Technical Evaluation

and

Preliminary Determination

Occidental Chemical Company

Swift Creek Chemical Complex

Hamilton County, Florida

Permit Numbers

STATE

Sulfuric Acid Plant "F" AC 24-56209
Auxiliary Boiler "E" AC 24-56210
Sulfuric Acid Plant "E" AC 24-56211

FEDERAL

Sulfuric Acid Plant Production Rate Increase PSD-FL-082
and
Auxiliary Boiler "E" Fuel Conversion

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

October 25, 1982

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NOTICE OF PROPOSED AGENCY ACTION

The Department of Environmental Regulations gives notice of its intent to issue permits to Occidental Chemical Company. These permits will allow an increase in the production of two existing sulfuric acid plants and the use of fuel oil containing a higher percentage of sulfur than they are currently permitted to use in four existing steam boilers and a diammonium phosphate dryer. These sources are located at the Suwannee River (SRCC) and Swift Creek Chemical Complexes (SCCC) near White Springs in Hamilton County, Florida. No physical modifications to the plant equipment is required to accomplish these operational changes.

A best available control technology (BACT) determination was required for sulfur dioxide (SO_2).

Emission of criteria pollutants from the two chemical complexes will increase by the quantities in tons per year (TPY), listed below.

	SO_2
SRCC	443.9
SCCC	951

Emissions from the modified sources will consume increment but will not violate any state or federal ambient air quality standards. The maximum increment consumption, in micrograms per cubic meter (ug/m^3), and percent of available increment are listed below.

	SRCC		SCCC	
	ug/m^3	Percent	ug/m^3	Percent
SO_2				
Three hours	256	50	416	81
24-hours	73	80	79	87
Annual	12	60	8	40

A person who is substantially affected by the Department's proposed permitting decision may request a hearing in accordance with Section 120.57, Florida Statutes, and Chapter 17-1 and 28-5 Florida Administrative Code. The request for hearing must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request hearing under Section 120.57, Florida Statutes.

By authority of the U. S. Environmental Protection Agency, the Florida Department of Environmental Regulation (FDER) has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21). The FDER has made a preliminary determination that the construction can be approved provided certain conditions are met. A summary of the basis for this determination and the application for a permit submitted by Occidental Chemical Company are available for public review in the following FDER offices:

Department of Environmental Regulation
Northeast District
3426 Bills Road
Jacksonville, Florida 32207

Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Columbia County Public Library
490 N. Columbia Street
Lake City, Florida

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

I. SYNOPSIS OF APPLICATION

A. Name and Address of Applicant

Occidental Chemical Company
P. O. Box 300
White Springs, Florida 32096

B. Source Location

The proposed source is located at Occidental Chemical Company's Swift Creek Chemical Complex; at SR 137, White Springs, Hamilton County, Florida. The UTM coordinates are 320.860 km East and 3,369.750 km North.

C. Project Description

Occidental proposes to increase the production of sulfuric acid from 2 existing sulfuric acid plants at the Swift Creek Chemical Complex (SCCC) and to increase the sulfur content of the fuel oil used to fire the existing sulfuric acid plants auxiliary boiler.

The proposed production capacity of the two sulfuric acid plants ("E" and "F") will be increased from 2,000 tons per day to 2,500 tons per day each of 100 percent sulfuric acid. The proposed modifications to the "E" auxiliary boiler will result in a change to fuel oil with a maximum of 1.0 percent sulfur and an increase in the annual operating factor from 93.0 to 97.5 percent.

D. Process and Controls

The principal steps in the sulfuric acid manufacturing process consist of burning sulfur (S) in air to form sulfur dioxide (SO_2), combining the sulfur dioxide with oxygen (O_2) to form sulfur trioxide (SO_3), and combining the sulfur trioxide with water (H_2O) to form sulfuric acid (H_2SO_4). The chemical reactions are:

$S + O_2 = SO_2$ In sulfur furnace

$SO_2 + 1/2\ O_2 = SO_3$ In converter

$SO_3 + H_2O = H_2SO_4$ In two absorption towers

The dual absorption process selected by the applicant is the best demonstrated control technology for SO_2 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

A. Federal Regulations

The proposed project 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 as amended in the Federal Register of August 7, 1980 (45 CFR 52676). Specifically, the proposed project involves three major stationary sources (40 CFR 52.21(b)(1) located in an area currently designed as attainment in accordance with 40 CFR 81.310 for all criteria pollutants regulated under the Clean Air Act (CAA).

The proposed project will be a major modification (40 CFR 52.21(b)(2)) for sulfur dioxide (SO_2), and sulfuric acid mist. Emissions of SO_2 and sulfuric acid mist will increase above the significant criteria set in the PSD regulations. Therefore, the proposed project is subject to PSD review for these pollutants.

The emission rates increases for particulate matter, nitrogen oxides, carbon monoxide and hydrocarbons are below the de minimus levels established for these pollutants.

The PSD review consists of a determination of Best Available Control Technology (BACT) and, unless otherwise exempted, an analysis of the air quality impact of the increased emissions.

The review also includes an analysis of the project's impacts on soils, vegetation and visibility along with 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).

B. State Regulations

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, Hamilton County, is an area currently designed as attainment in accordance with Section 17-2.420 FAC for all criteria pollutants.

The sources comprise a major emitting facility for sulfur dioxide (SO_2), sulfuric acid mist and nitrogen oxides (NO_x) as defined in Chapter 17-2, because the potential

emissions of each exceed 100 tons per year (TPY). The project is subject to the provisions of Subsection 17-2.650, FAC, Table II. Emission Limiting Standards, and Subsection 17-2.500 Prevention of Significant Deterioration PSD Review which requires the use of Best Available Control Technology (BACT).

The sources are 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 17-2.660, FAC.

III. SOURCE IMPACT ANALYSIS

A. Emission Limitations

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

The operation of the 156 MMBTU/hr auxiliary boiler will produce emissions of particulate matter (PM), sulfur dioxide (SO_2) nitrogen oxides (NO_x), carbon monoxide (CO) and volatile organic compounds (VOC) to the atmosphere.

Table 1 summarizes potential to emit all pollutants regulated under the act which are affected by the proposed project.

As the table shows, the proposed emissions increase of SO_2 and sulfuric acid mist 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.

Best Available Control Technology (BACT) has been determined for SO_2 and sulfuric acid mist for the Sulfuric acid plant and SO_2, for the auxiliary boiler "E". The emission limiting standard selected as BACT and made a condition of the permits are listed in Table 2. Justification for the standards selected is included in Technical Appendix A.

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

B. Air Quality Impact Analysis

The air quality impact analysis required for SO_2 and sulfuric acid mist consists of:

- An analysis of existing air quality;
- A PSD increment analysis (for SO_2 only);
- A National and Florida Ambient Air Quality Standards (AAQS) analysis;

Table 1
SUMMARY OF EMISSIONS
(Tons per year)

SOURCE	Pollutant Emissions					
	SO_2	PM	H_2SO_4 Mist	NO_x	CO	VOC
"E" Sulfuric Acid Plant						
Proposed Emission	1825	--	68.3	64.8	0.5	---
Permitted Emission	1460	--	54.8	51.7	0.4	---
Increase[1]	365	--	13.5	13.1	0.1	---
"F" Sulfuric Acid Plant						
Proposed Emission	1825	--	68.3	64.8	0.5	---
Permitted Emission	1460	--	54.8	51.7	0.4	---
Increase[1]	365	--	13.5	13.1	0.1	---
"E" Auxiliary Boiler						
Proposed Emission	729	59	---	273	23	5
Existing Emission	508	64	---	260	21	4
Increase[1]	221	-5	---	13	2	1
Fugitive Emission[2]	----	--	---	<1	1	<1
Net Increase from Proposed Modification	951	-5	27	39.2	3	1
PSD Significance Level[3]	40	25	7	40	100	40

(1) Applicant's estimate of emission rate increases that will result from increasing the production capacity of the "E" and "F" sulfuric acid plants from 2,000 TPD to 2,500 TPD each and from increasing the sulfur content of the fuel to the "E" auxiliary boiler to 1.0 percent.

(2) Vehicle Traffic.

(3) 40 CFR 52.21.

