Preliminary Determination

and

Technical Evaluation

Buckeye Cellulose Corporation

Power Boiler No. 1

Taylor County, Florida

Permit numbers:

State: AC 62-45987

Federal: PSD-FL-085

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

September 22, 1981

Technical Evaluation

and

Preliminary Determination

CONTENTS

I. PROJECT DESCRIPTION

A. Applicant

Buckeye Cellulose Corporation
State Road 30
Perry, Florida 32347

B. Project and Location

Buckeye Cellulose is proposing to modify an existing power boiler (#1, permit number AO 62-10945) to burn an alternate fuel. The boiler presently burns residual oil. Two of the four burners will be replaced to accommodate wood fines as a fuel. This is a test project to determine the feasibility of converting the entire boiler to this fuel and others in the future. The project is located in Perry, Taylor County, Florida. The UTM coordinates are 256.74 km East and 3328.7 km North.

C. Process and Controls

The number 1 power boiler presently has the capacity to burn either gas or oil. The modification will replace the lower two burners with wood suspension burners. These burners will operate separately but in parallel with the two remaining residual oil burner. The dried wood fines will be supplied from the bark dryer currently permitted by AC 62-30466. The fines will be pulverized and metered to the new burners.

The controls for the test period will be an existing side stream venturi scrubber. This scrubber treats approximately 50% of the exhaust gas from the number 1 power boiler. After the test period has been completed, additional controls will be installed to meet the applicable standards for power boilers.

II. SUMMARY OF EMISSIONS

The potential emission increases (uncontrolled) and projected actual emissions for the proposed project are listed below.

Pollutant	Potential Emission Rate Increase (uncontrolled) (tons/year)	Applicant's Projected Actual Emission Rate (tons/year)
Particulate	2,383	1,346
Sulfur Dioxide	-1,449	1,496
Carbon Monoxide	25	62
VOC	-55	62
Nitrogen Oxides	-136	302

The actual emissions are based on the use of a side stream venturi scrubber as control and the use of AP-42 factors. After the two year test period, these emission rates are expected to decrease by the addition of more or new controls.

III. RULE APPLICABILITY

A. State Rule

The Buckeye mill is in an area designated attainment for all criteria pollutants, and it is more than 50 km from any particulate matter (PM) or SO_2 nonattainment area. It is within 100 km of the St. Marks National Wilderness Class I area.

Since the proposed project is a change in the method of operation of an existing major emitting facility which would result in an increase in potential emissions of PM, it constitutes a modification subject to review under State prevention of significant deterioration (PSD) regulations (17-2.04(6),

FAC), PSD review consists of determination of best available control technology (BACT) for each pollutant for which there would be an increase in concentration over the baseline and an air quality impact analysis to demonstrate that the project would not cause or contribute to a violation of any ambient air quality standard or PSD increment. For the proposed project, PSD review is required for PM only. The BACT determination for PM takes into account that the proposed project is a test program of limited duration.

Since power boiler #1 has a maximum heat input rate less than or equal to 250 million Btu/hr, the project is not subject to the federal new source performance standards (NSPS) for fossil-fuel steam generators (40 CFR 60.40, Subpart D) adopted by reference under 17-2.21 (2) (a), FAC. While burning liquid fossil fuel, the boiler is subject to a visible emissions limit of 20% opacity and emission limitations for PM, SO_2, and NO_x which represent BACT (17-2.05 (6), Table II, E.(2), FAC).

B. Federal Rule

The proposed source is subject to federal PSD review because it is a major modification. The net increases for pollutant emissions and significant emission rates are listed as follows:

Regulated Pollutant	Net Emission Increase (tons/year)	Significant Emission Rate (tons/year)
Particulate Matter (PM)	1,294	25
SO_2	-1,449	40
CO	25	100
VOC	-55	40
NO_x	-136	40

Since the proposed project is a change in the method of operation of an existing major stationary source which would result in a significant net emissions increase of at least one regulated pollutant, it constitutes a major modification subject to review under federal PSD regulations (40 CFR 52.21(i)). PSD review consists of a determination of best available control technology (BACT) and, unless otherwise exempted, an air quality impact analysis for each attainment pollutant that would be emitted in a significant net amount. For the proposed project, PSD review is required for PM only. An air quality impact analysis is not required since the project duration will not exceed two years and the applicant has demonstrated that the net increase in PM emissions will not have a significant impact (1 ug/m^3, 24-hour average) on the St. Marks National Wilderness Class I area. The BACT determination for PM takes into account that the proposed project is a test program of limited duration.

