Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

February 16, 1990

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

This letter is to request an amendment to construction permit No. AC16-168607 (Kraft Recovery Boiler) for our mill in Jacksonville, As indicated earlier, Seminole Kraft has engaged in extensive engineering studies related to the proposed new recovery boiler installation as well as examining how best to position the mill for the future. These studies have concluded that the mill is a high cost operation in its current configuration and would remain so even after the installation of the new recovery boiler currently estimated to cost $130,000,000.

Accordingly, three months ago, Seminole Kraft began an investigation to determine what technology alternatives to the recovery boiler project might provide an improved environment to the City of Jacksonville and a mill that would be more competitive in domestic and foreign markets in the future.

An alternative has been tentatively selected that will provide the business with the stability required to insure a long term viable operation. This alternative provides for reconfiguration of the existing mill to enable it to use 100% recycled fiber instead of virgin fiber to produce 1,200 tons per day of linerboard on our existing No.2 paper machine. The kraft pulp mill, old recovery boilers and associated facilities will be permanently shut down and the No.1 paper machine will be placed on cold standby. This alternative will result in the elimination of all regulated TRS (odor) emission sources prior to the stated November 12, 1992 deadline as well as substantial reductions in particulate emissions. This conversion will increase the use of recycled fiber at the mill from about 100 TPD to about 1,400 TPD and will substantially increase Florida's waste paper recycle rate.

As we discussed, the best approach to providing regulatory approval of this alternative appears to be an amendment to the specific conditions in the new recovery boiler construction permit. We believe this new condition should relieve Seminole Kraft of the obligation of building a new recovery boiler if Seminole chooses to shut down the Kraft pulping operation, old recovery boilers and related facilities by supplying recycled fiber to the paper machine instead of virgin wood pulp from the Kraft pulp mill. In addition, this new condition would require Seminole Kraft to turn in the operating permits for the old recovery boilers once the recycle operation is up and running and to make the old recovery boiler incapable of operation. We believe this specific condition should also provide the mechanism for retaining the recovery boiler creditable emission reductions for potential use by Seminole Kraft pursuant to 17-2.500(2)(e) 3 & 4. As noted, our No.1 paper machine (presently making bag paper) will be placed on cold standby for the time being. However we hope to develop a project to use recycle fiber on the No.1 paper machine in the future and if AES cannot supply the required steam, we would like to use the creditable emissions from the recovery boilers for a power boiler to supply steam to the No.1 paper machine.

Finally, this specific condition should provide for notice to DER of Seminole Kraft's final decision to pursue this alternative or proceed with the new recovery boiler by a date certain.

To facilitate development of the language for this amendment, we have prepared the draft specific condition shown below for your consideration.

15. Seminole Kraft Corporation has indicated to the Department that as an alternative to replacing the three existing kraft recovery boilers with a new recovery boiler, it may choose to convert the mill to a 100% recycle fiber operation and close down the kraft pulp mill, recovery boilers and associated facilities. In the event that Seminole Kraft chooses this alternative, the following conditions apply:

    a. The existing kraft pulp mill, including three recovery boilers, three smelt dissolving tanks, digester system, three lime kilns and three multiple effect evaporators, will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this same date.

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

February 16, 1990

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

This letter is to request an amendment to construction permit No. AC16-168607 (Kraft Recovery Boiler) for our mill in Jacksonville. As indicated earlier, Seminole Kraft has engaged in extensive engineering studies related to the proposed new recovery boiler installation as well as examining how best to position the mill for the future. These studies have concluded that the mill is a high cost operation in its current configuration and would remain so even after the installation of the new recovery boiler currently estimated to cost $130,000,000.

Accordingly, three months ago, Seminole Kraft began an investigation to determine what technology alternatives to the recovery boiler project might provide an improved environment to the City of Jacksonville and a mill that would be more competitive in domestic and foreign markets in the future.

An alternative has been tentatively selected that will provide the business with the stability required to insure a long term viable operation. This alternative provides for reconfiguration of the existing mill to enable it to use 100% recycled fiber instead of virgin fiber to produce 1,200 tons per day of linerboard on our existing No.2 paper machine. The kraft pulp mill, old recovery boilers and associated facilities will be permanently shut down and the No.1 paper machine will be placed on cold standby. This alternative will result in the elimination of all regulated TRS (odor) emission sources prior to the stated November 12, 1992 deadline as well as substantial reductions in particulate emissions. This conversion will increase the use of recycled fiber at the mill from about 100 TPD to about 1,400 TPD and will substantially increase Florida's waste paper recycle rate.

We hope this information will be adequate to proceed with processing the proposed amendment. Please let us know if you require any additional information. We would be happy to meet with the Department to help expedite the handling of this matter.

Sincerely,

L.A. Stanley

L.A. Stanley
General Manager

ah

CC: Steve Smallwood
Dale Twachtmann
James L.Manning
Richard Maguire
Mike Riddle
Curt Barton
Al Koleff
P. Raval
B. Andrews
M. Linn
G. Feltgen, NE Dist
H. Aronson, EPA
C. Shaver NPS
CHF/BK F/ET

b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by May 1, 1990.

c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle fiber project is completed and in operation.

d. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation and shuts down the kraft pulp mill sources listed in a. above, the following creditable emission reductions are available to Seminole Kraft for five (5) years from the date construction on this alternative is complete or November 12, 1992, whichever is earlier.

CREDITABLE EMISSION REDUCTIONS (TPY)
(1983-84)*

Source	TSP	PM_{10}	SO_2	NO_x	CO	TRS
3 existing Recovery Boilers	427.2	320.5	1481	321.1	2327.2	89.3
3 Existing Smelt Dissolving Tanks	122.6	109.7	8.6	-	-	8.9
3 Existing Lime Kilns	74.1	72.6	1.4	98.1	21.2	17.3
No.1 & No.2 Lime Slaker (shut down in 1988)	140.5	133.0	-	-	-	-
No.3 Lime Slaker	14.0	12.8	-	-	-	-

*Note that emissions for the recovery boilers, smelt dissolving tanks, and lime slakers are the same as in the PSD construction permit application (see Attachment A). The emissions for the lime kilns are based on 1983-84 operating hours, but today's control technology/emission limits. See Attachment B for details.

ATTACHMENT A

(Table 4-3 from Original Recovery Boiler PSD Appliciation)

Table 4-3 Baseline Emissions (1983-1984) from Existing Recovery Boilers and Smelt Dissolving Tanks at Seminole Kraft

	Annual Baseline Emissions (TPY)						
Polllutant	RB1	RB2	RB3	SDT1	SDT2	SDT3	Totals
Particulate Matter (TSP)	143.8	144.4	139.0	31.3	48.4	42.9	549.8
Particulate Matter (PM10)	107.9	108.3	104.3	28.0	43.3	38.4	430.2
Sulfur Dioxide	429.5	519.8	531.7	2.5	3.0	3.1	1,489.6
Nitrogen Oxides	94.4	112.7	114.0	-	-	-	321.1
Carbon Monoxide	674.9	816.8	835.5	-	-	-	2,327.2
Volatile Organic Compounds	100.0	119.4	120.8	-	-	-	340.2
Total Reduced Sulfur	25.2	31.3	32.8	2.6	3.1	3.2	98.2
Lead	.012	0.13	0.12	-	-	-	0.37
Mercury	-	-	-	-	-	-	-
Beryllium	0.0090	0.0098	0.0090	-	-	-	0.0278
Sulfuric Acid Mist	6.18	6.76	6.19	-	-	-	19.1
Inorganic Arsenic	-	-	-	-	-	-	-
Fluorides	-	-	-	-	-	-	-
Asbestos	-	-	-	-	-	-	-
Vinyl Chloride	-	-	-	-	-	-	-

Note: TPY = tons per year

ATTACHMENT B

Basis for Lime Kiln Creditable Emissions

Particulate Emissions - actual data from 1983-84 Annual Report
PM_{10} - used AP-42 Table 10.1-4 and particulate emissions from 1983-84 Annual Report.
NO_x used NCASI Technical Bulletin No. 107, April 1988

Kiln No.	mmBTU/Year 83	mmBTU/Year 84	Tons No_x/Year 83	Tons No_x/Year 84	Average
1	156150	89535	12.5	7.16	9.8
2	241883	322084	37.5	49.9	43.7
3	267245	308848	41.4	47.9	44.6
				Total	98.1

TRS emissions calculated from actual gas flow rates in 1983-84 and at 20 ppm TRS as H_2S. This would correspond to permit limit today.

CO used AP-42 Table 10.1-1 (0.1 lbs/ADUP)

Year	Pulp Produced (Tons-ADUP/Year)	CO Emissions (TPY)
1983	410,238	20.5
1984	436,032	21.8
	Avg.	21.2

For SO_2-use data compiled in 1989's operating permit application.

Kiln	SO_2 Emission Rate	Avg. Hours of Operation	SO_2 (TPY)
No.1	0.16 lb/hr	3882	0.31
No.2	0.06 lb/hr	6829	0.21
No.3	0.24 lb/hr w/noncondensibles	7462	0.90
		Total	1.42

File Copy
AC 16-168607
PSD-FL-141

Florida Department of Environmental Regulation

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

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

June 6, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. L. A. Stanley
General Manager
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218-0998

Dear Mr. Stanley:

Re: Contemporaneous Emissions Credit Calculations

The Department and the U.S. EPA - Region IV have reviewed your letter with attachments dated February 16, 1990. A letter of response, which is attached, was received from Ms. Jewell A. Harper, Chief of the Air Enforcement Branch, U.S. EPA-Region IV, posing a concern about the calculation of contemporaneous emissions credit. Specifically, contemporaneous emissions shall be based on actual emissions data established by conducting emissions tests and on actual operating data (hours per year) from the two years previous to shutdown, unless another time period within the last 5 years prior to shutdown is more representative of actual operating conditions. The Department concurs with EPA on this issue since this is the guidelines established in both the federal and state regulations.

Because Seminole Kraft Corporation (SKC) has indicated that the mill might be going to 100% recycled fiber by no later than November 12, 1992, the mill will have adequate time to conduct emissions tests on the various sources that would be shut down and candidates for contemporaneous emissions credit. Therefore, the Department requests that SKC conduct emissions tests on all sources that it intends to shutdown in order to calculate contemporaneous emissions credit.

If there are any questions, please call Bruce Mitchell at (904)488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/BM/t

attachments

cc: A. Kutyna, NE District
J. Manning, BESD
J. Harper, U.S. EPA
C. Shaver, NPS
T. Cole, OHF & C, P.A.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 4 1990

4APT-AEB

RECEIVED

APR 09 1990

DER-BAQM

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Seminole Kraft Corporation (PSD-FL-141)

Dear Mr. Fancy:

This is to acknowledge receipt of a package from your office transmitting a request from Seminole Kraft Corporation to modify their prevention of significant deterioration (PSD) permit, dated February 16, 1990. As discussed between Mr. Pradeep Raval of your staff and Mr. Gregg Worley of my staff on March 30, 1990, we have the following comments.

CREDITABLE EMISSIONS REDUCTIONS

The source has requested that conditions be placed in the PSD permit to allow them the flexibility to convert to 100% recycled fiber in lieu of constructing the new recovery boiler. In the event that the source makes the decision to convert to recycled fiber, the source would like to retain emissions credit for the units which would be shut down at the facility (i.e., the existing kraft pulp mill). The credit for shutting down any units may be retained but we must emphasize that such credit must be based on actual operating data from the two years previous to the shutdown, unless another time period is determined to be more representative of actual operating conditions. The information submitted by Seminole Kraft is based on the years 1983-84. Apparently the source used the operating hours of this time period along with presently permitted allowable emission rates to arrive at their creditable emission reductions. This is not acceptable. We would suggest that it would be prudent of FDER to require testing of the units prior to shutdown for the pollutants which are to be credited. In any case, the actual emission rates must be used rather than the permitted allowable rates unless the actual emissions exceed the allowable emissions.

