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DAP Application withdrawn & Replaced
Feb. 6, 1980

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DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

CENTRAL AIR PERMITTING SECTION

ACTION NO

ACTION DUE DATE

TO: (NAME, OFFICE, LOCATION)				
1. AMODIO	BOCK	FANCY	GEORGE	INITIAL / DATE
2. HANKS	HERON	HOLLADAY	FANCY	INITIAL / DATE
3. MITCHELL	BECKY	PALAGYI	POWELL	INITIAL / DATE
4. ROGERS	SVEC	THOMAS		INITIAL / DATE

REMARKS:

50 ton DAP ups' owing
want operating permit

other 4: 20 tph DAP plants are
down & they will leave them
down as offsets, rather than #13

Total 4 20 tph ones backing up

dry rock for phosphate rock plant!
when #4 comes on stream
till #3 converted to wet rock
& #4 goes down
#2 would have to be shut down

20 tph
23#/hr each
92#/hr

INFORMATION: REVIEW & RETURN; REVIEW & FILE; INITIAL & FORWARD

DISPOSITION: REVIEW & RESPOND; PREPARE RESPONSE; FOR MY SIGNATURE; FOR YOUR SIGNATURE; LET'S DISCUSS; SET UP MEETING; INVESTIGATE & REPT; INITIAL & FORWARD; DISTRIBUTE; CONCURRENCE; FOR PROCESSING; INITIAL & RETURN

FROM:

DATE

PHONE

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4. ROGERS	SVEC	THOMAS		INITIAL / DATE

REMARKS:

until #3 phos acid
over to wet rock
mod.

#4 ~~[illegible]~~ will

#4 phos

21343 ll/pd
1/1/83

21345

#3 mod

#1 & #2
standing

INFORMATION: REVIEW & RETURN; REVIEW & FILE; INITIAL & FORWARD

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FROM:

DATE

PHONE

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT APPLICATION FOR PROPOSED MODIFICATIONS AT GARDINIER, INC.'s TAMPA CHEMICAL PLANT

Submitted By:
Gardinier Inc.
P.O. Box 3269
Tampa, Florida 33608

Submitted To:
U.S. Environmental Protection Agency
Region IV

GARDINIER INC.

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

RUDY J. CABINA
VICE PRESIDENT

November 26, 1979

U.S. Environmental Protection Agency, Region IV
Air and Hazardous Materials Division
Air Facilities Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Attention: Mr. Tommie A. Gibbs, Branch Chief

Re: Prevention of Significant Deterioration Permit Application for Proposed Modifications At Gardinier, Inc's Tampa Chemical Plant

Dear Mr. Gibbs:

Attached is a Prevention of Significant Deterioration (PSD) permit application for proposed modifications at Gardinier's Tampa Chemical Plant. This project has previously been discussed with you and your staff at meetings held on October 5, 1979, and on October 29, 1979. Representing Gardinier at these meetings was Al Morrison, Superintendent of Environmental and Chemical Services, and our environmental consultant, Dames & Moore. The attached application incorporates suggestions and recommendations made during these meetings (and during related telephone discussions), including suggestions made at the October 29 meeting by Jeff Shumaker who represents your contractor, TRW Inc.

Based on information received from EPA, it is our understanding that Gardinier's proposed project will be reviewed under existing PSD regulations and, under these regulations, will be subject to Tier 1 requirements only. The content of our application, particularly with regard to evaluation of control technology and air quality impacts, is structured in accordance with this understanding.

As agreed to at the October 29 meeting, we are simultaneously submitting permit application copies to EPA, TRW, and the Florida Department of Environmental Regulation. Should your staff or TRW have any questions concerning the application, please direct them to Al Morrison at the Tampa Chemical Plant (813-677-9111). Since time is an important consideration on this project, we would appreciate a conclusion of the completeness review as soon as possible and immediate notification if it appears that the application might be considered incomplete. We will be pleased to meet with your representatives or otherwise provide additional information at any time if this will assist in EPA and TRW's review.

Sincerely,

Rudy J. Cabina

Rudy J. Cabina
Vice President

Attachment
cc: Jeff Shumaker, TRW Inc.
Steve Smallwood, Florida DER

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. APPLICANT INFORMATION

1.1 GENERAL INFORMATION

COMPANY NAME: GARDINIER, INC.
Tampa Chemical Plant

ADDRESS: Post Office Box 3269
Tampa, Florida 33601

TELEPHONE: (813) 677-9111

RESPONSIBLE OFFICERS: Rudy J. Cabina, Vice President
Allen E. Morrison, Superintendent, Environmental Chemical Services

SOURCE LOCATION: The location of the Tampa Chemical Plant operated by Gardinier, Inc. is approximately 8 km south of the city of Tampa at the intersection of U.S. Highway 41 and Riverview Drive. The facility is situated at UTM co-ordinates 362.9 E, 3082.5 N.

NATURE OF THE PROPOSED PROJECT: Gardinier, Inc. plans to modify its existing phosphate processing plant to allow approximately a 20 percent increase in production of P_2O_5 on a yearly basis.

DISTANCE TO NEAREST PSD CLASS I AREA: The nearest PSD Class I area is the Chassahowitzka National Wilderness Area (NWA) located 90 km to the north of the plant site. The only other Class I areas in Florida are the St. Marks NWA located 300 km to the northwest, the Everglades National Park located 300 km to the south-southeast and the Bradwell Bay NWA which is 320 km to the northwest.

1.2 PROJECT SCHEDULE OBJECTIVES

Start Construction: April-July 1980

Start Operation: Within two years of starting construction.

1.3 EXPECTED NORMAL OPERATING SCHEDULE

(See copies of construction permit applications in Appendix.)

2. SITE INFORMATION

2.1 GENERAL INFORMATION

The Tampa Chemical Plant, operated by Gardinier, Inc., is located approximately 8 km south of Tampa on the west side of U.S. Highway 41 at the intersection of Riverview Drive. The relative location of the plant site is shown in Figure 2-1.

2.2 SITE PLAN

The site plan of Gardinier's Tampa Chemical Plant is shown in Figure 2-2. The figure shows the location of proposed modifications and additions to this facility as described herein.

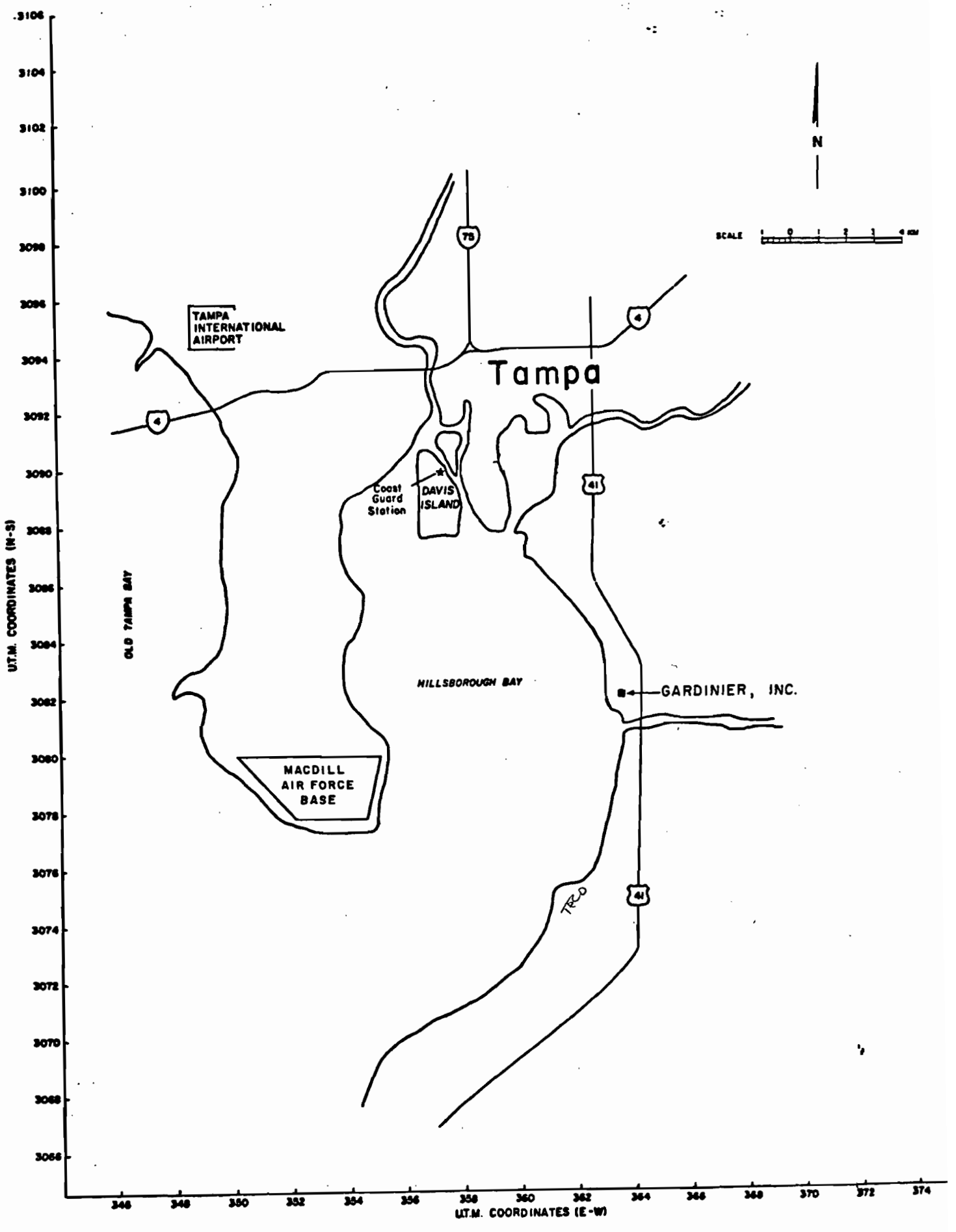


FIGURE 2-1. RELATIVE LOCATION OF GARDINIER'S TAMPA CHEMICAL PLANT

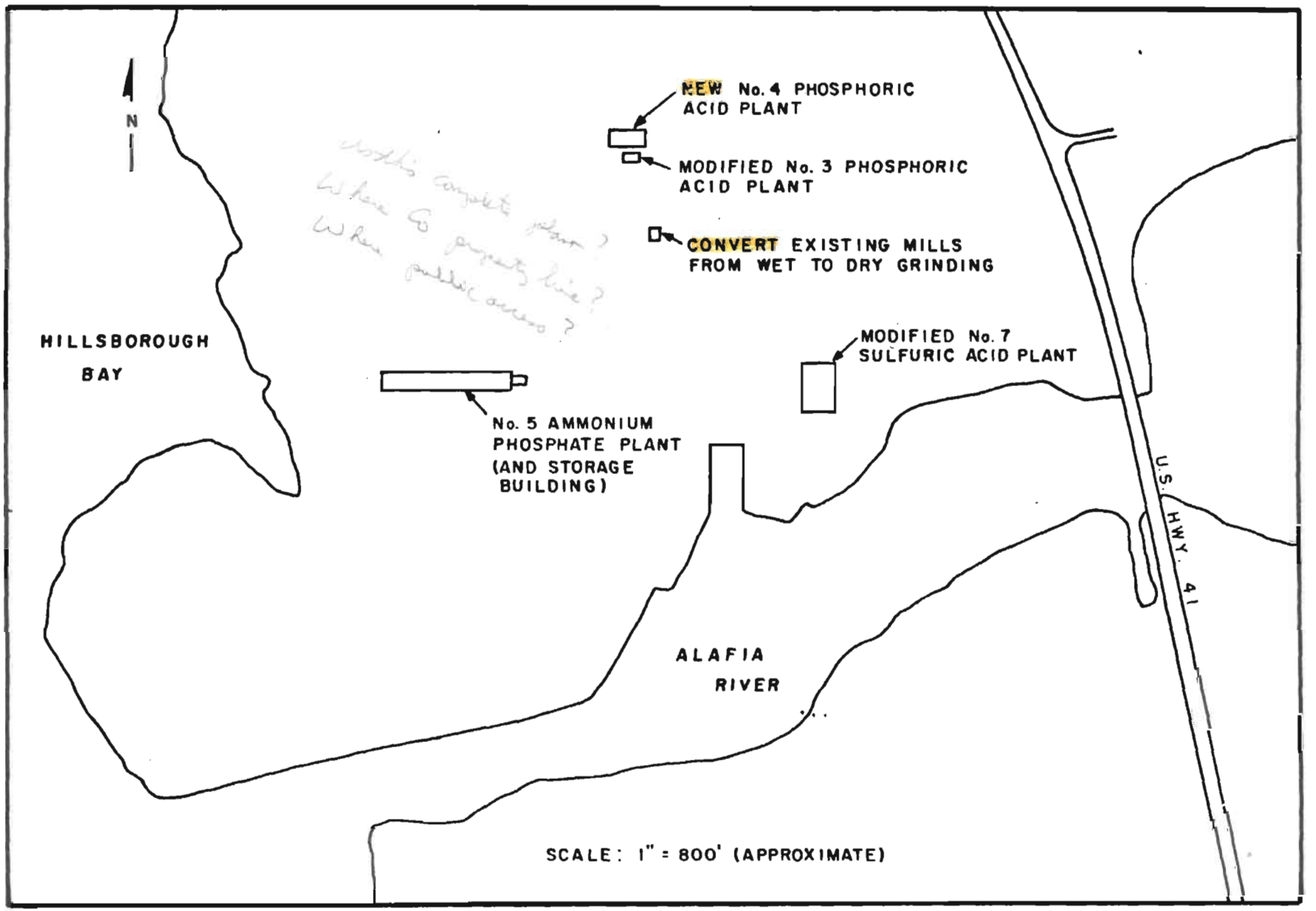


Figure 2-2. Relative Location of New and Modified Facilities.

