relieve the loading of the No. 1 Boiler.

D. Install a new superheater/economizer in the exit of the 3A pass in parallel with the existing one. Lower gas temperature to the absorbing tower and reduced gas side pressure drop would result.

E. Install additional catalyst in main converter. This would improve conversion at higher rates, when "C" and "D" above, are installed.

F. Replace cast iron cooling coils with new stainless steel heat exchangers for acid cooling. This would allow slightly colder air into sulfur burner and remove possible bottlenecks on acid cooling system.

Third Modification:

If the above-described two steps do not achieve the desired 2200 STPD at 4 lb/ton of acid and 0.15 lb/mist/ton of acid then implementation of more extensive replacement of the steam system, boiler, blower and turbine, etc., would be required.

At no time during the construction period will 4 lb SO_2 and 0.15 lb acid mist per ton of sulfuric acid produced, be exceeded.

It is not possible at this time to estimate the cost of the project. It could be as low as $250,000 or as much as several million dollars.

If this letter is acceptable, please consider the applications for both the No. 7, and No. 8 Sulfuric Acid Plants complete as of this date and process them together.

Please contact me if you have any questions.

Yours very truly,

Rudy J. Cabina

Rudy J. Cabina
Vice President

RJC:rw
Enclosures
cc: Mr. Bill Thomas
Mr. Steve Gyotog

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This project will modify the No. 8 Sulfuric Acid Plant to produce 430 tons per day of additional sulfuric acid. Emissions from this source will comply with all applicable State of Florida and Hillsborough County regulations.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction November 1, 1984 Completion of Construction June 30, 1987

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

(See cover letter)

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Permit No.	A029-18228	A029-2930	AC29-2390
Issued	Apr 26, 1979	Apr 21, 1977	Nov 25, 1974
Expire	Apr 15, 1984	May 10, 1979	Mar 1, 1977

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __x__ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr n/a ; if seasonal, describe: not seasonal

G. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes
   a. If yes, has "offset" been applied? N/A
   b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A
   c. If yes, list non-attainment pollutants.
      Total suspended particulates, Ozone
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Sulfur	-	-	60,124	A
Oxygen	-	-	89,913	B
Water	-	-	33,677	C

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 183,714

2. Product Weight (lbs/hr): 183,333

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Sulfur Dioxide	367	1,607	4 lb/ton H_2SO_4	367	367	1,607	D
Sulfuric Acid	13.7	60	0.15 lb/ton H_2SO_4	13.7	13.7	60	D

D. *Control Devices:* (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Final Converter	Sulfur Dioxide	99.5+	-	See Attach.
Final Absorber and Mist	Sulfuric Acid	99+	Unk	
Eliminator	Mist			

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard

[4] Emission, if source operated without control (See Section V, Item 3)

[5] If Applicable

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[X] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [x] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

Supplemental Requirements

1. Total Process Input Rate and Product Weight:

The following data and chemical equations will describe the input rates and product weight:

The atomic weight of sulfur (2) is 32.064
The molecular weight of oxygen (O_2) is 31.9988
The molecular weight of water (H_2O) is 18.01534
The molecular weight of sulfur dioxide (SO_2) is 64.0628
The molecular weight of sulfur trioxide (SO_3) is 80.0622
The molecular weight of sulfuric acid (H_2SO_4) is 98.0754

The following chemical equations describe the production of sulfuric acid:

$$S + O_2 \longrightarrow SO_2$$

$$SO_2 + \tfrac{1}{2}O_2 \longrightarrow SO_3$$

$$SO_3 + H_2O \longrightarrow H_2SO_4$$

If the plant produces 183,333 lbs/hr of H_2SO_4 and emits 367 lbs/hr of SO_2 and 13.7 lbs/hr of H_2SO_4 mist, then the amounts of sulfur, oxygen and water required are easily calculated. These amounts are:

Sulfur = 60,124 lbs/hr

Oxygen = 89,913 lbs/hr

Water = 33,677 lbs/hr

Total = 183,714 lbs/hr input weight

2. Emission estimate is based on performance standards for new sulfuric acid plants. EPA Method 8 will be used to determine compliance.

3. Potential discharge is the actual emission.

4. Design details are discussed in attached report.

5. SO_2 Efficiency based on sulfur budget is as follows:

Total Sulfur input = 60,124 lbs/hr

Sulfur Emitted as SO_2 = 183 lbs/hr

$$\frac{183}{60124} \times 100 = 0.30\%$$

100% - 0.30% = 99.70% Efficiency

Acid Mist Efficiency is 99.99%

2-19-85

Best Available Control Technology (BACT) Determination
Gardinier, Inc.
Hillsborough County

The applicant plans to increase the product rate from their Number 7 and Number 8 sulfuric acid plants that are located at their Tampa phosphate fertilizer complex. The production of sulfuric acid from the No. 7 plant will be increased from 1750 tons per day (TPD) to 2200 TPD, and the No. 8 plant from 1770 TPD also to 2200 TPD. No restrictions to limit the hours of operation of either plant has been requested.

Increasing the product output from the two sulfuric acid plants will also result in more air pollutants being emitted to the atmosphere. The air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of SO_2 emitted to the atmosphere is an inverse function of sulfur conversion efficiency. When sulfur trioxide combines with water vapor at a temperature below the dew point of sulfur trioxide, acid mist is formed. The amount of acid mist is usually dependent upon the type of sulfur feedstock, the strength of acid produced, and the operational parameters in the absorber. Based upon the applicant's data, the net increase in air pollutant emissions would be 2327 tons of SO_2 and 92 tons of acid mist per year.

Under the regulations in Chapter 17-2, Florida Administrative Code, the increase in SO_2 and acid mist emissions exceed the significant emission rates as listed in Table 500-2. A BACT determination, therefore, is required for the regulated air pollutants sulfur dioxide and acid mist.

BACT Determination Requested by the Applicant:

The air pollutant emissions from No. 7 sulfuric acid plant would be limited to 4 pounds of SO_2 and 0.15 pounds of acid mist per ton of 100% acid produced.

The air pollutant emissions from No. 8 sulfuric acid plant would be limited to 10 pounds of SO_2 and 0.30 pounds of acid mist per ton of 100% acid produced.

Date Receipt of a BACT application:

July 6, 1984

Date of Publication in the Florida Administrative Weekly:

July 27, 1984

Review Group Members:

The determination was based upon comments received from the Stationary Source Control Section, Air Modeling and Data Analysis Section, the Southwest District Office, and the Hillsborough County Environmental Protection Commission.

