PREVENTION OF SIGNIFICANT DETERIORATION ANALYSIS

No. 8 Sulfuric Acid Plant Expansion
GARDINIER, INC.
Tampa, Florida

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1.0 PROJECT DESCRIPTION

Gardinier, Inc. of Tampa, Florida, is proposing to expand the production capacity of the No. 8 Sulfuric Acid (H_2SO_4) plant at the Tampa phosphate fertilizer complex. The No. 8 H_2SO_4 plant is currently permitted to produce 2,200 tons per day (TPD) of H_2SO_4. It is proposed to increase the H_2SO_4 production capabilities of the No. 8 H_2SO_4 plant to 2,500 TPD. The proposed project will also involve the installation of electric cogeneration facilities. These facilities will utilize steam from the H_2SO_4 plants (Nos. 7, 8 and 9) to produce electric power for use in the Gardinier plant and for sale to the electric power grid.

Phosphate fertilizers are manufactured at the Gardinier plant. Sulfuric acid is used to produce phosphoric acid from mined phosphate rock. The Gardinier plant currently has sufficient H_2SO_4 production capabilities to meet phosphoric acid and phosphate fertilizer production capacities which are allowed under existing air pollution permits for those specific facilities. Expansion of the No. 8 H_2SO_4 plant will increase the efficiency of steam production to support the electric cogeneration facilities. Total annual production of sulfuric acid at the facility is not expected to increase.

Gardinier received a construction permit and PSD permit from the Florida Department of Environmental Regulation (FDER) in February 1985 for increasing the production capacity of the No. 8 H_2SO_4 plant from 1,770 TPD to 2,200 TPD. The construction permit limited SO_2 emissions from the source to 4 pounds sulfur dioxide per ton (lb/ton) of H_2SO_4 produced (366.7 lb/hr SO_2), and limited H_2SO_4 mist emissions to 0.15 lb/ton (13.75 lb/hr). The No. 8 H_2SO_4 plant is currently operating under the conditions specified in the construction permit.

The Gardinier plant is located south of Tampa on Hillsborough Bay (Figures 1-1 and 1-2). The surrounding land area is rural in nature. Other significant air pollution sources located nearby include the Tampa Electric Company (TEC) Big Bend, Hookers Point, and Gannon generating stations.

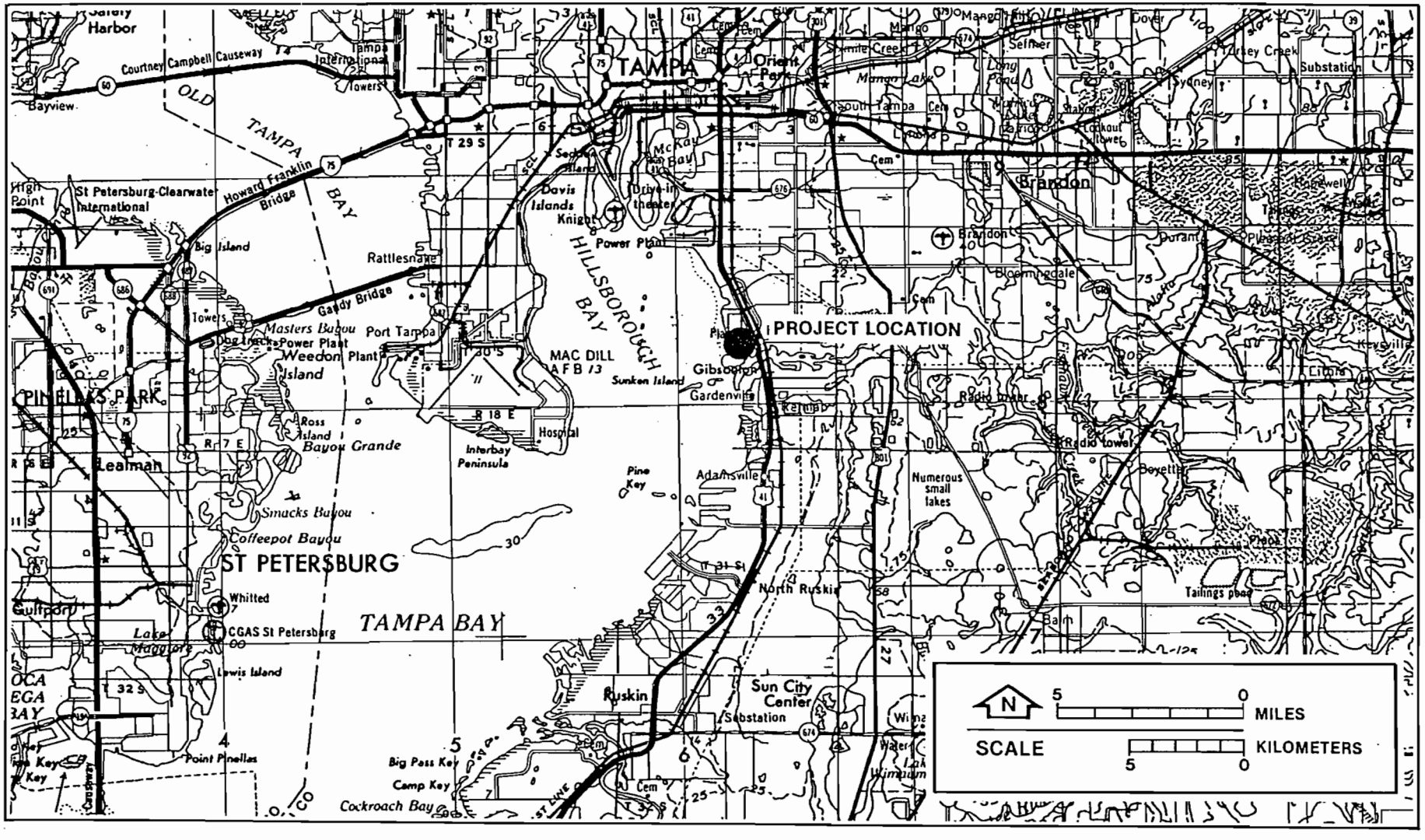

Figure 1-1
GENERAL LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1972.

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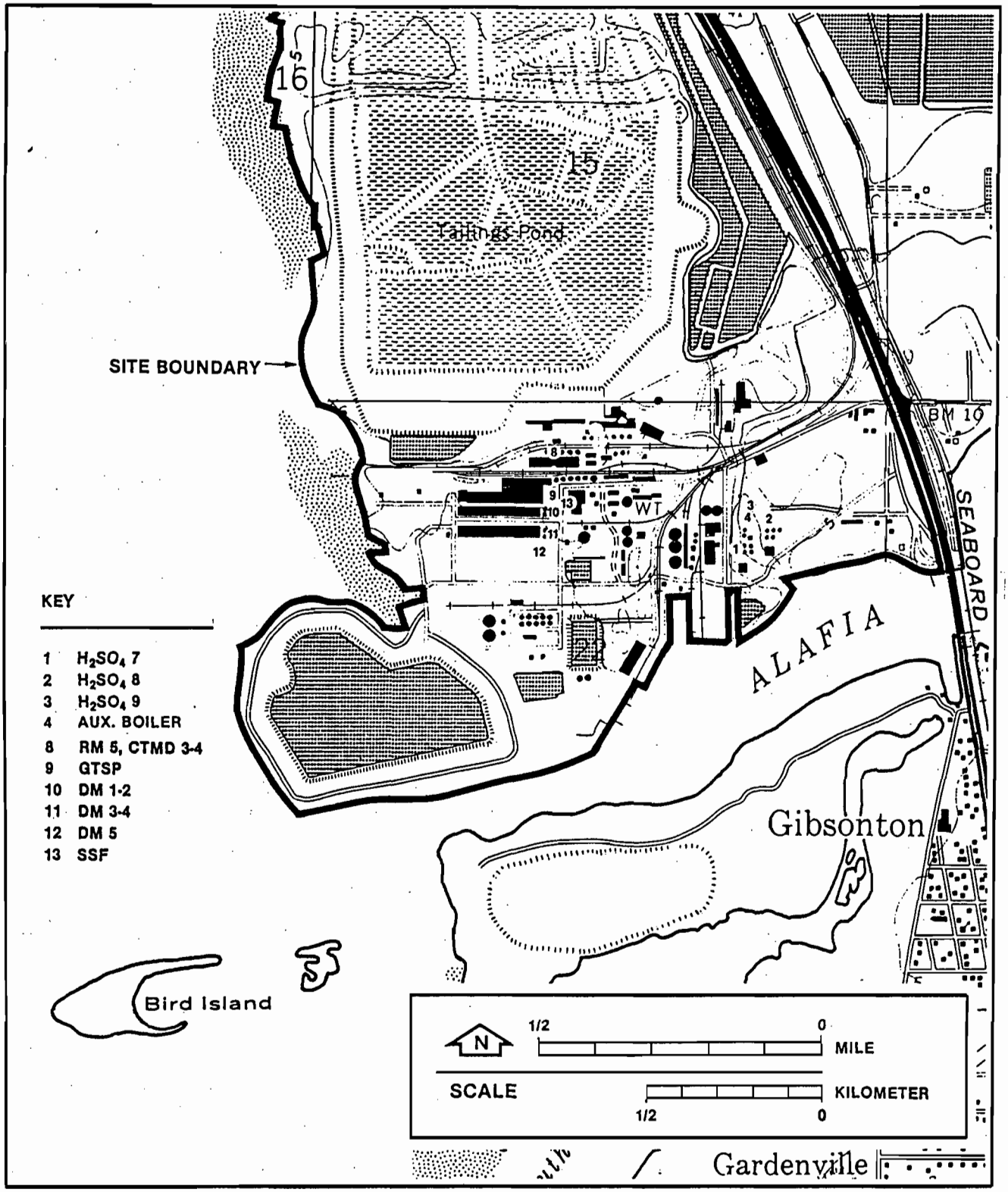

Figure 1-2
SITE LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1981.

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The only pollutants emitted by the No. 8 H_2SO_4 plant are sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4 mist). As a result, these are also the only pollutants affected by the proposed expansion. The H_2SO_4 plants are the only H_2SO_4 mist-emitting sources at the Gardinier plant. Several other small SO_2 emission sources exist at the plant as a result of fuel oil burning. The majority of these sources do not have any emission limit or allowable emission rate for SO_2. Shown in Table 1-1 are the calculated SO_2 emissions from each source other than the H_2SO_4 plants, based on the rated heat input (10^6 Btu/hr) and the type oil fired. Many of the fuel-burning sources can use and have historically used natural gas. Price and availability dictate which fuel is used. The values in Table 1-1 reflect all fuel oil burning, which is the worst-case for SO_2 emissions.

The No. 5 diammonium phosphate plant SO_2 emissions are limited by permit condition to 10 pounds per hour (lb/hr). It is noted that Table 1-1 does not include one permitted source of SO_2 emissions--the Auxiliary Boiler. This boiler will operate only when one of the H_2SO_4 plants is shutdown, and therefore will operate very infrequently. In addition, maximum SO_2 emissions from the Auxiliary Boiler are only 55.6 lb/hr, which is much lower than the emissions from any one of the H_2SO_4 plants.

Stack parameters and emissions for all SO_2 sources operating in the future at Gardinier, including the expanded No. 8 H_2SO_4 plant, are presented in Table 1-2. The locations of the various sources within the Gardinier complex are shown in Figure 1-2. The No. 7 H_2SO_4 plant emissions are based upon 2,200 TPD H_2SO_4 production and 4 lb/ton H_2SO_4 produced, while the No. 9 H_2SO_4 plant emissions are based upon 2,600 TPD H_2SO_4 and 4 lb SO_2/ton. These are maximum rates allowed in the current operating permits for these sources. Stack parameters for the H_2SO_4 plants are based upon the source tests described in the footnotes to Table 1-2. No modifications will be made to the existing stack serving the No. 8 H_2SO_4 plant.

Stack parameters for all other SO_2 sources are based upon available information, such as recent Air Pollution Emissions reports submitted to

Table 1-1. Maximum SO_2 Emissions from Fuel-Burning Sources at Gardinier

Source	Unit Code	Maximum Heat Input (10^6 Btu/hr)	Type Oil	Maximum Gallons Per Hour	Maximum SO_2 Emissions (lb/hr)
No. 5 Mill	RM 5	0.2	#2	1.5	0.084
No. 3 Triple Dryer	CTMD 3	13.5	#6	91.2	38.4
No. 4 Triple Dryer	CTMD 4	13.5	#6	91.2	38.4
Granular Triple Super Phosphate	GTSP	40	#6	270.3	113.7
Nos. 1 and 2 Diammonium phosphate*	DM 1-2	3.6	#2	27.5	1.54
Nos. 3 and 4 Diammonium phosphate*	DM 3-4	3.6	#2	27.5	1.54
No. 5 Diammonium phosphate	DM 5	--	#2	--	10.0+
Sodium Fluosilicate	SSF	1.3	#2	9.9	0.55

* Values represent total of both sources.

+ Based upon PSD permit (PSD-FL-026) of July 11, 1980.

Table 1-2. Maximum SO_2 Emissions and Stack Parameters for Gardinier After Expansion of No. 8 H_2SO_4 Plant

Unit Code	Maximum SO_2 Emission Rate (g/s)	Height (m)	Diameter (m)	Velocity (m/s)	Temperature (K)	UTM Coordinates (km) X	UTM Coordinates (km) Y
RM 5	0.01	20.1	0.61	14.9	336	362.65	3082.60
CTMD 3	4.84	20.7	1.07	10.7	316	362.65	3082.60
CTMD 4	4.84	20.7	1.07	12.2	316	362.65	3082.60
GTSP	14.3	38.4	2.44	11.0	327	362.60	3082.45
DM 1-2*	0.19	27.4	1.22	16.8	336	362.60	3082.40
DM 3-4*	0.19	27.4	1.07	20.4	336	362.60	3082.30
DM 5	3.05	40.4	2.13	16.0	314	362.60	3082.25
SSF	0.069	12.2	0.51	9.1	322	362.75	3082.45
H_2SO_4 7+	46.2	45.6	2.29	14.0	340	363.20	3082.30
H_2SO_4 8**	52.5	45.6	2.44	10.6	339	363.30	3082.40
H_2SO_4 9++	54.6	45.6	2.74	11.9	350	363.20	3082.45

* Emissions represent total for both plants; stack parameters represent individual plants

\+ Emissions for No. 7 H_2SO_4 based upon 2,200 TPD (91.7 TPH) H_2SO_4 and 4 lb SO_2/ton H_2SO_4. Stack parameters based on source test of 4/9/85, which reflected production rate of 87.8 TPH.

** Emissions for No. 8 H_2SO_4 based upon 2,500 TPD (104.2 TPH) and 4 lb SO_2/ton H_2SO_4. Stack parameters based upon source test of 6/14/85 which reflected production rate of 98.4 TPH.

++ Emissions for No. 9 H_2SO_4 based upon 2,600 TPD (108.3 TPH) H_2SO_4 and 4 lb SO_2/ton. Stack parameters based upon stack test of 4/26/84, with 110.8 TPH production.

FDER, and generally represent average values. SO_2 emissions represent maximum values due to fuel oil burning, as presented in Table 1-1.

2.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the regulatory requirements that must be met for the construction and operation of the modified No. 8 H_2SO_4 plant at Gardinier. Both federal and state of Florida air quality regulations are discussed.

2.1 NATIONAL AND STATE AAQS

The existing applicable National and Florida ambient air quality standards (AAQS) are presented in Table 2-1. Primary National AAQS were promulgated to protect the public health, and secondary National AAQS were promulgated to protect the public welfare from any known or anticipated adverse affects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. Hillsborough County is currently designated an attainment or unclassifiable area for all criteria pollutants except particulate matter and ozone.

2.2 PSD REQUIREMENTS

2.2.1 General Requirements

Under federal Prevention of Significant Deterioration (PSD) review requirements, all major new or modified sources of air pollutants regulated under The Clean Air Act (CAA) must be reviewed and approved by the U.S. Environmental Protection Agency (USEPA) [in this case, reviewed and approved by the Florida Department of Environmental Regulation (FDER) since PSD review authority has been delegated to the state]. A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 tons per year (TPY) or more, or any other stationary source which has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability at maximum design capacity to emit a pollutant after the application of control equipment.

Table 2-1. Federal and State of Florida Ambient Air Quality Standards

Pollutant	Averaging Time	AAQS (ug/m^3) Federal Primary Standard	Federal Secondary Standard	State of Florida
Suspended Particulate Matter	Annual Geometric Mean	75	60	60
	24-Hour Maximum*	260	150	150
Sulfur Dioxide	Annual Arithmetic Mean	80	N/A	60
	24-Hour Maximum*	365	N/A	260
	3-Hour Maximum*	N/A	1,300	1,300
Carbon Monoxide	8-Hour Maximum*	10,000	10,000	10,000
	1-Hour Maximum*	40,000	40,000	40,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100
Ozone	1-Hour Maximum+	235	235	235
Lead	Calendar Quarter	1.5	1.5	1.5

Notes: N/A = Not applicable.
ug/m^3 = micrograms per cubic meter

*Maximum concentration not to be exceeded more than once per year.
+Maximum concentration not to be exceeded more than an average of 1 calendar day per year.

Sources: 40 CFR, Parts 50 and 52.
Florida Administrative Code (FAC), Chapter 17-2

A "major modification" is defined under PSD regulations as a change at an existing major stationary source which increases emissions by greater than "significant amounts". PSD significant emission rates are shown in Table 2-2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified source. PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality. Major sources and modifications are required to undergo the following analysis related to PSD for each pollutant emitted in "significant" amounts:

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

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

2.2.2 Increments/Classifications

In promulgating the 1977 CAA Amendments, Congress specified that certain increases above an air quality "baseline concentration" level of SO_2 and PM concentrations would constitute "significant deterioration". The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres, and national parks larger than 6,000 acres) or as Class II (all areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. EPA then promulgated as regulations the requirements for classifications and

Table 2-2. PSD Significant Emission Rates

Pollutant	Regulated Under	Significant Emission Rate (TPY)
Sulfur Dioxide	NAAQS, NSPS	40
Particulate Matter	NAAQS, NSPS	25
Nitrogen Oxides	NAAQS, NSPS	40
Carbon Monoxide	NAAQS, NSPS	100
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40
Lead	NAAQS	0.6
Sulfuric Acid Mist	NSPS	7
Total Fluorides	NSPS	3
Total Reduced Sulfur	NSPS	10
Reduced Sulfur Compounds	NSPS	10
Hydrogen Sulfide	NSPS	10
Asbestos	NESHAP	0.007
Beryllium	NESHAP	0.0004
Mercury	NESHAP	0.1
Vinyl Chloride	NESHAP	1
Benzene	NESHAP	0
Radionuclides	NESHAP	0
Inorganic Arsenic	NESHAP	0
Any Regulated Pollutant	--	Class I Impact*

* Any emission rate for a source located within 10 km of a Class I area which causes impacts of 1 ug/m^3, 24-hour average, or greater.

Notes: TPY = Tons per year.
NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.

Source: 40 CFR 52.21.
FAC, Chapter 17-2.

area designations. The Florida DER has adopted the EPA class designations and allowable PSD increments, which are presented in Table 2-3.
The term "baseline concentration" evolves from federal and state PSD regulations and denotes a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition in the PSD regulations, as amended August 7, 1980, baseline concentration means the ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of sources in existence on the applicable baseline date; and
2. The allowable emissions of major stationary sources which commenced construction before January 6, 1975, but were not in operation by the applicable baseline date.

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

1. Actual emissions from any major stationary source on which construction commenced after January 6, 1975; and
2. Actual emission increases and decreases at any stationary source occurring after the baseline date.

"Baseline date" means the earliest date after August 7, 1977, on which the first complete application under 40 CFR 52.21 is submitted by a major stationary source or major modification subject to the requirements of 40 CFR 52.21. The baseline date for the entire state of Florida, including Hillsborough County, has been set as December 27, 1977 (FAC, Chapter 17-2).

2.2.3 Control Technology Review

The control technology review requirements of the federal PSD regulations require that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to control emissions from the source (40 CFR 52.21). The BACT requirements are

Table 2-3. Federal and State of Florida PSD Allowable Increments

Pollutant/Averaging Time	Allowable Increment (ug/m^3)		
	Class I	Class II	Class III
Particulate Matter			
Annual Geometric Mean	5	19	37
24-Hour Maximum**	10	37	75
Sulfur Dioxide			
Annual Arithmetic Mean	2	20	40
24-Hour Maximum**	5	91	182
3-Hour Maximum**	25	512	700

** Maximum concentration not to be exceeded more than once per year.

Source: 40 CFR Part 52, Section 52.21.
Florida Administrative Code, Chapter 17-2

applicable to all regulated pollutants for which the increase in emissions from the source or modification exceeds the significant emission rate (see Table 2-2).

BACT is defined in 40 CFR 52.21 as:

> An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act...which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable...through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.... If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology.

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

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

2.2.4 Air Quality Analysis

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

According to CAA, ambient air monitoring for a period of up to 1 year generally is appropriate to satisfy the PSD monitoring requirements. A minimum of four (4) months of data is required. Existing data from the vicinity of the proposed source may be utilized if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in USEPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration" (USEPA, 1981).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that the Administrator may exempt a proposed major stationary source or major modification from the monitoring requirements of 40 CFR 52.21(m) with respect to a particular pollutant if the emissions increase of the pollutant from the source or modification would cause, in any area, air quality impacts less than the de minimis levels presented in Table 2-4.

The state of Florida has passed PSD air quality analysis requirements identical to the federal requirements. In February 1981, USEPA revised the de minimis levels and averaging times for three of the pollutants (USEPA, 1981). The averaging period for lead was changed to 3 months and the de minimis impact levels for beryllium and hydrogen sulfide were changed to 0.001 ug/m^3 and 0.2 ug/m^3, respectively. These revisions have been proposed in the Federal Register, but have not yet been promulgated. The state of Florida recently (August 1986) adopted the revised de minimis levels.

2.2.5 Source Impact Analysis

A source impact analysis must be performed by a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 2-2). The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated USEPA models must normally be used in performing the impact analysis. Specific applications for other than USEPA-approved models require USEPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the USEPA publications, "Guideline on Air Quality Models (Revised)" (USEPA, 1986a) and "Regional Workshops on Air Quality Modeling: A Summary Report" (USEPA, 1983). Criteria pollutants may be exempt from the source impact analysis if the net increase in impacts due to the new source is below significance levels, as presented in Table 2-5.

Table 2-4. EPA and Florida PSD De Minimis Impact Levels

Pollutant	De Minimis Air Quality Impact Level (ug/m^3)	
	Code of Federal Regulations	EPA Ambient Monitoring Guidelines and Florida
Sulfur Dioxide	13, 24-hour	13, 24-hour
Particulate Matter	10, 24-hour	10, 24-hour
Nitrogen Oxides	14, annual	14, annual
Carbon Monoxide	575, 8-hour	575, 8-hour
Ozone	100 TPY*	100 TPY*
Lead	0.1, 24-hour	0.1, 3-month
Sulfuric Acid Mist	**	**
Total Fluoride	0.25, 24-hour	0.25, 24-hour
Total Reduced Sulfur	10, 1-hour	**
Reduced Sulfur Compounds	10, 1-hour	**
Hydrogen Sulfide	0.04, 1-hour	0.2, 1-hour
Asbestos	**	**
Beryllium	0.0005, 24-hour	0.001, 24-hour
Mercury	0.25, 24-hour	0.25, 24-hour
Vinyl Chloride	15, 24-hour	15, 24-hour
Benzene	**	**
Radionuclides	**	**
Inorganic Arsenic	**	**

* Increase in volatile organic compounds (VOC) emissions.
** No ambient air measurement method; no monitoring required.