In a related matter, we do not think it is wise to include as a permit condition the language suggested by the source in provision 15 (d) which specifies what credits are available prior to the shutdown of the units. It appears that such a provision would lock FDER into accepting those numbers as creditable emissions no matter what the source operation was prior to shutdown. The fact that emissions resulting from federally enforceable shutdowns are creditible does not need to be established in a permit; the fact that such emissions are creditable is already established in federal and Florida regulations. In addition, the contemporaneous time period for which the emissions are creditable is established in regulations. Thus, it is redundant to state that "...the following emissions reductions will be available to Seminole Kraft for five (5) years from the date construction on this alternative is complete or November 12, 1992, whichever is earlier." By establishing a federally enforceable shutdown date at the completion of construction or November 12, 1992, whichever is earlier, it is understood that emissions credit is available for a period of five years from that point.

EFFECT ON THE AES CEDAR BAY PROJECT

The AES project which is currently under review for permitting plans to use the ambient impacts of shutting down several units at Seminole Kraft in their air quality analysis. How will the proposed permit amendment by Seminole Kraft affect the AES project?

Thank you for the opportunity to review and comment on this proposal by Seminole Kraft. If you have any questions or comments on this matter, please do not hesitate to contact Mr. Gregg Worley of my staff at 404/347-2864.

Sincerely yours

Jewell A. Harper

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☒ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
L. A. Stanley
Seminole Kraft Corp.
9469 Eastport Road
Jacksonville, FL 32218

4. Article Number
P 938 762 803

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Address
X S/ Linda Northup

6. Signature — Agent
X

7. Date of Delivery
1-10-90

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

PS Form **3811**, Mar. 1988 ★ U.S.G.P.O. 1988-212-865 **DOMESTIC RETURN RECEIPT**

P 938 762 803

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

Sent to L. A. Stanley Seminole Kraft Corp.	
Street and No. 9469 Eastport Road	
P.O., State and ZIP Code Jacksonville, FL 32218	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date mailed: 1/9/90 AC 16-168607, -168608 & -168609; PSD-FL-141	

PS Form 3800, June 1985

-File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-240

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMITS

Mr. L. A. Stanley
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218

January 5, 1990

Enclosed are construction permits Nos. AC 16-168607, -168608, -168609 and PSD-FL-141 for Seminole Kraft Corporation to modify the recovery boiler project at their facility in Jacksonville, Duval County, Florida. These permits are issued pursuant to Section 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copy furnished to:

A. Kutyna, NE District
S. Pace, BESD
W. Aronson, EPA
C. Shaver, NPS
D. Buff, KBN
J. Subramani, Oertel & Hoffman
Reading File
Barry Andrews
Pradeep Raval
Max Linn
1-8-90 RBM

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 1-9-90.

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

Kim Tober 1-9-90
Clerk Date

Florida Department of Environmental Regulation

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

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

November 22, 1989

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. L. A. Stanley
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218

Dear Mr. Stanley:

Re: Construction Permits for the Recovery Boiler/ Smelt Dissolving Tank/ Multiple Effect Evaporator Set Project Numbers: AC 16-168607, -168608, -168609, and PSD-FL-141.

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Seminole Kraft's above mentioned project at the existing facility in Jacksonville, Duval County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Regulation.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pr

Attachments

cc: A. Kutyna, NE District
S. Pace, BESD
W. Aronson, EPA
C. Shaver, NPS
D. Buff, KBN
J. Subramani, Oertel & Hoffman

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

DER File Nos. AC 16-168607
AC 16-168608
AC 16-168609
PSD-FL-141

INTENT TO ISSUE

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

The applicant, Seminole Kraft Corporation, applied on August 11, 1989, to the Department of Environmental Regulation for a modification of the construction permit for the Recovery Boiler project at the existing facility in Jacksonville, Duval County, Florida.

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

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at the address specified within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the applicant have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copies furnished to:

A. Kutyna, NE District
S. Pace, BESD
W. Aronson, EPA
C. Shaver, NPS
D. Buff, KBN
J. Subramani, Oertel & Hoffman

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

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

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

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

Division of Bio-Environmental Services
421 Church Street, Room 412
Jacksonville, Florida 32206

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue construction permits to Seminole Kraft Corporation (SKC), 9469 Eastport Road, Jacksonville, Florida 32218, to replace the three existing kraft recovery boilers (RBs), Nos. 1, 2, and 3; three existing smelt dissolving tanks (SDTs), Nos. 1, 2, and 3; and three existing sets of multiple effect evaporators (MEEs), Nos. 1, 2, and 3; with a new RB, a new SDT, and a new set of MEEs. SKC is proposing these changes to comply with the TRS (total reduced sulfur compounds) Compliance Plan previously submitted. The project will be located at the existing Seminole Kraft facility in Jacksonville, Duval County, Florida.

There will be a net increase in the emissions of nitrogen oxides (NOx) from the recovery boiler for which a Best Available Control Technology (BACT) determination was required. The Class I NOx increment consumed is 0.016 ug/m^3, of the allowable 2.5 ug/m^3 (representing about 0.6%, annual basis). There is no Class II NOx increment consumed by this project. The maximum combined pollutant concentrations from the proposed project and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 11/22/89.

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

Keri Tobin 11/22/89
Clerk Date

Technical Evaluation
and
Preliminary Determination

Seminole Kraft Corporation
Duval County
Jacksonville, Florida

Permit Numbers:

AC 16-168607, Kraft Recovery Boiler
AC 16-168608, Smelt Dissolving Tank
AC 16-168609, Multiple Effect Evaporators

PSD-FL-141

Florida Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

November 22, 1989

I. Application

A. Applicant

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218

B. Project and Location

The applicant proposes to replace the three existing kraft recovery boilers (RBs), Nos. 1, 2, and 3; three existing smelt dissolving tanks (SDTs), Nos. 1, 2, and 3; and three existing sets of multiple effect evaporators (MEEs), Nos. 1, 2, and 3; with a new RB, a new SDT, and a new set of MEEs. The applicant is proposing these changes as part of an overall compliance plan to bring the mill into compliance with Florida's TRS (total reduced sulfur compounds) rules and to comply with the TRS Compliance Plan previously submitted by Seminole Kraft. There will be no change in the pulp production capacity of the mill associated with this modification.

The project will be located at the Seminole Kraft Corporation (SKC) facility in Jacksonville, Duval County, Florida. The UTM coordinates of the facility are Zone 17, 744.2 km East, and 3365.5 km North.

SKC's application was received on August 11, 1989, and was deemed complete on September 12, 1989.

C. Facility Category

The Standard Industrial Classification (SIC) Code for the Seminole Kraft pulp and paper mill is 2621 - Paper Mills.

The NEDs Source Classification Codes (SCC) are as follows:

a) 3-07-001-04 (tons ADUP), Recovery Boiler
b) 3-07-001-05 (tons ADUP), Smelt Dissolving Tank
c) 3-07-001-03 (tons ADUP), Multiple Effect Evaporators

The Seminole Kraft mill is classified as a major facility in accordance with Chapter 17-2 of the Florida Administrative Code (F.A.C.).

II. Project Description

A. Process

In the pulp manufacturing process, wood chips are cooked with white liquor in a digester. After the cooking cycle, the digester blows the pressure cooked pulp and black liquor into a blow tank which is at atmospheric pressure, thus flashing off steam and non condensible gases (NCG). In the case of SKC, these gases (containing TRS) are eventually transported to the No. 2 or No. 3 lime kiln for incineration.

The spent liquor (black liquor), is then concentrated in the MEE system where the weak black liquor is evaporated to about 70% black liquor solids. This concentrated black liquor is fired in the recovery boiler to recover the chemicals and heat value from the liquor. The NCG from the MEEs will be incinerated in the No. 2 or No. 3 lime kiln.

The recovery boiler smelt is fed to a smelt dissolving tank where it is dissolved in the weak liquor from the causticizing plant. The resulting green liquor is then filtered to separate the white liquor (used in the cooking cycle) from the calcium carbonate "mud" which is sent to the lime kiln to obtain quick lime.

The new RB and associated SDT will be able to process 170,833 lb/hr of dry black liquor solids (BLS), as compared with the combined capacity of the three old RBs of about 155,000 lb/hr.

The new MEE set will be able to process 184,500 lb/hr dry BLS, the same as the combined capacity of the three old sets of MEEs.

B. Controls

The new RB will utilize a 99% efficient, two chamber, dry bottom electrostatic precipitator to control particulate matter (PM) emissions. Additional controls may be required for nitrogen oxides, if necessary, to comply with the Best Available Control Technology (BACT) determination.

The new SDT will utilize a venturi scrubber to control emissions of both PM and TRS, in order to comply with the emission limiting standards.

The TRS emissions from the new MEEs will be transported to the No. 2 or No. 3 lime kiln for incineration, as is currently permitted for the existing MEEs.

III. Rule Applicability

The existing Seminole Kraft facility is major in accordance with Chapter 17-2.100 of the Florida Administrative Code (F.A.C.).

The proposed project is subject to preconstruction review and will be permitted in accordance with F.A.C. Rules 17-2 and 17-4; and Chapter 403 of the Florida Statutes.

The proposed project is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-4.140 - Reports; 17-2.240 - Circumvention; and 17-2.250 - Excess Emissions.

The proposed project will be located in Duval County, an area designated as nonattainment for ozone; within the area of influence of the PM nonattainment area; attainment for NO_x and carbon monoxide (CO); and unclassifiable for sulfur dioxide (SO_2); in accordance with F.A.C. Rules 17-2.410, 17-2.420 and 17-2.430, respectively. The proposed project will also be located within 100 km of Okefenokee National Wilderness Area, a designated Class I Area, in accordance with F.A.C. Rule 17-2.440.

The proposed project is not subject to F.A.C. Rule 17-2.510, Nonattainment Review Requirements for PM and volatile organic compounds (VOCs), for ozone, in accordance with F.A.C. Rule 17-2.510(2)(d), because there will be a net reduction in PM and VOC emissions.

The proposed project is subject to F.A.C. Rule 17-2.500, Source Review Requirement - Prevention of Significant Deterioration (PSD), since the net increase in NO_x emissions exceeds the significant emissions levels in Table 17-2.500-2, in accordance with F.A.C. Rule 17-2.500(2)(d).

The proposed project is subject to Specific Source Emission Limiting Standards for the RB, SDT, and MEEs, in accordance with F.A.C. Rule 17-2.600(4) for kraft pulp mills.

The proposed project is subject to the provisions of F.A.C. Rule 17-2.610(2), General Visible Emission Standard.

The proposed project is subject to the provisions of F.A.C. Rule 17-2.620, General Pollutant Emission Limiting Standards which prohibits objectionable odor.

The proposed project is subject to F.A.C. Rule 17-2.630, BACT determination for NO_x.

The proposed project is subject to F.A.C. Rule 17-2.660, Standards of Performance for New Stationary Sources (NSPS) for the RB, SDT and MEEs, in accordance with 40 CFR 60 Subpart BB.

The proposed project is subject to F.A.C. Rule 17-2.700, Source Sampling and Monitoring Requirements for the RB, SDT and the MEEs. Compliance tests shall be conducted in accordance with the July 1, 1988 version of the 40 CFR 60 Appendix A as follows:

a) EPA Method 1, for sample and velocity traverses
b) EPA Method 2, for velocity and volumetric flow rate
c) EPA Method 3, for gas analysis
d) EPA Method 5/17, for PM
e) EPA Method 6/8, for SO_2
f) EPA Method 7/7A, for NO_x
g) EPA Method 9, for visible emissions (VE)
h) EPA Method 16/16A, for TRS
i) ASTMD 396-76, for determining fuel oil sulfur content.

The proposed project is subject to F.A.C. Rule 17-2.710(3), Continuous Monitoring Requirements for Kraft Pulp Mills; and 17-2.710(4), Quarterly Reporting Requirements.