BACT Determined by DER:

Sulfuric Acid Plants No. 7 and No. 8

Pollutant	Emission Limit
Sulfur Dioxide (SO_2)	Not to exceed 4 pounds per ton of 100% acid produced
Acid Mist[1]	Not to exceed 0.15 pounds per ton of 100% acid produced
Visible Emissions	5% opacity maximum

[1] Acid mist means sulfuric acid mist, as measured by Method 8 of 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 60.85, Subpart H, New Source Performance Standards.

DER Method 9 (17-2.700(6)(a)9, FAC) will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

Florida Administrative Code Rule 17-2.100(105) defines "modification" as any physical change in, or addition to a stationary facility which increase the actual emissions of any air pollutant, regulated under this Chapter, including any not previously emitted, from any source within such facility.

If the increase in emissions as a result of the major source modification are equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates; a Best Available Control Technology (BACT) determination is required, Rule 17-2.500(5)(c). In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR Part 60 - New Source Performance Standards (NSPS), Rule 17-2.630(1)(a).

Sulfuric acid plants are subject to the provisions of the New Source Performance Standards, 40 CFR 60.80, Subpart H. The standards under Subpart H are; 4.0 pounds of SO_2 per ton of acid produced and 0.15 pound of acid mist per ton of acid produced, expressed as 100 percent sulfuric acid. The visible emissions limit is less than 10 percent opacity.

The NSPS standards, Subpart H, were reviewed by EPA in 1979 and EPA concluded that from the standpoint of technology, and considering costs, and the small quantity of emissions in question, that it did not appear necessary to revise the standards. The department has reviewed the test results obtained from several different sulfuric acid plants and concurs with EPA's conclusion. The provisions of Subpart H are judged to be BACT.

The visible emissions limitation determined as BACT is equal to Hillsborough County's requirement as per Chapter 1-3.03 V1.C - visible emissions shall not exceed 5% opacity except for 30 minute periods during plant startups when opacity shall be no greater than 40%.

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the department has reasonable assurance that the proposed sulfuric acid plant modifications, subject to the these BACT emission limitations, will not cause or contribute to a violation of the PSD increment or ambient air quality standard.

Details of the Analysis may be Obtained by Contacting:

Ed Palagyi
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended by:

C. H. Fancy, Deputy Bureau Chief

Date: 2/8/85

Approved by:

for Victoria J. Tschinkel, Secretary

Date: 2/12/85

Lowest Achievable Emission Rate (LAER) Determination
Austill Packaging
Division of Smurfit Industries
Duval County

The applicant has installed an Intaroto eight color rotogravure press at their Jacksonville facility. The unit, Press No. 5, is used to print labels for various consumer goods. The substrate for the labels may be paper or foil laminated to paper. The press is scheduled to operate 6000 hours per year.

The rotogravure printing process uses a steel cylinder upon which an image has been engraved. The cylinder rotates in an ink trough. The inked image is transferred directly to the substrate by impression. The product is then dried. Basically, the process is the application of a relatively high solvent content ink to the surface of a moving web or film, then rapid solvent evaporation using heated air. The solvent-laden air is exhausted from the system.

The solvent-laden air, containing volatile organic solvents (VOC's) when discharged to the atmosphere, contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. VOC emissions are most significant as air pollutants in their role of photochemical oxidant percursors.

The dryer is the major source of VOC emissions with lesser amounts emitted at the ink fountain, the press, and the chill rolls. Vapor capture systems are necessary to minimize fugitive solvent vapor loss around the ink fountain and at the chill rolls. VOC emissions can also be reduced by using low solvent technology inks, if compatible with the planned line substrate.

The Austill Packaging plant is located in Duval County which is classified nonattainment for the pollutant ozone (VOC), Rule 17-2.410. The additional press will result in an ozone (VOC) emission increase above the significant emission rate and is considered to be a modification to a major facility thus subject to the provisions of Rule 17-2.510(2)(d)4.a. The application and employment of Lowest Achievable Emission Rate (LAER) is a preconstruction review requirement (Rule 17-2.510(4)(a).). The procedure for determining LAER is set forth in Section 17-2.640.

LAER Determination Requested by the Applicant:

Enclosures and ducts will be installed to capture 80 percent of the VOC vapors emitted at the press. The vapors will be conveyed to a new catalytic incinerator designed to convert 92-95 percent of the VOC's to innocuous CO_2 and water by rapid oxidation.

Date of Receipt of a LAER application:

November 15, 1984

Review Group Members:

The determination was based upon comments received from the New Source Review Section, the Northeast District Office, Jacksonville Division of Bio-Environmental Services, the Bureau Chief and Deputy Bureau Chief-Bureau of Air Quality Management, and USEPA-Region IV.

LAER Determined by DER:

Pollutant	Emission Limit
Ozone (VOC)	80 percent capture efficiency of the VOC vapors emitted at the press and 95 percent destruction of the collected VOC vapors by the catalytic incinerator.

LAER Determination Rationale:

In rotogravure printing from stationary sources, volatile organic compounds (VOC's) can be released to the atmosphere by evaporation from the inking, cleaning, and curing operations. Hydrocarbons comprise a class of VOC's containing only carbon and hydrogen in various combinations. Most of these compounds and their by-products are considered poisonous, but most are harmful only in very high concentrations. Hydrocarbons can react with other chemicals, notably in the photochemical reaction, which results in the oxidants commonly called smog.

To control VOC emissions the applicant first considered using waterborne inks instead of organic solvent inks. They experimented with waterborne inks but concluded that, even though promising, waterborne inks are not yet well enough developed for their printing requirements. Only add-on control devices remain for consideration.

The three most popular types of add-on devices are those for thermal and catalytic incineration or carbon absorption.

- Carbon absorption: The solvent laden air is passed through a bed of activated carbon. The solvent is absorbed onto the carbon. The solvent is recovered by steam desorption, condensation, and decantation. The applicant's printing products vary in color and substrate, which require different solvents, some of which are not amenable to this type of control technology. The department agrees, that in this case, carbon absorption is not the recommended control technology.

- Incineration: The solvent-laden air is heated to ignition temperatures, burning the solvent vapors to carbon dioxide and water. Catalytic oxidation or thermal oxidation are two suitable methods and allows heat to be recovered from the exhaust gases. There are some rotogravure operations that use complex solvent mixtures. For such operations thermal incineration may be the most feasible control method, which is the case at press No. 5.