Sources: 40 CFR 52.21(i)(8).
EPA, 1980.
EPA, 1981.

Table 2-5. Significant Impact Levels for Criteria Pollutants

Pollutant	Average Period	Concentration (ug/m^3)
Sulfur Dioxide	3-Hour	25
	24-Hour	5
	Annual	1
Particulate Matter	24-Hour	5
	Annual	1
Nitrogen Dioxide	Annual	1
Carbon Monoxide	1-Hour	2,000
	8-Hour	500

Source: EPA, 1980

Various lengths of record for meteorological data can be utilized for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor must normally be used for comparison to air quality standards.

2.2.6 Additional Impact Analysis

In addition to air quality impact analyses, federal PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 2-2).

2.2.7 Good Engineering Practice Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP, or any other dispersion technique. On July 8, 1985, USEPA promulgated final stack height regulations (USEPA, 1985a).

GEP stack height is defined as the highest of:

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

   $Hg = H + 1.5L$

   where: H_g = GEP stack height,

   H = Height of the structure or nearby structure, and

   L = Lesser dimension (height or projected width) of nearby structure(s).
3. A height demonstrated by a fluid model or field study.

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

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where "plume impaction" occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with "elevated terrain." "Elevated terrain" is defined as terrain which exceeds the height calculated by the GEP stack height formula. Because the terrain in the vicinity of the Gardinier facility is flat, plume impaction was not considered in determining the GEP stack height.

2.3 SOURCE APPLICABILITY

2.3.1 Pollutant Applicability

As described in Section 1.0, the only regulated pollutants affected by the proposed No. 8 H_2SO_4 plant expansion are SO_2 and H_2SO_4 mist. Since phosphate rock processing plants are one of the 28 listed PSD source categories, and the Gardinier plant is a phosphate rock processing plant, the plant is an existing major source if emissions of any regulated pollutant exceed 100 tons per year. Permitted SO_2 emissions from the three

H_2SO_4 plants alone are greater then 5,300 TPY. As a result, the Gardinier plant is an existing major source for PSD purposes.

A major modification, as described in Section 2.2, is a significant increase in emissions of any regulated pollutant at a major stationary source. PSD review applies to each pollutant for which the increase in emissions exceeds the PSD significant emission rate (Table 2-2). Since emission increases at the Gardinier plant due to the proposed modification will only occur at the No. 8 H_2SO_4 plant, only this source was considered in determining the net emissions increase. Emissions from all other SO_2 sources will not exceed current permit conditions, although emissions may fluctuate below these levels depending upon phosphate fertilizer market conditions and fuel type and quality. Since such fluctuations constitute normal routine operation, they are not considered in determining the net emissions increase [40 CFR 52.21(2)(i) and FAC 17-2.100(102)].

Current allowable emissions, proposed allowable emissions, and the net increase in allowable emissions of SO_2 and H_2SO_4 mist from the No. 8 H_2SO_4 plant are shown in Table 2-6. The net increase in both SO_2 and H_2SO_4 mist emissions are estimated to exceed the PSD significant emission rates. As a result, both of these pollutants are required to undergo the PSD review described in Section 2.2.

2.3.2 Emission Standards

The No. 8 H_2SO_4 plant is currently required to emit no more than 4 lb SO_2/ton H_2SO_4 produced and 0.15 lb H_2SO_4 mist per ton H_2SO4 produced. These limits are equivalent to the federal NSPS for new H_2SO_4 plants. These emission limits will be retained after the expansion of the H_2SO_4 production capacity of the No. 8 H_2SO_4 plant.

2.3.3 Increment Consumption

The PSD increments allow a specified amount of deterioration in air quality to occur as judged against a "baseline" air quality level. The baseline date has been established for the entire state of Florida by DER as

Table 2-6. Net Emission Increases at Gardinier, Inc., Due to the Proposed Modification

Emission Scenario	SO_2 (tons/yr)	H_2SO_4 Mist (tons/yr)
Current Permitted Emissions		
No. 8 H_2SO_4 @ 2,200 TPD	1,606.0	60.2
Proposed Allowable Emissions		
No. 8 H_2SO_4 @ 2,500 TPD	1,825.0	68.4
Net Increase	219.0	8.2
PSD Significant Emission Rate	40	7

Note: Emission calculations reflect maximum production rates and allowable emissions of 4.0 lb/ton for SO_2 and 0.15 lb/ton for H_2SO_4 mist.

December 27, 1977. Several provisions exist in FAC 17-2.500(4) which identify emissions which affect PSD increment consumption. These provisions relate to emission increases and decreases at facilities due to construction commencing after January 6, 1975.

A review of the history of the Gardinier plant in regard to SO_2 emissions was presented in the 1984 PSD application for the No. 7 and No. 8 H_2SO_4 plant expansions (ESE, 1984). This permit history, shown in Table 2-7, reflects changes in only the H_2SO_4 plants at Gardinier. A brief review of this history follows:

Nos. 4, 5 and 6 H_2SO_4 - Units shutdown in 1976.

No. 7 H_2SO_4 - Modified to double absorption in 1974; increased capacity to 1,750 TPD in 1979; increased capacity to 2,200 TPD in 1985.

No. 8 H_2SO_4 - Modified to double absorption in 1974; increased capacity to 2,200 TPD in 1985.

No. 9 H_2SO_4 - Construction permit for 2,600 TPD plant issued in 1974; current operating permit is for 2,600 TPD.

The SO_2 emission decreases and increases at the Gardinier H_2SO_4 plants which affect increment consumption, including the presently proposed expansion, are summarized in Table 2-8. Both actual and allowable emissions are shown, based upon a 100-percent capacity factor on all units. The post-January 6, 1975 capacity increases at the No. 7 and No. 8 H_2SO_4 plants represent increases in actual emissions which consume PSD increment. Although the allowable SO_2 emission rates for both these plants were reduced from 10 lb/ton to 4 lb/ton, review of historic source test data shows that the units had generally met the 4-lb/ton limit since converting to double adsorption in 1977. Thus, for purposes of calculating actual emission changes from No. 7 and No. 8 H_2SO_4 plants, the 4-lb/ton factor was used.

Table 2-7. Permit History of H_2SO_4 Plants at Gardinier.

Permit No.	Date	Comments
No. 7 H_2SO_4		
AC 29-2384	11/25/74	Modify to double absorption plant
AO 29-5763	11/02/77	Operating permit for double absorption plant (1,380 TPD)
AC 29-21337	9/07/79	Increase to 1,750 TPD H_2SO_4 and reduce allowable SO_2 emissions from 10 lb/ton to 4 lb/ton
AO 29-22820	9/10/82	Operating permit for 1,750 TPD expansion
AC 29-089697	2/8/85	Modify to 2,200 TPD
AO 29-104895	8/23/85	Operating permit (2,200 TPD)
No. 8 H_2SO_4		
AC 29-3290	11/25/74	Modify to double absorption plant
AO 29-2390	5/21/77	Operating permit for double absorption plant (1,784 TPD)
AO 29-18228	5/26/79	Renew operating permit
AO 29-84015	6/8/84	Renew operating permit
AC 29-089696	2/8/85	Increase to 2,200 TPD H_2SO_4 and reduce allowable SO_2 emissions from 10 lb/ton to 4 lb/ton
No. 9 H_2SO_4		
AC 29-2391	11/25/74	Original construction permit for 2,600 TPD double absorption plant
AO 29-2391	3/29/77	Operating permit (2,800 TPD)
AO 29-16532	2/09/79	Renew operating permit (2,631 TPD)
AO 29-78960	2/28/84	Renew operating permit (2,600 TPD)
Nos. 4, 5, and 6 H_2SO_4		
	October 1976	Units shutdown

Table 2-8. Summary of SO_2 Emission Changes at Gardinier H_2SO_4 Plants Which Affect PSD Increment Consumption

Unit/Date	Change	Actual SO_2 (tons/yr)*	Allowable SO_2 (tons/yr)*
No. 7 H_2SO_4			
9/07/79	Increase capacity from 1,380 TPD to 1,750 TPD and reduce allowables from 10 lb/ton to 4 lb/ton	+270+	-1,241
2/8/85	Increase capacity from 1,750 TPD to 2,200 TPD	+329+	+ 329
No. 8 H_2SO_4			
2/8/85	Increase capacity from 1,770 TPD to 2,200 TPD and reduce allowables from 10 lb/ton to 4 lb/ton	+314+	-1,624
Proposed	Increase capacity from 2,200 TPD to 2,500 TPD	+219+	+ 219
No. 4 H_2SO_4			
1976	Unit shutdown, 274 TPD @ 6,992 lb SO_2/day	-892**	-1,276
No. 5 H_2SO_4			
1976	Unit shutdown, 475 TPD @ 12,140 lb SO_2/day	-1,773**	-2,216
No. 6 H_2SO_4			
1976	Unit shutdown, 650 TPD @ 16,598 lb SO_2/day	-2,469**	-3,029
Net Change		-4,002	-8,838

* Based upon year-round, continuous operation. Negative numbers indicate emission decreases; positive numbers indicate emission increases.

\+ Based upon 4 lb/ton before and after increase in capacity.

** Average of last 2 years of operation (1975 and 1976) based upon Air Pollutant Emissions Reports.

No change has been made in the H_2SO_4 production capacity of No. 9 H_2SO_4 plant since it was permitted to construct in 1974. As a result, the No. 9 H_2SO_4 plant does not affect PSD increment consumption.

The currently proposed increase in production capacity of the No. 8 H_2SO_4 plant will also represent a post-January 6, 1975 emissions increase which consumes PSD increments. Actual emissions for No. 8 H_2SO_4 are based upon 4 lb/ton, since historic source test data show that this level has been generally approached in actual operation, and the 4 lb/ton emission rate is the source-specific allowable emission rate determined as BACT in the 1985 PSD permit issued for the unit. The shutdown of the No. 4, No. 5, and No. 6 H_2SO_4 plants in 1976 represents post-January 6, 1975 emission decreases which expand the available PSD increments. The actual emissions for these units are based upon the last 2 years of operation (1975 through October 1976), as reported in the Air Pollutant Emissions Report submitted to the state of Florida for 1975 and 1976.

As shown in Table 2-8, the net change in increment-affecting emissions at Gardinier, including the proposed expansion of the No. 8 H_2SO_4 plant, reflects a large decrease in both actual and allowable SO_2 emissions. In addition to these increment-affecting changes in emissions, the stack heights of the No. 7 and No. 8 H_2SO_4 plants are currently 149.5 feet. The shutdown No. 4, No. 5, and No. 6 H_2SO_4 plants all had shorter stacks, ranging from 72 feet to 80 feet. Thus, the air quality impacts from the older units would be proportionately greater than that for the No. 7 and No. 8 units.

Changes to other SO_2-emitting sources at Gardinier since January 6, 1975, have been minimal and would not significantly affect the results shown in Table 2-8. These changes include the addition of the No. 5 diammonium phosphate plant (10 lb/hr, 44 TPY), and the shutdown of the ammonia plant (less than 5 TPY), Concentrators No. 7 and No. 8 (171 lb/hr, 747 TPY), mills KVS 12 (1.3 lb/hr, 5.6 TPY), and RM 6-10 (0.4 lb/hr and 1.7 TPY).

Based upon the above considerations, it is concluded that the proposed expansion of the No. 8 H_2SO_4 plants at Gardinier will not cause or contribute to any violation of the allowable SO_2 PSD increments. The Gardinier plant is not located in an area where the PSD increments are known to be violated. Emission reductions at Gardinier since January 6, 1975, provide greatly expanded PSD increments in the vicinity of the plant. These emission decreases are of such magnitude that no detailed modeling analysis is needed, either for the PSD Class II area surrounding the Gardinier site, or for the PSD Class I area located 85 km to the north of the site (Chassahowitzka National Wilderness Area).

2.3.4 GEP Stack Height

The height of the existing No. 8. H_2SO_4 plant is 149.5 feet (45.6 m). This existing stack will not be modified as a result of the proposed expansion. This stack height is less than the 65-m de minimis height allowed under the GEP stack height regulations and, therefore, the stack will not exceed the GEP stack height.

2.3.5 Ambient Monitoring

An ambient monitoring analysis for SO_2 is presented in Section 3.0 to satisfy PSD preconstruction monitoring requirements. Currently, no ambient monitoring requirements exist for H_2SO_4 mist under PSD, as no acceptable ambient monitoring technique has been approved (see Table 2-4).

3.0 AIR QUALITY ANALYSIS

3.1 MONITORING REQUIREMENTS

The Clean Air Act Amendments of 1977 require that the owner or operator of any proposed major new source or major modification conduct ambient air monitoring for applicable pollutants. As discussed in the source applicability section, Section 2.3, only SO_2 requires an air quality analysis to meet PSD preconstruction monitoring requirements for the proposed Gardinier expansion. Monitoring must be conducted for a period of up to 1 year prior to submission of a construction permit application. However, if the increase in impacts due to the proposed new source or modification is less than the PSD de minimis monitoring concentrations, the applicant may be exempted from the PSD preconstruction monitoring requirements. For SO_2, the de minimis level is 13 ug/m^3, 24-hour average. As demonstrated in Section 4.0, the predicted maximum increase in 24-hour SO_2 impacts due to the proposed modification at Gardinier is 7.6 ug/m^3. As a result, the proposed modification may be exempted from preconstruction SO_2 monitoring.

3.2 BACKGROUND SO_2 CONCENTRATIONS

A background SO_2 concentration must be estimated to account for SO_2 sources which are not explicitly included in the atmospheric dispersion modeling analysis. In order to estimate reasonable background SO_2 concentrations, a review of recent, available SO_2 monitoring data in the area of Gardinier was performed. Presented in Table 3-1 is a summary of ambient SO_2 data available from 1983 to 1985 for all monitors located within 10 km of the Gardinier site. A total of five stations are located within 10 km of Gardinier, three of which have continuous SO_2 monitors. The monitors are operated by Hillsborough County Environmental Protection Commission. Data recoveries exceed 85 percent for all the stations.

Annual average, 24-hour maximums, and 3-hour maximums for SO_2 are shown in Table 3-1. Since all of the monitors are located in an area of multisource emissions (refer to Section 4.0), these concentrations are expected to include substantial contributions from sources in the area, including the

Table 3-1. Summary of Ambient SO_2 Concentrations for Sites Within 10 km of Gardinier, Inc., 1983 - 1985.

SAROAD Site No. (Distance Away)	City	Monitoring Method	Period	No. of Obs.	Percent Data Recovery	SO_2 Concentration (ug/m^3) 3-Hour*	24-Hour*	Annual Average
1800-021+	South	Continuous	1983	8506	97.1	729	114	14
(8.2 km)	of Gibsonton		1984	8638	98.3	437	82	13
			1985	8657	98.8	637	134	15
1800-066+	Gibsonton	Gas bubbler	1983	5	-	-	29	7
(3.9 km)			1984	55	-	-	29	8
			1985	56	-	-	39	11
1800-083+	Riverview	Gas bubbler	1983	57	-	-	31	8
(0.6 km)			1984	62	-	-	39	10
			1985	61	-	-	47	13
1800-95+	Tampa	Continuous	1983	8404	95.9	396	80	18
(7.0 km)			1984	8392	95.5	456	103	15
			1985	7731	88.3	376	83	21
4360-035+	Tampa	Continuous	1983	8241	94.1	291	77	21
(9.8 km)			1984	8673	98.7	393	82	19
			1985	8146	93.0	287	67	14
4360-053**	Tampa	Continuous	1983	8062	92.0	222	68	15
(9.5 km)			1984	8684	98.9	383	69	16
			1985	8121	92.7	265	69	15

* Second-highest concentrations for calendar year are shown
\+ Monitoring objective for this site is to measure the impact of a significant source
**Monitoring objective for this site is to measure pollutant concentrations representative of areas of high population density

Source: Florida DER, 1984, 1985, 1986.

existing Gardinier facility. These potential major contributing sources are explicitly included in the modeling analysis. As a result, for the short-term averaging times, these concentrations would not be representative of actual background concentrations which would be expected to occur in conjunction with the worst-case meteorology. For the annual averaging time, the actual background concentration would be significantly lower than the values shown in Table 3-1.

A representative background SO_2 concentration was considered to be the 1985 annual average concentration of 15 ug/m^3 recorded at monitoring site 1800-021. This value is consistent with the background concentration assumed from a previous air modeling analysis performed for Gardinier (ESE, 1984), which used the same monitoring site to develop a background concentration. Site 1800-021 is located 8.2 km southeast of Gardinier and 5 km west of the TEC Big Bend power plant. These two sources are the only nearby sources of SO_2 that would directly influence the monitor. Therefore, the data from this site were considered to be more representative of the background concentration than the data from the other monitoring sites listed in Table 3-1, which could be impacted by a number of SO_2 sources.

The 15 ug/m^3 background SO_2 level was used for all averaging times and was added to dispersion modeling results, presented in Section 4.0, in order to estimate total air quality impacts. The highest and second-highest 3-hour and 24-hour concentrations reported for monitoring site 1800-021 in Table 3-1 are assumed to be due to either the Gardinier plant or the TEC Big Bend plant, and therefore were considered not to be representative of the short-term background concentration. Since all major SO_2 sources located within 50 km of the Gardinier plant were considered in the dispersion modeling analysis, the 15 ug/m^3 annual average recorded at Station 1800-021 was also considered to be representative of the short-term background concentration level.

4.0 SOURCE IMPACT ANALYSIS

4.1 ANALYSIS APPROACH AND ASSUMPTIONS

4.1.1 General Modeling Approach

The general modeling approach followed USEPA and FDER modeling guidelines for determining compliance with AAQS. In general, when model predictions are used to determine compliance with AAQS, current USEPA and FDER policies stipulate that the highest annual average and highest, second-highest short-term (i.e., 24 hours or less) concentrations can be compared to the applicable AAQS. If concentrations are predicted with only 1 year of meteorological data, the highest short-term concentration calculated among the field of receptors should be compared with AAQS. The use of a 5-year meteorological database allows comparison of the predicted highest, second-highest short-term concentration with short-term AAQS. The highest, second-highest concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with AAQS, which permits a short-term average concentration to be exceeded once per year at each receptor.

Model predictions for all averaging periods were performed using the Industrial Source Complex Short-Term (ISCST) model. A brief description of the ISCST model is given in Section 4.2. To develop the maximum short-term SO_2 concentrations for the proposed Gardinier expansion, the general modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. The basic difference between the two phases is the receptor grid used when predicting concentrations, the number of emission points, and the number of meteorological periods evaluated. In general, concentrations for the screening phase were predicted using a coarse receptor grid, limited number of major sources, and a 5-year meteorological record.

After a final list of highest, second-highest short-term concentrations was developed, the refined phase of the analysis was conducted by predicting concentrations for a refined receptor grid centered on the receptor at which the highest, second-highest concentration from the screening phase was produced. The ISCST model was executed for the meteorological periods during which both the highest and second-highest concentrations were predicted to occur at that receptor, based on the screening phase results. This approach was used to ensure that valid highest, second-highest concentrations were obtained. More detailed descriptions of the emission inventory and receptor grids used in the screening and refined phases of the analysis are presented in Sections 4.1.4 and 4.1.5, respectively.

4.1.2 Model Selection

The ISC dispersion model (USEPA, 1986b) was used to evaluate the SO_2 emissions from the Gardinier facility. This model is contained in USEPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 6 (USEPA, 1986c). The ISC model was selected primarily for the following reasons:

1. USEPA and FDER have approved the general use of the model for air quality dispersion analysis because the model assumptions and methods are consistent with those in the Guideline on Air Quality Models (USEPA, 1986a).
2. The ISC model is capable of predicting the impacts from stack, area, and volume sources that are spatially distributed over large areas and located in flat or gently rolling terrain.
3. The results from the ISC model are appropriate for addressing compliance with AAQS.

The ISC model consists of two sets of computer codes which are used to calculate short- and long-term ground level concentrations. The main differences between the two codes are the input format of the meteorological data and the method of estimating the plume's horizontal dispersion.

The first model code, the ISCST model, is an extended version of the single-source (CRSTER) model (USEPA, 1977). The ISCST model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The hourly concentrations are processed into non-overlapping, short-term and annual averaging periods. For example, a 24-hour average concentration is based on twenty-four 1-hour averages calculated from midnight to midnight of each day. For each short-term averaging period selected, the highest and second-highest average concentrations are calculated for each receptor. As an option, a table of the 50 highest concentrations over the entire field of receptors can be produced.

The second model code of the ISC model is the ISC long-term (ISCLT) model, which is an extension of the Air Quality Display Model (AQDM) and the Climatological Dispersion Model (CDM). The ISCLT model uses joint frequencies of wind direction, wind speed, and atmospheric stability to calculate seasonal and/or annual average ground-level concentrations. Because the input wind directions are for 16 sectors, with each sector defined as 22.5 degrees, the model calculates concentrations by assuming that the pollutant is uniformly distributed in the horizontal plane within a 22.5-degree sector.

In this analysis, the ISCST model was used to calculate both short-term and annual average concentrations because these concentrations are readily obtainable from the model output.

Major features of the ISCST model are presented in Table 4-1. Concentrations due to stack and volume sources are calculated by the ISCST model using the steady-state Gaussian plume equation for a continuous source. The area source equation in the ISCST model is based on the equation for a continuous and finite crosswind line source.

Table 4-1. Major Features of the ISCST Model

ISCST Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975)
• Procedures suggested by Huber and Snyder (1976) and Huber (1977) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple point sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume and area sources
• Capability to calculate dry deposition
• Variation with height of wind speed (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing

Source: EPA, 1986b

The ISC model has rural and urban options which affect the wind speed profile exponent law, dispersion rates, and mixing-height formulations used in calculating ground level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the proposed plant's surroundings (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential for more than 50 percent of the area within a 3 km radium circle centered on the proposed source, the urban option should be selected. Otherwise, the rural option is more appropriate.

For modeling analyses that will undergo regulatory review, such as PSD permit applications, the following model features are recommended by USEPA (1986c) and are referred to as the regulatory options in the ISCST model:

1. Final plume rise at all receptor locations,
2. Stack-tip downwash,
3. Buoyancy-induced dispersion,
4. Default wind speed profile coefficients for rural or urban option,
5. Default vertical potential temperature gradients,
6. Calm wind processing, and
7. A decay half life of 4 hours for SO_2 concentration calculations in urban areas.

Some of the above model features have been recommended for use by USEPA over the last 5 years. These assumptions include the use of final plume rise, default wind speed profile coefficients, default vertical potential temperature gradients, and calm wind processing of maximum ground level concentrations. The recently revised USEPA modeling guidelines recommend use of the remaining features, including the use of calm wind processing regardless if impacts are expected to occur under such meteorological conditions. The effect of using these options to predict maximum ground level concentrations from elevated point sources is to produce higher concentrations than if these options were not used by:

- Lowering the effective plume height (stack-tip downwash),
- Increasing the plume width such that the plume may have an impact over areas where it previously would not (buoyancy-induced dispersion), and
- Mathematically adjusting the longer term averaging concentration (i.e., 24 hours or more) by the number of non-calm hours (calm wind processing).