3. DESCRIPTION OF MODIFICATIONS AND NEW FACILITIES

3.1 GENERAL INFORMATION

Gardinier's planned modifications to its existing facilities as well as the construction of a new diammonium phosphate production unit will result in an expanded production from 600,000 to 720,000 tons of P_2O_5 per year. The primary changes in the physical plant which will occur are as follows:

- Conversion of the present No. 3 Phosphoric Acid Plant to handle wet rock (as opposed to the currently processed dry rock) as well as the elimination of a dilution cooler, the addition of a flash cooler, and the modification of the cross-flow packed scrubber.
- Replacement of the present No. 2 Phosphoric Acid Plant with a new plant (to be designated the No. 4 Phosphoric Acid Plant).
- Construction of a new wet rock mill and the conversion of three existing dry rock mills to the wet rock process.
- Construction of a new 50 ton/h diammonium phosphate production unit (to be designated as the No. 5 Ammonium Phosphate Plant) and associated storage building.
- Modification of the existing No. 7 Sulfuric Acid Plant to facilitate an increase in production capacity from 1,380 tons of H_2SO_4/day to 1,750 tons/day.

In addition to these modifications, the following facilities will be shut down:

- No. 6, 7, 8, 10 rock grinding mills.
- No. 11, 12 KVS rock mills.
- 68BPL rock unloading and storage.
- South No. 2, 3 rock transfer airslides.
- North No. 2 rock transfer airslide
- Center No. 3 rock transfer airslide.
- No. 3 rock transfer airslide bin.

° No. 2, 3 filter buildings.

° Normal superphosphate plant (presently not in operation; see Section 4. for additional discussion).

3.2 FUEL CONSUMPTION

Of the above-mentioned modifications and additions, only the operation of the new Ammonium Phosphate Plant will involve the utilization of combustible fuel. This new facility will consume approximately 150 gal/h of No. 6 fuel oil in order to provide 21.9 MMBTU/h heat input to the rotary dryer.

3.3 PROCESS FLOW DIAGRAMS

Process flow diagrams for each of the new or modified processes are contained in the Appendix. These flow diagrams are included as part of the construction permit applications previously submitted to the Florida Department of Environmental Regulation (DER). Flow diagrams are provided for each of the following processes:

° No. 3 Phosphoric Acid Plant (modification to existing plant)

° No. 4 Phosphoric Acid Plant (replaces No. 2 Phosphoric Acid Plant)

° No. 7 Sulfuric Acid Plant (modification to existing plant)

° No. 5 Ammonium Phosphate Plant (new plant)

4. EMISSION SOURCE INFORMATION

4.1 IDENTIFICATION OF EMISSION SOURCES

Tables 4-1 through 4-5 set forth the emission status of all proposed new or modified emission sources for the Tampa Chemical Plant. These tables contain information on emission rates and emission source characteristics for each affected source of emission, including sources which will be removed from service upon project completion. Table 4-5 presents an overall summary of annual emission changes for affected pollutants assuming continuous operation of all emission sources (see footnote at bottom of table).

From Table 4-5 it can be seen that the allowable emissions of fluorides will decrease as a result of the proposed project, although the net change in potential fluoride emissions will be greater than 100 tons/year thereby requiring that a PSD permit be obtained. Both particulate matter and sulfur dioxide net emission changes (potential as well as allowable) are emission reductions as a result of shutting down several emission sources and installing current technology control equipment on new and modified sources. Potential and allowable emissions of nitrogen dioxide are also estimated to be less than 50 tons/year.

There will also be an additional factor not reflected in Tables 4-1 and 4-5 which further supports the improvement in particulate matter air quality which will be gained if the proposed project is approved: namely, conversion to a wet-rock process will eliminate a considerable amount of fugitive dust for which no credit is taken in this application. The Hillsborough County Environmental Protection Commission has estimated that present fugitive dust emissions generated by Gardinier's Tampa Chemical plant are approximately 2,200 tons/year.

For better understanding of Tables 4-1, 4-2, and 4-5, it should be noted that the Normal Superphosphate Plant is a permitted emission source but is not presently operating. When the No. 5 Ammonium Phosphate Plant is started up, there will not be an adequate supply of raw materials to allow simultaneous operation of both it and the Superphosphate plant. Therefore, as part of the proposed project, this

TABLE 4-1

SUMMARY OF AFFECTED PARTICULATE MATTER EMISSION SOURCES

Emission Source Description	Potential[a] Particulate Emission Rate (lb/h)	Permitted or Allowable Particulate Emission Rate (lb/h)	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Exit Temperature (°F)	Exit Volumetric Flow (ft^3/min)
1. Existing Facilities Which Will Be Shut Down							
No. 6, 7, 8, 10 Rock Grinding Mills[c]	100	39.3[b]	95	2.0	95.5	152	18,000
No. 11 KVS Rock Mill[c]	400	30.6[b]	70	1.6	44.3	145	5,340
No. 12 KVS Rock Mill[c]	80	32.9[b]	71	1.6	70.7	148	8,530
68BPL Rock Unloading and Storage	176	42.5[b]	30	1.7	97.8	100	13,320
South No. 2 Rock Transfer Airslide[c]	210	18.2[b]	96	1.0	54.5	105	2,570
North No. 2 Rock Transfer Airslide[c]	210	18.2[b]	85	0.4	83.6	102	630
South No. 3 Rock Transfer Airslide[c]	105	9.65[b]	96	1.2	21.1	132	1,430
Center No. 3 Rock Transfer Airslide[c]	105	9.65[b]	115	1.2	22.7	118	1,540
North No. 3 Rock Transfer Airslide[c]	105	9.65[b]	82	1.2	14.4	97	980
No. 3 Rock Transfer Airslide Bin[c]	105	9.65[b]	108	1.2	21.5	128	1,460
Normal Superphosphate	20	19.4[b]	73	2.5	49.8	86	14,670
Total	1616	239.7					
2. New Facilities							
No. 5 Ammonium Phosphate	210	10[d]	90	8.0	45.1	140	136,000
Net Emissions	-1406[e]	-229.7[e]					

[a] Potential emissions in the absence of control equipment, based on estimated control efficiency.
[b] From process weight-rate regulation.
[c] Equipped with bag filters having vent deflectors.
[d] Maximum based on available data.
[e] Represents a net emission reduction.

TABLE 4-2

SUMMARY OF AFFECTED FLUORIDE EMISSION SOURCES

Emission Source Description	Potential Fluoride Emission Rate (lb/h)	Permitted or Allowable Fluoride Emission Rate (lb/h)	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Exit Temperature (°F)	Exit Volumetric Flow (ft^3/min)
1. Existing Facilities Which Will Be Shut Down or Modified							
No. 2 Phosphoric Acid (shut down)	8.0[a]	1.12	110	4.0	37.3	154	28,120
No. 2 Filter Building (shut down)	5.4[a]	0.37	59	4.75	32.1	97	34,130
No. 3 Phosphoric Acid (modified)	25.0[a]	0.94	93	4.0	29.4	124	22,170
No. 3 Filter Building (shut down)	18.6[a]	0.83	51	4.5	40.6	108	38,740
Normal Superphosphate	0.5	0.50	73	2.5	49.8	86	14,670
Total	57.5	3.76					
2. New or Modified Facilities							
No. 3 Phosphoric Acid (modified)	25.0[b]	0.9	93	4.0	15.9	135	11,990
No. 4 Phosphoric Acid (new)	32.2[b]	1.2	115	4.0	15.9	135	11,990
No. 5 Ammonium Phosphate (new)	176.0[b]	1.4	90	8.0	45.1	140	136,000
Total	233.2	3.5					
Net Emissions	+175.7	-0.26					

[a]Potential emissions in the absence of control equipment, based on estimated control efficiency.

[b]Based on typical scrubber water analysis.

TABLE 4-3

SUMMARY OF AFFECTED SULFUR DIOXIDE EMISSION SOURCES

Emission Source Description	Potential Sul. Diox. Emission Rate (lb/h)	Permitted or Allowable Sul. Diox. Emission Rate (lb/h)	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Exit Temperature (°F)	Exit Volumetric Flow (ft^3/min)
1. Existing Facilities Which Will Be Modified							
No. 7 Sulfuric Acid	a	575	150	7.5	27.1	153	71,830
2. Modified Facility							
No. 7 Sulfuric Acid	a	292	150	7.5	33.9	155	89,860
Net Emissions	a	-283[b]					

[a] Potential emissions are difficult to define in this case because control method (double-absorption process) is an integral part of unit and not an add-on flue gas sulfur removal method.

[b] Represents a net emission reduction.

TABLE 4-4

SUMMARY OF AFFECTED NITROGEN DIOXIDE EMISSION SOURCES

Emission Source Description	Potential Nit. Diox. Emission Rate (lb/h)	Permitted or Allowable Nit. Diox. Emission Rate (lb/h)	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Exit Temperature (°F)	Exit Volumetric Flow (ft^3/min)
1. New Facility							
No. 5 Ammonium Phosphate	9.0[a]	9.0[a]	90	8.0	45.1	140	136,000

Permit proviso

[a]Based on AP-42 emission factors for industrial boilers of 60 lb NO_2 per 1000 gal of residual fuel oil.

TABLE 4-5

SUMMARY OF NET CHANGE IN ANNUAL EMISSIONS
RESULTING FROM PROPOSED MODIFICATIONS

Emission Type	Particulate Matter (t/y)	Fluorides (t/y)	Sulfur Dioxide (t/y)	Nitrogen Dioxide (t/y)
Potential Emissions[a]	-6158	+770	-1240[b]	+40
Allowable Emissions[a]	-1006	-1	-1240[b]	+40

[a]Based on the assumption that emission sources operate continuously throughout the year. Continuous operation is not actually possible, of course. However, the normal operating hours of offsetting fluoride emission sources are such that assuming continuous operation assures no underestimation of annual potential or allowable fluoride emissions. The continuous operation assumption also provides an upper limit on nitrogen dioxide emissions from the No. 5 Ammonium Phosphate Plant.

[b]Sulfur dioxide emissions result from operation of the No. 7 Sulfuric Acid Plant. Since emission controls are integral to the acid production process, potential and allowable emissions are assumed to be equivalent.

Superphosphate Plant will be dismantled and will no longer be even a potential source of emissions.

As a concluding note, there will also be sulfuric acid mist emissions from the No. 7 Sulfuric Acid Plant. Allowable emissions will decrease from the present limit of 17.3 lb/h (72 tons/year) to 10.9 lb/h (46 tons/year) after modifications have been completed. (The annual rate is based on an operating schedule of approximately 8300 hours/year.) This amounts to a net reduction of approximately 26 tons/year.

4.2 DERIVATION OF EMISSION RATE ESTIMATES

Existing Emission Sources

The allowable emission rates shown in Tables 4-1 through 4-3 for existing emission sources scheduled to be shut down or modified are the limits specified in current state permits.

New Particulate Matter Emission Source

The only new particulate matter emission source involved in the proposed project is the No. 5 Ammonium Phosphate Plant. At present there is not a specific federal New Source Performance Standard or a Florida emission limiting standard for particulate emissions from diammonium phosphate production units. The estimated maximum emission rate of 10 lb/h shown in Table 4-1 is based on performance data for comparable new equipment operated elsewhere within the Florida phosphate industry. The allowable emission rate based solely on Florida process weight rate standards would be much higher than 10 lb/h (see Table 6-1), but Gardinier is confident of achieving an emission rate of no greater than 10 lb/h and is willing to accept this rate as a condition of state and federal permits.

New and Modified Fluoride Emission Sources

The allowable fluoride emission rates listed in Table 4-2 for new and modified facilities are based strictly on the rates allowed by

federal New Source Performance Standards and Florida emission limiting standards specific to these types of facilities (wet-process phosphoric acid plants and diammonium phosphate plants). Applicable standards and equivalent P_2O_5 process quantities used to develop emission rates are presented in a later section (in Table 6-1). Actual emission rates are expected to be somewhat less than allowed by emission standards (see Table 6-1), but Gardinier requests that permit emission restrictions be no more stringent than required by performance standards for new sources.

Modified Sulfur Dioxide Emission Source

The only source of sulfur dioxide affected by the proposed project is the No. 7 Sulfuric Acid Plant. The emission rate shown in Table 4-3 for the modified facility is derived from the federal New Source Performance Standard and Florida emission limiting standard for new sources as shown in Table 6-1.

New Nitrogen Dioxide Emission Source

The only new source of nitrogen dioxide emissions is the No. 5 Ammonium Phosphate Plant. Relatively low emissions of NO_x are expected to result from combustion of No. 6 fuel oil in the dryer. Specific state or federal NO_x emission standards for this type of combustion do not exist. The emission rate shown in Table 4-4 is derived from the AP-42 emission factor for industrial boilers which is 60 lb NO_2 per thousand gallons of residual fuel oil burned. Based on an expected fuel combustion rate of 150 gal/h, the resulting emission rate estimate is 9 lb/h.

4.3 TIMING OF EMISSION SOURCE CHANGES

Particulate Matter Emission Sources

The only new source of particulate matter emissions is the No. 5 Ammonium Phosphate Plant. At least one of the dry rock grinding mills listed in Table 4-1 with sufficient emissions to offset the No. 5 Ammonium Phosphate Plant will have shut down by the time the No. 5 Plant

becomes operational. All of the existing facilities scheduled for shut down as listed in Table 4-1 will have ceased operation within nine months of the startup of the No. 5 Ammonium Phosphate Plant. In summary, there will not be any period when allowable emissions of particulate matter will exceed those presently in effect.

Sulfur Dioxide Emission Source

The only sulfur dioxide emission source involved in the proposed project is the No. 7 Sulfuric Acid Plant. This plant will be out of service while undergoing final modifications (a phase which will last approximately 6 weeks), and when started back up will be operating at a lower allowable emission rate than at present.

Flouride Emission Sources

The present schedule for shutting down, modifying, and adding the fluoride emission sources listed in Table 4-2 is somewhat complicated. Before getting into the details of this schedule, however, it should be recognized that even if all of the new and modified emission sources were operating at full capacity simultaneously with sources slated to be shut down (a situation which will not occur), the total allowable fluoride emission rate would only be 6.4 pounds per hour (equivalent to an annual rate of 28 tons). The question of overlapping operating periods is therefore not particularly significant.

