

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544



BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WILLIAM K. HENNESSEY
DISTRICT MANAGER

June 3, 1982

* S.W. district
modification

Mr. R. E. Graf
Vice President, General Manager
Conserv, Inc.
P.O. Box 314
Nichols, Fla. 33863

Dear Mr. Graf:

RE: Modification of Conditions
Permit NO. AC53-42397

DER
JUN 09 1982
BAQM

We are in receipt of your request for a modification of the permit conditions.
The conditions are changed as follows:

<u>Condition</u>	<u>From</u>	<u>To</u>
Expiration Date	12/03/82	03/03/83

This letter must be attached to your permit and becomes a part of that permit.

Sincerely,

Dan A. Williams, P.E.
District Air Engineer

DAW/rkt

cc: Willard Hanks ✓
CAPS, Tallahassee

DER Form 17-1.122(59)

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To: _____	Loctn.: _____
To: _____	Loctn.: _____
To: _____	Loctn.: _____
From: _____	Date: _____

TO: Victoria J. Tschinkel

FROM: *for* Steve Smallwood, Chief, Bureau of Air Quality Management *Steve Smallwood*

DATE: July 16, 1981

SUBJ: Approval and Signature - Air Construction Permit
Conserv, Inc.

Attached please find an Air Construction Permit for which the applicant is Conserv, Inc. The proposed construction is for a sulfuric acid plant to be located 2 miles SW of Mulberry, in Polk County, Florida.

The day after which the permit would be issued by default is July 21, 1981.

I recommend your approval and signature.

SS:dav

RECEIVED

JUL 20 1981

Office of the Secretary

Final Determination

Conserv, Inc.
Polk County, Florida

Sulfuric Acid Plant
Construction Permit
AC 53-42397

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting
July 16, 1981

Conserv, Inc.

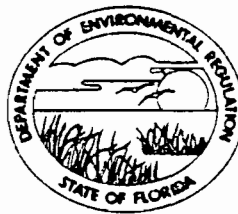
Construction Permit

Conserv, Inc's application for a permit to construct a sulfuric acid plant in Polk County has been reviewed by the Bureau of Air Quality Management. Public notice of the Department's Intent to Issue the construction permit was published in the Tampa Tribune on June 12, 1981. Copies of the preliminary determination have been available for public inspection at the Department's Southwest District Office in Tampa, and the Bureau of Air Quality Management Office in Tallahassee.

No comments were received during the public notice period that would involve modifications to the draft permit.

The final action by the Department shall be to issue the permit as noticed in the public review process.

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



BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

July 16, 1981


Mr. R.E. Graf
Vice President, General Manager
Conserv, Inc.
P. O. Box 314
Nichols, Florida 33863

Dear Mr. Graf:

Enclosed is Permit Number AC 53-42397, dated July 16, 1981
to Conserv, Inc.
issued pursuant to Section 403, Florida Statutes.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely,

for 
Steve Smallwood, Chief
Bureau of Air Quality Management

SS:dav

cc: SW District Office



STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

CONSTRUCTION
PERMIT

NO. AC 53-42397

CONSERV, INC.
POLK COUNTY, FLORIDA
SULFURIC ACID PLANT

DATE OF ISSUANCE

JULY 16, 1981

DATE OF EXPIRATION

DECEMBER 3, 1982

VICTORIA J. TSCHINKEL,
SECRETARY

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



BOB GRAHAM
GOVERNOR
JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Conserv
P. O. Box 314
Nichols, Florida 33863

PERMIT/CERTIFICATION
NO. 53-42397

COUNTY: Polk

PROJECT: Sulfuric Acid
Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2
and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a 2,000 TPD double absorption type sulfuric acid plant to be located 2 miles SW of Mulberry, in Polk County, Florida. UTM Coordinates of the proposed plant are 398.41 km east and 3084.2 km north.

Construction shall be in accordance with the attached permit application and plans, documents, and drawings except as otherwise noted in pages 3 and 4 -Specific Conditions.

Attachment :

1. Application to Construct Air Pollution Sources, DER form 17-1.122(16).

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

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 Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court 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 indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

3. 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 non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. 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.

4. As provided in subsection 403.087(6), 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.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. 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 Section 403.111, F.S.

7. In the case of an operation permit, 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.

8. 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, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation 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.

13. This permit also constitutes:

- Determination of Best Available Control Technology (BACT)
- Determination of Prevention of Significant Deterioration (PSD)
- Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

SPECIFIC CONDITIONS:

1. Maximum operation time will be 8,736 hours per year.
2. Maximum production rate will be 2,000 tons per day and 85.1 tons per hour of 100% sulfuric acid.
3. The maximum amount of sulfur dioxide emitted will be 4 lb SO₂/ton 100% H₂SO₄ and 333.4 lb SO₂/hr.
4. The maximum amount of H₂SO₄ mist emitted will be 0.15 lb acid mist/ton 100% H₂SO₄ and 12.5 lb acid mist/hr.
5. Visible emissions shall not exceed 10% opacity.
6. Sulfur dioxide emission of the new sulfuric acid plant shall be continuously monitored in accordance with the provisions of Paragraph 60.84 of 40 CFR 60, Subpart H - Standards of Performance for Sulfuric Acid Plants. The applicant shall also comply with all other applicable requirements of 40 CFR 60, Subpart H. Quarterly reports of excess emissions from this plant will be submitted to the Department's Southwest District Office.
7. Existing sulfuric acid plants permit No. AO 53-5771 will be shut down and any permits for these sources returned to the Department within 3 months after written notification from DER that the compliance test in the new sulfuric acid plant is acceptable.
8. Reasonable precautions to prevent fugitive particulate emissions during construction by spraying roads and construction sites used by contractors, will be taken by the applicant.
9. Construction shall reasonably conform to the plans submitted in the application.
10. The applicant shall report any delays in construction and completion of this plant to the Department's Southwest District Office.
11. Before this construction permit expires, the sulfuric acid plant will be tested for visible emissions, sulfur dioxide and sulfuric acid mist. Test procedures will be EPA reference methods 1,2,3,8, and 9 as published in 40 CFR 60, Appendix A, dated July 1, 1978 or by any other State-approved method. Minimum sample volume and time per run will be as defined in 40 CFR 60, Subpart H. The Department will be notified 30 days in advance of the compliance test. The test will be conducted at permitted production capacity $\pm 10\%$.

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

Specific Conditions (Cont'd)

12. The applicant will demonstrate compliance with the conditions of this construction permit and submit a complete application for an operating permit to the Department's Southwest District Office prior to 90 days before the expiration date of this permit. The applicant may continue to operate in compliance with all terms of this construction permit until its expiration or until issuance of an operation permit.
13. Upon obtaining an operating permit, the applicant will be required to submit periodic test reports on the actual operation and emissions of the facility.
14. Stack sampling facilities will include the eyebolt and angle described in Chapter 17-2.23, F.A.C.

Expiration Date: December 3, 1982

Issued this 16 day of July, 1981

_____ Pages Attached.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Victoria J. ...
Signature

PAGE 4 OF 4

Final Determination

Conserv, Inc.

(PSD-FL-076)

On July 23, 1981, FDER issued a Preliminary Determination that the source could be approved with conditions. The Preliminary Determination was advertised in the Tampa Tribune on August 29, 1981, and made available for inspection at the Bartow Public Library, EPA, Region IV, and the FDER's Offices in Tallahassee and Tampa.

Comments were received from Mr. Tommie A. Gibbs, Chief, Air Facilities Branch and Mr. James T. Wilburn, Chief, Compliance Branch, Enforcement Division, EPA Region IV. EPA questioned the Department's Preliminary Determination in several areas. The areas of question and DER's response are as follows:

Comment 1

Modeling of all SO₂ sources in the vicinity of the proposed modification does not represent the total background. Background should also include "natural and distant non-specified sources" therefore, the total NAAQS analysis should include background plus other major sources plus proposed source impacts.

Response 1

The FDER has customarily assumed a background value of 0 ug/m³ for SO₂ in those areas of the state in which space heating requirements are low and the easterly subtropical flow prevails. However, a conservative background SO₂ concentration attributable to non-specified sources can be estimated from

current monitoring sites in the surrounding region. The annual average from these sites may be used as the background concentration for all averaging times. This may be assumed because the distances from non-specified sources are greater than 50 kilometers. The monitor locations and annual concentrations are listed below.

<u>Monitor Location</u>	<u>Annual Average (ug/m³)</u>	<u>Year</u>
Plant City, Florida	7	1980
Bradley, Florida	7	1980
Mulberry, Florida	3	1980
Bartow, Florida	5	1980

All of these locations are influenced by local sources and thereby give a conservative estimate of the background concentration from distant sources. Nevertheless, the addition of a 7 ug/m³ to the previously computed concentrations in the Conserv modeling will not result in a violation of an applicable ambient air quality standard.

Comment 2

The initial chemical reaction will take place in the furnace of a boiler where the sulfur is burned and converted to SO₂. It is difficult to determine from the preliminary determination whether or not this boiler is also part of the modification. If it is, the type of fuel used should be presented along with emissions calculations and compared to the significance levels for such pollutants as TSP and NO_x.

Response 2

A process flow diagram of a contact sulfuric acid plant (copy attached) shows the process equipment where chemical reactions take place. The waste heat boiler is part of the process equipment. It is designed to recover heat and to cool the gas containing SO_2 to the required converter inlet temperature of $795^\circ\text{--}820^\circ\text{F}$ (catalytic oxidation). Supplementary fuel is not burned in this boiler.

Comment 3

It is recommended that the State permit not be issued until a final federal PSD determination is made, since a source cannot construct until it receives both permits anyway.

Response 3

Pursuant to Chapter 120, Florida Administrative Procedures Act, final agency action must take place within 90 days after a complete application is received.

Comment 4

Our only comment concerns the permitted 2000 tons per day of 100% H_2SO_4 . As cited in Technical Appendix D - Specific Condition No. 3, the maximum allowable operating rate is stated as 85.1 tons/hour of 100% H_2SO_4 . At this hourly production rate, the maximum permitted production rate for the daily basis would be exceeded with a resultant change in the allowable emission rate for sulfuric acid mist and sulfur dioxide.

Response 4

DER has added and corrected the maximum capacity of the plant as follows: 85.1 tons per hour and a daily production of 2000 tons per day of 100% H_2SO_4 .

Final Determination

Conserv, Inc.
Polk County, Florida

Sulfur Acid Plant
Federal Permit Number:
PSD-FL-076

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting
October 1, 1981

Final Determination

Conserv, Inc.

PSD-FL-076

I. PROJECT DESCRIPTION

A. Applicant:

Conserv, Inc.

P. O. Box 314

Nichols, Florida 33863

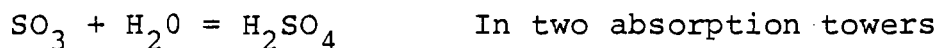
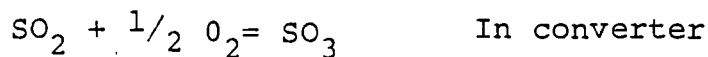
B. Project and Location:

The applicant proposes to construct a 2,000 tons per day (TPD) (100% H₂SO₄ basis) double absorption sulfuric acid plant to replace two existing 750 TPD plants. The new plant will increase Conserv's production of sulfuric acid by 500 TPD.

The plant site is in Polk County at State Road 676, 2 miles southwest of Mulberry, Florida. UTM coordinates are 398.41 km East and 3084.km North.

C. Process and Controls:

The principal steps in the process consist of burning sulfur (S) in air to form sulfur dioxide (SO₂), combining the sulfur dioxide with oxygen (O₂) to form sulfur trioxide (SO₃), and combining the sulfur trioxide with water (H₂O) to form sulfuric acid (H₂SO₄). The chemical reactions are:



The dual absorption process selected by the applicant is the best demonstrated control technology for SO₂ emissions from sulfuric acid plants. The high efficiency acid mist eliminator is the best demonstrated control technology for acid mist emissions. These controls will reduce the total emissions from the proposed source to a level that is in compliance with the federal New Source Performance Standards (NSPS) requirements of 40 CFR 60, Subpart H.

II. RULE APPLICABILITY:

The proposed project, building a new sulfuric acid plant to replace two existing units, is subject to preconstruction review under federal prevention of significant deterioration (PSD) regulations, Section 52.21 of Title 40 of the Code of Federal Regulations (40 CFR 52.21) as amended in the Federal Register of August 7, 1980 (45 FR 52676). Specifically, the new sulfuric acid plant is a major stationary source (40 CFR 52.21(b)(1)) located in an area designated in 40 CFR 81.310 as unclassifiable for the criteria pollutant particulate matter and attainment for the remaining criteria pollutants including SO₂. The plant will increase production from 1500 TPD to 2000 TPD; this will result in a significant net emissions increase of SO₂, thereby rendering it a major modification (40 CFR 52.21(b)(2)) subject to PSD review (40 CFR 52.21(i)).

Full PSD review is required for each pollutant for which a significant net emissions increase would occur. For this modification, the review is required for SO₂ only. The review consists of a determination of best available control technology (BACT) and an analysis of the air quality impact of the increased emissions. The review also includes an analysis of the impact of the proposed project on soils, vegetation, visibility and the air quality impacts resulting from associated commercial, residential and industrial growth.

The proposed project is also subject to the provisions of the federal New Source Performance Standard (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H).

III. SUMMARY OF EMISSIONS AND AIR QUALITY ANALYSIS:

A. Emission Limitations

Table I summarizes the emissions of all pollutants regulated under the Act which are affected by the proposed modification. The contemporaneous emissions reductions of sulfuric acid mist and nitrogen oxides (NO_x) from the existing plants that will be shut down have been credited to the proposed emissions of the new plant. As the table shows, the proposed emissions increase of SO₂ exceeds the significance levels set in the PSD regulations. Although the other regulated pollutants are exempt from a PSD review because their emissions do not increase, they are required to meet all applicable emission limits and standards of performance under the Florida State Implementation Plan and Federal New Source Performance Standards.

Best Available Control Technology (BACT) has been determined for SO₂ emissions from the proposed source. The emission limiting standards selected as BACT and made a condition of this permit are listed in Table II. Justification for the standard selected is included in Technical Appendix A.

The permitted emissions, including those subject to BACT, are in compliance with the Federal New Source Performance Standards (NSPS) requirements of 40 CFR 60, Subpart H.

Table I

Emission Summary

(Tons per Year)

<u>SOURCE</u>	<u>SO₂</u>	<u>Acid Mist</u>	<u>NO_x</u>
A. New Sulfuric Acid Plant	1460 ^a	54.76 ^a	225.5 ^a
B. Existing Sulfuric Acid Plants to be shut down	529.25 ^b	60.84 ^b	380.1 ^b
C. Net Increase from Proposed Construction	+930.75	-5.72 ^c	-157.6 ^c
D. PSD Significance Level	40 ^d	7.0 ^d	40.0 ^d

(a) Permitted allowable emissions (PSD-FL-076) at maximum allowable production rate of 2000 tons per day of 100% H₂SO₄ for 365 days per year.

(b) Applicant's estimate of actual (1979-1980) emissions.

(c) Emissions decrease after the shut down of the existing plants.

(d) 40 CFR 52.21(b)(23).

Table II

Allowable Emission Limits

<u>Pollutant</u>	<u>Pounds per hour</u>	<u>Max. Emission Rate</u>	<u>Basis</u>
Sulfur Dioxide	333.4	4 ^a	NSPS, BACT
Acid Mist	12.5	0.15 ^a	NSPS
Visible Emissions		10% opacity	NSPS, BACT
Nitrogen Oxides	50.8		Documentat- ion of con- temporaneous change

(a) Pounds per ton of 100% H₂SO₄ produced.

B. Air Quality Impacts

An air quality impacts analysis has been performed to evaluate the impact of the proposed project on ambient concentrations of sulfur dioxide. Through the use of dispersion modeling, the analysis considered the impacts of all sulfur dioxide emitting sources within the Conserv plant along with those sources at other facilities surrounding the site which may add to the impact from Conserv.

Results of the analysis provide reasonable assurance that the project, as described in this permit and subject to the conditions herein, will not lead to any violation of National Ambient Air Quality Standards or PSD increments. Details of the analysis are discussed in the Technical Appendix B.

C. Additional Impact Analysis

An additional impacts analysis has been performed to assess (1) the impact of the proposed project on soils, vegetation, and visibility and (2) any air quality impacts resulting from associated commercial, residential, or industrial growth. No adverse impacts are expected; details of the analysis are discussed in Technical Appendix C.

CONCLUSIONS

Based on the review of the data submitted by Conserv, Inc. for the construction of a double absorption type sulfuric acid plant, the FDER concludes that compliance with all applicable federal air quality regulations will be achieved provided certain specific conditions are met. The NSPS emission limits proposed by the applicant of 4 pounds of sulfur dioxide per ton of 100% acid produced, 0.15 pounds of acid mist per ton of 100% acid produced, and 10 percent opacity have been determined to be the Best Available Control Technology (BACT). The impact of the sulfuric acid plant emissions will not cause or contribute to a violation of any ambient air quality standard or PSD increment.

The FDER therefore proposes that an authorization to construct be issued to Conserv, Inc. for the proposed sulfuric acid plant subject to specific conditions to insure compliance with all applicable regulations. Appendix D includes the proposed conditions.

TECHNICAL APPENDIX A

BACT ANALYSIS

The applicant is required under the provisions of 40 CFR 52.21 as revised August 7, 1980 (45 CFR 52676), to apply BACT to all criteria and non-criteria pollutants for which a significant net emissions increase would occur. In this case, only sulfur dioxide is affected.

The applicant proposed double absorption technology and an emission limit of 4.0 pounds of sulfur dioxide per ton of 100% H₂SO₄ produced as BACT for this sulfuric acid plant. This limit meets NSPS requirements (40 CFR 60.82).

EPA recently reviewed available sulfuric acid plant technology and concluded that double absorption remains the best technology for SO₂ emissions control. No basis for reducing the NSPS limit was found to exist. Similarly, no justification could be found by FDER to require a lower emission limit for the proposed plant.

TECHNICAL APPENDIX B

AIR QUALITY ANALYSIS

PSD Increment Analysis

PSD increment analysis pertains only to sulfur dioxide (SO₂) and particulate matter (PM) for which maximum allowable increases (increments) are defined in 40 CFR 52.21(c). These increments provide for future industrial growth while also ensuring that "cleaner" areas of the nation remain relatively clean. The class II PSD increments apply in the area of the Conserv plant.

For the proposed modification (sulfuric acid plant replacement) at the Conserv facility, only one pollutant, SO₂, is subject to PSD review. The emission rate increase of this pollutant is above the significance level defined in 40 CFR 52.21(b)(23).

Two EPA-approved dispersion models, CRSTER and ISC, were used in the PSD increment analysis. The CRSTER model was used for preliminary analysis and the ISC short-term model was used for a more refined analysis. CRSTER was utilized to determine worst-case meteorology over a five year record and to determine annual increment consumption. In the above applications of CRSTER, the conservative assumption of all emissions of Conserv and Mobil Chemicals Co. being colocated was used.

The ISC model was run for all short-term (3-hour and 24-hour) periods using only the days of critical meteorology as determined by previous CRSTER runs. The ISC model is more complex than the CRSTER model in that it allows for greater variation of information in its input and output; e.g., separation

of sources. It is, however, equivalent to CRSTER in regards to the dispersion algorithm.

The meteorological data input to the models for both hourly surface observations and twice-daily mixing heights were that of Tampa, Florida, 1970-1974.

The results of the PSD increment analysis, taking into account all increment consuming sources within a 50 kilometer radius of Conserv, show no violation of any maximum allowable increase.

<u>Pollutant (Avg, Time)</u>	<u>Maximum Increment Consumed</u>	<u>Class II Allowable Increment</u>
SO ₂ (annual)	1 ug/m ³	20 ug/m ³
SO ₂ (24-hour)	27.6 ug/m ³	91 ug/m ³
SO ₂ (3-hour)	88.8 ug/m ³	512 ug/m ³

Preconstruction Monitoring

Under the PSD regulations, FDER may require a period of continuous preconstruction monitoring for any pollutant subject to review. An exemption from this requirement can be obtained if the net emissions increase of the pollutant from the modification would cause, in any area, an air quality impact less than a certain de minimus level as defined in 40 CFR 52.21(1)(8)(i). Using the CRSTER model, the applicant has shown that this exemption is valid for the proposed modification in that the maximum obtained, 10.7 ug/m³, is less than the 13 ug/m³ de minimus level for SO₂ on a 24-hour basis. Therefore, the Department has not required Conserv to conduct preconstruction monitoring as part of the air quality analysis.

National Ambient Air Quality Standards Analysis

The National Ambient Air Quality Standards (NAAQS) are established to protect public health and welfare. PSD regulations require the permit applicant to demonstrate that a proposed emissions increase subject to PSD review will not cause or contribute to any NAAQS violation. For the proposed modification at Conserv, PSD review is required for SO₂.

The maximum annual average ground-level SO₂ concentration was computed using the CRSTER dispersion model. A receptor grid spacing of 0.1 kilometers was used. Two conservative assumptions were made in the input to the model run: one, the collocation of all point sources at Conserv and Mobil; and two, the inclusion of two standby boilers which would be run only when the new plant is shut down.

The 24-hour and 3-hour maximum impacts were determined for selected days of critical meteorology. The ISC short-term dispersion model was used with a receptor spacing of 0.1 kilometers. All significant sources upwind of Conserv were included in the model runs as appropriate. The Mobil plant, which is located in close proximity, was included in all runs. The values obtained were highest second-high concentrations over a five year meteorological record. Included in all cases but one were the two stand-by boilers.

In both the annual and short-term analyses, the background value for SO₂ was assumed to be zero since all sources of SO₂ in the area were included in the modeling. The results of the NAAQS analysis are as follows:

<u>Pollutant (Avg. Time)</u>	<u>Projected Air Quality</u>	<u>NAAQS</u>
SO ₂ (annual)	43.2 ug/m ³	80 ug/m ³
SO ₂ (24-hour)	223.3 ug/m ³	365 ug/m ³
SO ₂ (3-hour)	748.2 ug/m ³	1300 ug/m ³

Class I Area Analysis

The nearest Class I area to the Conserv plant is the Chassahowitzka National Wilderness Area more than 100 kilometers to the northwest. Based on a long-range transport screening procedure contained in the EPA document Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10 (Revised), impact on this area as a result of the proposed modification would be less than the significance level of 1 ug/m³, 24-hour average.

Stack Heights

For the new sulfuric acid plant, the applicant has proposed a stack height consistent with Good Engineering Practice (GEP). The GEP stack height is determined from the formula $h_s = h_b + 1.5a$ where h_b is a building height and "a" is the lesser of the building height or maximum building width. For the Conserv sources, the major obstacle which could produce downwash of the stack effluent is a rock pile 60 feet in height and approximately 110 feet wide. The appropriate GEP stack height of 150 feet was used in all model calculations.

TECHNICAL APPENDIX C
ADDITIONAL IMPACTS ANALYSIS

Impacts on Soils, Vegetation, and Visibility

The maximum impact of the proposed increase in SO₂ emissions, as demonstrated through the air quality analysis, will be below the national secondary air quality standards established to protect public welfare related values. As such, no adverse effect on soils, vegetation, and visibility is expected.

Growth Impacts

The increased production of sulfuric acid by 500 tons per day is the result of replacing existing units. There will be little or no increase in the number of employees at this site due to the modification, and no secondary residential, commercial, or industrial growth which will adversely affect air quality in the area is expected.

TECHNICAL APPENDIX D

SPECIFIC CONDITIONS

FDER proposes a preliminary determination of approval with conditions for the project (construction of a new sulfuric acid plant to replace two existing plants) requested by Conserv, Inc. in the complete PSD permit application submitted on April 23, 1981.

The specific conditions of approval are as follows:

1. The new facility shall be constructed in accordance with the capacities and specifications stated in Table 1.

2. Following start-up and shake-down (180 days maximum) of the new sulfuric acid plant, the existing sulfuric acid plants will cease operation. During the shake-down period, the existing facilities may be operated so long as the combined capacity utilization of the new and existing facilities does not exceed the maximum capacity of the new unit (85.1 tons per hour and a daily production of 2000 tons per day of 100% H₂SO₄).

3. Emission of sulfur dioxide from the sulfuric acid plant shall not exceed 333.4 pounds per hour at the maximum allowable operating rate of 85.1 tons per hour of 100% H₂SO₄. At lower operating rates, the emissions shall not exceed 4 pounds per ton of 100% H₂SO₄ produced.

4. Emission of acid mist from the sulfuric acid plant shall not exceed 12.5 pounds per hour at the maximum allowable operating rate of 85.1 tons per hour of 100% H₂SO₄. At lower operating rates, the emissions shall not exceed 0.15 pounds per ton 100% H₂SO₄.

5. Visible emissions from the sulfuric acid plant shall not exceed 10% opacity.

6. Sulfur dioxide emissions from the sulfuric acid plant shall be continuously monitored in accordance with the provisions of Paragraph 60.84 of 40 CFR 60, Subpart H - Standards of Performance for Sulfuric Acid Plants. The applicant shall also comply with all other requirements of 40 CFR 60, Subpart H.