The proposed project is subject to F.A.C. Rule 17-2.960(1), Compliance Schedules for Kraft Pulp Mills; and 17-2.971, Compliance Schedules for Continuous Monitoring Requirements.

The technical review on the lime kilns' incineration of NCG from the MEEs will depend on performance test results from the lime kilns once construction is completed and the system is operational. The applicant has stated that there will be no increase in the No. 2 and No. 3 lime kilns' TRS and SO_2 emissions.

IV. Source Impact Analysis

A. Emission Limitations

The following are the emission limitations for the RB and SDT, including the emission's basis:

1. Recovery Boiler

Pollutant	Basis	Emission Limit lb/hr	Emission Limit TPY
PM (TSP)	0.044 gr/dscf @ 8% O_2	107.0	468.7
PM_{10}	74.8% of PM	80.8	350.6
SO_2	180 ppmvd @ 8% O_2 (max)	514.0	-
	120 ppmvd @ 8% O_2 (avg)	339.3	1486.0
NO_x BACT	75 ppmvd @ 8% O_2	153.0	670.2
CO	400 ppmvd @ 8% O_2	494.8	2167.2
VOC	80 ppmvd @ 8% O_2	56.6	247.9
TRS	5 ppmvd @ 8% O_2	7.5	32.9
Lead	3900 lb / 10^{12} dscf	0.047	0.21
Beryllium	300 lb / 10^{12} dscf	0.0036	0.016
Sulfuric Acid Mist	0.81 ppm	3.0	13.3

Visible emissions (VE) shall be less than 35% opacity.

Note: The TRS emissions are based on a 12-hr average.

2. Smelt Dissolving Tank

Pollutant	Basis	Emission Limit lb/hr	TPY
PM (TSP)	0.2 lb/ton BLS	17.1	74.9
PM_{10}	89.5% of PM	15.3	67.0
SO_2	0.2 lb/ton ADUP and 80% removal	2.28	10.0
TRS	0.032 lb/ton BLS	2.73	12.0

Visible Emissions shall be less than 20% opacity.

3. Multiple Effect Evaporators

There will be no emissions vented directly to the atmosphere from the MEEs since all the NCG will be transported to the No. 2 or No. 3 lime kiln for incineration. There is a requirement for a minimum temperature of 1200°F and 0.5 second for the destruction of TRS.

The following table lists the net emission changes at the Seminole Kraft mill as a result of the proposed project.

Pollutant	Shut down Sources TPY	New RB TPY	New SDT TPY	New MEE TPY	Net Increase TPY
PM (TSP)	549.8	468.7	74.9	-	-6.2
PM_{10}	430.2	350.6	67.0	-	-12.6
SO_2	1489.6	1486.0	10.0	-	6.4
NO_x	321.1	670.2	-	-	349.1
CO	2327.2	2167.2	-	-	-160
VOC	340.2	247.9	-	-	-92.3
TRS	98.2	32.9	12.0	-	-53.3
Lead	0.37	0.21	-	-	-0.16
Beryllium	0.028	0.016	-	-	-0.012
H_2SO_4 Mist	19.1	13.3	-	-	-5.8

In this preliminary determination there are three different tables indicating emission changes at the Seminole Kraft facility. The table above indicates the net changes after considering DER's evaluation. Table 1 in the ambient impact analysis portion reflects the emission changes which the applicant took into consideration in the modeling submitted to DER. The table in the BACT showing emission changes as submitted by the applicant does not take into account DER's evaluation of a revised NOx emissions and the slaker contemporaneous emissions. Previous contemporaneous emissions are zero. The applicant submitted the emissions decrease from the slaker project which are not creditable.

B. Air Quality Impacts

(i) Introduction

The proposed modifications to the Seminole Kraft plant, located in Jacksonville, will emit in PSD-significant amounts one pollutant, nitrogen dioxides (NOx).

The air quality impact analysis required by the PSD regulations for NOx include:

* An analysis of existing air quality;
* A PSD increment analysis (NOx only);
* An 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 determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The AAQS analysis depends on the air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analyses, the Department has reasonable assurance that the proposed modifications to the sources at the Seminole Kraft facility, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any ambient air quality standard. A discussion of the modeling methodology and required analysis follows.

(ii) Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used in the air quality impact analysis. The applicant used the EPA recommended regulatory options in each modeling scenario.

The modeling used a radial receptor grid with the center of the grid coinciding with the center of the Seminole Kraft facility. Radials were spaced at 10 degree increments from 10 to 360 degrees. The ring distances were placed at downwind distances of 0.1, 0.2, 0.3, 0.4, 0.6, 1.0, 1.3, 1.6, 2.0, 2.5, 3.0, 3.5, and 4.0 km.

Discrete receptors were used to determine the air quality impacts at the boundary of the Okefenokee Wilderness area (PSD Class I area).

The net air quality change was obtained spatially by subtracting the maximum predicted baseline NOx concentrations from the predicted future concentrations receptor by receptor.

Meteorological data used in the modeling consisted of five years (1983-1987) of hourly surface data taken at Jacksonville. Mixing heights used in the modeling were based on upper air data from Waycross, Georgia.

Table 1 lists the significant and net emission rates submitted initially by Seminole Kraft for the proposed modification. Table 2 lists the stack parameters and emission rates for the proposed modification and the sources that are to be replaced by the modifications.

Table 1. Significant and Net Emission Rates (Tons per Year)

Pollutant	Significant Emission Rate	Existing Emissions	Proposed Maximum Emissions	Net Emissions	Applicable Pollutant (Yes/No)
CO	100	2327.2	2167.2	-160.0	No
NO_2	40	321.1	1617.5	1296.4	Yes
SO_2	40	1489.6	1372.2	-117.4	No
PM	25	549.8	543.6	-140.7*	No
PM10	15	430.2	417.6	-138.6*	No
O_3 (VOC)	40	340.2	247.9	-92.3	No
Lead	0.6	0.37	0.21	-0.16	No
Be	0.0004	0.028	0.016	-0.012	No
Sulfuric Acid Mst	7	19.1	13.1	-5.8	No
TRS	10	98.2	44.9	-53.3	No

* Includes previous contemporaneous emissions reductions.

Table 2. Stack Parameters for Proposed and Existing NOx Sources.

Source	Emission Rate (g/s)	Height (m)	Exit Temp (K)	Exit Vel (m/s)	Diameter (m)
Proposed Rec. Boil.	46.6	121	477	20.4	3.43
Existing					
R. B. #1	3.0	38	344	17.9	2.59
R. B. #2	9.4	38	344	17.4	2.74
R. B. #3	9.4	38	344	17.4	2.74

(iii) Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. In general, one year of quality assured data using an EPA reference, or the equivalent monitor must be submitted. Sometimes less than one year of data, but no less than four months, may be accepted when Departmental approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined by air quality modeling, is less than a pollutant-specific "de minimus" concentration. In addition, if current monitoring data exists and these data are representative of the proposed source area, then at the discretion of the Department these data may be used.

The predicted ambient impact of the net emission increase of NOx is less than zero. As such no additional monitoring was required.

In 1988 the maximum annual arithmetic mean for NOx was 35 ug/m3 near the Seminole Kraft facility. For the purposes of this application, this value is considered to be the "background" concentration for NOx in this area.

(iv) PSD Increment Analysis (NOx)

a. Class II Area

The Seminole Kraft facility is located in a Class II area. This area is also designated as an attainment area for NOx. Therefore, a PSD increment analysis is required to show compliance with the Class II NOx increment.

The PSD NOx increment represents the amount that new sources in an area may increase ambient ground-level concentrations of NOx. At no time, however, can the increased loading of NOx cause or contribute to a violation of the ambient air quality standard.

Atmospheric dispersion modeling, as previously described, was performed to quantify the amount of PSD increment consumed. The results of this modeling indicate that all the net impacts in the Class II area have negative concentrations. Consequently, no PSD Class II increment is consumed by this project.

b. Class I Area

A Class I area increment analysis is required because the facility is located within 100 km of the Okefenokee Wilderness Area, a designated Class I area. Modeling results indicate the maximum NOx PSD Class I increment consumed is 0.016 ug/m3, which is less than one percent of the allowable PSD NOx increment of 2.5 ug/m3, annual average.

(v) AAQS Analysis

Given existing air quality in the area of the Seminole Kraft facility, emissions from the proposed modifications are not expected to cause or contribute to a violation of the AAQS for NO2. The results of the AAQS analysis are summarized in Table 3.

Table 3. Ambient Air Quality Impact

Pollutant and Averaging Time	Maximum Impact of Proposed Project (ug/m3)	Predicted Total Impact (ug/m3)	Florida AAQS (ug/m3)
NO2 (Annual)	0.23	35.23	100

(vi) Additional Impacts Analysis

a. Impacts on Soils and Vegetation

The maximum ground-level concentration predicted to occur for NOx as a result of the proposed project, including a background concentration, will be below the applicable AAQS including the national secondary standard (same quantity as primary standard) developed to protect public welfare- related values. As such, this project is not expected to have a harmful impact on soils and vegetation.

b. Impact on Visibility

Impacts upon visibility in the PSD Class I area (Okefenokee Wilderness Area) were predicted with the EPA Level-1 visibility screening model. The predicted impacts upon visibility are below the Level-1 screening criteria for the visibility parameters. As a result, virtually no impact upon visibility are predicted.

c. Growth-Related Air Quality Impacts

The proposed modification is not expected to significantly change employment, population, housing or commercial/industrial development in the area to the extent that an air quality impact will result.

d. GEP Stack Height Determination

Good Engineering Practice (GEP) stack height means the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. For the new recovery boiler a stack height of 121.0 meters is proposed. The proposed stack height is equal to the GEP calculated height.

V. Conclusion

Based on the information provided by Seminole Kraft, the Department has reasonable assurance that the proposed replacement of the three existing recovery boilers, smelt dissolving tanks, and multiple effect evaporators, with a new recovery boiler, smelt dissolving tank, and a set of multiple effect evaporators, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

H A Thomas
11/22/89

d. GEP Stack Height Determination

Good Engineering Practice (GEP) stack height means the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. For the new recovery boiler a stack height of 121.0 meters is proposed. The proposed stack height is equal to the GEP calculated height.

V. Conclusion

Based on the information provided by Seminole Kraft, the Department has reasonable assurance that the proposed replacement of the three existing recovery boilers, smelt dissolving tanks, and multiple effect evaporators, with a new recovery boiler, smelt dissolving tank, and a set of multiple effect evaporators, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

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3. Article Addressed to: Mr. L. A. Stanley Seminole Kraft Corporation 9469 Eastport Road Jacksonville, FL 32218	4. Article Number P 938 762 760 Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature — Address X	8. Addressee's Address *(ONLY if requested and fee paid)*
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P 938 762 760

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Street and No. 9469 Eastport Rd.	
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Postage	$
Certified Fee	
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3. Article Addressed to: Mr. L. A. Stanley, Gen. Mgr. Seminole Kraft Corp. 9469 Eastport Road Jacksonville, FL 32218-0998	4. Article Number P 423 104 507
	Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise
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5. Signature — Addressee X	8. Addressee's Address *(ONLY if requested and fee paid)*
6. Signature — Agent X	
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P 423 104 507

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Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date mailed: 6/6/90 AC 16-168607 PSD-FL-141	

PS Form 3800, June 1985

Final Determination

Seminole Kraft Corporation
Duval County
Jacksonville, Florida

Permit Numbers:

AC 16-168607, Kraft Recovery Boiler
AC 16-168608, Smelt Dissolving Tank
AC 16-168609, Multiple Effect Evaporators

PSD-FL-141

Florida Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

December 29, 1989

Final Determination

Seminole Kraft Corporation's application for construction of a new recovery boiler (RB), a smelt dissolving tank (SDT), and a new set of multiple effect evaporators (MEEs), at their existing facility in Jacksonville, Duval County, Florida, has been reviewed by DER's Bureau of Air Regulation (BAR).

Public Notice of the Department's Intent to Issue the permit was published in the Florida Times Union on November 29, 1989.