The total period scheduled for adding, modifying, and shutting down sources is approximately 23 months after construction permits are obtained. During this time there may be overlapping periods when fluoride emission sources not presently in operation will be operating simultaneously with existing sources before modification or shut down. The current development schedule showing maximum periods of overlap is presented in Figure 4-1.

This figure should be evaluated with three considerations in mind. First, the periods of overlap include testing phases for the No. 3 Phosphoric Acid Plant, No. 4 Phosphoric Acid Plant, and No. 5 Ammonium Phosphate Plant. The testing phase for each plant will last

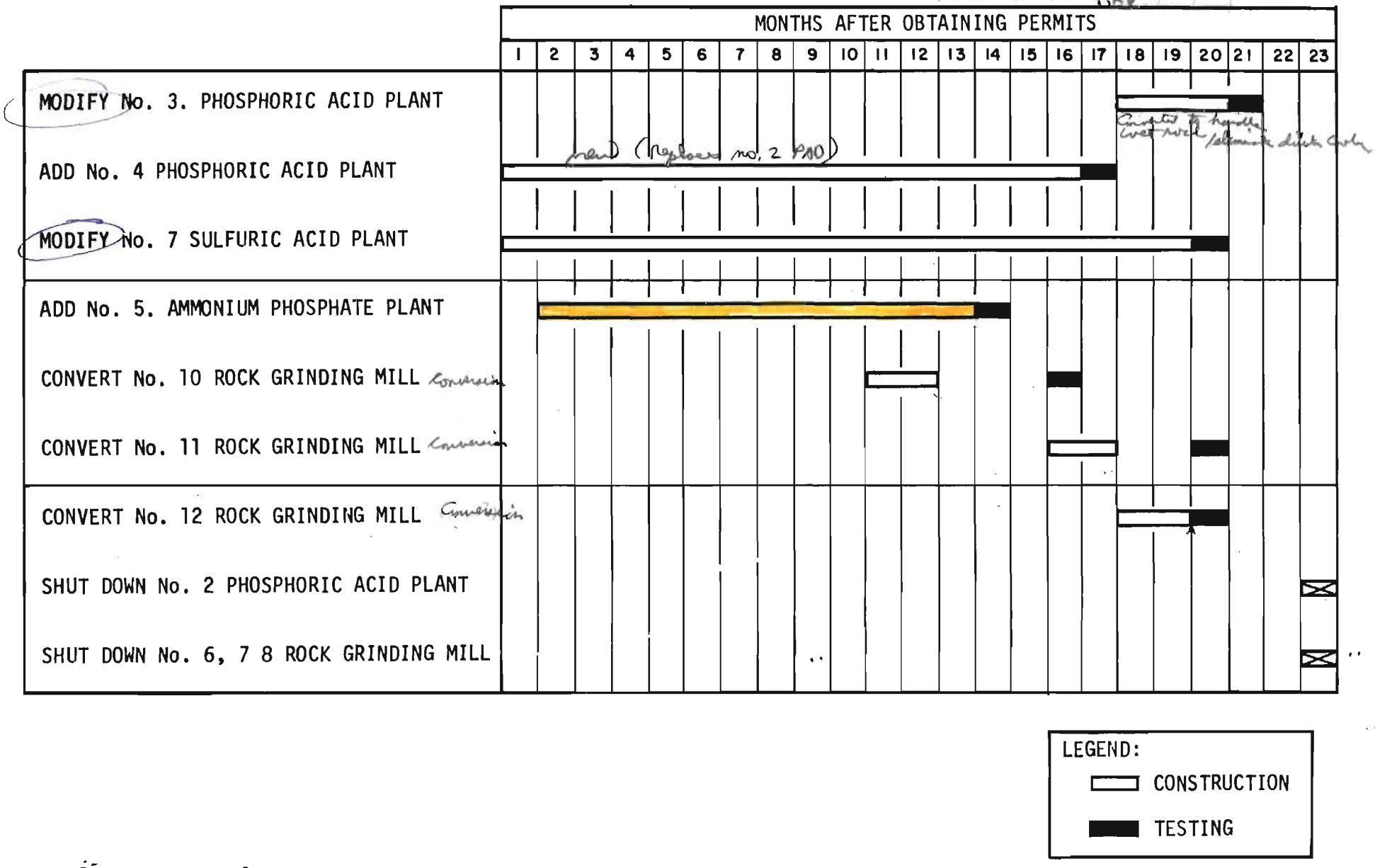


Figure 4-1. Proposed Project Development Schedule.

approximately one month, during which time fluoride emissions will be intermittent rather than continuous. Second, the raw material supply available for the entire plant complex will not allow each existing and new facility to be operated simultaneously at full capacity. As a result, total fluoride emissions even during overlap periods will be essentially equal to present emissions. Third, the schedule for development of the No. 5 Ammonium Phosphate Plant is somewhat flexible and could be adjusted to reduce the duration of overlap periods if necessary.

5. REGULATORY CONSIDERATIONS

Under the existing regulations governing PSD, new or modified sources with allowable emissions of less than 50 tons/year are exempt from full PSD review. In accordance with these regulations, such sources need not: demonstrate the use of Best Available Control Technology (BACT); demonstrate that the source would not cause or contribute to violations of applicable PSD increments or the national ambient air quality standards (NAAQS); assess direct or indirect effects of the source on visibility, soils or vegetation; or provide ambient air quality monitoring data, unless the source is expected to impact a PSD Class I area or an area where an applicable increment or standard is known to be violated. An applicant must, however, demonstrate that the source would meet all applicable emission limitations regulated under the state implementation plan (SIP) and all applicable emission standards and new source performance standards (NSPS) under 40 CFR, parts 60 and 61.

In discussing Gardinier's project with EPA, a question arose as to whether or not the proposed modification of the No. 7 Sulfuric Acid Plant requires a BACT analysis. Allowable SO_2 emissions from the modified facility will exceed 50 tons per year, but in comparison with allowable SO_2 emissions from the existing facility there will be a decrease in allowable emissions of 1240 tons per year (as shown in Table 4-5). Gardinier recognizes that achieving internal emission offsets does not provide an exemption from BACT review when there is an increase in emissions of 50 tons per year or more at one facility and an offsetting emissions reduction at an entirely separate facility within the same plant complex. In the present case, however, the offset is being achieved as a result of modifying a single facility, the No. 7 Sulfuric Acid Plant. In this situation, Gardinier feels that section 52.21 (j)(3) of the existing PSD regulations is governing. This section states that "In the case of modification, the requirement for best available control technology shall apply only to each new or modified facility which would increase the allowable emissions of an

applicable pollutant." (The term facility is defined as "an identifiable piece of process equipment.") However, since the question of BACT applicability has not been resolved, a further discussion of modifications proposed for the No. 7 Sulfuric Acid Plant is provided in Section 6 in the event that EPA requires further assurance on planned emission controls.

Inasmuch as all allowable net increases in emissions for the proposed additions and modifications to this plant complex are less than 50 tons/year (see Table 4-5), and furthermore in that the allowable emissions from individual new and modified facilities are less than 50 tons/year without offsets (except for the No. 7 Sulfuric Acid Plant as discussed above), it is expected that the proposed changes will be exempt from full PSD review. Regarding the demonstration of compliance with state and federal emission limitation standards, this will be shown in Section 6.

At the present time, the area of Hillsborough County in which the Tampa Chemical Plant is located is officially designated as a nonattainment area for particulate matter. In view of this situation, it is necessary to ensure that there will be no adverse air quality impact on this nonattainment area as a result of the proposed modifications. Ambient air quality considerations are discussed in Section 7.

LAER ~ Down 50 TPY

6. EMISSION CONTROL

As discussed in the previous section, a demonstration of BACT is not expected to be required for the permitting of these facilities since all allowable net changes in contaminant emissions are less than 50 tons/year. It should be noted, however, that all new and modified facilities will be equipped with technologically current emission control devices to ensure that the best available emission control technology is in fact being utilized.

Because the Tampa Chemical Plant is located within a nonattainment area for total suspended particulates, particulate matter emissions are of special concern. As shown in Table 4-1, there will be a net reduction in allowable particulate matter emissions of about 210 lb/h (920 ton/yr) as a result of these modifications (not counting reduction in fugitive dust emissions). The primary reason for the large reduction in particulate matter emissions is the conversion to wet-rock processing and consequent elimination of dry-rock grinding and handling.

As required under the regulations governing PSD, it is necessary to demonstrate compliance with all applicable state and Federal emission limitation standards. Table 6-1 sets forth these standards, compared with the expected maximum emission rates for each facility. As shown in the table, emission standards for this facility apply to fluorides (No. 3 and No. 4 Phosphoric Acid Plants and the No. 5 Ammonium Phosphate Plant), particulates (No. 5 Ammonium Phosphate Plant), as well as sulfur dioxide and sulfuric acid mist (No. 7 Sulfuric Acid Plant). All of these emissions are shown to be lower than or equal to the applicable emission standard.

Comments were made in Section 5. on the question of whether or not a BACT analysis is required for the No. 7 Sulfuric Acid Plant. Without discussing further the regulatory aspects of this question, additional information on modifications proposed for this facility is provided below. This information is taken in part from the construction permit application copy contained in the appendix.

TABLE 6-1

COMPARISON OF ACTUAL FACILITY EMISSIONS VERSUS
APPLICABLE EMISSION LIMITATION STANDARDS

Facility	Product	Process Rate (lb/h)	Contaminant	Expected Maximum Emission Rate (lb/h)	Applicable[a] Emission Standard (lb/ton)	Emission Limitation (lb/h)
No. 3 Phosphoric Acid Plant	Phosphoric Acid	93,000 (P_2O_5)	Fluorides	0.83	0.02 lb/ton of P_2O_5	0.9
No. 4 Phosphoric Acid Plant	Phosphoric Acid	120,000 (P_2O_5)	Fluorides	0.83	0.02 lb/ton of P_2O_5	1.2
No. 5 Ammonium Phosphate Plant	Di-Ammonium Phosphate	46,000 (P_2O_5)	Fluorides	1.4	0.06 lb/ton of P_2O_5	1.4
"	"	100,000 (Process input)	Particulates	10.0	$17.31P^{0.16}$[b]	32.4
No. 7 Sulfuric Acid Plant	H_2SO_4	145,833 (H_2SO_4)	SO_2	291.7	4 lb/ton of H_2SO_4	291.7
"	"	"	H_2SO_4 (mist)	10.9	0.15 lb/ton of H_2SO_4	10.9

[a] State and Federal standards are equivalent except where noted.

[b] State standard only. "P" represents process feed rate in tons per hour.

The modifications undertaken will increase plant capacity from 1380 tons of 100% sulfuric acid per day to 1750 tons per day. This will be accomplished by the following changes:

1. Drying Tower - Replace packed spray catcher with a mesh pad; remaining tower internals will not be changed.

2. Sulfur Burner - Change sulfur sprays to handle 60 gallons per minute (gpm) of sulfur.

3. Sulfur Pumps - Increase capacity to 60 gpm.

4. No. 1 Waste Heat Boiler - New boiler required.

5. Converter - Installation of an additional 21,000 liters of Type 210 catalyst will keep SO_2 emission levels below 4.0 lb/ton H_2SO_4.

6. Superheaters - No. 2 superheater must be retubed. Allowance was made in the original design to accomodate sufficient additional surface area without rebuilding the converter internals.

7. Economizer - One additional section must be added.

8. Interpass Absorption Tower - Install additional HVM mist eliminators in spaces provided. Remainder of interpass tower and internals are adequate. (It is expected that no additional mist eliminators will be required upstream of booster blower.)

9. Booster Blower - Install new booster blower between interpass absorption tower and shell side of No. 1 cold heat exchanger. Blower to handle 69,000 SCFM at approximately 75 inches w.g. and approximately 175°F.

10. Mesh Pad and Vessel - Install new S.S. mesh pad in new vessel at discharge of booster blower to protect cold heat exchanger.

11. Acid Coolers - Rearrange existing radiator coolers to provide seven cooler banks for D.T. circuit duty, sixteen cooler banks for IPAT circuit duty, and two cooler banks for product acid duty.

12. Acid Pumps - Increase D.T. acid pump capacity to 3,700 gpm and IPAT acid pump capacity to 5,000 gpm.

Sulfur dioxide emissions control is accomplished as an integral part of the acid production process within the double-absorption converter. Improvements in the system will permit the modified plant to achieve compliance with federal New Source Performance Standards. Although it is theoretically conceivable that additional emissions control could be achieved by some add-on stack flue gas desulfurization system, discussion with vendors confirms that double-absorption is sufficient to achieve emission standards for new sources and that flue gas controls are neither practical nor necessary.

It is recognized that BACT decisions are not based solely on compliance with emission standards but must be made on a "case-by-case" basis which may suggest emission limits more stringent than allowed by emission standards. In this regard, an important point to consider for Gardiner's project is that compliance with new source standards will result in a decrease in allowable emissions on both a pound of SO_2 per ton of acid basis and on a total tons per year of SO_2 basis. Therefore, in this "case," defining BACT as equivalent to NSPS will result in air quality improvement. Defining BACT any more stringently than this does not seem justified.

7. AMBIENT AIR QUALITY

7.1 GENERAL

Since net emission changes (for any pollutant) will not exceed 50 tons/year, the existing regulations governing PSD do not require that an estimate of air quality impact be made. It should be noted, moreover, that only emissions of nitrogen dioxide will be increased as a result of facility modifications. Nitrogen dioxide emissions will result from the operation of the No. 5 Ammonium Phosphate Plant at an estimated maximum rate of 40 tons/year (9 lb/h); however, such a small emission rate should have an almost negligible effect on ambient levels of NO_2 in relation to the ambient standard for NO_2 which is an annual average standard.

Because the Tampa Chemical Plant is located in a particulate matter nonattainment area, there may be some concern about whether or not proposed particulate emission reductions will also result in reduced ambient concentrations. By reference to Table 4-1, it can easily be seen that the effective stack height (physical stack height plus plume rise) of the new particulate matter source (No. 5 Ammonium Phosphate) will exceed that of sources which will be shut down. This difference in effective stack height results from the much greater volumetric flow of the new source coupled with a stack height and exit temperature which are comparable to those of the sources which will be shut down. According to standard Gaussian modeling concepts, a higher effective stack height will necessarily lead to reduced ground-level impacts provided emissions do not increase.