7. Compliance with all emission limits shall be determined by performance tests scheduled in accordance with the attached General Conditions. Except as provided under 40 CFR 60.8(b), the performance tests shall be conducted in accordance with the provisions of the following reference methods which are described in Appendix A of 40 CFR 60:

- a. Method 1 for sample and velocity traverses;
- b. Method 2 for volumetric flow rate;
- c. Method 3 for gas analysis;
- d. Method 7 for nitrogen oxides;
- e. Method 8 for concentration of SO₂ and acid mist; and
- f. Method 9 for visible emissions.

A compliance test shall consist of the average of three consecutive runs. The maximum sample time and volume per run will be as specified in the NSPS (40 CFR 60.85). The facility shall operate within 10 percent of maximum capacity during sampling. The parameters for the operating rate and control equipment variables and all continuous monitoring results shall be recorded during compliance testing and made a part of the test report.

8. The plant shall be allowed to operate continuously (8736 hours per year).

9. The plant shall comply with the requirements of the attached General Conditions.

10. This permit is not valid until the applicant has received a permit covering the proposed modification issued under the State of Florida SIP. Any emission limits in the State permit which are more stringent than those specified in the conditions above shall become a condition of this permit.

GENERAL CONDITIONS

1. The permittee shall notify the permitting authority in writing of the beginning of construction of the permitted source within 30 days of such action and the estimated date of start-up of operation.
2. The permittee shall notify the permitting authority in writing of the actual start-up of the permitted source within 30 days of such action and the estimated date of demonstration of compliance as required in the specific conditions.
3. Each emission point for which an emission test method is established in this permit shall be tested in order to determine compliance with the emission limitations contained herein within sixty (60) days of achieving the maximum production rate, but in no event later than 180 days after initial start-up of the permitted source. The permittee shall notify the permitting authority of the scheduled date of compliance testing at least thirty (30) days in advance of such test. Compliance test results shall be submitted to the permitting authority within forty-five (45) days after the complete testing. The permittee shall provide (1) sampling ports adequate for test methods applicable to such facility, (2) safe sampling platforms, (3) safe access to sampling platforms, and (4) utilities for sampling and testing equipment.
4. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specified in the specific conditions of this permit for a minimum of two (2) years from the date of recording.
5. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide the permitting authority with the following information in writing within five (5) days of such conditions:
 - (a) Qualitative and quantitative description of noncomplying emission(s),
 - (b) cause of noncompliance,
 - (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,
 - (d) steps taken by the permittee to reduce and eliminate the non-complying emission,and
 - (e) steps taken by the permittee to prevent recurrence of the noncomplying emission.

Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of this report does not constitute a waiver of the emission limitations contained within this permit.

Best Available Copy

6. Any change in the information submitted in the application regarding facility emissions or changes in the quantity or quality of materials processed that will result in new or increased emissions must be reported to the permitting authority. If appropriate, modifications to the permit may then be made by the permitting authority to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein.
7. In the event of any change in control or ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit by letter and forward a copy of such letter to the permitting authority. Such notification must be given prior to transfer of ownership.
8. The permittee shall allow representatives of the State environmental control agency and/or representatives (including contractors) of the Environmental Protection Agency, upon the presentation of credentials:
 - (a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of the permit;
 - (b) to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Act;
 - (c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;
 - (d) to sample at reasonable times and emission of pollutants;and
 - (e) to perform at reasonable times an operation and maintenance inspection of the permitted source.
9. All correspondence required to be submitted by this permit to the permitting agency shall be mailed to the:

Chief, Consolidated Permits Branch
Enforcement Division
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365
10. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

The emission of any pollutant more frequently or at a level in excess of that authorized by this permit shall constitute a violation of the terms and conditions of this permit.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

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



BOB GRAHAM
GOVERNOR
VICTORIA J. TSCHINKEL
SECRETARY

October 1, 1981

Mr. Kent Williams, Chief
New Source Review Section
Air Facilities Branch
U.S. Environmental Protection
Agency, Region IV
345 Courtland Street
Atlanta, Georgia 30365

Dear Mr. Williams:

RE: PSD Permit Application - Conserv, Inc. (PSD-FL-076)

Enclosed please find a copy of the proof of publication of the public notice, the public comments and the Department's response to the public comments and Final Determination for the subject project. We recommend that the applicant be granted Authority to Construct, subject to the conditions in the Final Determination.

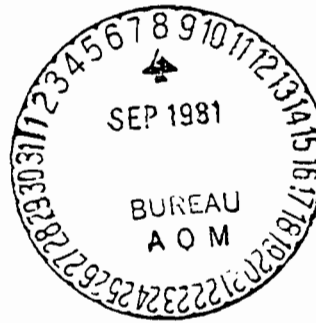
Sincerely,

C. H. Fancy, P.E.
Central Air Permitting

CHF:caa

THE TAMPA TRIBUNE

Published Daily
Tampa, Hillsborough County, Florida



State of Florida }
County of Hillsborough } ss.

Before the undersigned authority personally appeared R. F. Pittman, who on oath says that he is Publisher 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 Conserv, Inc. proposes to replace two existing sulfuric acid plants with a new double absorption type sulfuric acid plant at their chemical complex in Polk County, Florida.

was published in said newspaper in the issues of August 29, 1981

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.

A. D. Arman

Sworn to and subscribed before me, this 31st day of August A.D. 19 81.

A. Michelle Ingram

Notary Public State of Florida at Large
My Commission Expires Aug. 7, 1983.

(SEAL)

Public Notice
Conserv, Inc. proposes to replace two existing sulfuric acid plants with a new double absorption type sulfuric acid plant at their chemical complex in Polk County, Florida. The new plant will have a maximum production rate of 2,000 tons of 100% sulfuric acid per day. The modification will increase emissions of sulfur dioxide by 930.75 tons per year.

By authority of the U.S. Environmental Protection Agency, the Florida Department of Environmental Regulation (FDER) has reviewed the proposed modification under federal prevention of significant deterioration (PSD) regulations (40 CFR 52.21). The FDER has made a preliminary determination that the modification can be approved provided certain conditions are met. A summary of the basis for this determination and the application for a permit submitted by Conserv, Inc. are available for public review in the Bartow Public Library, Bartow, Florida, and the following FDER Offices:

Southwest District, 7601 Highway 301 North, Tampa, Florida 33601

Bureau of Air Quality Management, 2600 Blair Stone Road, Tallahassee, Florida 32301

The maximum percentage of allowable PSD increment consumed by the proposed modification is as follows:

SO2	Percent of Class II Increment Consumed	
	Annual 24-Hour	3-Hour
	5	17

Any person may submit written comments to FDER regarding the proposed modification. All comments postmarked not later than 30 days from the date of this notice will be considered by FDER in making a final determination regarding approval of this modification. These comments will be made available for public review at the above mentioned Department Offices. Furthermore, a public hearing can be requested by any person. Such requests should be submitted within 15 days of the date of this notice. Letters should be addressed to:

Mr. Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301
M3110 Aug. 29, 1981

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
From: _____	Date: _____	
Reply Optional []	Reply Required []	Info. Only []
Date Due: _____	Date Due: _____	

TO: Bill Thomas/Willard Hanks

FROM: Bob Garrett *RG*

DATE: July 7, 1981

SUBJECT: Proposed Construct Permit - Conserv, Sulfuric Acid Plant

For the record, prior to and in 1978, the Department has received some complaints from the Nichols area which is influenced by Conserv's Chemical Plant, Mobil's rock dryers, and New Wales Chemical Plants. During the month of January this year our Nichols ambient air station received higher than normal (45 to 131 micrograms/cubic meter) SO₂ measurements. The meteorological group has detailed data on this phenomenon from this office. See attachments - a microanalysis in addition to the general models run might reveal an SO₂ problem of a specific nature.

We have no objection to the issuance of this permit for a DC/DA plant which in general is an improvement over the older existing scrubbed sulfuric acid plants. Their steady state emission output is much more reliable and would tend to preclude incidences such as the January '81 high SO₂ concentrations mentioned.

RRG/rkt

Return to Teresa

Attachments

TO: The Files

Thru: Harry Kerns / Dan Williams

Fr: Bob Garrett / Steve Thompson

Subj: Complaint Investigation of SO₂ plant damage on 9 & 10 May '78
in The Nichols area.

Summary: A complaint was received from Mr. Whitten at
noon on 5/12/78 which was investigated by Mr. Thompson
and Mr. Garrett from The DER. The complaint was for
damage to Mr. Whitten and ^{his} neighbor's garden which
was determined to have been caused by excessive SO₂ gas
and/or acid mists. The three phosphate plants under
suspicion in the Nichols area were investigated and
records were examined for the 10th, 11th & 12th of May for
upsets to any SO₂ emitters. No dramatic
incidents were discovered from plant records, but
severe nighttime inversions caused a meteorological
concentration of pollutants.

③ 1-22-81 $Q=147$ $C=1.7(147)=250 \text{ } \mu\text{g}/\text{cm}$

Metereological Contributions:

① 1-10-81 $\frac{23}{24} \text{ hrs} \times 22 \text{ } \mu\text{g}/\text{cm} = 21 \text{ } \mu\text{g}/\text{cm}$

1-16-81 $(\frac{4}{24})(68) + \frac{7}{24}(80) + \frac{10}{24}(22) = 43.8 \text{ } \mu\text{g}/\text{cm}$

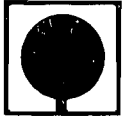
② 1-10-81 $\frac{23}{24}(34.6) + \frac{23}{24}(66) = 96.4 \text{ } \mu\text{g}/\text{cm}$

1-16-81 $\frac{21}{24}(17.7) + \frac{21}{24}(66.8) = 73.9 \text{ } \mu\text{g}/\text{cm}$

③ 1-22-81 $\frac{6}{24}(250) = 62.5 \text{ } \mu\text{g}/\text{cm}$

Comparisons:

	<u>Nickol's Sta. $\mu\text{g}/\text{cm}$</u>	<u>Gaussian Estimates</u>
1-10-81	45	117.4
→ 1-16-81	131	117.7
1-22-81	62	62.5



Conserv

P.O. BOX 314 · NICHOLS, FLORIDA 33863 · (813) 425-1164

RONALD E. GRAF
VICE PRESIDENT
GENERAL MANAGER

June 17, 1981



State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, Florida 32301

Attention: Mr. Willard Hanks
Bureau of Air Quality Management

Re: Application for Permit to
Construct a Sulfuric Acid Plant
Permit/Certification No. 53-42397

Gentlemen:

We have received and reviewed copies of the Technical Evaluation and Preliminary Determination, BACT Determination and proposed permit to construct a sulfuric acid plant at our Polk County facility. Please be advised that Conserv finds the provisions and stipulations of the proposed permit in order and has no comments to submit.

We appreciate DER's efforts, to date, in expediting the review of the application for permit to construct. As a result of Governor Graham's personal interest and support in Conserv's proposed construction of a high energy efficient sulfuric acid plant with its significant cogeneration capabilities and the added support of the Florida Department of Energy Conserv was able to negotiate a cogeneration agreement in Florida with a utility, Tampa Electric Company, thereby making a significant contribution to the production of energy from waste heat and coincidentally reducing emissions from a coal-fired utility. This, to my knowledge, is a first for Florida.

Our present schedule for commencement of construction is July 15, 1981. Delays past that point will become additionally expensive due to interest payments on this \$34,000,000 job. I respectfully request as expeditious handling of the construction permit approval as is practicable to EPA.

Sincerely,

REG:bem

cc: T. T. Houston
E. T. L. Borie

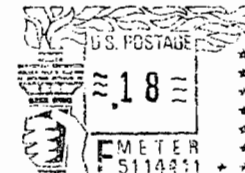
Department of Philipp Brothers Division

PHIBRO CORPORATION



Conserv Department of Philipp Brothers Division

PHIBRO CORPORATION
P.O. BOX 314 · NICHOLS, FLORIDA · TEL. (813) 425-1164



State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, Florida 32301

.. Mr. Willard Hanks
Bureau of Air Quality Management

THE TAMPA TRIBUNE

Published Daily
Tampa, Hillsborough County, Florida

State of Florida }
County of Hillsborough } ss.

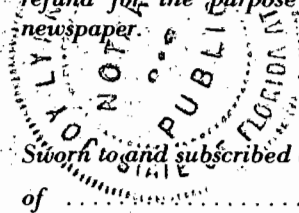
Before the undersigned authority personally appeared G. T. Gleason, who on oath says that he is Controller of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a

-----LEGAL NOTICE-----

in the matter of Notice that the Fla. Dept. of Environmental Regulation has received an application from and intends to issue a construction permit to Consery, Inc.

was published in said newspaper in the issues of June 12, 1981

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 24th day of June, A.D. 1981

Joy Lynn Kibler

Notary Public State of Florida at Largo
My Commission Expires Oct. 25, 1982.

(SEAL)

CONSTRUCTION NOTICE
The Florida Department of Environmental Regulation (DER) has received an Application from and intends to issue a Construction Permit to Consery, Inc. for the construction of a sulfuric acid plant to be located at their chemical complex near Mulberry, in Polk County, Florida. A Determination of Best Available Control Technology was required. Copies of the Applications, BACT Determination, Technical Evaluation, and Departmental intent are available for inspection at the following offices:
DER Southwest District
7601 Highway 301 North
Tampa, Florida 33610
DER Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301
Comments on this action shall be submitted in writing to: Willard Hanks of the Tallahassee Office, within 30 days of this notice.
M2763 June 12, 1981

\$39.00

The Florida Department of Environmental Regulation (DER) has received an Application from and intends to issue a Construction Permit to Conserv, Inc. for the construction of a sulfuric acid plant to be located at their chemical complex near Mulberry, in Polk County, Florida. A Determination of Best Available Control Technology was required. Copies of the Applications, BACT Determination, Technical Evaluation, and Departmental Intent are available for inspection at the following offices:

DER Southwest District
7601 Highway 301 North
Tampa, Florida 33610

DER Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Comments on this action shall be submitted in writing to Willard Hanks of the Tallahassee Office, within 30 days of this notice.

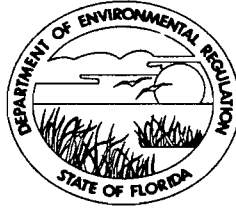
To appear in Tampa Tribune on June 12, 1981.

to purchasing 6/5/81

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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



BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

TO: Mr. R.E. Graf, Vice President General Manager, Conserv
Mr. William Hennessey, Southwest District

FROM: Steve Smallwood, Chief, Bureau of Air Quality Management

DATE: June 2, 1981

SUBJ: Conserv, Application for Permit to Construct a Sulfuric
Acid Plant.

Attached is one copy of the application, Technical Evaluation and Preliminary Determination, BACT Determination and proposed permit to construct a sulfuric acid plant to be located at the Conserv facility in Polk County, Florida.

Please submit any comments which you wish to have considered concerning this action, in writing, to Willard Hanks of the Bureau of Air Quality Management.

SS:dav

Public Notice

The Department intends to issue a permit to Conserv for the construction of a sulfuric acid plant at their chemical complex in Polk County. The permit will include conditions to assure compliance with Chapter 17-2 Florida Administrative Code (F.A.C.).

Any person wishing to file comments on this proposed action may do so by submitting such comments in writing to:

Mr. Willard Hanks
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Any comments received within thirty days after publication of this notice will be considered and noted in the Department's final determination.

Any person whose substantial interest would be affected by the Department's intended action on this permit may request an administrative hearing by filing a petition as set forth in Section 28-5.15 F.A.C. within 14 days of the date of this notice with:

Ms. Mary Clark
Office of General Counsel
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Technical Evaluation
and
Preliminary Determination

Conserv, Inc.
Polk County, Florida

Sulfuric Acid Plant
Application Number:
AC 53-42397

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting
June 2, 1981

I. PROJECT DESCRIPTION

A. Applicant

Conserv, Inc.
P. O. Box 314
Nichols, Florida 33863

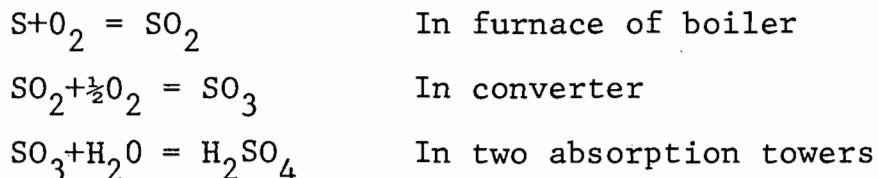
B. Project and Location

The applicant proposes to replace two existing sulfuric acid plants with a new double absorption unit equipped with a mist eliminator. The plant will have a maximum production rate of 2,000 tons of 100% sulfuric acid per day.

The plant site is two miles SW of Mulberry, Polk County, Florida. UTM Coordinates are 398.41 km East and 3084.2 km North.

C. Process and Controls

The principal steps in the process consist of burning sulfur (S) in air to form sulfur dioxide (SO₂), combining the sulfur dioxide with oxygen (O₂) to form sulfur trioxide (SO₃), and combining the sulfur trioxide with water (H₂O) to form a solution containing sulfuric acid (H₂SO₄). The chemical reactions are:



The dual absorption process selected by the applicant is the best demonstrated control technology for SO₂ emissions from sulfuric acid plants. The high efficiency acid mist eliminator is the best demonstrated control technology for acid mist emissions. These controls will reduce the total emissions from the proposed sources to a level that it is in compliance with New Source Performance Standards (NSPS) requirements (40 CFR 60, Subpart H) and State regulations.

II. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code.

The proposed project location is in the area of influence of the Hillsborough County particulate matter nonattainment area; however, the proposed plant will not emit particulate matter, and is therefore exempt from the provisions of Section 17-2.17, New Source Review for Nonattainment Areas. The proposed location is in an area designated "unclassifiable" for the criteria pollutant particulate matter and attainment for the remaining criteria pollutants including sulfur dioxide.

The source is a major emitting facility for sulfur dioxide, nitrogen oxides, and sulfuric acid mist as defined in Chapter 17-2, because the potential emissions are greater than 100 tons per year (TPY). The project is subject to the provisions of Subsection 17-2.05(6) Table II, Emission Limiting Standards, and Subsection 17-2.04(6) Prevention of Significant Deterioration PSD Review which requires the use of Best Available Control Technology (BACT).

The source is also subject to the provisions of the federal New Source Performance Standard (NSPS) for sulfuric acid plants, 40 CFR 60, Subpart H. This NSPS has been adopted by reference in Section 17-2.21.

III. SUMMARY OF EMISSIONS AND AIR QUALITY ANALYSIS:

A. Emission Limitations

The regulated pollutant emissions from the sulfuric acid plant are sulfur dioxide, acid mist and opacity. Organic compounds, nitrogen oxides, nitrosyl sulfuric acid and water vapor may also be present in the emissions from the plant.

Best Available Control Technology (BACT) has been determined in accordance with Section 17-2.03 for sulfur dioxide, sulfuric acid mist and visible emissions from the proposed source. The emission limiting standards selected as BACT and made permit conditions are listed below. Justification for the standards selected is included in Technical Appendix A (attached).

Pollutant	Emission Limiting Standards (lb/ton of 100% H ₂ SO ₄ produced)	Emission Rate (lb/hr)
Sulfur Dioxide	4	333.4
Acid Mist	0.15	12.5
Visible Emission	10% opacity	

Table I
Emission Summary
(Tons per year)

<u>Source</u>	<u>SO₂</u>	<u>Acid Mist</u>	<u>NO_x</u>
A. New Construction			
New Sulfuric Acid Plant			
Potential Emission (1)	1460	621	222.5
Allowable Emission (2)	1460	54.8	222.5
B. Existing Sulfuric Acid Plants that will be shut down (3)	529.25	60.48	380.1
C. Emission Decrease from shut down (4)	0	-5.72	-157.6
D. Emission Increase from Proposed Construction	930.75	0	0

(1) Potential emissions (as defined in Chapter 17-2)

(2) Permitted emissions (Permit AC 53-42397)

(3) Permitted emissions (Permit AO 53-5771)

(4) Emissions decrease after the shut down of the existing plants as estimated by the applicant.

Table I summarizes the emissions of all pollutants which are affected by the proposed construction.

The permitted emissions, including those determined as BACT, are in compliance with all applicable requirements of Chapter 17-2 including the adopted New Source Performance Standards (NSPS) requirements of 40 CFR 60, Subpart H.

B. Air Quality Analysis

An air quality analysis has been performed to evaluate the impact of the proposed project on ambient concentrations of SO₂. Through the use of dispersion modeling, the analysis considered the impacts of all SO₂ emitting sources within 50 km of Conserv along with those large sources outside of 50 km (e.g. Florida Power, Bartow Plant).

Results of the analysis provide reasonable assurance that the project, as described in the permit and subject to the conditions therein, will not lead to any violation of Florida ambient air quality standards or PSD increment. Details of the analysis are discussed at length in the Conserv's application to construct a sulfuric acid plant, dated on April 10, 1981 and revised in May, 1981.

IV. CONCLUSIONS

The emission limits requested by the applicant of 4 pounds of sulfur dioxide per ton of acid produced, 0.15 pounds of acid mist per ton of acid produced, and 10 percent opacity have been determined to be BACT and can be achieved by the proposed plant.

The permitted emissions from the plant, while the plant is at its maximum production rate of 2,000 TPD sulfuric acid, will not cause or contribute to any violation of ambient air quality standards or PSD increments.

The General and Specific Conditions listed in the proposed permit (attached) will assure compliance with all applicable requirements of Chapter 17-2.

TECHNICAL APPENDIX A

BACT ANALYSIS

A determination of BACT for the Conserv's sulfuric acid plant was made by the Department on May 20, 1981. A copy of this BACT determination follows.

Best Available Control Technology (BACT) Determination

CONSERV

Polk County, Florida

The applicant proposes to replace two existing sulfuric acid plants with one new 2000 ton per day (TPD) plant at their phosphate processing facility located in Nichols, Florida. The installation will result in a net increase of 500 TPD of sulfuric acid. The applicant purchases this incremental amount of acid to supplement process requirements, therefore product output will remain status quo. The plant will operate 8760 hours per year. Sulfur dioxide emissions will be controlled by use of the dual absorption process and the use of high efficiency acid mist eliminators to control acid mist.

BACT Determination Requested by the Applicant:

<u>Pollutant</u>	<u>Emission Limit</u>
Sulfur Dioxide	4 lb/ton
Acid Mist	0.15 lb/ton

Date of Receipt of the BACT Application:

April 23, 1981

Date of Publication in the Florida Administrative Weekly:

May 22, 1981

Review Group Members:

There have been no changes in the New Source Performance Standards for sulfuric acid plants to justify a formal review group. Comments were obtained from the New Source Review Section and the Air Modeling Section.

BACT Determination by DER:

<u>Pollutant</u>	<u>Emission Limit</u>
Sulfur Dioxide	4.0 lb/ton 100% sulfuric acid
Acid Mist	0.15 lb/ton 100% sulfuric acid
Visible Emissions	Maximum 10% opacity

Page Two

Justification of DER Determination:

The limits agree with NSPS, 40 CFR 60, Subpart H and with previous Department determinations for similar installations.

Details of the Analysis May Be Obtained by Contacting:

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

Recommended By:

CTA Jency
for Steve Smallwood, Chief, BAQM

Date:

5/18/81

Approved:

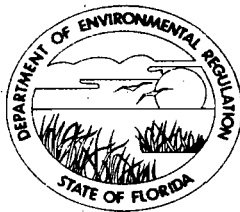
Victoria J. Tschinkel
Victoria J. Tschinkel, Secretary

Date:

May 20, 1981

SS:dav

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



BOB GRAHAM
GOVERNOR
JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Conserv
P. O. Box 314
Nichols, Florida 33863

PERMIT/CERTIFICATION
NO. 53-42397

COUNTY: Polk

PROJECT: Sulfuric Acid
Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a 2,000 TPD double absorption type sulfuric acid plant to be located 2 miles SW of Mulberry, in Polk County, Florida. UTM Coordinates of the proposed plant are 398.41 km east and 3084.2 km north.

Construction shall be in accordance with the attached permit application and plans, documents, and drawings except as otherwise noted in pages 3 and 4 -Specific Conditions.