Copies of the Preliminary Determination have been available for public inspection at the Department's Northeast District office in Jacksonville, Duval County's Bio-Environmental Services Division's (BESD) office in Jacksonville, and the Department's Bureau of Air Regulation in Tallahassee.

Comments in response to the Department's Preliminary Determination were received from Seminole Kraft Corporation (SKC), BESD, EPA, BAR, and Department of Interior. These comments are not rewritten here, instead they are attached. The responses below are in the same order as the comments.

I. Responses to Seminole Kraft Corp. comments (attachment No. 10) received on December 1, 1989:

A. RB Permit, AC 16-168607

1. The NOx emission limit will remain as stated in the permit. Non-compliance issues will be addressed if and when necessary. BAR is optimistic about the technical expertise of a prudently chosen RB manufacturer in achieving the proposed NOx emission level.

2. The heat input quantity in S.C. No. 3 will be amended to reflect the quantity in the application.

3. The second S.C. No. 3 will be deleted from the permit.

4. A microprocessor will be allowed for CEM data collection with a hard copy recorded using a computer printout, only if the unit is capable of maintaining the integrity of CEM data. BAR and BESD will need such assurance along with the manufacturer's literature and guarantee, at the time the selection is being considered.

5. The oxygen CEM's span setting requirements in S.C. No. 7 will be changed to 20.8% for monitoring convenience.

6. The BACT NOx emission factor will be corrected using the appropriate process input.

B. SDT Permit, AC 16-168608

1. The visible emission limitation in S.C. No. 3 will be clarified as requested, to reflect that moisture interference will be taken into consideration when determining compliance.

C. MEE Permit, AC 16-168609

1. The temperature and residence time requirements for the lime kiln(s) are in accordance with 40 CFR 60 Subpart BB.

D. For the RB, SDT and MEE Permits, AC 16-168607, -608, -609

1. A test results submittal period of 45 days will be allowed after completion of compliance tests, in S.C. No. 11 (RB), S.C. No. 10 (SDT), and S.C. No. 11 (MEE).

2. Existing equipment to be shut down will be "made incapable of operation" instead of being "dismantled", in S.C. No. 12 (RB), S.C. No. 11 (SDT), and S.C. No. 12 (MEE).

3. The requirement for DER approval for changes in operation aspects, refers to "Modification" as defined in F.A.C. Rule 17-2.100. A more specific reference for the definition is not included since rule renumbering may cause confusion.

4. The expiration date of the permits will be changed to April 1, 1993, to provide the applicant adequate time to file an application for an operation permit. It should be noted that the the sources are required to be in compliance by November 12, 1992, although the proof of compliance must be submitted no later than 45 days after this date. This provision is consistent with the other permits issued by BAR for the recent TRS control projects.

5. The requirement for filing for operation permits within 45 days of test completion or a minimum of 90 days prior to the construction permit expiration date, whichever occurs first, is compatible with the change mentioned in I.D.4 above.

II. Responses to BESD comments (attachment No. 11) received December 6, 1989:

A. Recovery Boiler Permit, AC 16-168607

1. "Or" will be deleted from Specific Condition (S.C.) No. 2, to clarify that both short term (lbs/hr) and the long term (lbs/day) process rate limitations, are applicable.

2. The heat input quantity in S.C. No. 3 will be amended to reflect the quantity in the application.

3. The word "basis" in S.C. No. 4 will be replaced by "concentration" for PM, TRS, and NOx, for which those are requirements by rule and BACT, respectively.

4. Test methods for lead, beryllium, VOC, CO and sulfuric acid mist will be added to the initial testing requirements in S.C. No. 6 to determine the validity of emissions documented for inventory and PSD purposes.

5. A statement will be added to S.C. No. 3 to clarify the record keeping requirement for the quantity of fuel oil fired in the RB.

6. Specific reference to the requirements in 40 CFR 60.7 (notification and records) and 60.8 (performance tests) will be added to S.C. No. 8. This reference will also be added to S.C. No. 7 of both the SDT and the MEE permits.

B. Smelt Dissolving Tank Permit, AC 16-168608

1. The visible emission limitations for SDTs in Chapter 17-2.650 of the Florida Administrative Code (F.A.C.), of 10% opacity, will be incorporated into S.C. No. 3.

2. The word "basis" in S.C.s No. 3 will be replaced by "concentration", for PM and TRS as discussed in II.A.3 above.

C. Multiple Effect Evaporator Permit, AC 16-168609

1. The word "or" will be deleted from S.C. No. 2, as discussed in II.A.1 above.

BESD's comments received on December 22, 1989, regarding SKC's comments, are included as attachment No. 13.

III. Responses to EPA Comments:

A. RB Permit, AC 16-168607

1. The second S.C. No. 3 will be deleted from the permit.

2. The fuel oil usage documented in S.C. No. 3 will be made a limitation to make it federally enforceable.

3. The heat input quantity in S.C. No. 3 will be amended to reflect the quantity in the application.

IV. Comments from BAR are as follows:

A. RB Permit, AC 16-168607

1. The electrical generating capacity associated with the recovery boiler will be mentioned in the description of the project.

2. The UTM coordinates will be corrected.

3. The annual emissions listed in S.C. Nos. 4 and 5 will be rounded off.

4. BAR will process the approvals required in S.C. Nos. 6 and 10. A requirement for annual testing for SO_2 will be added to S.C. No. 6.

5. The general reporting requirements in S.C. No. 8 will be updated.

B. SDT Permit, AC 16-168608

1. The annual emissions listed in S.C. Nos. 3 and 4 will be rounded off.

2. The VE compliance issues referred to in S.C. No. 3 will be coordinated by BESD.

3. BAR will process the approvals required in S.C. Nos. 5 and 9. An initial and annual moisture content determination requirement will be added to S.C. No. 5.

4. The general reporting requirements in S.C. No. 7 will be updated.

C. MEE Permit, AC 16-168609

1. The word "changed" will be replaced by the word "amended", in S.C. No. 3.

2. The general reporting requirements in S.C. No. 7 will be updated.

3. S.C. No. 8 will specify that BAR may require operating temperature determination for the lime kiln(s).

4. BAR will process the approval required in S.C. No. 10.

V. Comments from Department of Interior are attached (Attachment No. 14).

The final action of the Department is to issue the BACT and permits as proposed in the Preliminary Determination with the changes mentioned above, and listed below:

A. AC 16-168607 (RB) amend S.C. Nos. 2, 3, 4, 5, 6, 7, 8, 10, 11 and 12.

B. AC 16-168608 (SDT) amend S.C. Nos. 3, 4, 5, 7, 9, 10 and 11.

C. AC 16-168609 (MEE) amend S.C. Nos. 2, 3, 7, 8, 10, 11 and 12.

Best Available Control Technology (BACT) Determination
Seminole Kraft Corporation
Duval County

The applicant proposes to install a kraft recovery boiler at their facility located in Jacksonville, Florida. The recovery boiler, rated at 1,125 MMBtu/hr, will replace three old recovery boilers. Also included in the project is the installation of a new smelt dissolving tank and a new set of evaporators which will replace three old smelt dissolving tanks and three old sets of evaporators, respectively.

The applicant has indicated the maximum net total annual tonnage of regulated air pollutants emitted from the project based on 8,760 hours per year operation to be as follows:

Pollutant	Max. Net Increase in Emissions (TPY)	PSD Significant Emission Rate (TPY)
TSP	-140.7	25
PM_{10}	-138.6	15
SO_2	6.4	40
NOx	1296.4	40
CO	-160.0	100
VOC	-92.3	40
TRS	-53.3	10
Pb	-0.16	0.6
Be	-0.012	0.004
H_2SO_4	-5.8	7

Rule 17-2.500(2)(f)(3) of the Florida Administrative Code (F.A.C.) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table. The NOx emissions from the smelt dissolving tank and the multiple effect evaporators are negligible and will not be considered as part of the BACT analysis.

BACT Determination Requested by the Applicant

Pollutant	Determination
NOx	180 ppm (corrected to 8% oxygen)

Date of Receipt of a BACT Application

September 11, 1989

Review Group Members

This determination was based upon comments received from the applicant and the Permitting and Standards Section.

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Analysis

A review of recent BACT determinations for nitrogen oxides from kraft recovery boilers indicates that the emission rate proposed by the applicant does not represent BACT. The rationale for establishing BACT at a lower than proposed level is presented as follows:

The applicant has indicated that an emission rate of 180 ppm corrected to 8% oxygen is representative of BACT taking into consideration guarantees common to all potential manufacturers, the black liquor fuel analysis, and performance deterioration based on a 24-hour average.

A review of the BACT/LAER Clearinghouse indicates a wide range of NOx limitations. Although several of the most recent BACT determinations range from 50-80 ppm corrected to 8% oxygen, none of the facilities listed utilize NOx reduction systems operating downstream from a kraft recovery boiler. However, in keeping with the "top down" BACT analysis, "add on" control equipment will be evaluated as part of the analysis.

The two types of control that are typically utilized for NOx reduction are selective catalytic reduction (SCR) and Thermal De NOx. Each of these technologies utilizes ammonia injection as the means to react with and thereby reduce the concentrations of NOx in the gas stream. Although these technologies have not been utilized for this type of application the economics of using such equipment should be addressed.

The applicant has indicated that using Thermal DeNOx as a control device for NOx results in a cost of $2,000 per ton of NOx reduced. Although this cost is not excessive compared to recent BACT determinations in which NOx removal was justified at costs up to approximately $4,500 per ton, the use of Thermal DeNOx as a control measure has not been demonstrated on kraft recovery boilers and hence has not been seriously considered as BACT for recent determinations. Similarly SCR has not been used in kraft recovery boiler applications and should not be considered as BACT for these facilities.

Although "add on" NOx controls have not been utilized for kraft recovery boilers, a survey of the most recent BACT determinations indicates that kraft recovery boiler manufacturers are capable of limiting NOx emissions to suprisingly low levels (generally 53 to 75 ppm @ 8% oxygen) by equipment design.

Discussions with the BACT coordinators from other states which have pulp and paper industry indicate that all of the known manufacturers of kraft recovery boilers have proposed or agreed to meet NOx emission limitations which fall within the range discussed above. Although many of these facilities were just recently permitted and have yet to be constructed and tested, there is sufficient data available to suggest that these limitations can indeed be met.

In a technical study completed by the National Council of the Paper Industry for Air and Stream Improvement, Inc. (NCASI), several large kraft recovery furnaces (boilers) were tested for NOx emissions. The publication entitled "A Study of Nitrogen Oxides Emissions from Large Kraft Recovery Furnaces" provides evidence that NOx emissions can be held to levels which are now being proposed by kraft recovery boiler manufacturers.

The NCASI report focused on the NOx emissions from four large kraft recovery boilers, with three of the units being located in the southeastern United States. The size of the units tested ranged from firing rates of 3.18 - 4.06 million pounds of black liquor solids (BLS) per day. This is comparable to the proposed kraft recovery boiler which has a firing of 4.1 million pounds of BLS per day.

Based on the NOx emission studies completed, the NCASI report concluded the following:

1) NOx emissions from large kraft recovery boilers were not size dependent.

2) NOx emissions ranged from 0.06 to 0.11 lbs/million Btu heat input.

Based on the applicant's maximum BLS input of 4.1×10^6 lb/day (170,833.3 lb/hr) a comparison of the proposed NOx emission limit can be made with the NCASI test results.

The applicant has estimated the maximum hourly NOx emission to be 369.3 pounds. Taking this into account with the BLS heating value of 6585 Btu per pound, the calculated emission rate on a heat input basis is approximately 0.33 lbs per million Btu. This emission level ranges from approximately 3 to 5.5 times greater than that observed by the NCASI study.

Environmental Impact Analysis

A review of the NOx impacts associated with the proposed kraft recovery boiler installation indicates that there will be a reduction in the maximum annual impact. This reduction in the NOx impact will be attributed to the replacement of the three old recovery boilers which are now exhibiting higher impacts than what will be expected for the new unit.