As an example of differences in effective stack height, consider the No.5 Ammonium Phosphate Plant in comparison with the outlet handling emissions from the No. 6, 7, 8, 10 Rock Grinding Mills. (The No. 6, 7, 8, 10 Rock Grinding Mills outlet is selected for comparison because it has the highest effective stack height of the existing particulate emission source due to temperature and volumetric flow characteristics.) The physical stack heights of these two emission points

are nearly the same (90 ft and 95 ft); therefore, any difference in effective stack height will be due to plume rise. Using the Briggs plume rise calculation method commonly applied in evaluations of this type, the expected plume rise of the No. 5 Ammonium Phosphate Plant plume is four times greater than the plume rise of the Rock Grinding Mills during unstable and neutral atmospheric conditions, and two times greater during stable conditions. Coupled with reduced particulate emissions, the increase in effective stack height should result in lower ground-level concentrations.

7.2 PSD CLASS I AREA IMPACT

The nearest Class I area to Gardinier's Tampa Chemical Plant site is the Chassahowitzka NWA located 90 km to the north. This area is far beyond any expected range of influence for this plant complex (for any pollutant) and consequently there will be no adverse impact on it as a result of the proposed modifications.

8. STATE OF FLORIDA PERMIT APPLICATIONS

The proposed modifications and additions to Gardinier's Tampa Chemical Plant are currently undergoing review by the Florida DER. (In fact, a construction permit for the No. 3 Phosphoric Acid Plant has already been issued.) Copies of construction permit applications submitted to DER are included in the Appendix for the following sources:

- No. 3 Phosphoric Acid Plant
- No. 4 Phosphoric Acid Plant
- No. 7 Sulfuric Acid Plant
- No. 5 Ammonium Phosphate Plant

9. CONCLUSIONS

It has been shown previously that the net change in allowable emission rates as a result of proposed modifications will not exceed 50 tons/year for any pollutant thereby presumably exempting this application from full (tier 2) PSD review. Moreover, it is evident from the previous discussion that the proposed modifications and additions to this facility will not result in any adverse air quality impacts either in the surrounding area or in any PSD Class I area. It has further been shown that contaminant emissions will comply with the applicable state and federal emission limitation standards for the particular processes in question.

APPENDIX

This apendix contains relevant portions of construction permit applications as submitted to the Florida Department of Environmental Regulation (DER) for the following facilities:

- No. 3 Phosphoric Acid Plant ~~NEW~~ MOD., NEW CNTRL. EQUIP.
- No. 4 Phosphoric Acid Plant ONLY FLUORIDES
- No. 7 Sulfuric Acid Plant MOD. SO_2 ← AC, AO
- No. 5 Ammonium Phosphate Plant ~~NEW~~ MOD.

AWAITING NEW APPLICATION.

IN — PSD | NEW VALUES ?

(HAVE MODEL RESULTS.)

NO. 3 PHOSPHORIC ACID PLANT

BEST AVAILABLE COPY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: Air Pollution [X] Incinerator [ ]
Type application: [ ] Operation [X] Construction
Source Status: [ ] New [ ] Existing [X] Modification
Company Name: Gardinier, Inc. County: Hillsborough
Source Identification: No. 3 Phosphoric Acid Plant
Source Location: Street: U.S. Highway 41 and Riverview Drive City: South of Tampa
UTM: East: 362.9 North 3082.5
Appl. Name and Title: Rudy J. Cabina, Vice President
Appl. Address: P.O. Box 3269, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative of* Gardinier, Inc.

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department and revisions thereof. I also understand that a permit, if granted by the Department, will be nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

By: Rudy J Cabina Vice President
Signature of the Owner or Authorized Representative and Title

Date: 6/8/79 Telephone No.: 813-677-9111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained for a $5.00 charge from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulation of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: C S Daugherty Mailing Address: P.O. Box 3269, Tampa, Florida 33601

Name: C. S. Daugherty (Please Type)

Company Name: Gardinier, Inc. Telephone No.: 813-677-9111

Florida Registration Number: 21150 Date: 6/8/79

(Affix Seal)

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

No. 3 Phosphoric Acid Plant will be modified to process wet ground Phosphate rock. Modifications to the existing crossflow scrubber will be performed to handle increased fluoride evolution from the rock digestion system.

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction: April 1, 1980

Completion of Construction: April 1, 1983

C. Costs of Construction (Show a breakdown of estimated costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Modification to Existing Teller Scrubber - $150,000

D. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

Permit	Issued	Expire
A029-6752	8/16/78	7/15/83

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

 (other than incinerators)

A. Identification of Air Contaminants:

1) [ ] Particulates
a) [ ] Dust b) [ ] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [ ] Sulfur Compounds
a) [ ] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [ ] Nitrogen Compounds
a) [ ] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [X] Fluorides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify): _____

Raw Materials and Chemicals Used (Be Specific):

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
Phosphate Rock	310,000	Fluoride	3.5	A
Sulfuric Acid	238,960			B
Water	276,950	-	-	C

C. Process Rate:

1) Total Process Input Rate (Units*): 548,960 lb/hr

2) Product Weight (Units*): 88,350 ~~85,000~~ lb/hr P_2O_5 ***

3) Normal Operating Time: 7,600 hr/yr If seasonal describe: not seasonal

hrs./day: 20.8 days/wk.: 7 wks/yr.: 52

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge lbs./hr.	Actual** Discharge T/yr.	Discharge Criteria - Rate*	Allowable Discharge lbs./hr.	Relate to Flow Diagram
Fluoride	0.83	3.2	0.02 lb F/ton P_2O_5 input	0.9	D

* Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate = lbs./ton P_2O_5, lbs./M BTU/hr., etc.)

** Estimate only if this is an application to construct.

***This figure is revised from figure originally submitted to DER.

BEST AVAILABLE COPY

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data
Teller Crossflow	Fluoride	99+		Design

*Use required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels: No fuels are used.

Type (Be Specific)	Consumption*		Maximum Heat Input MMBTU/hr.
	Avg./hr.	Max./hr.	

*Units: Natural Gas — MCG/hr.; Fuel Oils, Coal — lbs./hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lb./gal.

Heat Capacity: _____ BTU/lb. _____ BTU/ga

Other Fuel Contaminants: _____

G. Indicate liquid or solid wastes generated and method of disposal:

Liquid and solid wastes will be discharged to the in-plant water recycle system.

Emission Stack Geometry and Flow Characteristics, (provide data for each stack):

Stack Height: 95 ft. Stack Diameter: 4.0

Gas Flow Rate: 48,000 ACFM Gas Exit Temperature: 105

Water Vapor Content: 20 %

Please Provide the Following Required Supplements For All Pollution Sources:

1. Total process input rate and product weight — show derivation. See below.

2. Efficiency estimation — show derivation. See below.

3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See attached.

4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. See attached.

5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways. See attached.

6. Description and sketch of storm water control measures taken both during and after construction.

1. Process Input Rate

Phosphate Rock - 310,000 lb/hr 29% P_2O_5

Sulfuric Acid - 238,960 lb/hr

Water - 276,950 lb/hr

Product Weight

Phosphoric Acid, 29% P_2O_5

310,000 X .29 = 89,900* lb/hr P_2O_5

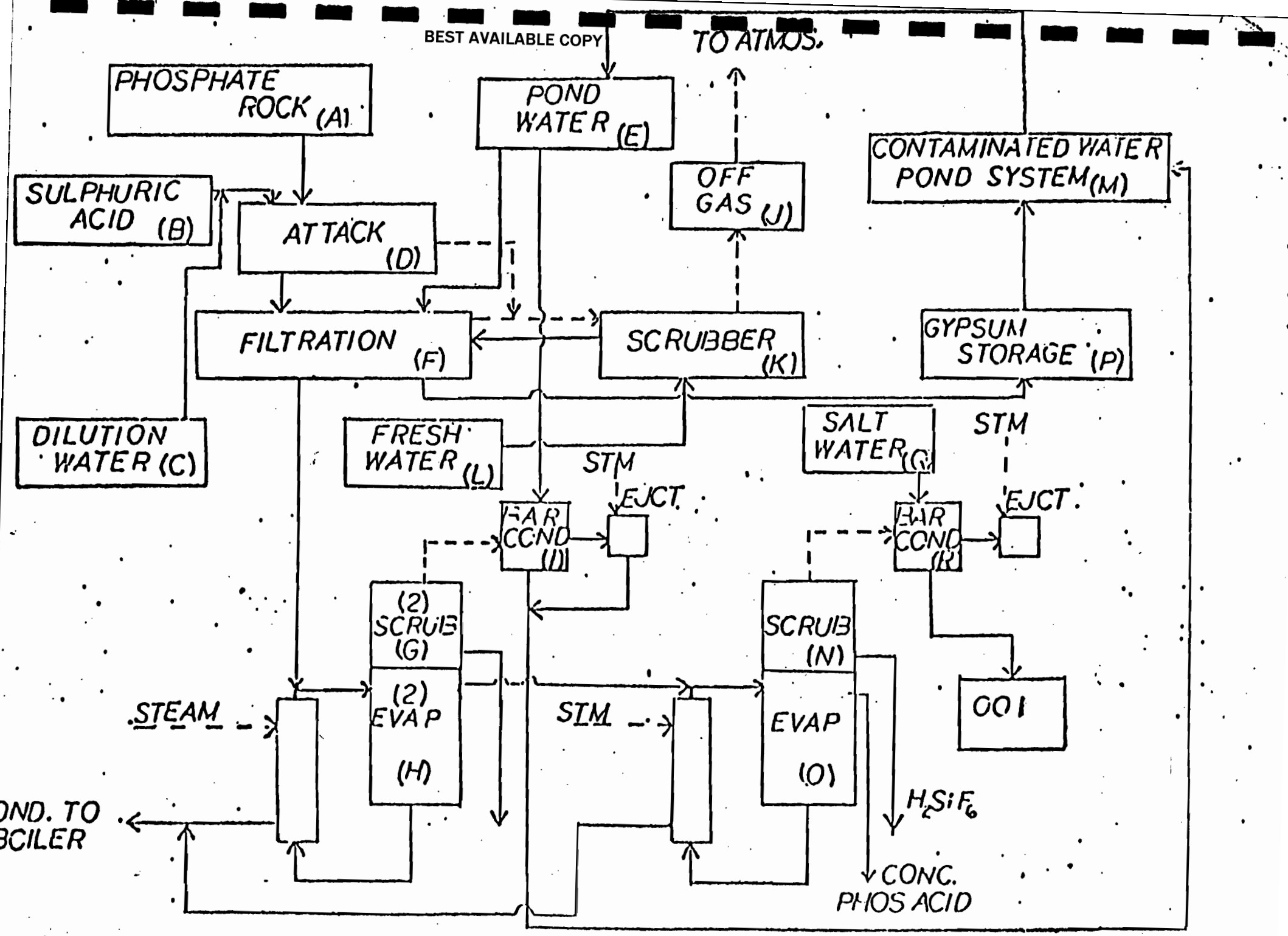
89,900 ÷ .29 = 310,000 lb/hr 29% P_2O_5 Aci

310,000 X .95 = 294,500 lb/hr 29% P_2O_5 Ac
Recover

= 85,405 lb/hr P_2O_5 Recovere

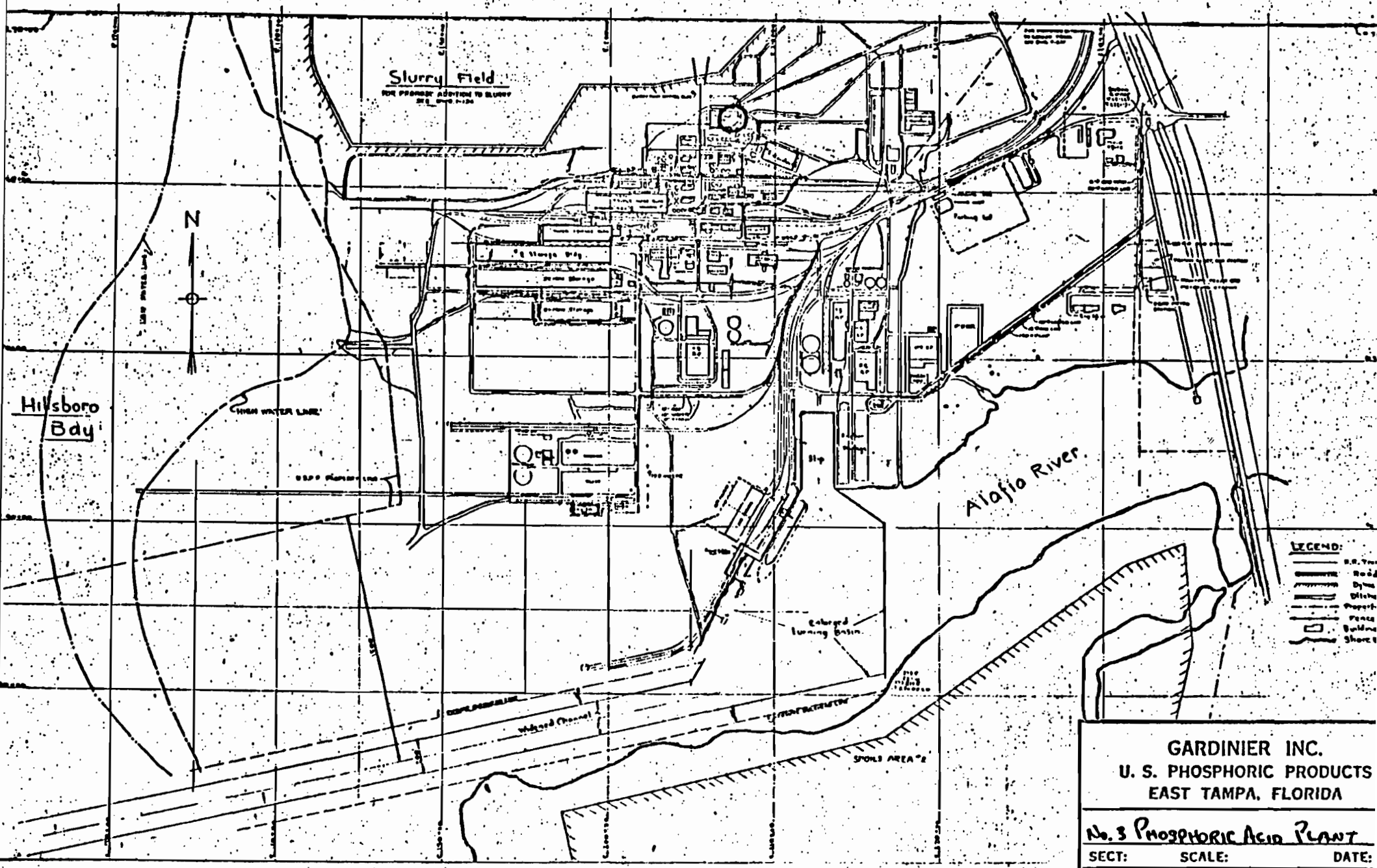
2. Only scrubber exit loadings are measured. Efficiency cannot be measured.