The applicant will use a catalytic incinerator to reduce by 95% the amount of VOC's discharged to the atmosphere when press 5 is operating. The add-on unit will be a ComCat catalytic incinerator manufactured by Pillar Corporation. The applicant will install the necessary enclosures and ducting at press 5 to capture 80 percent of the vapors generated. The VOC destruction efficiency of the catalytic incinerator will be 95%. The planned incinerator and press ducting modifications will result in 250 less tons of VOC's discharged into the atmosphere per year.

The Department, when preparing a Lowest Achievable Emission Rate (LAER) determination, shall give consideration to and make a determination that reflects: 1) any information published by the USEPA, including the BACT/LAER Clearinghouse, 2) the most stringent emission limitation which is contained in the implementation plan of any state, 3) the most stringent emission limitation which is achieved in practice, and 4) all scientific, engineering, technical material, or other relevant information available to the department.

The latest (May 1984) BACT/LAER Clearinghouse summary lists data for eight facilities in the graphic arts category, half of which are rotogravure systems. Most of the efficiencies reported were based on a stack test for the control device and did not include the capture efficiency of the vapors generated at the emission point. At one of the listed facilities a material balance around the control device and vapor collection system was done. The control device efficiency was 95% and the capture efficiency was 73%. This facility did not have to meet LAER. A control device destruction efficiency of 95% with a capture efficiency of 85% was recommended as LAER for Press 5 by PEDCO Environmental Inc.

The literature research indicates that a 95% destruction efficiency of a catalytic incinerator is obtainable and judged to be LAER. The efficiency of a vapor capture system is still debatable especially in the case where such a system was not considered in the original source design. The department has judged that the 80% capture efficiency proposed by the applicant is LAER. However, if the applicant can demonstrate that the system was properly installed, operated and maintained, and through compliance testing that the 95% efficiency cannot be achieved because it is beyond the limit of the technology of the DER approved system, the applicant can apply for a modification of the LAER for a lower efficiency of not less than 92%. If

application for such modification is filed within 60 days of the compliance test showing an efficiency of less than 95%, then during the pendency of such application, the facility can be operated provided that the efficiency shall not be less than 92%, and provided however, the system has been properly installed and is being properly operated and maintained.

Details of the Analysis May be Obtained by Contacting:

Edward Palagyi, LAER Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended By:

C. H. Fancy, Deputy Bureau Chief

Date: 2/12/85

Approved:

Victoria J. Tschinkel, Secretary

Date: 2/18/85

Best Available Control Technology (BACT) Determination
Gardinier, Inc.
Hillsborough County

The applicant plans to increase the product rate from their Number 7 and Number 8 sulfuric acid plants that are located at their Tampa phosphate fertilizer complex. The production of sulfuric acid from the No. 7 plant will be increased from 1750 tons per day (TPD) to 2200 TPD, and the No. 8 plant from 1770 TPD also to 2200 TPD. No restrictions to limit the hours of operation of either plant has been requested.

Increasing the product output from the two sulfuric acid plants will also result in more air pollutants being emitted to the atmosphere. The air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of SO_2 emitted to the atmosphere is an inverse function of sulfur conversion efficiency. When sulfur trioxide combines with water vapor at a temperature below the dew point of sulfur trioxide, acid mist is formed. The amount of acid mist is usually dependent upon the type of sulfur feedstock, the strength of acid produced, and the operational parameters in the absorber. Based upon the applicant's data, the net increase in air pollutant emissions would be 2327 tons of SO_2 and 92 tons of acid mist per year.

Under the regulations in Chapter 17-2, Florida Administrative Code, the increase in SO_2 and acid mist emissions exceed the significant emission rates as listed in Table 500-2. A BACT determination, therefore, is required for the regulated air pollutants sulfur dioxide and acid mist.

BACT Determination Requested by the Applicant:

The air pollutant emissions from No. 7 sulfuric acid plant would be limited to 4 pounds of SO_2 and 0.15 pounds of acid mist per ton of 100% acid produced.

The air pollutant emissions from No. 8 sulfuric acid plant would be limited to 10 pounds of SO_2 and 0.30 pounds of acid mist per ton of 100% acid produced.

Date Receipt of a BACT application:

July 6, 1984

Date of Publication in the Florida Administrative Weekly:

July 27, 1984

Review Group Members:

The determination was based upon comments received from the Stationary Source Control Section, Air Modeling and Data Analysis Section, the Southwest District Office, and the Hillsborough County Environmental Protection Commission.

BACT Determined by DER:

Sulfuric Acid Plants No. 7 and No. 8

Pollutant	Emission Limit
Sulfur Dioxide (SO_2)	Not to exceed 4 pounds per ton of 100% acid produced
Acid Mist[1]	Not to exceed 0.15 pounds per ton of 100% acid produced
Visible Emissions	5% opacity maximum

[1] Acid mist means sulfuric acid mist, as measured by Method 8 of 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 60.85, Subpart H, New Source Performance Standards.

DER Method 9 (17-2.700(6)(a)9, FAC) will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

Florida Administrative Code Rule 17-2.100(105) defines "modification" as any physical change in, or addition to a stationary facility which increase the actual emissions of any air pollutant, regulated under this Chapter, including any not previously emitted, from any source within such facility.

If the increase in emissions as a result of the major source modification are equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates; a Best Available Control Technology (BACT) determination is required, Rule 17-2.500(5)(c). In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR Part 60 - New Source Performance Standards (NSPS), Rule 17-2.630(1)(a).

Sulfuric acid plants are subject to the provisions of the New Source Performance Standards, 40 CFR 60.80, Subpart H. The standards under Subpart H are; 4.0 pounds of SO_2 per ton of acid produced and 0.15 pound of acid mist per ton of acid produced, expressed as 100 percent sulfuric acid. The visible emissions limit is less than 10 percent opacity.

The NSPS standards, Subpart H, were reviewed by EPA in 1979 and EPA concluded that from the standpoint of technology, and considering costs, and the small quantity of emissions in question, that it did not appear necessary to revise the standards. The department has reviewed the test results obtained from several different sulfuric acid plants and concurs with EPA's conclusion. The provisions of Subpart H are judged to be BACT.

The visible emissions limitation determined as BACT is equal to Hillsborough County's requirement as per Chapter 1-3.03 V1.C - visible emissions shall not exceed 5% opacity except for 30 minute periods during plant startups when opacity shall be no greater than 40%.

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the department has reasonable assurance that the proposed sulfuric acid plant modifications, subject to the these BACT emission limitations, will not cause or contribute to a violation of the PSD increment or ambient air quality standard.