BACT Determination by DER:

Based on the information presented in this analysis, the Department has determined that BACT should be established as follows:

Pollutant	Emission Limit
NOx	75 ppm by volume, corrected to 8% oxygen

This NOx emission limitation is representative of the levels that are being proposed in recent applications as BACT for kraft recovery boilers supplied by all known manufacturers. In addition, this level is supported by the NCASI report which showed NOx emissions ranging from 37 to 60 ppm, corrected to 8% oxygen, for all of the facilities tested over a three hour period.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

January 3, 1990
Date

Approved by:

Dale Twachtmann, Secretary
Dept. of Environmental Regulation

5 Jan 1990
Date

Florida Department of Environmental Regulation

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

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

PERMITTEE:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: April 1, 1993
County: Duval
Latitude/Longitude: 30°25'17"N
81°36'19"W
Project: Kraft Recovery Boiler

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

For the construction of a low odor kraft recovery boiler with a capacity of firing 170,833 lbs/hr dry black liquor solids, and approximately 750,000 gals/yr of No. 6 fuel oil during start-up, shutdown or malfunction. Steam from the recovery boiler will be used in the plant and to generate 43 MW of electricity. The particulate emissions will be controlled by a dry bottom ESP. The project will be located at Seminole Kraft Corporation's (SKC) existing facility in Jacksonville, Duval County, Florida.

The UTM coordinates are Zone 17, 441.9 km East and 3365.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. SKC's application received August 11, 1989.
2. EPA's letter received August 31, 1989.
3. DER's incompleteness letter dated September 8, 1989.
4. KBN's letter received September 11, 1989.
5. SKC's response received September 12, 1989.
6. SKC's letter received September 14, 1989.
7. KBN's letter received October 11, 1989.
8. EPA's letter received November 9, 1989.
9. DER's Preliminary Determination dated November 22, 1989.
10. SKC's comments received December 1, 1989.
11. BESD's comments received December 6, 1989.
12. EPA's comments received December 11, 1989.
13. BESD's comments received December 22, 1989.
14. Dept. of Interior's comments received December 26, 1989.
15. DER's Final Determination dated December 29, 1989.

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: April 1, 1993

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

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

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The Kraft Recovery Boiler (RB) may operate continuously, i.e., 8760 hours/year.

2. The maximum process rate shall neither exceed 170,833 lbs/hr dry black liquor solids (BLS), nor 4,100,000 lb/day dry BLS. This reflects a 1987 TPD ADUP (tons per day of air dried unbleached pulp) production rate for the mill.

3. The maximum heat input to the RB shall not exceed 1,125 MMBtu/hr. The No. 6 fuel oil utilization rate will not exceed 750,000 gals/year (used during start-up, shutdown, and malfunction). The fuel oil consumption shall be recorded on a daily basis.

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: April 1, 1993

SPECIFIC CONDITIONS:

4. Particulate emissions shall be controlled by a dry bottom electrostatic precipitator. The NOx emissions are based on the BACT determination. The maximum pollutant emissions from the RB shall not exceed:

Pollutant	Basis	Emission Limit lb/hr	TPY
PM (TSP)	* 0.044 gr/dscf @ 8% O_2	107.0	469
SO_2	180 ppmvd @ 8% O_2 (max)	514.0	-
	120 ppmvd @ 8% O_2 (avg)	339.3	1486
NO_x	* 75 ppmvd @ 8% O_2	153.0	670
TRS	* 5 ppmvd @ 8% O_2	7.5	33

*Note: The flue gas concentrations for PM, TRS, and NOx are emission limitations by rule and BACT, respectively, and shall be complied with. The TRS emissions are based on a 12-hr average.

Visible emissions (VE) shall be less than 35% opacity.

5. The following are tabulated for PSD and inventory purposes:

Pollutant	Basis	Emission Limit lb/hr	TPY
PM_{10}	74.8% of PM	80.8	351
CO	400 ppmvd @ 8% O_2	494.8	2167
VOC	80 ppmvd @ 8% O_2	56.6	248
Lead	3900 lb / 10^{12} dscf	0.047	0.21
Beryllium	300 lb / 10^{12} dscf	0.0036	0.016
H_2SO_4 Mist	0.81 ppm	3.0	13.3

6. Initial (I) and annual (A) compliance tests shall be conducted in accordance with the July 1, 1988 version of 40 CFR 60 and 61, as follows:

a) EPA Method 1, for sample and velocity traverses (I,A)
b) EPA Method 2, for determining stack gas flow rate (I,A)
c) EPA Method 3, for gas analyses (I,A)
d) EPA Method 4, for stack gas moisture content (I,A)
e) EPA Method 5/17, for PM (I,A)
f) EPA Method 6/8, for SO_2 (I,A)
g) EPA Method 8, for H_2SO_4 mist (I)
h) EPA Method 7/7A, for NO_x (I,A)
i) EPA Method 9, for VE (I,A)
j) EPA Method 10, for CO (I)
k) EPA Method 12, for lead (I)
l) EPA Method 16/16A, for TRS (I,A)
m) EPA Method 25 or 25A, for VOCs (I)
n) EPA Method 104, for beryllium (I)
o) ASTM D 396-76, for sulfur content of No. 6 fuel oil (I)

SPECIFIC CONDITIONS:

Compliance test methods, other than those mentioned above, may be used only after prior written approval from DER's Bureau of Air Regulation (BAR).

7. The permittee shall install, calibrate, maintain, and operate the following continuous monitoring systems in accordance with the July 1, 1988 version of 40 CFR 60 Subpart BB:

a) Opacity monitor and recorder, with the span set at 70% opacity
b) TRS monitor and recorder, with the span set at 30 ppm TRS (monitoring on dry basis)
c) Oxygen monitor and recorder, with the span set at 20.8% O_2 (monitoring on dry basis)

8. The RB is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-2.240 - Circumvention; 17-2.250 - Excess Emissions; 17-2.700(7) - Reports; 17-2.710(3) - Continuous Monitoring; 17-2.710(4) - Quarterly Reporting Requirements; 17-2.971 - Compliance Schedules for Continuous Monitoring Requirements; and all other applicable provisions of F.A.C. Chapters 17-2 and 17-4; the July 1, 1988 version of 40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills; 40 CFR 60.7 - Notification and Records; and 40 CFR 60.8 - Performance Tests.

9. Objectionable odors shall not be allowed off plant property, in accordance with F.A.C. Rule 17-2.620(2).

10. Any change in the method of operation, raw materials and chemicals processed, equipment, or operating hours, or any other changes pursuant to F.A.C. Rule 17-2.100, defining modification, shall be submitted for approval to BAR.

11. The Duval County's Bio-Environmental Services Division (BESD) office shall be notified, in writing, a minimum of 15 days prior to source testing. Written reports of the test results shall be submitted to the BESD office within 45 days of test completion.

12. The operation permits for the three existing recovery boiler Nos. 1, 2, and 3 (AO 16-71206, -07, and -08), which shall be permanently shut down and made incapable of operation, shall be turned in to the BESD office upon receipt of the operation permit for the new recovery boiler. The method by which the existing units will be made incapable of operation will be approved by BAR and BESD.

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: April 1, 1993

SPECIFIC CONDITIONS:

13. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

14. An application for an operation permit must be submitted to the BESD office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 5 day
of Jan, 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtmann

Dale Twachtmann, Secretary

Florida Department of Environmental Regulation

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

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

PERMITTEE:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

Permit Number: AC 16-168608
PSD-FL-141
Expiration Date: April 1, 1993
County: Duval
Latitude/Longitude: 30°25'18"N
81°36'18"W
Project: Smelt Dissolving Tank

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

For the construction of a smelt dissolving tank associated with the recovery boiler which has a capacity of 170,833 lbs/hr dry black liquor solids (BLS). TRS and particulate emissions will be controlled by a venturi scrubber. The project will be located at Seminole Kraft Corporation's (SKC) existing facility in Jacksonville, Duval County, Florida.

The UTM coordinates are Zone 17, 441.9 km East and 3365.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. SKC's application received August 11, 1989.
2. EPA's letter received August 31, 1989.
3. DER's incompleteness letter dated September 8, 1989.
4. KBN's letter received September 11, 1989.
5. SKC's response received September 12, 1989.
6. SKC's letter received September 14, 1989.
7. KBN's letter received October 11, 1989.
8. EPA's letter received November 9, 1989.
9. DER's Preliminary Determination dated November 22, 1989.
10. SKC's comments received December 1, 1989.
11. BESD's comments received December 6, 1989.
12. EPA's comments received December 11, 1989.
13. BESD's comments received December 22, 1989.
14. Dept. of Interior's comments received December 26, 1989.
15. DER's Final Determination dated December 29, 1989.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The smelt dissolving tank (SDT) may operate continuously, i.e., 8760 hours/year.

2. The maximum smelt processing rate shall not exceed the rate corresponding to 170,833 lbs/hr dry black liquor solids (BLS) for the recovery boiler.

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168608
PSD-FL-141
Expiration Date: April 1, 1993

SPECIFIC CONDITIONS:

3. The PM and TRS emissions shall be controlled by a venturi scrubber. The maximum emissions from the SDT shall not exceed:

Pollutant	Emission Limits		
	Concentration	lb/hr	TPY
PM (TSP)	0.2 lb/ton BLS	17.1	75
TRS	0.032 lb/ton BLS	2.73	12

Visible Emissions shall be less than 10% opacity. If the Department observes visible emissions in excess of 10% opacity, it shall be considered good reason to believe that the applicable mass emission standard is in danger of being violated. The permittee shall be required to run a special compliance test in accordance with F.A.C Rule 17-2.700(2)(b). Such test shall be conducted within 14 days after Duval County's Bio-Environmental Services Division (BESD) has notified the permitee of the applicability of this permit condition.

4. The following are tabulated for PSD and inventory purposes:

Pollutant	Basis	Emission Limit	
		lb/hr	TPY
PM_{10}	89.5% of PM	15.3	67
SO_2	0.2 lb/ton ADUP and 80% removal	2.28	10

5. Initial (I) and annual (A) compliance tests shall be conducted in accordance with the July 1, 1988 version of 40 CFR 60, Appendix A, as follows:

a) EPA Method 1, for sample and velocity traverses (I,A)
b) EPA Method 2, for velocity and volumetric flow rate (I,A)
c) EPA Method 3, for gas analyzers (I,A)
d) EPA Method 4, for stack gas moisture content (I,A)
e) EPA Method 5, for PM (I,A)
f) EPA Method 6/8, for SO_2 (I)
g) EPA Method 9, for VE (I,A)
h) EPA Method 16/16A, for TRS (I,A)

Compliance test methods, other than those mentioned above, may be used only after prior written approval from DER's Bureau of Air Regulation (BAR).

SPECIFIC CONDITIONS:

6. The permittee shall install, calibrate, maintain, and operate the following continuous monitoring systems in accordance with the July 1, 1988 version of 40 CFR 60 Subpart BB:

a) measurement of the pressure loss of the gas stream through the venturi scrubber, accurate to within 2" water gauge pressure

b) measurement of the scrubbing liquid supply pressure to the scrubber, accurate to within 15% of the design scrubber liquid pressure

7. The SDT is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-2.240 - Circumvention; 17-2.250 - Excess Emissions; 17-2.700(7) - Reports; 17-2.710(3) - Continuous Monitoring; 17-2.710(4) - Quarterly Reporting Requirements; 17-2.971 - Compliance Schedules for Continuous Monitoring Requirements; and all other applicable provisions of F.A.C. Chapters 17-2 and 17-4; the July 1, 1988 version of 40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills; 40 CFR 60.7 - Notification and Records; and 40 CFR 60.8 - Performance Tests.

8. Objectionable odors shall not be allowed of plant property, in accordance with F.A.C. Rule 17-2.620(2).

9. Any change in the method of operation, raw materials and chemicals processed, equipment, or operating hours pursuant to F.A.C. Rule 17-2.100, defining modification, shall be submitted for approval to BAR.