In this analysis, the regulatory options were used to address maximum impacts from the Gardinier facility. Based on a review of the land use around the Gardinier facility, the rural mode was selected because of the general lack of, or minimal residential, industrial and commercial development.

4.1.3 Meteorological Data

Meteorological data used in the ISCST model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations from the National Weather Service (NWS) station at Tampa International Airport and twice-daily radiosonde soundings from the NWS station at Ruskin, Florida. The 5-year period of meteorological data consisted of 1974, 1975, 1978, 1979, and 1981. Based on discussions with the FDER (KBN, 1986), this database is acceptable for use in assessing impacts for an air quality permit application.

The NWS station in Tampa, located approximately 18 km to the northwest of the Gardinier plant site, and Ruskin, located approximately 15 km to the south-southwest of the plant site, were selected for use in the study because they are the closest primary weather stations to the study area with similar surrounding topographical features and land-water boundaries. These stations also have the most readily available and complete database which is representative of the proposed plant site.

The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling. The wind speed, cloud cover, and cloud

ceiling values were used in the ISCST meteorological preprocessor program to determine atmospheric stability using the Turner stability scheme. Based on the temperature measurements at Tampa, Florida, morning and afternoon mixing heights were calculated with the radiosonde data at Ruskin using the Holzworth approach (1972). Hourly mixing heights were derived from the morning and afternoon mixing heights using the interpolation method developed by USEPA (Holzworth, 1972). The hourly surface data and mixing heights were used to develop a sequential series of hourly meteorological data (i.e., wind direction, wind speed, temperature, stability, and mixing heights). Because the observed hourly wind directions were classified into one of thirty-six 10-degree sectors, the wind directions were randomized within each sector using an USEPA preprocessing program to account for the expected variability in air flow.

4.1.4 Emission Inventory

A listing of all sources, other than Gardinier, considered in the SO_2 modeling analyses for determining total air quality impacts is presented in Table 4-2. The emission and stack parameters for the Gardinier sources were presented in Table 1-2 in Section 1.0. The emission and stack parameters for all other sources were obtained from the FDER, Southwest District office. These data were based on information developed for the PSD permit application for the Hillsborough County Resource Recovery facility, and updated to reflect changes made by the FDER (1985). Data for several of the utility sources were obtained from the Florida Air Pollution Inventory System (APIS) and the previous air quality impact assessment prepared for Gardinier (ESE, 1984).

The FDER has recommended a technique for eliminating sources in the modeling analyses if the source's emissions do not meet an emission criteria. The technique is the "Screening Threshold" method, developed by the North Carolina Department of Natural Resources and Community Development, and approved by the USEPA. The method is designed to objectively eliminate from the emission inventory those sources which are not likely to have a significant interaction with the source undergoing evaluation. In general,

Table 4-2. SO_2 Emission Inventory of Sources Considered in the Modeling

No.	Source	Maximum Allowable Emissions (TPY)	Distance(D) from Gardinier (KM)	"Screening Threshold" Emissions (TPY)*	Sources Included in Modeling Analyses	
					Screening	Refined
1	Hillsborough County Resource Recovery Facility (RRF)	1,029	11.4	228	No	Yes
2	Pinellas County RRF	1,095	28.3	566	No	Yes
3	McKay Bay RRF	744	10.1	202	No	Yes
4	TECO Big Bend	298,900	7.6	152	Yes	Yes
5	FPC Bartow	54,960	21.0	420	Yes	Yes
6	FPC Higgins	11,195	31.3	626	No	Yes
7	FPC Anclote	116,840	53.1	1,062	No	Yes
8	TECO Hookers Point	13,474	10.2	204	Yes	Yes
9	TECO Gannon	92,856	6.1	122	Yes	Yes
10	General Portland	12,132	9.8	196	Yes	Yes
11	AMAX	3,313	33.4	668	No	Yes
12	CF Industries	1,700	37.2	744	No	Yes
13	Chloride Metals	702	6.1	122	No	Yes
14	Columbus Company	167	4.8	96	No	Yes

Table 4-2. SO_2 Emission Inventory of Sources Considered in the Modeling
(Continued, Page 2 of 2)

No.	Source	Maximum Allowable Emissions (TPY)	Distance(D) from Gardinier (KM)	"Screening Threshold" Emissions (TPY)*	Sources Included in Modeling Analyses	
					Screening	Refined
15	Couch Construction	115	15.7	314	No	No
16	Delta Asphalt	167	24.6	492	No	No
17	Gulf Coast Lead Co.	1,641	11.4	228	No	Yes
18	IMC Port Sutton	1,443	6.1	122	No	Yes
19	Thatcher Glass	181	21.0	420	No	No
20	Nitram	108	6.6	132	No	No
21	National Gypsum	138	16.1	322	No	No
22	AMAX (Manatee County)	3,290	29.2	584	No	Yes
23	FPL Manatee	75,680	28.5	570	Yes	Yes

*"Screening Threshold" emissions (Q) are equal to 20 x D. Sources with emissions less than Q were eliminated from modeling (see text for details).

Source: KBN, 1986
Florida DER, 1986

sources that should be considered in the modeling analyses are those with emissions greater than Q (in TPY) which is calculated by the following criteria:

$$Q = 20 \times D$$

where D is the distance (km) from the source to the source undergoing evaluation.

A listing of the sources in the inventory with associated maximum allowable emissions, distance from Gardinier, and associated Q are presented in Table 4-2. Those sources with maximum allowable SO_2 emissions which are below the calculated "screening threshold" emissions were eliminated from further consideration in the modeling analysis. To reduce the amount of computation time required to model the remaining sources, including those at the Gardinier plant, the modeling was performed in screening and refined phases. In the screening phase, only those sources with SO_2 emissions above a certain threshold based on the source's location from the Gardinier plant were considered. The following criteria were used to determine the sources to be modeled:

1. For Gardinier sources, individual point sources with SO_2 emissions greater than or equal to 125 TPY.
2. For other sources, SO_2 emissions:
   - greater than 750 TPY within 10 km of Gardinier
   - greater than 2,000 TPY between 10 and 20 km from Gardinier
   - greater than 10,000 TPY between 20 and 50 km from Gardinier.

Sources located more than 50 km from Gardinier were not considered in the screening analysis. For the screening modeling, sources with similar stack heights and stack parameters were combined and treated as one stack to reduce computation time. The Gardinier screening emission inventory is presented in Table 4-3. The emissions, stack, and operating parameters for the other sources considered in the screening analysis are presented in Table 4-4.

Table 4-3. Combined Gardinier Sources Used for Screening Modeling

Sources	SO_2 Emissions (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Velocity (m/s)	Exit Gas Temperature (K)	UTM Coordinates (km)	
						X	Y
RM 5, CTMD 3, 4	9.69	20.7	1.07	11.5	316	362.65	3082.6
GTSP	14.3	38.4	2.44	11.0	327	362.6	3082.45
H_2SO_4 7	46.3	45.6	2.29	14.0	340	363.2	3082.3
H_2SO_4 8	52.5	45.6	2.44	10.6	339	363.3	3082.4
H_2SO_4 9	54.6	45.6	2.74	11.9	350	363.2	3082.45

Source: KBN, 1986

Table 4-4. SO_2 Emission, Stack, and Operating Data for Sources Considered in the Modeling
(Page 1 of 3)

No.	Source	UTM Coordinates (km) East	UTM Coordinates (km) North	SO_2 Emissions (g/s)	Stack Data (m) Height	Stack Data (m) Diameter	Operating Data Temperature (K)	Operating Data Velocity (m/s)
1	Hillsborough Co. RRF	368.2	3092.7	29.6	67.0	3.50	494	16.9
2	Pinellas RRF 1-3	335.2	3084.1	31.5	49.1	2.37	505	26.8
3	McKay Bay RRF	360.0	3091.9	21.4	45.7	1.91	500	21.3
4	TECO Big Bend	361.9	3075.0					
	No. 1,2			5252	149.4	7.32	423	28.7
	No. 3*			2692	149.4	7.32	418	14.4
	No. 4			655	149.4	7.32	342	19.9
5	FPC Bartow	342.4	3082.7					
	No. 1			423.0	91.5	2.74	429	36.3
	No. 2			448.0	91.5	2.74	425	31.4
	No. 3*			710.0	91.5	3.35	408	34.6
6	FPC Higgins	336.5	3098.4					
	No. 1			97.3	53.1	3.81	429	8.45
	No. 2			94.9	53.1	3.81	427	8.53
	No. 3			130.0	53.1	3.81	422	7.47
7	FPC Anclote	324.4	3118.7					
	No. 1			1681.0	152.1	7.32	433	19.1
	No. 2			1681.0	152.1	7.32	431	19.0
8	TECO Hooker Pt.	358.0	3091.0					
	No. 1*			41.3	85.4	3.40	402	18.2
	No. 2			41.3	85.4	3.40	402	18.2
	No. 3			57.0	85.4	3.70	397	11.5
	No. 4			57.0	85.4	3.70	397	11.5
	No. 5			84.0	85.4	3.40	402	18.2
	No. 6			107.0	85.4	2.90	436	17.9

Table 4-4. SO_2 Emission, Stack, and Operating Data for Sources Considered in the Modeling
(Page 2 of 3)

No.	Source	UTM Coordinates (km) East	UTM Coordinates (km) North	SO_2 Emissions (g/s)	Stack Data (m) Height	Stack Data (m) Diameter	Operating Data Temperature (K)	Operating Data Velocity (m/s)
9	TECO Gannon**	360.0	3087.5					
	No. 1			282.5	93.3	3.70	438	22.5
	No. 2			282.5	93.3	3.10	438	32.4
	No. 3			321.4	93.3	3.20	427	35.4
	No. 4			421.6	93.3	2.90	443	24.6
	No. 5			513.4	93.3	4.50	415	20.6
	No. 6			853.6	93.3	5.40	415	23.7
10	General Portland	358.0	3090.6	349.0	44.3	4.72	473	6.6
11	AMAX (Point No.)	393.8	3096.3					
	01			12.0	30.5	1.37	335.1	12.0
	02			3.3	24.4	1.67	315.8	8.9
	03			17.6	46.3	1.76	308.6	11.0
	05			29.0	45.7	1.76	315.6	15.9
	19			2.8	6.1	0.40	550.2	15.3
	20			1.4	3.4	0.37	605.2	20.2
	26 - 28			27.1	46.3	1.76	298.0	13.1
	29			2.1	10.6	0.36	605.2	15.3
12	CF Industries (Point No.)	380.0	3115.7					
	01			6.1	7.5	1.07	560.0	19.7
	10			6.2	28.7	3.05	316.3	7.2
	11			9.2	54.9	2.79	321.9	12.6
	12			13.7	54.9	2.79	315.2	9.8
	13			13.7	54.9	2.79	324.7	10.5
13	Chloride Metals (Point No.)	361.8	3088.3					
	01			10.1	32.2	0.58	346.7	27.8
	04			10.1	29.9	0.61	363.0	14.4

Table 4-4. SO_2 Emission, Stack, and Operating Data for Sources Considered in the Modeling
(Page 3 of 3)

No.	Source	UTM Coordinates (km) East	UTM Coordinates (km) North	SO_2 Emissions (g/s)	Stack Data (m) Height	Stack Data (m) Diameter	Operating Data Temperature (K)	Operating Data Velocity (m/s)
14	Columbus Company	361.9	3077.8	4.8	12.6	1.24	449.7	20.0
17	Gulf Coast Lead	363.9	3093.8	47.2	29.6	0.62	347.4	24.9
18	IMC Port Sutton	360.1	3087.5	41.5	19.8	2.41	338.6	10.5
22	AMAX (Manatee County)	348.5	3057.3					
	2-01, 02			90.7	61.0	2.40	337.0	10.3
	2-06, 07			3.1	61.0	2.10	311.0	20.5
	2-11			0.83	12.5	1.40	299.0	10.0
23	FPL Manatee, No. 1, 2	367.3	3054.2	2177.0	152.1	7.98	426.0	23.6

*For the screening modeling analysis, the emissions from the source were combined and modeled using the stack and operating data for this unit.

**For the screening modeling analysis, the emissions from No. 1 and No. 2 were combined and modeled using the stack and operating data for No. 1. Similarly, emissions from No. 3 and No. 5 were combined and modeled using using data for No. 5.

Source: Florida DER, 1986

After the screening modeling was performed and the worst-case meteorological periods identified, all the sources shown in Table 4-4, and the Gardinier sources shown in Table 1-2 were modeled using a refined receptor grid.

A summary of the SO_2 emissions considered in the screening and refined phases of the analysis is presented in Table 4-5. As shown in this table, emissions from sources located within 50 km of Gardinier and considered in the screening and refined phases represent approximately 95.3 and 99.9 percent, respectively, of all SO_2 emissions. For sources located within 10 km of the Gardinier plant, the emissions considered in the screening and refined phases represent approximately 99.3 and 100.0 percent, respectively, of the total emissions. In the refined analysis, the FPC Anclote facility was included even though it is located approximately 53 km from Gardinier. Emissions from this source are also included in the total emissions shown in Table 4-5. For the Gardinier sources, the emissions considered in the screening phase represent approximately 99 percent of all emissions from the Gardinier plant.

4.1.5 Receptor Locations

As discussed in Section 4.1.1, the general modeling approach considered screening and refined phases to address compliance with AAQS. For the screening phase, concentrations were predicted for a main receptor grid using a limited number of receptors and sources. The receptor grid consisted of 180 receptors located in a radial grid centered on the Gardinier facility with 36 radials separated by 10 degree increments. Along each radial, receptors were located at 0.2, 0.5, 0.8, 1.1, and 1.6 km from the Gardinier facility.

After the screening modeling was completed, the refined modeling consisted of modeling all sources in the refined phase (see Section 4.1.4) using a receptor grid centered on the receptor which had the highest, second-highest 3- and 24-hour concentrations. The receptors were located at intervals of 100 m between the distances considered in the screening phase along 7 radials, at 2 degree increments, centered on the radial along which the

Table 4-5. Summary of SO_2 Emissions for Sources Located at Various Distances from Gardinier

Distance (km) from Gardinier	Total Emissions* (TPY)	Emissions (TPY) Considered in Modeling Analysis (% of total for Distance)	
		Screening	Refined
0 - 10	406,308	403,888 (99.4)	406,201 (100.0)
10 - 20	17,141	13,474 (78.6)	16,888 (98.5)
20 - 50	151,581	130,640 (86.2)	151,233 (99.8)
0 - 50	575,030	548,002 (95.3)	574,322 (99.9)

*Does not include emissions from Gardinier or from sources located more than 50 km from Gardinier

Source: KBN, 1986

maximum concentration was produced. For example, if the maximum concentration was produced along the 90 degree radial at a distance of 0.9 km, the refined receptor grid would consist of receptors at the following locations:

Directions (degrees)	Distance (km)
84, 86, 88, 90, 92, 94, 96	0.6, 0.7, 0.8., 0.9, 1.1, 1.2, 1.3, per direction

To ensure that a valid highest, second-highest concentration was calculated, concentrations were predicted for the refined grid for the periods that produced both the highest and second-highest concentration from the screening receptor grid. Refined modeling analysis was not performed for the annual averaging period because the spatial distribution of annual average concentrations is not expected to vary significantly from those produced from the screening analysis.

To determine if the impacts from Gardinier are significant in the SO_2 nonattainment area located in Pasco County, concentrations were calculated for the Gardinier sources at 3 receptor locations located along the southern and eastern boundaries of the nonattainment area. These boundaries are the nearest boundaries to the Gardinier facility. The receptor locations were:

Receptor	UTM Coordinates (km)		Relative location from Gardinier	
No.	East	North	Direction (°)	Distance (km)
1	325.0	3112.0	308	48.5
2	329.0	3112.0	311	45.4
3	329.0	3117.0	315	48.8

Because the impacts from the proposed modification were well below the significant impact levels, only screening modeling was performed.

4.1.6 Background Concentrations

To estimate total air quality concentrations, a background concentration must be added to the modeling results. The background concentration is considered to be the air quality concentration contributed by sources not included in the modeling evaluation.

The derivation of the background concentration for the modeling analysis was presented in Section 3.0. Based on this analysis, the background SO_2 concentration was determined to be 15 ug/m^3. This background level was considered to be representative of all averaging times. This background level was added to model-predicted concentrations to estimate total air quality levels for comparison to AAQS.

4.2 MODEL RESULTS

A summary of the maximum 3-hour, 24-hour, and annual average total SO_2 concentrations predicted for all sources for the screening and refined analyses is presented in Table 4-6. The total concentrations are determined from the impacts of Gardinier and other modeled sources, added to background concentrations determined from monitoring data. Based on the results presented in these tables, the maximum SO_2 concentrations due to all sources are predicted to be less than the AAQS for all averaging periods.

As shown in Table 4-6, the total 3-hour average concentrations for all receptor locations considered in the modeling are predicted to be less than the Florida 3-hour AAQS of 1,300 ug/m^3, which is not to be exceeded more than once per year. The maximum predicted 3-hour concentration from the refined analysis was 870 ug/m^3 and occurred on Gardinier property, approximately 0.7 km to the north of the H_2SO_4 plants. This maximum concentration is primarily due to sources to the north of the Gardinier facility with sources at Gardinier contributing only 36 percent of the total concentration.

The total 24-hour average concentrations for all receptors considered in the modeling are predicted to be less than the Florida 24-hour AAQS of

Table 4-6. Maximum Total SO_2 Concentrations Predicted in the Vicinity of the Gardinier Facility

Averaging Period	Modeling Analysis	SO_2 Concentration (ug/m^3)				Receptor Location+		Period		
			Total Due To							
		TOTAL	Gardinier	Other Modeled Sources	Back-ground	Direction (°)	Distance (km)	Julian Day	Hour Ending	Year
3-Hour*	Screening	885	313	557	15	10	0.8	220	12	1981
	Refined	870	310	545	15	10	0.7	220	12	1981
24-Hour*	Screening	239	108	116	15	10	0.8	248	24	1979
	Refined	226	94	117	15	12	0.6	248	24	1979
Annual	Screening	60	25	20	15	90	0.8	-	-	1981

Note: Florida 3- and 24-hour AAQS are 1300 and 260 ug/m^3, respectively, not to be exceeded more than once per year. Florida annual AAQS is 60 ug/m^3.

+With respect to the Gardinier facility

*Highest, second-highest concentration presented for this averaging period

260 ug/m^3, which is not to be exceeded more than once per year. From the refined analysis, the maximum predicted 24-hour concentration of 226 ug/m^3 occurred approximately 0.6 km to the north of the sulfuric acid units. This maximum concentration is approximately equally due to other modeled sources and the Gardinier sources, which contributed 42 percent to the total concentration.

The total annual average concentrations for all receptors considered in the modeling are predicted to be equal to the Florida annual AAQS of 60 ug/m^3. The maximum predicted annual average concentration occurred approximately 0.8 km to the east of the sulfuric acid units. The Gardinier sources contributed 42 percent to the maximum concentration. This maximum concentration is a conservative estimate (i.e., higher than expected) of the annual average concentration because all sources were modeled at their maximum allowable emissions for every hour in the year. By considering actual operating conditions, the emissions are expected to be lower which would result in lower ambient impacts. Also, because the calm wind processing option was used, all calm hours were eliminated from the meteorological database. As a result, the annual concentration was based on the number of non-calm hours in the year.

A summary of the maximum SO_2 concentrations predicted for the proposed modification only in the screening analysis is presented in Table 4-7. These results indicate the proposed increase in SO_2 emissions from the No. 8 H_2SO_4 plant will result in low ambient impacts and that the maximum concentrations are slightly greater than the significance levels for the 3- and 24-hour averaging periods. Based on these results, the significant impact area for the proposed modification extends approximately out to 0.8 km from the location of No. 8 H_2SO_4 plant, which in most directions, is on Gardinier property.

A summary of the maximum SO_2 concentrations predicted for the proposed modification only at the SO_2 nonattainment area in the screening analysis is presented in Table 4-8. These results indicate the proposed increase in SO_2

Table 4-7. Maximum SO_2 Concentrations Predicted for the Proposed Modification Only -- Screening Analysis

Averaging Period	Concentration (ug/m^3)	Period			Location+	
		Julian Day	Hour Ending	Year	Direction	Distance (km)
3-Hour*	28.6	235	15	1978	220	0.5
24-Hour*	7.6	212	24	1979	90	0.8
Annual	1.0	-	-	1981	90	0.8

Note: Significance levels for 3-, 24-hour, and annual averaging periods are 25, 5, and 1.0 ug/m^3, respectively.

+With respect to Gardinier
*Highest, second highest concentration for this averaging period

Table 4-8. Maximum SO_2 Concentrations Predicted for the Proposed Modification Only at the SO_2 Nonattainment Area -- Screening Analysis

Averaging Period	Concentration (ug/m^3)	Period			Location+	
		Julian Day	Hour Ending	Year	Direction	Distance (km)
3-Hour*	1.1	333	3	1978	311	45.4
24-Hour*	0.20	66	24	1978	315	48.8
Annual	0.02	-	-	1974	311	45.4

Note: Significance levels for 3-, 24-hour, and annual averaging periods are 25, 5, and 1.0 ug/m^3, respectively.

+With respect to Gardinier
*Highest, second highest concentration for this averaging period

emissions from the No. 8 H_2SO_4 plant will result in maximum concentrations that are much lower than the significance levels. Therefore, the proposed modification will produce no significant impact on the SO_2 nonattainment area located more than 45 km from Gardinier.

5.0 ADDITIONAL IMPACT ANALYSIS

5.1 IMPACTS UPON VEGETATION

Cut-over pine flatwoods and mixed forest comprise the natural vegetation in the vicinity of the Gardinier site. Mangrove trees and salt-tolerant plants are found near the coast. Winter vegetables and pasture grasses are cultivated inland from the facility.

The response of plants to atmospheric pollutants is a function of the concentration during exposure, duration of each exposure, and the frequency of exposures. The usual pattern of pollutant exposure is that of a few episodes of relatively high concentrations for a short duration interspersed with long periods of extremely low concentrations. Effects on most plants will be from the short-term higher doses (a dose is the product of the concentration of the pollutant and the duration of exposure).

The total maximum (highest, second-highest) predicted 3-hour concentration of SO_2 predicted in the vicinity of the Gardinier facility is 870 ug/m^3. This concentration is predicted to occur within 1 km of Gardinier. Concentrations will diminish appreciably with distance beyond the location of the maximum concentration.

The total maximum predicted 24-hour average SO_2 concentration is 226 ug/m^3, and is predicted to occur 0.6 km northwest of the Gardinier sources in Hillsborough Bay. The total maximum predicted annual SO_2 concentration, including the background concentration level, is 60 ug/m^3, and also occurs within 1 km of Gardinier.

Woltz and Howe (1981) investigated the effects of pollutants on some species of native vegetation in Florida. They showed that exposure to 1,300 ug/m^3 SO_2 for 8 hours caused no visible injury to bald cypress (Taxodium distichum), slash pine (Pinus elliottii), live oak (Quercus virginiana), or red mangrove (Rhizophora mangle).

The predicted maximum concentrations are below values shown to cause injury to native vegetation and below the threshold SO_2 doses known to adversely affect the growth of some common vegetables and grasses. These values are shown in Table 5-1. As a result, no adverse impacts to vegetation are predicted due to the proposed Gardinier modification.