Details of the Analysis may be Obtained by Contacting:

Ed Palagyi
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended by:

C. H. Fancy

C. H. Fancy, Deputy Bureau Chief

Date: 2/8/85

Approved by:

for Victoria J. Tschinkel, Secretary

Date: 2/12/85

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

July 17, 1984

Mrs. Liz Cloud
Florida Administrative Weekly
Department of State
The Capitol
Tallahassee, Florida 32304

Dear Mrs. Cloud:

Re: Receipt of an Application for BACT Determination

Please publish the attached notice in the July 27, 1984 issue of the Florida Administrative Weekly.

Should you have any questions, please call me at 488-1344.

Sincerely,

Edward Palagyi

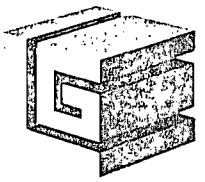
Edward Palagyi, BACT Coordinator
Bureau of Air Quality
Management

EP/s

attachment

cc: Geneva Hartsfield
2600 Blair Stone Road
Tallahassee, Florida 32301

THE DEPARTMENT OF ENVIRONMENTAL REGULATION announces receipt on July 6, 1984 of an application for determination of Best Available Control Technology (BACT) to minimize air pollutant emissions from two sulfuric acid plants, Gardinier Inc., South of Tampa, Hillsborough County, Florida. Information regarding this application may be obtained by writing: Edward Palagyi, BACT Coordinator, Florida Department of Environmental Regulation, Bureau of Air Quality Management, 2600 Blair Stone Road, Tallahassee, Florida 32301, Telephone (904)488-1344.



GARDINIER INC.

September 11, 1984

Mr. Clair H. Fancy, P.E.
Deputy Chief, Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Fancy:

The following information is supplied in response to your letter of July 27, 1984:

1. Section II.C. of the application states the converter and steam systems of the acid plants will be modified to increase production. Section 1.0 of Environmental Science and Engineering, Inc.'s attachment to the applications mentions changes to the drying tower, converter, and absorbing tower cooling systems. What are the current design capacities (acid production) of the absorbing towers and sulfuric acid mist eliminators? Please describe briefly all modifications to each of the acid plants that may be required to increase production to the proposed capacity and supply engineering design details that confirm this equipment can handle the proposed production rates.

DESCRIPTION OF NO. 7 ACID PLANT MODIFICATIONS:

A. The acid cross-circulating system between the Dry and Interpass Tower acid coolers and pump tanks will be changed from "Cold Side" cross flow to "Hot" cross flow. This would allow better acid temperature control of the absorbing tower at the higher production rates.

B. Mixing vanes in the gas duct at the second catalyst mass inlet will be added. This would provide better mixing of gas streams of three different temperatures and improve the performance of this mass.

C. Install a new separate pump to improve the flow of water from the existing cooling tower to the final absorbing tower cooler. This would increase the cooler's capacity.

DESCRIPTION OF NO. 8 ACID PLANT MODIFICATIONS:

A. Install the necessary gas ducting to permit parallel gas flows through the last two catalyst masses in the main converter. This would allow increased production by reducing the pressure drop (resistance to gas flow) throughout the system.

B. Install larger diameter export steam piping to handle the additional steam production from the plant.

ENGINEERING DESIGN DETAILS

Interpass Absorbing Tower

	Standard	No. 7 at 2200 STPD	No. 8 at 2200 STPD
Tower Diameter Ratio Sq.Ft./STPD	0.13	0.230	0.230
Packing Volume Ratio Cu.Ft./STPD	1.7	3.24	3.24
Mist Eliminator Area Ratio-Sq.Ft./STPD	.09	0.098	0.115
Final Absorbing Tower			
Tower Diameter Ratio Sq.Ft./STPD	.11	0.116	0.15
Tower Packing Volume Ratio Cu.Ft./STPD	1.6	1.67	2.3
Mist Eliminator Area Ratio-Sq.Ft./STPD	0.09	0.093	0.103

2. Please provide technical data to support your statement that the acid mist removal efficiencies for the two plants are 99.99 percent.

The removal efficiencies were based on the mist emitted as compared to the acid produced. It was not intended to represent the efficiency of the mist eliminators only.

3. Your answer to question 5 of the supplemental requirements for the No. 7 Acid Plant listed that 124 lb/hr of sulfur is emitted as sulfur dioxide. Is this number correct?

The number is a typographical error. The correct figure is 184.

4. Environmental Science and Engineering, Inc. attached two tables titled, "No. 7 Sulfuric Acid Plant Emission Tests". What are the bases for the average and maximum emissions listed in the tables? In three instances (Dec 9, 1977; Mar 7, 1979; and Oct 25, 1979) the emissions exceeded NSPS. Is the cause of these higher emissions known? Please provide a similar table of data and explanation for emissions in excess of NSPS for the No. 8 acid plant.

This is a typographical error. Page A-2 is incorrectly labled "#7 Sulfuric Acid Plant". It should be labeled "#8 Sulfuric Acid Plant". Also, Page A-3 should be labeled, "#9 Sulfric Acid Plant". Three runs are made with each stack test. The value shown as maximum is the highest of the three. The average is the average of the three. There were no emissions in excess of NSPS for #7 Sulfuric Acid Plant (Page A-1). #8 Sulfuric Acid Plant is an existing source and is not subject to NSPS. There were no violations of the State of Florida standards for existing sulfuric acid plants.

5. Please provide a copy of the document in which EPA concluded that BACT for a sulfuric acid plant is 10 lb SO2/T acid and 0.3 lb mist/T acid.

The statement is incorrect. The figures are limitations for an existing source by Chapter 17-2 FAC.

6. Why are the emissions from the No. 8 acid plant greater than those from the No. 7 Plant? Can the No. 8 plant be modified to meet the NSPS of 4 lb SO2/T acid and 0.15 lb mist/T acid? If so, what modifications will be needed and what is the approximate cost of these modifications?

Why are the emissions from the No. 8 Acid Plant greater than those from the No. 7 Plant?

No. 8 Plant has not undergone and is not planned to undergo the major modifications carried out at No. 7 Acid Plant.

Can the No. 8 Plant be modified to meet the NSPS of 4 lb SO2/T acid and 0.15 lb mist/T acid?

Yes, it could be.

If so, what modifications will be needed and what is the aproximate cost of these modifications?

The modifications required would be very extensive and would include a new boiler, new water and steam system, new blower and turbine, new catalyst, etc. The total cost would be in excess of $7mm (1984 dollars).