*P_2O_5 process input rate has been revised to 93,000 lb/hr.



NO 3 PHOSPHORIC ACID MFG. SYSTEM

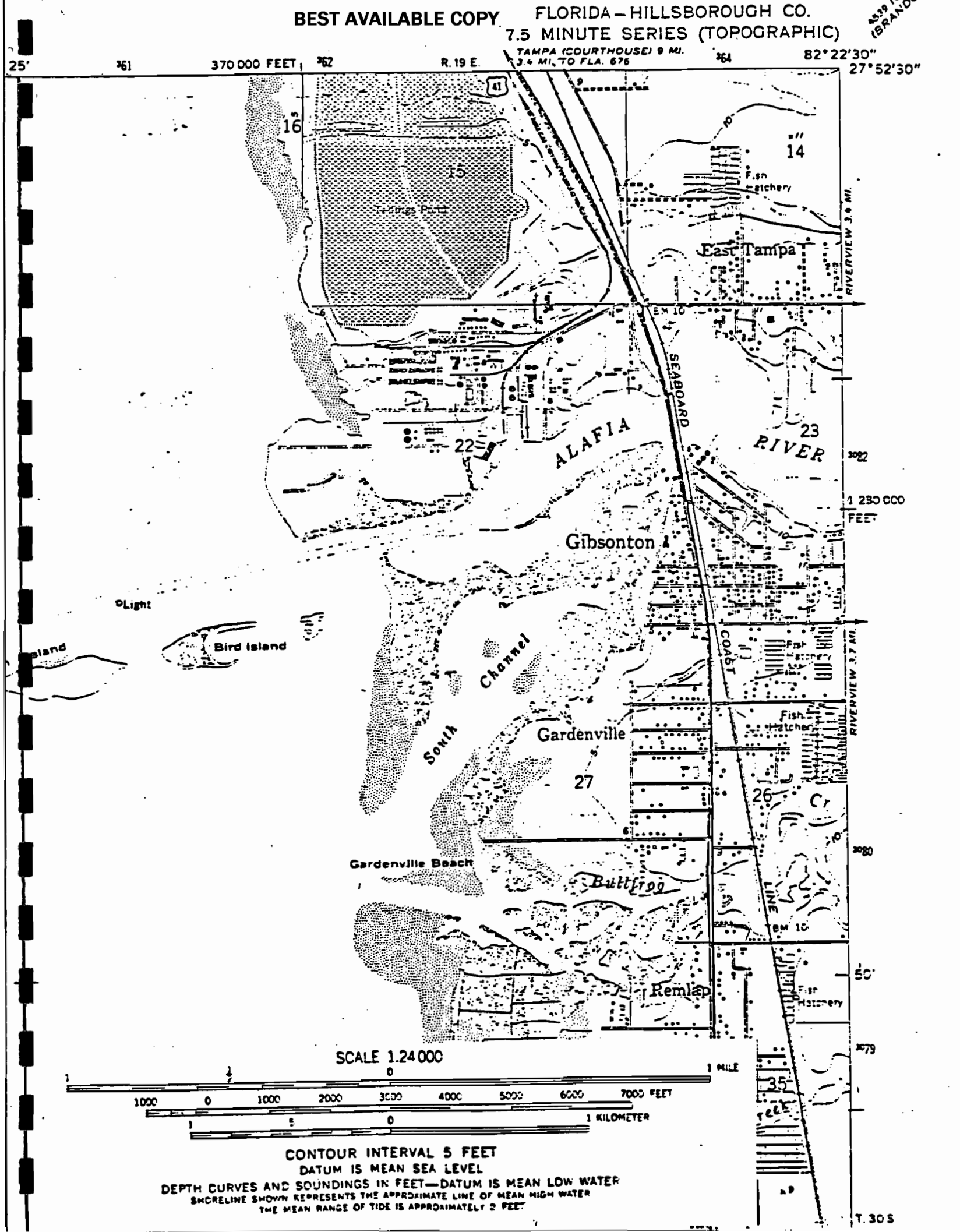
DRC



GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA

No. 3 Phosphoric Acid Plant

SECT:	SCALE:	DATE:
DR.		DRAWING
TR.		
CH.		



SCALE 1:24 000

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1 5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

DATUM IS MEAN SEA LEVEL

DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER

SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER

THE MEAN RANGE OF TIDE IS APPROXIMATELY 2 FEET

NO. 4 PHOSPHORIC ACID PLANT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: Air Pollution [X] Incinerator [ ]
Type application: [ ] Operation [X] Construction
Source Status: [X] New [ ] Existing [ ] Modification
Company Name: Gardinier, Inc. County: Hillsborough
Source Identification: No. 4 Phosphoric Acid Plant
Source Location: Street: U.S. Highway 41 South City: South of Tampa
UTM: East: 362.9 North: 3082.5
Appl. Name and Title: Rudy J. Cabina, Vice President
Appl. Address: P.O. Box 3269, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative of* Gardinier, Inc.

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department and revisions thereof. I also understand that a permit, if granted by the Department, will be nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

By: Rudy J Cabina Vice President
Signature of the Owner or Authorized Representative and Title

Date: 6/8/79 Telephone No.: 813-677-9111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained for a $5.00 charge from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulation of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: C S Daugherty
Name: C. S. Daugherty
(Please Type)
Company Name: Gardinier, Inc.
Florida Registration Number: 21150
(Affix Seal)

Mailing Address: P.O. Box 3269
Tampa, Florida 33601
Telephone No.: 813-677-9111
Date: 6/8/79

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

This plant will replace the existing No. 2 Phosphoric Acid System. The existing system's three scrubbers will be replaced by one emission point. Emissions of fluoride will be reduced from a permitted level of 55.7 lbs/day to approximately 20 lbs/day. The No. 4 Phosphoric Acid Plant will utilize best available control technology.

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction: April 1, 1980

Completion of Construction: April 1, 1983

C. Costs of Construction (Show a breakdown of estimated costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Packed Crossflow Scrubber with attendant equipment - $1,000,000

D. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

None

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

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants:

1) [ ] Particulates
a) [ ] Dust b) [ ] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [ ] Sulfur Compounds
a) [ ] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [ ] Nitrogen Compounds
a) [ ] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [X] Fluorides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify): _____

B. Raw Materials and Chemicals Used (Be Specific):

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
Phosphate Rock	400,000	Fluoride	3.5	A
Sulfuric Acid, 100%	308,333	-	-	B
Water	357,357	-	-	C

C. Process Rate:

1) Total Process Input Rate (Units*): 708,333 lbs/hr

2) Product Weight (Units*): 114,000 ~~110,200~~ lbs/hr P_2O_5 ***

3) Normal Operating Time: 317 days/yr, if seasonal describe: not seasonal

hrs./day: 20.8 days/wk.: 7 wks/yr.: 52

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge		Discharge Criteria Rate*	Allowable Discharge lbs./hr.	Relate to Flow Diagram
	lbs./hr.	T/yr.			
Fluoride	0.83	3.17	0.02 #F/ton P_2O_5 input	1.2	J

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate = lbs./ton P_2O_5, lbs./M BTU/hr., etc.)

**Estimate only if this is an application to construct.

***This figure is revised from figure originally submitted to DER.

Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data
Packed Crossflow	Fluoride	99+	Saturated 120°F	Design

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels: No fuels are used.

Type (Be Specific)	Consumption*		Maximum Heat Input MMBTU/hr.
	Avg./hr.	Max./hr.	

*Units: Natural Gas — MCG/hr.; Fuel Oils, Coal — lbs./hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lb./gal.

Heat Capacity: _____ BTU/lb. _____ BTU/gal.

Other Fuel Contaminants: _____

G. Indicate liquid or solid wastes generated and method of disposal:

Liquid and solid wastes will be discharged to the in-plant water recycle system.

H. Emission Stack Geometry and Flow Characteristics, (provide data for each stack):

Stack Height: 95 ft. Stack Diameter: 4.0 ft.

Gas Flow Rate: 48,000 ACFM Gas Exit Temperature: 105 °F

Water Vapor Content: 20 %

Please Provide the Following Required Supplements For All Pollution Sources:

1. Total process input rate and product weight – show derivation. See below.

2. Efficiency estimation – show derivation. See below.

3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.

6. Description and sketch of storm water control measures taken both during and after construction.

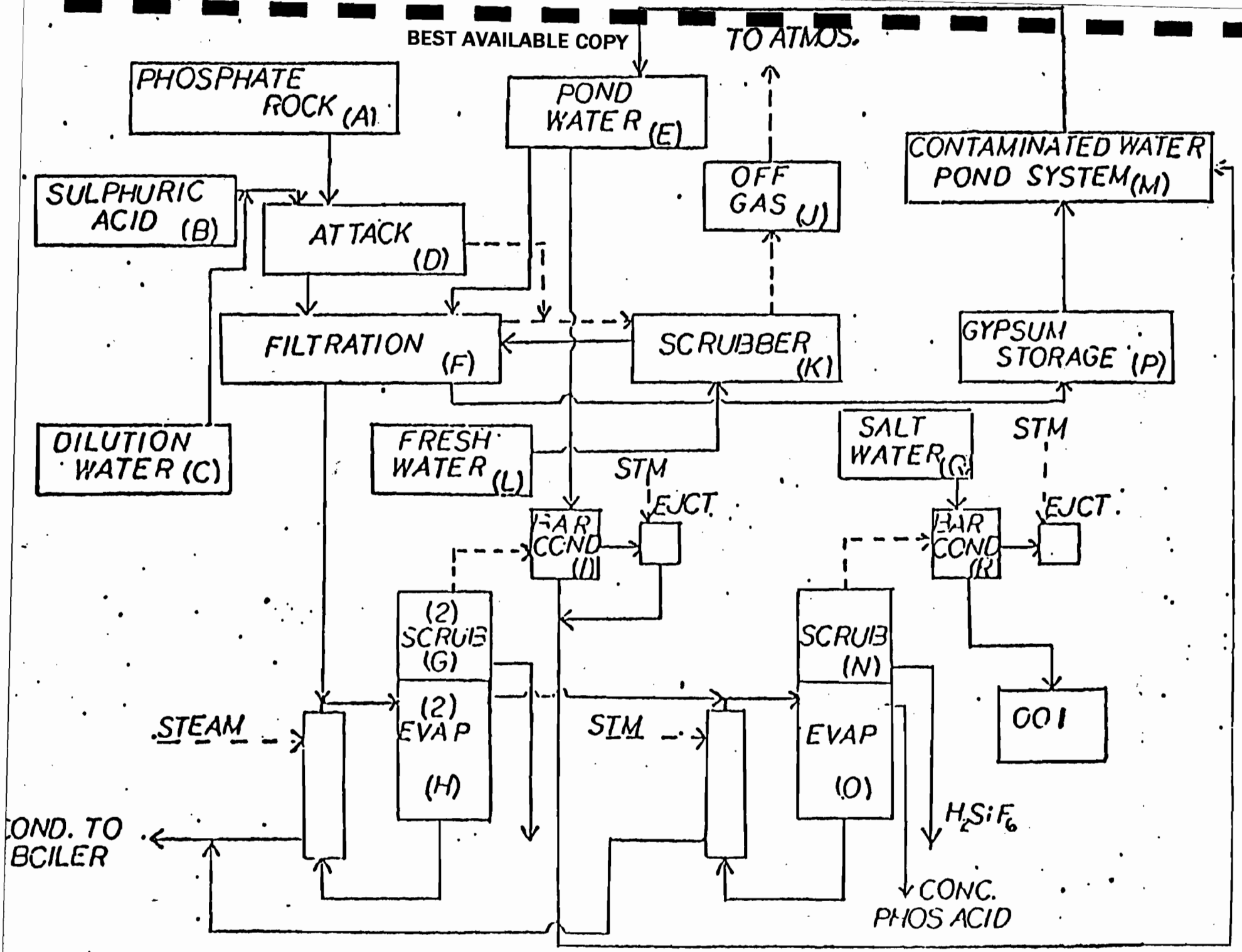
See Permit No. IC29-2379

1. Process Input Rate:

		Product Weight
Phosphate Rock	400,000 lbs/hr 29% P_2O_5	Phosphoric Acid, 29% P_2O_5
Sulfuric Acid	308,333 lbs/hr	400,000 x .29 = 116,000* lbs/hr P_2O_5
Water	357,357 lbs/hr	116,000 ÷ .29 = 400,000 lbs/hr 29% H_3PO_4
	1,065,690 lbs/hr	400,000 x .95 = 380,000 lbs/hr recovered
		= 110,200 lb/hr P_2O_5 recovere