Table 2

ALLOWABLE EMISSION LIMITS

SOURCE	POLLUTANT EMISSION						
	SO_2	PM	Mist	NO_x	CO	VOC	BASIS
"E" Sulfuric Acid Plant							
Standard	4 lb/ton 100% acid	--	0.15 lb/ton 100% acid	---	---	---	NSPS and BACT
Emission Rate(lb/hr)	416.7	--	15.6	14.8	0.1	---	
"F" Sulfuric Acid Plant							
Standard	4 lb/ton 100% acid	--	0.15 lb/ton 100% acid	---	---	---	NSPS and BACT
Emission Rate(lb/hr)	416.7	--	15.6	14.8	0.1	---	
"E" Auxiliary Boiler							
Emission Rate	1.1 $lb/10^6$ BTU heat input and 170.7 lb/hr	--	----	---	---	---	
		13.9	----	64	5.3	1.1	BACT and Emission rates as estimated by the applicant

- An analysis of impacts on soils, vegetation and visibility and of growth-related air quality impacts; and

- A "good engineering practice (GEP)" stack height evaluation.

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

Based on these required analyses, the Department has reasonable assurance that the proposed Occidental Chemical Company Swift Creek Chemical Complex (SCCC) modification, as described in this permit and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. A discussion of the modeling methodology and required analyses follows.

1. Modeling Methodology

Four EPA-approved atmospheric dispersion models were used to predict ground-level pollutant concentrations. The Single-Source (CRSTER) model and the PTMTPW model were used for short-term (24 hours or less) averages to predict maximum concentrations in the vicinity of the facility. CRSTER was used first to establish the meteorological conditions resulting in the highest, second- high impacts. PTMTPW was then run for these days of critical meteorology to further refine the results using all possible sources which may significantly interact with the facility, along with a finer receptor grid spacing (0.1 km).

The Air Quality Display Model (AQDM) was used to predict annual concentrations. Receptors for this modeling were placed at 1.0 km intervals.

The Industrial Source Complex Short-Term (ISCST) model was used to predict short and long term concentrations on the nearest Class I area, the Okefenokee National Wildlife Refuge in southeast Georgia. This model was used to take advantage of the pollutant decay feature written into the program. An SO_2 half-life of 12 hours was used. This additional refinement was needed to show that Class I PSD increments would not be violated.

The surface meteorological data used in the models were National Weather Service (NWS) data collected at Valdosta, Georgia for the period 1972-1976. Upper-air meteorological data were collected at the NWS Waycross, Georgia station for the same period.

Stack parameters and emission rates used in evaluating the proposed modification are given in Tables 1 and 2. Table 1 lists all the SO_2 emission units at both the SCCC and the Suwannee River Chemical Complex (SRCC) facilities at the emission rates to be allowed after the proposed modifications to both facilities. Table 2 lists all SO_2 increment consuming emission units at both facilities for that part of their emission rates which consume increment.

2. Analysis of Existing Air Quality

Under the State regulations (Rule 17-2.500(5)(f)FAC) the applicant is required to submit preconstruction monitoring data for all pollutants for which a significant increase in annual emissions is proposed and for which an ambient air quality standard exists. For the SCCC facility only SO_2 is subject to this rule. (The Department has determined that preconstruction monitoring for sulfuric acid mist is not necessary.) The monitoring must be continuous and in general comprise a one-year period. The Department may reduce the length of this period to no less than four months when sufficient justification warrants. Due to the rural setting of this facility and its remoteness from other SO_2 emitting sources, the Department has determined that four months of continuous monitoring data at one site is sufficient to satisfy the requirement. A similar federal regulation requiring preconstruction monitoring (40 CFR 52.21(m)) is not applicable to the federal permit because a complete application was submitted by the applicant before this regulation went into effect.

The applicant has elected to use an existing monitor operated by the Department to satisfy the monitoring requirement. The monitor is continuous and satisfies the EPA site selection criteria guidelines. Four months of data (April 1982 through July 1982)* have been analysed from this monitor, and are summarized summarized in the following table.

Averaging Period	Highest (ug/m^3)	2nd Highest (ug/m^3)
1-hour	371	357
3-hour	314	180
24-hour	67	26
4-month	4	

*Monitor began operation April, 1982.

A determination of the background concentration of SO_2 for the area surrounding the SCCC facility can be obtained by averaging the monitored SO_2 values over all hours for which the monitor was not influenced by the SCCC and SRCC sources. This background value is calculated to be 0 ug/m^3.

Table 1

SUMMARY OF SULFUR DIOXIDE EMISSIONS
OCCIDENTAL CHEMICAL COMPANY
SRCC & SCCC

SOURCE NAME	EMISSION RATE LB/HR	EMISSION RATE (G/SEC)	STACK HT. (M)	STACK TEMP. (DEG-K)	EXIT VEL. (M/SEC)	STACK DIA. (M)
Sulfuric Acid A	1208.3	152.25 (1)	61.0	350.0	15.50	1.80
Sulfuric Acid B	1208.3	152.25 (1)	61.0	350.0	15.50	1.80
Sulfuric Acid C	300.0	37.80 (2)	45.7	356.0	28.70	1.59
Sulfuric Acid D	300.0	37.80 (2)	45.7	356.0	28.70	1.59
DAP 1	11.1	1.40 (4)	36.6	322.0	12.20	2.13
DAP 2	11.8	1.49 (4)	42.7	325.0	13.10	2.44
GTSP/Dical	11.1	1.40 (10)	32.3	314.0	13.10	2.13
Auxiliary Boiler A	102.4	12.90 (5)	12.2	466.0	12.50	1.13
Pollyphos Feed Prep.	4.9	0.62 (4)	28.7	342.0	14.90	1.07
Pollyphos Reactor A	5.0	0.63 (6)	30.5	322.0	10.10	1.22
Pollyphos Reactor B	5.0	0.63 (6)	30.5	322.0	10.10	1.22
SPA #1	0.8	0.10 (6)	30.5	318.0	17.80	0.43
Rock Dryer #3 (SCCC)	38.1	4.80 (10)	15.2	317.0	17.20	2.16
Rock Dryer East	28.7	3.61 (10)	18.3	343.0	5.70	2.95
Rock Dryer West	28.7	3.61 (10)	18.3	343.0	5.70	2.95
Auxiliary Boiler B	174.9	22.00 (7)	10.7	468.0	9.50	1.46
Auxiliary Boilers C&D	262.2	33.00 (8)	31.7	468.0	15.20	1.98
Sulfuric Acid E(SCCC)	416.7	52.50 (3)	61.0	356.0	9.30	2.90
Sulfuric Acid F(SCCC)	416.7	52.50 (3)	61.0	356.0	9.30	2.90
Auxiliary Boiler E (SCCC)	170.8	21.50 (4)	15.3	428.0	15.90	1.60

(1) At 1000 tpd 100% H_2SO_4 and 29 lb SO_2/ton of acid.
(2) At 1800 tpd 100% H_2SO_4 and 4 lb SO_2/ton of acid.
(3) At 2500 tpd 100% h_2SO_4 and 4 lb/SO_2/ton of acid.
(4) At 1.5% sulfur fuel and 80% SO_2 sorption.
(5) At 62.5 x 10^6 BTU/hr and 1.5% sulfur fuel. A 25% operating factor is imposed when Sulfuric Acid Plants A and B are operating at rated capacity.
(6) Based on emission measurements.
(7) At 160 x 10^6 BTU/hr and 1.0% sulfur fuel.
(8) Two boilers at 120 x 10^6 BTU/hr each and 1.0% sulfur fuel.
(9) At 156 x 10^6 BTU/hr and 1.0% sulfur fuel.
(10) Actual emissions with 1.5% sulfur fuel.

Table 2

SUMMARY OF INCREMENT CONSUMING EMISSIONS

Emission Unit	SO_2 Increment Consuming Emission(g/s)
Sulfuric Acid E (SCCC)	52.5
Sulfuric Acid F (SCCC)	52.5
Auxiliary Boiler E (SCCC)	21.5
Auxiliary Boiler B (SRCC)	22.0
Auxiliary Boilers C and D (SRCC)	33.0
DAP 2 "Z"-train (SRCC)	0.69(1)

(1) Only 0.69 g/s of the total SO_2 emission of 1.49 g/s contributes to increment consumption.