10. The Duval County's Bio-Environmental Services Division (BESD) office shall be notified, in writing, a minimum of 15 days prior to source testing pursuant to F.A.C. Rule 17-2.700(2)(a)5. Written reports of the test results shall be submitted to the BESD office within 45 days of test completion.

11. The operation permits for the three existing smelt dissolving tank Nos. 1, 2, and 3 (AO 16-71209, -10, -11), which shall be permanently shut down and made incapable of operation, shall be turned in to the BESD office upon receipt of the operation permit for the new smelt dissolving tank. The method by which the existing units will be made incapable of operation will be approved by BAR and BESD.

12. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168608
PSD-FL-141
Expiration Date: April 1, 1993

SPECIFIC CONDITIONS:

13. An application for an operation permit must be submitted to the BESD office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 5 day of Jan, 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtmann

Dale Twachtmann, Secretary

Florida Department of Environmental Regulation

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

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

PERMITTEE:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

Permit Number: AC 16-168609
PSD-FL-141
Expiration Date: April 1, 1993
County: Duval
Latitude/Longitude: 30°25'15"N
81°36'00"W
Project: Multiple Effect Evaporators

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

For the construction of a set of multiple effect evaporators (MEEs) with a capacity to process 184,500 lbs/hr dry black liquor solids (BLS), evaporating weak black liquor to about 70% BLS. The MEE set will consist of six effects of the falling film type. TRS gases will be transported to the No. 2 or No. 3 lime kiln for incineration. The project will be located at Seminole Kraft Corporation's (SKC) existing facility in Jacksonville, Duval County, Florida.

The UTM coordinates are Zone 17, 441.9 km East and 3365.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. SKC's application received August 11, 1989.
2. EPA's letter received August 31, 1989.
3. DER's incompleteness letter dated September 8, 1989.
4. KBN's letter received September 11, 1989.
5. SKC's response received September 12, 1989.
6. SKC's letter received September 14, 1989.
7. KBN's letter received October 11, 1989.
8. EPA's letter received November 9, 1989.
9. DER's Preliminary Determination dated November 22, 1989.
10. SKC's comments received December 1, 1989.
11. BESD's comments received December 6, 1989.
12. EPA's comments received December 11, 1989.
13. BESD's comments received December 22, 1989.
14. Dept. of Interior's comments received December 26, 1989.
15. DER's Final Determination dated December 29, 1989.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The multiple effect evaporators (MEEs) may operate continuously, i.e., 8760 hours/year.

2. The maximum process rate of the MEEs shall neither exceed 184,500 lbs/hr dry black liquor solids (BLS), nor 4,428,000 lbs/day dry BLS. This reflects a 1987 TPD ADUP (tons per day of air dried unbleached pulp) production rate for the mill.

SPECIFIC CONDITIONS:

3. The TRS gases from the MEEs shall be combusted in the No. 2 or No. 3 lime kiln. The TRS gases from the MEEs shall be subjected to a minimum temperature of 1200° for at least 0.5 second. The No. 2 and No. 3 lime kiln exhaust gases shall not contain TRS in excess of 20 ppmvd at standard conditions corrected to 10% O_2 as a 12-hr average, in accordance with F.A.C. Rule 17-2.600(4)(c)5. The construction permits for the No. 2 and No. 3 lime kilns shall be amended to state that they are the pollution control devices for the MEE system.

4. The MEE system is subject to the provisions of F.A.C. Rule 17-2.600(4)(c)1.c., which includes the requirement of establishing a contingency plan.

5. All process equipment shall be maintained in good operating condition to minimize fugitive gaseous emissions.

6. In the event that a compliance test has to be performed on the MEE system for TRS emissions, EPA Method 16/16A, pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60 Appendix A, shall be used.

7. The MEE system is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-2.240 - Circumvention; 17-2.250 - Excess Emissions; 17-2.700(7) - Reports; 17-2.710(4) - Quarterly Reporting Requirements; and all other applicable provisions of F.A.C. Chapters 17-2 and 17-4; the July 1, 1988 version of 40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills; 40 CFR 60.7 - Notification and Records; and 40 CFR 60.8 - Performance Tests.

8. The No. 2 and No. 3 lime kiln shall be tested for TRS and SO_2 emissions to determine whether or not further technical review is required for the project pursuant to F.A.C. Rule 17-2, and 17-4. DER's Bureau of Air Regulation (BAR) may require a determination of the kiln operating temperature in the zone where TRS gases are combusted.

9. Objectionable odors shall not be allowed off plant property, in accordance with F.A.C. Rule 17-2.620(2).

10. Any change in the method of operation, raw materials and chemicals processed, equipment, or operating hours pursuant to F.A.C. Rule 17-2.100, defining modification, shall be submitted for approval to BAR.

PERMITTEE: Seminole Kraft Corporation

Permit Number: AC 16-168609
PSD-FL-141
Expiration Date: April 1, 1993

SPECIFIC CONDITIONS:

11. The Duval County's Bio-Environmental Services Division (BESD) office shall be notified, in writing, a minimum of 15 days prior to source testing pursuant to F.A.C. Rule 17-2.700(2)(a)5. Written reports of the test results shall be submitted to the BESD office within 45 days of test completion.

12. The existing permits for the three existing sets of MEEs Nos. 1, 2, and 3 (AC 16-141799, -800, -801), which shall be permanently shut down and made incapable of operation, shall be turned in to the BESD office upon receipt of the operation permit for the new set of MEEs. The method by which the existing units will be made incapable of operation will be approved by BAR and BESD.

13. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

14. An application for an operation permit must be submitted to the BESD office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 5 day of Jan, 1990

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Dale Twachtmann

Dale Twachtmann, Secretary

Attachments 1-9 Available Upon Request

Attachment 10

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary

PERMITTEE:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

Permit Number: AC 16-168609
PSD-FL-141
Expiration Date: November 12, 1992
County: Duval
Latitude/Longitude: 30°25'15"N
81°36'00"W
Project: Multiple Effect Evaporators

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

For the construction of a set of multiple effect evaporators (MEEs) with a capacity to process 184,500 lbs/hr dry black liquor solids (BLS), evaporating weak black liquor to about 70% BLS. The MEE set will consist of six effects of the falling film type. TRS gases will be transported to the No. 2 or No. 3 lime kiln for incineration. The project will be located at Seminole Kraft Corporation's (SKC) existing facility in Jacksonville, Duval County, Florida.

The UTM coordinates are Zone 17, 744.2 km East and 3365.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. SKC's application received August 11, 1989.
2. EPA's letter received August 31, 1989.
3. DER's incompleteness letter dated September 8, 1989.
4. KBN's letter received September 11, 1989.
5. SKC's response received September 12, 1989.
6. SKC's letter received September 14, 1989.
7. KBN's letter received October 11, 1989.
8. EPA's letter received November 9, 1989.
9. DER's Preliminary Determination dated November 22, 1989.

PERMITTEE:

Seminole Kraft Corporation

Permit Number: AC 16-168609
PSD-FL-141
Expiration Date: November 12, 1992

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

PERMITTEE:

Seminole Kraft Corporation

Permit Number: AC 16-168609
PSD-FL-141
Expiration Date: November 12, 1992

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The multiple effect evaporators (MEEs) may operate continuously, i.e., 8760 hours/year.

2. The maximum process rate of the MEEs shall not exceed 184,500 lbs/hr dry black liquor solids (BLS), or 4,428,000 lbs/day dry BLS. This reflects a 1987 TPD ADUP (tons per day of air dried unbleached pulp) production rate for the mill.

PERMITTEE: Permit Number: AC 16-168609 PSD-FL-141

Seminole Kraft Corporation Expiration Date: November 12, 1992

SPECIFIC CONDITIONS:

3. The TRS gases from the MEEs shall be combusted in the No. 2 or No. 3 lime kiln. The TRS gases from the MEEs shall be subjected to a minimum temperature of 1200° for at least 0.5 second. The No. 2 and No. 3 lime kiln exhaust gases shall not contain TRS in excess of 20 ppmvd at standard conditions corrected to 10% O_2 as a 12-hr average, in accordance with F.A.C. Rule 17-2.600(4)(c)5. The construction permits for the No. 2 and No. 3 lime kilns shall be changed to state that they are the pollution control devices for the MEE system.

4. The MEE system is subject to the provisions of F.A.C. Rule 17-2.600(4)(c)1.c., which includes the requirement of establishing a contingency plan.

5. All process equipment shall be maintained in good operating condition to minimize fugitive gaseous emssions.

6. In the event that a compliance test has to be performed on the MEE system for TRS emissions, EPA Method 16/16A, pursuant to F.A.C. Rule 17-2.700 and 40 CFR 60 Appendix A, shall be used.

7. The MEE system is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-4.140 - Reports; 17-2.240 - Circumvention; 17-2.250 - Excess Emissions; 17-2.710(4) - Quarterly Reporting Requirements; and all other applicable provisions of F.A.C. Rules 17-2, 17-4 and July 1, 1988 version of 40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills.

8. The No. 2 and No. 3 lime kiln shall be tested for TRS and SO_2 emissions to determine whether or not further technical review is required for the project pursuant to F.A.C. Rule 17-2, and 17-4. The DER may require a determination of the kiln operating temperature in the zone where TRS gases are combusted.

9. Objectionable odors shall not be allowed off plant property, in accordance with F.A.C. Rule 17-2.620(2).

10. Any change in the method of operation, raw materials and chemicals processed, equipment, or operating hours pursuant to F.A.C. Rule 17-2.100, defining modification, shall be submitted for approval to DER's Bureau of Air Regulation and the Bio-Environmental Services Division (BESD) office.

SPECIFIC CONDITIONS:

11. The BESD office shall be notified, in writing, a minimum of 15 days prior to source testing pursuant to F.A.C. Rule 17-2.700(2)(a)5. Written reports of the test results shall be submitted to the BESD office within 30 days of test completion.

12. The existing permits for the three existing sets of MEEs Nos. 1, 2, and 3 (AC 16-141799, -800, -801), which shall be permanently shut down and dismantled, shall be turned in to the BESD office upon receipt of the operation permit for the new set of MEEs.

13. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

14. An application for an operation permit must be submitted to the BESD office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this ______ day
of ________________, 1989

**STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION**

____
Dale Twachtmann, Secretary

Florida Department of Environmental Regulation

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

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

PERMITTEE:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

Permit Number: AC 16-168608
PSD-FL-141
Expiration Date: November 12, 1992
County: Duval
Latitude/Longitude: 30°25'18"N
81°36'18"W
Project: Smelt Dissolving Tank

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

For the construction of a smelt dissolving tank associated with the recovery boiler which has a capacity of 170,833 lbs/hr dry black liquor solids (BLS). TRS and particulate emissions will be controlled by a venturi scrubber. The project will be located at Seminole Kraft Corporation's (SKC) existing facility in Jacksonville, Duval County, Florida.

The UTM coordinates are Zone 17, 744.2 km East and 3365.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. SKC's application received August 11, 1989.
2. EPA's letter received August 31, 1989.
3. DER's incompleteness letter dated September 8, 1989.
4. KBN's letter received September 11, 1989.
5. SKC's response received September 12, 1989.
6. SKC's letter received September 14, 1989.
7. KBN's letter received October 11, 1989.
8. EPA's letter received November 9, 1989.
9. DER's Preliminary Determination dated November 22, 1989.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168608
PSD-FL-141
Expiration Date: November 12, 1992

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The smelt dissolving tank (SDT) may operate continuously, i.e., 8760 hours/year.

2. The maximum smelt processing rate shall not exceed the rate corresponding to 170,833 lbs/hr dry black liquor solids (BLS) for the recovery boiler.