7. Will any phosphate plant (acid, DAP, GTSP, etc) have to be modified to increase its production up to its permitted capacity? If so, which plants will be modified and what modifications will be required?

No.

8. Please estimate the actual increases in particulate matter, sulfur dioxide and fluoride emissions from each phosphate plant due directly or indirectly to the use of the additional sulfuric acid that can be produced by the modified sulfuric acid plants.

There will be no increase in the daily maximum emissions as the downstream plants are operated at their maximum rates as long as acid is available. There could and probably will be an increase in the daily average rate.

This is not possible to quantify because of two factors; the additional sulfuric acid requirements could, as has occurred in the past, be purchased, and it is not possible to predict the end product split.

The attached report by ESE supplies responses to Questions 9 thru 13, inclusive. Supportive computer printouts are enclosed.

Please contact me if you have any questions.

Yours very truly,

G. E. Wilkinson

GEW:rw
Enclosure
cc: Mr. Rudy J. Cabina
Mr. A. E. Morrison

Comment 9

The listing of sources provided by DER as missing or incorrect is acknowledged and has been verified by Mr. Steve Gyororg of Hillsborough County Environmental Protection Commission. To investigate the effects of these sources on maximum predicted sulfur dioxide (SO_2) concentrations due to the proposed Gardinier H_2SO_4 plant expansion, Environmental Science and Engineering, Inc. (ESE) performed additional air dispersion modeling. The Industrial Source Complex (ISC) Model was used, with model assumptions identical to those used in the previous modeling analysis (ESE report dated January 13, 1984).

The source inventory consisted of the original source inventory (January 1984 report) modified to account for the new/revised sources. The worst-case days identified from the previous analysis were rerun with the revised inventory. Only the receptor grids around Gardinier (north, south, east-west) were considered because the previous analysis showed that Gardinier did not contribute significantly to maximum concentrations predicted for other receptor grids (see Table 5-5 of January 1984 report).

In addition, only receptors located at or off of plant property were considered. The results of revised SO_2 modeling analysis are shown in Tables 1 and 2. As shown, the highest, second-highest 3-hour SO_2 concentration increased slightly from 901 ug/m^3 to 915 ug/m^3. The revised maximum concentration is still well below the Florida ambient air quality standard (AAQS) of 1,300 ug/m^3. The maximum predicted 24-hour SO_2 concentration did not increase above the 249-ug/m^3 level predicted previously. However, a 249-ug/m^3 level is now also predicted for the south grid.

Comment 10

A map locating the Gardinier plant property boundaries is provided under the response to Comment 11. The Gardinier plant is surrounded on two

Table 1. Revised Maximum 3-Hour Average SO_2 Concentrations for Comparison to AAQS--Receptors Around Gardinier

Receptor Grid Location	Value	Concentration (ug/m^3)				Receptor Location UTM Coordinates (km)		Period		
		Total	Contribution From: Gardinier Sources	Contribution From: Other Modeled Sources	Contribution From: Background	X	Y	Julian Day	Hour Ending	Year
Previous Modeling										
North	H2H	901	456	430	15	363.5	3083.4	158	18	1978
Revised Modeling										
North	H	972	396	561	15	363.5	3083.4	160	9	1978
	H2H	915	456	444	15	363.5	3083.4	158	18	1978
South	H	786	771	0	15	362.8	3081.8	235	15	1978
	H2H	750	735	0	15	362.8	3081.8	257	15	1978
East-West	H	1062	298	749	15	363.6	3083.6	82	12	1975
	H2H	843	565	263	15	363.6	3083.6	66	12	1975

Note: H = Highest concentration.
H2H = Highest, second-highest.

Source: ESE, 1984.

Table 2. Revised Maximum 24-Hour Average SO_2 Concentrations for Comparison to AAQS--Receptors Around Gardinier

Receptor Grid Location	Value	Concentration (ug/m^3) Total	Contribution From Gardinier Sources	Contribution From Other Modeled Sources	Contribution From Background	Receptor Location UTM Coordinates (km) X	Receptor Location UTM Coordinates (km) Y	Period Julian Day	Period Year
Previous Modeling									
North	H2H	249	234	0	15	362.0	3083.1	127	1979
Revised Modeling									
North	H	272	257	0	15	362.0	3083.1	263	1979
	H2H	249	234	0	15	362.0	3083.1	127	1979
South	H	251	104	132	15	364.35	3081.1	58	1973
	H2H	249	127	107	15	364.35	3081.1	351	1973
East-West	H	236	221	0	15	362.0	3082.4	253	1979
	H2H	234	219	0	15	362.0	3082.4	254	1979

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

sides by water. To the north is located the Gypsum stack, which is precluded from public access. To the northeast and east, the plant is bounded by U.S. 41 and railroad tracks, providing an effective barrier against public access.

The location and magnitude of maximum ground-level SO_2 concentrations without regard to plant boundaries was determined by performing additional dispersion modeling. Receptor locations are shown in the map under the response to Comment 11. A 5-year screening analysis was performed using all sources from the revised SO_2 inventory with annual emissions exceeding 250 tons per year. The results of these analyses are presented in Tables 3, 4 and 5.

Table 3 shows maximum predicted on-plant property 3-hour SO_2 concentrations. Of concern is whether the 3-hour AAQS of 1,300 ug/m^3, not to be exceeded more than once per year, is predicted to be violated. The highest (H) and highest, second-highest (H2H) concentrations occurring in 1975 were both due to the occurrence of calm winds. The next valid H concentration was 871 ug/m^3 in 1975. The other years in which the 1,000-ug/m^3 level was exceeded were: the H2H in 1974 of 1,107 ug/m^3 was due to calm winds; the H2H in 1978 of 1,189 ug/m^3 was due to calm winds. This analysis demonstrates that maximum predicted (unrefined) 3-hour SO_2 impacts on plant property are below 1,189 ug/m^3, and well below the 1,300-ug/m^3 AAQS.

Table 4 shows a similar analysis for the 24-hour averaging time. The H and H2H levels predicted in any year (351 and 326 ug/m^3 in 1978) were both due to calms in the meteorological data base. The next highest H2H value is 227 ug/m^3 (1975) and is well below the 24-hour AAQS of 260 ug/m^3.