3. PSD Increment Analysis

The SCCC facility is located in an area where the Class II PSD increments apply. The nearest Class I area is the Okefenokee National Wildlife Refuge located approximately 40 kilometers to the northeast. Both a Class II and a Class I PSD increment analysis for SO_2 is required.

The emission units at the SCCC facility which consume SO_2 increment are the E and F sulfuric acid plants and the E auxiliary boiler. Increment consuming sources at the SRCC facility have been modeled along with the SCCC sources due to the close proximity of these facilities. No other sources of SO_2 significantly impact this area.

The results of the Class II modeling analysis are contained in the following table.

Pollutant and Time Average	Class II Increment(ug/m^3)	Predicted Increase(ug/m^3)	Percent Increment Consumed
SO_2			
Three-hour(1)	512	416	81
24-hour(1)	91	79	87
Annual	20	8	40

(1) Not to be exceeded more than once per year.

A more refined modeling analysis was performed to assess the impact of the proposed emission increases on the Okefenokee Class I area. Due to the long distance (approximately 40 km) and, hence the longer transport time of the plume to the Class I area, conversion of some of the SO_2 to sulfates will be realized, thereby lessening the ground-level concentrations of SO_2. The method by which this conversion is simulated in the model is by introducing an appropriate half-life for SO_2--in this case, 12 hours. The results of this modeling analysis are summarized in the following table.

Pollutant and Time Average	Class I Increment(ug/m^3)	Predicted Increase(ug/m^3)	Percent Increment Consumed
SO_2			
Three-hour(1)	25	25	100
24-hour(1)	5	5	100
Annual	2	1	50

1 Not to be exceeded more than once per year.

No violation of a PSD allowable increment is predicted as a result of the proposed modification at the SCCC facility.

4. AAQS Analysis

An AAQS analysis is required for all pollutants for which a significant increase in annual emissions is proposed. The analysis includes an evaluation of the background concentrations of the subject pollutants and a modeling evaluation of all sources of those pollutants at both the modified facility and any surrounding facilities (within 50 km) which may impact the area.

An evaluation for SO_2 and sulfuric acid mist is required at the SCCC facility. An estimate of the background concentration of SO_2 is obtained from the preconstruction monitoring described in a previous section. A value of 0 ug/m^3 for all averaging times is obtained. The maximum ground-level concentrations in the vicinity of the SCCC facility are summarized in the following table.

Pollutant and Time Average	Florida AAQS	National AAQS	Predicted Impact
SO_2 (ug/m^3)			
Three-hour(1)	1300	1300(2)	425
24-hour(1)	260	365	195
Annual	60	80	10
Sulfuric Acid Mist (ug/m^3)			
Three-hour	-----	-----	11
24-hour	-----	-----	2
Annual	-----	-----	<1

(1) Not to be exceeded more than once per year
(2) Secondary Standard.

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

The maximum ground-level concentrations predicted to occur as a result of the proposed modifications at SCCC are below the applicable National and Florida AAQS for SO_2, including the secondary standard designed to protect public welfare-related values. Therefore, no adverse impacts on soils and vegetation are expected.

The SCCC is located within 40 kilometers of a Class I area' however, no adverse impact on visibility is expected. Significant emission increases will be realized for SO_2 only. Visibility degradation is related much more to particulate and nitrogenoxides emissions.

The proposed modification at the SCCC will result in no new jobs. As a result no growth-related air quality impacts will occur.

6. GEP Stack Height Evaluation

Regulations published by EPA in the Federal Register of February 8, 1982, define GEP stack height as the highest of:

1. 65 meters; or
2. The maximum nearby building height plus 1.5 times the building height or width, whichever is less.

While the actual stack height employed can exceed this height, the stack height used in modeling to determine compliance with the AAQS and PSD increments cannot. As seen in Table 1, all stacks at SCCC are less than the GEP limit of 65 meters.

IV. CONCLUSIONS

Based on the review of the data submitted by Occidental Chemical Company for the modification of two double absorption type sulfuric acid plants, and the increase in the sulfur content of the fuel oil in the "E" auxiliary boiler, the FDER concludes that compliance with all applicable federal and State air quality regulations will be achieved provided certain specific conditions are met. The 1% sulfur content in the fuel oil and 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 plants and auxiliary boiler "E" 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 Occidental Chemical Company for the proposed sulfuric acid plants "E" and "F" and auxiliary boiler "E" subject to specific conditions to insure compliance with all applicable regulations. Appendix B includes the proposed conditions.

TECHNICAL APPENDIX A

BACT DETERMINATION

Best Available Control Technology (BACT) Determination
Part I of III
Occidental Chemical Company
Hamilton County

The applicant plans to increase production from the sulfuric acid plants "E" and "F" located at their fertilizer grade phosphate rock processing facility at the Swift Creek Chemical Complex near White Springs, Florida. The production capacity of each acid plant is to be increased 25 percent to 2500 tons per day of 100% acid. Both acid plants have inherent in the initial design a production rate of 2300 tons per day with no major equipment modifications. It will be necessary to modify the economizer, gas handling and catalyst loading systems to achieve the 2500 tons per day production rate.

Air pollutants emitted from the sulfuric acid plants will be SO_2, NO_x, CO and sulfuric acid mist increasing the annual ambient air burden by 730,26,1, and 27 tons, respectively. Sulfur dioxide and sulfuric acid mist emissions increase exceeds the significant emission rate and requires a Best Available Control Technology determination as set forth in 17-2.500(2)(f), FAC.

The applicant has submitted several applications that require a BACT determination. Three determinations have been made by combining similar sources as follows:

PART I - Sulfuric Acid Plants,
PART II - Boiler Fuel Conversions
PART III - DAP Dryer Fuel Conversion.

BACT Determination Requested by the Applicant:

Sulfuric Acid Plant E and F.

Pollutant	Emission Limit
SO_2	4.0 lb/ton 100% acid
H_2SO_4 mist	0.15 lb/ton 100% acid

Sulfur dioxide emissions will be controlled by double absorption with catalyst screening and make up every three to five years.

Sulfuric acid mist emissions will be controlled with HV mist eliminators.

Date of Receipt of a BACT application:

May 27, 1982

Date of Publication in the Florida Administrative Weekly:

June 11, 1982

Review Group Members:

The final determination was based upon comments received from the New Source Review Section and the Air Modeling Section.

BACT Determined by DER:

Sulfur dioxide emissions from sulfuric acid plants E and F not to exceed 4 pounds per tons of 100% sulfuric acid produced.

Sulfuric acid mist emissions from sulfuric acid plants E and F not to exceed 0.15 pounds per ton of 100% sulfuric acid produced.

Visible emissions to be less than 10% opacity.

Test methods and procedures per the NSPS, 40 CFR Part 60, Subpart H, Subsections 60.84 and 60.85.

Justification of DER Determination:

Sulfur dioxide and sulfuric acid mist emissions are subject to standards of performance for sulfuric acid plants (40 CFR 60.80) promulgated in 1971. U. S. EPA reviewed the standard in 1979 (44 FR15742) and decided not to change the emission limits.

BACT for the sulfuric acid plants E and F is determined to be equal to New Source Performance Standards (NSPS) for sulfuric acid plants, 40 CFR 60, Subpart H.

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:

for

Steve Smallwood, Chief BAQM

Date: 11/2/82

Approved:

Victoria J. Tschinkel, Secretary

Date:

Best Available Control Technology (BACT) Determination
Part II of III
Occidental Chemical Company
Hamilton County

The applicant plans to fire a higher sulfur content fuel in four fossil-fuel fired steam generators located at their facilities near White Springs, Florida. Boiler E is at the Swift Creek Complex and boilers B, C, D are at the Suwannee River Complex. The existing sources are as follows.

1. Gas fired auxiliary steam boiler "B" is rated at 160 million BTU per hour heat input. The steam produced is used to augment the steam produced by the sulfuric acid plants B and C. Boiler B is operated at 25% of rated capacity when the sulfuric acid plants are in operation. No. 6 oil is used as a stand-by fuel, the sulfur content of which is limited by permit conditions at 0.8% maximum.

2. Gas fired auxiliary steam boiler "C" is rated at 120 million BTU per hour heat input. The steam produced is used in the superphosphoric acid evaporators. No. 6 oil is used as a stand-by fuel, the sulfur content of which is limited by permit conditions at 0.8% maximum.