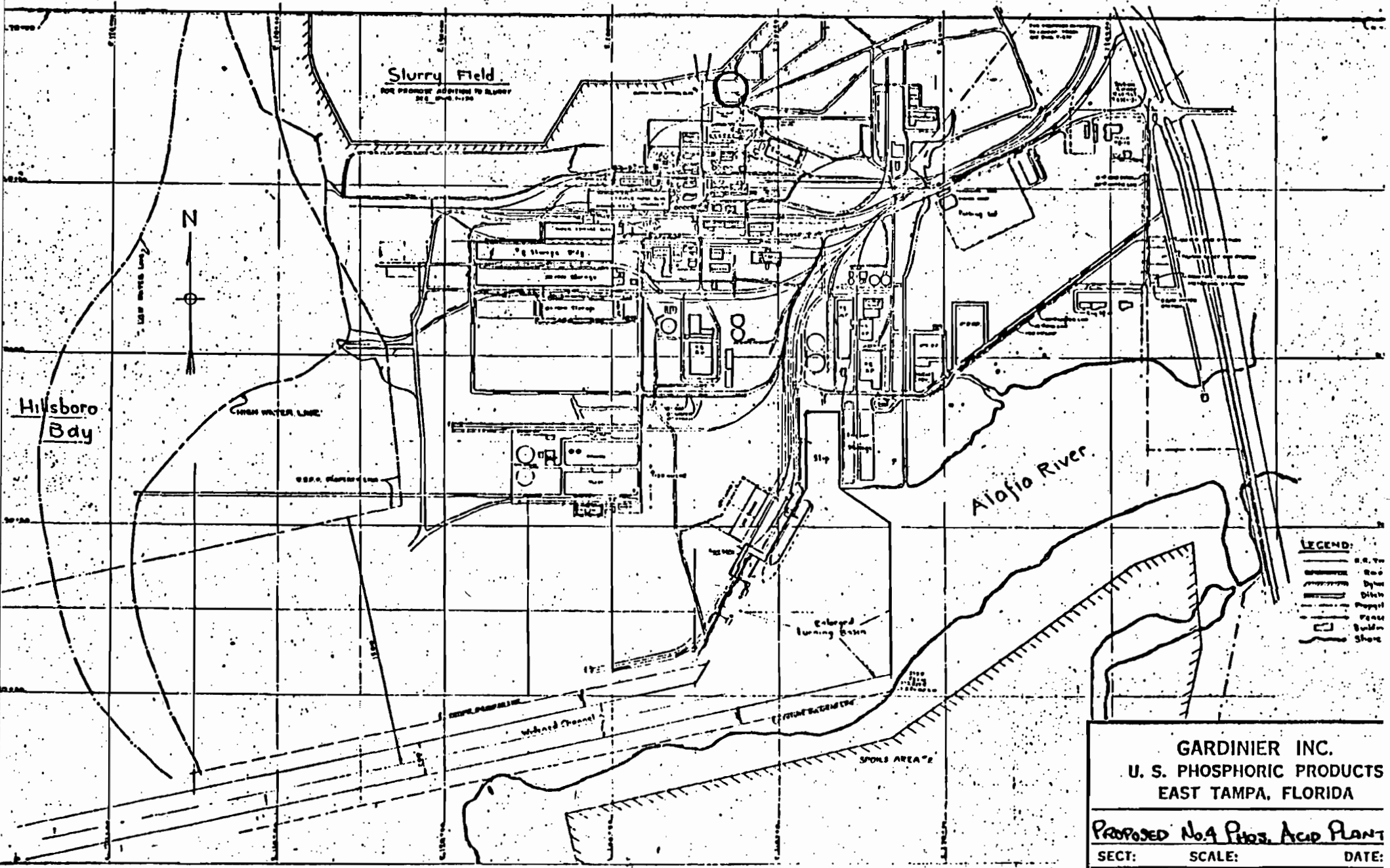
2. Efficiency cannot be determined as only scrubber exit loadings are measured.

*P_2O_5 process input rate has been revised to 120,000 lb/hr.



NO 4 PHOSPHORIC ACID MFG SYSTEM

DRC

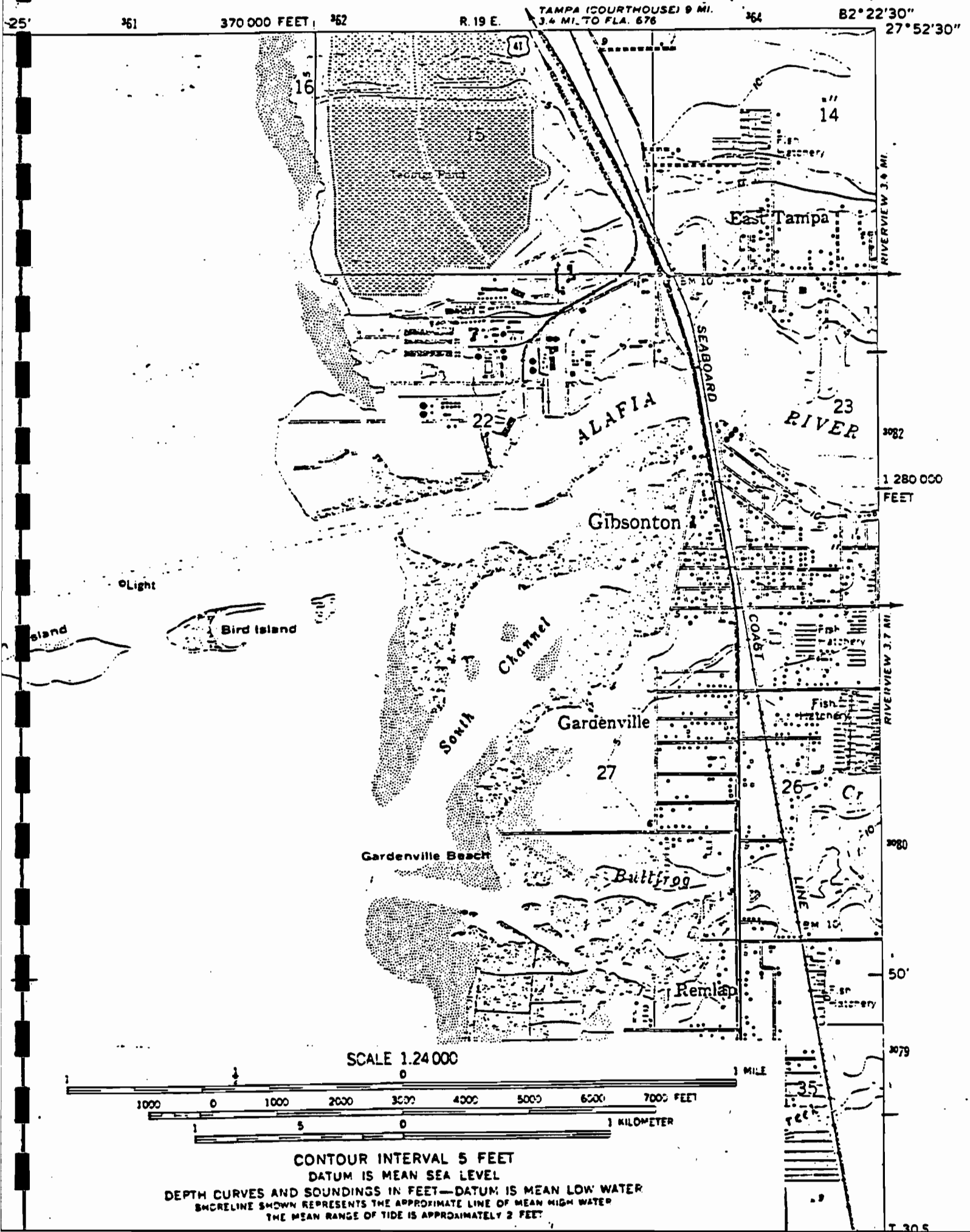


GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA

PROPOSED No.4 PHOS. ACID PLANT

SECT:	SCALE:	DATE:
DR.		DRAWIN
TR.		
CH.		

GIBSONTON QUADRANGLE
FLORIDA—HILLSBOROUGH CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 2 FEET

NO. 7 SULFURIC ACID PLANT

BEST AVAILABLE COPY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: Air Pollution [X] Incinerator [ ]

Type application: [ ] Operation [X] Construction

Source Status: [ ] New [ ] Existing [X] Modification

Company Name: Gardinier, Inc. County: Hillsborough

Source Identification: #7 Sulfuric Acid Plant

Source Location: Street: U.S. Highway 41 and Riverview Drive City: South of Tampa

UTM: East: 363.2 North: 3082.2

Appl. Name and Title: Rudy J. Cabina, Vice President

Appl. Address: P.O. Box 3269, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

APPLICANT

I am the undersigned owner or authorized representative of* Gardinier, Inc.

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department and revisions thereof. I also understand that a permit, if granted by the Department, will be nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

By: Rudy J. Cabina Vice President
Signature of the Owner or Authorized Representative and Title

Date: 6/8/79 Telephone No.: 813-677-9111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained for a $5.00 charge from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulation of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: C. S. Daugherty

Name: C. S. Daugherty
(Please Type)

Mailing Address: P.O. Box 3269
Tampa, Florida 33601

Company Name: Gardinier, Inc.

Telephone No.: 813-677-9111

Florida Registration Number: 21150

Date: 6/8/79

(Affix Seal)

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

This project consists of modifying an "add-on" Leonard-Monsanto double absorption, double conversion Sulfuric Acid Plant to increase its capacity from 1380 tons 100% sulfuric acid per day, to 1750 tons 100% sulfuric acid per day. The Plant is currently permitted to emit 10# SO_2 per ton of H_2SO_4 or 13,800 # per day. After modification the plant will meet new source standards of 4# SO_2 per ton of H_2SO_4 or 7,000 # per day. The plant will be in compliance with applicable EPA, State of Florida and Hillsborough County regulations. Details are attached.

B. Schedule of Project: Covered in this Application (Construction Permit Application Only).

Start of Construction: April 1, 1980

Completion of Construction: April 1, 1983

C. Costs of Construction (Show a breakdown of estimated costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Additional Catalyst - $50,000

D. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

Permit	Issued	Expires
A029-2180	5/25/73	7/1/75
AC29-2384	11/25/74	3/1/77
A029-5763	11/2/77	9/30/79

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

AIR POLLUTION SOURCES & CONTROL DEVICES

(other than incinerators)

A. Identification of Air Contaminants:

1) [ ] Particulates
a) [ ] Dust b) [ ] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [X] Sulfur Compounds
a) [X] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [ ] Nitrogen Compounds
a) [ ] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Fluorides 5) [X] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [X] Other (Specify): Opacity

B. Raw Materials and Chemicals Used (Be Specific):

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
Sulfur	47818.9	Sulfur	100	A
Atmospheric Oxygen	71521.2	-	-	B
Water	26795.5	-	-	C

C. Process Rate:

1) Total Process Input Rate (Units*): 146,135.6 #/hr
2) Product Weight (Units*): 145,833
3) Normal Operating Time: 8322 hrs/yr, if seasonal describe: not seasonal
hrs./day: 22.8 days/wk.: 7 wks/yr.: 52

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge		Discharge Criteria Rate*	Allowable Discharge lbs./hr.	Relate to Flow Diagram
	lbs./hr.	T/yr.			
Sulfur Dioxide	291.7	1213.6	4#/Ton H_2SO_4	291.7	D
Sulfur Trioxide and Acid Mist	10.9	45.5	0.15#/ton H_2SO_4	10.9	D
Opacity	10%		10%	10%	D

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate = lbs./ton P_2O_5, lbs./M BTU/hr., etc.)
**Estimate only if this is an application to construct.

Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data
Final Converter	Sulfur Dioxide	99.8	Dry 450°	Design
inal Absorber	Sulfur	99.99	Dry 180°	Design
	Trioxide &			
	Acid Mist			

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels: No fuels are used.

Type (Be Specific)	Consumption*		Maximum Heat Input MMBTU/hr.
	Avg./hr.	Max./hr.	

*Units: Natural Gas – MCG/hr.; Fuel Oils, Coal – lbs./hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lb./gal.

Heat Capacity: _____ BTU/lb. _____ BTU/gal.

Other Fuel Contaminants: _____

Indicate liquid or solid wastes generated and method of disposal:

Cooling tower and boiler blowdown are discharged from plant Outfall 005. Turbine blower condenser water is discharged from plant Outfall 001. There are no solid wastes generated

Emission Stack Geometry and Flow Characteristics, (provide data for each stack):

Stack Height: 150 ft. Stack Diameter: 7.0 ft.

Gas Flow Rate: 90,000 ACFM Gas Exit Temperature: 175 °F

Water Vapor Content: 0 %

Please Provide the Following Required Supplements For All Pollution Sources:

1. Total process input rate and product weight — show derivation. See below.

2. Efficiency estimation — show derivation. See below.

3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.

6. Description and sketch of storm water control measures taken both during and after construction.

Storm water runoff is captured by plant ditches 001 and 005 (see attached general plant layout diagram).

1. Process Input and Product Rates

Product: H_2SO_4 = 1750 T/D = 1750 (2000/24) = 154,833 #/hr

Acid Mist = 1750 x 0.15 = 262.5 #/D = 262.5/24 = 10.9 #/hr

SO_2 = 1750 x 4 = 7000 #/D = 7000/24 = 291.7

Input: Sulfur = (145,833 + 10.9)(32.06/98.08) + 291.7 (32.06/64.06) = 47818.9 #/

Water = (145,833 + 10.9)(18.02/98.08) = 26795.5 #/hr

Atmospheric Oxygen = (145,833 + 10.9)(48/98.08) + 291.7 (32/64.06) = 71521.1 #/hr

2. Efficiency Estimate:

Converter - (2000/(2000 + 4)) x 100 = 98.80%

Abosrption - (2000/(200 + .15)) x 100 = 99.99%

Item A

Modifications Necessary to Increase No. 7 Plant Capacity to 1750 STPD

1. Drying Tower

   Replace packed spray catcher with a mesh pad. Remaining tower internals are adequate.

2. Sulfur Burner

   Change sulfur sprays to handle 60 gpm of sulfur.

3. Sulfur Pumps

   Increase capacity to 60 gpm.