5.2 IMPACTS UPON SOILS

Soils in the vicinity of the Gardinier site consist primarily of tidal lands and poorly drained sands with organic pans (Leighty et al., 1958). These tidal lands occur along the coast between the tidal swamps and the flatwoods. The tidal lands consist of mucky fine sand to dark-gray fine sand overlying gray fine sand, mixed with broken and whole shells. These soils will not be affected by SO_2 concentrations resulting from facility emissions, because both the underlying substrate and the sea spray from the nearby Hillsborough bay are neutral to alkaline and would neutralize any acidifying effects of SO_2 deposition.

The poorly drained sands are already naturally strongly acidic. Normal liming practices currently used on soils in the vicinity of Gardinier by agricultural interests will effectively mitigate the small effects of any increased SO_2 deposition resulting from the increased SO_2 emissions from the proposed expansion.

5.3 IMPACTS UPON VISIBILITY

The existing No. 8 H_2SO_4 plant must currently meet an opacity limitation of 10 percent. This opacity limit is expected to be met after the plant is expanded to greater capacity. This opacity level produces essentially no visible emissions and, therefore, no increase in the visible plume from the No. 8 H_2SO_4 due to the expansion is expected.

Since the Chassahowitzka PSD Class I area is located approximately 85 km to the north of the Gardinier site, a visibility impact assessment of the Class I area is required. A Level I visibility screening analysis was conducted following the procedures outlined in "Workbook for Estimating

Table 5-1. Lowest Doses of SO_2 Reported to Affect Growth of Some Grasses and Vegetables

Species	Lowest SO_2 Dose Known to Affect Species (ug/m^3)	Reference
Rye grass	367, for 131 days reduced growth	Ayazloo and Bell, 1981
Orchard grass	37 to 62, for 72 days reduced growth	Crittenden and Read, 1979
Oats	1,048, for 3 hours four times during life cycle reduced growth	Heck and Dunning, 1978
Sweet corn	812, for 7 days causes chlorosis, but no yield effects	Mandl et al., 1975
Tomato	1,258, for 5 hours on each of 57 days reduced growth	Kohut et al., 1982
	520, for 15 days, threshold for initial symptoms of tissue death, etc.	Unzicker et al., 1975
Radish	262, for 3 hours reduced growth	Reinert et al., 1982
Cucumber	52, for 672 hours reduced growth	Meistrik, 1980

Visibility Impairment" (USEPA, 1980). The procedure calculates three visibility parameters: plume contrast against the sky (C_1), plume contrast against terrain (C_2), and change in sky/terrain contrast (C_3). If the absolute value of each of these parameters is less than 0.1, then it is highly unlikely that the emissions from the source would cause visibility impairment in the Class I area.

Parameter C_1 is dependent upon NO_x emissions; since the H_2SO_4 plants do not emit NO_x, the resulting value of C_1 is zero. Parameter C_2 is dependent upon both particulate and NO_x emissions, where particulate emissions would include H_2SO_4 mist. Parameter C_3 is dependent upon particulate and SO_2 emissions. Particulate (H_2SO_4 mist) and SO_2 emissions used for the calculations were based upon the total allowable emissions from the No. 8 H_2SO_4 plant after expansion (not just the increase in allowables due to the proposed expansion). Following the Workbook procedure, the value of C_2 was calculated to be less than 1×10^{-4} and C_3 was calculated to be 0.0006 (see Figure 5-1). Since the absolute values of C_2 and C_3 are below the threshold criteria of 0.10, no visibility impacts are expected upon the Class I area due to emissions from the proposed No. 8 H_2SO_4 plant expansion.

5.4 ADDITIONAL GROWTH

Only the existing No. 8 H_2SO_4 plant is being expanded at the Gardinier facility, along with the addition of cogeneration facilities. Total H_2SO_4 production capacity for the Gardinier plant will increase by 300 tons per day, representing only a 4 percent increase in total capacity. A small increase in jobs, payroll, and taxes in the area is expected as a result of these changes. As a result, no significant growth-related impacts are expected due to the proposed expansion.

VISIBILITY LEVEL-1 SCREENING MODEL

DEVELOPED BY:
KBN ENGINEERING AND APPLIED SCIENCES, INC.
JANUARY 1986

BASED UPON "WORKBOOK FOR ESTIMATING VISIBILITY IMPAIRMENT" (NOV. 1980)

GARDINIER VISIBILITY ANALYSIS - CLASS I

NO. 8 H2SO4

INPUT PARAMETERS:

PARTICULATE MATTER EMISSION RATE	=	0.19 TONS/DAY
SULFUR DIOXIDE EMISSION RATE	=	5.00 TONS/DAY
NITROGEN OXIDES EMISSION RATE	=	0.00 TONS/DAY
BACKGROUND VISUAL RANGE	=	25.00 KM
DISTANCE TO CLASS I AREA	=	85.00 KM

CALCULATED PARAMETERS:

DISPERSION PARAMETER SIGMA Z	=	89.80 METERS
PLUME DISPERSION PARAMETER	=	26203.0
OPTICAL THICKNESS (PARTICULATES)	=	0.00444
OPTICAL THICKNESS (NOX)	=	0.00000
OPTICAL THICKNESS (AEROSOL)	=	0.001619

PLUME CONTRAST AGAINST THE SKY, C1	=	0.0000
PLUME CONTRAST AGAINST TERRAIN, C2	=	0.0000
CHANGE IN SKY/TERRAIN CONTRAST, C3	=	0.000595

THE ABSOLUTE VALUE OF C1,C2,AND C3 ARE ALL BELOW 0 .1

THE SOURCE HAS PASSED THE LEVEL-1 SCREENING ANALYSIS

Figure 5-1. Level-1 Visibility Screening Analysis for Gardinier Expansion

6.0 BEST AVAILABLE CONTROL TECHNOLOGY

The source applicability analysis for the proposed Gardinier No. 8 H_2SO_4 plant expansion, presented in Section 2.0, identified SO_2 and H_2SO_4 mist as air pollutants requiring a BACT review under federal and state PSD regulations. This section describes the proposed BACT and emission limits for each pollutant subject to BACT. An analysis of alternative control technologies is also presented.

6.1 SULFUR DIOXIDE

6.1.1 Proposed SO_2 BACT

The No. 8 H_2SO_4 plant at Gardinier is a double-absorption, 5-stage converter plant. SO_2 to H_2SO_4 conversion efficiency depends primarily on the number of converter stages and, to a lesser extent, on the amount of catalyst. No H_2SO_4 plant in the United States is known to currently have more than five converter stages. The double absorption, 5-stage converter plant is considered to be state-of-the-art in reducing SO_2 emissions from H_2SO_4 plants and is already in operation at the No. 8 H_2SO_4 plant. Therefore, this control technology is proposed as BACT for SO_2. The proposed BACT SO_2 emission limit is the current allowable level of 4 lb/ton of H_2SO_4 produced, and is equivalent to the BACT emission rate determined by FDER in the 1985 PSD construction permit for the No. 8 H_2SO_4 expansion (see Appendix C).

SO_2 and H_2SO_4 mist source test data for the No. 8 H_2SO_4 plant from 1977 to the present are presented in Table 6-1. The data show that compliance test results for SO_2 have ranged from 0.73 lb/ton to 6.01 lb/ton, with two values exceeding the 4-lb/ton level. Of greatest interest is the June 14, 1985 test which displayed an H_2SO_4 production rate (98.4 TPH) closest to that of the proposed increased production rate (104.2 TPH). This test showed SO_2 emissions to average 3.2 lb/ton, with a maximum of 3.4 lb/ton. Thus, SO_2 emissions are approaching the 4.0 lb/ton level at the higher production levels. Day-to-day variations in process variables and catalyst aging effects could cause SO_2 emissions to increase above the historic measured levels for this plant. Thus, the 4.0 lb/ton SO_2 emission rate proposed as BACT and determined previously as BACT for this plant is considered to be

Table 6-1. Summary of No. 8 H_2SO_4 Plant Source Emission Tests, 1977 - 1986.

Date	Average Production Rate (tons/hr)	Sulfur Dioxide (lb/hr) Avg.	Sulfur Dioxide (lb/hr) Max.	Sulfur Dioxide (lb/ton) Avg.	Sulfur Dioxide (lb/ton) Max.	H_2SO_4 Mist (lb/hr) Avg.	H_2SO_4 Mist (lb/hr) Max.	H_2SO_4 Mist (lb/ton) Avg.	H_2SO_4 Mist (lb/ton) Max.
03/02/77	74.0	127	133	1.73	1.81	4.5	5.7	0.061	0.077
12/09/77	53.4	39	41	0.73	0.78	9.3	11.0	0.174	0.207
08/04/78	63.5	86	95	1.36	1.49	6.8	9.4	0.107	0.147
03/07/79	73.8	299	307	4.05	4.16	2.6	2.7	0.035	0.036
10/25/79	65.1	391	404	6.01	6.20	2.7	3.7	0.042	0.057
08/05/80	69.1	231	245	3.35	3.55	4.2	4.5	0.060	0.065
03/03/81	68.2	118	120	1.70	1.80	3.4	6.2	0.050	0.090
01/26/82	69.8	110	111	1.58	1.59	7.0	10.3	0.100	0.150
08/18/82	66.0	93	93	1.40	1.41	2.2	2.4	0.040	0.040
11/15/83	70.5	138	145	1.95	2.05	2.7	3.4	0.04	0.05
07/31/84	68.5	195	200	2.85	2.92	4.5	5.9	0.07	0.09
06/14/85	98.4	253	264	3.20	3.40	3.0	3.3	0.04	0.04
08/19/86	43.1	131	137	3.04	3.20	2.0	3.5	0.05	0.08

Source: Gardinier, Inc., 1987.

achievable at the proposed higher production rate. However, a lower SO_2 emission level may not be achievable on a continuous basis, particularly in light of the potential effects of catalyst aging and other process variables.

6.1.2 Alternative SO_2 Control Technologies

EPA's latest review of New Source Performance Standards (NSPS) for H_2SO_4 plants (MITRE Corp., 1979) presents a comprehensive assessment of alternative control technologies for removing SO_2 from H_2SO_4 plant tail gases. Alternative technologies identified included the double-absorption contact H_2SO_4 plant, sodium sulfite-bisulfite scrubbing, ammonia scrubbing, and molecular sieves. The study concluded that the best demonstrated control technology to reduce SO_2 emissions is the double-absorption H_2SO_4 plant. Nearly all the H_2SO_4 plants built in the United States since 1971 have used the double-absorption process, wherein two absorber stages are used. The SO_2 conversion efficiency for the double-absorption plant is 96 percent or greater.

A review of H_2SO_4 plant BACT determinations was conducted to determine control technologies and emission rates associated with plants constructed or modified since the EPA study was conducted in 1979. Summarized in Table 6-2 are the results of the review. This information was obtained from the EPA's BACT/LAER Clearinghouse publications (EPA 1985b, 1986d). As indicated in the table, all BACT determinations since 1979 have resulted in allowable SO_2 levels equivalent to the NSPS of 4.0 lb/ton. These plants have ranged in capacity from 1750 TPD to 2750 TPD. All have utilized the double-absorption technology. In addition, the FDER determined BACT for SO_2 emissions from the No. 8 H_2SO_4 plant to be 4.0 lb/ton in the recent (1985) PSD permit issued for the No. 8 H_2SO_4 expansion (see Appendix C). Since this determination, no significant changes have occurred at Gardinier or in regards to air quality levels to warrant a lower BACT limit.

Reduction of SO_2 emissions below those currently achieved by the No. 8 H_2SO_4 double-absorption plant would require add-on control equipment, such as one

Table 6-2. Previous BACT Determinations for H_2SO_4 Plants in U.S., 1980-1985.

Date Permit Issued	Company Name	Plant Capacity (TPD)	Sulfur Dioxide Allowable Emissions (lb/ton)	Sulfur Dioxide Basis	H_2SO_4 Mist Allowable Emissions (lb/ton)	H_2SO_4 Mist Basis
06/13/84	Chevron Co., USA	1900	4.0	NSPS	0.15	NSPS
10/02/81	Conserv, Inc.	2000	4.0	NSPS, Double Absorption	0.15	NSPS, Acid Mist Eliminator
06/01/81	New Wales Chemical, Inc.	2750	4.0	NSPS, Double Absorption	0.15	NSPS
04/01/81	U.S.S. Agri-Chemicals	1850	4.0	NSPS	-	-
07/11/80	Gardinier, Inc. (No. 7 H_2SO_4 Plant)	1750	4.0	NSPS, Double Absorption	0.15	NSPS

Source: USEPA, 1985b, 1986d.

of the flue gas desulfurization (FGD) processes described above. This would add considerable capital and operating costs to the present system, produce a waste disposal problem, and would not result in significant benefits to the environment. The proposed Gardinier expansion will increase allowable SO_2 emissions from the entire plant by 50.0 lb/hr. This represents less than a 15 percent increase in allowable SO_2 emissions from the No. 8 H_2SO_4 plant. The air quality impact analysis presented in Section 3.0 demonstrated that the proposed increase in emissions will have a very minor impact upon current air quality levels, i.e., maximum impacts are less than 1 ug/m^3, annual average; 8 ug/m^3, 24-hour average; and 30 ug/m^3, 3-hour average.

The EPA NSPS review analyzed the SO_2 control alternative of replacing the catalyst bed in the dual-absorption plant more frequently than is normally practiced. Complete replacement of the first three beds of a 4-stage converter at a frequency rate three times greater than is normally practiced was estimated to result in a cost impact of $0.50/ton of H_2SO_4 produced. This was considered to be an unacceptable method because pretax profits to the plant could be reduced by 20 percent or more.

None of the alternative SO_2 control technologies is considered to be superior to the selected BACT, based on economic, energy, and environmental impacts. The chosen SO_2 BACT for the No. 8 H_2SO_4 plant is the currently operating double-absorption plant, reflective of a maximum SO_2 emission rate of 4.0 lb/ton.

6.2 SULFURIC ACID MIST

6.2.1 Proposed H_2SO_4 Mist BACT

The No. 8 H_2SO_4 plant at Gardinier is currently equipped with a Brinks vertical pad-type, high efficiency mist eliminator to control H_2SO_4 mist emissions. Current emission limits are 0.15 lb/ton for H_2SO_4 mist based upon FDER's 1985 PSD permit and BACT determination. The proposed BACT emission level for H_2SO_4 mist is the current allowable for the unit--0.15 lb/ton.

All H_2SO_4 plants operating in the United States in 1979 that were required to meet the NSPS level for H_2SO_4 mist of 0.15 lb/ton used high efficiency mist eliminators, primarily of the vertical pad type (MITRE Corp., 1979). Acid mist emissions are primarily related to moisture levels in the sulfur feedstock and in the air fed to the furnace, and the efficiency of the mist eliminator. Since the Gardinier No. 8 H_2SO_4 plant currently uses a high efficiency mist eliminator, and this technology is considered to be the state-of-the-art control, it is proposed as BACT for H_2SO_4 mist emissions. The EPA NSPS review study (MITRE Corp., 1979) identified these types of mist eliminators as the best demonstrated control technology for H_2SO_4 emissions. In addition, FDER previously determined this technology as BACT for the No. 8 H_2SO_4 expansion permitted in 1985 (see Appendix C).

Review of the source test data presented in Table 6-1 shows that past H_2SO_4 mist compliance test values have ranged from 0.035 lb/ton to 0.174 lb/ton for the No. 8 H_2SO_4 plant. These data indicate that emissions can fluctuate significantly, due to the factors discussed previously, and can range up to the 0.15-lb/ton current allowable limit. Based on the source test data, no reduction in the current allowable level is justified.

6.2.2 Alternative H_2SO_4 Mist Control Technologies

EPA's review of the H_2SO_4 plant NSPS (MITRE Corp., 1979) identified three types of fiber mist eliminators and an electrostatic precipitator (ESP) as control techniques for controlling H_2SO_4 mist emissions from H_2SO_4 plants. EPA chose the fiber mist eliminator as the best demonstrated technology for the following reasons:

1. No evidence exists that any new H_2SO_4 plants have installed ESPs to control mist emissions.
2. ESPs require a relatively large space for erection.
3. ESPs would have high capital and installation costs, as well as high operating costs as a result of high maintenance due to the acid environment in which the ESP would operate.

The three types of fiber mist eliminators identified as applicable to H_2SO_4 plants are the vertical tube, the vertical panel, and the horizontal pad filters. Source test data in the EPA review indicated that all types can meet the NSPS level of 0.15 lb/ton, and no one type is superior to the others, although the majority of plants use the vertical tube type. Therefore, it is concluded that the alternative filter types cannot achieve a degree of H_2SO_4 mist reduction that is significantly better than the vertical pad filters currently in use on the No. 8 H_2SO_4 plant.

Previous BACT determinations for H_2SO_4 plants throughout the U.S. are summarized in Table 6-2. This information was obtained from the EPA's BACT/LAER Clearinghouse publications (EPA, 1985b, 1986d). The data show that all BACT determinations for H_2SO_4 plants constructed or modified since 1980 have resulted in allowable H_2SO_4 mist emission rates equivalent to the NSPS of 0.15 lb/ton. Based upon these considerations, the selected BACT for control of H_2SO_4 mist emissions is the currently operating, high efficiency mist eliminators to control mist emissions to 0.15 lb/ton.

The proposed Gardinier H_2SO_4 expansion will increase allowable H_2SO_4 mist emissions by 1.9 lb/hr. This will result in only a 14 percent increase in the current allowable H_2SO_4 emissions of 13.8 lb/hr. A lower BACT emission limit would not result in significant benefits to the environment.

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APPENDIX A

Basis of Stack Parameters for Nos. 7, 8, and 9 H_2SO_4 Plants

SO_2

SOURCE TEST RESULTS

Company Name: Gardinier, Inc. - U. S. Phosphoric Products

Company Conducting Test: Gardinier, Inc. - U. S. Phosphoric Products

Source Identification: #7 CAP Sulfuric Acid Mfg. System - Exit Stack

Date: 4/9/85

Run	Molecular Weight	Dry Gas Meter DSCF	ACFM	SCFM	Stack Temp. °F	Production Rate, Tons 100% H_2SO_4/Hr.	Percent Isokinetic	Emissions Lbs/Hr.	Emissions, Lbs/Ton 100% H_2SO_4	Allowable Emissions, Lbs/Ton 100% H_2SO_4
1	28.33	46.110	116269	100879	153	87.8	104	334	3.8	
2	28.33	44.734	120095	104370	152	87.8	97	337	3.8	
3	28.33	44.423	115657	100037	154	87.8	101	314	3.6	
	28.33	45.089	117340	101762	153	87.8	101	328	3.7	4.0

Standard Conditions = Dry, 68 °F, 29.92 in. Hg.

SO_2

SOURCE TEST RESULTS

Company Name: Gardinier, Inc. - U. S. Phosphoric Products

Company Conducting Test: Gardinier, Inc. - U. S. Phosphoric Products

Source Identification: Sulfuric Acid Mfg. System - No. 8 CAP Process Scrubber

Date: 6/14/85

Run	Molecular Weight	Dry Gas Meter DSCF	ACFM	SCFM	Stack Temp. °F	Production Rate, Tons 100% H_2SO_4/Hr.	Percent Isokinetic	Emissions Lbs/Hr.	Emissions, Lbs/Ton 100% H_2SO_4	Allowable Emissions, Lbs/Ton 100% H_2SO_4
1	28.24	44.906	96,929	83,598	153	98.3	104	244	3.1	
2	28.24	39.009	99,940	86,763	150	98.5	102	264	3.4	
3	28.24	39.472	100,606	86,895	151.5	98.3	103	251	3.2	
Mean	28.24	41.129	99,158	85,752	151.5	98.4	103	253	3.2	4.0

Standard Conditions = Dry, 68°F, 29.92 in. Hg.

SO_2

SOURCE TEST RESULTS

Company Name: Gardinier, Inc. - U. S. Phosphoric Products

Company Conducting Test: Gardinier, Inc. - U. S. Phosphoric Products

Source Identification: Sulfuric Acid Mfg. - No. 9 Contact Acid Plant

Date: 4/26/84

Run	Molecular Weight	Dry Gas Meter DSCF	ACFM	SCFM	Stack Temp. °F	Production Rate, Tons 100% H_2SO_4/Hr.	Percent Isokinetic	Emissions Lbs/Hr.	Emissions, Lbs/Ton 100% H_2SO_4	Allowable Emissions, Lbs/Ton 100% H_2SO_4
1	28.24	46.87	149,154	125,671	168	110.8	103	221.0	1.99	
2	28.24	48.06	153,483	129,029	170	110.8	103	226.1	2.04	
3	28.24	47.41	152,567	128,215	170	110.8	102	212.3	1.92	
Mean	28.24	47.45	151,738	127,638	170	110.8	103	219.8	1.98	4.0

Standard Conditions = Dry, 68°F, 29.92 in. Hg.

File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

August 24, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. O. Morris, Environmental Manager
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

Dear Mr. Morris:

Re: Modification of BACT Determinations and Construction Permits
Gardinier, Inc., Hillsborough County, Florida.
AC 29-089697, No. 7 Sulfuric Acid Plant
AC 29-089696, No. 8 Sulfuric Acid Plant
AC 29-130371, No. 8 Sulfuric Acid Plant
PSD-FL-026, Nos. 7 and 8 Sulfuric Acid Plants
PSD-FL-118, No. 8 Sulfuric Acid Plant

The Department is in receipt of KBN's August 7, 1990, letter requesting the visible emission standard in the referenced construction permits and BACT determinations for the No. 7 and No. 8 sulfuric acid plants be relaxed from 5% opacity to 10% opacity. As noted in KBN's letter, the 5% opacity standard was based on Chapter 1-3.300V1.C. of the Hillsborough County regulations. The 10% opacity standard requested is consistent with the revised Hillsborough County regulations, the Department's air regulations, and the new source performance standard for sulfuric acid plants (40 CFF 60, Subpart H). This request is acceptable and the referenced construction permits and BACT determinations are modified to allow visible emissions from Gardinier's No. 7 and No. 8 sulfuric acid plants of 10% opacity (6 minute average as determined by Reference Method 9 as described in 40 CFR 60, Appendix A, July 1, 1988).

A copy of this letter must be filed with the referenced construction permits and shall become a part of those permits.

Sincerely,

Dale Twachtmann
Secretary

DT/plm

Attachment: KBN letter dated August 7, 1990

Copies: Bill Thomas, SW District
Jerry Campbell, EPCHC
Jewell Harper, EPA
David Buff, KBN

P 256 396 183

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Gardinier, Inc.
P.O. Box 3269
Tampa, Fl 33601

4. Article Number
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August 7, 1990

Mr. Clair Fancy, P.E.
Bureau Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Gardinier, Inc. Hillsborough County
Sulfuric Acid Plants No. 7 and No. 8

Dear Mr. Fancy:

This correspondence is in regards to the No. 7 and No. 8 Sulfuric Acid plants located at Gardinier, Inc., Hillsborough County. It is requested that the visible emissions limitation set forth in the most recent construction permits for these two sources be revised. A discussion of the permitting history of each source and the visible emission (VE) limitations is presented below.