Table 3. Maximum 3-Hour Average SO_2 Concentrations for Receptors Located on Plant Property

Year	Value	Concentration (ug/m^3)			Receptor Location UTM Coordinates (km)		Period		Comments
			Contribution From						
		Total	Modeled Sources	Background	X	Y	Julian Day	Hour Ending	
1973	H	931	916	15	363.1	3082.9	37	8	No check for calms
	H2H	867	852	15			346	7	No check for calms
1974	H	1,146	1,131	15	362.4	3083.6	69	1	No check for calms
	H2H	1,107	1,092	15			162	8	Due to calms
1975	H	1,659	1,644	15	362.4	3083.6	165	1	Due to calms
	H2H	1,491	1,476	15			300	1	Due to calms
	H	871	856	15			82	4	Valid
1978	H	1,266	1,251	15	362.4	3083.6	119	1	Due to calms
	H2H	1,189	1,172	15			161	1	Due to calms
1979	H	914	899	15	362.5	3082.9	235	4	Valid
	H2H	819	804	15			276	8	Due to calms

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

Table 4. Maximum 24-Hour Average SO_2 Concentrations for Receptors Located on Plant Property

Year	Value	Concentration (ug/m^3)			Receptor Location UTM Coordinates (km)		Julian Day	Comments
		Total	Contribution From: Modeled Sources	Contribution From: Background	X	Y		
1973	H	210	195	15	362.1	3083.2	359	Not checked for calms
	H2H	202	187	15			88	Not checked for calms
1974	H	195	190	15	362.95	3083.2	106	Not checked for calms
	H2H	191	176	15			40	Not checked for calms
1975	H	387	372	15	362.4	3083.6	165	Not checked for calms
	H2H	227	212	15			300	Not checked for calms
1978	H	351	336	15	362.4	3083.6	119	Due to calms
	H2H	326	311	15			63	Due to calms
	H	241	226	15	362.3	3082.6	171	Valid
	H2H	233	218	15			114	Valid
1979	H	248	233	15	362.3	3082.6	262	Not checked for calms
	H2H	226	211	14			176	Not checked for calms

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

Table 5. Maximum Annual Average SO_2 Concentrations for Receptors Located on Plant Property

Year	Concentration (ug/m^3)			Receptor Location UTM Coordinates (km)		Comments
		Contribution From				
	Total	Modeled Sources	Back-ground	X	Y	
1973	54	39	15	362.2	3082.9	Includes contribution due to calms
1974	54	39	15	362.3	3082.6	Includes contribution due to calms
1975	61	46	15	362.3	3082.6	Includes contribution due to calms
1978	64	49	15	362.4	3082.2	Includes contribution due to calms
1979	60	45	15	362.3	3082.6	Includes contribution due to calms

Source: ESE, 1984.

Maximum annual average SO_2 impacts on plant property are shown in Table 5. The maximum value of 64 ug/m^3 slightly exceeds the annual AAQS of 60 ug/m^3, but the predicted value includes the effects of calm wind conditions on the concentration estimates. This maximum also occurs well within plant property boundaries.

Comment 11

See attached working maps for receptor sites in the vicinity of Gardinier (north, south, and east-west grids) and TEC Big Bend. A table of receptor locations is provided for northern receptors which clearly defines distance and direction from Gardinier.

Comment 12

Working maps are provided in response to this comment.

Comment 13

Additional dispersion modeling was conducted in order to assess the impact of the proposed modification upon the Pinellas County SO_2 nonattainment area. A 5-year ISC model execution was performed, using only the increase in allowable SO_2 emissions from the Gardinier H_2SO_4 Plants 7 and 8. Stack parameters were assumed to be the same for before and after the modification. This assumption is conservative since the stack flows are based upon the higher production rate and allowable emissions, and therefore would tend to underpredict baseline impacts and overpredict the increase in air quality impacts. Because of the distance to the nonattainment area from Gardinier, a single receptor paint was used in the analysis (329.0, 3112.0). The results of the analysis are summarized in Table 6.

As shown, the predicted increase in SO_2 concentrations in the nonattainment area due to the proposed modification are less than significance levels. The significance levels are 1, 5, and 25 ug/m^3 for the annual, 24-hour, and 3-hour averaging times, respectively.

Table 6. Maximum SO_2 Concentrations Predicted for the SO_2 Nonattainment Area

Averaging Time	Value	Increase in Concentration (ug/m^3)	Period		
			Julian Day	Hour Ending	Year
Annual	H	0.1	--	--	All
24-Hour	H	3.2	15	24	1973
	H2H	3.1	253	24	1973
3-Hour	H	17	253	6	1973
	H2H	15	15	6	1973

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

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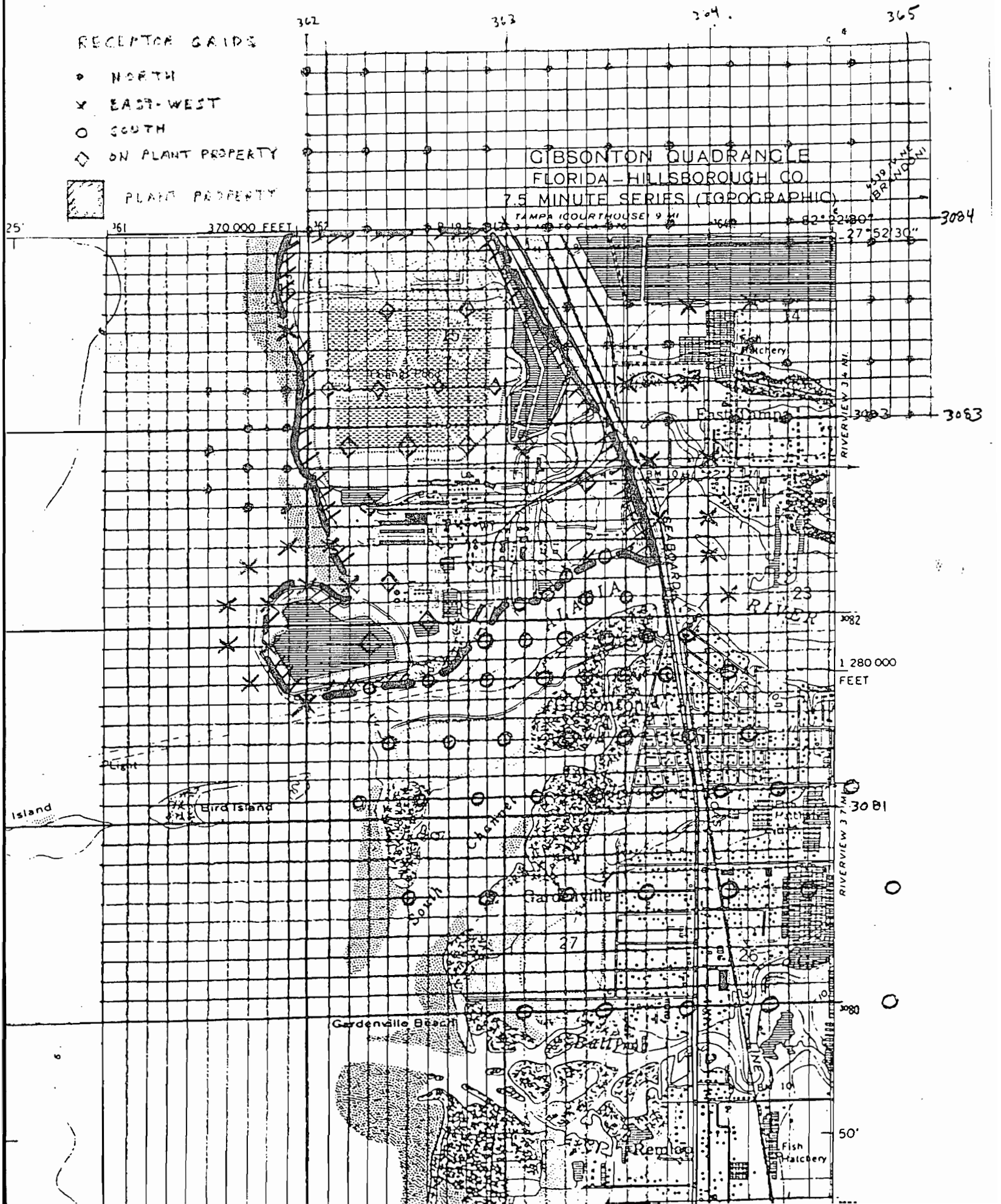