Boiler "C" has recently been modified to fire a coal-oil mixture (COM), also a stand-by fuel for this unit. The sulfur content of the COM is limited by permit conditions at 0.7% maximum.

3. Gas fired auxiliary steam boiler "D" is rated at 120 million BTU per hour heat input. The steam produced is used in the superphosphoric acid evaporators. No. 6 oil is used as a stand-by fuel, the sulfur content of which is limited by permit conditions at 0.8% maximum.

The combustion gases from boiler "C" and boiler "D" exhaust through a common stack. There is a fabric filter baghouse which is used to control particulate emissions only when COM is fired.

4. Oil fired auxiliary steam boiler "E" is rated at 156 BTU per hour heat input. The steam produced is used to augment the steam produced by the sulfuric acid plants. No. 6 oil is fired, the sulfur content of which is limited by permit conditions at 0.8% maximum.

Emission Evaluation: (1)

Pollutant	Boiler B	Boiler C	Boiler D	Boiler E
Particulates	lb/hr	lb/hr	lb/hr	lb/hr
current	12.01	9.01	9.01	11.55
proposed	14.20	10.65	10.65	13.9
increase	2.19	1.64	1.64	2.35
SO_2	lb/hr	lb/hr	lb/hr	lb/hr
current	137.16	102.87	102.87	131.88
proposed	174.8	128.58	128.58	170.7
increase	37.64	25.71	25.71	38.82
Fuel Use	GPH	GPH	GPH	GPH
MAX	1092	819	819	1050
AVE	273	210	210	252
COM		922		

(1) AP-42 Emission Factors, Table 1.3.1

The applicant plans to fire No. 6 oil having a sulfur content of 1.0 percent instead of the 0.8 percent maximum presently allowed. The increase in sulfur dioxide emissions, as a result of burning the higher sulfur fuel, exceeds the significant emission rate of 40 tons per year and requires a BACT determination (17-2.500(5)(c)FAC) for the pollutant sulfur dioxide.

The applicant has submitted several applications that require a BACT determination. Three determinations have been made by combining similar sources as follows:

PART I - Sulfuric Acid Plants,
PART II - Boiler Fuel Conversions
PART III - DAP Dryer Fuel Conversion.

BACT Determination Requested by the Applicant:

Boilers, B, C, D, and E

Pollutant	Emission Limit
SO_2 (oil)	1.1 lb/million BTU heat input (1% sulfur content)
SO_2 (com)	0.9% sulfur content

Date of Receipt of a BACT application:

May 27, 1982

Date of Publication in the Florida Administrative Weekly:

June 11, 1982

Review Group Members:

The final determination was based upon comments received from the New Source Review Section and the Air Modeling Section.

BACT Determined by DER:

Auxiliary boiler E - Swift Creek Complex
Auxiliary boiler B, C, D - Suwannee River Complex

Sulfur dioxide emissions controlled by limiting the sulfur content of the No. 6 oil fired to a maximum of 1.0 percent and the COM fuel to 0.9 percent.

Compliance with the SO_2 emission limit will be based upon the Sulfur content of the fuel fired. Each shipment of fuel delivered to the facility will be sampled and the sulfur content determined and recorded. A certified analysis from the applicants fuel supplier may be substituted for on-site analysis. Applicable test methods by the American Society for Testing Material (A.S.T.M.) will be used.

Justification of DER Determination:

The facility is within 50 kilometers of the Okefenokee National Wilderness area, a Class 1 area. Air modeling indicates that at the conditions determined as BACT, the impact of sulfur dioxide emissions from the facility will be just less than the maximum allowable increase for a Class 1 area.

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:

for _____
Steve Smallwood, Chief BAQM

Date: 11/7/82

Approved:

_____
Victoria J. Tschinkel, Secretary

Date: _____

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) DETERMINATION

PART III OF III

OCCIDENTAL CHEMICAL COMPANY

HAMILTON COUNTY

The applicant plans to increase the sulfur content of the fuel oil fired in the diammonium phosphate plant (DAP) dryer. The dryer is in the Suwannee River complex located near White Springs, Florida. The existing dryer is gas fired with No. 6 residual oil fired only during periods of gas curtailment. The sulfur content of the oil is to be increased to 1.5 percent from the presently permitted maximum of 0.8 percent.

At maximum dryer capacity No. 6 oil is fired at a rate of 246 gallons per hour. SO_2 emissions, at this rate of oil consumption (assume 80% SO_2 absorption), when firing 0.8% and 1.5% sulfur content oil is 6.3 and 11.8 pounds per hour respectively. The increase in SO_2 emissions would be 5.5 pounds per hour.

A Venturi scrubber in series with a packed tail-gas scrubber is used to reduce the air pollutants emitted in the dryer exhaust gases. Sulfur dioxide emissions are reduced by the control system, and, in addition, by reaction with the material being dried.

The applicant has submitted several applications that require a BACT determination. Three determinations have been made by combining similar sources as follows:

PART I - Sulfuric Acid Plants,
PART II - Boiler Fuel Conversions
PART III - DAP Dryer Fuel Conversion.

BACT Determination Requested by the Applicant:

Pollutant	Emission Limit
SO_2	0.41 lb/ton P_2O_5 input (fuel with 1.5% sulfur)

Date of Receipt of a BACT Application:

May 27, 1982

Date of Publication in the Florida Administrative Weekly:

June 11, 1982

Review Group Members:

The final determination was based upon comments received from the New Source Review Section and the Air Monitoring Section.

BACT Determined by DER:

Diammonium Phosphate Plant No. 2 product rotary dryer.
Suwannee River Chemical Complex

Sulfur dioxide emissions controlled by limiting the sulfur content of the No. 6 oil fired to a maximum of 1.5 percent, and SO_2 emissions to 0.20 lb. SO_2/ton DAP.

The applicant shall prepare a procedure to prevent the unloading of No. 6 oil containing 1.5% sulfur into the tank(s) which contain No. 6 oil having a lower sulfur content. A record will be kept of the amount of 1.5% oil received and the DAP dryer oil consumption rate. The records shall be made available to the department upon request.

Compliance with the SO_2 emission limit will be based upon the sulfur content of the fuel fired. Each shipment of fuel delivered to the facility will be sampled and the sulfur content determined and recorded. A certified analysis from the applicants fuel supplier may be substituted for on-site analysis. Applicable test methods by the American Society for Testing Material (A.S.T.M.) will be used.

Justification of DER Determination:

To reiterate per the BACT determination, Part II, the facility is within 50 kilometers of the Okefenokee National Wilderness area, a Class I area. Air modeling indicates that at the conditions determined as BACT, the impact of sulfur dioxide emissions from the facility will be just less than the maximum allowable increase for a Class 1 area.

The quantity of controlled SO_2 emissions from the dryer, when firing 1.5% sulfur content oil, is comparable to the amount of uncontrolled SO_2 emissions when firing 1.0% sulfur content oil. Oil is the stand-by fuel for this unit and would be fired only during periods of gas curtailment.

The use of the same grade fuel oil, but with different sulfur contents, will require, at the minimum, two fuel oil storage tanks. The applicant will have to set up a fuel oil handling procedure to prevent the transfer of the higher sulfur content oil to the wrong tank or other sources.

The department has determined, in this case, that the increase in the sulfur content of the oil fired (0.8% to 1.5%) is reasonable.

provided the anticipated 80% reduction in SO_2 emissions is documented.

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:

(C. H. Fancy)
for Steve Smallwood, Chief BAQM

Date: 11/2/82

Approved:

Victoria J. Tschinkel, Secretary

Date:

APPENDIX B

SPECIFIC CONDITIONS

FDER proposes a preliminary determination of approval with conditions for the project requested by Occidental Chemical Company in the permit applications submitted on June 8, 1981 (federal application) and May 21, 1982 (state application).

Special conditions listed in the state permits AC 24-56209, AC 24-56210, AC 24-56211 are adopted as special conditions for the federal permit, PSD-FL-082, for these sources.

The attached General Conditions (federal) are also made a part of the proposed federal permit PSD-FL-082.