Since power boiler # 1 has a maximum heat input rate less than or equal to 250 million Btu/hr, the project is not subject to the federal new source performance standards (NSPS) for fossil-fuel steam generators (40 CFR 60.40, Subpart D).

IV. Air Quality Impact Analysis

A. Summary

The State PSD review for PM requires an air quality impact analysis which includes a PSD increment analysis and a Florida Ambient Air Quality Standards (FAAQS) analysis. The State PSD increment and FAAQS analyses depend on air quality modeling carried out in accordance with FDER-approved methods.

Based on these required analyses, FDER has reasonable assurance that the Buckeye Cellulose 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 required analyses follows.

B. Discussion

1. Modeling Methodology

The Single-Source (CRSTER) model, an FDER and EPA-approved dispersion model, was used to determine the maximum predicted annual concentrations and to identify the worst-case short-term meteorological conditions which would affect emissions from Buckeye Cellulose after the proposed modification is completed. The maximum short-term impacts were refined using the CRSTER model with a 0.1 kilometer spacing between receptor rings and only the days on which worst-case meteorological conditions occurred.

The surface meteorological data used in the model were National Weather Service data collected at Tallahassee, Florida, during the year 1964. Upper air meteorological data used in the model were collected during the same year at Montgomery, Alabama.

Final stack parameters and emission rates used in modeling the proposed Buckeye Cellulose modification are contained in Tables I and 2.

2. Analysis of Existing Air Quality

There are no FDER or EPA approved total suspended particulate (TSP) monitors in the vicinity of the Buckeye Cellulose mill. Since this mill is located in a remote area with respect to emissions of PM from other sources and since all PM sources at the mill itself were included in the modeling, a background value of 35 ug/m^3 was assumed by FDER.

3. PSD Increment Analysis

Buckeye Cellulose mill is located in an area where the Class II PSD increments apply. The nearest Class I area is St. Marks National Wilderness Area, approximately 44 kilometers away from the mill site.

In addition to the proposed modification to boiler No. 1, increment consumption is affected by the addition of a calciner to the mill in 1979. As shown in the following table, modeling results predict that the maximum TSP increment consumption due to the calciner and the proposed modification to boiler No. 1 will not exceed allowable increments. The highest 24-hour predicted concentration is given in the table since only one year of meteorological data was used in the modeling.

4. Ambient Air Quality Standards Analysis

State PSD regulations require the permit applicant to demonstrate that, given existing air quality in an area, a proposed emissions increase subject to PSD review will not cause or contribute to any violation of ambient air quality standards. As shown in the following table, modeling results predict that maximum ground-level TSP concentrations resulting from total mill emissions after the proposed modification will be below the FAAQS. The highest short-term predicted values are given in this table since only one year of meteorological data was used in the modeling.

Averaging Time	Projected TSP Concentration* (ug/m^3)	FAAQS (ug/m^3)
Annual	42	60
24-hour	102	150

*Includes background concentration of 35 ug/m^3.

Table 1

Stack Parameters for Buckeye Cellulose - Baseline Case

Emissions Unit	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)	Emission Rate (g/sec) PM
No. 1 Kiln	29.26	1.22	9.69	344.7	2.31
No. 2 Kiln	29.26	1.22	15.20	343.6	2.48
No. 3 Kiln	29.26	1.22	11.77	349.7	2.61
No. 2 Recovery Blr.	68.58	3.35	14.11	430.2	11.65
No. 2 Smelt Tank	43.28	0.91	7.55	343.6	3.16
No. 3 Recovery Blr.	68.58	2.74	17.63	402.4	10.37
No. 3 Smelt Tank	42.67	1.22	8.81	345.8	3.04
No. 4 Recovery Blr.	68.58	2.90	21.71	474.7	11.72
No. 4 Smelt Tank	49.38	1.22	10.33	344.7	3.28
Power Boilers Stack	68.58	3.96	15.56	413.0	25.04