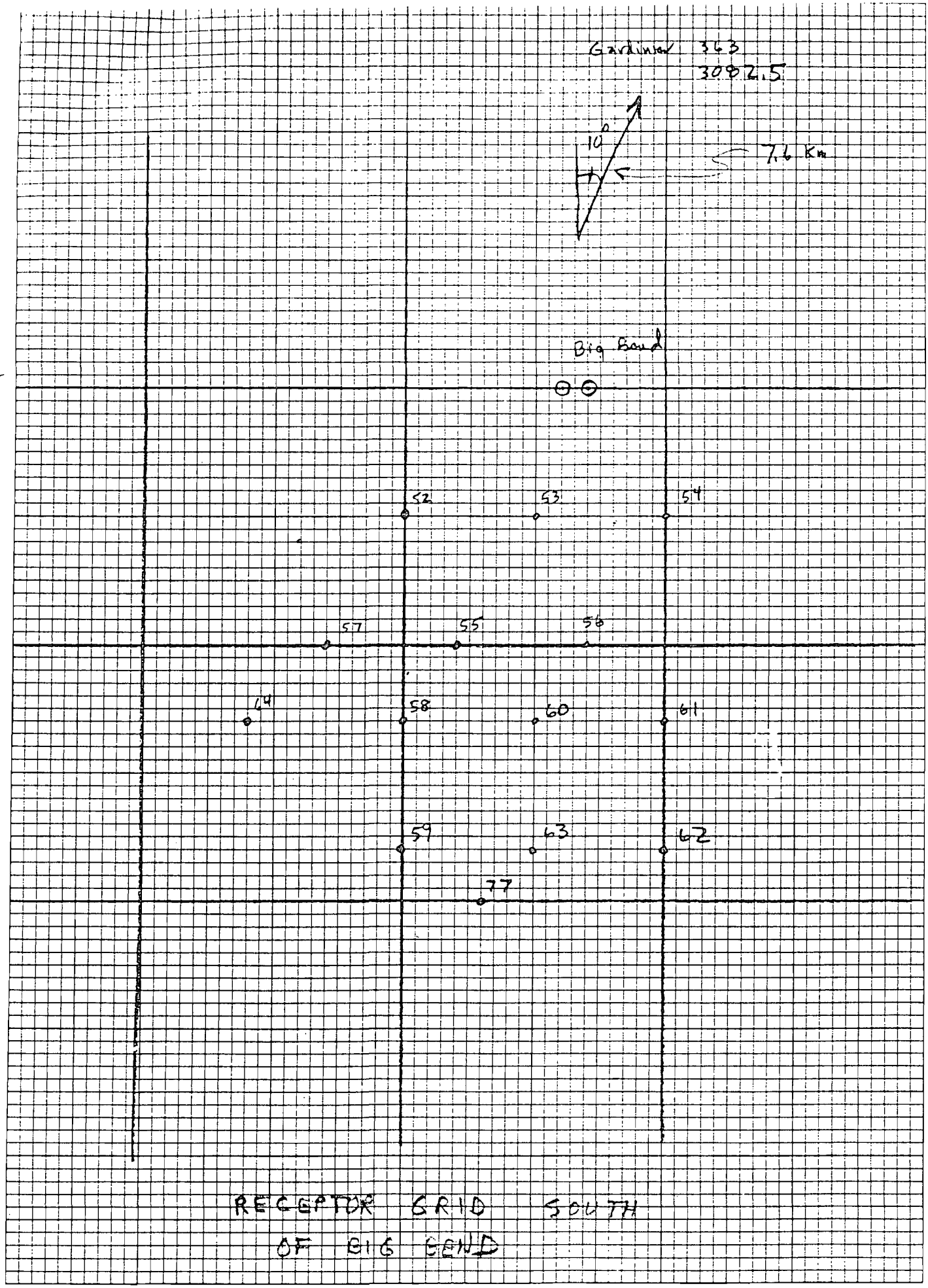

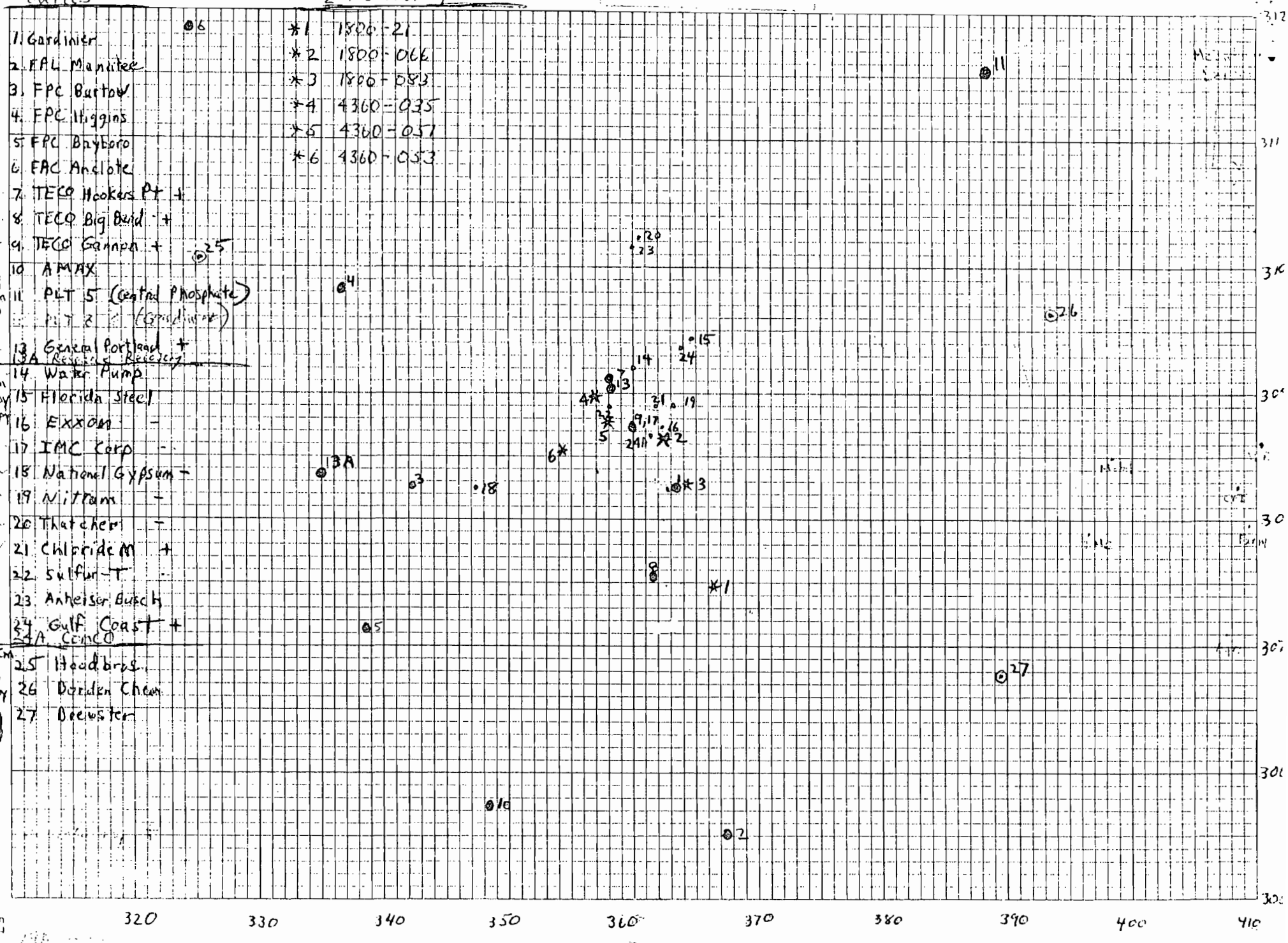

LOCATION SO_2 SOURCES AND AMBIENT MONITORING SITES

ESE
P. O. Box ESE
GAINESVILLE, FL 32602
(904) 332-3318

JOB
SHEET NO. 4 OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

RECEPTOR GRID NORTH OF INTERACTION SOURCES

6	Gardinier		363	3082.5		
		(Sr. No. on Map)			Direction from Gardinier	Distance (km)
2	Chloride Metals	(21)	361.8	3088.3	348	5.9
3	TECO	HP (7)	358.0	3091.0	330	9.9
5	TECO	Gannon (9)	360.0	3087.5	329	5.8
1	Gen Portland	(13)	350.0	3090.6	328	9.5
2	Gulf Coast	(24)	363.9	3093.8	5	11.3

18

Receptors - north of Interaction Sources

Source	Receptors	Downwind Distance from source		Source Location
Gannon	359.74, 3087.93	from Gannon 0.5	329°	360.0 3087.5
	359.48, 3088.02	1.0		
	358.29, 3089.53	2.0		
TECO HP, GenPort	357.75, 3091.43	from HP 0.5	330°	358 3091
	357.50, 3091.87	1.0		
	357.0, 3092.73	2.0		
Chloride Metals	361.7, 3088.79	from Chloride Metals 0.5	348°	361.8 3088.3
	361.59, 3089.28	1.0		
	361.38, 3090.26	2.0		
Gulf Coast	363.94, 3094.3	0.5	5°	363.9 3093.8
	363.99, 3094.8	1.0		
	364.07, 3095.79	2.0		

P. O. BOX 14000, JUNO BEACH, FL 33408

FLORIDA POWER & LIGHT COMPANY

August 12, 1983

DER

AUG 24 1983

BAQM

Mr. Ed Palagyi
Air Quality Branch
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Dear Mr. Palagyi:

I am writing you in hopes of clarifying the state rules regarding our Martin Power Plant Units 1 and 2. The Martin Units are classified as 1971 NSPS oil fired power plants which are located in Martin County.