Technical Evaluation

and

Preliminary Determination

Occidental Chemical Company

Suwannee River Chemical Complex

Hamilton County, Florida

PERMIT NUMBERS:

STATE

Auxiliary Boiler "B"	AC 24-56212
Auxiliary Boiler "C"	AC 24-56214
Auxiliary Boiler "D"	AC 24-56213
DAP Plant No. 2	AC 24-56215

FEDERAL

SRCC Fuel Conversion Project PSD-FL-083

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

October 25, 1982

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Application to Construct Air Pollution Sources.
(State and Federal)

Correspondence

I. SYNOPSIS OF APPLICATION

A. Name and Address of Applicant

Occidental Chemical Company
P. O. Box 300
White Springs, Florida 32096

B. Source Location

Occidental Chemical Company (OCC) operates two phosphate fertilizer facilities north of White Springs in Hamilton County, Florida. The facilities are the Swift Creek Chemical Complex (SCCC), located on SR 100 and the Suwannee River Chemical Complex, (SRCC) located on SR 137. The Department of Environmental Regulation (DER) is currently processing applications for modifications to existing sources at both chemical complexes. This determination is for the modification planned for the SRCC whose UTM coordinates are 328.320 km. East and 3,368.810 km. North. Modifications planned for SCCC are discussed in a separate document.

C. Project Description

The modifications requested by OCC is the substitution of a lower grade No. 6 fuel oil (higher sulfur content) in three auxiliary boilers (B, C, and D) and the No. 2 DAP plant dryer. The maximum sulfur content of the fuel oil used in the boilers will be increased from 0.8 to 1.0 percent. In the No. 2 DAP plant, the maximum sulfur in the fuel oil will increase from 0.8 to 1.5 percent.

No physical changes are required for this equipment to burn the lower grade fuel oil. The lower grade fuel will increase sulfur dioxide emissions from these units. The maximum sulfur content of the fuels is such that no violations of federal or state regulations will be caused by its use.

D. Process Description

Auxiliary boiler "B" produces 125,000 pounds of steam per hour from 160 MMBTU/hour heat input. It can use either natural gas or No. 6 oil for fuel. The 160 MMBTU/hour heat input is equivalent to 1,067 GPH of No. 6 fuel oil. The steam from auxiliary boiler B is used to augment steam produced by two sulfuric acid plants, B and C.

Auxiliary boiler "D" produces 100,000 pounds of steam per hour from 120 MMBTU/hour heat input. It can use either natural gas or No. 6 oil fuel. The 120 MMBTU/hour heat input is equivalent to 820 GPH No. 6 fuel oil. The steam

from auxiliary boiler D is used in the superphosphoric acid plant. This boiler shares a common stack with auxiliary boiler C.

Auxiliary boiler "C" is identical to auxiliary boiler D except it has been modified to allow the use of COM fuel also. A baghouse and dust collector are needed when COM fuel is burned in this boiler to control particulate matter emissions.

The dryer in the No. 2 DAP plant uses 36 MMBTU/hour of natural gas or No. 6 oil as fuel to produce 60 TPH DAP product. This requires 248 GPH of oil. OCC reports over 80 percent of the sulfur dioxide produced when the sulfur in the oil is burned is retained in the product and not emitted to the atmosphere. The free ammonia in the scrubber reacts with the sulfur dioxide and this compound is removed by the acid scrubbing liquid, which is later neutralized to form DAP.

II. RULE APPLICABILITY

A. Federal Regulations

The proposed project, substituting fuel oil with a maximum sulfur content of 1.0 percent in boilers B, C, and D and 1.5 percent for the No. 2 DAP plant for the 0.8 percent the sources are presently permitted to burn, 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, each modified boiler and the No. 2 DAP plant constitute a major stationary source (40 CFR 52.21(b)(1)) located in an area designated in 40 CFR 81.310 as attainment for all criteria pollutants.

Use of the alternate fuels will result in a significant net emission increase of sulfur dioxide, thereby rendering it a major modification (40 CFR 52.21 (b)(2)) subject to PSD review (40 CFR 52.21(i)). The increase in emissions of other criteria pollutants are below the significant levels.

Full PSD review is required for each pollutant for which a significant net emission increase would occur. For this modification, the review is required for sulfur dioxide. 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 impact resulting from associated commercial, residential and industrial growth.

B. State Regulations

The proposed project, increasing the sulfur content of the fuel oil used in boilers B, C, and D and the No. 2 DAP plant, is subject to preconstruction review under the provisions of Chapter 403, FS, and Chapter 17-2, FAC.

The plant site is in an area designated attainment for all criteria pollutants. It is within 40 km of the Okefenokee National Wilderness Refuge, a Class I area.

The plant is a major emitting facility for sulfur dioxide, nitrogen oxides, and particulate matter as defined in Chapter 17-2 because the potential emissions of each of these criteria pollutants exceeds 100 TPY.

The project is subject to the provisions of Subsection 17-2.500, Prevention of Significant Deterioration (PSD),

because the modification will result in increased emissions of sulfur dioxide above the significant levels listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates.

PSD requires the use of Best Available Control Technology (BACT), determination of the ambient air impact and preconstruction air quality monitoring and analysis.

III. SOURCE IMPACT ANALYSIS

A. Emission Limitations

The modification to the three (3) auxiliary boilers and DAP dryer will produce emissions of particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO) and volatile organic compounds (VOC) to the atmosphere.

Table 1 summarizes potential to emit all pollutants regulated under the act which are affected by the proposed project.

As the table shows, the proposed emissions increase of SO_2 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.

Best Available Control Technology (BACT) has been determined for SO_2.

The emission limiting standard selected as BACT and made a condition of the permits are listed in Table 2. Justification for the standards selected is included in Technical Appendix A.

The permitted emission, including those determined as BACT, are in compliance with all applicable requirements of Chapter 17-2 and Federal regulations 40 CFR 52.21.

B. Air Quality Impact Analysis

The air quality impact analysis required for SO_2 consists of:

- An analysis of existing air quality;
- A PSD increment analysis;
- A National and Florida Ambient Air Quality Standards (AAQS) analysis;
- An analysis of impacts on soils, vegetation and visibility and of growth-related air quality impacts; and
- A "good engineering practice (GEP)" stack height evaluation.

Table 1

SUMMARY OF EMISSIONS

(Tons per year)[1]

SOURCE	POLLUTANT				
	PM	SO_2	NO_2	CO	VOC
Boiler "B"					
Permitted[2]	70.00	597		---	---
Proposed[3]	62.3	765.8	287.2	23.9	4.8
Increase	-7.7	168.8		-0-	-0-
Boiler "C"					
Permitted[2]	39.5	442.4	----	----	----
Proposed[3]	16.6	572.1	239	18.4	4.5
Increase	22.9	129.7	-0-	-0-	-0-
Boiler "D"					
Permitted[2]	39.5	442.4	----	----	----
Proposed[3]	46.7	564.0	215	18	4
Increase	7.2	121.6	-0-	-0-	-0-
TOTAL INCREASE**	22.4	420.1	-0-	-0-	-0-
#2 DAP Dryer*	PM	SO_2	F		
Permitted[2]	193	27.7	6.1	---	---
Proposed[3]	193	51.5	6.1	---	---
Increase	----	23.8	-0-	---	---
TOTAL INCREASE**	-0-	23.8	-0-	-0-	-0-
Significant Levels	25	40	40	3	100	40

(1) Emissions calculations based on 8760 hours per year and 100% on oil for Boilers B,D and DAP plant No. 2. Boiler C calculations are based on 100% on COM.

(2) Permitted emissions as stated in the federal application PSD-FL-083 (Table 2-1) and Boiler B operating permit AO 24-34186
Boiler C and D operating permit AO 24-21059, and
DAP plant #2 operating permit AO 24-33051

(3) Proposed emissions as calculated by the applicant in the State applications and additional correspondence

* Fluoride Emissions for the #2 DAP plant will not change ($0.06\#F/TP_2O_5$)

** Emission rate increases of regulated pollutants (nitrogen oxides, VOC and carbon monoxide) will not be affected by the proposed change.