Table 2

Stack Parameters for Buckeye Cellulose - Projected Case

Emissions Unit	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)	Emission Rate (g/sec) PM
No. 1 Kiln	29.26	1.22	9.69	344.7	2.31
No. 2 Kiln	29.26	1.22	15.20	343.6	2.48
No. 3 Kiln	29.26	1.22	11.77	349.7	2.61
No. 2 Recovery Blr.	68.58	3.35	14.11	430.2	11.65
No. 2 Smelt Tank	43.28	0.91	7.55	343.6	3.16
No. 3 Recovery Blr.	68.58	2.74	17.63	402.4	10.37
No. 3 Smelt Tank	42.67	1.22	8.81	345.8	3.04
No. 4 Recovery Blr.	68.58	2.90	21.71	474.7	11.72
No. 4 Smelt Tank	49.38	1.22	10.33	344.7	3.28
Power Boilers Stack	68.58	3.96	16.90	377.0	57.15
Calciner	37.49	1.52	15.70	341.3	3.30
Shave Off Scrubber	52.00	1.07	12.10	341.0	3.53

Maximum TSP Increment Consumption

(ug/m^3)

	Averaging Time	
	24-hour	Annual
Class II PSD Increment Consumed by Buckeye Cellulose	14	1
Allowable Class II Increment	37	19
Class I PSD Increment Consumed By Buckeye Cellulose	2	< 1
Allowable Class I Increment	10	5

V. CONCLUSIONS

The emissions projected by the applicant are reasonable for the test period (2 years). Upon conclusion of the testing program, the emission limitations as described in the BACT determination shall become effective. The project schedule as well as additional provisions outlined in the BACT determination shall become conditions of the permit.

The General and Specific conditions stated in the proposed state permit (AC 62-45987) and federal permit (PSD-FL-085) will assure no violations of ambient air quality standards or PSD increments.

Preliminary Determination

Buckeye Cellulose Corporation

Application PSD-FL-085

The preceeding Technical Evaluation and Preliminary Determination are adopted by reference for the proposed federal permit PSD-FL-085.

Special Conditions listed in the draft State permit, AC 62-45987, are adopted as special conditions for the draft federal permit, PSD-FL-085, for this source.

The attached General Conditions are also made a part of the proposed federal permit PSD-FL-085 for this source.

Attachment: General Conditions (Federal)

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 specifed 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) 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 noncomplying 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.

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.

8. The permittee shall allow representatives of the State environmental control agency or representatives 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 any 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 any 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:

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

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 invalud, 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 constitute a violation of the terms and conditions of this permit.

Best Available Control Technology (BACT) Determination

The Buckeye Cellulose Corporation

Taylor County, Florida

The applicant proposes to modify an existing 250 million Btu per hour heat input fossil fuel fired power boiler at their facility located six miles southeast of Perry, Florida. The upper two gas/oil burners in the No. 1 power boiler will remain intact, the lower two will be removed and two wood suspension burners installed. The new burners will operate separately but in parallel with the two remaining gas/oil burners. The new burners will fire wood fines from the bark dryer. This wood fuel will contain ~10 percent moisture and will pass a No. 35 U.S. Standard mesh (500 microns). At maximum capacity 14,530 pounds of wood fines, 20.4 barrels of No. 6 oil or 0.12 million cubic feet of natural gas will be consumed per hour. The unit is scheduled to operate 8,400 hours per year.

This is a project to optimize operating parameters to use dried wood fines as a replacement fuel for residual oil in existing power boilers. The data obtained will be used to finalize an operational unit equipped with an efficient pollutant emission control device(s).

BACT Determination Requested by the Applicant:

A maximum particulate emission limit is set as 308 lb/hr from the firing of wood fines and 12.5 lb/hr from the fossil fuel. Since this is a new firing concept and the actual emissions unknown, BACT is to run a series of tests to obtain pollutant emission data. The test plan and schedule follows:

I. Baseline Testing of Existing Boiler:

Burners on gas and oil.
Start testing 8/81, 1 month required.
Learn response and stability of existing B & W burners on gas and oil. Measure pressures, excess air, superheat and steam output.