SPECIFIC CONDITIONS:

3. The PM and TRS emissions shall be controlled by a venturi scrubber. The maximum emissions from the SDT shall not exceed:

Pollutant	Basis	Emission Limit lb/hr	TPY
PM (TSP)	0.2 lb/ton BLS	17.1	74.9
TRS	0.032 lb/ton BLS	2.73	12.0

Visible Emissions shall be less than 20% opacity.

4. The following are tabulated for PSD and inventory purposes:

Pollutant	Basis	Emission Limit lb/hr	TPY
PM_{10}	89.5% of PM	15.3	67.0
SO_2	0.2 lb/ton ADUP and 80% removal	2.28	10.0

5. Initial (I) and annual (A) compliance tests shall be conducted in accordance with the July 1, 1988 version of 40 CFR 60, Appendix A, as follows:

a) EPA Method 1, for sample and velocity traverses (I,A)
b) EPA Method 2, for velocity and volumetric flow rate (I,A)
c) EPA Method 3, for gas analyzers (I,A)
d) EPA Method 5, for PM (I,A)
e) EPA Method 6/8, for SO_2 (I)
f) EPA Method 9, for VE (I,A)
g) EPA Method 16/16A, for TRS (I,A)

Compliance test methods, other than those mentioned above, may be used only after prior DER approval.

6. The permittee shall install, calibrate, maintain, and operate the following continuous monitoring systems in accordance with the July 1, 1988 version of 40 CFR 60 Subpart BB:

a) measurement of the pressure loss of the gas stream through the venturi scrubber, accurate to within 2" water gauge pressure

SPECIFIC CONDITIONS:

b) measurement of the scrubbing liquid supply pressure to the scrubber, accurate to within 15% of the design scrubber liquid pressure

7. The SDT is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-4.140 - Reports; 17-2.240 - Circumvention; 17-2.250 - Excess Emissions; 17-2.710(3) - Continuous Monitoring; 17-2.710(4) - Quarterly Reporting Requirements; 17-2.971 - Compliance Schedules for Continuous Monitoring Requirements; and all other applicable provisions of F.A.C. Rules 17-2, 17-4 and July 1, 1988 version of 40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills.

8. Objectionable odors shall not be allowed of plant property, in accordance with F.A.C. Rule 17-2.620(2).

9. Any change in the method of operation, raw materials and chemicals processed, equipment, or operating hours pursuant to F.A.C. Rule 17-2.100, defining modification, shall be submitted for approval to DER's Bureau of Air Regulation and the Bio-Environmental Services Division (BESD) office.

10. The BESD office shall be notified, in writing, a minimum of 15 days prior to source testing pursuant to F.A.C. Rule 17-2.700(2)(a)5. Written reports of the test results shall be submitted to the BESD office within 30 days of test completion.

11. The operation permits for the three existing smelt dissolving tank Nos. 1, 2, and 3 (AO 16-71209, -10, -11), which shall be permanently shut down and dismantled, shall be turned in to the BESD office upon receipt of the operation permit for the new smelt dissolving tank.

12. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

13. An application for an operation permit must be submitted to the BESD office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168608
PSD-FL-141
Expiration Date: November 12, 1992

Issued this ______ day
of _______________, 1989

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

____
Dale Twachtmann, Secretary

Florida Department of Environmental Regulation

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

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

PERMITTEE:

Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: November 12, 1992
County: Duval
Latitude/Longitude: 30°25'17"N
81°36'19"W
Project: Kraft Recovery Boiler

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

For the construction of a low odor kraft recovery boiler with a capacity of firing 170,833 lbs/hr dry black liquor solids, and approximately 750,000 gals/yr of No. 6 fuel oil during start-up, shutdown or malfunction. Particulate emissions will be controlled by a dry bottom ESP. The project will be located at Seminole Kraft Corporation's (SKC) existing facility in Jacksonville, Duval County, Florida.

The UTM coordinates are Zone 17, 744.2 km East and 3365.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. SKC's application received August 11, 1989.
2. EPA's letter received August 31, 1989.
3. DER's incompleteness letter dated September 8, 1989.
4. KBN's letter received September 11, 1989.
5. SKC's response received September 12, 1989.
6. SKC's letter received September 14, 1989.
7. KBN's letter received October 11, 1989.
8. EPA's letter received November 9, 1989.
9. DER's Preliminary Determination dated November 22, 1989.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

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

GENERAL CONDITIONS:

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

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

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

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The Kraft Recovery Boiler (RB) may operate continuously, i.e., 8760 hours/year.

2. The maximum process rate shall not exceed 170,833 lbs/hr dry black liquor solids (BLS), or 4,100,000 lb/day dry BLS. This reflects a 1987 TPD ADUP (tons per day of air dried unbleached pulp) production rate for the mill.

3. The maximum heat input to the RB shall not exceed 1,125,000 Btu/hr. It is anticipated that the No. 6 fuel oil utilization rate will not exceed 750,000 gals/year (used during start-up, shutdown, and malfunction).

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: November 12, 1992

SPECIFIC CONDITIONS:

3. The maximum heat input to the RB shall not exceed 1,125,000 Btu/hr. It is anticipated that the No. 6 fuel oil utilization rate will not exceed 750,000 gals/year (used during start-up, shutdown, and malfunction).

4. Particulate emissions shall be controlled by a dry bottom electrostatic precipitator. The NOx emissions are based on the BACT determination. The maximum pollutant emissions from the RB shall not exceed:

Pollutant	Basis	Emission Limit lb/hr	Emission Limit TPY
PM (TSP)	0.044 gr/dscf @ 8% O_2	107.0	468.7
SO_2	180 ppmvd @ 8% O_2 (max)	514.0	-
	120 ppmvd @ 8% O_2 (avg)	339.3	1486.0
NO_x	75 ppmvd @ 8% O_2	153.0	670.2
TRS	5 ppmvd @ 8% O_2	7.5	32.9

Note: The TRS emissions are based on a 12-hr average.

Visible emissions (VE) shall be less than 35% opacity.

5. The following are tabulated for PSD and inventory purposes:

Pollutant	Basis	Emission Limit lb/hr	Emission Limit TPY
PM_{10}	74.8% of PM	80.8	350.6
CO	400 ppmvd @ 8% O_2	494.8	2167.2
VOC	80 ppmvd @ 8% O_2	56.6	247.9
Lead	3900 lb / 10^{12} dscf	0.047	0.21
Beryllium	300 lb / 10^{12} dscf	0.0036	0.016
H_2SO_4 Mist	0.81 ppm	3.0	13.3

6. Initial (I) and annual (A) compliance tests shall be conducted in accordance with the July 1, 1988 version of 40 CFR 60, Appendix A, as follows:

a) EPA Method 1, for sample and velocity traverses (I,A)
b) EPA Method 3, for gas analyses (I,A)
c) EPA Method 5/17, for PM (I,A)
d) EPA Method 6/8, for SO_2 (I)
e) EPA Method 7/7A, for NO_x (I,A)
f) EPA Method 9, for VE (I,A)
g) EPA Method 16/16A, for TRS (I,A)
h) ASTM D 396-76, for sulfur content of No. 6 fuel oil (I)

SPECIFIC CONDITIONS:

DER may require a compliance test for SO_2 at the time of operation permit renewal. Compliance test methods, other than those mentioned above, may be used only after prior DER approval.

7. The permittee shall install, calibrate, maintain, and operate the following continuous monitoring systems in accordance with the July 1, 1988 version of 40 CFR 60 Subpart BB:

a) Opacity monitor and recorder, with the span set at 70% opacity
b) TRS monitor and recorder, with the span set at 30 ppm TRS (monitoring on dry basis)
c) Oxygen monitor and recorder, with the span set at 20% O_2 (monitoring on dry basis)

8. The RB is subject to the provisions of F.A.C. Rules 17-4.130 - Plant Operation Problems; 17-4.140 - Reports; 17-2.240 - Circumvention; 17-2.250 - Excess Emissions; 17-2.710(3) - Continuous Monitoring; 17-2.710(4) - Quarterly Reporting Requirements; 17-2.971 - Compliance Schedules for Continuous Monitoring Requirements; and all other applicable provisions of F.A.C. Rules 17-2, 17-4 and the July 1, 1988 version of 40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills.

9. Objectionable odors shall not be allowed off plant property, in accordance with F.A.C. Rule 17-2.620(2).

10. Any change in the method of operation, raw materials and chemicals processed, equipment, or operating hours, pursuant to F.A.C. Rule 17-2.100, defining modification, shall be submitted for approval to DER's Bureau of Air Regulation and the Bio-Environmental Services Division (BESD) office.

11. The BESD office shall be notified, in writing, a minimum of 15 days prior to source testing. Written reports of the test results shall be submitted to the BESD office within 30 days of test completion.

12. The operation permits for the three existing recovery boiler Nos. 1, 2, and 3 (AO 16-71206, -07, and -08), which shall be permanently shut down and dismantled, shall be turned in to the BESD office upon receipt of the operation permit for the new recovery boiler.

13. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

PERMITTEE:
Seminole Kraft Corporation

Permit Number: AC 16-168607
PSD-FL-141
Expiration Date: November 12, 1992

SPECIFIC CONDITIONS:

14. An application for an operation permit must be submitted to the BESD office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this ______ day
of ______________, 1989

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

____
Dale Twachtmann, Secretary

Best Available Control Technology (BACT) Determination
Seminole Kraft Corporation
Duval County

The applicant proposes to install a kraft recovery boiler at their facility located in Jacksonville, Florida. The recovery boiler, rated at 1,125 MMBtu/hr, will replace three old recovery boilers. Also included in the project is the installation of a new smelt dissolving tank and a new set of evaporators which will replace three old smelt dissolving tanks and three old sets of evaporators, respectively.

The applicant has indicated the maximum net total annual tonnage of regulated air pollutants emitted from the project based on 8,760 hours per year operation to be as follows:

Pollutant	Max. Net Increase in Emissions (TPY)	PSD Significant Emission Rate (TPY)
TSP	-140.7	25
PM_{10}	-138.6	15
SO_2	6.4	40
NOx	1296.4	40
CO	-160.0	100
VOC	-92.3	40
TRS	-53.3	10
Pb	-0.16	0.6
Be	-0.012	0.004
H_2SO_4	-5.8	7

Rule 17-2.500(2)(f)(3) of the Florida Administrative Code (F.A.C.) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table. The NOx emissions from the smelt dissolving tank and the multiple effect evaporators are negligible and will not be considered as part of the BACT analysis.

BACT Determination Requested by the Applicant

Pollutant	Determination
NOx	180 ppm (corrected to 8% oxygen)

Date of Receipt of a BACT Application

September 11, 1989

Review Group Members

This determination was based upon comments received from the applicant and the Stationary Source Control Section.

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Analysis

A review of recent BACT determinations for nitrogen oxides from kraft recovery boilers indicates that the emission rate proposed by the applicant does not represent BACT. The rationale for establishing BACT at a lower than proposed level is presented as follows:

The applicant has indicated that an emission rate of 180 ppm corrected to 8% oxygen is representative of BACT taking into consideration guarantees common to all potential manufacturers, the black liquor fuel analysis, and performance deterioration based on a 24-hour average.

A review of the BACT/LAER Clearinghouse indicates a wide range of NOx limitations. Although several of the most recent BACT determinations range from 50-80 ppm corrected to 8% oxygen, none of the facilities listed utilize NOx reduction systems operating downstream from a kraft recovery boiler. However, in keeping with the "top down" BACT analysis, "add on" control equipment will be evaluated as part of the analysis.

The two types of control that are typically utilized for NOx reduction are selective catalytic reduction (SCR) and Thermal De NOx. Each of these technologies utilizes ammonia injection as the means to react with and thereby reduce the concentrations of NOx in the gas stream. Although these technologies have not been utilized for this type of application the economics of using such equipment should be addressed.

The applicant has indicated that using Thermal DeNOx as a control increase for NOx results in a cost of $2,000 per ton of NOx reduced. Although this costs is not excessive compared to recent BACT determinations in which NOx removal was justified at costs up to approximately $4,500 per ton, the use of Thermal DeNOx as a control measure has not been demonstrated on Kraft recovery boilers and hence has not been seriously considered as BACT for recent determinations. Similarly SCR has not been used in Kraft recovery boiler applications and should not be considered as BACT for these facilities.