Attachment:

1. Application to Construct Air Pollution Sources, DER form 17-1.122(16).

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

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 Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court 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 indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.
3. 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 non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. 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.
4. As provided in subsection 403.087(6), 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.
5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.
6. 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 Section 403.111, F.S.
7. In the case of an operation permit, 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.
8. 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, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.
9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.
10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.
11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.
12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation 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.
13. This permit also constitutes:
 - Determination of Best Available Control Technology (BACT)
 - Determination of Prevention of Significant Deterioration (PSD)
 - Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

SPECIFIC CONDITIONS:

1. Maximum operation time will be 8,736 hours per year.
2. Maximum production rate will be 2,000 tons per day and 85.1 tons per hour of 100% sulfuric acid.
3. The maximum amount of sulfur dioxide emitted will be 4 lb SO₂/ton 100% H₂SO₄ and 333.4 lb SO₂/hr.
4. The maximum amount of H₂SO₄ mist emitted will be 0.15 lb acid mist/ton 100% H₂SO₄ and 12.5 lb acid mist/hr.
5. Visible emissions shall not exceed 10% opacity.
6. Sulfur dioxide emission of the new sulfuric acid plant shall be continuously monitored in accordance with the provisions of Paragraph 60.84 of 40 CFR 60, Subpart H - Standards of Performance for Sulfuric Acid Plants. The applicant shall also comply with all other applicable requirements of 40 CFR 60, Subpart H. Quarterly reports of excess emissions from this plant will be submitted to the Department's Southwest District Office.
7. Existing sulfuric acid plants permit No. AO 53-5771 will be shut down and any permits for these sources returned to the Department within 3 months after written notification from DER that the compliance test in the new sulfuric acid plant is acceptable.
8. Reasonable precautions to prevent fugitive particulate emissions during construction by spraying roads and construction sites used by contractors, will be taken by the applicant.
9. Construction shall reasonably conform to the plans submitted in the application.
10. The applicant shall report any delays in construction and completion of this plant to the Department's Southwest District Office.
11. Before this construction permit expires, the sulfuric acid plant will be tested for visible emissions, sulfur dioxide and sulfuric acid mist. Test procedures will be EPA reference methods 1,2,3,8, and 9 as published in 40 CFR 60, Appendix A, dated July 1, 1978 or by any other State-approved method. Minimum sample volume and time per run will be as defined in 40 CFR 60, Subpart H. The Department will be notified 30 days in advance of the compliance test. The test will be conducted at permitted production capacity $\pm 10\%$.

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

Specific Conditions (Con't)

12. The applicant will demonstrate compliance with the conditions of this construction permit and submit a complete application for an operating permit to the Department's Southwest District Office prior to 90 days before the expiration date of this permit. The applicant may continue to operate in compliance with all terms of this construction permit until its expiration or until issuance of an operation permit.
13. Upon obtaining an operating permit, the applicant will be required to submit periodic test reports on the actual operation and emissions of the facility.
14. Stack sampling facilities will include the eyebolt and angle described in Chapter 17-2.23, F.A.C.

Victoria J. Tschinkel,
Secretary

Expiration Date: December 3, 1982

Issued this _____ day of _____, 19_____.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

_____ Pages Attached.

Signature

PERMIT NO.: AC 53-42397
APPLICANT: Conserv

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 Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court 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 indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.
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5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.
6. 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 Section 403.111, F.S.
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8. 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, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.
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12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation 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.
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 - Determination of Prevention of Significant Deterioration (PSD)
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PERMIT NO.: AC 53-42397
APPLICANT: Conserv

Specific Conditions (Con't)

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Victoria J. Tschinkel,
Secretary

Expiration Date: December 3, 1982

Issued this _____ day of _____, 19_____.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

_____ Pages Attached.

Signature



**PREVENTION OF SIGNIFICANT DETERIORATION
REVIEW APPLICATION
AND
APPLICATION TO CONSTRUCT
PROPOSED SULFURIC ACID PLANT
POLK COUNTY, FLORIDA**

**CONSERV
NICHOLS, FLORIDA**

VOLUME I

**WH&A Job No. 2777
April 1981**



WALK, HAYDEL & ASSOCIATES, INC.

ENGINEERS

NEW ORLEANS · MOBILE · BATON ROUGE

WALK, HAYDEL & ASSOCIATES, INC.

ENGINEERING CONSULTANTS AND DESIGNERS

NEW ORLEANS, LOUISIANA, U. S. A.

May 8, 1981

DESIGN AND ENGINEERING SUPERVISION
OF INDUSTRIAL FACILITIES

COMPLETE PLANTS
ADDITIONS
MODERNIZATIONS

FACILITIES EVALUATIONS
ECONOMIC SURVEYS AND REPORTS

MAIN OFFICES
600 CARONDELET STREET 70130
TELEPHONE 504-586-8111
CABLES "WALHAY"

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

Attention: Mr. Dan Williams



L-6

Re: PSD Review for Conserv
Our File No. 2777-32

Gentlemen:

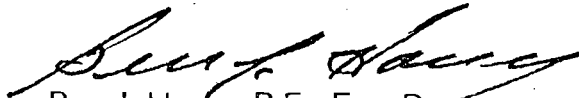
On April 14, 1981 copies of an air emission construction permit application for a proposed sulfuric acid plant at Conserv's Nichols, Florida facility were submitted to your office. In order to expedite the application review process, the application documents were submitted prior to receiving the level of review that is standard operating procedure for Walk, Haydel & Associates, Inc. As a consequence, some typographical errors have been found in the document which have since been corrected.

Enclosed for your files are two copies of the revised Volume I of the "Prevention of Significant Deterioration Review Application and Application to Construct". As noted above, this revised Volume I is not substantively different from the previous submittal with the exception of containing fewer typographical errors.

We trust the enclosed will be helpful for your review. If there are any questions, please do not hesitate to contact us.

Very truly yours,

WALK, HAYDEL & ASSOCIATES, INC.


Ben J. Haney, P.E., Eng. D.

BJH/bh

cc: Mr. T. Rogers (3 copies)
Mr. T. Houston - Conserv (2 copies)

DER PERMIT APPLICATION TRACKING SYSTEM MASTER RECORD

FILE#000000042397 COE#	DER PROCESSOR:THOMAS	DER OFFICE:TLH
FILE NAME:CONSERV	DATE FIRST REC: 04/23/81	APPLICATION TYPE:AC
APPL NAME:R. E. GRAF	APPL PHONE:(813)425-1164	PROJECT COUNTY:53
ADDR:P. O. BOX 314	CITY:NICHOLS	ST:FLZIP:33863
AGNT NAME:FORREST E. DRYDEN	AGNT PHONE:(504)586-8111	
ADDR:600 CARONDELET ST.	CITY:NEW ORLEANS	ST:LAZIP:70130

ADDITIONAL INFO REQ: / / / / / / REC: / / / / / /
 APPL COMPLETE DATE: / / COMMENTS NEC:Y DATE REQ: / / DATE REC: / /
 LETTER OF INTENT NEC:Y DATE WHEN INTENT ISSUED: / / WAIVER DATE: / /

HEARING REQUEST DATES: / / / / / /
 HEARING WITHDRAWN/DENIED/ORDER -- DATES: / / / / / /
 HEARING ORDER OR FINAL ACTION DUE DATE: / / MANUAL TRACKING DESIRED:N

THIS RECORD HAS BEEN SUCCESSFULLY ADDED 04/24/81 09:08:30
 FEE PD DATE#1:04/23/81 \$0020 RECEIPT#00033569 REFUND DATE: / / REFUND \$
 FEE PD DATE#2: / / \$ RECEIPT# REFUND DATE: / / REFUND \$
 APPL:ACTIVE/INACTIVE/DENIED/WITHDRAWN/TRANSFERRED/EXEMPT/ISSUED:AC DATE:04/23/81
 REMARKS: NEW DOUBLE ABSORPTION SULFURIC ACID PLANT (2000 TPD) W/MIST ELIMIN-
 ATORS TO REPLACE TWO EXISTING PLANTS (1500 TPD COMBINED). ONLY SO2 EMISSIONS TO
 INCREASE, BY 930 TPY. UTM = 7398410E/3084200N. LAT/LONG = 80.2.0.N/27.55.0.W.

3 copies of PSD Review Application and Application to construct.
 (only one signed). Sent from SW. District. Also includes 8 large
 volumes of modeling output.

- 1 copy to Review Engineer
- 1 copy to Meteorology
- 1 copy to CAPS File (signed copy)

More copies made: 6.
 To: E. Palogyi (U)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Nº 33569

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from CONSERVE Date April 23, 1981

Address P.O. Box 314 Nichols, Florida 33263 Dollars \$ 20⁰⁰

Applicant Name & Address R. E. Graf, (above)

Source of Revenue _____

Revenue Code 0101 Application Number AC. 53-42397

By Tim Powell

WALK, HAYDEL & ASSOCIATES, INC.

ENGINEERING CONSULTANTS AND DESIGNERS
NEW ORLEANS, LOUISIANA, U. S. A.

DESIGN AND ENGINEERING SUPERVISION
OF INDUSTRIAL FACILITIES

COMPLETE PLANTS
ADDITIONS
MODERNIZATIONS

FACILITIES EVALUATIONS
ECONOMIC SURVEYS AND REPORTS

MAIN OFFICES
600 CARONDELET STREET 70130
TELEPHONE 504-586-8111
CABLES "WALHAY"

April 14, 1981

State of Florida
Department of Environmental Regulation
Southwest District
7601 Highway 301 N.
Tampa, Florida 33610



Attention: Mr. Dan Williams

L-4
Re: PSD Review For Conserv
Our File No. 2777-32

Gentlemen:

Conserv is applying for Federal and State of Florida permission to construct a 2,000 ton per day sulfuric acid plant at their present location. This application is submitted in compliance with Federal Prevention of Significant Deterioration of Air Quality (PSD) regulations and State of Florida air rules. A review of this application is requested according to Federal PSD guidelines due to the intent of the State of Florida to amend their current regulations in the near future to reflect Federal PSD rulings. This application was developed in cooperation with Federal and State of Florida authorities and in conjunction with their requirements.

The facility proposed will employ the best available control technology (BACT) as determined by the EPA and will meet or supersede all emissions limitations under Federal and State of Florida regulations. An analysis of increment consumption and ambient air impact were performed by dispersion modeling techniques and these analyses indicate that no standards or limitations will be exceeded. It is concluded that Conserv will be in compliance with all required regulations and air quality rules.

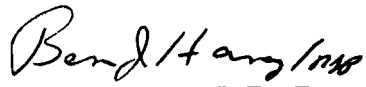
Due to the confidential nature and proprietary content of Figure 2 in Volume 1, Monsanto Enviro-Chem Systems, Inc. has requested that this figure be given attention as confidential and placed in the confidential files of the Florida DER.

Conserv is requesting an expeditious review of their application due to compliance of the proposed facility with all regulations and due to their anticipation of construction in the near future. Please find the twenty dollars enclosed for the application fee.

We trust the enclosed document satisfies your needs. If there are any questions, please do not hesitate to contact us.

Very truly yours,

WALK, HAYDEL & ASSOCIATES, INC.

A handwritten signature in black ink that reads "Ben J. Haney". The signature is written in a cursive style with a large initial "B".

Ben J. Haney, P.E., Eng. D.

Enclosures

BJH/bh

PHIBRO NYK CLG 4 14 81

CONSERV
NICHOLS FLA

ATTENTION: MR. R. E. GRAF

URGENT RUSH RUSH RUSH URGENT

THIS HEREBY AUTHORIZES MR. RONALD E. GRAF, VICE PRESIDENT,
GENERAL MANAGER OF CONSERV DEPARTMENT OF PHILIPP BROTHERS
TO SIGN APPLICATION TO CONSTRUCT THE PROPOSED SULFURIC ACID
PLANT.

E. S. MACMICHAEL
GROUP VICE PRESIDENT
PHILIPP BROTHERS

PHIBRO NYK

CORRECTION: 2ND LINE - 2ND WORD SHOULD READ "MANAGER"

ENDS 1 PCS

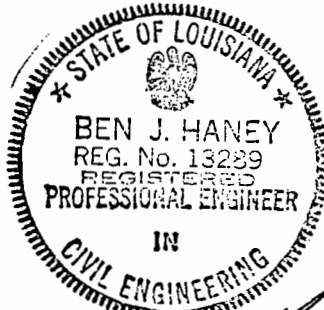
CONSERV NICH

P

PREVENTION OF SIGNIFICANT
DETERIORATION REVIEW APPLICATION
AND
APPLICATION TO CONSTRUCT

PROPOSED SULFURIC ACID PLANT
POLK COUNTY, FLORIDA

CONSERV
Nichols, Florida



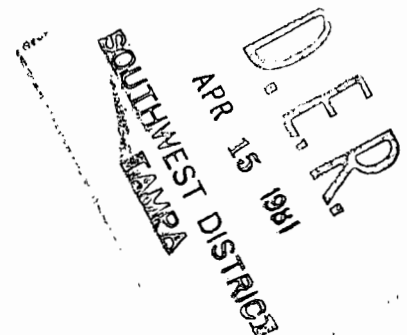
Prepared by:

Michael E. Neal
Michael E. Neal

Reviewed and Approved by:

Ben J. Haney
Ben J. Haney, P.E., Eng. D.

WH&A Job No. 80-2777
April 10, 1981



CONSERV
NICHOLS, FLORIDA

WH&A Job No. 80-2777

PREVENTION OF SIGNIFICANT
DETERIORATION REVIEW APPLICATION
AND
APPLICATION TO CONSTRUCT

PROPOSED SULFURIC ACID PLANT
POLK COUNTY, FLORIDA

April 10, 1981

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NICHOLS FLA
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I.0 INTRODUCTION

1.0 INTRODUCTION

Pursuant to compliance with Federal Prevention of Significant Deterioration of Air Quality (PSD) regulations (40 CFR 52.21) and State of Florida air regulations, Conserv is applying for Federal and State permission to construct a 2000 ton per day (TPD) sulfuric acid plant at their present location. This application will address all required items under the newly promulgated amendments to Federal PSD regulations (August 7, 1980) and State of Florida air regulations. Conserv is requesting a Federal PSD rule review by the review authorities due to the intent of the State of Florida to amend their current regulations in several important areas in the near future to reflect Federal PSD guidelines. Conserv will, however, maintain all limits and standards for significance, increment consumption, and ambient air as currently held by the State of Florida regulations. This application will provide the necessary data and information to demonstrate that Conserv will be in compliance with all required regulations at both the State and Federal level.

The modification to Conserv's facilities will be considered major only for the emission of sulfur dioxide (SO_2) from the list of criteria or non-criteria pollutants. Therefore, this application will address only this pollutant in detail and all dispersion model cases will indicate the dispersion of this pollutant.

Conserv is proposing to construct a 2000 ton per day sulfuric acid plant at their existing facility site in Nichols, Florida (Figure 1). The proposed facility will replace two 750 TPD sulfuric acid plants at the same site. It should be noted that no increase in production or operational procedures of other facilities will result from this modification (1500 TPD to 2000 TPD) since Conserv must currently purchase approximately 500 TPD of acid to meet their process requirements. The new plant will incorporate double absorption towers, acid mist eliminators, and cogeneration capabilities (Figure 2).

2.0 LOCATION

2.0 LOCATION

The Conserv facilities complex is located near Nichols, Florida in Polk County at Universal Transverse Mercator (UTM) coordinates 398.41 kilometers east and 3084.2 kilometers north (See Figure 3). The Mobil facilities are closest to Conserv (1 KM) to the northwest and Kaiser is the next plant site at a distance of 4 kilometers to the northeast.

3.0 PROPOSED FACILITY

3.0 PROPOSED FACILITY

Conserv is proposing to construct a 2000 ton per day (100% H_2SO_4 Basis) double absorption sulfuric acid plant (See Figure 2). The newer plant will modify Conserv's facilities by a net increase of 500 TPD of sulfuric acid produced since it will replace two 750 TPD sulfuric acid plants. This additional production will not increase in any form the production or operation of other facilities at this site.

The new plant will be a contact process incorporating three major operations: (1) burning of elemental sulfur, (2) the catalytic oxidation of sulfur dioxide to sulfur trioxide, and (3) absorption of SO_3 by strong acid. Sulfur will first be burned with predried air to form a gas mixture of sulfur dioxide, oxygen, and nitrogen. Sulfur dioxide is then oxidized in the presence of a catalyst in the converter. The converter will receive a gas stream containing 12% SO_2 and will perform a 99.7% conversion of SO_2 to SO_3 . Gas to gas heat exchange cools the gas exiting the converter before the SO_3 is conveyed to the absorption tower where it is absorbed in approximately 96% sulfuric acid.

The plant design calls for maximum efficiency in energy conservation and recovery, economy, and environmental protection. Primary and secondary economizers will be incorporated in the heat recovery section in conjunction with a waste heat boiler, superheater, and cogeneration of electricity facilities. Two Monsanto mist eliminators will reduce the acid mist emissions from the absorption process and one mist eliminator will be installed for the drying tower. Emissions of sulfur dioxide will be maintained at less than 4 LB. SO_2 /ton of 100% sulfuric acid produced and acid mist will be controlled to at least 0.15 LB. H_2SO_4 /ton of 100% of sulfuric acid produced (per new source performance standards.)

4.0 PSD REGULATIONS

4.0 PSD REGULATIONS

The Environmental Protection Agency (EPA) promulgated amendments to PSD regulations (40 CFR 52.21) on August 7, 1980. These regulations require a proposed major source or major modification to submit an application for a PSD permit and compliance with applicable limitations and rules. All regulated pollutants emitted at greater than de minimis or specified limits must be addressed individually for each requirement under the regulations. These rules apply for Federal regulations as well as the State regulations which are based on federal promulgations. PSD regulations require for each subject pollutant: (1) an analysis of ambient air for the pollutant(s) emitted or increased in significant amounts (including monitoring), (2) an analysis of the impact of the source on national standards for each criteria pollutant, and the extent of degradation in air quality, and (3) analysis of the impact on soil, vegetation, visibility, effect on growth, and the effect of any growth on air quality. Each source emitting a pollutant subject to PSD must comply with all applicable emissions limitations and must also apply the best available control technology (BACT) to that pollutant's emissions. These rules apply only to those geographic regions designated as attainment or unclassifiable under Section 107 of the Clean Air Act for any criteria pollutant.

Applicability of PSD to a source is determined by the source's potential to emit pollutants regulated by the Clean Air Act. Potential to emit is defined as the capability at maximum design capacity to emit a pollutant after air pollution control equipment has been applied, considering all federally enforceable permit restrictions that limit the design capacity utilization, hours of operation, or type or amount of material processed or stored. Currently there are 15 regulated pollutants - of which the new facility will emit nitrogen oxides and sulfur dioxide from the criteria list and sulfuric acid mist from the non-criteria list. The proposed plant will only be considered major or PSD applies only to the emission of sulfur dioxide. In calculating applicability of these pollutants, only those same pollutants and respective actual rates from the old plants to be shut down were included with allowable

emissions from the new plant. No other contemporaneous credits will be taken.

4.1 Sulfur Dioxide

Sulfur dioxide emissions from the proposed facility are based on required standards of performance of 4 pounds SO_2 /ton of 100% H_2SO_4 produced. At this rate the new plant will emit 1460 tons per year. The existing plants' average actual emissions over the two year period for 1979-1980 resulted in 529.25 tons/year SO_2 . The net increase in SO_2 emitted is 930.75 tons/year at allowable rates for the new plant. (See calculation sheets for further details).

4.2 Acid Mist

Emissions for acid mist from the proposed facility are based on the 0.15 pounds mist/ton 100% sulfuric acid standard. This standard applied to 2000 TPD of H_2SO_4 results in 54.76 tons/year of acid mist. The old plants emitted 60.48 tons/year of acid mist based on average results. The net decrease in acid mist is 5.72 tons/year.

4.3 Nitrous Oxides

Nitrous oxides are usually emitted at concentrations of less than 100 parts per million (ppm) resulting from the decomposition of spent acid containing nitrogen compounds in a furnace operating at about 2000°F (per EPA Standards of Performance). In a process such as Conserv proposes, elemental sulfur is the furnace feed and should therefore, produce less NO_x than the decomposition of spent acid feed. It should be noted that NO_x is soluble in the product sulfuric acid and its concentration is consequently decreased even further. To be very conservative, the 100 ppm concentration was utilized for calculating

NO_x emissions for both existing and proposed plants. The existing plants produced 380.1 tons/year NO_x, while the proposed facility at design rates will produce 222.5 tons/year. The net decrease is largely due to the fact that the new plant will operate with 12% SO₂ to the converter versus only 8% SO₂ for the existing facility. Consequently, there is less air required in the new process and, hence, less nitrogen which can be thermodynamically fixed in the furnace. The net decrease is 157.6 tons/year.

5.0 CONTROL TECHNOLOGY

5.0 CONTROL TECHNOLOGY

Any new major stationary source or major modification is required to meet any applicable emissions limitations and to provide the best available control technology to each pollutant emitted in significant amounts. These requirements will be discussed separately below.

5.1 Emissions Limitations

Emissions limitations may be imposed under the State Implementation Plan or applicable emissions standards or standards of performance under 40 CFR Parts 60 and 61. Under the State of Florida Air Pollution Rules a new sulfuric acid plant is limited by a standard of 4 pounds SO_2 /ton 100% H_2SO_4 produced and 0.15 pounds acid mist/ton 100% H_2SO_4 produced (Section 17-2.05, Table II).

Standards of performance established under Section III of the Clean Air Act reflect emission limits achievable with the best demonstrated technological system. Standards of Performance for new sulfuric acid plants (EPA-450/3-79-003) are the same standards as listed above for the State of Florida. The proposed facility will meet or supersede these standards. ^{exceed?}

5.2 Best Available Control Technology (BACT)

Best available control technology means "an emissions limitations (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator ⁽⁶⁾ on a case-by-case basis, taking into account energy, environmental, economic impacts and other costs, determines is achievable for such source or modification 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." This technology cannot allow emissions above those stated in a standard of performance. BACT must be applied to each pollutant emitted in significant amounts. The EPA has determined that BACT for new sulfuric acid plants is the use of dual absorption process for the control of SO_2 , and the use of high efficiency acid mist eliminators for the control of acid mist. These correlate with the standards of performance given above. In the recent past, the Florida Department of Environmental Regulation (DER) designated the above two standards as BACT for new sulfuric acid plants (pursuant to Chapter 17-2.03 FAC) and additionally added the following standard:

Opacity - Not greater than 10 percent

Test Method - As prescribed in EPA NSPS, 40 CFR, Part 60,
Subpart H.

Conserv is requesting that these same standards as stated be implemented as BACT for their proposed facility. The proposal facility will be of dual absorption design with high efficiency Monsanto acid mist eliminators.

6.0 MONITORING REQUIREMENTS

6.0 MONITORING REQUIREMENTS

PSD regulations usually require either a period of continuous monitoring for applicable pollutants or dispersion modeling as a means of analysis of air quality. However, if the monitor data would not improve or validate estimates made by modeling or if the concentrations of present air quality are quite small, monitoring may not be required. PSD regulations also include a table of de minimis values for several pollutants, such that "The Administrator may exempt a stationary source or modification from the requirements of paragraph (m) with respect to monitoring for a particular pollutant if: (i) the emissions increase of the pollutant from the new source or the net emissions increase of the pollutant from the modification would cause, in any area, air quality impacts less than the following amounts: Sulfur Dioxide - 13 micrograms/m³, 24 hour average; " 40 CFR 52.21(1)(8)(i) .

With respect to this upper limit of 13 micrograms/m³, the change in emissions due to the new sulfuric acid plant (at allowable rates) and the retiring of the old plants (at actual rates) were modeled to determine the net maximum concentration of sulfur dioxide at any point from the proposed modified facility. The CRSTER model was implemented for this task with the worst case meteorology from the year 1972. Days 173 and 174 were excluded from the meteorology (per Florida DER, Tallahassee) since these days constituted (along with day 175) a period of influence from a hurricane. The second high for the model was day 178 and resulted in a maximum concentration of 10.66 micrograms/m³ at 3.1 km from the facility at a direction of 90 degrees from north (see computer printouts in Volume 2 through 10). Due to the above results and the results of the ambient air modeling effort discussed later , Conserv requests exemption from all monitoring requirements.

7.0 GOOD ENGINEERING PRACTICE (GEP)
FOR STACK HEIGHT

7.0 GOOD ENGINEERING PRACTICE (GEP) FOR STACK HEIGHT

The EPA has proposed a rule known as GEP which imposes limitations on the use of excessively high stacks. These rules require that dispersion modeling be performed at the GEP determined height unless it can be shown that excessive concentrations will occur due to aerodynamic downwash. The proposed facility at Conserv has several tall structures surrounding the plant stack, however, the most formidable is a rock pile of 60 feet in height and approximately 110 feet square in a direction northwest of the plant stack (Figure 2). In order to avoid excessive downwash from this obstacle and other structures, the plant stack is designed to be 150 feet in height as per GEP requirements: $h_s = h_b + 1.5a$, where h_b is rock pile height and "a" is the lesser of the height or maximum width of the rock pile. Since the rock pile is within 5 "building heights" (rock pile heights) from the stack, then significant downwash could occur if the stack is not at least 150 feet high (Figure 2). All modeling exercises were, therefore, performed using the 150 feet height as per conversations with representatives of Florida DER on March 16, 1981 and based on the results of the above analysis.

8.0 DISPERSION MODELS

8.0 DISPERSION MODELING

8.1 Model Descriptions

Two models which were developed by the EPA were utilized in all modeling efforts - CRSTER and the Industrial Source Complex (ISC) short term dispersion model. The CRSTER model was primarily used in preliminary analyses, however, this model did satisfy some of the final analysis requirements. The ISC short term model was implemented in the complex analyses required for short term averaging times in increment consumption and ambient air determinations.