II. Testing of New Burners on Gas and Oil:

Start testing 10/81, 1 month required.

III. Test Fines Burners for Performance:

Start testing 1/82, 1-3 months required.
Determine flame shaping with optimum fuel conditions; i.e., smallest particle size, low moisture range, wood from existing dryer.

IV. Vary Pulverizer Configuration:

Start testing 4/82, 1-2 months required.

Vary classification to determine optimum arrangement vs. horsepower and capacity.

V. Resume Burner Testing:

Start testing 6/82, 1-3 months required.
Test burners with varying particule size and moisture content. Evaluate pulverizer/drying system as a coupled unit.

VI. Commence Environmental Testing:

Start testing - 9/82, 1-3 months required.
Measure particulate, HC, CO and NO_x emissions as load, particle size and moisture content are varied.

VII. Boiler Performance Tests:

Start testing 12/82, 1-3 months required.
Determine ash fallout in various sections of boiler.
Need for grate, ash dump, fly ash fallout, superheat temperature.

VIII. Green Wood Testing:

Start testing 3/83 - 1-3 months required.
Test prototype for performance as a full-scale dryer/pulverizer system using factors of each of the previous tests.

IX. Operational Testing for Long Term Stability:

Start testing 6/83, 6 months required.
Test factors such as erosion, sooting, fouling, etc.

The flue gas stream will be split, a portion into an on site side stream venturi scrubber, the remainder into a stack discharging to the atmosphere. This stack also handles the flue gases from two bark boilers and an oil fired boiler.

Date of Receipt of a BACT Application:

July 30, 1981

Date of Publication in the Florida Administrative Weekly:

August 7, 1981

Review Group Members:

Willard Hanks - BAQM New Source Review Section
Carl Bock - BAQM New Source Review Section
Mike Harley - Office of Rules and Special Projects
Johnny Cole - St. Johns River Subdistrict

The final BACT determination is based on the review group recommendations.

BACT Determination by DER:

I. Design Goal Emission Limits

Pollutant	Emission Limit
Particulates	0.15 lb/million Btu heat input
SO_2	Fuel oil with ≤ 2.5% sulfur content
NO_x	0.30 lb/million Btu heat input
Visible Emissions	20% opacity except for 27% for 6 minutes per hour.

The emission limits in I. above become effective at completion of the testing program or June 1983, whichever comes first.

II. Interim Emission Limits:

Pollutant	Emission Limit
Particulates (wood fuel)	308 lb/hr
Particulates (fossil fuel)	12.5 lb/hr
SO_2	Fuel oil with ≤ 2.5% sulfur content.

The emission limits in II. above apply only to the emissions resulting from the No. 1 power boiler conversion project.

III. Project Schedule.

The test plan and schedule as proposed by the applicant is approved with the following provisions.

1. A project progress report is to be submitted every ninety (90) days to the DER St. Johns River Subdistrict Office, to the attention of Mr. Johnny Cole.

2. EPA reference test methods or other State approved methods will be used to determine pollutant emission rates. Minimum sample volume and time will be as specified in the NSPS for fossil fuel fired steam generators, 40 CFR 60, Subpart D.

Justification of DER Determination:

The Department has determined the BACT in three parts; (I) final or design emission limits; (II) interim emission limits, and (III) the project schedule.

The final emission limit for particulate matter is less stringent than NSPS for fossil fuel boilers (40 CFR 50, Subpart D) but more stringent than the State emission limit for carbonaceous fuel (17-2.05(6)I.(2)(b)F.A.C.). The SO_2 emission limit is based upon the sulfur content of the fuel oil, SO_2 emissions from the burning of wood fines are negligible. These emission limits will apply after completion of the project test program.

The interim emission limits determined as BACT will apply during the conversion and testing of No. 1 boiler. Ambient air quality modeling predicts no violation of AAQ standards.

The Department accepts the proposed time schedule for the conversion project. The reasons for the two added provisions are self-explanatory.

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

Steve Smallwood, Chief, BAQM

Date:

9/16/81

Approved:

Terry Cole for

Victoria Tschinkel, Secretary

Date:

September 18, 1981

SS:caa