No. 7 Sulfuric Acid Plant

The No. 7 Sulfuric Acid plant received a federal and state PSD permit in 1985 (AC29-089697). This permit authorized the increase in production rate from 1,750 tons per day (TPD) to 2,200 TPD. The VE opacity limitation determined as BACT for the expansion was the Hillsborough County rule contained in Chapter 1-3.30 V1.c. This rule allowed 5% opacity, with the exception that up to 40% opacity was allowed for 30 minute periods during plant startups. It appears that the sole basis for the BACT determination was the Hillsborough County rule. Since the limit was a rule, Gardinier in essence could not challenge the BACT determination at that time. It is noted that the Hillsborough VE regulation was more stringent than Florida's regulation, which limited VE to 10%.

In August 1985, Gardinier received the initial operating permit for the sulfuric acid expansion (AO29-104895). The VE limit in the permit was 5% opacity for any 6-minute consecutive period. This limit was somewhat different than limit stated in the construction permit.

Subsequent to this permit issuance, Hillsborough County rewrote portions of their air quality regulations, and in 1986 revised their VE regulation to conform to the state regulation. The new rule was codified in Chapter 1-3.63(a), and allowed 10% opacity except for a thirty minute period during plant startup, during which time 40% opacity is allowed. This rule is currently in effect in Hillsborough County.

As a result of the change in the Hillsborough County VE rule, in mid-1986 the Hillsborough County Environmental Protection Commission initiated efforts to revise the operating permit to be consistent with the Hillsborough County rule. DER subsequently revised the permit in a letter dated August 22, 1986, which amended Specific Condition 3.c. of the permit to 10% opacity, except that up to 40% is allowed for a thirty minute period during plant startup.

Gardinier was recently issued an operating permit renewal for No. 7 Sulfuric Acid plant. The new permit (AO29-178406), in Specific Condition 5, limits VE to 10% opacity. Specific Condition 8 of the permit contains provisions for excess emissions during times of startup, shutdown or malfunction. In addition, Specific Condition 23 requires that Gardinier apply to FDER's Bureau of Air Regulation in Tallahassee to request an amendment to Specific Condition 4 of the construction permit (AC29-89697) to be consistent with Specific Condition 5 of the operating permit. This condition reflects both Hillsborough County's and FDER Tampa's recognition that the construction permit needs to be amended, and that they believe the proper opacity limit is 10%.

Gardinier is requesting that the original BACT determination for VE of 5% opacity contained in the construction permit AC29-089697 be amended to reflect the 10% opacity limit that has been written into the operating permits for the source since 1986. This is also the current state and Hillsborough County limits for VE. It appears that the sole basis for the original BACT determination was the old Hillsborough County rule, so it is appropriate to revise the BACT based on the revised rule. Hillsborough County and FDER Tampa are in agreement with this request.

No. 8 Sulfuric Acid Plant

The No. 8 Sulfuric Acid plant received a federal and state PSD permit in 1985 (AC29-089696) and again in 1987 (AC29-089696). These permits authorized the increase in production rate from 1,784 TPD to 2,200 TPD and 2,500 TPD, respectively. The VE opacity limitation determined as BACT for the 1985 expansion was the 5% opacity limitation contained in Hillsborough County Rule Chapter 1-3.30 Vl.c. This BACT was determined jointly with the No. 7 Sulfuric Acid plant expansion in 1985. Again, it appears that the sole basis for the BACT determination was the Hillsborough County rule.

The BACT for the second plant expansion in 1987 was also 5% VE. FDER again referred to the Hillsborough County rule Chapter 1-3.03 Vl.C as the sole justification for the limit. Apparently, the state was following the previous BACT determination for the source, and did not recognize that the Hillsborough County rule had been revised in 1986 to 10% opacity. However, the limit was corrected in the operating permit subsequently issued (AO29-162411) in October 1989. The VE limitation in Specific Condition 2 of this permit quotes the revised Hillsborough County rule of 10% opacity and references the rule citation.

Gardinier is therefore, requesting that the original BACT determination for VE of 5% opacity contained in the construction permit AC29-089696 for No. 8 Sulfuric Acid plant be amended to reflect the 10% opacity limit that has been written into the operating permit for the source. This is also the current state and Hillsborough County limits for VE. It appears that the sole basis for the original BACT determination was the old Hillsborough County rule, so it is appropriate to revise the BACT based on the revised rule.

If this request is approved, the VE limitation for all three sulfuric acid plants at Gardinier would be the same (10%), and would be consistent with the Hillsborough County and FDER VE limits for sulfuric acid plants.

KBN

If you should have any questions concerning the above requests, please do not hesitate to contact me.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

cc: Ozzie Morris
T. Hanks
B. Andrews
B. Thomas
J. Campbell

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

July 5, 1988

Mr. Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division
U.S. EPA - Region IV
345 Courtland Street, Northeast
Atlanta, Georgia 30365

Dear Bruce:

This letter is in response to EPA's June 14, 1988, letter to Gardinier, Inc., concerning the modification to PSD permit PSD-FL-026. We had assumed that the ultimate acceptance of the representative period for actual emissions is FDER's responsibility (see attached letter dated July 27, 1987).

We would like to have clarification regarding the modified SO_2 limits since 32.4 lbs/hr (higher than our limit of 31.8 lbs/hr) does not equate with "458.4 lbs/day or 83.7 tons/year" (unless a 14 hour day is assumed). Should "or" be "and" since an annual standard alone is not considered to be federally enforceable?

Your response to these comments will be appreciated.

Sincerely,

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

CHF/plm

Attachment

cc: W. Thomas, S.E. District
J. Campbell, EPCHC
E. O. Morris, Gardinier

Atlanta, GA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

DER

JUL 27 1987

JUL 29 1987

BAQM

Mr. Clair Fancy, Deputy Chief
Bureau of Air Quality Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Re: Gardinier Inc. - Proposed No. 5 DAP Plant Modification

Dear Mr. Fancy:

This is in regard to your letter of June 29, 1987, regarding Gardinier's response to FDER comments on their application of May 26, 1987. In our review of the application submitted to EPA on June 2, 1987, we had questions as to the use of actual emissions for netting calculations as addressed in your June 8, 1987, letter to Gardinier. Therefore, their response of June 22, 1987, is crucial in determining the acceptance of their proposed actual emissions decreases.

In their proposal, 1979 actual emissions are used for TSP and 1981 actual emissions are used for SO_2. The regulations state that actual emissions are generally the most recent two year average of actual emissions. Therefore, the company's use of highest actual emissions in two seperate years over a ten year period does not appear to represent actual emissions at this facility. We would assume that a contemporaneous and continuous time period would be used in assessing actual emissions from this source. Therefore, if the years 1979 and 1981 are the boundaries of the continuous time period a three year average should be used. However, the ultimate acceptance of the representative period for actual emissions is FDER's responsibility.

If you have any comments or questions regarding this letter, please contact Mr. Michael Brandon at (404) 347-2864.

Sincerely,

Bruce P. Miller

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

Copied: John Reynolds
Miguel Flores
CHF/BT
Bill Thomas - SW Dist

7/31/87

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

September 24, 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. O. Morris, Manager
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

RE: Permit Number AC 29-130371
Number 8 Sulfuric Acid Plant

Dear Mr. Morris:

Your letter of August 12, 1987, with reference to the "third modification" in specific condition No. 10 of subject permit, will satisfy the prior approval requirement.

Sincerely,

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

CHF/mvj

cc: Bill Thomas, SW Dist.
Jerry Campbell, EPCHC

P 274 007 686

RECEIPT FOR CERTIFIED MAIL

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PS Form 3800, June 1985 ☆ U.S.G.P.O. 1985-480-794

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

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1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to: Mr. E.O. Morris
Gardinier, Inc.
P.O. Box 3269
Tampa, FL 33601

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P 274 007 686

Always obtain signature of addressee or agent and **DATE DELIVERED.**

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
9-28

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

PM
13 Aug 87
Tampa, Fl

File Copy

GARDINIER INC.

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

August 12, 1987

DER
AUG 17 1987
BAQM

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

RE: Permit No. AC29-130371
No. 8 Sulfuric Acid Plant

Dear Mr. Fancy:

The last sentence of specific condition 10 of the newly issued subject permit is not applicable.

As we indicated to you in our response to permit application comments dated March 20, 1987, specifically response to comment 2, as part of the cogeneration project the third set of modifications as indicated in Mr. Cabina's letter of October 15, 1984 will be complete.

The unit now and after modification will meet all applicable emission standards.

We apologize for not discovering this problem with the condition language until after issuance of the permit. If I can supply any additional information, please feel free to call.

Very truly yours,

E. O. Morris
Manager, Environmental & Development
:gf

CHF/BT
cc: W. Thomas/DER - SW
J. Campbell/HCEPC
Kleinschmidt
Fernandez
Weyers
B. Daughtery
J. Rogers
W. Arthson - EPA
M. Flora - NPS
} 8/17/87

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

TAMPA AUG 13 '87 FLA.
U.S. POSTAGE
0.22

Mr. Clair H. Fancy
Manager, Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 323-99-2400

PM
6/25/87
Atlanta, Georgia

file copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

JUN 23 1988

4APT/APB-ljf

DER

JUN 29 1987

BAQM

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

Re: Gardinier, Inc. (PSD-FL-118)
AC 29-130371

Dear Mr. Fancy:

This is to acknowledge the receipt of your PSD preliminary determination on the proposed modification at the above-referenced source.

After reviewing your preliminary determination, we concur with your evaluation and your determination will not be subject to review under the Region IV Overview of State Programs policy. Please forward copies of the final determination and permit when they are issued.

If you have any questions, please contact me or Mr. Gary Ng of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

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

Copied: Bob Dougherty
Jerry Campbell
Bill Thomas (SW Dist.)
Tom Rogers
BT/CHD

Clair
~~Bill~~,

6-30-87

FYI. Return
for filing. [redacted]
Or, can it.

Maggie

Hill

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

July 23, 1987

Mr. Miguel Flores
Chief
Permit Review and Technical
Support Branch
National Park Service-Air
Post Office Box 25287
Denver, Colorado 80225

Dear Mr. Flores:

RE: Gardinier, Inc.
State Construction Permit: AC 29-130371
PSD Permit: PSD-FL-118

Enclosed is the final determination for Gardinier, Inc. If you have any comments or questions, please contact Bob Daugherty or Tom Rogers at the above address or at (904)488-1344.

Sincerely,

Maggie James for

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

CHF/mj

enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

July 23, 1987

Mr. Wayne Aronson
Chief
Program Support Section
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Aronson:

RE: Gardinier, Inc.
State Construction Permit: AC 29-130371
PSD Permit: PSD-FL-118

Enclosed is the final determination for Gardinier, Inc. If you have any comments or questions, please contact Bob Daugherty or Tom Rogers at the above address or at (904)488-1344.

Sincerely,

Maggie James for

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

CHF/mj

enclosure

File

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

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

July 23, 1987

Enclosed is construction permit No. AC 29-130371 (PSD-FL-118) for Gardinier, Inc. which authorizes the modification (expand the production capacity) of the No. 8 sulfuric acid (H_2SO_4) plant at their phosphate fertilizer complex located in Tampa, Hillsborough County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any Party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for Bill Thomas

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

Copy furnished to:

B. Thomas, SW
J. Campbell, HCEPC
R. Nettles, P.E.
W. Aronson, U.S. EPA
M. Flores, NPS

P 274 007 726

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Rudy J. Cabina, V.P. Gardinier, Inc.	
Street and No. P.O. Box 3269	
P.O., State and ZIP Code Tampa, FL 33601	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 07/23/87 Permit: AC 29-130371 PSD-FL-118	

PS Form 3800, June 1985 ★ U.S.G.P.O. 1985-480-794

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

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1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:

Mr. Rudy J. Cabina, Vice-President
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P 274 007 726

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
JUL 27 1987

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

Final Determination

Gardinier, Inc.
Tampa, Florida
Hillsborough County

No. 8 Sulfur Acid Plant Modification
Permit Numbers:

State: AC 29-130371
Federal: PSD-FL-118

Florida Department of Environmental Regulation
Central Air Permitting
Bureau of Air Quality Management

July 20, 1987

FINAL DETERMINATION

Gardinier, Inc.'s application for a permit to modify (expand the production capacity) the No. 8 sulfuric acid (H_2SO_4) plant at their Tampa phosphate fertilizer complex has been reviewed by the Bureau of Air Quality Management. Public Notice of the Department's intent to issue the permit was published in The Tampa Tribune on June 10, 1987. Copies of the Technical Evaluation and Preliminary Determination were available for public inspection at the Hillsborough County Environmental Protection Commission office in Tampa and the Department's offices in Tampa and Tallahassee.

Comments were submitted by the Hillsborough County Environmental Protection Commission (HCEPC). The issues and the Department's responses are as follows:

1. Issue: Specific Condition No. 4 of the draft permit stipulates visibile emissions shall not exceed 5% opacity. Furthermore the BACT determination rationale references Chapter 1-3.03, VI.C. of the Environmental Protection Commission rules as the authority to require such a standard. Since the issuance of AC 29-089696 which set the 5% VE standard for the No. 8 H_2SO_4 plant, the County's air rules have been revised. One of the changes was to increase the general opacity standard from 5% to 10%. Opacities up to 40% are still allowed for no greater than 30 minutes during start-up only.

Response: Ten percent (10%) opacity will be allowed in accordance with NSPS rules.

2. Issue: Recommend the performance testing requirements of 40 CFR 60.8 be explicitly described in a separate condition.

Response: Add to Specific Condition No. 5 - all requirements of 40 CFR 60.8 shall be complied with.

3. Issue: Recommend the Federal notification requirements of 40 CFR 60.7 be added as Specific Condition No. 15 (or any number).

Response: This seems inappropriate for an existing, operating plant. The following was added to Specific Condition No. 5. Notify HCEPC when expected to achieve a new production rate within the permitted range.

4. Issue: Recommend the advanced notification of the compliance test date in Specific Condition No. 5 be made 30 days in advance, not 15, pursuant to 40 CFR 60.8(d).

Response: Changes will be made as recommended.

5. Issue: Recommend Specific Condition No. 13 be deleted. This is a condition more appropriately stipulated in an operating permit.

Response: Specific Condition No. 13 will be retained to ensure that minimum data will be submitted in the annual reports.

6. Issue: Recommend Specific Condition No. 12 be reworded.

Response: The following will be added - "within 45 days of completion of compliance testing or at least 90 days prior to the expiration of this permit, whichever occurs first".

The final action of the Department will be to issue the permit, which incorporates the changes above and the modifications to expand the capacity of the No. 8 sulfuric acid plant, as proposed in the Preliminary Determination.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Permit Number: AC 29-130371
Expiration Date: June 30, 1989
County: Hillsborough
Latitude/Longitude: 27° 51' 28" N
82° 23' 15" W
Project: No. 8 Sulfuric Acid
Plant Modification

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4 and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Modifications to the No. 8 sulfuric acid plant that will increase production from 2200 to 2500 TPD. The modifications involve installing a superheater in parallel with No. 1 boiler and a new superheater/economizer in the exit of the 3A pass in parallel with the existing one. The applicant will then install additional catalyst in the main converter and will make other major modifications which have been approved by the Department and the Hillsborough County Environmental Protection Commission by prior permitting actions.

The UTM coordinates of the site are 17-363.3 km E and 3082.4 km N.

Construction shall be accordance with the application for a permit to construct/modify the No. 8 sulfuric acid plant that was signed by Mr. Rudy Cabina on February 4, 1987, and the additional information supplied in Gardinier, Inc.'s March 20, 1987 letter except for changes mentioned in the Technical Evaluation and Preliminary Determination and listed as Specific Conditions in the permit to construct.

Attachments:

1. Application signed February 4, 1987.
2. DER letter dated February 27, 1987.
3. Gardinier, Inc.'s letter dated March 20, 1987.
4. Victor San Agustin's (HCEPC) letter dated June 11, 1987.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-130371
Expiration Date: June 30, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

(x) Determination of Best Available Control Technology (BACT)
(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Sulfuric acid production measured as 100% H_2SO_4, shall not exceed 2500 TPD or 104.17 TPH.

2. Sulfur dioxide emissions shall not exceed 4.0 lbs/ton of acid produced and shall not exceed 10,000 lbs/day or 416.67 lbs/hr average per 3 hour period.

3. Acid mist emissions shall not exceed 0.15 lb/ton of acid produced and and shall not exceed 375 lbs/day or 15.63 lbs/hr average per 3 hour period.

4. Visible emissions shall not exceed 10% opacity, average for any consecutive 6 minute period.

SPECIFIC CONDITIONS:

5. Compliance tests will continue and shall be conducted while the plant is operating within 5% of its permitted capacity of 104.17 TPH acid. If the compliance tests are conducted at an operating rate of less than 95% of permitted capacity, then any permit to operate issued for the plant shall restrict its maximum production to not more than 5% above the production rate that existed during the compliance test. Notify HCEPC when expected to achieve a new production rate within the permitted range. The test methods and procedures described in 40 CFR 60.85 shall be used to determine the status of the source with the sulfur dioxide and acid mist standards. Method 9, as described in 40 CFR 60, Appendix A, shall be used to determine the compliance status of the source with the visible emissions standard. Hillsborough County Environmental Protection Commission (HCEPC) shall be notified in writing 30 days prior to any compliance tests and all requirements of 40 CFR 60.8 shall be complied with.

6. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained and operated on this plant as specified in 40 CFR 60.84. Excess emissions shall be reported to the HCEPC.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants.

8. The plant may operate continuously, 8760 hours per year.

9. This construction permit replaces the current construction permit (AC 29-089696) for this sulfuric acid plant. During the modifications of this plant, the emissions shall not exceed 4 lbs SO_2 per ton of acid produced and 0.15 lb acid mist per ton of acid produced while the plant is operating commercially.

10. Construction shall reasonably conform to the plans and schedule in the application. Bi-annual reports describing the status of the modifications shall be submitted to the state and county regulatory agencies. Gardinier, Inc. shall obtain prior approval from the Department and HCEPC before proceeding with any construction referred to as "third modification" in the October 15, 1984 letter.

11. Gardinier, Inc. shall take precautionary measures to prevent emissions from leaks at the plant. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provisions in FAC Rule 17-2.610(3). These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or industrial related

SPECIFIC CONDITIONS:

activities such as loading, unloading, storing and handling of materials.

12. Gardinier, Inc. shall submit a complete application for a permit to operate the sulfuric acid plant, which includes an emissions test report, to the Hillsborough County Environmental Protection Commission within 45 days of completion of compliance testing or at least 90 days prior to the expiration of this permit, whichever occurs first. Gardinier, Inc. may continue to operate this sulfuric acid plant, if the source is in compliance with the conditions in this permit, until the expiration date of this construction permit or until the expiration date of any permit to operate that is issued for this source.

13. Upon obtaining a permit to operate, the applicant will be required to submit annual operation reports which shall include, as a minimum, the annual production of the plant and a recent emissions test report.

Issued this 21st day of July, 1987

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Dale Twachtmann, Secretary

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

Gardinier, Inc. plans to increase the production rate of the No. 8 sulfuric acid plant that is located at their Tampa phosphate fertilizer chemical complex. Production of the No. 8 sulfuric acid plant will be increased from 2200 TPD to 2500 TPD. No restrictions to limit the hours of operation has been requested.

Increased production of the sulfuric acid plant will result in more air pollutants being emitted to the atmosphere. The primary air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of sulfur dioxide 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 on permitted emissions, the net increase in air pollutant emissions would be 219 tons of sulfur dioxide (SO_2) and 8.2 tons of acid mist per year.

Under the regulations, in Florida Administrative Code (FAC) Rule 17-2, the increase in sulfur dioxide 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 Request by the Applicant:

The air pollutant emissions from the No. 8 sulfuric acid plant would be limited to 4.0 pounds of sulfur dioxide (SO_2) and 0.15 pounds of acid mist per ton of 100% acid produced.

Date of Receipt of a BACT Application:

February 9, 1987

Date of Publication in Florida Administrative Weekly:

May 15, 1987

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 Determinied by DER:

Sulfuric Acid Plant 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 EPA Method 8, 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 40 CFR 60.85, Subpart H, New Source Performance Standards.

EPA Method 9, 40 CFR 60, Appendix A, will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

FAC Rule 17-2.100(117) defines "modification" as any physical change in, or change in the method of operation of, 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), FAC 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:

Bob E. Daugherty
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

for John C. Brown Jr
C. H. Fancy, Deputy Bureau Chief

Date: July 20, 1987

Approved by:

Dale Twachtmann, Secretary

Date: 7/22/87

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

TO: Dale Twachtmann

THRU: Howard Rhodes

FROM: for Clair Fancy

DATE: July 17, 1987

SUBJ: Approval of Construction Permit No. AC 29-130371
PSD-FL-118
Gardinier, Inc.

Attached for your approval and signature is a construction permit to modify (expand the production capacity) the No. 8 sulfuric acid (H_2SO_4) plant at their phosphate fertilizer complex located in Tampa, Hillsborough County, Florida. There were comments received during the public notice period.

Day 90 after which this permit will be issued by default is July 24, 1987.

The Bureau recommends approval and signature.

CHF/MJ/s

attachment

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

June 22, 1987

Mr. Wayne Aronson
Chief
Program Support Section
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Aronson:

RE: PSD Public Notice
Gardinier, Inc.
PSD-FL-118

Enclosed is the PSD public notice for the above referenced proposed permit. Comments received by July 22, 1987, will be considered in the final determination. Contacts for processing the proposed permit are Bob Daugherty and Tom Rogers and they can be reached at (904)488-1344 and at the above address.

Sincerely,

R. Bruce Mitchell

R. Bruce Mitchell
Bureau of Air Quality
Management

/bm

enclosure

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

June 22, 1987

Mr. Miguel Flores
Chief, Permit Review and Technical
Support Branch
National Park Service - Air
Post Office Box 25287
Denver, Colorado 80225

Dear Mr. Flores:

RE: PSD Public Notice
Gardinier, Inc.
PSD-FL-118

Enclosed is the PSD public notice for the above referenced proposed permit. Comments received by July 22, 1987, will be considered in the final determination. Contacts for processing the proposed permit are Bob Daugherty and Tom Rogers and they can be reached at (904)488-1344 and at the above address.

Sincerely,

R. Bruce Mitchell

R. Bruce Mitchell
Bureau of Air Quality
Management

/bm

enclosure

PM
6-17-87
Tampa, FL

File Copy

DER

JUN 19 1987

BAQM

GARDINIER INC.

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

June 16, 1987

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

Subject: DER File AC29-130371
PSD-FL-118

Dear Mr. Fancy:

Please find attached, a certified copy of the publication of the Department's proposed action regarding the Gardinier No. 8 Sulfuric Acid Plant.

Please initiate the appropriate action. If we can supply additional information, please advise.

Very truly yours,

E. O. Morris
Manager
Environmental & Development

EOM:rw
Enclosure
cc: Mr. Henk Mathot
Mr. Rudy J. Cabina
Mr. Roger Fernandez

copied:
Bob Daugherty
Ferry Campbell
Bill Thomas (SW Dist)
Wayne Aronson
Miguel Flores
} 6-22-87 RAM

Published Daily
Tampa, Hillsborough County, Florida

BEST AVAILABLE COPY

State of Florida
County of Hillsborough } ss.

Before the undersigned authority personally appeared G. T. Gleason, who on oath says that he is Controller of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a .....

LEGAL NOTICE

in the matter of Notice of Proposed Agency Action

was published in said newspaper in the issues of .....