The CRSTER model was implemented specifically for the following applications:

- 1) To determine worst case meteorology for the five years of data
- 2) impact determinations
- 3) validation of monitoring exemption
- 4) annual ambient air analysis, and
- 5) annual increment consumption analysis.

In these cases CRSTER should be considered very conservative since the model calculates all emissions from all sources from a single location instead of their actual geographic locality.

The ISC short term model was utilized for all three hour and twenty-four hour averaging time cases for both increment consumption and ambient air analysis. This model accepts the preprocessed meteorological data from CRSTER since both programs incorporate the same preprocessor. Therefore, the same hourly meteorological data could be input to both programs. The following options were taken in each ISC dispersion case:

- 1) concentration calculated in micrograms per cubic meter.
- 2) polar receptor grid system.
- 3) flat topography - all elevations given as 0.0 feet mean sea level.
- 4) printing of program control parameters, source data, and receptor data.
- 5) highest and second highest tables
- 6) maximum 50 tables
- 7) rural mixing heights
- 8) final plume rise at all downwind receptor locations
- 9) concentration calculations for specified groups of sources at all receptors
- 10) specific meteorological days. ISC model outputs are found in volumes 2 through 10 of this application.

8.2 Meteorology

The same meteorological data was utilized for both CRSTER and the ISC models. Hourly data and mixing height data were obtained for the Tampa, Florida station for the years 1970, 1971, 1972, 1973 and 1974. In choosing the worst case meteorology (for use in the ISC model), all days for a given year were input to the CRSTER model in conjunction with 10 sources from Conserv and Mobil. The CRSTER model prints out the worst day and second high day for each of 36 sectors (every 10 degrees for a total of 360 degrees) at specified distances from the sources emissions. In determining the worst case days for any particular increment or ambient air dispersion case, the procedure listed below was followed:

- 1) using Figures 4 and 5 in Appendix B, the directional angles for a given case were determined so as to include all sources for that case,

- 2) these angles were then used to obtain worst case days (high and second high) for major sectors in the desired directions for each year,
- 3) worst case days for each year for a particular case were then tabulated,
- 4) the critical direction (chosen by selecting the source complex closest to Conserv with the largest emissions output) in the interval of angles for a case was selected,
- 5) this critical angle was then used to compare the highest and second high concentrations for each of the five years of data - the highest concentration indicated the worst case meteorology for this direction out of the five years of data. This year of data and its high and second high days for all necessary angles was then selected for input to the ISC program.

8.3 Emissions Inventory

An inventory of emissions for all SO₂ sources (phosphate and non-phosphate) was compiled from records in the Tampa office of the Florida DER. Sources within 50 kilometers of Conserv were included in the inventory, and particularly large sources outside of 50 kilometers were included (e.g., Florida Power, Bartow plant).

The final inventory, Table 2 Appendix A, consists of sources whose emissions approached or exceeded a rate of 5.0 grams/second for sources greater than approximately 15 kilometers in distance from Conserv. For facilities that were close to Conserv (Mobil, Kaiser) all documented sources of SO₂ were included.

8.4 PSD Regulations

For the purpose of modeling (inclusion or exclusion of sources for a particular case), Federal PSD rules were followed per instructions of

Florida DER (Tallahassee). This plan was chosen since amendments to the Florida Air Pollution Rules which encompass PSD rulings are pending. Very little difference (if any for these dispersion cases and sources) would have resulted for either set of regulations. All other State of Florida standards and limits, however, have been adhered to in this application.

8.5 Area of Impact

The area of impact for any given averaging time is that area which the proposed emissions have been determined to significantly impact. The impact area is a circular area whose radius is equal to the greatest distance from the source to which approved dispersion modeling shows the proposed emissions will have a significant impact. Significant levels for SO₂ are given as follows:

Annual - 1 microgram/m³,
24 Hour Average - 5 micrograms/m³,
3 Hour Average - 25 micrograms/m³.

As indicated in the CRSTER printout (see computer printouts in Volume 2), it was necessary to include all sources within 50 km for the short averaging times of 3 hours and 24 hours. Therefore, all ISC dispersion model cases include sources out to 50 km. Further distances were not processed since guidelines for dispersion model implementation (based on dispersion coefficients, wind, variation, and plume tracking) suggest that these two EPA models be limited to a distance of 50 km. Plume dispersion beyond this distance is questionable due to inherent assumptions in the plume dispersion model calculations and other factors as listed above.

For the purpose of impact, no further study was necessary since the Conserv facility does not impact any Class I Areas.

9.0 INCREMENT CONSUMPTION

9.0 INCREMENT CONSUMPTION

9.1 PSD Regulations

Under PSD regulations 40 CFR 52.21(b)(13)(ii) and 40 CFR 52.21(k) and (m) , an analysis of maximum allowable increases over the baseline concentration in any area of impact for a major source must be analyzed for applicable pollutants. At present, increment standards exist only for SO₂ and particulate matter. An analysis of increment consumption includes the following:

- 1) emissions from major source construction commencing after January 6, 1975 and major modifications
- 2) emissions changes occurring after the baseline date at sources whose previous emissions are included in the baseline concentration,
- 3) emissions changes due to SIP revisions approved after the baseline date, and
- 4) minor and area source growth occurring after the baseline date.

The EPA has concluded that increment consumption and expansion should be based primarily on actual emissions increases and decreases, which can be assumed to be allowable rates for sources subject to limitations. With reference to expansion of increment, the EPA has concluded that "... it is also reasonable to allow these contemporaneous pre-baseline date reductions to expand the increment ..." (Federal Register, Vol. 45, No. 154, Aug. 7, 1980, pg. 52720). This reference is made to the retirement of old equipment and similar actions prior to the baseline date. In the analyses made on increment consumption for Conserv, only retirement of facilities and modifications due to SIP actions were considered for expansion of increment. The baseline date for the purpose of this study was August 7, 1977 since no clear determination had been made at the time of this study (per conversations with the Florida DER, Tallahassee).

9.2 Methodology

In order to analyze increment consumption for the Conserv facility and other sources, the procedure below was followed:

- 1) choose a facility (which has increment consuming sources) which is near Conserv and take that major direction out to 50 KM,
- 2) all facilities located near this direction (within reason) will be included in this particular dispersion model (see Figure 4 Appendix B),
- 3) include the worst case meteorology selected for the case (described in previous section), and,
- 4) model these sources for 3 and 24 hour averaging times.

Eleven individual cases were analyzed for these two averaging times for increment consumption. Three of these cases (5,6,11) were not completed or included in the final results due to their initial dispersion results indicating a total concentration (for sources other than Conserv and Mobil) of zero. This situation occurred due to retirement or modification of facilities included in these cases. The sources retired (increment expanders) were modeled with negative emission rates and the increment consuming sources with positive emission rates. Therefore, the concentration for these combinations of sources were zero and indicated that no further analysis was necessary.

The analysis of the consumption of increment (or ambient air) may be performed basically by two approaches with respect to meteorology (per conservations with the Florida DER):

- 1) include both the worst case days and the second high days in the analysis - the result chosen is the highest concentration from the second high day (or the second high table), or

- 2) include in the analysis only the second high days and select then the maximum concentration listed or the maximum concentration from the "maximum 50" table.

The former case was implemented since dispersion cases were already in progress before the conversations mentioned. Therefore, in selecting the "second high" concentration, the highest concentration resulting from a second high day was selected.

9.3 Results

Results for the cases analyzed are tabulated in Tables 4 and 5. The results indicate that increment standards given below will not be violated:

	<u>Annual</u>	<u>24 Hour</u>	<u>3 Hour</u>
Federal (micrograms /m ³)	20	91	512
Florida (micrograms /m ³)	40	182	700

The annual increment analysis was performed with CRSTER by modeling all of the increment consumers at Conserv and Mobil. The analysis indicated an annual arithmetic average of zero (see computer printouts in Volumes 2 through 10). Modeling all sources at one location is considered very conservative.

10.0 AMBIENT AIR ANALYSIS

10.0 AMBIENT AIR ANALYSIS

The analysis of ambient air is required under the same sections of PSD regulations as listed under increment consumption and under the same authority. The ambient air analyses were conducted in similar manner as the increment cases except that all sources from a given facility in existence now or which has applied for a construction permit are included in the analysis. Sources which were retired and no longer exist were not included in any analysis. Methodologies and interpretations as given under increment analysis were applied in like manner for the ambient dispersion model cases.

Fourteen cases for ambient air analysis were modeled using the ISC dispersion model (see Figure 5 Appendix B). Only three sources were not given major consideration in the ambient air analyses. Macasphalt (near Tampa Bay) and Dolime Minerals were not included in any cases since their respective sources were very small and their distances from Conserv substantial. Kraft (near Plant City) was included in Case 5, however, this source was not given preeminence for a separate case since the rate of its emissions were so small.

The standards for ambient air are as follows:

	<u>Annual</u>	<u>24 Hour</u>	<u>3 Hour</u>
Federal (micrograms/m ³)	80	365	1300
Florida DER (micrograms/m ³)	60	260	1300

The results are tabulated for each run in Tables 6 and 7. The results indicate that there are no violations of ambient air standards. It should be noted that Case 7 (24 hour average) differs from the other cases in that it does not consider emissions from Conserv's standby boilers. The two standby boilers at Conserv were taken out of the analysis because their inclusion resulted in excessive projections not representative of actual operating conditions.

These two boilers will never be used when the new facility is in operation and will be needed to provide steam only on those occasions when the new plant shuts down. These boilers would then replace the steam normally generated by the sulfuric acid plant. The Case 7 dispersion model results reflects normal operating conditions without these boilers and all other cases results are extremely conservative since the emissions from these boilers were included.

The annual ambient analysis was conducted considering emissions from all sources at Conserv and Mobil, year 1971 data, using the CRSTER model (per agreement with the Florida DER). The results indicate an annual arithmetic average of 43.164 micrograms/m³.

It is concluded, therefore, that no violations of any ambient or increment standards will occur.

11.0 ADDITIONAL IMPACTS

11.0 ADDITIONAL IMPACTS

There are several miscellaneous impact analyses which are required under 40 CFR 52.21(0). These include impairment to visibility, soils, and vegetation that would occur as a result of the construction or modification of a source.

The proposed facility will increase the production of sulfuric acid by 500 TPD, however, the incremental effect of SO₂ produced and growth incurred will be minimal. Since the proposed unit will replace the existing units, there should be little or no increase in the number of employees at this site. No secondary developments or industries are anticipated as a result of this installation, therefore, it can be concluded that little or no residential, commercial, or industrial growth will result from this modification.

According to Air Quality reports published by the EPA, adverse effects on vegetation have been observed when the annual concentrations of SO₂ averaged 85 micrograms/m³. As indicated in the results, the annual average is approximately half of this level.

Visibility should not be impaired to any extent since Conserv has requested the same opacity listed in other BACT determinations of 10 percent.

It is concluded, therefore, that the proposed sulfuric acid facility will neither directly nor indirectly adversely affect the surrounding area.

APPENDIX A
TABLES

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- TABLE 3: INCREMENT CONSUMPTION SOURCES
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TABLE I
SUMMARY OF FACILITIES CONSIDERED FOR
DISPERSION MODEL INPUT

(A) PHOSPHATE SOURCES*

AGRICO CHEMICALS
 ALCOA
 BORDEN
 CF CHEMICALS
 DOLIME MINERALS
 ELECTROPHOS
 ESTECH
 FARMLAND INDUSTRIES
 GARDINIER
 W.R. GRACE
 IMC
 KAISER
 MOBIL CHEMICALS
 NEW WALES CHEMICALS (IMC)
 ROYSTER
 SWIFT AGRICHEM
 URANIUM RECOVERY
 BREWSTER PHOSPHATES
 CENTRAL PHOSPHATES
 STAUFFER
 BEKER PHOSPHATES
 USS AGRICHEM

(B) NON PHOSPHATE SOURCES*

AMERICAN ORANGE CORP
 FLORIDA FENCE POST, INC.
 AMOCO OIL CO.
 ANHEUSER-BUSH, INC.
 W.R. BONSAI CO.
 CAMDEN GRAIN CO.
 BRIMSTONE TERMINALS, INC.
 CAST CRETE CORP. OF FLORIDA
 CHLORIDE METALS DIVISIONS
 CONCRETE PRODUCTS CORP.
 CONE BROTHERS CONTRACTING
 DELTA ASPHALT PAVING CO.
 DELMONTE CORP.
 EXXON CO. USA
 FLORIDA MINING & MATERIALS CORP.
 FLORIDA SIP, INC.
 FLORIDA STEEL CORP.
 GENERAL PORTLAND CEMENT
 GULF COAST LEAD CO.
 LYKES FOOD PRODUCTS
 MACASPHALT CO.
 NITRAM, INC.
 JOSEPH SCHLITZ BREWING CO.
 SCRAP-ALL, INC.
 SPEEDLING, INC.
 SWIFT PROCESSED MEATS
 TEXASGULF, INC.
 VERLITE, CO.
 FLORIDA POWER & LIGHT
 ADAMS PACKING CO.
 ALL SUN JUICES, INC.
 THE COCA-COLA CO.
 COOK'S PROCESSING

TABLE I
(cont'd)

(A) PHOSPHATE SOURCES*

(B) NON PHOSPHATE SOURCES*

FLORIDA DISTILLERS
HOLLY HILL FRUIT PRODUCTS
ORANGE-CO OF FLORIDA, INC.
STANDARD SAND SILICA
SUN-PAC FOODS, INC.
CITY OF LAKELAND
TRIANGLE PACIFIC CORP.
TAMPA ELECTRIC
KRAFT

*All SO₂ sources at these facilities were recorded and given consideration for inclusion in the dispersion model exercises.

TABLE 2
SOURCES AND PARAMETERS USED IN DISPERSION MODELING

Name	I.D.	Emission Rate (g/s)	UTM Coordinates East	UTM Coordinates North	Height (m)	Temp. (°F)	Exit Velocity	Diameter (m)
1) <u>AGRICO CHEM.</u>								
a) Sulfuric Acid #10	01010	37.8	407.9	3071.0	45.72	360.	8.71	1.58
b) SAP #11	01020	37.8	407.9	3071.0	45.72	57.	10.21	1.58
c) R. Dryer 1	01030	11.09	407.9	3071.0	24.38	339.	12.94	1.52
d) Dryers 3 & 4	01040	17.47	407.9	3071.0	24.38	339.	17.92	2.9
e) SAP (New)	01050	42.0	407.6	3071.3	45.72	350.	9.54	2.9
f) DAP (New)	01060	12.41	407.6	3071.3	38.1	327.	14.55	3.05
2) <u>BORDEN</u>								
a) Ph. Rock Dryer	02010	5.29	414.5	3109.0	17.07	333.	8.26	2.34
b) Ph. Rock Dryer	02020	6.48	394.8	3069.6	30.48	344.	14.79	1.82
3) <u>C.F. CHEMICALS</u>								
a) SPA Plt. 1	03010	4.31	408.198	3082.678	9.14	355.	15.78	.433
b) SAP No. 7	03020	41.99	408.198	3082.678	61.57	350.8	9.77	2.44
c) SAP No. 2	03030	-110.6	408.198	3082.678	30.48	350.	4.6	1.68
d) SAP No. 1	03040	114.66	408.198	3082.678	30.48	347.	7.27	1.68
e) SAP No. 6	03050	25.19	408.198	3082.678	63.4	370.	7.28	2.13
f) SAP No. 3	03060	42.0	408.198	3082.678	34.31	305.	18.9	1.24
g) SAP No. 4	03070	55.18	408.198	3082.678	30.48	308.	20.2	1.22

TABLE 2
Continued

	h)	SAP No. 5	03080	63.0	408.198	3082.678	63.4	361.	10.88	2.13
4)		<u>DOLIME</u>								
	a)	Boiler	04010	4.52	404.813	3069.548	27.43	494.1	7.25	.61
	b)	Dryer	04020	5.68	404.813	3069.548	27.43	333.	20.67	1.52
5)		<u>ELECTROPHOS</u>								
	a)	Calciner	05010	6.24	405.6	3079.4	25.6	322.	8.01	2.13
6)		<u>FARMLAND INDUSTRIES</u>								
	a)	SAP No. 4	06010	57.74	409.5	3079.5	30.48	305.	23.9	1.37
	b)	SAP No. 2	06020	41.99	409.5	3079.5	30.48	311.	22.3	1.37
	c)	SAP No. 1	06030	41.99	409.5	3079.5	30.48	311.	19.9	1.37
	d)	SAP No. 3	06040	63.0	409.5	3079.5	30.48	301.	24.1	1.37
	e)	Boiler	06050	4.58	409.5	3079.5	14.17	444.	12.66	1.22
7)		<u>GARDINIER</u>								
	a)	R.Dryer	07010	17.6	415.3	3063.3	19.2	344.	8.96	2.89
	b)	SAP No. 8	07020	91.87	363.4	3082.4	45.72	355.	8.63	2.44
	c)	GTSP	07030	9.6	363.4	3082.4	38.4	328.	11.56	2.44
	d)	SAP No. 7	07040	36.75	363.4	3082.4	45.72	355.	9.20	2.29
	e)	Dryer	07050	28.89	363.4	3082.4	20.73	310.	13.12	1.07
	f)	Boiler	07060	10.08	363.4	3082.4	18.29	589.	6.99	2.54
	g)	Ph.A. Conc	07070	7.56	363.4	3082.4	23.77	345.	6.19	1.83
	h)	No. 7 PAC	07080	6.56	363.4	3082.4	23.77	343.	6.8	1.83
	i)	No. 8 PAC	07090	6.35	363.4	3082.4	23.77	343.	6.8	1.83
	j)	SAP No.9	07100	54.6	363.4	3082.4	45.72	344.	12.5	2.74
	k)	SAP 4,5,6	07110	-196.3	363.4	3082.4	22.6	322.	19.51	1.52
	l)	SAP No. 7	07041	-50.71	363.4	3082.4	45.72	355.	9.2	2.29
	m)	DAP P24	07120	4.29	363.4	3082.4	60.39	320	13.38	2.13

TABLE 2
Continued

8) <u>W.R. GRACE</u>									
a)	SAP No. 1	08010	-108.0	409.77	3086.99	45.72	352.	16.5	1.37
b)	SAP No. 2	08020	-108.0	409.77	3086.99	45.72	352.	16.5	1.37
c)	SAP No. 3	08030	52.5	409.77	3086.99	45.72	311.	16.7	1.52
d)	SAP No. 7,8	08040	35.28	409.77	3086.99	60.96	347.	28.61	1.52
e)	SAP No. 5	08050	35.28	409.77	3086.99	60.96	347.	25.10	1.52
f)	SAP No. 6	08060	35.27	409.77	3086.99	60.96	346.	25.10	1.52
g)	SAP No. 4	08070	35.69	409.77	3086.99	61.57	347.	13.82	2.06
h)	DAP Pit	08080	12.1	409.77	3086.99	40.39	319.	21.34	2.13
i)	R. Dryer	08090	39.41	409.77	3086.99	15.24	327.	17.32	2.04
j)	R. Dryder	08100	39.41	409.77	3086.99	15.24	327.	17.32	2.04
9) <u>IMC</u>									
a)	Calcliner	09010	30.64	414.7	3080.3	13.72	330.	40.4	1.22
b)	King. Dryer	09020	11.6	398.2	3075.7	21.3	344.	12.9	2.13
c)	No. 2 R. Dryer	09030	8.9	414.7	3080.3	16.76	343.	36.7	1.28
d)	Boiler	09040	5.73	396.7	3078.9	9.14	533.	30.3	.46
e)	Ph. R. Dryer	09050	26.7	396.7	3078.9	19.8	339.	12.6	2.29
f)	Multi-FOS	09060	37.14	396.83	3079.43	52.43	311.	13.8	1.37
g)	SAP No. 3	09070	41.99	396.7	3078.9	60.96	341.	11.4	2.59
h)	SAP No. 2	09080	54.59	396.7	3078.9	60.96	345.	14.6	2.59
i)	SAP No. 1	09090	48.3	396.7	3078.9	60.96	350.	14.04	2.59
j)	GTSP	09100	8.6	396.7	3078.9	40.23	319.	18.8	1.83
k)	SAP No. 5	09110	57.75	396.56	3078.64	60.7	350.	13.37	2.6
l)	SAP No. 4	09120	57.75	396.49	3078.64	60.7	350.	13.37	2.6
m)	DAP Pit.	09130	5.54	396.45	3079.15	36.6	319.	19.81	1.8
n)	AFI Pit	09140	3.78	396.75	3079.35	52.4	322.	13.04	2.4
o)	Multi-FOS	09150	5.36	396.83	3079.43	52.4	319.	6.84	2.4
p)	Std. By Boiler	09160	20.36	396.7	3078.9	25.9	564.	8.42	1.69

TABLE 2
Continued

10) KAISER									
a)	Dryer	10010	1.23	401.5	3086.5	18.29	333.	11.9	.27
b)	Dryer	10020	1.41	401.5	3086.5	21.34	311.	28.4	.46
11) MOBIL									
a)	Calciner	11010	13.48	398.0	3085.3	30.48	366.	18.0	1.37
b)	No. 3 Dryer	11020	7.35	398.0	3085.3	30.48	355.	7.74	1.46
c)	No. 2 Dryer	11030	19.78	398.0	3085.3	25.9	346.	8.75	2.29
d)	No. 1 Dryer	11040	15.9	398.0	3085.3	25.9	346.	12.86	2.29
e)	No. 4 Dryer	11050	2.44	398.29	3084.29	25.9	339	16.05	2.29
12) ROYSTER									
a)	SAP I	12010	63.5	406.7	3085.2	60.96	366.	9.93	2.13
b)	SAP I	12011	-257.25	406.7	3085.2	60.96	366.	9.93	2.13
c)	DAP Pit	12020	4.01	406.7	3085.2	31.09	316.	10.58	2.68
13) SWIFT-AGRI CHEM.									
a)	SAP I	13010	32.2	411.5	3074.2	30.79	358.	3.9	2.13
b)	Dryer	13020	18.1	411.5	3074.2	18.29	339.	8.47	2.95
c)	Dryer	13030	33.4	411.5	3074.2	18.75	340.	5.06	2.95
14) USS AGRI-CHEM.									
a)	SAP I	14010	41.9	413.2	3086.3	28.96	305.	7.5	2.12
b)	R. Dryer	14020	3.41	413.2	3086.3	15.8	332.	10.01	1.83
c)	DAP Pit	14030	3.93	413.2	3086.3	40.54	305.	12.69	2.13
d)	R. Dryer	14040	9.20	416.0	3069.0	25.6	332.	16.26	1.52
e)	R. Dryer	14050	9.20	416.0	3069.0	25.6	332.	16.26	1.52
f)	GTSP	14060	28.35	416.0	3069.0	28.35	330.	17.6	1.52
g)	SAP 2	14070	-73.5	416.0	3069.0	60.96	304	6.5	30.5
h)	New SAP	14080	92.40	416.0	3069.0	53.34	355	9.4	2.59

TABLE 2
Continued

<u>BORDEN</u>									
c)	Kiln	02030	11.45	393.8	3096.3	24.38	315.	13.7	1.8
d)	Kiln	02040	6.59	393.8	3096.3	30.48	339.	9.63	1.37
e)	Kiln	02050	14.48	393.8	3096.3	46.33	309.	19.56	1.76
f)	Kiln	02060	18.23	393.8	3096.3	46.33	309.	21.81	1.76
g)	Kiln	02070	65.97	393.8	3096.3	60.96	311.	28.36	1.76
k)	SAP	02080	41.99	414.5	3109.0	60.96	353.	13.0	2.36
15) <u>BREWSTER PHOSPHATES</u>									
a)	R. Dryer	15010	20.79	389.55	3067.93	38.1	347.	15.4	2.44
b)	R. Dryer	15020	20.59	389.55	3067.93	38.1	342.	14.18	2.44
16) <u>CENTRAL PHOSPHATES</u>									
a)	SAP "C"	16010	36.75	388.3	3115.7	60.81	344.	11.66	2.44
b)	SAP "D"	16020	29.46	388.3	3115.7	60.81	349.	10.73	2.44
c)	DAP "A"	16030	3.59	388.3	3115.7	28.5	334.	9.05	3.05
d)	DAP "Z"	16040	4.31	388.3	3115.7	54.86	335.	14.4	2.79
e)	SAP "A"	16050	52.50	388.3	3115.7	23.77	306.	16.64	1.54
f)	ROP Dryer	16060	4.6	388.3	3115.7	30.48	311.	11.67	1.83
g)	MGTSP Dry	16070	4.6	388.3	3115.7	30.48	310.	11.67	1.83
h)	SAP "B"	16080	52.50	388.3	3115.7	23.77	310.	18.14	1.52
17) <u>BEKER PHOSPHATES</u>									
a)	R. Dryer	17010	43.64	387.5	3042.3	43.64	340.	15.15	2.13
18) <u>ESTECH</u>									
a)	No. 1 Dryer	18010	15.37	388.95	3047.28	38.1	340.	12.	2.44
b)	No. 2 Dryer	18020	15.37	388.95	3047.28	38.1	340.	12.	2.44
19) <u>AMERICAN ORNGNE</u>									
a)	Peel Dryer	19010	6.17	419.819	3047.346	10.67	355.	4.8	3.05
b)	Peel Dryer	19020	9.48	419.819	3047.346	10.67	358.	1.65	4.05