4. No. 1 Waste Heat Boiler

   New boiler required.

5. Converter

   Installation of an additional 21,000 liters of Type 210 catalyst will keep SO_2 emissions levels below 4.0 lbs/ton of H_2SO_4. (Note: This assumes existing catalyst is in as new condition.)

6. Superheaters

   No. 2 superheater must be retubed. Allowance was made in the original design to accommodate sufficient additional surface area without rebuilding the converter internals.

7. Economizer

   One additional section must be added.

8. Interpass Absorption Tower

   Install additional HVM mist eliminators in spaces provided. (Note: It is expected that no additional mist eliminators will be required upstream of the booster blower.) The remainder of the interpass tower and internals is adequate.

9. Booster Blower

   Install new booster blower between interpass absorption tower and shell side of No. 1 cold heat exchanger. Blower to handle 69,000 SCFM at approximately 75 inches w.g. and approximately 175°F. (Exact conditions will depend on detailed design.)

10. Mesh Pad and Vessel

    Install new S.S. mesh pad in new vessel at discharge of booster blower. This is to protect the cold heat exchanger.

Item A, Cont -

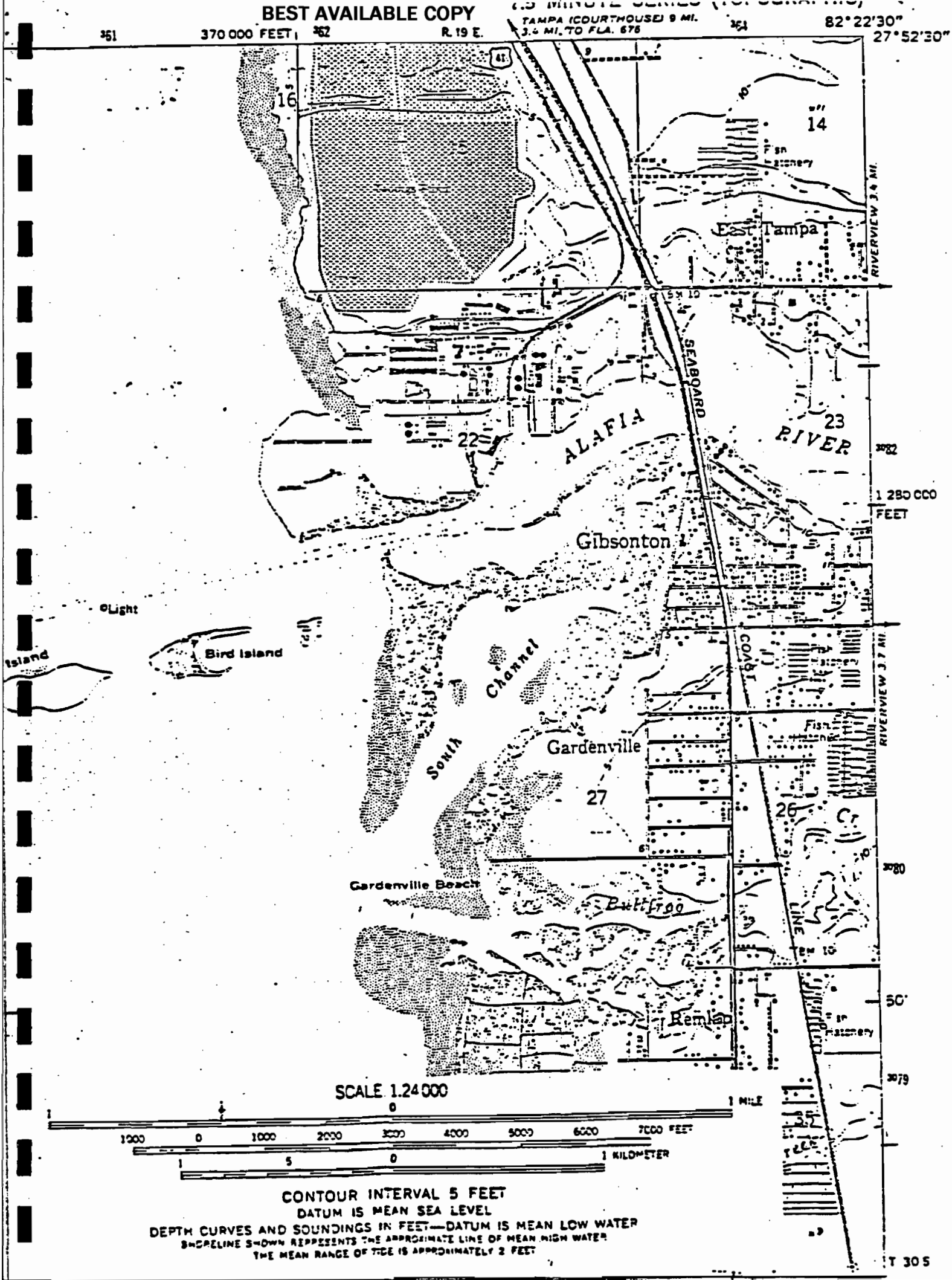
11. Acid Coolers

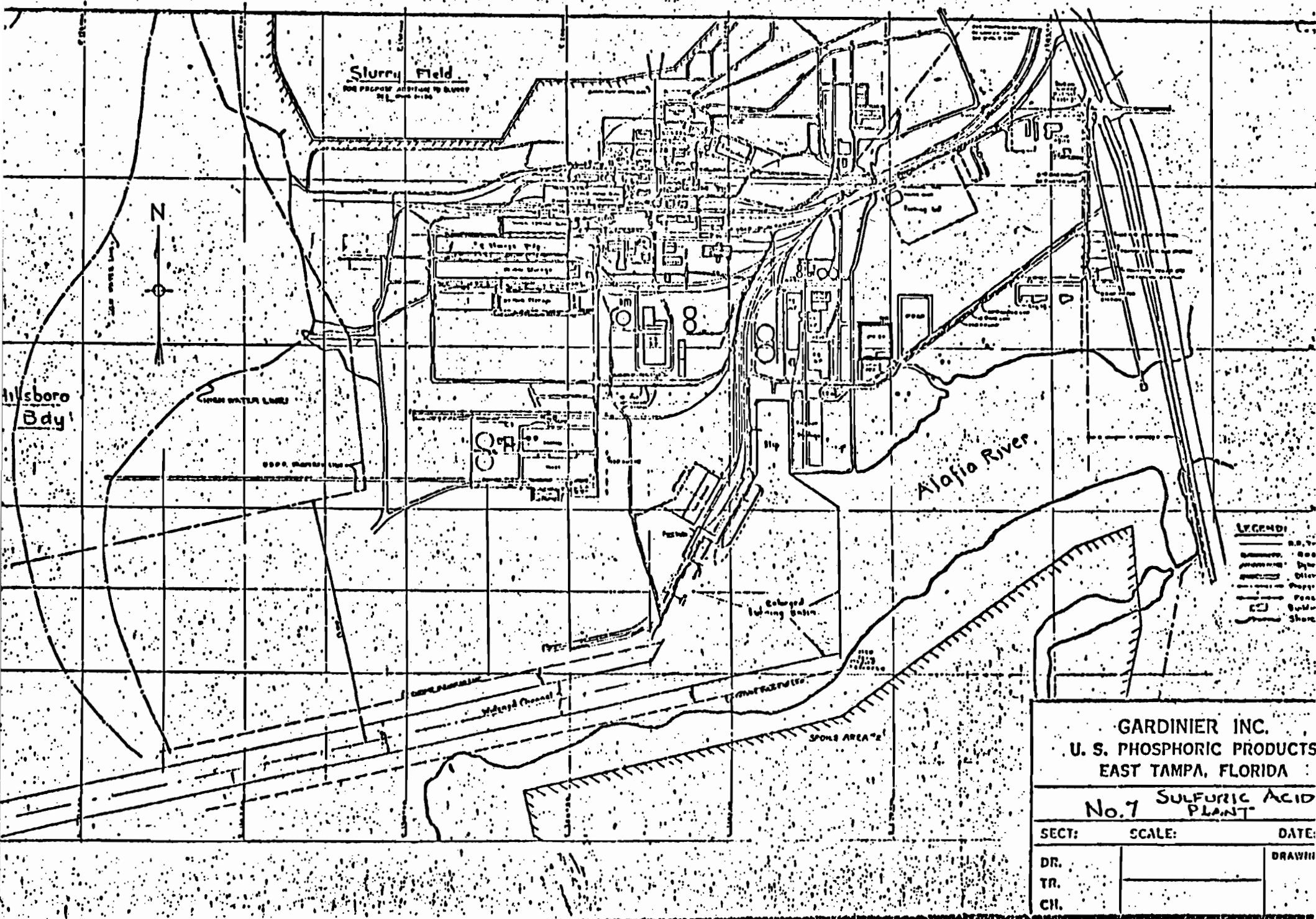
By rearranging existing radiator coolers as follows, there should be adequate cooler area for the D.T. and IPAT circuits plus product acid:

a. Seven cooler banks for D.T. circuit duty.
b. Sixteen cooler banks for IPAT circuit duty.
c. Two cooler banks for product acid duty.

12. Acid Pumps

Increase D.T. acid pump capacity to 3,700 gpm.
Increase IPAT acid pump capacity to 5,000 gpm.

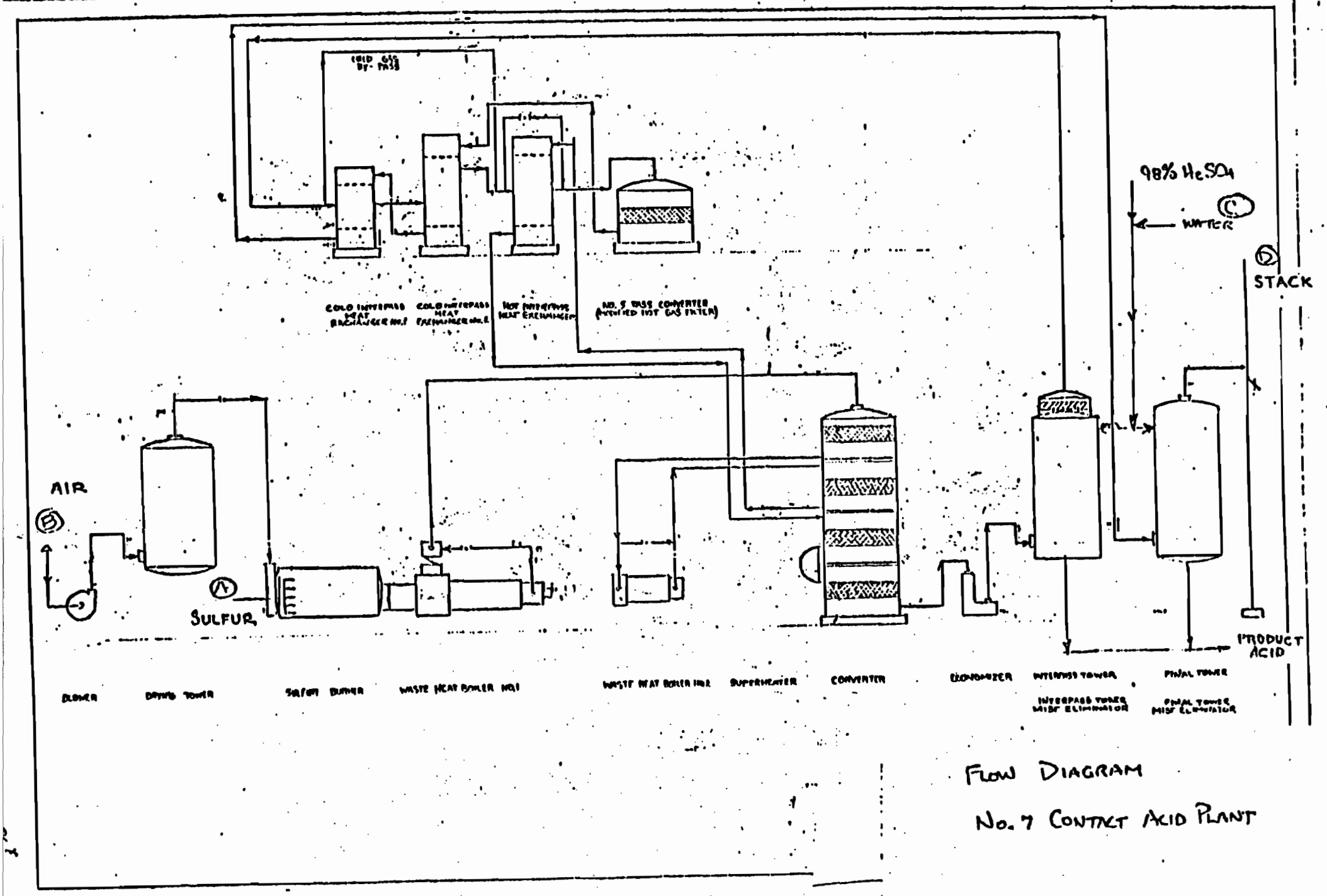




GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA

No.7 SULFURIC ACID PLANT

SECT:	SCALE:	DATE:
DR.		DRAWIN
TR.		
CH.		



FLOW DIAGRAM

No. 7 CONTACT ACID PLANT

NO. 5 AMMONIUM PHOSPHATE PLANT

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THIS APPLIC WITHDRAWN ?

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: Air Pollution [X] Incinerator [ ]

Type application: [ ] Operation [X] Construction

Source Status: [X] New [ ] Existing [ ] Modification

Company Name: Gardinier, Inc. County: Hillsborough

Source Identification: No. 5 Ammonium Phosphate Plant

Source Location: Street: U.S. Highway 41 and Riverview Drive City: South of Tampa

UTM: East: 362.9 North 3082.5

Appl. Name and Title: Rudy J. Cabina, Vice President

Appl. Address: P.O. Box 3269, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

APPLICANT

I am the undersigned owner or authorized representative of* Gardinier, Inc.