Table 2

ALLOWABLE EMISSIONS

SOURCE/FUEL	POLLUTANT									
	PM		SO_2		NOx		CO		VOC	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Boiler B										
Oil(2)	14.2	62.3	174.8	765.8	65.5	287.2	5.5	23.9	1.1	4.8
This boiler shall be allowed to operate 60% of rated capacity (Specific Condition No. 1).										
Boiler C*										
Gas(2)	1.2	5.3	0.1	0.3	21.0	92.0	2.0	8.9	0.4	1.6
Oil(3)	10.7	46.7	128.7	563.9	49.2	215.5	4.1	18.0	0.8	3.6
COM	3.8	16.6	130.6	572.1	54.6	239.2	4.2	18.4	1.0	4.5
Boiler D*										
Gas	1.2	5.3	0.1	0.3	21.0	92.0	2.0	9	0.4	2
Oil	10.7	47	128.7	564	49.2	215	4.1	18	0.8	4
#2 DAP Dryer										
Oil(4)	46	193	11.8	51.5						

(1) Allowable Emissions as estimated by the applicant based on an operating time of 8760 hours per year with the exceptions as noted in this table.

(2) SO_2 emission limit shall not exceed 1.1 lb/MMBTU heat input (Fuel oil with 1% sulfur content).

(3) Coal-Oil mix (COM) with 0.9% sulfur content.

(4) Fuel oil with 1.5% sulfur content. (SO_2 emission limit shall not exceed 0.2 lb/ton DAP).

Fluoride emisions shall not exceed 1.74 lb/hr and 0.6#F/TP_2O_5.
Boilers C, and D shall be allowed to operate 25% of the time.
*Boiler "C" shares a common stack with auxiliary boiler "D".

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

Based on these required analyses, the department has reasonable assurance that the proposed Occidental Chemical Company Suwannee River Chemical Complex (SRCC) modification, as described in this permit and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. A discussion of the modeling methodology and required analyses follows.

1. Modeling Methodology

Four EPA-approved atmospheric dispersion models were used to predict ground-level pollutant concentrations. The Single-Source (CRSTER) model and the PTMTPW model were used for short-term (24 hours or less) averages to predict maximum concentrations in the vicinity of the facility. CRSTER was used first to establish the meteorological conditions resulting in the highest, second-high impacts. PTMTPW was then run for these days of critical meteorology to further refine the results using all possible sources which may significantly interact with the facility, along with a finer receptor grid spacing (0.1 km).

The Industrial Source Complex Long-Term (ISCLT) was used to predict annual concentrations. Receptors for this modeling were placed at 0.25 km intervals.

The Industrial Source Complex Short-Term (ISCST) model was used to predict short- and long-term concentrations on the nearest Class I area, the Okefenokee National Wildlife Refuge in southeast Georgia. This model was used to take advantage of the pollutant decay feature written into the program. An SO_2 half-life of 12 hours was used. This additional refinement was needed to show that Class I PSD increments would not be violated.

The surface meteorological data used in the models were National Weather Service (NWS) data collected at Valdosta, Georgia for the period 1972-1976. Upper-air meteorological data were collected at the NWS Waycross, Georgia station for the same period.

Stack parameters and emission rates used in evaluating the proposed modification are given in Tables 1 and 2. Table 1 lists all the SO_2 emission units at both the SRCC and the Swift Creek Chemical Complex (SCCC) facilities at the emission rates to be allowed after the proposed modifications to both facilities. Table 2 lists all SO_2 increment consuming emission units at

both facilities for that part of their emission rates which consume increment.

2. Analysis of Existing Air Quality

Under the State regulations (Rule 17-2.500(5)(f), FAC) the applicant is required to submit preconstruction monitoring data for all pollutants for which a significant increase in annual emissions is proposed and for which an ambient air quality standard exists. For the SRCC facility only SO_2 is subject to this rule. The monitoring must be continuous and in general comprise a one-year period. The Department may reduce the length of this period to no less than four months when sufficient justification warrants. Due to the rural setting of this facility and its remoteness from other SO_2 emitting sources, the Department has determined that four months of continuous monitoring data at one site is sufficient to satisfy the requirement. A similar federal regulation requiring preconstruction monitoring (40 CFR 52.21(m)) is not applicable to the federal permit because a complete application was submitted by the applicant before this regulation went into effect.

The applicant has elected to use an existing monitor operated by the Department to satisfy the monitoring requirement. The monitor is continuous and satisfies the EPA site selection criteria guidelines. Four months of data (April 1982 through July 1982)* have been analysed from this monitor, and are summarized in the following table.

Averaging Period	Highest (ug/m^3)	2nd Highest (ug/m^3)
1-hour	371	357
3-hour	314	180
24-hour	67	26
4-month	4	

*Monitor began operation April, 1982.

A determination of the background concentration of SO_2 for the area surrounding the SRCC facility can be obtained by averaging the monitored SO_2 values over all hours for which the monitor was not influenced by the SRCC and SCCC sources. This background value is calculated to be 0 ug/m^3.

Table 1

SUMMARY OF SULFUR DIOXIDE EMISSIONS
OCCIDENTAL CHEMICAL COMPANY
SRCC & SCCC

SOURCE NAME	EMISSION RATE LB/HR	EMISSION RATE (G/SEC)	STACK HT. (M)	STACK TEMP. (DEG-K)	EXIT VEL. (M/SEC)	STACK DIA. (M)
Sulfuric Acid A	1208.3	152.25 (1)	61.0	350.0	15.50	1.80
Sulfuric Acid B	1208.3	152.25 (1)	61.0	350.0	15.50	1.80
Sulfuric Acid C	300.0	37.80 (2)	45.7	356.0	28.70	1.59
Sulfuric Acid D	300.0	37.80 (2)	45.7	356.0	28.70	1.59
DAP 1	11.1	1.40 (4)	36.6	322.0	12.20	2.13
DAP 2	11.8	1.49 (4)	42.7	325.0	13.10	2.44
GTSP/Dical	11.1	1.40 (10)	32.3	314.0	13.10	2.13
Auxiliary Boiler A	102.4	12.90 (5)	12.2	466.0	12.50	1.13
Pollyphos Feed Prep.	4.9	0.62 (4)	28.7	342.0	14.90	1.07
Pollyphos Reactor A	5.0	0.63 (6)	30.5	322.0	10.10	1.22
Pollyphos Reactor B	5.0	0.63 (6)	30.5	322.0	10.10	1.22
SPA #1	0.8	0.10 (6)	30.5	318.0	17.80	0.43
Rock Dryer #3 (SCCC)	38.1	4.80 (10)	15.2	317.0	17.20	2.16
Rock Dryer East	28.7	3.61 (10)	18.3	343.0	5.70	2.95
Rock Dryer West	28.7	3.61 (10)	18.3	343.0	5.70	2.95
Auxiliary Boiler B	174.9	22.00 (7)	10.7	468.0	9.50	1.46
Auxiliary Boilers C&D	262.2	33.00 (8)	31.7	468.0	15.20	1.98
Sulfuric Acid E(SCCC)	416.7	52.50 (3)	61.0	356.0	9.30	2.90
Sulfuric Acid F(SCCC)	416.7	52.50 (3)	61.0	356.0	9.30	2.90
Auxiliary Boiler E (SCCC)	170.8	21.50 (4)	15.3	428.0	15.90	1.60

(1) At 1000 tpd 100% H_2SO_4 and 29 lb SO_2/ton of acid.
(2) At 1800 tpd 100% H_2SO_4 and 4 lb SO_2/ton of acid.
(3) At 2500 tpd 100% h_2SO_4 and 4 lb/SO_2/ton of acid.
(4) At 1.5% sulfur fuel and 80% SO_2 sorption.
(5) At 62.5 x 10^6 BTU/hr and 1.5% sulfur fuel. A 25% operating factor is imposed when Sulfuric Acid Plants A and B are operating at rated capacity.
(6) Based on emission measurements.
(7) At 160 x 10^6 BTU/hr and 1.0% sulfur fuel.
(8) Two boilers at 120 x 10^6 BTU/hr each and 1.0% sulfur fuel.
(9) At 156 x 10^6 BTU/hr and 1.0% sulfur fuel.
(10) Actual emissions with 1.5% sulfur fuel.

Table 2

SUMMARY OF INCREMENT CONSUMING EMISSIONS

Emission Unit	SO_2 Increment Consuming Emission(g/s)
Sulfuric Acid E (SCCC)	52.5
Sulfuric Acid F (SCCC)	52.5
Auxiliary Boiler E (SCCC)	21.5
Auxiliary Boiler B (SRCC)	22.0
Auxiliary Boilers C and D (SRCC)	33.0
DAP 2 "Z"-train (SRCC)	0.69(1)

(1) Only 0.69 g/s of the total emission rate of 1.49 g/s contributes to increment consumption.