TABLE 2
Continued

20)	<u>CAMDEN GRAIN</u>								
	a) Furnace	20010	29.8	360.2	3102.5	30.18	344.	18.62	.66
	b) Furnace	20020	10.48	360.2	3102.5	30.18	344.	18.1	.66
21)	<u>CHLORIDE METALS</u>								
	a) Furnace	21010	12.98	361.8	3088.3	30.17	397.4	22.86	.61
	b) Furnace	21020	8.04	361.8	3088.3	29.87	354.	17.2	.61
22)	<u>CONCRETE PRODUCTS</u>								
	a) Boiler	22010	5.9	362.8	3097.9	9.14	455.	5.39	.406
23)	<u>DELMONTE</u>	23010	4.22	359.6	3093.05	11.89	494.1	3.0	1.36
24)	<u>GEN. PORT. CEMENT</u>								
	a) Kiln No. 6	24010	100.8	358.0	3090.6	44.35	473.	6.6	4.72
	b) Kiln No. 4	24020	62.99	358.0	3090.6	35.97	505.2	17.61	2.74
	c) Kiln No. 5	24030	69.3	358.0	3090.6	45.42	494.1	5.8	3.81
25)	<u>GULF COAST LEAD</u>								
	a) Furnace	25010	22.0	363.9	3093.85	30.48	350.	22.4	.61
26)	<u>MACASPHALT</u>								
	a) Heater	26010	17.83	363.5	3066.8	7.62	408.	15.06	1.52
	b) Plant	26020	11.05	423.13	3101.53	12.19	327.	2.26	3.05
27)	<u>FLORIDA POWER & LIGHT</u>								
	a) Station 1	27010	732.9	367.1	3053.8	152.1	425.	20.67	7.925
	b) Station 2	27020	732.9	367.1	3053.8	152.1	425.	20.67	7.925
28)	<u>ADAMS PACKING</u>								
	a) Dryer	28010	2.89	421.70	3104.2	28.04	347.	22.93	1.43

TABLE 2
Continued

29)	<u>COCA-COLA</u>								
	a) Dryer	29010	18.8	421.3	3103.6	30.48	345.	15.02	.98
30)	<u>HOLLY HILL FRUIT</u>								
	a) Dryer	30010	4.64	441.0	3115.4	17.98	344.	18.7	.86
31))	<u>STD. SAND</u>								
	a) Dryer	31010	8.06	441.7	3118.2	25.91	315.	12.08	1.22
32)	<u>CITY OF LAKELAND</u>								
	a) Pft. No. 3	32010	468.71	408.5	3105.8	76.2	350.	24.6	4.88
33)	<u>CF INDUST.</u>								
	a) Boiler	33010	6.06	388.3	3115.7	7.62	561.	18.67	1.07
34)	<u>TAMPA ELEC.</u>								
	a) Big Bend No. 4	34010	653.17	361.6	3075.	149.3	404.	34.3	7.3
35)	<u>ELECTROPHOS</u>								
	a) Calciner	05030	6.24	405.6	3079.4	25.6	322.	8.01	2.13
36)	<u>CONSERV</u>								
	a) Old SAP	35010	-15.225	398.41	3084.2	30.48	308.	18.89	1.81
	b) New SAP	35020	41.99	398.41	3084.2	45.72	352.4	10.349	2.29
	c) Boiler SB	35030	11.18	398.41	3084.2	11.89	533.	8.88	.98
	d) Boiler SB	35040	6.98	398.41	3084.2	8.23	533.	13.65	.61
	e) Dryer	35050	16.16	398.41	3084.2	24.38	327.	4.98	2.32
	f) DAP Dryer	35060	1.006	398.41	3084.2	24.38	333.	23.1	1.07
37)	<u>FLORIDA POWER CORP.</u>								
	a) (Bartow) No. 1	36010	411.51	342.4	3082.7	91.44	427.4	28.50	2.74

TABLE 2
Continued

No. 2	36020	447.92	342.4	3082.7	91.44	427.4	31.12	2.74
No. 3	36030	720.45	342.4	3082.7	91.44	430.2	29.18	3.35
b)	Teeco Big Bend							
No. 1	36040	2926.0	361.9	3075.0	149.35	425.8	14.30	7.32
No. 2	36050	2753.3	361.9	3075.0	149.35	404.7	14.36	7.32
No. 3	36060	3069.8	361.9	3075.0	149.35	410.2	13.33	7.62
c)	GANNON							
No. 1	36070	164.17	360.0	3087.5	93.27	426.9	24.02	3.05
No. 2	36080	164.17	360.0	3087.5	93.27	426.9	24.02	3.05
No. 3	36090	221.37	360.0	3087.5	93.27	403.	18.72	3.23
No. 4	36100	263.2	360.0	3087.5	93.27	438.	42.43	2.93
No. 5	36100	263.2	360.0	3087.5	93.27	438.	42.43	2.93
No. 5	36110	611.97	360.0	3087.5	93.27	415.2	41.52	3.14
No. 6	36120	991.98	360.0	3087.5	93.27	417.2	23.42	5.36
d)	Hookers Pt.							
No. 1	30130	4.56	358.0	3091.0	85.34	402.4	9.19	3.43
No. 2	36140	32.89	358.0	3091.0	85.34	402.4	9.19	3.43
No. 3	36150	48.38	358.0	3091.0	85.34	396.9	11.44	3.66
No. 4	36160	50.90	358.0	3091.0	85.34	396.9	11.44	3.66
No. 5	36170	73.83	358.0	3091.0	85.34	402.4	18.20	3.43
No. 6	36180	107.98	358.0	3091.0	85.34	435.8	17.87	2.87
38)	CITY OF LAKELAND							
a)	McKintosh							
No. 1	37010	326.3	408.5	3105.8	47.7	399.7	24.01	2.74
No. 2	37020	110.21	408.5	3105.8	47.7	402.4	21.29	3.17
b)	Larsen							
No. 4	37030	81.52	409.	3106.2	50.29	433.	5.63	3.05
No. 5	37040	92.48	409.	3106.2	50.29	449.7	11.21	3.05

TABLE 2
Continued

No. 6	37050	93.87	409.	3106.2	50.29	433.	8.81	3.05
No. 7	37060	168.21	409.	3106.2	50.29	449.7	15.33	3.05
39) <u>CITRUS WORLD</u>								
<u>Dryer</u>								
No. 1	38010	9.53	441.0	3087.3	22.86	324.8	16.28	.762
No. 2	38020	19.03	441.0	3087.3	22.86	323.9	13.98	.966
No. 3	38030	19.03	441.0	3087.3	16.76	316.	25.2	.75
<u>Boiler</u>								
No. 1	38040	8.44	441.0	3087.3	12.19	505.	1.43	1.12
No. 2	38050	8.44	441.0	3087.3	12.19	505.	1.43	1.12
No. 3	38060	20.41	441.0	3087.3	12.19	505.	1.43	1.12
No. 4	38070	20.34	441.0	3087.3	12.19	505.	1.43	1.12
No. 5	38080	16.98	441.0	3087.3	12.19	505.	1.43	1.12
40) <u>KRAFT</u>								
a) Peel Dryer	39010	9.13	399.0	3101.8	27.43	333.	11.79	.91

TABLE 3
INCREMENT CONSUMPTION SOURCES

- (1) AGRICO CHEMICAL
 - New Sulfuric Acid Plant (01050)
 - New DAP Plant (01060)

- (2) BORDEN
 - Phosphate Rock Dryer - Located south of Conserv (02020)

- (3) CF CHEMICALS
 - No. 2 Sulfuric Acid Plant (03030)

- (4) DOLIME MINERALS
 - Dryer (04020)

- (5) FARM LAND INDUSTRIES
 - Boiler (06050)

- (6) GARDINIER
 - Sulfuric Acid Plant No. 7 (07040 and 07041)
 - Sulfuric Acid Plants 4,5, and 6 (07110)

- (7) WR GRACE
 - Sulfuric Acid Plant No. 1 (08010)
 - Sulfuric Acid Plant No. 2 (08020)
 - Sulfuric Acid Plants No. 7, 8 (08040)
 - Sulfuric Acid Plant No. 5 (08050)
 - Sulfuric Acid Plant No. 6 (08060)
 - Dap Plant (08080)

- (8) IMC (INCLUDING NEW WALES)
 - Calciner (09010) - Noralyn
 - Boiler (09040)
 - Multi-Fos (09060)
 - Sulfuric Acid Plant No. 5 (09110)

TABLE 3

(cont'd)

- (8) IMC (INCLUDING NEW WALES) (cont'd)
Sulfuric Acid Plant No. 4 (09120)
DAP Plant (09130)
AFI Plant (09140)
Multi-FOS (09150)

- (9) MOBIL
No. 4 Dryer (11050)

- (10) ROYSTER
Sulfuric Acid Plant No. 1 (12010 and 12011)

- (11) USS AGRI-CHEM
Sulfuric Acid Plant No. 2 (14070)
Sulfuric Acid Plant (14080) - Fort Meade

- (12) BREWSTER PHOSPHATES
Rock Dryer (15020)

- (13) BEKER PHOSPHATES
Rock Dryer (17010)

- (14) ESTECH
No. 1 Dryer (18010)
No. 2 Dryer (18020)

- (15) AMERICAN ORANGE
Peel Dryer (19010)
Peel Dryer (19020)

- (16) CHLORIDE METALS
Furnace (21010)

TABLE 3
(cont'd)

- (17) MASCASPHALT
Heater (26010)
Plant (26020)

- (18) ADAMS PACKING
Dryer (28010)

- (19) COCA-COLA
Dryer (29010)

- (20) HOLLY HILL FRUIT
Dryer (30010)

- (21) STANDARD SAND & SILICA
Dryer (31010)

- (22) CITY OF LAKELAND
Plant No. 3 (32010)

- (23) CF INDUSTRIES
Boiler (33010)

- (24) TAMPA ELECTRIC
Big Bend No. 4 (34010)

- (25) CONSERV
New Sulfuric Acid Plant (35010)
Old Sulfuric Acid Plant (35020)

TABLE 4

INCREMENT CONSUMPTION RESULTS - 3 HOUR AVERAGE

Case No./Per	CONSERV			MOBIL			ALL OTHERS			TOTAL			High Day	2nd High Day
	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees		
1 3	19.68	2800	20	4.28	2700	15	88.78	150	15	88.78	150	15	148/116	97/115/331
2 3	32.82	1400	80	2.19	1500	70	4.36	4000	70	35.42	1400	80	252/289	71/312
** 3 3	34.85	1100	90	1.97	3200	80	0	4000	90	44.55	1100	90	224	190/137
4 3	17.69	2600	160	5.92	300	170	2.31	4000	170	20.72	2500	160	133	316
* 7 3	19.07	2500	300	5.85	2500	310	2.00	4000	300	28.86	2800	310	180	32
8 3	18.29	2800	320	5.79	2500	325	7.91	170	330	25.91	2600	325	67/328	21/32
* 9 3	29.54	1200	205	3.22	300	215	34.18	150	205	47.91	3200	210	274	107
** 10 3	18.58	2600	230	3.22	1300	240	1.83	150	240	24.82	2600	230	295	290

* The 2nd high concentration (maximum concentration from a 2nd worst meteorological day) was hidden by the highest concentration.

** A second worst meteorological day produced the maximum concentration.

TABLE 5
INCREMENT CONSUMPTION RESULTS - 24 HOUR AVERAGE

Case No./Per	CONSERV			MOBIL			ALL OTHERS			TOTAL			High Day	2nd High Day
	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees		
1 24	5.69	3100	20	1.08	3100	15	27.59	150	25	27.57	150	25	318/80/221	87/88/224
2 24	6.09	1900	80	1.04	3000	70	2.63	2100	80	8.34	1800	80	172/177	99/151
3 24	7.31	3000	90	1.21	3200	80	0	4000	90	3.37	3200	90	177/178	99/152
4 24	4.84	3400	165	1.36	150	170	0.14	150	160	5.56	3300	165		177/171
* 7 24	5.63	2400	300	1.23	2400	310	.94	150	310	7.72	1700	300	205/293	292/252
8 24	5.26	3800	325	1.62	2000	330	3.09	150	320	9.93	3500	325	89/90	328/359
9 24	4.78	2600	205	1.13	2400	215	7.66	150	215	12.07	2900	205	266/279	107/312/330
* 10 24	6.22	3000	225	1.699	2700	240	0.67	150	225	7.78	3700	225	266/267	295/312
** 11 24	4.41	2900	255	1.76	2200	255	0.0	4000	255	.326	4000	255	272/290	181/273

* A second high meteorological day produced the highest concentration.

** For example only - the sources (other than Conserv and Mobil) concentration was zero, and the total concentration was only .326. This case plus cases 5 and 6 were deleted.

TABLE 6
 AMBIENT AIR ANALYSIS RESULTS - 3 HOUR AVERAGE

Case No./Per	CONSERV			MOBIL			ALL OTHERS			TOTAL			High Day	2nd High Day
	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees		
1 3	513.78	500	20	165.21	2200	10	189.09	150	10	664.31	500	20	148	531
2 3	495.01	400	50	221.55	1000	40	57.8	3600	50	505.91	400	50	205	178
3 3	539.83	500	70	66.83	1500	70	99.22	4000	70	633.38	500	70	252	71
* 4 3	596.38	500	80	43.68	500	90	67.77	2600	90	705.55	500	80	178	137
5 3	454.14	500	160	193.57	300	170	35.77	2100	165	643.67	500	160	133	316
** 6 3	613.65	500	260	183.57	1300	265	124.63	150	250	748.72	500	260	109	336
** 7 3	574.36	300	280	216.82	1900	295	244.9	200	295	726.71	600	280	31	105
** 8 3	510.38	600	300	184.3	2300	310	54.62	150	310	585.4	600	300	240/180	292/32
9 3	522.33	500	210	89.10	300	215	125.64	1000	205	596.06	800	210	274	107
** 10 3	488.8	500	230	105.86	1400	240	6.73	150	240	579.2	500	230	295	290
** 11 3	520.72	700	250	145.34	1600	255	102.32	2300	245	721.07	700	250	288	280
* 12 3	661.75	500	100	88.31	1100	95	77.09	150	95	730.4	400	100	195	178
* 13 3	447.2	500	110	77.66	200	115	9.79	300	110	497.84	500	110	193	255
14 3	496.11	500	320	181.94	2300	325	28.40	150	330	516.21	500	320	67	21

* The second high was hidden under the maximum case.

** The second high meteorological day produced the highest concentration.

TABLE 7

AMBIENT AIR ANALYSIS RESULTS - 24 HOUR AVERAGE

Case No./Per	CONSERV			MOBIL			ALL OTHERS			TOTAL			High Day	2nd High Day
	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees	2nd High	Distance	Degrees		
1 24	156.96	600	20	54.43	2400	10	60.83	150	25	213.16	600	20	80	88
2 24	182.76	600	50	27.47	3900	40	28.21	3800	50	186.41	600	50	223/50	222/50
3 24	166.08	400	80	27.49	3000	70	53.41	150	80	202.43	400	80	177	99
4 24	207.11	600	90	32.05	3200	80	19.51	600	90	223.29	600	90	178	152
5 24	118.53	700	165	45.49	150	160	15.19	150	170	152.67	500	160	319	171
6 24	166.91	400	265	67.49	1600	265	38.65	150	250	202.03	500	265	14	140
*7 24	721.65	900	285	64.14	2000	295	73.45	1300	295	155.26	900	285	133/127	121/119
**7 24	208.48	500	285	64.14	2000	295	73.45	1300	295	293.66	500	285	133/127	121/119
8 24	151.35	400	300	33.41	2400	310	20.74	1100	310	189.81	500	300	293	292/252
9 24	137.22	600	205	29.27	2400	215	27.89	150	215	170.27	600	205	279	330/107
10 24	183.06	600	225	40.14	2600	240	2.55	150	225	184.97	600	225	266/267	312/295
11 24	116.99	600	250	50.24	220	255	23.15	600	245	139.24	600	250	290	181
**12 24	203.27	500	95	22.08	1500	95	23.41	150	105	226.4	500	95	230/192	71/145
13 24	135.74	500	110	37.13	1300	110	3.38	2900	110	154.61	500	110	143	44
**14 24	176.05	600	325	66.94	1800	330	12.32	1300	325	189.91	600	325	90/89	359/328

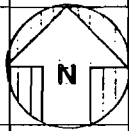
- *The first case is without the standby boilers and the second Case 7 is with the standby boilers.
 **The second high concentration listed is a high or worst case day and not a second high day. The highest second high concentration is founded on the maximum 50 table by locating the first concentration by a second worst day.

APPENDIX B
FIGURES

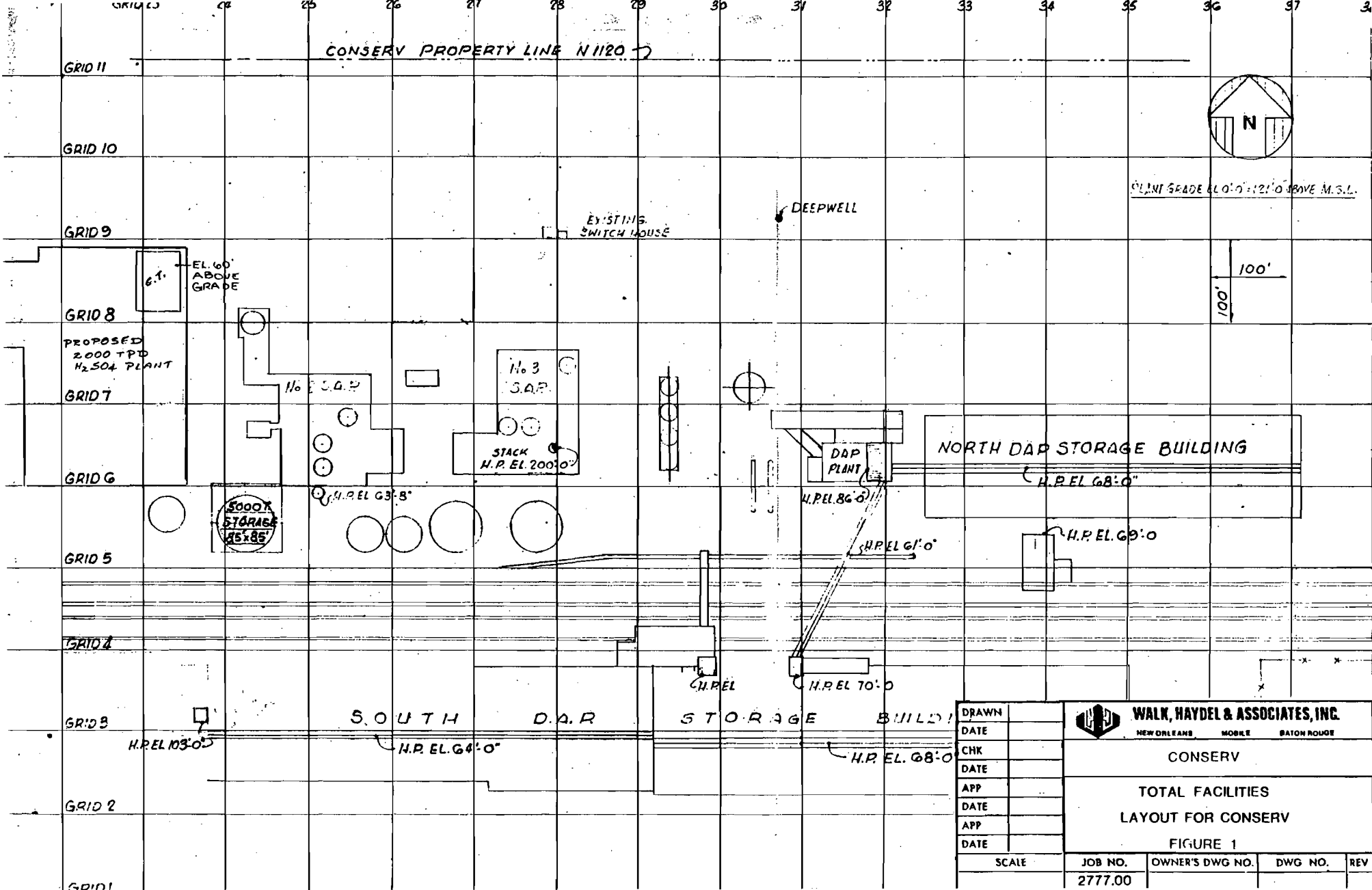
LIST OF FIGURES

- FIGURE 1 - TOTAL FACILITIES
LAYOUT FOR CONSERV
- FIGURE 2 - PLOT PLAN CONSERV
NICHOLS FLA
- FIGURE 3 - SOURCE LOCATIONS WITHIN
50 KM
- FIGURE 4 - INCREMENT CONSUMPTION
DISPERSION MODEL CASES
- FIGURE 5 - AMBIENT AIR DISPERSIONS
MODEL CASES
- FIGURE 6 - BLOCK FLOW DIAGRAM

CONSERV PROPERTY LINE N 1120



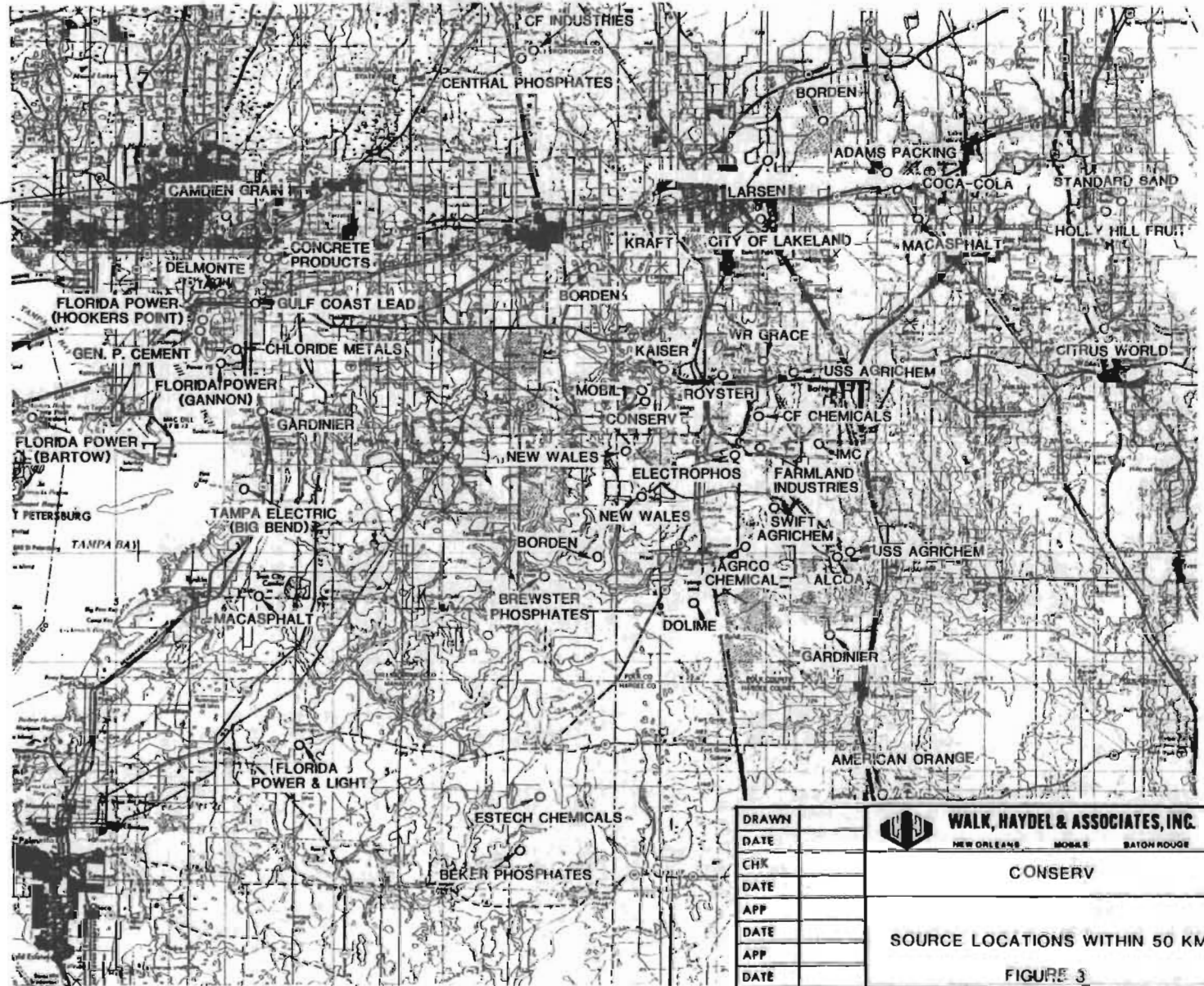
PLANT GRADE EL. 0'-0" = 121'-0" ABOVE M.S.L.