June 10th, 1987

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa, in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm, or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

G. T. Gleason

Sworn to and subscribed before me, this 10th *day of* June *A.D. 19* 87

Leslie A. Peralta

(SEAL)

Notary Public, State of Florida
My Commission Expires Nov. 23, 1990
Bonded Thru Troy Fain - Insurance Inc.

Proposed Agency Action on Permit Application

The Department of Environmental Regulation gives notice of its intent to issue a permit to modify Gardinier, Inc.'s No. 8 sulfuric acid plant located south of Tampa in Hillsborough County at the intersection of U.S. Highway 41 and Riverview Drive. A determination of best available control technology (BACT) was required.

The Company has requested permission to make modifications to increase production of their No. 8 sulfuric acid plant to 2500 TPD. The allowable emissions will be 4.0 lbs sulfuric dioxide and 0.15 lb acid mist per ton of acid produced and visible emissions of 5 percent opacity. These emissions will not cause or contribute to an ambient air quality standard violation or violate any federal, state, or county regulation. No increment consumption will result from the changes in emissions at this plant after this modification.

Persons whose substantial interests are affected by the Department's proposd permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this preliminary statement. Therefore, persons who may not object to the proposed agency action may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

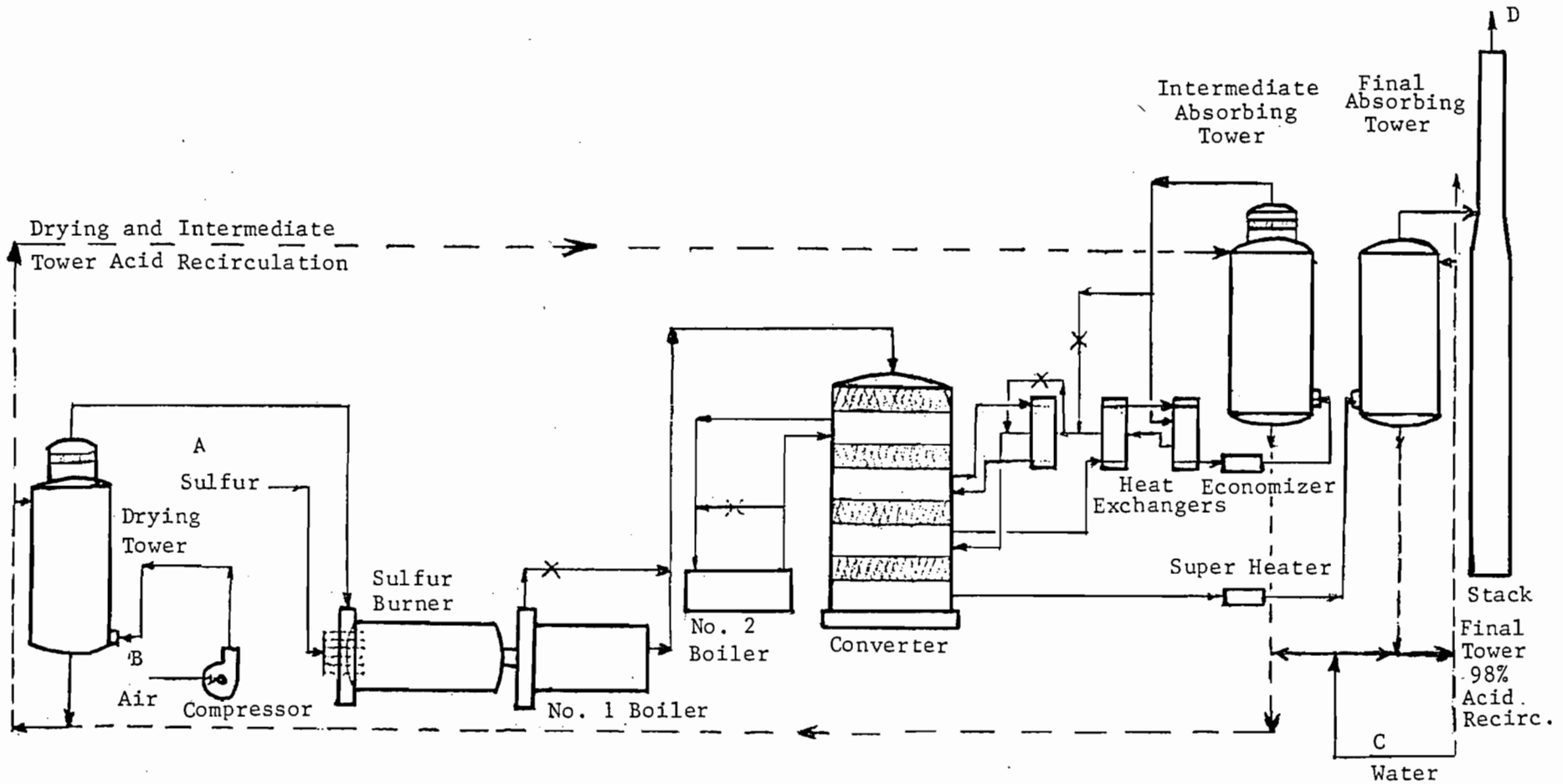
Hillsborough County
Environmental
Protection Commission
1900 9th Avenue
Tampa, Florida 33605

Dept. of
Environmental Regulation
Bureau of Air Quality
Management
2600 Blair Stone Road
Tallahassee, Florida
32399-2400

Department of
Environmental Regulation
Southwest District
7601 Highway 301 North
Tampa, Florida 33610

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

2775 6/10/87



FLOW DIAGRAM

KBN

File Copy

ENVIRONMENTAL PROTECTION COMMISSION
OF
HILLSBOROUGH COUNTY
RODNEY COLSON
PAM IORIO
RUBIN E. PADGETT
JAN KAMINIS PLATT
HAVEN POE
JAMES D. SELVEY
PICKENS C. TALLEY II

ROGER P. STEWART
DIRECTOR
1900 - 9th AVE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960

DER
JUL 10 1987
BAQM

MEMORANDUM

Date June 11, 1987

To Bill Thomas

From Victor San Agustin VSA thru: Jerry Campbell JC AC 29-130371

Subject: BAQM's Proposed Permit for Gardinier's #8 H_2SO_4 Plant PSD-FL-118

This memo is in response to Clair Fancy's May 29, 1987, letter. The letter asks for written comments which any person would wish to be considered.

We have reviewed the Technical Evaluation and Preliminary Determination and offer the following comments:

1. Specific condition 4 of the draft permit stipulates v.e.'s shall not exceed 5% opacity. Furthermore, the BACT determination rationale references Chap. 1-3.03, VI.C. of the Environmental Protection Commission rules as the authority to require such a standard. Since the issuance of AC29-089696 for the #8 H_2SO_4 plant, the county's air rules has undergone major changes. One of the changes is the increase in opacity standard from 5% to 10%. Opacities up to 40% are still allowed for no greater than 30 minutes during start-ups only. I have enclosed a copy of our new rules for your reference and future use. We therefore, recommend the condition be reworded as follows:

   " 4. Visible emissions shall not exceed 10% opacity except for a 30 minute period during plant start-ups, where the opacity is allowed up to 40%. (Chapter 1-3.63(a), Rules of the Environmental Protection Commission of Hillsborough County)."

2. We recommend the performance testing requirements of 40CFR60.8 be explicitly described in a separate condition. This is for the benefit of our compliance inspectors who need to audit the stack test. We propose condition 14 (or any number you wish) which reads:

   "14. Within 60 days after achieving a maximum production rate of 2500 TPD, but no later than 180 after start-up of the modified plant, the permittee shall test for the following pollutants and submit two copies of test results no later than 45 days from the date of testing:

   (X) Opacity
   (X) Sulfur Dioxide
   (X) Acid Mist

BEST AVAILABLE COPY

FEDERAL EXPRESS

USE THIS AIRBILL FOR DOMESTIC SHIPMENTS AND FOR SHIPMENTS FROM PUERTO RICO TO THE U.S.A.
FILL OUT PURPLE AREAS. FOR ASSISTANCE, CALL 800-238-5355 TOLL FREE.
SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS.

SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER: 1149-3414-5

DATE: 7/9/87

1 From (Your Name): VICTOR SAN AGUSTIN
Your Phone Number (Very Important): (813) 272-5531
Company: Environmental Protection Commission – Air Pollution Control
Department/Floor No.:
Street Address: 1410 North 21st St.
City: Tampa
State: FL
ZIP Zip Code Required For Correct Invoicing: 33605

AIRBILL NO. 676269031

2 To (Recipient's Name): Bob Daugherty
Recipient's Phone Number (Very Important): (904) 488-1344
Company: Bureau of Air Quality Management – CAPS
Department/Floor No.:
Exact Street Address (Use of P.O. Boxes or P.O. Zip Codes Will Delay Delivery And Result in Extra Charge.): 2600 Blair Stone Road
City: Tallahassee
State: FL
ZIP Street Address Zip Required (No P.O. Box Zip Code): 32301

3 YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.): EPC – Victor San Agustin

PAYMENT ☑ Bill Shipper ☐ Bill Recipient's FedEx Acct. No. Fill in line below ☐ Bill 3rd Party FedEx Acct. No. Fill in line below ☐ Bill Credit Card Fill in line below ☐ Cash
FedEx Acct. No. or Major Credit Card No. 1149-3414-5

H HOLD FOR PICK-UP AT THIS FEDERAL EXPRESS STATION:
Street Address (See Service Guide or Call 800-238-5355)
City / State
ZIP Zip Code of Street Address Required

4 SERVICES CHECK ONLY ONE BOX

1 ☐ PRIORITY 1 Overnight Delivery Using Your Packaging
6 ☑ OVERNIGHT LETTER (Our Packaging) 9"x12"

OVERNIGHT DELIVERY USING OUR PACKAGING
2 ☐ Courier-Pak Overnight Envelope 12"x 15½"
3 ☐ Overnight Box 12½"x 17½"x 3" A ☐
4 ☐ Overnight Tube 38"x 6"x 6"x 6" B ☐

5 ☐ STANDARD AIR Delivery not later than second business day

SERVICE COMMITMENT
PRIORITY 1 - Delivery is scheduled early next business morning in most locations. It may take two or more business days if the destination is outside our primary service areas.
STANDARD AIR - Delivery is generally next business day or not later than second business day. It may take three or more business days if the destination is outside our primary service areas.

DELIVERY AND SPECIAL HANDLING CHECK SERVICES REQUIRED
1 ☐ HOLD FOR PICK-UP Give the Federal Express address where you want package held in Section H at right.
2 ☑ DELIVER WEEKDAY
3 ☐ DELIVER SATURDAY (Extra charge applies)
4 ☐ RESTRICTED ARTICLES SERVICE (P-1 and Standard Air Packages only. Extra charge applies)
5 ☐ CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge applies)
6 ☐ DRY ICE ______ Lbs.
7 ☐ OTHER SPECIAL SERVICE ______
8 ☐
9 ☐ SATURDAY PICK-UP OR SATURDAY DROP-OFF (Extra charge applies)

PACKAGES	WEIGHT	YOUR DECLARED VALUE	OVER SIZE
Total	Total	Total	

Received At: Shipper's Door ☐ Regular Stop ☒ On-Call Stop ☐ FedEx Loc.
Federal Express Corp. Employee No. 77615
Date/Time For Federal Express Use: 7/9 1655

Emp. No. / Date
☐ Cash Received
☐ Return Shipment
☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold
Street Address
City / State / Zip
Received By:
X
Date/Time Received / FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Origin Agent Charge
Other
Total Charges

PART #2041738900 FEC-S-750-25 REVISION DATE 2/85 PRINTED U.S.A. NCR

RECIPIENT'S COPY

Bob:
APIS has been updated.
Please order a Master
Detail report there as
our line is down
Victor

Testing procedures shall be consistent with the requirements of Section 17-2.700, F.A.C. and 40CFR60, Appendix A."

3. We recommend the federal notification requirements of 40CFR60.7 be added as specific condition 15 (or any number) which reads:

"15. Pursuant to 40CFR60.7, the permittee shall furnish United States Environmental Protection Agency, Florida Department of Environmental Regulation, and Environmental Protection Commission of Hillsborough County the following written notifications:

a. A notification of the anticipated date of initial start-up of the modified plant post marked not more than 60 days and no less than 30 days prior to such date.

b. A notification of the actual date of initial start-up of the modified plant post marked within 15 days after such date.

c. A notification of the date the physical or operational change is commenced post marked 60 days or as soon as practicable before the change is commenced. The notification shall include information describing the precise nature of the change, the productive capacity of the plant before and after the change, and the expected completion date. United States Environmental Protection Agency, Florida Department of Environmental Regulation and Environmental Protection Commission of Hillsborough County may request additional relevant information subsequent to the notification.

4. We recommend the advanced notification of the compliance test date in specific condition 5 be made 30 days in advance, not 15, pursuant to 40CFR60.8(d).

5. We recommend specific condition 13 be deleted. This is a condition more appropriate stipulated in an operating permit.

6. We recommend specific condition 12 be reworded as follows:

"12. An application for an operation permit shall be submitted to the Environmental Protection Commission of Hillsborough County within 45 days of completion of compliance testing or at least 90 days prior to the expiration of this permit, whichever occurs first. The operation permit application shall consist of four copies of a completed Certificate of Completion of Construction and compliance test results.

I have enclosed an APIS update of the source.

Your consideration of the above comments is requested. If you have any questions please call me at SC 571-5530.

jes

Copied: Bob Daugherty - 7-10-87 (mr)

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

June 1, 1987

Mr. Wayne Aronson
Chief
Program Support Section
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Aronson:

RE: PSD Application
Technical Evaluation & Preliminary Determination
Gardinier, Inc.: PSD-FL-118

Enclosed for your review and comment is a copy of the Technical Evaluation and Preliminary Determination for Gardinier, Inc., for modifications to the No. 8 sulfuric acid plant at their existing Tampa phosphate fertilizer chemical complex located in Hillsborough County, Florida. If you have any comments or questions, please contact Bob Daugherty at (904)488-1344 or write to me at the above address.

Sincerely,

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

/bm

enclosure

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

June 1, 1987

Mr. Miguel Flores
Chief, Permit Review and Technical
Support Branch
National Park Service - Air
Post Office Box 25287
Denver, Colorado 80225

Dear Mr. Flores:

RE: PSD Application
Technical Evaluation & Preliminary Determination
Gardinier, Inc.: PSD-FL-118

Enclosed for your review and comment is a copy of the Technical Evaluation and Preliminary Determination for Gardinier, Inc., for modifications to the No. 8 sulfuric acid plant at their existing Tampa phosphate fertilizer chemical complex located in Hillsborough County, Florida. If you have any comments or questions, please contact Bob Daugherty at (904)488-1344 or write to me at the above address.

Sincerely,

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

/bm

enclosure

cc: Russ Galipeau, SE Regional Office, NPS (w/o enclosures)
Glen A. Carowan, Jr., Chassahowitzka-National Wildlife Refuge
U.S. Fish & Wildlife Service (w/o enclosures)

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

DER File No. AC 29-130371

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Gardinier, Inc., applied on February 9, 1987, to the Department of Environmental Regulation for a permit to expand the production capacity of the No. 8 sulfuric acid plant at their existing Tampa phosphate fertilizer chemical complex. The information submitted in the March 20, 1987, letter from the company completed the application so that it could be processed by the Department. Information submitted by the company shows the modified acid plant will comply with all federal, state, and county air pollution regulations.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit was needed for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, FAC, you (the applicant) are required to publish at your own expense the enclosed Notice of Proposed Agency Action on permit application. The notice must be published one time only in a section of a major local newspaper of general circulation in the county in which the project is located and within thirty (30) days from receipt of this intent. Proof of publication must be provided to the Department within seven days of publication of

the notice. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, Florida Statutes. A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. Petitions must comply with the requirement of Florida Administrative Code Rules 17-103.155 and 28-5.201 (copies enclosed) and be filed with (received by) the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant must be filed within fourteen (14) days of receipt of this intent. Petitions filed by other persons must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this intent, whichever first occurs. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions will be dismissed.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

Copies furnished to:

B. Thomas, SW District
E. Morris, Gardinier, Inc.
R. Nettles, P.E., Gardinier, Inc.
J. Campbell, HCEPC
D. Buff, KBN
W. Aronson, EPA
M. Flores, NPS

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on June 1, 1987.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

R Bowen Mitchell
Clerk

6/1/87
Date

State of Florida
Department of Environmental Regulation
Notice of Proposed Agency Action
on Permit Application

The Department of Environmental Regulation gives notice of its intent to issue a permit to modify Gardinier, Inc.'s No. 8 sulfuric acid plant located south of Tampa in Hillsborough County at the intersection of U.S. Highway 41 and Riverview Drive. A determination of best available control technology (BACT) was required.

The Company has requested permission to make modifications to increase production of their No. 8 sulfuric acid plant to 2500 TPD. The allowable emissions will be 4.0 lbs sulfur dioxide and 0.15 lb acid mist per ton of acid produced and visible emissions of 5 percent opacity. These emissions will not cause or contribute to an ambient air quality standard violation or violate any federal, state, or county regulation. No increment consumption will result from the changes in emissions at this plant after this modification.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this preliminary statement. Therefore, persons who may not object to the proposed agency action may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the peitition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee,

Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Hillsborough County Environmental
Protection Commission
1900 9th Avenue
Tampa, Florida 33605

Dept. of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Southwest District
7601 Highway 301 North
Tampa, Florida 33610

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

(1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) All disputed issues of material fact. If there are none, the petition must so indicate;

(d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;

(e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;

(f) A demand for the relief to which the petitioner deems himself entitled; and

(g) Such other information which the petitioner contends is material.

Technical Evaluation
and
Preliminary Determination

Gardinier, Inc.
Hillsborough County
Tampa, Florida 33601

No. 8 Sulfur Acid Plant Modification
Permit Numbers:
State: AC 29-130371
Federal: PSD-FL-118

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

May 29, 1987

I. Applicant

Gardinier, Inc.
Tampa Chemical Plant
P. O. Box 3269
Tampa, Florida 33601

II. Location

The proposed source to be modified is located on the southeast shore of Hillsborough Bay in Hillsborough County at the intersection of U.S. Highway 41 and Riverview Drive. The UTM coordinates are: zone 17, 363.3 km E and 3082.4 km N.

III. Project Description

Gardinier, Inc. proposes to expand the production capacity of the No. 8 sulfuric acid (H_2SO_4) plant at their Tampa phosphate fertilizer complex. This No. 8 sulfuric acid plant is currently permitted (construction permit No. AC 29-089696, expiration date is October 1, 1987) to produce 2200 tons per day (TPD) of H_2SO_4. It is proposed to increase the H_2SO_4 production capabilities of the No. 8 sulfuric acid plant to 2500 TPD. The proposed project will also involve the installation of (32 megawatt) electric cogeneration facilities.

These facilities will utilize steam from the sulfuric acid plants (Nos. 7, 8, and 9) to produce electric power for use in the Gardinier plant and for sale to the electric power grid.

Gardiner, Inc. states that expansion of the allowable production of the No. 8 sulfuric acid plant to 2500 TPD will allow for the improved efficiency of steam production to support electrical cogeneration facilities. However, total annual production of sulfuric acid at the facility, is not expected to increase.

Gardiner's sulfuric acid demand is mainly dependent on their need to produce phosphoric acid. Phosphoric acid production is limited by the two existing phosphoric acid plants. Gardinier reports they presently have no plans, nor does the market demand, additional phosphoric acid production.

IV. Rule Applicability

The proposed project, modification to No. 8 sulfuric acid plant to increase production, is subject to preconstruction review under the provisions of Chapter 403, FS, and Chapter 17-2, FAC.

The sulfuric acid plant is in an area designated nonattainment for particulate matter and ozone (17-2.420).

The proposed modification is not subject to New Source Review for nonattainment area (17-2.510) because the sulfuric acid plants are not a source of particulate matter or volatile organic compounds.

The facility is a major source of sulfur dioxide (17-2.100) because total emissions exceed 100 TPY. The modification will cause significant net emission increases of sulfur dioxide and acid mist. Therefore, the modification is subject to the Prevention of Significant Deterioration regulations (17-2.500(2)(d)(4.) and the preconstruction review requirements outlined in 17-2.500(5). Emission standards for the modified plant will be established by a Best Available Control Technology determination (17-2.500(5)(c)). In addition, the modified plant will have to comply with the applicable standards of Performance for New Stationary Sources (17-2.660).

The plant must also comply with the regulations of the Hillsborough County Environmental Protection Commission.

V. Technical Evaluation

Gardinier, Inc. received a construction permit (AC 29-089696) from the Department in February 1985, to increase the production capacity of the No. 8 sulfuric acid plant from 1770 TPD to 2200 TPD. That construction permit limited SO_2 emissions from the source to NSPS-4 lbs sulfur dioxide per ton of H_2SO_4 produced (366.7 lbs/hr SO_2) and limited H_2SO_4 mist emissions to 0.15 lb/ton of H_2SO_4 produced (13.75 lbs/hr). Gardiner reports that No. 8 sulfuric acid plant is currently operating under these specified conditions and will continue to comply with them.

In order to achieve these emission requirements, Gardinier installed the necessary gas ducting to permit parallel gas flows through the last two catalyst masses in the main converter. This allows increased production by reducing the pressure drop throughout the system. They installed larger diameter export steam piping to handle additional steam production from the plant and replaced the cast iron cooling coils with new stainless steel heat exchangers for acid cooling.

To achieve these same emission requirements at the proposed 2500 TPD, Gardinier will install a superheater in parallel with No. 1 boiler and a new super heater/economizer in the exit of the 3A pass in parallel with the existing one. Additional catalyst will be installed in the main converter. If the plant is unable to meet the new production and emission limits, then more extensive replacement of the steam system, boiler, blower, and turbine will be required.

The applicant's technical and economical feasibility evaluations of electrical cogeneration facilities with the

production of sulfuric acid at Gardinier have indicated that major changes and modifications are needed at the No. 8 sulfuric acid plant. The feasibility of the project is dependent on the increase in production of No. 8 plant for the increase in efficiency of steam production for electrical cogeneration.

VI. Ambient Air Quality Analysis

An ambient air quality analysis is required for the pollutants sulfur dioxide (SO_2) and sulfuric acid (H_2SO_4) mist. The annual emissions for both of these pollutants will significantly increase. The analysis required consists of:

- An analysis of existing air quality;
- A PSD increment analysis;
- An ambient air quality standards (AAQS) analysis;
- An analysis of impacts on soils, vegetation, and visibility, and of growth-related air quality impact; and
- A good engineering practice (GEP) stack height evaluation.

The analysis of existing air quality relies on preconstruction ambient air monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analysis depend on air quality modeling carried out in accordance with EPA and department guidelines.

Based on these required analysis, the Department has reasonable assurance that the proposed production increase of the No. 8 H_2SO_4 plant, as described in this permit and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard.

Modeling Methodology

The Industrial Source Complex Short-Term (ISCST) atmospheric dispersion model was used to complete the modeling requirements. It is an EPA-approved Gaussian plume model designed to calculate ground-level pollutant concentrations along flat or gently rolling terrain. The model provides for plume rise, transport by the mean wind, horizontal and vertical diffusion, and pollutant deposition and transformation. The model also allows, among other features, the capability of simulating point, volume, and area type sources separated in space; the capability of evaluating building wake downwash; and the use of either a polar or cartesian coordinate system for locating receptors. The model requires sequential hourly meteorolgical data and can calculate

one-hour to annual average ambient ground-level concentrations. The surface and upper-air meteorological data used in the model were National Weather Service data collected at Tampa, Florida for the years 1974, 1975, 1978, 1979, and 1981.