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department and revisions thereof. I also understand that a permit, if granted by the Department, will be nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

By: Rudy J Cabina Vice President

Signature of the Owner or Authorized Representative and Title

Date: 6/8/79 Telephone No.: 813-677-9111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained for a $5.00 charge from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulation of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: C S Daugherty Mailing Address: P.O. Box 3269

Tampa, Florida 33601

Name: C. S. Daugherty (Please Type)

Company Name: Gardinier, Inc. Telephone No.: 813-677-9111

Florida Registration Number: 21150 Date: 6/8/79

(Affix Seal)

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

This is an application to construct an entirely new ammonium phosphate production facility. A "TVA" type plant is proposed and will utilize all latest reasonably available control technology to achieve lowest achievable emission rates. (LAER)

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction: April 1980

Completion of Construction: April 1984

C. Costs of Construction (Show a breakdown of estimated costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Venturi -
Packed Crossflow - $1,000,000 + $400,000 Water Line

D. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

None

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

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AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants:

1) [X] Particulates
a) [ ] Dust b) [ ] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [ ] Sulfur Compounds
a) [ ] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [ ] Nitrogen Compounds
a) [ ] NO_x as NO_2 b) [X] NH_3 c) [ ] Other (Identify)

4) [X] Fluorides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify): _____

B. Raw Materials and Chemicals Used (Be Specific):

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
Phosphoric Acid, 100% H_3PO_4,				
Dry, plus Solids	74,108	Fluoride	1.8%	A
Anhydrous Ammonia	22,885	Ammonia	100%	B
Sulfuric Acid, 100%	3,213	Particulate	100%	D

C. Process Rate:

1) Total Process Input Rate (Units*): 100,206 lb/hr (dry)
2) Product Weight (Units*): 100,000 lb/hr
3) Normal Operating Time: 7600 hrs/yr, if seasonal describe: not seasonal
hrs./day: 20.8 days/wk.: 7 wks/yr.: 52

D. Airborne Contaminants Discharged: Estimated

Name of Contaminant	Actual** Discharge		Discharge Criteria Rate*	Allowable Discharge lbs./hr.	Relate to Flow Diagram
	lbs./hr.	T/yr.			
Particulate ***	10	38	p·16 X 17.31 lb/hr	32.4	C
Fluoride	1.4	5.32	0.06 lbF/ton P_2O_5 Input	1.4	C
Ammonia	2.1	7.98	None	No limit	C

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate = lbs./ton P_2O_5, lbs./M BTU/hr., etc.)

**Estimate only if this is an application to construct.

***Revised from figures originally submitted to DER.

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data
Davy Powergas	Particulate	99+	Saturated 140°F	Design
	Fluoride	99+		Design
	Ammonia	99+		Design
	SO_2			

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

51#SO_2/hr
1938 T SO_2/yr
POTENTIAL FROM OIL

F. Fuels:

Type (Be Specific)	Consumption* Avg./hr.	Consumption* Max./hr.	Maximum Heat Input MMBTU/hr.
No. 6 Fuel Oil	~~1530~~ 1275***		26.3
SO_2			

*Units: Natural Gas – MCG/hr.; Fuel Oils, Coal – lbs./hr.

***This figure will be supplied to DER in a revised permit application.

Fuel Analysis:

Percent Sulfur: 2.0 Percent Ash: –

Density: 8.5 lb./gal.

Heat Capacity: _____ BTU/lb. 146,000 BTU/gal.

Other Fuel Contaminants: _____

G. Indicate liquid or solid wastes generated and method of disposal:

Scrubber effluent will be consumed in the plant-wide water recycle system.

H. Emission Stack Geometry and Flow Characteristics, (provide data for each stack):

Stack Height: 90 ft. Stack Diameter: 8.0 ft. $\frac{\pi D^2}{4} = 50.3 FT^2$

Gas Flow Rate: 136,000 ACFM (45 FPS) Gas Exit Temperature: 140 °F

Water Vapor Content: 20 %

$\frac{136,000}{600°R} \times \frac{528°R}{1 atm} \times .80 atm = 95,744$ SCFM $\left(\frac{.01 \#}{SFT^3} \times \frac{\#}{7,000 GR} \times \frac{60 MIN}{HR}\right)$

$= 8.2 \#/hr$

Please Provide the Following Required Supplements For All Pollution Sources:

1. Total process input rate and product weight – show derivation. See below.

2. Efficiency estimation – show derivation. See below.

3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Attached.

4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. See Attached.

5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways. See attached.

6. Description and sketch of storm water control measures taken both during and after construction.
See Permit IC29-2379

1. Process Input Rate and Prbduct Weight

Input		Product Weight (from design information)
Phosphoric Acid, 100% + Solids	- 74,108 lb/hr = 46,904 lb/hr P_2O_5 (23.5 TPH P_2O_5)	100,000 lb/hr @ 1.5% H_2O
Anhydrous Ammonia	- 22,885 lb/hr	= 98,500 lb/hr dry
Sulfuric Acid, 100%	- 3,213 lb/hr	= 46,000 lb/hr P_2O_5
	100,206 lb/hr	= 21,857 lb/hr NH_3
(Does not include uncombined water)		(Differences due to scrubber losses)

2. Efficiency Estimation

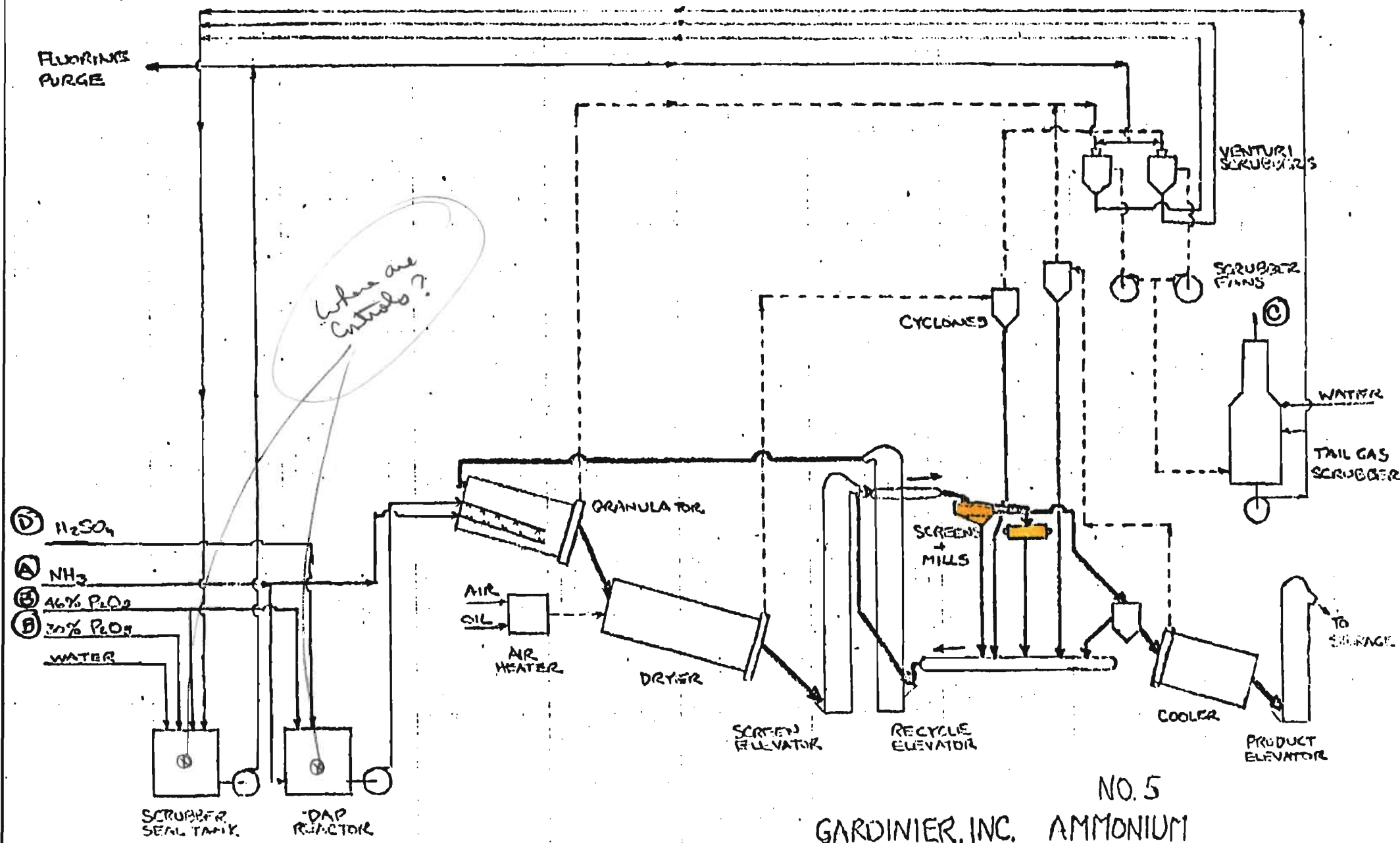
Fluroride

Input - 74,108 X .018 = 1334 lb fluoride input per hour

Output - 1.4 lb fluoride per hour in stack gas

$$100 - \left(\frac{1.4}{1334} \times 100\right) = 99.89\% \text{ Efficiency}$$

MORE DETAILS NEEDED,



NO. 5

GARDINIER, INC. AMMONIUM PHOSPHATE PLANT

STB 6-1-77

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GIBSONTON QUADRANGLE
FLORIDA – HILLSBOROUGH CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

4539 IV NE (BRANDON)

25' 361 370 000 FEET 362 R. 19 E. TAMPA (COURTHOUSE) 9 MI. 3.4 MI. TO FLA. 676 364 82°22'30" 27°52'30"

CO. APPX LINE ? FENCED/GUARDED AREA? PUBLIC ACCESS AREA?

16 15 14 13 22 23 27 26 35

Fish Hatchery

East Tampa

RIVERVIEW 3.4 MI.

SEABOARD COAST LINE

ALAFIA RIVER

3082

1 280 000 FEET

Gibsonton

Light

Island

Bird Island

South Channel

COAST LINE

RIVERVIEW 3.7 MI.

Gardenville

Gardenville Beach

Bullfrog Cr

3080

Remlap

50'

3079

T. 30 S

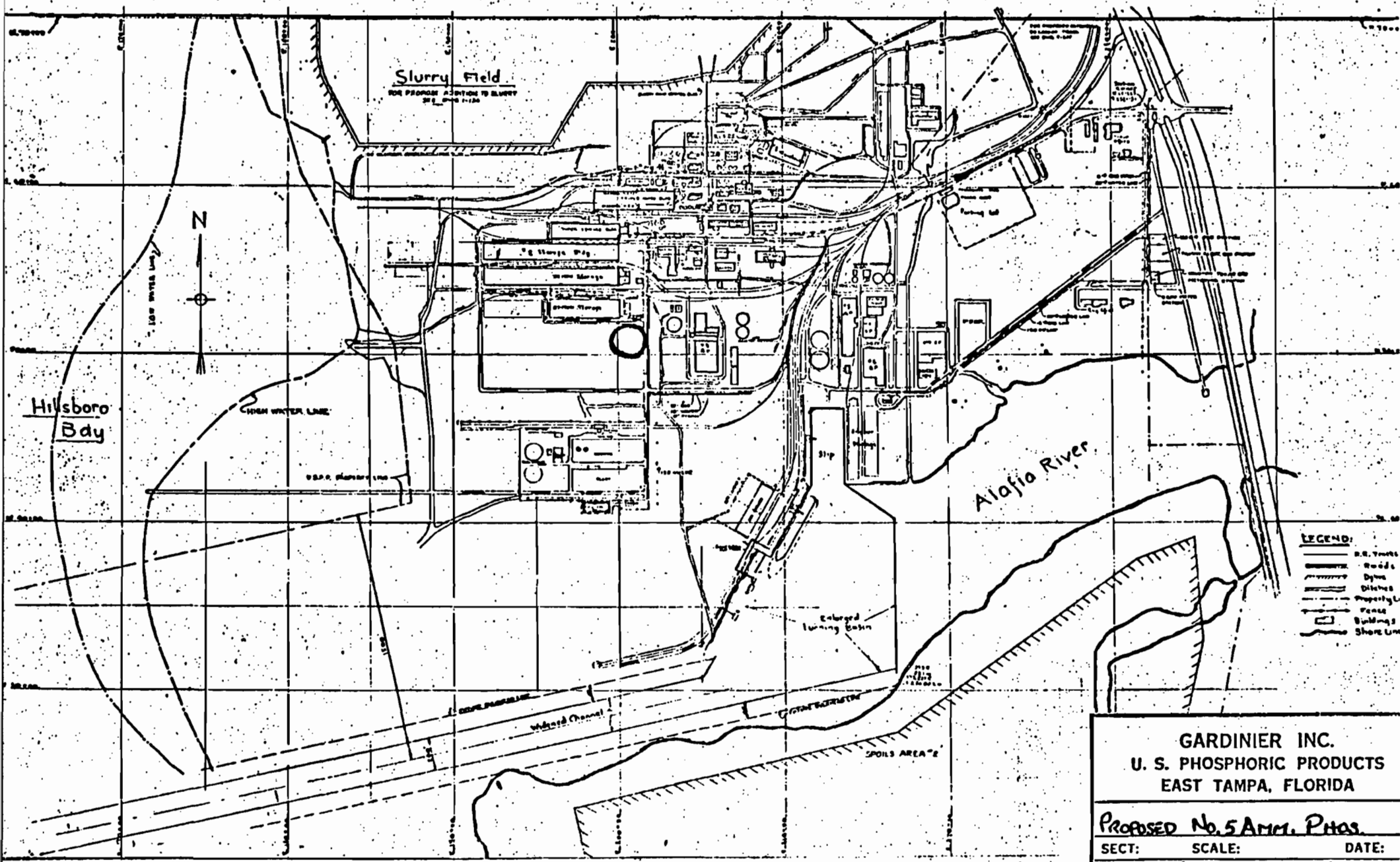
SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 2 FEET



GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA

PROPOSED No. 5 AMM. PHOS.

SECT:	SCALE:	DATE:
DR.		DRAWING
TR.		
CH.		