DRAWN	
DATE	
CHK	
DATE	
APP	
DATE	
APP	
DATE	


				CONSERV
TOTAL FACILITIES LAYOUT FOR CONSERV				
FIGURE 1				
SCALE	JOB NO.	OWNER'S DWG. NO.	DWG. NO.	REV
	2777.00			

CAMDEN



DRAWN	 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BATON ROUGE			
DATE				
CHK	CONSERV			
DATE				
APP	SOURCE LOCATIONS WITHIN 50 KM			
DATE				
APP	FIGURE 3			
DATE				
SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV
	2777.00			



DRAWN		 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BATON ROUGE				
DATE						
CHK		CONSERV				
DATE						
APP		AMBIENT AIR DISPERSION MODEL CASES FIGURE 5				
DATE						
APP						
DATE		SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV
			2777.00			

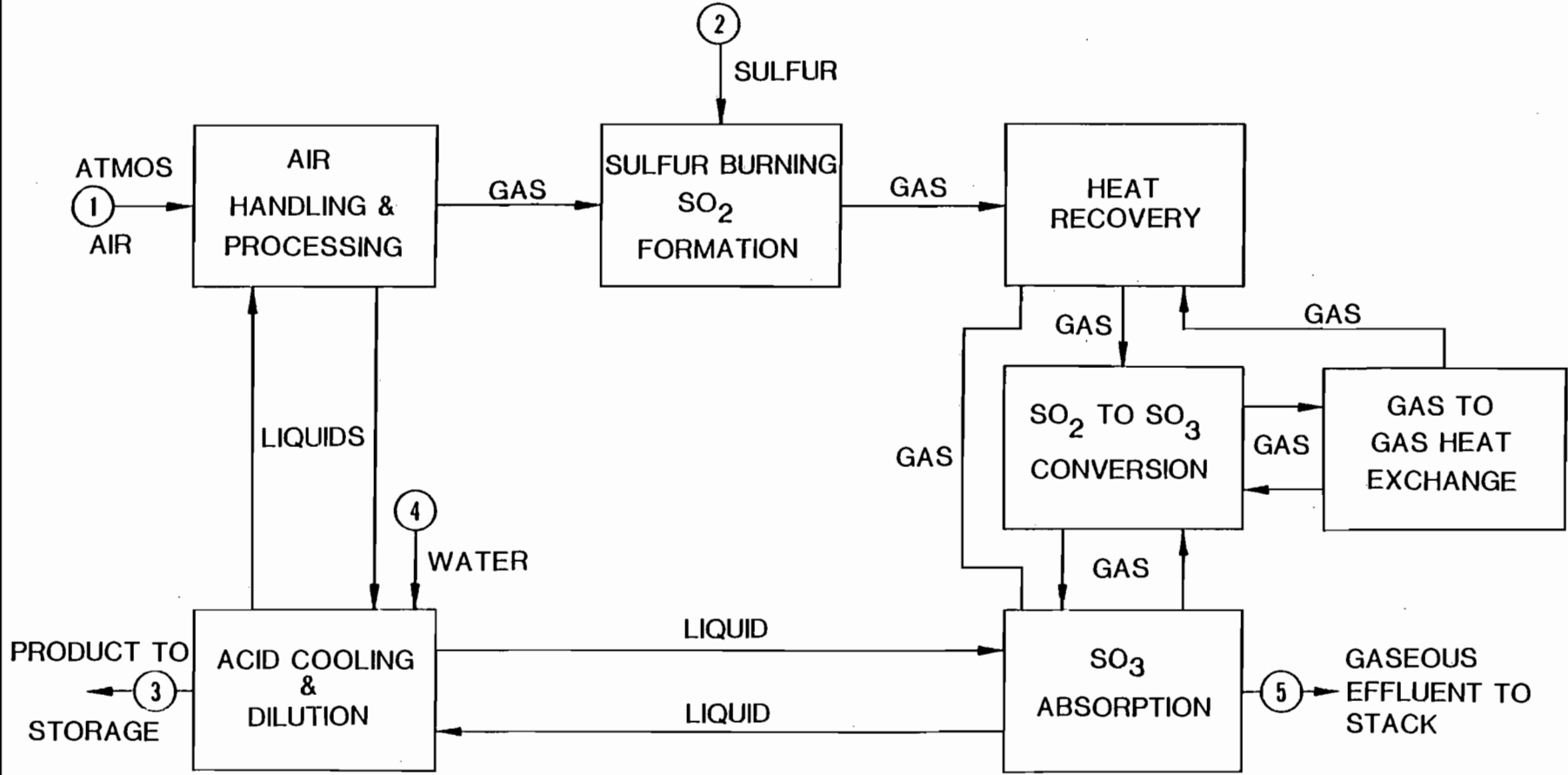


FIGURE 6

CONSERV

SULFURIC ACID PLANT
BLOCK FLOW DIAGRAM

APPENDIX C

APPLICATION TO CONSTRUCT
AIR POLLUTION SOURCES



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO OPERATE/CONSTRUCT
AIR POLLUTION SOURCES

SOURCE TYPE: _____ New¹ Existing¹
 APPLICATION TYPE: Construction Operation Modification
 COMPANY NAME: Conserv COUNTY: Polk
 Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) Sulfuric Acid Plant - Dual Absorption/Acid Mist Elim.
 SOURCE LOCATION: Street P. O. Box 314 City Nichols
 UTM: East 7398410 North 3084200
 Latitude 82 ° 2 ' 0 "N Longitude 27 ° 55 ' 0 "W
 APPLICANT NAME AND TITLE: Mr. R. E. Graf Vice President General Manager
 APPLICANT ADDRESS: P. O. Box 314 Nichols, Florida 33863

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Conserv

I certify that the statements made in this application for a 2000 TPD Sulfuric Acid Plant 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: Ronald E Graf
R. E. Graf Vice President General Manager
 Name and Title (Please Type)
 Date: 4/13/81 Telephone No. 813-425-1164

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 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: Forrest E. Dryden
Forrest E. Dryden
 Name (Please Type)
Walk, Haydel & Associates, Inc.
 Company Name (Please Type)
600 Carondelet St., New Orleans, La. 70130
 Mailing Address (Please Type)
 Date: 4/13/81 Telephone No. 504-586-8111

(Affix Seal)



Florida Registration No. _____

¹See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

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.

Conserv is proposing to replace two existing sulfuric acid plants with a new double absorption unit equipped with mist eliminators. The sulfuric acid plant will meet Best Available Control Technology (BACT) and New Source Performance Standards and will comply with all applicable regulations (see attached report).

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

Start of Construction September 1981 Completion of Construction Mid 1982

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.)

Pollution controls are integral parts of the plants' design and individual cost estimates are not possible.

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

N/A

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

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr ; if seasonal, describe:

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

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

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

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		
Elemental Sulfur			54,900	2 in Figure 6
Water			28,680	4 in Figure 6
Air			5,958,360	1 in Figure 6

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

1. Total Process Input Rate (lbs/hr): 601920

2. Product Weight (lbs/hr): 173640 (98%)

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission ¹		Allowed Emission ² Rate per Ch. 17-2, F.A.C.	Allowable ³ Emission lbs/hr	Potential Emission ⁴		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
SO ₂	333.4	1460	4 lbs/Ton Acid	333.4	Same		5
Acid Mist	12.5	54.8	.15 lb/Ton Acid	12.5	141.7*	621	5
NO _x	50.8	222.5	N/A	N/A	50.8	222.5	5

*Per AP-42 (1.7 lb/Ton Acid)

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles ⁵ Size Collected (in microns)	Basis for Efficiency (Sec. V, It ⁵)
Dual Absorption Towers	SO ₂	99.7%		Vendor Info
Monsanto Mist Eliminator	Acid Mist	99 %	< 10	Vendor Info

¹See Section V, Item 2.

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

³Calculated from operating rate and applicable standard

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

⁵If Applicable

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Not Applicable - N.A.			

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr

Fuel Analysis:

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.
Not Applicable

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

Stack Height: 150 ft. Stack Diameter: 7.5 ft.

Gas Flow Rate: 91531 ACFM Gas Exit Temperature: 182-185 °F.

Water Vapor Content: Not Available % Velocity: 34.53 FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs/hr Incinerated							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ days/week _____

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diameter _____ 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: _____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

- Total process input rate and product weight -- show derivation. **See Report**
- 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. **See Report**
- Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). **See Calculations in Report**
- 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, etc.). **Not Applicable**
- 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). **Vendor Guarantee**
- An 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. **See Figure 6**
- An 8½" 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). **See Figure 3**
- An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. **See Figures 1 and 2**

9. An application fee of \$20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

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

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/Ton - Double Absorption
Acid Mist	0.15 lb/Ton

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

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/Ton - Double Absorption
Acid Mist	0.15 lb/Ton

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

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/Ton
Acid Mist	0.15 lb/Ton

- D. Describe the existing control and treatment technology (if any). Emission control technology is integral part of system design. Specific control device costs are not available.
- Control Device/System:
 - Operating Principles:
 - Efficiency: *
 - Capital Costs:
 - Useful Life:
 - Operating Costs:
 - Energy:
 - Maintenance Cost:
 - Emissions:

Contaminant	Rate or Concentration
Sulfur Dioxide	333.4 LB/HR
Acid Mist	12.5 LB/HR
Nitrogen Oxide	50.8 LB/HR

* Explain method of determining D 3 above.

10. Stack Parameters

- | | | | | | |
|---------------|-------|------|-----------------|---------|-----|
| a. Height: | 150 | ft. | b. Diameter: | 7.5 | ft. |
| c. Flow Rate: | 91531 | ACFM | d. Temperature: | 182-185 | °F |
| e. Velocity: | 34.53 | FPS | | | |

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

1. Same as D

- a. Control Device:
- b. Operating Principles:

- c. Efficiency*:
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy*:
- 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*:
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy**:
- h. Maintenance Costs:
- 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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power — KWH design rate.

3.

- a. Control Device:
- b. Operating Principles:

- c. Efficiency*:
- d. Capital Cost:
- e. Life:
- f. Operating Cost:
- g. Energy:
- h. Maintenance Cost:

*Explain method of determining efficiency above.

- 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*:
 - d. Capital Cost:
 - e. Life:
 - f. Operating Cost:
 - g. Energy:
 - 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: **Sulfuric Acid System design by Monsanto Enviro-Chem Systems, Inc.**

- 1. Control Device: **Double Absorption/Mist Elimination**
- 2. Efficiency*: **99.7 SO₂ to SO₃ Conversion**
- 3. Capital Cost: **Definitive costs not available**
- 4. Life: **20 years**
- 5. Operating Cost: **Definitive costs not available**
- 6. Energy: **Not available**
- 7. Maintenance Cost: **Definitive costs not available**
- 8. Manufacturer: **Monsanto Enviro-Chem Systems, Inc.**
- 9. Other locations where employed on similar processes: **Similar acid plant technology used throughout the industry**
 - a.
 - (1) Company:
 - (2) Mailing Address:
 - (3) City:
 - (4) State:
 - (5) Environmental Manager:
 - (6) Telephone No.:

*Explain method of determining efficiency above. **Vendor guarantee**

(7) Emissions*:

Contaminant	Rate or Concentration

- (8) Process Rate*:
- b.

- (1) Company:
- (2) Mailing Address:
- (3) City:
- (4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration
_____	_____
_____	_____
_____	_____

(8) Process Rate*:

10. Reason for selection and description of systems:

*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

A. Company Monitored Data **NOT APPLICABLE - SEE REPORT**

1. _____ no sites _____ TSP _____ () SO₂* _____ 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.

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. 5 Year(s) of data from 1 / 1 / 1970 to 12 / 31 / 1974
 month day year month day year

2. Surface data obtained from (location) Tampa

3. Upper air (mixing height) data obtained from (location) Tampa

4. Stability wind rose (STAR) data obtained from (location) Tampa

C. Computer Models Used

1. CRSTER NO Modified? If yes, attach description.

2. Industrial Source Complex NO 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. **See Report**

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	<u>Not Applicable</u> grams/sec
SO ₂	<u>41.99</u> grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time. **See Report**

F. Attach all other information supportive to the PSD review. **See Report**

*Specify bubbler (B) or continuous (C).

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.

The proposed acid plant will replace two older existing facilities. It will not change current operations at Conserv other than eliminate the need to import 500 tons/day of sulfuric acid. In addition, cogeneration features will reduce Conserv's dependency on outside power 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. **See Report**

APPENDIX D
CALCULATIONS

(DATA PER CONSERV)

II OLD H₂SO₄ PLANTS (750 TPD EACH)

SINGLE ABSORPTION / 8% SO₂ TO CONVERTER
 AMMONIA SCRUBBER
 STACK HEIGHT (COMMON STACK) = 100 ft = 30.48 m

DIAMETER = 5.94 ft = 1.81 m

TEMP. = 85 °F (1 PLT) = 302 °K
 = 100 °F (2 PLT) = 311 °K

FLOW RATE = 57,600 ACFM (1 PLANT)
53.71 m³/s = 113,800 ACFM (2 PLANTS)

MEASURED SO₂ RATE = 120.83 LB/HR AVG. (1979-1980)
 = 150.0 LB/HR WORST CASE
 = 18.9 g/s

SO₂ = 3600.0 LB/DAY
 = 657.0 TONS/YEAR } WORST CASE

RATE = 18.90 GRAMS/SEC

FLUE CONCENTRATION FOR SO₂:

A) AVG.:

$$\frac{120.83 \text{ LB}}{\text{HR}} \left(\frac{\text{min}}{113800 \text{ ft}^3} \right) \left(\frac{453.59 \times 10^6 \text{ } \mu\text{S}}{\text{LB}} \right) \left(\frac{\text{HR}}{60 \text{ min}} \right) \left(\frac{35.3147 \text{ ft}^3}{\text{m}^3} \right)$$

$$\text{SO}_2 = \underline{.283 \times 10^6 \text{ } \mu\text{g}/\text{m}^3}$$

$$\frac{120.83 \text{ LB}}{\text{HR}} \left(\frac{\text{mole}}{64 \text{ LB}} \right) \left(\frac{\text{HR}}{60 \text{ min}} \right) \left(\frac{379.4 \text{ ft}^3}{\text{LB mole}} \right) \left(\frac{\text{min}}{113800 \text{ ft}^3} \right) \left(\frac{520}{545} \right) (10^6)$$

$$\text{SO}_2 = \underline{100.1 \text{ PPM}}$$

(B) WORST CASE

$$150.0 \frac{\text{LB}}{\text{HR}} \left(\frac{\text{min}}{113,800 \text{ ft}^3} \right) \times 2.6697 \times 10^8 = \underline{.35 \times 10^6 \text{ } \mu\text{g}/\text{m}^3}$$

$$150.0 \frac{\text{LB}}{\text{HR}} \times \frac{\text{min}}{113,800 \text{ ft}^3} \times 9.427 \times 10^4 = \underline{124.3 \text{ PPM}}$$

NOx EMISSIONS

UNDER CONDITIONS STATED PER NSPS FOR
SULFURIC ACID FACILITIES 100 PPM OR
LESS NOx SHOULD BE EXPECTED. ASSUME
WORST CASE.

100 PPM NOx

$$\begin{aligned} \text{NO}_x \frac{\text{LB}}{\text{HR}} &= 100 \left(\frac{25 \text{ mole}}{46.01 \text{ LB}} \right) \left(\frac{\text{HR}}{60 \text{ M}} \right) \left(\frac{379.4 \text{ FT}^3}{25 \text{ MOLE}} \right) \left(\frac{\text{MIN}}{113800} \right) \left(\frac{520}{545} \right) (10^6) \\ &= 86.78 \text{ LB/HR} \Rightarrow \underline{10.94 \text{ G/SEC}} \\ &= 2082.7 \text{ LB/DAY} \\ &= 380.1 \text{ TONS/YR} \end{aligned}$$

CONCENTRATION

$$\frac{\text{MG}}{\text{M}^3} = 86.78 \frac{\text{LB}}{\text{HR}} \left(\frac{\text{MIN}}{113800} \right) (2.6697 \times 10^8) = .204 \times 10^6$$

PPM = 100 OR LESS

ACID MIST

$$1979 \text{ AVG.} = 18.14 \text{ LB/HR}$$

$$1980 \text{ AVG.} = 10.475 \text{ LB/HR}$$

$$2 \text{ YR AVG.} = 13.808 \text{ LB/HR}$$

$$= 60.48 \text{ TONS/YEAR}$$



12 BOILER - 32 MM BTU/HR } STANDBY STEAM
BABCOCK-WILCOX } GENERATION

STACK height = 39 ft = 11.89 m (683 hr/yr)

Diameter = 3.2 ft = .98 m

TEMP. = 500°F = 533°K

FLUE VOL. RATE = 14,188 ACFM = 0.70 m³/s

FUEL = NO. 2/6 FUEL OIL @ ~2.5% S

1.452 * 10⁵ BTU/GAL } BASED ON AVG.
ρ = 7.465 LB/GAL } VALUES FROM
AP-42

MAX FUEL USAGE = 220 GAL/HR

AVG. " " = 106 " "

MAX SO₂ = 220 $\frac{\text{GAL}}{\text{HR}}$ * (7.465 $\frac{\text{LB}}{\text{GAL}}$) * (0.025 $\frac{\text{LB S}}{\text{LB OIL}}$) * ($\frac{2 \text{ SO}_2}{15}$) = 82.12 $\frac{\text{LB}}{\text{HR}}$
= 10.35 g/s

AVG. SO₂ = 106 $\frac{\text{GAL}}{\text{HR}}$ * (.37325) = 39.56 $\frac{\text{LB}}{\text{HR}}$
= 4.98 g/sec

MAX = 10.35 g/SEC

AVG = 4.98 g/SEC

A) MAX CONC.

82.12 $\frac{\text{LB}}{\text{HR}}$ * ($\frac{\text{min}}{14188 \text{ ft}^3}$) * ($\frac{453.59 * 10^6 \text{ AS}}{\text{LB}}$) * ($\frac{\text{HR}}{60 \text{ min}}$) * ($\frac{35.3147 \text{ ft}^3}{\text{m}^3}$)
= 1.55 * 10⁶ $\mu\text{g}/\text{m}^3$

PPM = 82.12 $\frac{\text{LB}}{\text{HR}}$ * ($\frac{\text{LB MOLE}}{64 \text{ LB}}$) * ($\frac{\text{HR}}{60 \text{ min}}$) * ($\frac{379.4 \text{ ft}^3}{\text{LB MOLE}}$) * ($\frac{\text{min}}{14188 \text{ ft}^3}$) * (10⁶) * ($\frac{520}{960}$)
= 309.8

B) AVG CONC.

$\mu\text{g}/\text{m}^3 = 39.56 \frac{\text{LB}}{\text{HR}} * 1.8817 * 10^4 = .744 * 10^6 \mu\text{g}/\text{m}^3$

PPM = 39.56 * 3.772 = 149.2

$$\text{VELOCITY} = \frac{14188 \text{ ft}^3}{\text{min}} \times \frac{\text{min}}{60 \text{ sec}} \left(\frac{4}{\pi(3.12)^2} \right) = 29.4 \text{ ft/sec}$$

$$= 8.96 \text{ m/sec}$$

$$\frac{14188 \text{ ft}^3}{\text{min}} \times \frac{\text{min}}{60 \text{ sec}} \times \frac{\text{m}^3}{35.3147 \text{ ft}^3} = 6.7 \text{ m}^3/\text{sec}$$

3 BOILER - 21 MM BTU/HR } STANDBY STEAM
SCOTCH } GENERATOR

STACK HEIGHT = 27 ft = 8.23 m (1093 HR/YR)

DIAMETER = 2.0 ft = .61 m

TEMP. = 500°F = 533°K

FLUE RATE = 8463 ACFM = 3.99 m³/sec

FUEL = NO. 2 / G FUEL OIL @ ~ 2.5 % S

1.452 * 10⁵ BTU/GAL

ρ = 7.465 LB/GAL

MAX FUEL USAGE = 144.6 GAL/HR

AUG FUEL USAGE = 106 GAL/HR

$$\text{MAX SO}_2 = \frac{144.6 \text{ GAL}}{\text{HR}} \left(\frac{7.465 \text{ LB}}{\text{GAL}} \right) \left(0.025 \frac{\% \text{S}}{100} \right) \left(\frac{2 \text{ SO}_2}{\text{S}} \right) = 53.97 \text{ LB/HR}$$

$$= \underline{6.80 \text{ g/sec}}$$

$$\text{AUG SO}_2 = 106 \frac{\text{GAL}}{\text{HR}} * 0.37325 = 39.56 \text{ LB/HR}$$

$$= \underline{4.98 \text{ g/sec}}$$

MAX = 6.80 g/sec

AUG = 4.98 g/sec

(A) MAX CONC.

$$\mu\text{g/m}^3 = 53.97 \frac{\text{LB}}{\text{HR}} * 3.1546 \times 10^9 = 1.7 * 10^6 \mu\text{g/m}^3$$

$$\text{PPM} = 53.97 \frac{\text{LB}}{\text{HR}} * 6.3237 = 341.3$$



B) AUG CONC

$$\mu\text{g}/\text{m}^3 = 39.56 \frac{\text{lb}}{\text{hr}} (3.1546 \times 10^4) = 1.25 \times 10^6 \mu\text{g}/\text{m}^3$$

$$\text{PPM} = 39.56 \frac{\text{lb}}{\text{hr}} \times 6.3237 = 250.2$$

$$\text{VELOCITY: } 8463 \frac{\text{ft}^3}{\text{min}} \times \frac{\text{min}}{60 \text{ sec}} \left(\frac{4}{\pi (2)^2} \right) = 44.90 \text{ ft/sec} \\ = 13.69 \text{ m/sec}$$

$$8463 \frac{\text{ft}^3}{\text{min}} \times \frac{\text{min}}{60 \text{ sec}} \times \frac{\text{m}^3}{35.3147 \text{ ft}^3} = 3.99 \text{ m}^3/\text{sec}$$

[4] ROCK DRYER - 85 TPH FEED
 45 MM. BTU/HR

STACK HEIGHT = 80 ft = 24.38 m

DIAMETER = 7.6 ft = 2.32 m

TEMP. = 130°F = 327 OK

FLUE RATE = 44,600 ACFM = 21.05 m³/sec

FUEL = NO. 2/6 FUEL OIL @ 2.58% S

138,400 BTU/GAL

Q = 7.465

MAX FUEL USAGE = 325 GAL/HR

AUG FUEL USAGE = 257 GAL/HR

$$\text{MAX SO}_2 = 325 \frac{\text{GAL}}{\text{HR}} \left(\frac{7.465 \text{ lb}}{\text{GAL}} \right) (0.0258) (2) = 125.2 \text{ lb/HR} \\ = \underline{15.8 \text{ g/sec}}$$

$$\text{AUG SO}_2 = 257 \frac{\text{GAL}}{\text{HR}} (7.465) (0.0258) (2) = 98.99 \text{ lb/HR} \\ = \underline{12.47 \text{ g/sec}}$$

MAX = 15.77 g/SEC

AUG = 12.47 g/SEC



A) MAX CONC

$$\mu\text{g}/\text{m}^3 = 125.2 \frac{\text{lb}}{\text{hr}} \left(\frac{\text{min}}{44,600 \text{ ft}^3} \right) \left(\frac{453.59 \times 10^6 \mu\text{s}}{\text{lb}} \right) \left(\frac{\text{hr}}{60 \text{ min}} \right) \left(\frac{55.3147 \text{ ft}^3}{\text{min}} \right)$$

$$= .749 \times 10^6 \mu\text{g}/\text{m}^3$$

$$\text{PPM} = 125.2 \frac{\text{lb}}{\text{hr}} \left(\frac{\text{lb mole}}{64 \text{ lb}} \right) \left(\frac{\text{hr}}{60 \text{ min}} \right) \left(\frac{379.4 \text{ ft}^3}{\text{lb mole}} \right) \left(\frac{\text{min}}{44,600} \right) \left(10^6 \right) \left(\frac{520}{550} \right)$$

$$= 244.5$$

(B) AVG. CONC

$$\mu\text{g}/\text{m}^3 = 98.99 \frac{\text{lb}}{\text{hr}} * (5985.9) = .593 \times 10^6 \mu\text{g}/\text{m}^3$$

$$\text{PPM} = 98.99 \frac{\text{lb}}{\text{hr}} (1.9525) = 193.3$$

VELOCITY: $\frac{44600 \text{ ft}^3}{\text{min}} * \frac{\text{min}}{60 \text{ sec}} * \left(\frac{4}{\pi (7.6)^2} \right) = 16.39 \text{ ft}/\text{sec}$

$$= 5.0 \text{ m}/\text{sec}$$

$$\frac{44,600 \text{ ft}^3}{\text{min}} * \frac{\text{min}}{60 \text{ sec}} * \frac{\text{m}^3}{35.3147 \text{ ft}^3} = 21.05 \text{ m}^3/\text{sec}$$