The general modeling protocol used by the applicant was to first determine the critical days of meteorology from the five-year data set and then further refine the modeling for those days. The initial five-year runs placed 180 receptors around the Gardinier facility at distances of 0.2, 0.5, 0.8, 1.1, and 1.6 kilometers with receptor locations 10 degrees apart at each distance. All of the major interacting sources surrounding the Gardinier facility were included in these runs. To save computing time, some of the sources at each facility modeled were combined as single sources. From these runs, the highest and second-highest concentrations determined the locations and days to complete refined modeling. The refined runs did not combine individual sources and used a receptor grid resolution of 100 meters in range and 2 degrees in the azimuth. All significant sources of SO_2 within 50 kilometers of the Gardinier facility were modeled. Table I lists the source and emission characteristics for the Gardinier facility as used in the modeling. The source and emission data of the other sources used in the modeling can be found in the applicant's air quality report.

Analysis of Existing Air Quality

The current state of ambient air quality in the area surrounding a new or modified facility is usually determined by measuring pollutant concentrations with monitors. Preconstruction monitoring of all pollutants for which there is a significant increase in annual emissions is generally required. An exemption to this requirement may be obtained if the maximum air quality impact of the net emissions increase is less than a specified deminimus value. These impacts are determined through modeling. For SO_2 the deminimus level is 13 ug/m^3, 24-hour average; for H_2SO_4 mist there is no defined level.

Modeling performed by the applicants showed that the maximum 24-hour concentration due to the net emission increase is less than the deminimus level for SO_2. The applicant elected to use existing monitoring data to establish the current air quality. Table II summarizes all of the SO_2 monitoring data within 10 kilometers of the Gardinier facility. Ambient concentrations of SO_2 are well below ambient air quality standards.

PSD Increment Analysis

The Gardinier facility is located in an area where the Class II PSD increments for SO_2 apply. The nearest Class I area is the Chassahowitzka National Wilderness Area located 85 kilometers to the north.

Currently, three H_2SO_4 plants are operated at Gardinier, units No. 7, 8, and 9. All three commensed construction prior to January 6, 1975, thus, the actual emissions as of the baseline date are considered baseline emissions and are not counted against the increment. Both units No. 7 and 8 have expanded production since January 6, 1975. The associated increase in emissions, therefore, consume PSD increment. Three other H_2SO_4 plants, No. 4, 5, and 6 operated in the past. These were baseline sources which were shut down after January 6, 1975. As such, the increment is expanded by the amount that the emissions from these sources contributed to ambient concentrations of SO_2. The amount of actual emissions reduced from these sources greatly exceeds the emission increases from the No. 7 and 8 H_2SO_4 plants production increases. Therefore, on net, no PSD increment will be consumed as a result of any of the recent production increases, including the proposed increase of the No. 8 H_2SO_4 plant. Table III summarize the PSD emissions change for SO_2 at Gardinier.

Ambient Air Quality Standards Analysis

An AAQS analysis is required for SO_2. A background concentration is used to account for sources not explicitly included in the modeling. In this case a background concentration of 0 ug/m^3 is used because virtually all sources of SO_2 in the area are included in the modeling.

Table IV summarizes the result of the AAQS analysis. For each of the averaging periods the maximum predicted concentrations are below the Florida standards. The contribution due to Gardinier and the net emissions increase are also listed.

No ambient air quality standard is defined for H_2SO_4 mist. This pollutant is regulated through the BACT portion of the PSD regulation.

Analysis of Impacts on Soils, Vegetation, Visibility and Growth-Related Air Quality Impacts

The maximum ground-level concentrations predicted to occur near Gardinier, including the contribution due to the proposed emissions increase, are below the Florida AAQS. These concentrations are also less than the National secondary standard designed for the three-hour averaging period. The secondary standard is designed to protect public welfare-related values. As such, no adverse impact on soils and vegetation is anticipated. The applicant has reviewed the types of vegetation and soils in the vicinity of Gardinier and has summarized some of the dose-response relationships. These results can be found in the applicant's report.

A Level-I visibility screening analysis was conducted following the EPA-approved procedures outlined in the "Workbook for Estimating Visibility Impairment." The results indicate that the proposed production increase will not contribute to any visibility reduction in the Class I area located 85 kilometers to the north.

No growth-related air quality impacts are expected due to the proposed production increase.

VII. Conclusion

Based on the information submitted by Gardinier, Inc. the Department has concluded that the No. 8 sulfuric acid plant can be modified to produce 2500 TPD of sulfuric acid and be operated in compliance with all applicable air pollution control regulations. The Department proposes to issue a construction permit to authorize modification to No. 8 sulfuric acid plant. The General and Specific Conditions listed in the proposed permit will assure compliance of the source with the air pollution control regulations.

Table I

Gardinier SO_2 Emission Sources

Source	UTM-Coordinates Easting (km)	Northing (km)	SO_2 Emissions (g/s)	Stack Height (m)	Stack Gas Temp. (K)	Exit Gas Vel. (m/s)	Stack Diameter (m)
H_2SO_4 7	363.20	3082.30	46.2	45.6	340	14.0	2.29
H_2SO_4 8	363.30	3082.40	52.5(1)	45.6	339	10.6	2.44
H_2SO_4 9	363.20	3082.45	54.6	45.6	350	11.9	2.74
GTSP	362.60	3082.45	14.3	38.4	327	11.0	2.44
CTMD 3	362.65	3082.60	4.84	20.7	316	10.7	1.07
CTMD 4	362.65	3082.60	4.84	20.7	316	12.2	1.07
Rm 5	362.65	3082.60	0.01	20.1	336	14.9	0.61
Dm 1-2	362.60	3082.40	0.19	27.4	336	16.8	1.22
Dm 3-4	362.60	3082.30	0.19	27.4	336	20.4	1.07
Dm 5	362.60	3082.25	3.05	40.4	314	16.0	2.13
SSF	362.75	3082.45	0.069	12.2	322	9.1	0.51

(1) The net emissions increase due to the production rate increase accounts for 6.3 g/s of the 52.5 g/s total.

Table II

Gardinier Existing Air Quality

Site No.	Distance from Gardinier (km)	Year	No. of Observations	SO_2 Concentration (1) 3-hr (ug/m^3)	24-hr (ug/m^3)	Annual (ug/m^3)
1800-021	8.2	1983	8506	729	114	14
		1984	8638	437	82	13
		1985	8657	637	134	15
1800-095	7.0	1983	8404	396	80	18
		1984	8392	456	103	15
		1985	7731	376	83	21
4360-035	9.8	1983	8241	291	77	21
		1984	8673	393	82	19
		1985	8146	287	67	14
4360-053	9.5	1983	8062	222	68	15
		1984	8684	383	69	16
		1985	8121	265	69	15

(1) Second-highest concentrations for 3 and 24 hour values.

Table III

Gardinier SO_2 Emission Changes Affecting PSD Increment

Source	Date	Change	Actual SO_2 Emissions Change (ton/yr)
No. 7 H_2SO_4	9/7/79	Capacity increase 1380 TPD to 1750 TPD	+270 (1)
	2/8/85	Capacity increase 1750 TPD to 2200 TPD	+329 (1)
No. 8 H_2SO_4	2/8/85	Capacity increase 1770 TPD to 2200 TPD	+314 (1)
	Proposed	Capacity increase 2200 TPD to 2500 TPD	+219 (1)
No. 4 H_2SO_4	1976	Unit shut down	-892 (2)
No. 5 H_2SO_4	1976	Unit shut down	-1773 (2)
No. 6 H_2SO_4	1976	Unit shut down	-2469 (2)

(1) Based on 4 lb/ton SO_2 emission factor.
(2) Actual emissions averaged over two year period prior to shutdown.

Table IV

Gardinier Ambient Air Quality Standards Analysis

Pollutant and Averaging Time	Net Emissions Increase (ug/m^3)	Gardinier Facility (ug/m^3)	Total All (2) Sources (ug/m^3)	Florida AAQS (ug/m^3)
SO_2				
3-hour (1)	29	533	1031	1300
24-hour (1)	9	176	235	260
Annual	1	25	45	60

(1) Highest, second-highest predicted concentrations. The concentrations listed at each averaging time for the net emissions increase, the Gardinier facility, and the total do not occur at the same location and time.

(2) A background concentration of 0 ug/m^3 is assumed since all significant sources are modeled.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Permit Number: AC 29-130371
Expiration Date: June 30, 1989
County: Hillsborough
Latitude/Longitude: 27° 51' 28" N
82° 23' 15" W
Project: No. 8 Sulfuric Acid
Plant Modification

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4 and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Modifications to the No. 8 sulfuric acid plant that will increase production from 2200 to 2500 TPD. The modifications involve installing a superheater in parallel with No. 1 boiler and a new superheater/economizer in the exit of the 3A pass in parallel with the existing one. Then install additional catalyst in the main converter and other major modifications that have prior approval of the Department and the Hillsborough County Environmental Protection Commission.

The UTM coordinates of the site are 17-363.3 km E and 3082.4 km N.

Construction shall be accordance with the application for a permit to construct/modify the No. 8 sulfuric acid plant that was signed by Mr. Rudy Cabina on February 4, 1987, and the additional information supplied in Gardinier, Inc.'s March 20, 1987 letter except for changes mentioned in the Technical Evaluation and Preliminary Determination and listed as Specific Conditions in the permit to construct.

Attachments:

1. Application signed February 4, 1987.

2. DER letter dated February 27, 1987.

3. Gardinier, Inc.'s letter dated March 20, 1987.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-130371
Expiration Date: June 30, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

(x) Determination of Best Available Control Technology (BACT)
(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Sulfuric acid production measured as 100% H_2SO_4, shall not exceed 2500 TPD or 104.17 TPH.

2. Sulfur dioxide emissions shall not exceed 4.0 lbs/ton of acid produced and 10,000 lbs/day or 416.67 lbs/hr average per 3 hour period.

3. Acid mist emissions shall not exceed 0.15 lb/ton acid of produced and 375 lbs/day or 15.63 lbs/hr average per 3 hour period.

4. Visible emissions shall not exceed 5% opacity, average for any consecutive 6 minute period.

SPECIFIC CONDITIONS:

5. Compliance tests will continue and shall be conducted while the plant is operating within 5% of its permitted capacity of 104.17 TPH acid. If the compliance tests are conducted at an operating rate of less than 95% of permitted capacity, then any permit to operate issued for the plant shall restrict its maximum production to not more than 5% above the production rate that existed during the compliance test. The test methods and procedures described in 40 CFR 60.85 shall be used to determine the status of the source with the sulfur dioxide and acid mist standards. Method 9, as described in 40 CFR 60, Appendix A, shall be used to determine the compliance status of the source with the visible emissions standard. Hillsborough County Environmental Protection Commission (HCEPC) shall be notified in writing 15 days prior to any compliance tests.

6. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained and operated on this plant as specified in 40 CFR 60.84. Excess emissions shall be reported to the HCEPC.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants.

8. The plant may operate continuously, 8760 hours per year.

9. This construction permit replaces the current construction permit (AC 29-089696) for this sulfuric acid plant. During the modifications of this plant, the emissions shall not exceed 4 lbs SO_2 per ton of acid produced and 0.15 lb acid mist per ton of acid produced while the plant is operating commercially.

10. Construction shall reasonably conform to the plans and schedule in the application. Bi-annual reports describing the status of the modifications shall be submitted to the state and county regulatory agencies. Gardinier, Inc. shall obtain prior approval from the Department and HCEPC before proceeding with any construction referred to as "third modification" in the October 15, 1984 letter.

11. Gardinier, Inc. shall take precautionary measures to prevent emissions from leaks at the plant. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provisions in FAC Rule 17-2.610(3). These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or industrial related

SPECIFIC CONDITIONS:

activities such as loading, unloading, storing and handling of materials.

12. Gardinier, Inc. shall submit a complete application for a permit to operate the sulfuric acid plant, which includes an emissions test report, to the Hillsborough County Environmental Protection Commission at least 90 days prior to the expiration date of this construction permit. Gardinier, Inc. may continue to operate this sulfuric acid plant, if the source is in compliance with the conditions in this permit, until the expiration date of this construction permit or until the expiration date of any permit to operate that is issued for this source.

13. Upon obtaining a permit to operate, the applicant will be required to submit annual operation reports which shall include, as a minimum, the annual production of the plant and a recent emissions test report.

Issued this_____day of_____, 19___

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

_____
Dale Twachtmann, Secretary

____ pages attached.

BACT Determinied by DER:

Sulfuric Acid Plant 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 EPA Method 8, 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 40 CFR 60.85, Subpart H, New Source Performance Standards.

EPA Method 9, 40 CFR 60, Appendix A, will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

FAC Rule 17-2.100(117) defines "modification" as any physical change in, or change in the method of operation of, 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), FAC 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.

BACT Determinied by DER:

Sulfuric Acid Plant No. 8:

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

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

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 40 CFR 60.85, Subpart H, New Source Performance Standards.

EPA Method 9, 40 CFR 60, Appendix A, will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

FAC Rule 17-2.100(117) defines "modification" as any physical change in, or change in the method of operation of, 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), FAC 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:

Bob E. Daugherty
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

_____
C. H. Fancy, Deputy Bureau Chief

Date: _____

Approved by: _____

_____
Dale Twachtmann, Secretary

Date: _____

PM
3-23-87
Tampa, FL

RM: R 241-474-016

GARDINIER INC.

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

March 20, 1987

Mr. Clair H. Fancy, P. E.
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32301

SUBJECT: Gardinier Inc. No. 8 Sulfuric Acid Plant
File No. AC29-130371

Dear Mr. Fancy:

Please find attached responses to comments in your letter dated February 27, 1987 regarding increasing the capacity of the No. 8 Sulfuric Acid Plant and installation of electric power cogeneration. I believe this should resolve all issues regarding this project.

In addition, please find enclosed a copy of the computer printouts for the extra modeling analysis.

As we have indicated before, the cogeneration project is on a very fast track. If you require any additional information, please call.

Sincerely,

E. O. Morris
Manager
Environmental & Development

DER
MAR 25 1987
BAQM

:gf
Attachment

cc: B. Thomas, DER/Tampa/No printout attachment
J. Campbell, HCEPC "
R. Fernandez "
R. Nettles "
H. Mathot "

No. 8 Constructuion Permit Application
Responses to Comments from DER

RESPONSE TO COMMENT 1

The technical and economical feasibility evaluations of electrical cogeneration facilities with the production of sulfuric acid at Gardinier have indicated that major changes and modifications will be needed at the No. 8 sulfuric acid plant. The feasibility of the project is dependent on the increase in the production of the No. 8 plant for the increase in efficiency of steam production for electrical cogeneration. Additional annual sulfuric acid production is not needed.

Gardinier's sulfuric acid demand is mainly dependent on their need to produce phosphoric acid. Phosphoric acid production is limited by the two existing phos acid plants. Gardinier presently has no plans, nor does the market demand, additional phosphoric acid production. There is also a very poor market for sulfuric acid.

As we indicated in the subject application, expansion of the allowable production of the No. 8 sulfuric acid plant to 2500 TPD will allow for the increased efficiency of steam production to support electrical cogeneration facilities. However, total annual production of sulfuric acid at the facility is not expected to increase.

RESPONSE TO COMMENT 2

The first modifications have been completed as stated in Mr. Rudy Cabina's letter dated October 15, 1984 (Items A and B). Gardinier has completed Item F of the second set of modifications. Approximately $2.3 million dollars have been expended up to this time.

As part of the planned cogeneration project, Item E of the second set of modifications, plus items similar to C and D, and the third set of modifications as stated in the subject letter will be completed. The estimated cost for the No. 8 conversion to cogeneration is $6.0 million dollars.

RESPONSE TO COMMENT 3

The production rate as indicated on Table 6-1, page 6-2 for the June 14, 1985 compliance test is in error. The correct production rate as indicated in the submitted compliance test was 77.8 TPH. Gardinier does not exceed their permitted production limits, especilly when considering the 5% flexibility allowed by specific condition 5 of the present construction permit.

RESPONSE TO COMMENT 4

Gardinier has complied and will continue to comply with the 4 lbs. sulfur dioxide and 0.15 lbs. sulfuric acid mist per ton of product emission limits. Gardinier will continue to use the double absorption technology. As indicated in the present construction permit, Gardinier will increase the amount of catalyst in the main converter to maintain conversion efficiency.

RESPONSE TO COMMENT 5

Comment 5 requests that further modeling analysis be done to reveal possible masking of critical days by the combining of Tampa Electric Company (TEC) Big Bend into a single source for the screening analysis. As a selection criteria, the FDER proposed that for each averaging period, the meteorological periods producing the following concentrations for each of the five years of meteorology be modeled in the refined mode: (1) the highest concentration; (2) the highest, second-highest concentration; (3) the second-highest concentration at the location of the highest concentration; and (4) the highest concentration at the location of the highest, second-highest concentration. It was also suggested that the screening model output be scanned for additional days when sources other than TEC Big Bend might have interacted with Gardinier to produce higher concentrations than those produced with TEC Big Bend and Gardinier in the refined modeling analysis. The periods recommended to be modeled included the following Julian days:

	Averaging Period	
Year	3-Hour	24-Hour
1974	33, 210	40, 96
1975	210	19, 189
1978	71, 214	-
1979	248	-
1981	-	150, 171

KBN's review of the initial modeling analyses results revealed that criteria 2 and 4 of the FDER selection criteria have already been addressed in the application submitted to FDER, and therefore no additional analysis is required. To satisfy criteria 1 and 3, the screening model output was reviewed and all second-highest concentrations exceeding approximately 85% of the 3- and 24- hour AAQS and occurring within Gardinier's maximum impact area were identified. The meteorological periods associated with these concentrations are presented in Table 1. As an additional check, the year 1979 was rerun in the screening mode with TEC Big Bend sources separated. The year 1979 was rerun because this year reflected the highest concentrations for both the original analysis and the additional analysis. No new critical periods were identified from the year 1979 run.

The critical periods were then remodeled in a screening mode, i.e., combining of major sources into a single stack and use of a coarse receptor grid, except that TEC Big Bend's sources were separated into individual stacks. The results of this analysis are presented in Table 2 under "Additional Analysis". The concentrations shown in Table 2 are due to the point sources modeled, and do not include a background SO_2 concentration.

A comparison of the previous screening modeling analysis and the additional screening analysis is also presented in Table 2. The "Additional Analysis" results reflect the maximum impacts obtained for each year by analyzing only the critical periods identified in Table 1. The "Previous Analysis" results reflect the screening analysis results presented in the original permit application.

Based upon the additional modeling results, the maximum 3-hour concentration predicted from the additional screening analysis was further refined (Day 129, Period 5, 1979). The resulting maximum 3-hour SO_2 concentration was 1031 ug/m^3, which is higher than the 870 ug/m^3 maximum impact obtained from the previous analysis, but still well below the AAQS of 1300 ug/m^3. Similarly, the highest 24-hour impact from the additional screening analysis was also further refined (Day 211, 1979), since this day produced impacts significantly above the other days evaluated. The resulting maximum 24-hour impact was 235 ug/m^3, which is above the results obtained from the previous modeling analysis, but still below the 24-hour AAQS of 260 ug/m^3.

These results do not include a 'background' SO_2 concentration (i.e., background assumed to be 0 ug/m^3). In the original analysis, it was conservatively estimated that a background concentration of 15 ug/m^3 existed in conjunction with the worst case point source impacts. However, because 99.9 percent of all point source emissions of SO_2 were accounted for in the refined modeling analysis, it is reasonable to assume a 0 ug/m^3 background level.

This additional analysis substantiates the results from the original modeling, which demonstrated compliance with all AAQS.

Table 1. Critical Periods and Radials Considered in the Additional Modeling Analysis.

Averaging Period	Year	Period (Julian Day)	Radial (°)
3-Hour	1974	33, 210	240, 250, 260, 270, 280, 290
	1975	82, 210	10
		66, 82	160
		18, 82	360
	1978	71, 73, 212	250, 260, 270, 280
		71, 73, 212, 214	310, 320, 330
	1979	129, 248	310
		100, 129, 248	360
	1981	60, 323, 341	160, 170, 180
		158, 201	300, 310
24-Hour	1974	40, 96	140, 150, 160, 170
		84, 212	350
	1975	66, 82	20
		19, 66, 105	140, 150, 160
	1978	102, 128	20
		155, 354	310
	1979	100, 248	20
		73, 211, 212	90
		129, 248	310
		100, 129, 248	360
	1981	150, 171, 196	90
		141, 342	140, 150

Table 2. Comparison of Maximum Concentrations Predicted in Previous Screening Modeling Analyses and Additional Analysis.[+]

Averaging Period	Year	Previous Analysis*					Additional Analysis**				
		Concentration (ug/m^3)	Receptor Location		Period		Concentration (ug/m^3)	Receptor Location		Period	
			Direction (°)	Distance (km)	Julian Day	Hour Ending		Direction (°)	Distance (km)	Julian Day	Hour Ending
					Screening						
3-Hour	1974	780	10	0.8	98	15	355	250	1.6	210	12
	1975	776	10	0.8	66	12	722	360	0.8	18	15
	1978	1083	240	1.6	212	12	655	360	1.1	71	12
	1979	1070	10	0.8	100	12	902	360	0.8	129	15
	1981	870	10	0.8	220	12	527	310	0.2	60	12
24-Hour	1974	183	10	1.1	98	24	165	150	1.6	96	24
	1975	210	80	0.8	66	24	171	90	1.1	66	24
	1978	217	10	0.8	128	24	191	20	0.8	128	24
	1979	224	10	0.8	248	24	219	90	0.8	211	24
	1981	205	10	1.6	38	24	201	140	1.1	342	24
					Refined						
3-Hour	1979	-	-	-	-	-	1301	6	0.9	129	15
	1981	870[++]	10	0.7	220	12	-	-	-	-	-
24-Hour	1979	226[++]	12	0.6	248	-	235	92	0.8	73	-

[+] Results reflect a background concentration of 0 ug/m^3, unless otherwise noted.
* Results of screening analysis presented in original permit application.
** Maximum impacts from analysis of the critical periods identified in Table 1.
[++] Includes background concentration of 15 ug/m^3.

RESPONSE TO COMMENT 6

This comment pertains to the potential for building downwash effects at the Gardinier facility. In order to investigate the potential for building downwash at the facility, building heights and locations in relation to stacks were reviewed. This review showed that no potential exists for downwash from the H_2SO_4 plants. The stacks for these plants are 150 feet in height, and associated structures are no greater than 60 feet high. Thus, the H_2SO_4 plant stacks are at least 2.5 times the height of nearby structures. As shown in the plot plan attached, other significant buildings located at the facility are located at such distance as to not influence the H_2SO_4 plant stacks.

The other SO_2 sources at Gardinier will have the potential to produce building downwash effects. Presented in Table 3 are the most significant structures associated with these sources, building dimensions, the projected crosswind width, and the length and width input to the ISCST model. The projected crosswind widths were selected as the maximum crosswind width for the structure, regardless of wind direction, in order to be conservative in the analysis. For the DM 1,2,3,4 and 5 sources, the manufacturing areas for each process are the most influencing structures. The manufacturing areas are located at the east end of the respective storage buildings.