3. PSD Increment Analysis

The SRCC facility is located in an area where the Class II PSD increments apply. The nearest Class I area is the Okefenokee National Wildlife Refuge located approximately 40 kilometers to the northeast. Both a Class II and a Class I PSD increment analysis for SO_2 is required.

The consumption of increment in the area of the SRCC facility is affected by all of the SO_2 emissions from the B, C, and D auxiliary boilers, and by a portion of the SO_2 emissions from the DAP No. 2 "Z"-train. In addition, sources at Occidentals SCCC facility are included because of its close proximity to the SRCC site. No other sources of SO_2 significantly impact this area.

The results of the Class II modeling analysis are summarized in the following table.

Pollutant and Time Average	Class II Increment(ug/m^3)	Predicted Increase(ug/m^3)	Percent Increment Consumed
SO_2			
Three-hour(1)	512	256	50
24-hour(1)	91	73	80
Annual	20	12	60

1 Not to be exceeded more than once per year.

A more refined modeling analysis was performed to assess the impact of the proposed emission increases on the Okefenokee National Wilderness Refuge Class I area. Due to the long distance (approximately 40 km) and, hence, the longer transport time of the plume to the Class I area, conversion of some of the SO_2 to sulfates will be realized. Predicted ground-level impacts of SO_2 will be lessened depending upon the efficiency of this conversion. The method by which this conversion is simulated in the model is through the introduction of an appropriate SO_2 half-life--in this case, 12 hours.

The results of this modeling analysis are summarized in the following table.

Pollutant and Time Average	Class I Increment(ug/m^3)	Predicted Increase(ug/m^3)	Percent Increment Consumed
SO_2			
Three-hour(1)	25	25	100
24-hour(1)	5	5	100
Annual	2	1	50

(1) Not to be exceeded more than once per year.

No violation of a PSD allowable increment is predicted as a result of the proposed modification at the SRCC facility.

4. AAQS Analysis

An AAQS analysis is required for all pollutants for which a significant increase in annual emissions is proposed. The analysis includes an evaluation of the background concentration for each applicable pollutant, to take into account distant and natural sources, in addition to the explicit modeling of all sources in the surrounding (within 50 km) area.

An evaluation for SO_2 is required at the SRCC facility. An estimate of the background concentration as obtained from preconstruction monitoring and applicable to all averaging times is 0 ug/m^3. The maximum ground-level concentrations in the vicinity of the facility are summarized in the following table.

Pollutant and Time Average	Florida AAQS(ug/m^3)	National AAQS(ug/m^3)	Predicted Impact(ug/m^3)
SO_2			
Three-hour(1)	1300	1300(2)	425
24-hour(1)	260	365	195
Annual	60	80	10

(1) Not to be exceeded more than once per year
(2) Secondary standard.

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

The maximum ground-level concentrations predicted to occur as a result of the proposed modifications at SRCC are below the applicable National and Florida AAQS for SO_2, including the secondary standard designed to protect public welfare-related values. Therefore, no adverse impacts on soils and vegetation are expected.

The SRCC is located within 40 kilometers of a Class I area; however, no adverse impact on visibility is expected. Significant emission increases will be realized for SO_2 only. Visibility

degradation is related much more to particulate and nitrogenoxides emissions.

The proposed modification at the SRCC will result in no new jobs. As a result no growth-related air quality impacts will occur.

6. GEP Stack Height Evaluation

Regulations published by EPA in the Federal Register of February 8, 1982, define GEP stack height as the highest of:

1. 65 meters; or

2. The maximum nearby building height plus 1.5 times the building height or width, whichever is less.

While the actual stack height employed can exceed this height, the stack height used in modeling to determine compliance with the AAQS and PSD increments cannot. As seen in Table 1, all stacks at SRCC are less than the GEP limit of 65 meters.

IV. CONCLUSION

Based on a review of the data submitted by OCC for increasing the maximum sulfur content of the fuel for the No. 2 DAP plant and auxiliary boilers B, C, and D, the FDER concludes that compliance with all applicable federal and state air quality regulations will be achieved provided certain specific conditions are met. Use of fuel oil containing 1.5 percent sulfur in the No. 2 DAP plant, 1.0 percent sulfur in auxiliary boilers B, C, and D and COM fuel with 0.9 percent sulfur in auxiliary boiler C have been determined to be the Best Available Control Technology (BACT). The impact of the DAP dryer and auxiliary boilers 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 Occidental Chemical Company for the proposed DAP dryer and auxiliary boilers B, C, and D, subject to specific conditions to insure compliance with all applicable regulations. Appendix B includes the proposed conditions.

Appendix A

BACT DETERMINATION

Best Available Control Technology (BACT) Determination
Part I of III
Occidental Chemical Company
Hamilton County

The applicant plans to increase production from the sulfuric acid plants "E" and "F" located at their fertilizer grade phosphate rock processing facility at the Swift Creek Chemical Complex near White Springs, Florida. The production capacity of each acid plant is to be increased 25 percent to 2500 tons per day of 100% acid. Both acid plants have inherent in the initial design a production rate of 2300 tons per day with no major equipment modifications. It will be necessary to modify the economizer, gas handling and catalyst loading systems to achieve the 2500 tons per day production rate.

Air pollutants emitted from the sulfuric acid plants will be SO_2, NO_x, CO and sulfuric acid mist increasing the annual ambient air burden by 730,26,1, and 27 tons, respectively. Sulfur dioxide and sulfuric acid mist emissions increase exceeds the significant emission rate and requires a Best Available Control Technology determination as set forth in 17-2.500(2)(f), FAC.

The applicant has submitted several applications that require a BACT determination. Three determinations have been made by combining similar sources as follows:

PART I - Sulfuric Acid Plants,
PART II - Boiler Fuel Conversions
PART III - DAP Dryer Fuel Conversion.

BACT Determination Requested by the Applicant:

Sulfuric Acid Plant E and F.

Pollutant	Emission Limit
SO_2	4.0 lb/ton 100% acid
H_2SO_4 mist	0.15 lb/ton 100% acid

Sulfur dioxide emissions will be controlled by double absorption with catalyst screening and make up every three to five years.

Sulfuric acid mist emissions will be controlled with HV mist eliminators.

Date of Receipt of a BACT application:

May 27, 1982

Date of Publication in the Florida Administrative Weekly:

June 11, 1982

Review Group Members:

The final determination was based upon comments received from the New Source Review Section and the Air Modeling Section.

BACT Determined by DER:

Sulfur dioxide emissions from sulfuric acid plants E and F not to exceed 4 pounds per tons of 100% sulfuric acid produced.

Sulfuric acid mist emissions from sulfuric acid plants E and F not to exceed 0.15 pounds per ton of 100% sulfuric acid produced.

Visible emissions to be less than 10% opacity.

Test methods and procedures per the NSPS, 40 CFR Part 60, Subpart H, Subsections 60.84 and 60.85.

Justification of DER Determination:

Sulfur dioxide and sulfuric acid mist emissions are subject to standards of performance for sulfuric acid plants (40 CFR 60.80) promulgated in 1971. U. S. EPA reviewed the standard in 1979 (44 FR15742) and decided not to change the emission limits.

BACT for the sulfuric acid plants E and F is determined to be equal to New Source Performance Standards (NSPS) for sulfuric acid plants, 40 CFR 60, Subpart H.

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:

for _____
Steve Smallwood, Chief BAQM

Date: 11/2/92

Approved:

_____
Victoria J. Tschinkel, Secretary

Date: _____

Best Available Control Technology (BACT) Determination
Part II of III
Occidental Chemical Company
Hamilton County

The applicant plans to fire a higher sulfur content fuel in four fossil-fuel fired steam generators located at their facilities near White Springs, Florida. Boiler E is at the Swift Creek Complex and boilers B, C, D are at the Suwannee River Complex. The existing sources are as follows.

1. Gas fired auxiliary steam boiler "B" is rated at 160 million BTU per hour heat input. The steam produced is used to augment the steam produced by the sulfuric acid plants B and C. Boiler B is operated at 25% of rated capacity when the sulfuric acid plants are in operation. No. 6 oil is used as a stand-by fuel, the sulfur content of which is limited by permit conditions at 0.8% maximum.