15] DAP PLT. DRYER - 20 MM BTU/HR

STACK HEIGHT = 80 ft = 24.38 m

DIAMETER = 3.52 ft = 1.07 m

TEMP. = 140 °F = 333 °K

FLUE RATE = 44,000 ACFM = 20.77 m³/sec

FUEL = NO.2/G FUEL OIL @ 0.36% S

138,000 BTU/GAL ρ = 7.46

MAX FUEL USAGE = 145 GAL/HR

AVG FUEL USAGE = 35.4 GAL/HR

MAX SO₂ = $\frac{145 \text{ GAL}}{\text{HR}} (7.46) (.0036) (2) = 7.79 \text{ lb}/\text{HR} = .98 \text{ g}/\text{sec}$

AVG. SO₂ = $\frac{35.4 \text{ GAL}}{\text{HR}} (7.46) (.0036) (2) = 1.90 \text{ lb}/\text{HR} = .24 \text{ g}/\text{sec}$

(A) MAX CONC. i

$$\mu\text{g}/\text{m}^3 = 7.79 \frac{\text{lb}}{\text{HR}} \left(\frac{\text{min}}{44,000 \text{ ft}^3} \right) \left(2.6657 \times 10^8 \right) = .047 \times 10^6 \mu\text{g}/\text{m}^3$$

$$\text{PPM} = 7.79 \frac{\text{lb}}{\text{HR}} \left(\frac{\text{min}}{44,000 \text{ ft}^3} \right) \left(8.5628 \times 10^4 \right) = 15.2$$



B) AUG. CONC.

$$\frac{\mu\text{g}}{\text{m}^3} = 1.9 \frac{\text{lb}}{\text{hr}} \left(\frac{\text{min}}{44000 \text{ ft}^3} \right) (2.6697 \times 10^8) = .012 \times 10^6$$

$$\text{PPM} = 1.9 \frac{\text{lb}}{\text{hr}} \left(\frac{\text{min}}{44000 \text{ ft}^3} \right) (8.5628 \times 10^4) = 3.70$$

$$\text{VELOCITY} = \left. \begin{array}{l} 75.35 \text{ ft/sec} \\ 22.97 \text{ m/sec} \end{array} \right\} 20.77 \text{ m}^3/\text{SEC}$$

6 NEW H₂SO₄ PLANT

(DATA PER MONSANTO ENVIRO-CHEM)

DUAL ABSORPTION/ACID MIST ELIMINATOR

120% SO₂ to the converter 199.7% conversion

STACK HEIGHT: 150 ft = 45.72 m

DIAMETER: 7.5 ft = 2.286 m

FLUE RATE: 91531 ACFM = 43.198 m³/SEC
 69,819 SCFM

VELOCITY: 10.525 m/SEC

TEMP: 182-185 °F = 358°K (185°F)

SO₂ = 4 LB/TON 100% H₂SO₄ produced

ACID MIST = 0.15 LBS/TON 100% H₂SO₄ produced

2000 STPD AS 96% ACID (100% H₂SO₄ BASIS)

SO₂ EMISSIONS:

A) MAX RATE (PER NSPS)

$$\begin{aligned} \frac{4 \text{ LB}}{\text{TON ACID}} \left(\frac{173640 \text{ LB HR ACID}}{2000 \text{ LB/TON}} \right) (.96) &= 333.39 \text{ LB/HR} \\ &= 41.99 \text{ g/SEC} \\ &= 1460 \text{ TONS/YR} \\ &\quad (365 \text{ DAYS}) \end{aligned}$$

B) CONCENTRATION @ MAX RATES

$$\begin{aligned} \frac{\mu\text{g}}{\text{m}^3} &= 333.39 \frac{\text{LB}}{\text{HR}} \left(\frac{\text{min}}{91531} \right) \left(\frac{453.59 \times 10^6 \mu\text{g}}{\text{LB}} \right) \left(\frac{\text{HR}}{60 \text{ min}} \right) \left(\frac{35.3147 \text{ ft}^3}{\text{m}^3} \right) \\ &= .97 \times 10^6 \mu\text{g}/\text{m}^3 \end{aligned}$$



$$PPM : 333.39 \frac{LB}{HR} \left(\frac{LB \text{ mole}}{64 LB} \right) \left(\frac{HR}{60 \text{ min}} \right) \left(\frac{379.4 \text{ ft}^3}{LB \text{ mole}} \right) \left(\frac{\text{min}}{69819 \text{ SCF}} \right) (10^6)$$

$$= 471.8$$

ACID MIST EMISSIONS :

A) MAX RATE (Per NSPS)

$$\frac{.015 LB}{TON ACID} \times 173640 \frac{LB}{HR} \left(.96 \times \frac{1}{2000} \right) = 12.50 \frac{LB}{HR}$$

$$= 54.96 \text{ TONS/YR}$$

NO_x EMISSIONS

Per NSPS for SULFURIC ACID plants, conditions of Lower Furnace temperatures (Less than 2000°F) and low excess air, NO_x emissions are usually less than 100 PPM.

$$NO_x \frac{LB}{HR} = 100 / \left(\frac{LB \text{ mole}}{46.01 LB} \right) \left(\frac{HR}{60 \text{ min}} \right) \left(\frac{379.4 \text{ ft}^3}{LB \text{ mole}} \right) \left(\frac{\text{min}}{69819} \right) (10^6)$$

$$= 50.80 \frac{LB}{HR}$$

$$= 222.5 \text{ TONS/YR}$$

} MAX EXPECTED

CONCENTRATION

$$\mu\text{g}/\text{m}^3 = 50.80 \frac{LB}{HR} \left(\frac{\text{min}}{91531 \text{ ft}^3} \right) (2.6697 \times 10^8)$$

$$= .148 \times 10^6 \mu\text{g}/\text{m}^3$$

PPM = 100 or Less

(1) SO₂ EMISSIONS OFFSET (@ EMISSIONS LIMIT)

$$\begin{aligned} \text{EXISTING 1500 TPD SO}_2 \text{ RATE} &= 2900.0 \text{ LB/DAY} \\ &= 529.25 \text{ TON/YEAR} \end{aligned}$$

$$\begin{aligned} \text{PROPOSED 2000 TPD SO}_2 \text{ RATE} &= 8000 \text{ LB/DAY} \\ &= 1460 \text{ TONS/YEAR} \end{aligned}$$

$$\begin{aligned} \text{NET SO}_2 &= 1460 - 529.25 \\ &= 930.75 \text{ TON/YEAR @ LIMIT} \end{aligned}$$

(2) NO_x EMISSIONS OFFSET (WORST CASE)

$$\begin{aligned} \text{EXISTING 1500 TPD NO}_x \text{ RATE} &= 2082.7 \text{ LB/DAY} \\ &= 380.1 \text{ TONS/YR} \end{aligned}$$

$$\begin{aligned} \text{PROPOSED 2000 TPD NO}_x \text{ RATE} &= 1219.2 \text{ LB/DAY} \\ &= 222.5 \text{ TONS/YEAR} \end{aligned}$$

NET NO_x :

$$222.5 - 380.1 = \underline{-157.60 \text{ TONS/YEAR DECREASE}}$$

when the proposed facility is operated vs. the existing plant emissions. The ACTUAL decrease occurs due to less air being required in the proposed plant (therefore less N₂ which can be fixed).

(3) ACID MIST

$$\text{EXISTING 1500 TPD ACID MIST RATE} = 60.48 \text{ TPY}$$

$$\text{PROPOSED 2000 TPD ACID MIST RATE} = 54.76 \text{ TPY}$$

$$\begin{aligned} \text{NET ACID MIST} &= 54.76 - 60.48 \\ &= -5.72 \text{ TPY} \end{aligned}$$



MOBIL CHEMICAL CO.
NICHOLS, FLA.

UTM: 398.0 E
3085.3 N

PER LARRY GEORGE (METEOROLOGIST) @ DER
FLORIDA - MOBIL SOURCES MUST BE
modeled with CONSERV IN SOME OF
the model EXERCISES.

II DRYER NO. 1 - 97.5 MM BTU/HR

STACK HEIGHT = 85 ft = 25.91 m
DIAMETER = 7.5 ft = 2.29 m
TEMP = 160°F = 344°K
FUEL RATE = 112,000 ACFM = 52.86 m³/sec
= 93935 SCFM

$V = 42.2 \text{ ft/sec} = \underline{12.86 \text{ m/sec}}$

FUEL = NO. 6 OIL @ ~2.5% S
AVG. FUEL USAGE = 585 GPH
MAX FUEL USAGE = 650 GPH

SO₂ EMISSIONS:

A) MAX:

$650 \frac{\text{GAL}}{\text{HR}} \times 7.88 \frac{\text{LB}}{\text{GAL}} \times .025 \times 2 = 256.1 \text{ LB/HR}$
 $= \underline{32.27 \text{ g/sec}}$

B) AVG

$585 \times 7.88 \times .025 \times 2 = 230.5 \text{ LB/HR}$
 $= \underline{29.04 \text{ g/sec}}$

2 DRYER NO. 2 - 87 MM BTU/HR

STACK Height: 85 ft = 25.91 m

Diameter: 7.5 ft = 2.29 m

Temp.: 163 °F = 346 °K

FLUE RATE: 76,677 ACFM = 36.19 m³/sec
: 64,000 SCFM

FUEL = NO. 6 @ ~ 2.5 % S

AUG. FUEL RATE = 510 GAL/HR
MAX " " = 580

SO₂ EMISSION RATES

A) MAX

580 GAL/HR x .394 = 228.52 LB/HR = 28.79 g/sec

B) AVG

510 GAL/HR x .394 = 200.9 LB/HR = 25.31 g/sec

3 DRYER NO. 3 - 64 MM BTU/HR

STACK Height = 100 ft = 30.48 m

Diameter = 4.8 ft = 1.46 m

Temp = 192 °F = 362 °K

FLUE RATE = 27460 ACFM = 12.96 m³/sec
= 21,900 SCFM

FUEL = NO. 6 @ 2.5 % S

AUG. FUEL RATE = 148 GAL/HR

MAX FUEL RATE = 427 GAL/HR

SO₂ EMISSION RATES

A) MAX = 427 GAL/HR x .394 = 168 LB/HR = 21.17 g/sec

B) AVG = 148 GAL/HR x .394 = 58.31 LB/HR = 7.35 g/sec



4 DRYER NO. 4 (New source)

AC 2/12/80

93.75 MM BTU/HR

STACK Height = 85 ft = 25.91 m

Diameter = 7.5 ft = 2.29 m

Temp. = 150 °F = 339 °K

V = 50 ft/sec = 15.24 m/sec

FLUE RATE = 140,000 ACFM = 66.07 m³/sec
= 119,344 SCFM

MAX SO₂ = 260 LB/HR

ACTUAL = 19.4 LB/HR 2.44 g/SEC

NO. 6 FUEL OIL @ 2.5 % S

5 CALCINER /W SCRUBBER

STACK Height = 100 ft = 30.48 m

Diameter = 4.48 ft = 1.37 m

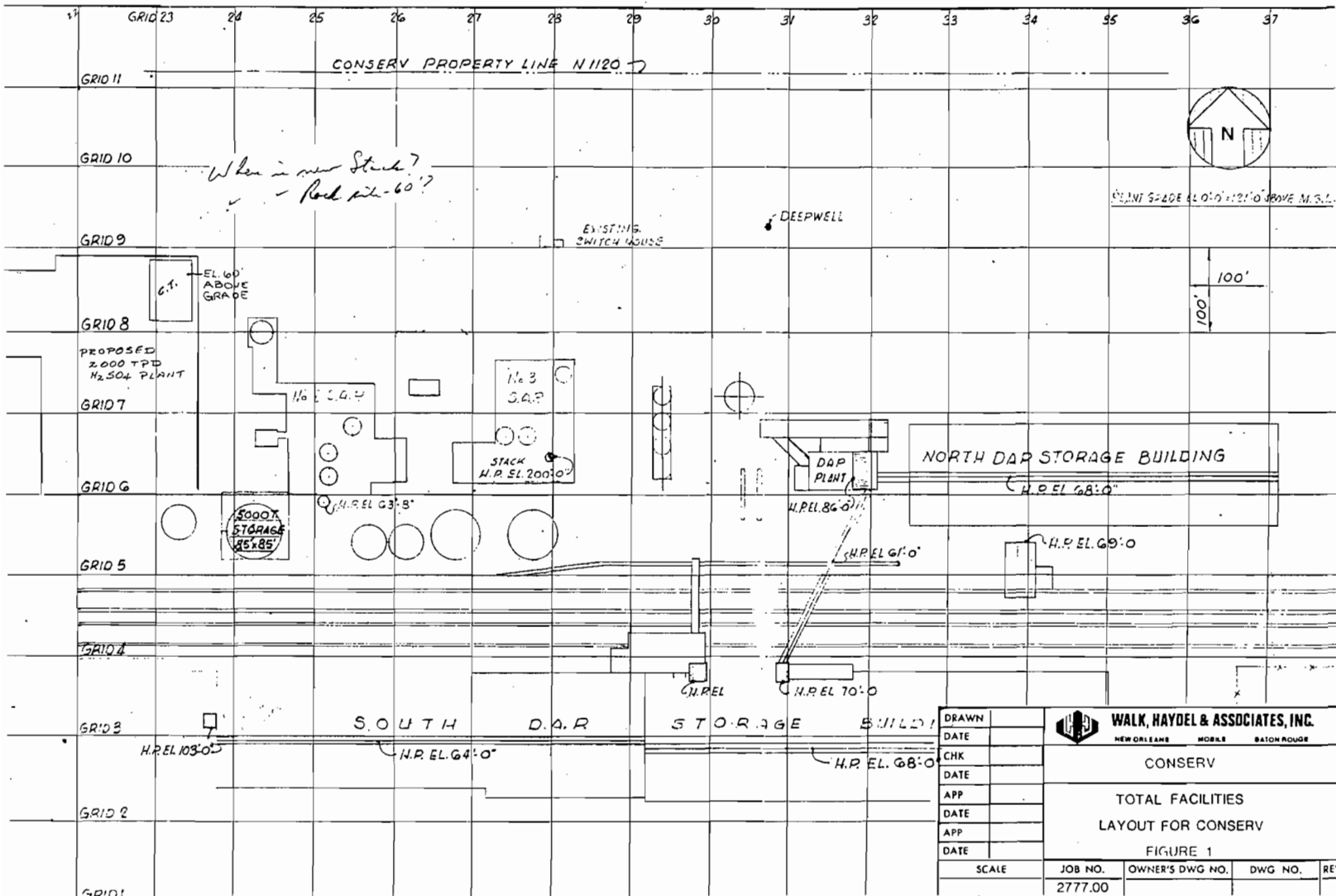
Temp. = 150 °F = 339 °K

ACFM = 38119 = 17.99 m³/sec

SO₂ = 107 LB/HR = 13.48 g/SEC

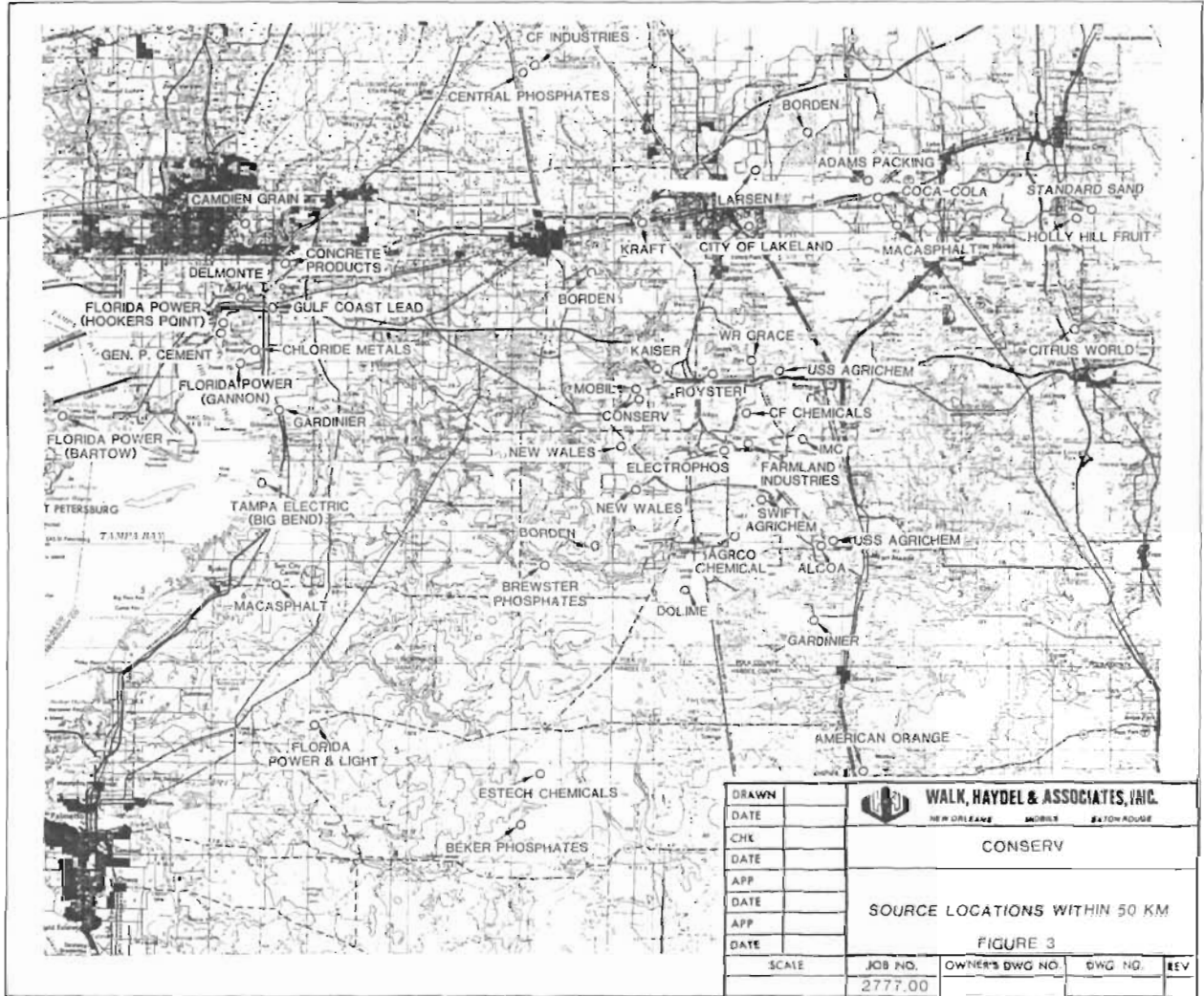
After scrubber






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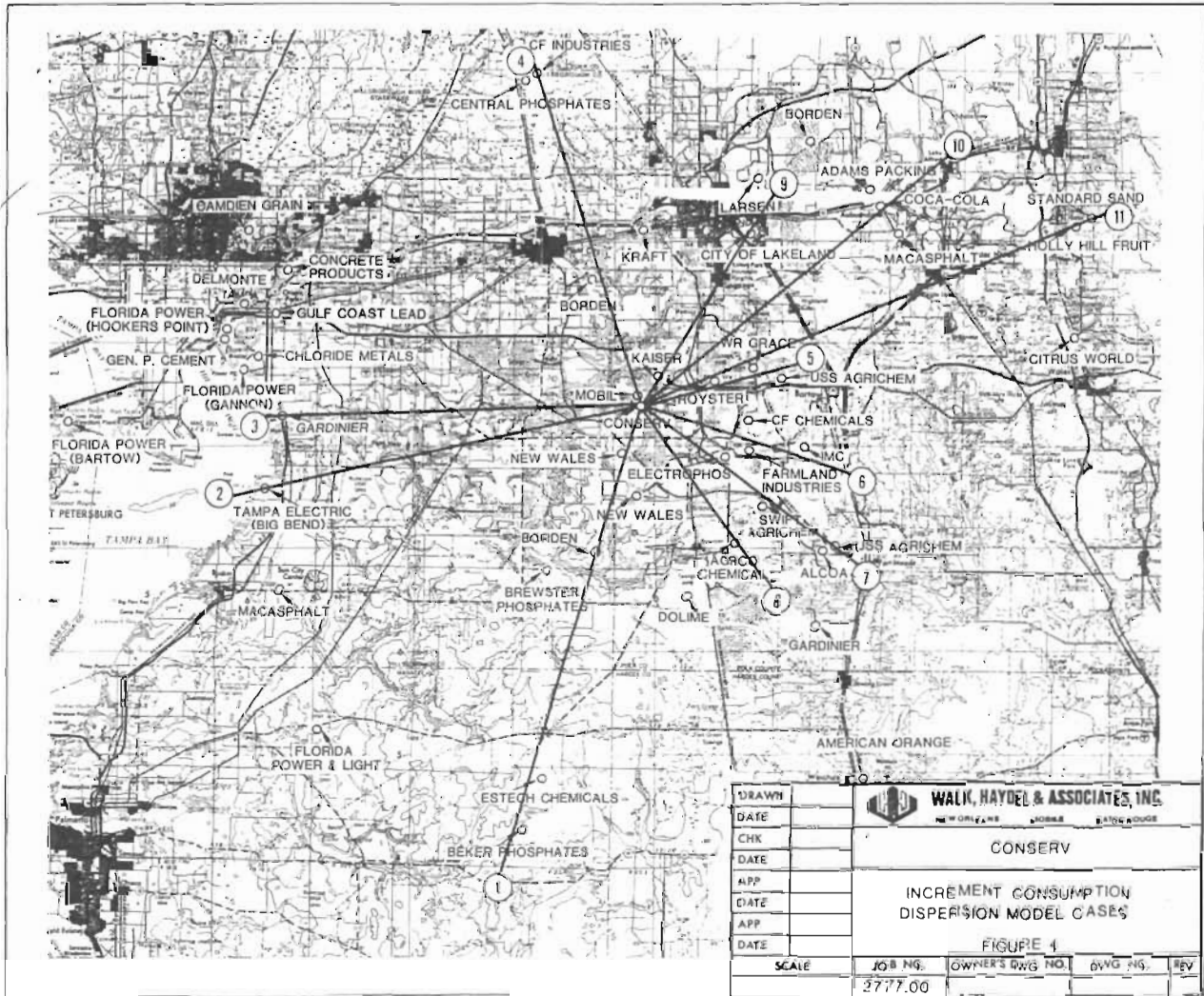
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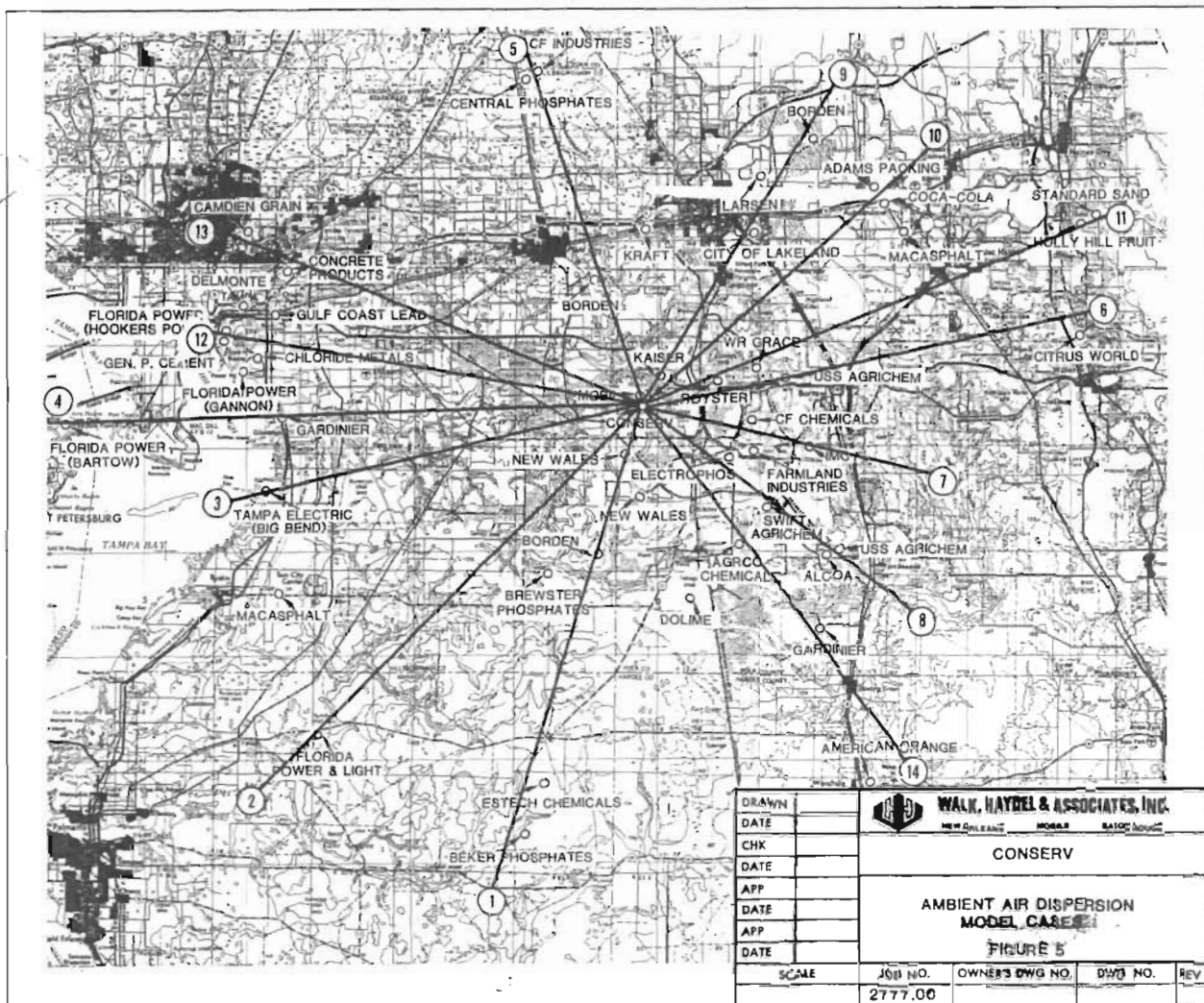
DRAWN	 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BATON ROUGE			
DATE				
CHK	CONSERV			
DATE				
APP	SOURCE LOCATIONS WITHIN 50 KM			
DATE				
APP	FIGURE 3			
DATE				
SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV.
	2777.00			