The ISCST model was executed in the refined mode for the critical meteorological periods, using the building downwash option for the Gardinier sources. The meteorological period for the 3-hour averaging time is based upon the highest, second-highest concentration from the five years of meteorology , i.e., Day 129, Period 5, 1979 (see Response to Comment 5 and Table 2). Because the 3-hour maximum impacts were well below the 3-hour AAQS of 1300 ug/m^3, no other 3-hour periods were evaluated. The resulting refined 3-hour maximum concentration was 1031 ug/m^3. Because this 3-hour maximum impact was well below the 3-hour AAQS of 1300 ug/m^3, no other 3-hour periods were evaluated. (Note: Impacts during this 3-hour period were due to Gardinier's H_2SO_4 plants and TEC Big Bend. The other sources at

Gardinier did not contribute during this period, and therefore the downwash and non-downwash results are identical.)

For the 24-hour averaging time, all of the critical periods and directions identified in Table 1, as well as the critical periods and directions identified from the original modeling analysis, were executed with the ISCST, with the downwash option used for Gardinier sources. The results from this modeling analysis showed that second-highest SO_2 concentrations greater than the 260 ug/m^3 AAQS occurred at only one receptor location (310° @ 800 m from the Gardinier H_2SO_4 plants). Based upon the plot plan attached and Figure 1-2 of the Prevention of Significant Deterioration Analysis submitted with the permit application, this receptor is located well within Gardinier plant property boundaries. Maximum concentrations at all other receptors produced from the downwash modeling were below the 260 ug/m^3 AAQS. As discussed in regard to Response to Comment 5, it is reasonable to assume a 0 ug/m^3 background SO_2 concentration for the analysis.

The downwash modeling analysis demonstrates that the AAQS will be met in the vicinity of the Gardinier plant, even under the conservative downwash assumption.

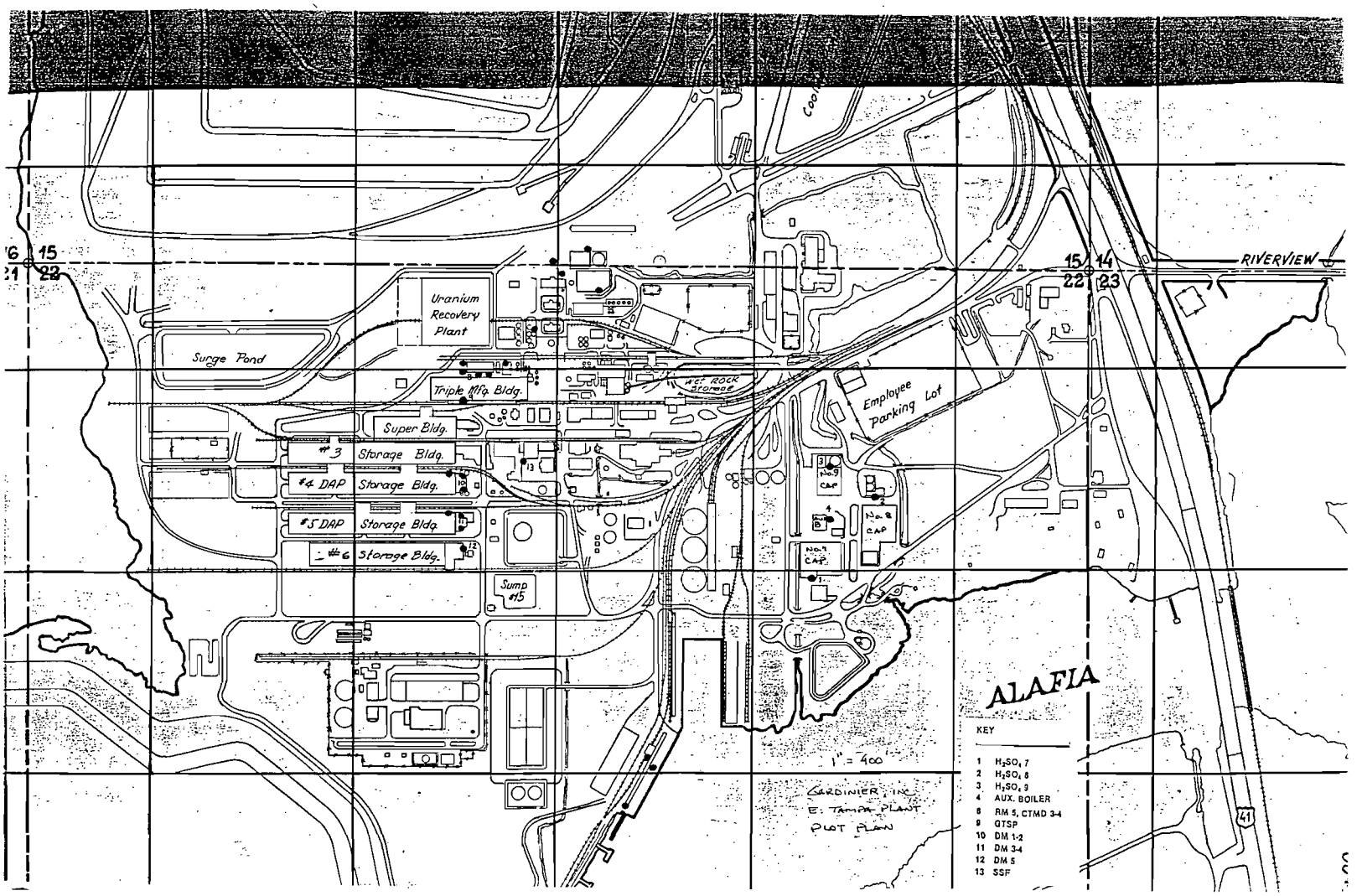
RESPONSE TO COMMENT 7

One copy of supportive computer model printouts for the additional modeling performed is included with this submittal.

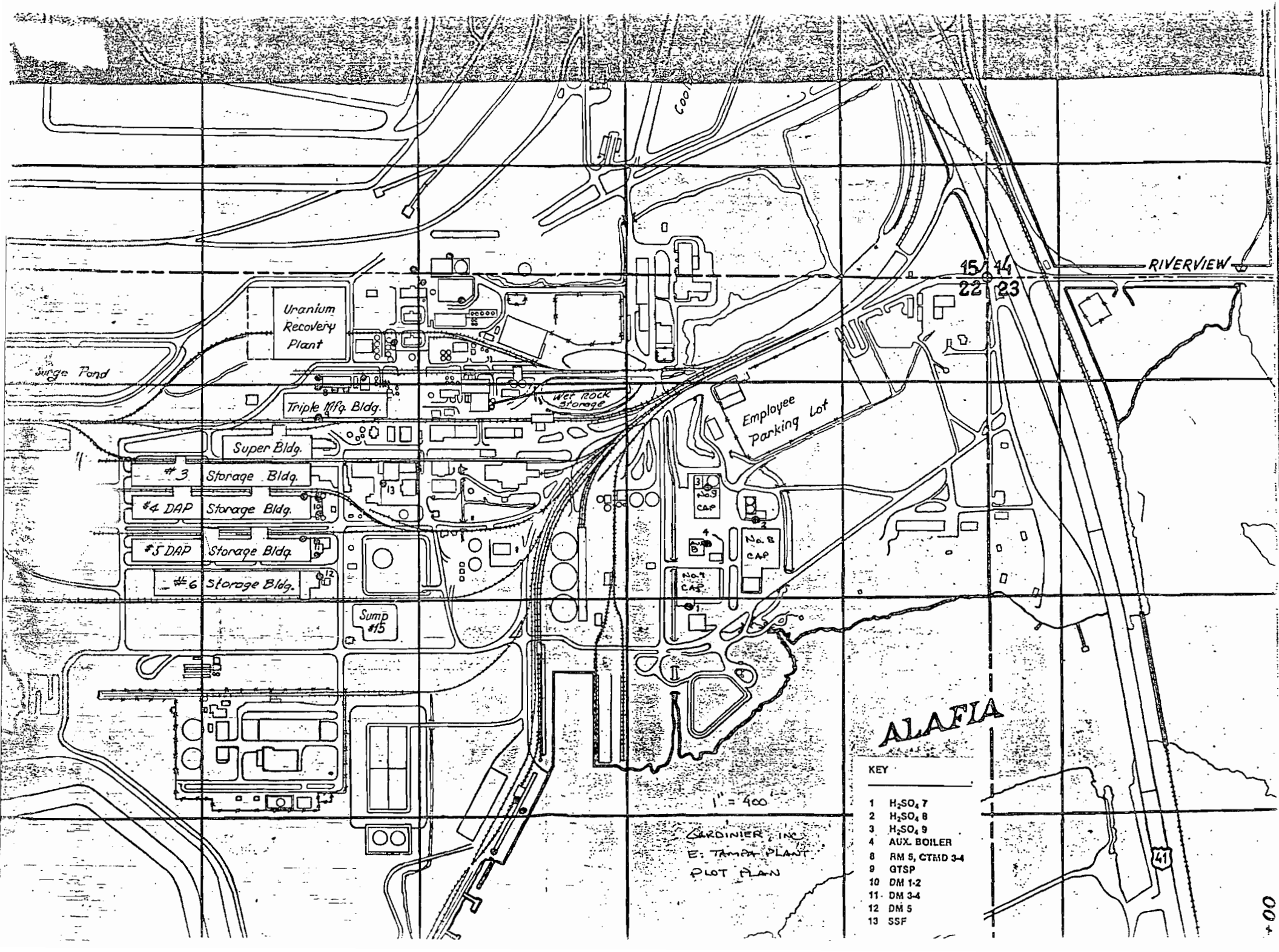
Table 3. Building Dimensions Associated With Gardinier SO_2 Sources

Stack #	Source	Associated Building	Height (ft)	Length (ft)	Width (ft)	Projected Crosswind Width (ft)	Length & Width Input to Model (ft)*
8	RM5, CTMD 3,4	Triple Manuf. Bldg.	75	100	480	500	443
9	GTSP	Triple Manuf. Bldg.	75	100	480	500	443
10	DM 1,2	DM 1,2 Manuf. Bldg.	85	100	60	60	53
11	DM 3,4	DM 3,4 Manuf. Bldg.	100	100	60	60	53
12	DM5	DM5 Manuf. Bldg.	117	130	90	90	80
13	SSF	Triple Manuf. Bldg.	75	100	480	500	443

*Calculated to result in model simulation of projected crosswind width.



BEST AVAILABLE COPY



P 408 531 169

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. E. O. Morris	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 3/2/87	

PS Form 3800, Feb. 1982

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. E. O. Morris
Gardinier, Inc.
P. O. Box 3269
Tampa, FL 33601

4. Type of Service:	Article Number
☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail	P 408 531 169

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
3-5-87

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

February 27, 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. O. Morris
Manager, Environmental & Development
Gardiner, Inc.
Tampa, Florida 33601

Dear Mr. Morris:

Re: No. 8 Sulfuric Acid Plant (File No. AC 29-130371)

The department has made a preliminary review of your application for a permit to modify Gardinier's No. 8 sulfur acid plant to produce 2500 tons per day of sulfuric acid and install electric power co-generation. Before this application can be processed, the department will need the following information.

1. Please explain your need for increasing the sulfuric acid capacity of your No. 8 acid plant without requiring an increase in annual acid production.

2. With reference to your letter of October 15, 1984, subject: No. 8 sulfuric acid plant modification, what modifications were required and what was the approximate cost?

3. Reference, Page 6-2, Table 6-1 of your application. You exceed your permitted production rate by 6.73 tons/hour during the June 14, 1985, No. 8 H_2SO_4 Plant Source Emission Tests. How often and of what duration does this occur?

4. Can you maintain the required permitted standards without additional modifications?

5. The department is concerned that the screening modeling completed may not have adequately represented conditions for selecting all the critical days to be used in the refined modeling. In particular, the combining of the TECO Big Bend sources in the screening modeling seems to have caused much higher ground-level concentrations than when these sources are separated. This overwhelming of the TECO Big Bend facility may have masked-out high concentrations occurring due to other sources, given that only the two highest concentrations are determined at each receptor.

The department does not feel that complete remodeling of the screening runs is necessary; however, several additional individual days need to be modeled. As a selection criteria we propose that for each averaging period, the day having: (1) the highest concentration; (2) the highest, second-highest; (3) the highest, second-highest at the location of the highest; and, (4) the highest at the location of the highest, second-highest be modeled in the refined mode for each of the five years. These days are often duplicative for a given year.

The following additional days need to be modeled:

Year	3-hour	24-hour
1974	33, 210	40, 96
1975	210	19, 189
1978	71, 214	--
1979	248	--
1981	--	150, 171

In addition, since the screening modeling may not have flagged some critical days, please scan the output for additional days when other sources (not TECO Big Bend) may have interacted with Gardinier to produce higher concentrations than TECO Big Bend produces with Gardinier in its refined mode.

6. The possibility of building wake downwash at the Gardinier facility was not addressed. Please determine the "calculated GEP" stack height for the Gardinier sources. The department does not feel that a complete rerunning of the screening modeling is necessary. However, an estimate of the potentially increased ground-level concentrations due to downwash should be made using the ISCST model in a screening mode (similar to PTPLU). The maximum increase should be added to the refined modeling results.

7. Please submit a copy of the additional modeling to be completed.

If you have questions on the information needed to complete your application, please write to me or call Bob Daugherty on questions 1-4 and Tom Rogers on questions 5-7 at (904)488-1344.

We will resume processing your application when the information requested above is submitted.

Sincerely,

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

CHF/BD/s

cc: B. Thomas, SW District
J. Campbell, HCEPC

BAQ.

GARDINIER INC.

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

February 4, 1987

Mr. Clair H. Fancy, P.E.
Florida Department
of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: Gardinier, Inc., No. 8 Sulfuric Acid Plant
Construction Permit Application - PSD Analysis

Dear Mr. Fancy:

Enclosed is a Gardinier construction permit application with the appropriate fee for the increase in the production of sulfuric acid from our No. 8 contact acid plant. Expansion of the plant will increase the efficiency of steam production to support planned new electrical cogeneration facilities. Total annual production of sulfuric acid for the facility is not expected to increase.

Gardinier plans to add 32 megawatts of cogeneration capability which will replace our power demand from the coal fire powered generators of Tampa Electric Company. This project will have a positive impact on the environment and energy conservation.

On December 10, 1986 I met with Mr. Bill Thomas and Mr. Willard Hanks to discuss the planned project. At that time we discussed the possibility of modifying the exsisting construction permit for the No. 8 plant by extending the expiration date and modifying the production rate from 2200 tons per day to 2500 tons per day. Mr Thomas advised me to resubmit a construction application and update the past PSD analysis at which time the Department would decide if a new construction permit was appropriate or modification of the present construction permit was appropriate.

This cogeneration project is on a very fast track. Gardinier personnel and consultants are ready to meet with your staff to discuss the application and PSD analysis as soon as possible.

Very truly yours,

E. O. Morris
Manager
Environmental & Development

EOM:rw
Enclosures
cc: Mr. Rudy J. Cabina
Mr. S. T. Boswell
Mr. Henk Mathot
Mr. R. Nettles
Mr. David Buff

RECEIVED
DER - MAIL ROOM
1987 FEB -9 PM 2:25

BAQM
1081

4461 13893 GARDINIER, INC. BOX 3269, TAMPA, FLORIDA 33601

VENDOR NUMBER	INVOICE NUMBER	INVOICE DATE	GROSS AMOUNT	DISCOUNT	NET AMOUNT
3351		1 29 87	100000		100000

BEST AVAILABLE COPY

Permit processing fee for No. 8 Sulfuric Acid Plant construction permit to increase capacity of plant to 2500 tons per day.

TOTAL		100000		100000

IF CORRECT, DETACH AND RETAIN STATEMENT. IF NOT CORRECT, RETURN WITH STATEMENT.

Dept# 1692

GARDINIER, INC. TAMPA, FLORIDA

NO. 13893
17-1
910

DATE MO.	DAY	YR.	PAY EXACTLY	DOLLARS AND	CENTS	DOLLARS	CENTS
1	31	87	******1,000	00		*****1,000	00

TO THE ORDER OF
FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
7601 HIGHWAY 301 N
TAMPA FL 33610

GARDINIER, INC.
David Wilson
AUTHORIZED SIGNATURE

NORWEST BANK, N.A.
MINNEAPOLIS, MINNESOTA

[redacted]

would decide if a new construction permit was appropriate or modification of the present construction permit was appropriate.

This cogeneration project is on a very fast track. Gardinier personnel and consultants are ready to meet with your staff to discuss the application and PSD analysis as soon as possible.

Very truly yours,

E. O. Morris
Manager
Environmental & Development

EOM:rw
Enclosures
cc: Mr. Rudy J. Cabina
Mr. S. T. Boswell
Mr. Henk Mathot
Mr. R. Nettles
Mr. David Buff

RECEIVED
DER - MAIL ROOM
1987 FEB -9 PM 2:25

BAQS
1081

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Nº 76148

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Gardinier Inc. Date February 9, 1978

Address P.O. Box 3269 Tampa, FL 33601 Dollars $ 1,000.00

Applicant Name & Address same as above

Source of Revenue

Revenue Code 001031 Application Number AC 29-130371

By Patricia G. Adams

AC 29-130391
PSD-FL-118

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

DER

FEB 9 1987

BAQM

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Phosphate Fertilizer Complex [ ] New[1] [x] Existing[1]

APPLICATION TYPE: [x] Construction [ ] Operation [x] Modification

COMPANY NAME: Gardinier, Inc. COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) No.8 Sulfuric Acid Plant

SOURCE LOCATION: Street Intersection of U.S. Highway 41 and Riverview Drive, south of Tampa City south of Tampa

UTM: East 363.3 North 3082.4

Latitude 27 ° 51 ' 28 "N Longitude 82 ° 23 ' 15 "W

APPLICANT NAME AND TITLE: Rudy J. Cabina, Vice-President

APPLICANT ADDRESS: P.O. Box 3269, Tampa, Florida 33601

SECTION I: 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-PSD 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 provision 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 non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: Rudy J Cabina

Rudy J. Cabina, Vice-President
Name and Title (Please Type)

Date: 2/4/87 Telephone No. (813)-677-9111

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

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

See Florida Administrative Code Rule 17-2.100(57) and (104)

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 regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed [signature]

Richard J. Nettles, P.E.
Name (Please Type)

Gardinier, Inc.
Company Name (Please Type)

P.O. Box 3269, Tampa, Florida 33601
Mailing Address (Please Type)

Florida Registration No. 29483 Date: 2/4/87 Telephone No. (813)-677-9111

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 Gardinier's No.8 Sulfuric Acid Plant to produce 2500 tons per day of sulfuric acid and install electric power co-generation. An increase in production of 300 tons per day of sulfuric acid and an extension of the current construction permit (AC-29-089696) expiration date to 12/31/88 is required. Emissions from this source will comply with all applicable Fla. and Hills. Co. regulatio

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

Start of Construction upon permit issue Completion of Construction 12/31/88

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.)

Modifications to converter, steam system, blower - $6,000,000

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

Permit No.	AC-29-089696	AO-29-84015	AO-29-18228	AO-29-2390	AC-29-2390
Issued	Feb., 1985	Jun., 1984	~~May~~ April, 1979	Apr., 1977	Nov., 1974
Expires	Oct., 1987	Apr., 1989	Apr., 1984	May, 1979	Apr., 1977

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr N/A; if seasonal, describe: Not seasonal.

F. 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 Deterioration" (PSD) requirement 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? Already being met.

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? no

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? no

   a. If yes, for what pollutants? N/A

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

Please see attached discussion.

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	-	-	68,324	A
Atmospheric Oxygen	-	-	102,173	B
Water	-	-	38,270	C

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

1. Total Process Input Rate (lbs/hr): 208,767

2. Product Weight (lbs/hr): 208,333 as 100% H_2SO_4

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Sulfur Dioxide	416.7	1826.4	4.0 lbs/Ton of acid	416.7	416.7	1826.4	D
Acid Mist	15.6	68.5	0.15 lbs/ton of acid	15.6	15.6	68.5	D

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 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).

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Final Converter	Sulfur Dioxide	99.7+	N/A	AP-42
Final Absorber and Mist Eliminator	Acid Mist	99+	Greater than one micron	AP-42

E. Fuels No fuel is used.

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: N/A

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

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

There are no solid wastes. Cooling tower and boiler blowdown will be discharged to Plant Outfall 005.

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

Stack Height: 149.5 ft. Stack Diameter: 8.0 ft.

Gas Flow Rate: 105,000 ACFM 90,800. DSCFM Gas Exit Temperature: 151 °F.

Water Vapor Content: 0 % Velocity: 34.8 FPS

SECTION IV: INCINERATOR INFORMATION

NOT APPLICABLE

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

NOT APPLICABLE

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Brief description of operating characteristics of control devices:

NOT APPLICABLE

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOT APPLICABLE

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS SEE ATTACHMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" 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.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. 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	4.0 lbs SO_2/ton 100% H_2SO_4
Acid Mist	0.15 lbs mist/ton 100% H_2SO_4

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[x] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur Dioxide	4.0 lbs SO_2/ton 100% H_2SO_4
Acid Mist	0.15 lbs mist/ton 100% H_2SO_4

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

Contaminant	Rate or Concentration
Sulfur Dioxide	4.0 lbs SO_2/ton 100% H_2SO_4
Acid Mist	0.15 lbs mist/ton 100% H_2SO_4

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy [2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: SEE ATTACHMENT

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

SEE ATTACHED SUPPLEMENT

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ ( ) SO_2* _____ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

SEE ATTACHED SUPPLEMENT

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

Basis of Emission Estimates
No. 8 Sulfuric Acid Plant

1. Design Parameters
   100% sulfuric acid = 208,333 lb/hr = 104.17 tons/hr
   Operating hours = 365.25 days/yr = 8766 hr/yr

2. Sulfur Dioxide
   Allowable = 4.0 lb/ton H_2SO_4
   104.17 tons/hr x 4.0 lb/ton = 416.7 lb/hr
   416.7 lb/hr x 8766 hr/yr / 2000 lb/ton = 1826.4 tons/yr

3. Sulfuric Acid Mist
   Allowable = 0.15 lb/ton H_2SO_4 mist
   104.17 tons/hr x 0.15 lb/ton = 15.6 lb/hr
   15.6 lb/hr x 8766 hr/yr / 2000 lb/ton = 68.5 tons/yr

P 408 531 189

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Rudy J. Cabina	
Gardinier, Inc. P.O. Box 3269	
P.O., State and ZIP Code Tampa, FL 33601	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 6/1/87 AC 29-130371	

PS Form 3800, Feb. 1982

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Rudy J. Cabina
Vice President
Gardinier, Inc.
P.O. Box 3269
Tampa, Florida 33601

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 408 531 189

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
6-03-87

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

May 29, 1987

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

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

Dear Mr. Cabina:

Attached is one copy of the Technical Evaluation and Preliminary Determination for the proposed modifications to the No. 8 sulfuric acid plant at your existing Tampa phosphate fertilizer chemical complex.

Please submit, in writing, any comments which you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

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

CHF/ks

Attachments

cc: B. Thomas, SW District
E. Morris, Gardinier, Inc.
R. Nettles, P.E., Gardinier, Inc.
J. Campbell, HCEPC
D. Buff, KBN
W. Aronson, EPA
M. Flores, NPS