2. Gas fired auxiliary steam boiler "C" is rated at 120 million BTU per hour heat input. The steam produced is used in the superphosphoric acid evaporators. No. 6 oil is used as a stand-by fuel, the sulfur content of which is limited by permit conditions at 0.8% maximum.

Boiler "C" has recently been modified to fire a coal-oil mixture (COM), also a stand-by fuel for this unit. The sulfur content of the COM is limited by permit conditions at 0.7% maximum.

3. Gas fired auxiliary steam boiler "D" is rated at 120 million BTU per hour heat input. The steam produced is used in the superphosphoric acid evaporators. No. 6 oil is used as a stand-by fuel, the sulfur content of which is limited by permit conditions at 0.8% maximum.

The combustion gases from boiler "C" and boiler "D" exhaust through a common stack. There is a fabric filter baghouse which is used to control particulate emissions only when COM is fired.

4. Oil fired auxiliary steam boiler "E" is rated at 156 BTU per hour heat input. The steam produced is used to augment the steam produced by the sulfuric acid plants. No. 6 oil is fired, the sulfur content of which is limited by permit conditions at 0.8% maximum.

Emission Evaluation: (1)

Pollutant	Boiler B	Boiler C	Boiler D	Boiler E
Particulates	lb/hr	lb/hr	lb/hr	lb/hr
current	12.01	9.01	9.01	11.55
proposed	14.20	10.65	10.65	13.9
increase	2.19	1.64	1.64	2.35
SO_2	lb/hr	lb/hr	lb/hr	lb/hr
current	137.16	102.87	102.87	131.88
proposed	174.8	128.58	128.58	170.7
increase	37.64	25.71	25.71	38.82
Fuel Use	GPH	GPH	GPH	GPH
MAX	1092	819	819	1050
AVE	273	210	210	252
COM		922		

(1) AP-42 Emission Factors, Table 1.3.1

The applicant plans to fire No. 6 oil having a sulfur content of 1.0 percent instead of the 0.8 percent maximum presently allowed. The increase in sulfur dioxide emissions, as a result of burning the higher sulfur fuel, exceeds the significant emission rate of 40 tons per year and requires a BACT determination (17-2.500(5)(c)FAC) for the pollutant sulfur dioxide.

The applicant has submitted several applications that require a BACT determination. Three determinations have been made by combining similar sources as follows:

PART I - Sulfuric Acid Plants,
PART II - Boiler Fuel Conversions
PART III - DAP Dryer Fuel Conversion.

BACT Determination Requested by the Applicant:

Boilers, B, C, D, and E

Pollutant	Emission Limit
SO_2 (oil)	1.1 lb/million BTU heat input (1% sulfur content)
SO_2 (com)	0.9% sulfur content

Date of Receipt of a BACT application:

May 27, 1982

Date of Publication in the Florida Administrative Weekly:

June 11, 1982

Review Group Members:

The final determination was based upon comments received from the New Source Review Section and the Air Modeling Section.

BACT Determined by DER:

Auxiliary boiler E - Swift Creek Complex
Auxiliary boiler B, C, D - Suwannee River Complex

Sulfur dioxide emissions controlled by limiting the sulfur content of the No. 6 oil fired to a maximum of 1.0 percent and the COM fuel to 0.9 percent.

Compliance with the SO_2 emission limit will be based upon the Sulfur content of the fuel fired. Each shipment of fuel delivered to the facility will be sampled and the sulfur content determined and recorded. A certified analysis from the applicants fuel supplier may be substituted for on-site analysis. Applicable test methods by the American Society for Testing Material (A.S.T.M.) will be used.

Justification of DER Determination:

The facility is within 50 kilometers of the Okefenokee National Wilderness area, a Class 1 area. Air modeling indicates that at the conditions determined as BACT, the impact of sulfur dioxide emissions from the facility will be just less than the maximum allowable increase for a Class 1 area.

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:

for _____
Steve Smallwood, Chief BAQM

Date: 11/7/82

Approved:

_____
Victoria J. Tschinkel, Secretary

Date: _____

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) DETERMINATION

PART III OF III

OCCIDENTAL CHEMICAL COMPANY

HAMILTON COUNTY

The applicant plans to increase the sulfur content of the fuel oil fired in the diammonium phosphate plant (DAP) dryer. The dryer is in the Suwannee River complex located near White Springs, Florida. The existing dryer is gas fired with No. 6 residual oil fired only during periods of gas curtailment. The sulfur content of the oil is to be increased to 1.5 percent from the presently permitted maximum of 0.8 percent.

At maximum dryer capacity No. 6 oil is fired at a rate of 246 gallons per hour. SO_2 emissions, at this rate of oil consumption (assume 80% SO_2 absorption), when firing 0.8% and 1.5% sulfur content oil is 6.3 and 11.8 pounds per hour respectively. The increase in SO_2 emissions would be 5.5 pounds per hour.

A Venturi scrubber in series with a packed tail-gas scrubber is used to reduce the air pollutants emitted in the dryer exhaust gases. Sulfur dioxide emissions are reduced by the control system, and, in addition, by reaction with the material being dried.

The applicant has submitted several applications that require a BACT determination. Three determinations have been made by combining similar sources as follows:

PART I - Sulfuric Acid Plants,
PART II - Boiler Fuel Conversions
PART III - DAP Dryer Fuel Conversion.

BACT Determination Requested by the Applicant:

Pollutant	Emission Limit
SO_2	0.41 lb/ton P_2O_5 input (fuel with 1.5% sulfur)

Date of Receipt of a BACT Application:

May 27, 1982

Date of Publication in the Florida Administrative Weekly:

June 11, 1982

Review Group Members:

The final determination was based upon comments received from the New Source Review Section and the Air Monitoring Section.

BACT Determined by DER:

Diammonium Phosphate Plant No. 2 product rotary dryer.
Suwannee River Chemical Complex

Sulfur dioxide emissions controlled by limiting the sulfur content of the No. 6 oil fired to a maximum of 1.5 percent, and SO_2 emissions to 0.20 lb. SO_2/ton DAP.

The applicant shall prepare a procedure to prevent the unloading of No. 6 oil containing 1.5% sulfur into the tank(s) which contain No. 6 oil having a lower sulfur content. A record will be kept of the amount of 1.5% oil received and the DAP dryer oil consumption rate. The records shall be made available to the department upon request.

Compliance with the SO_2 emission limit will be based upon the sulfur content of the fuel fired. Each shipment of fuel delivered to the facility will be sampled and the sulfur content determined and recorded. A certified analysis from the applicants fuel supplier may be substituted for on-site analysis. Applicable test methods by the American Society for Testing Material (A.S.T.M.) will be used.

Justification of DER Determination:

To reiterate per the BACT determination, Part II, the facility is within 50 kilometers of the Okefenokee National Wilderness area, a Class I area. Air modeling indicates that at the conditions determined as BACT, the impact of sulfur dioxide emissions from the facility will be just less than the maximum allowable increase for a Class 1 area.

The quantity of controlled SO_2 emissions from the dryer, when firing 1.5% sulfur content oil, is comparable to the amount of uncontrolled SO_2 emissions when firing 1.0% sulfur content oil. Oil is the stand-by fuel for this unit and would be fired only during periods of gas curtailment.

The use of the same grade fuel oil, but with different sulfur contents, will require, at the minimum, two fuel oil storage tanks. The applicant will have to set up a fuel oil handling procedure to prevent the transfer of the higher sulfur content oil to the wrong tank or other sources.

The department has determined, in this case, that the increase in the sulfur content of the oil fired (0.8% to 1.5%) is reasonable.

provided the anticipated 80% reduction in SO_2 emissions is documented.

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:

C. H. Fancy

for Steve Smallwood, Chief BAQM

Date: 11/2/82

Approved:

Victoria J. Tschinkel, Secretary

Date:

APPENDIX B

SPECIFIC CONDITIONS

FDER proposes a preliminary determination of approval with conditions for this project requested by Occidental Chemical Company in the permit applications submitted on June 8, 1982, (federal application) and May 21, 1982, (state application).

Special conditions listed in the State permits AC 24-56212, AC 24-56213, AC 24-56214, and AC 24-56215 are adopted as special conditions for the federal permit, PSD-FL-083, for these sources.

The attached General Conditions (federal) are also made a part of the proposed federal permit PSD-FL-083.