The Federal rule which regulates the allowable NOx emission rate is .3 lbs $NO_x/10^6$ Btu measured as a 3-hour average. The state rule is .3 lbs $NO_x/10^6$ Btu measured as a 2-hour average. The plant currently uses a recording device which calculates the 3-hour average. It is Florida Power & Light Company's intent to submit excess emission reports using the 3-hour average as required by EPA. We were given verbal approval by Mr. Tim Powell of your St. Lucie District to use the 3-hour average for reporting purposes. Florida Power & Light Company is asking DER to confirm their verbal permission in writing.

If further information is needed, please call me at (305) 863-3644.

Sincerely,

Thomas W. Barlow

Thomas W. Barlow

cc: Clair Fancy

Environmental Protection Agency
Jim Littell

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

August 24, 1983

Mr. Thomas W. Barlow
Florida Power & Light
P. O. Box 14000
Juno Beach, Florida 33408

Dear Mr. Barlow:

When measured by a continuous monitoring system the three-hour averaging period, as stated in 40 CFR 60.45(g)(2), is to be used to determine excess NOx emissions from Martin Power Plant Units 1 and 2. The State rule requires a two-hour average when testing for NOx emissions using EPA Method 7.

If you have further questions in this matter, please call Mr. Edward Palagyi at (904) 488-1344.

Sincerely,

C. H. Fancy, P. E.
Deputy Chief
Bureau of Air Quality
Management

CHF/EP/s

cc: Mr. Tim Powell
SE District Branch Office