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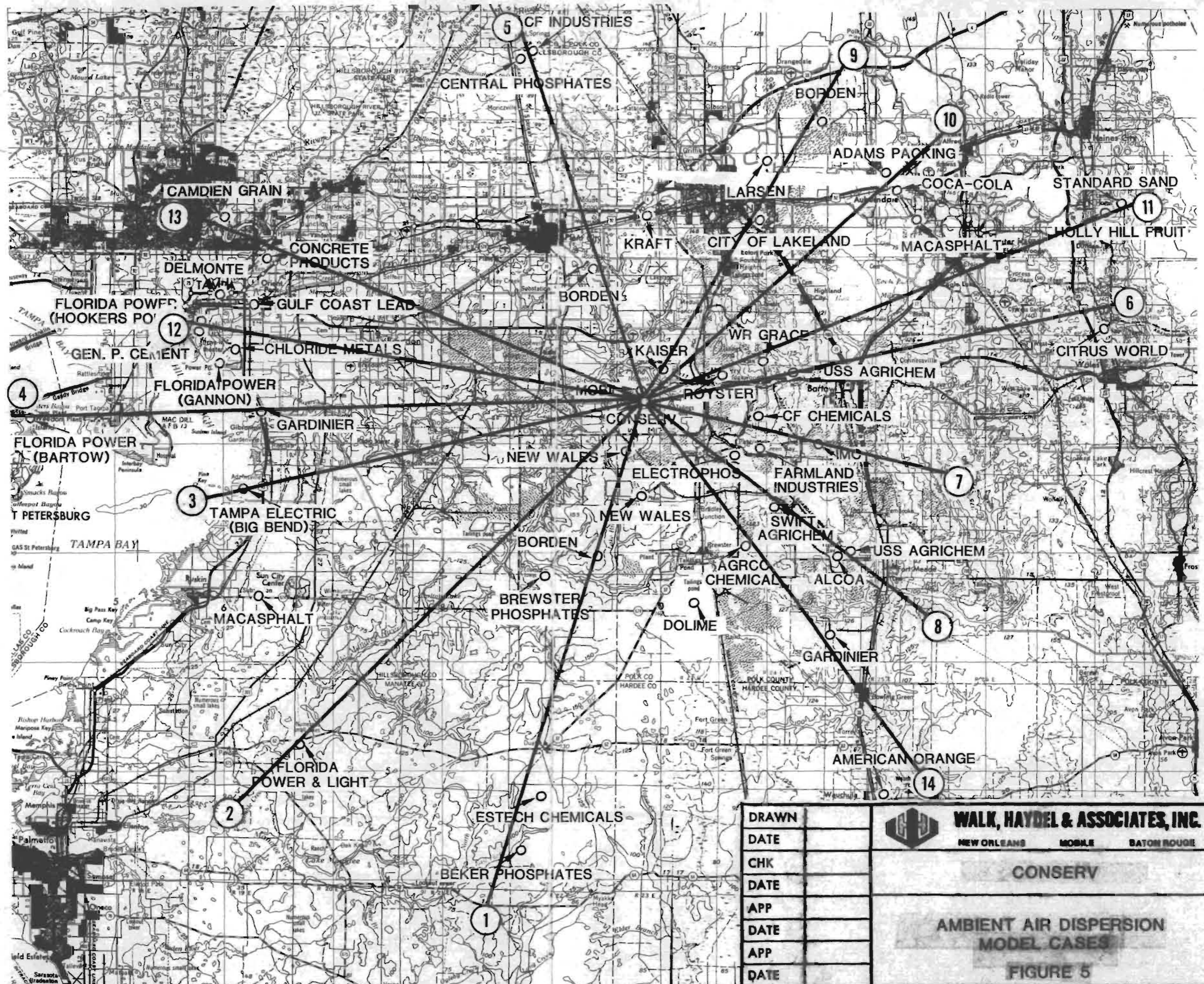
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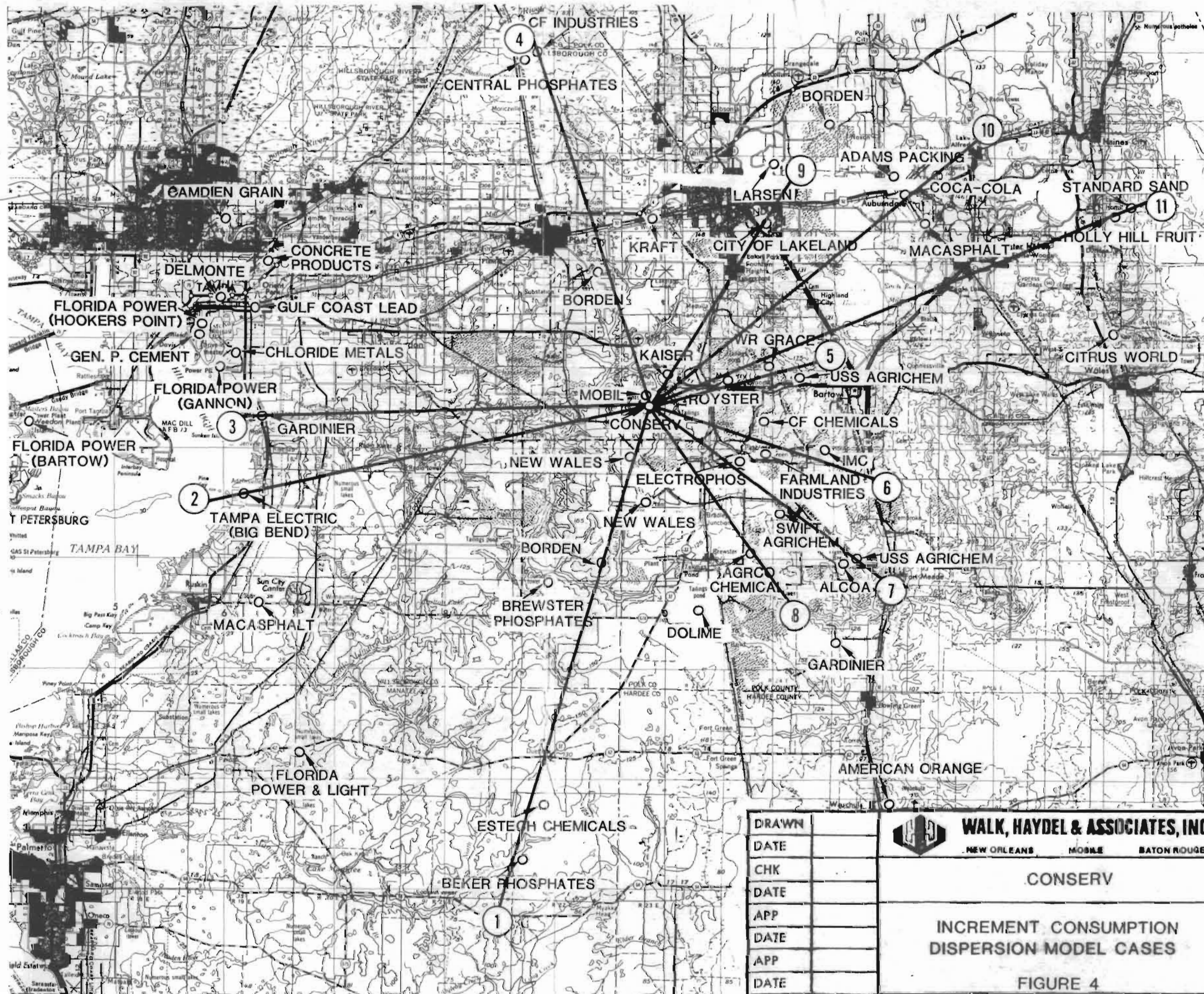



DRAWN	 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BAYTOWN				
DATE					
CHK	CONSERV				
DATE					
APP	AMBIENT AIR DISPERSION MODEL CASE FIGURE 5				
DATE					
APP					
DATE	SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV
		2777.00			



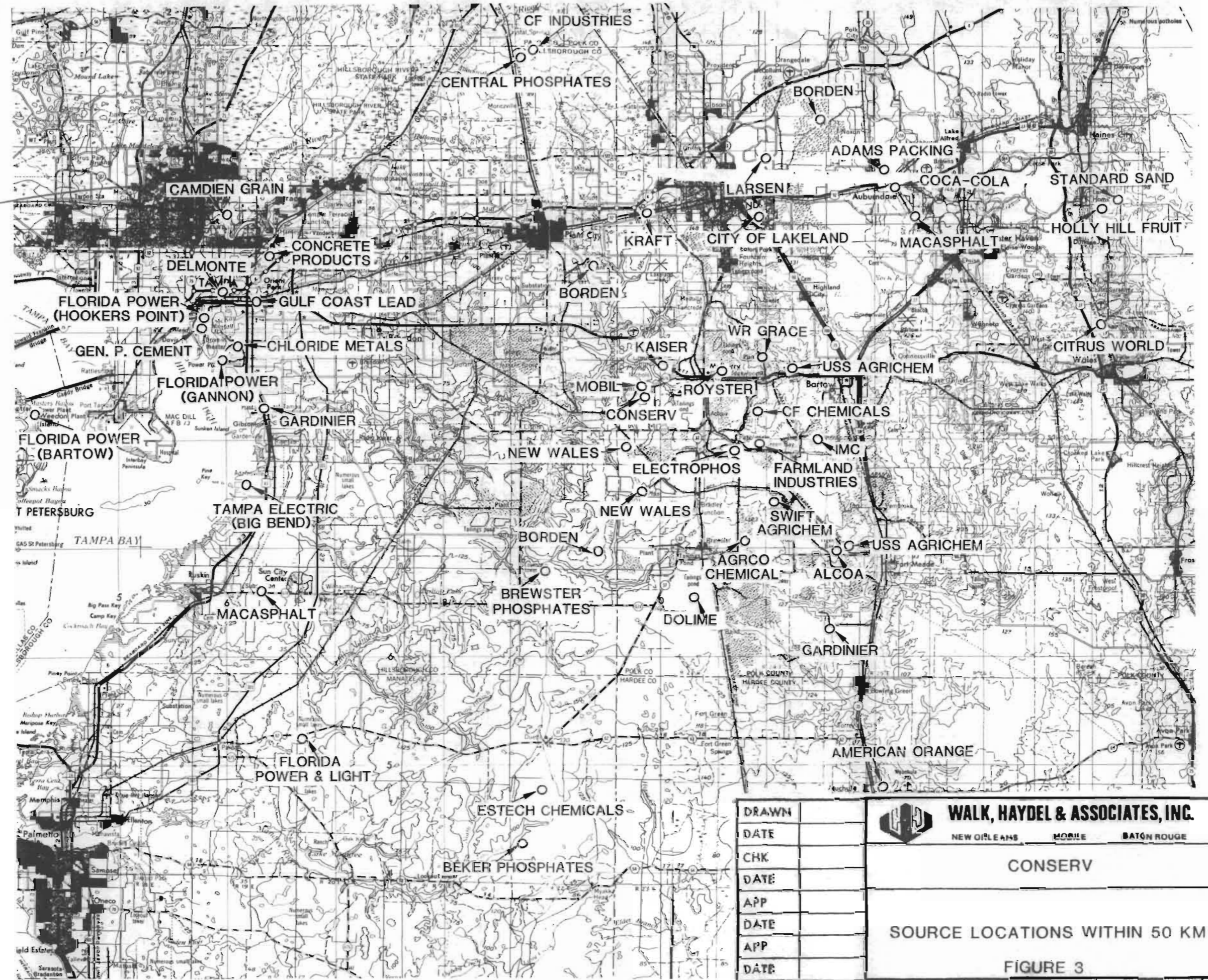
DRAWN		 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BATON ROUGE		
DATE				
CHK		CONSERV		
DATE				
APP		AMBIENT AIR DISPERSION MODEL CASES		
DATE				
APP		FIGURE 5		
DATE				
SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV
	2777.00			


CAMDEN

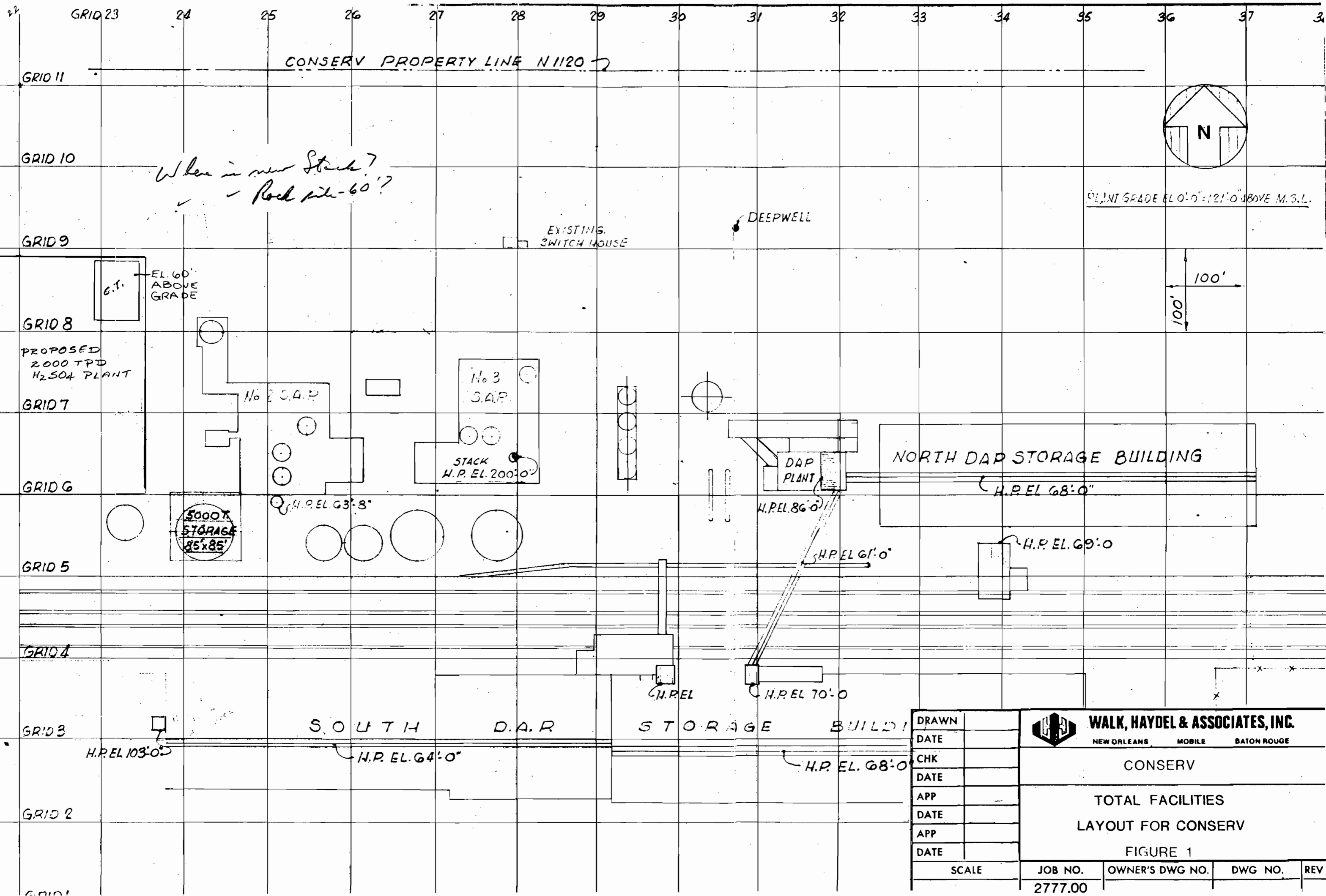


DRAWN		 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BATON ROUGE		
DATE				
CHK				
DATE				
APP				
DATE				
SCALE		CONSERV		
		INCREMENT CONSUMPTION DISPERSION MODEL CASES		
		FIGURE 4		
JOB NO.	2777.00	OWNER'S DWS NO.	DWS NO.	REV

CAMDEN

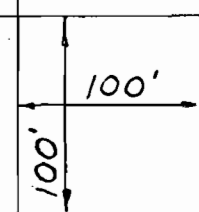


DRAWN	 WALK, HAYDEL & ASSOCIATES, INC. NEW ORLEANS MOBILE BATON ROUGE			
DATE				
CHK	CONSERV			
DATE				
APP	SOURCE LOCATIONS WITHIN 50 KM			
DATE				
APP	FIGURE 3			
DATE				
SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV
	2777.00			



Where in new Stack?
 Rock pile - 60'?

PLANT GRADE EL 0'-0" = 121'-0" ABOVE M.S.L.



DRAWN	
DATE	
CHK	
DATE	
APP	
DATE	
APP	
DATE	

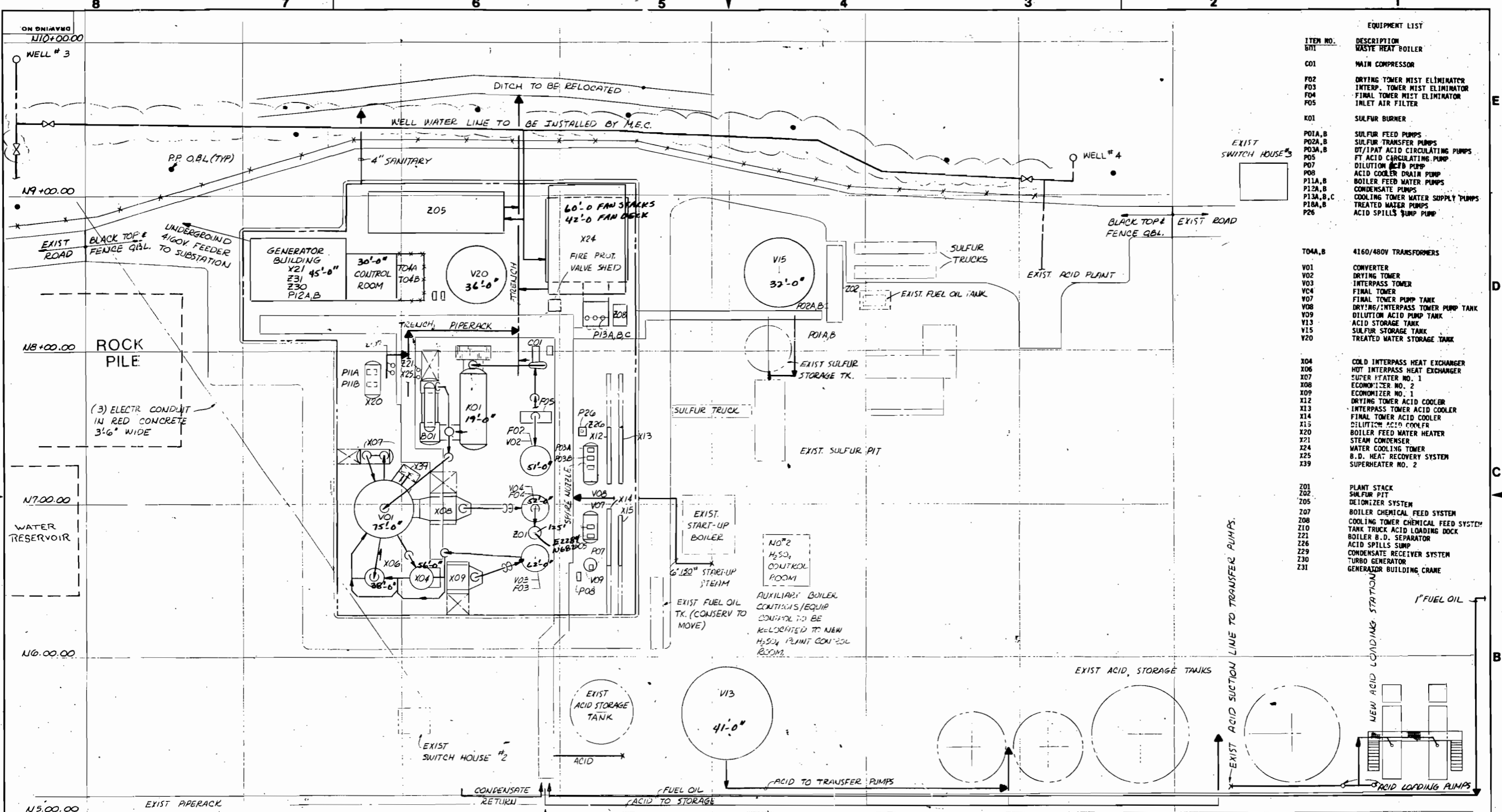
WALK, HAYDEL & ASSOCIATES, INC.
 NEW ORLEANS MOBILE BATON ROUGE

CONSERV

TOTAL FACILITIES
 LAYOUT FOR CONSERV

FIGURE 1

SCALE	JOB NO.	OWNER'S DWG NO.	DWG NO.	REV
	2777.00			



EQUIPMENT LIST

ITEM NO.	DESCRIPTION
BN1	WASTE HEAT BOILER
CO1	MAIN COMPRESSOR
FO2	DRYING TOWER MIST ELIMINATOR
FO3	INTERP. TOWER MIST ELIMINATOR
FO4	FINAL TOWER MIST ELIMINATOR
FO5	INLET AIR FILTER
X01	SULFUR BURNER
PO1A,B	SULFUR FEED PUMPS
PO2A,B	SULFUR TRANSFER PUMPS
PO3A,B	DT/1PAT ACID CIRCULATING PUMPS
PO5	FT ACID CIRCULATING PUMP
PO7	DILUTION ACID PUMP
PO8	ACID COOLER DRAIN PUMP
PI1A,B	BOILER FEED WATER PUMPS
PI2A,B	CONDENSATE PUMPS
PI3A,B,C	COOLING TOWER WATER SUPPLY PUMPS
PI8A,B	TREATED WATER PUMPS
P26	ACID SPILLS SUMP PUMP
TO4A,B	4160/480V TRANSFORMERS
VO1	CONVERTER
VO2	DRYING TOWER
VO3	INTERPASS TOWER
VO4	FINAL TOWER
VO7	FINAL TOWER PUMP TANK
VO8	DRYING/INTERPASS TOWER PUMP TANK
VO9	DILUTION ACID PUMP TANK
V13	ACID STORAGE TANK
V15	SULFUR STORAGE TANK
V20	TREATED WATER STORAGE TANK
X04	COLD INTERPASS HEAT EXCHANGER
X06	HOT INTERPASS HEAT EXCHANGER
X07	SUPER HEATER NO. 1
X08	ECONOMIZER NO. 2
X09	ECONOMIZER NO. 1
X12	DRYING TOWER ACID COOLER
X13	INTERPASS TOWER ACID COOLER
X14	FINAL TOWER ACID COOLER
X15	DILUTION ACID COOLER
X20	BOILER FEED WATER HEATER
X21	STEAM CONDENSER
X24	WATER COOLING TOWER
X25	B.D. HEAT RECOVERY SYSTEM
X39	SUPERHEATER NO. 2
Z01	PLANT STACK
Z02	SULFUR PIT
Z05	DEIONIZER SYSTEM
Z07	BOILER CHEMICAL FEED SYSTEM
Z08	COOLING TOWER CHEMICAL FEED SYSTEM
Z10	TANK TRUCK ACID LOADING DOCK
Z21	BOILER B.D. SEPARATOR
Z26	ACID SPILLS SUMP
Z29	CONDENSATE RECEIVER SYSTEM
Z30	TURBO GENERATOR
Z31	GENERATOR BUILDING CRANE

NOTE: SMALL BUILDING TO BE REMOVED BY M.E.C.

FIGURE 2

MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

PLOT PLAN
CONSERV
NICHOLS FLA.

NO.	DATE	DESCRIPTION	BY	BY	BY	NO.	DATE	DESCRIPTION	BY	BY	BY	NO.	DATE	DESCRIPTION	BY	BY	BY
1	2-11-81		OLSON														

ISSUE DATE: 2-11-81
PURPOSE OF ISSUE: PERMIT APPLICATION
SCALE: 1" = 30'
JOB NO.: 2238
DRAWING NO.: 301-102

MOSANTO'S PERMISSION FOR USE OF DRAWING FOR PERMIT APPLICATION PURPOSES RECEIVED 4/10/81

BRUNING 44-131-41686-1