Although "add on" NOx controls have not been utilized for kraft recovery boilers, a survey of the most recent BACT determinations indicates that kraft recovery boiler manufacturers are capable of limiting NOx emissions to suprisingly low levels (generally 53 to 75 ppm @ 8% oxygen) by equipment design.

Discussions with the BACT coordinators from other states which have pulp and paper industry indicate that all of the known manufacturers of kraft recovery boilers have proposed or agreed to meet NOx emission limitations which fall within the range discussed above. Although many of these facilities were just recently permitted and have yet to be constructed and tested, there is sufficient data available to suggest that these limitations can indeed be met.

In a technical study completed by the National Council of the Paper Industry for Air and Stream Improvement, Inc. (NCASI), several large kraft recovery furnaces (boilers) were tested for NOx emissions. The publication entitled "A Study of Nitrogen Oxides Emissions from Large Kraft Recovery Furnaces" provides evidence that NOx emissions can be held to levels which are now being proposed by kraft recovery boiler manufacturers.

The NCASI report focused on the NOx emissions from four large kraft recovery boilers, with three of the units being located in the southeastern United States. The size of the units tested ranged from firing rates of 3.18 - 4.06 million pounds of black liquor solids (BLS) per day. This is comparable to the proposed kraft recovery boiler which has a firing of 4.1 million pounds of BLS per day.

Based on the NOx emission studies completed, the NCASI report concluded the following:

1) NOx emissions from large kraft recovery boilers were not size dependent.

2) NOx emissions ranged from 0.06 to 0.11 lbs/million Btu heat input.

Based on the applicant's maximum BLS input of 4.1×10^6 lb/day (170,833.3 lb/hr) a comparison of the proposed NOx emission limit can be made with the NCASI test results.

The applicant has estimated the maximum hourly NOx emission to be 369.3 pounds. Taking this into account with the BLS heating value of 4,522 Btu per pound, the calculated emission rate on a heat input basis is approximately 0.48 lbs per million Btu. This emission level ranges from approximately 4 to 8 times greater than that observed by the NCASI study.

Environmental Impact Analysis

A review of the NOx impacts associated with the proposed kraft recovery boiler installation indicates that there will be a reduction in the maximum annual impact. This reduction in the NOx impact will be attributed to the replacement of the three old recovery boilers which are now exhibiting higher impacts than what will be expected for the new unit.

BACT Determination by DER:

Based on the information presented in this analysis, the Department has determined that BACT should be established as follows:

Pollutant	Emission Limit
NOx	75 ppm by volume, corrected to 8% oxygen

This NOx emission limitation is representative of the levels that are being proposed in recent applications as BACT for kraft recovery boilers supplied by all known manufacturers. In addition, this level is supported by the NCASI report which showed NOx emissions ranging from 37 to 60 ppm, corrected to 8% oxygen, for all of the facilities tested over a three hour period.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:	Approved by:
______________________________	______________________________
C. H. Fancy, P.E., Chief Bureau of Air Regulation	Dale Twachtmann, Secretary Dept. of Environmental Regulation
______________________ 1989 Date	______________________ 1989 Date

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to: Mr. L. A. Stanlet Gen. Mgr. 9469 Eastport Road Jacksonville, FL 32218-0998	4. Article Number P 423 104 510 Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature — Addressee X 6. Signature — Agent X Maj Emma 7. Date of Delivery	8. Addressee's Address *(ONLY if requested and fee paid)*

JACKSONVILLE, FL NORTH JACKSONVILLE STA. JUN 14 1990 USPS

PS Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

P 423 104 510

RECEIPT FOR CERTIFIED MAIL

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

Sent to Mr. L.A. Stanley, Gen. Mgr.	
Street and No. Seminole Kraft Corp. 9469 Eastport Road	
P.O., State and ZIP Code Jacksonville, FL 32218-0998	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date mailed: 6/12/90 AC 16-168607 PSD-FL-141	

★U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

File Copy

Florida Department of Environmental Regulation

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

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

June 6, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. L. A. Stanley
General Manager
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218-0998

Dear Mr. Stanley:

Re: Amendment Request to Construction Permits: AC 16-168607
PSD-FL-141

The Department and the U.S. EPA-Region IV have reviewed your letter with attachments dated February 16, 1990, which was amended by a letter from Mr. Terry Cole on May 21, 1990. The letters requested an amendment to the above referenced construction permits. The Department received responses to the request from Mr. James L. Manning, Deputy Director of Duval County's Bio-Environmental Services Division, on March 29, 1990, and from Ms. Jewell A. Harper, Chief of the Air Enforcement Branch, U.S. EPA-Region IV, on April 9, 1990. The Department's response to the request package will follow.

The final compliance date for those recovery furnaces subject to F.A.C. Rule 17-2.600(4)(c), that will be replaced, is November 12, 1992, pursuant to F.A.C. Rule 17-2.960(1)(d)2.b.(ii). The mill's plan to change to 100% recycle fiber instead of constructing a new recovery furnace to comply with the applicable regulations would not be a SIP violation because there is no change in the final compliance date. Therefore, the Department is in agreement to establish the potential for the mill to change to 100% recycle fiber for compliance purposes and to establish certain critical dates for reasonable assurances.

The letter of response from Ms. Jewell A. Harper posed specific concerns about contemporaneous emissions credit. The Department concurs with the issues discussed in the letter, that (1) contemporaneous emissions shall be based on actual emissions data established by conducting emissions tests and on actual operating data (hours per year) from the two years previous to shutdown, unless another time period within the last 5 years prior to shutdown is more representative of actual operating conditions, and (2) contemporaneous emissions credit should not be established as a permit condition prior to a source shutting down because of the potential premature lock-in of a shutdown date. Since both the federal and state regulations clearly define the process and time frames for the establishment of contemporaneous emissions credit, the request to establish contemporaneous emissions credit as a condition in the above referenced construction permits is denied.

The letter of response from Mr. James L. Manning posed concerns about the issues already discussed in the previous two paragraphs as well as a concern over the validity of the new recovery furnace construction permits. Since the mill is privileged to demonstrate compliance by its own choosing so long as it is within the guidelines of the appropriate rules, the permits shall remain viable in case the mill decides that it will continue with its original plans, which is to construct the new recovery boiler. The permits also contain compliance dates that still must be met and are federally enforceable. Consequently, until the mill makes its decision on how it will demonstrate compliance with the 111(d) TRS rule, the surrendering of the construction permits will not be required at this time.

Therefore, based on the discussions in the previous paragraphs, the following will be added:

<u>Specific Condition</u> (new)

15. Seminole Kraft Corporation has indicated to the Department that as an alternative to replacing the three existing kraft recovery boilers with a new recovery boiler, it may choose to convert the mill to a 100% recycle fiber operation and close down the kraft pulp mill, recovery boilers and associated facilities. In the event that Seminole Kraft chooses this alternative, the following conditions apply:

    a. The existing three recovery boilers and three smelt dissolving tanks will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this date.

    b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by June 15, 1990.

Mr. L. A. Stanley
Page Three
June 6, 1990

c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle project is completed and in operation.

Attachments to be Incorporated

16. Mr. L. A. Stanley's letter with attachments dated February 16, 1990.
17. Mr. James L. Manning's letter received March 29, 1990.
18. Ms. Jewell A. Harper's letter received April 9, 1990.
19. Mr. Terry Cole's letter received May 21, 1990.
20. Mr. Bruce Mitchell's Interoffice Memorandum dated June 1, 1990.

This letter must be attached to your air construction permits, AC 16-168607 and PSD-FL-141, and shall become a part of the permits.

Sincerely,

Dale Twachtmann
Secretary

DT/plm

Attachments

c: A. Kutyna, NE District
J. Manning, BESD
J. Harper, U.S. EPA
C. Shaver, NPS
T. Cole, OHF&C, P.A.
Reading File
Bruce Mitchell } 6-12-90 RAL

ATTACHMENT 16

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

February 16, 1990

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

This letter is to request an amendment to construction permit No. AC16-168607 (Kraft Recovery Boiler) for our mill in Jacksonville, As indicated earlier, Seminole Kraft has engaged in extensive engineering studies related to the proposed new recovery boiler installation as well as examining how best to position the mill for the future. These studies have concluded that the mill is a high cost operation in its current configuration and would remain so even after the installation of the new recovery boiler currently estimated to cost $130,000,000.

Accordingly, three months ago, Seminole Kraft began an investigation to determine what technology alternatives to the recovery boiler project might provide an improved environment to the City of Jacksonville and a mill that would be more competitive in domestic and foreign markets in the future.

An alternative has been tentatively selected that will provide the business with the stability required to insure a long term viable operation. This alternative provides for reconfiguration of the existing mill to enable it to use 100% recycled fiber instead of virgin fiber to produce 1,200 tons per day of linerboard on our existing No.2 paper machine. The kraft pulp mill, old recovery boilers and associated facilities will be permanently shut down and the No.1 paper machine will be placed on cold standby. This alternative will result in the elimination of all regulated TRS (odor) emission sources prior to the stated November 12, 1992 deadline as well as substantial reductions in particulate emissions. This conversion will increase the use of recycled fiber at the mill from about 100 TPD to about 1,400 TPD and will substantially increase Florida's waste paper recycle rate.

As we discussed, the best approach to providing regulatory approval of this alternative appears to be an amendment to the specific conditions in the new recovery boiler construction permit. We believe this new condition should relieve Seminole Kraft of the obligation of building a new recovery boiler if Seminole chooses to shut down the kraft pulping operation, old recovery boilers and related facilities by supplying recycled fiber to the paper machine instead of virgin wood pulp from the Kraft pulp mill. In addition, this new condition would require Seminole Kraft to turn in the operating permits for the old recovery boilers once the recycle operation is up and running and to make the old recovery boiler incapable of operation. We believe this specific condition should also provide the mechanism for retaining the recovery boiler creditable emission reductions for potential use by Seminole Kraft pursuant to 17-2.500(2)(e) 3 & 4. As noted, our No.1 paper machine (presently making bag paper) will be placed on cold standby for the time being. However we hope to develop a project to use recycle fiber on the No.1 paper machine in the future and if AES cannot supply the required steam, we would like to use the creditable emissions from the recovery boilers for a power boiler to supply steam to the No.1 paper machine.

Finally, this specific condition should provide for notice to DER of Seminole Kraft's final decision to pursue this alternative or proceed with the new recovery boiler by a date certain.

To facilitate development of the language for this amendment, we have prepared the draft specific condition shown below for your consideration.

15. Seminole Kraft Corporation has indicated to the Department that as an alternative to replacing the three existing kraft recovery boilers with a new recovery boiler, it may choose to convert the mill to a 100% recycle fiber operation and close down the kraft pulp mill, recovery boilers and associated facilities. In the event that Seminole Kraft chooses this alternative, the following conditions apply:

    a. The existing kraft pulp mill, including three recovery boilers, three smelt dissolving tanks, digester system, three lime kilns and three multiple effect evaporators, will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this same date.

b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by May 1, 1990.

c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle fiber project is completed and in operation.

d. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation and shuts down the kraft pulp mill sources listed in a. above, the following creditable emission reductions are available to Seminole Kraft for five (5) years from the date construction on this alternative is complete or November 12, 1992, whichever is earlier.

CREDITABLE EMISSION REDUCTIONS (TPY)
(1983-84)*

Source	TSP	PM_{10}	SO_2	NO_x	CO	TRS
3 existing Recovery Boilers	427.2	320.5	1481	321.1	2327.2	89.3
3 Existing Smelt Dissolving Tanks	122.6	109.7	8.6	-	-	8.9
3 Existing Lime Kilns	74.1	72.6	1.4	98.1	21.2	17.3
No.1 & No.2 Lime Slaker (shut down in 1988)	140.5	133.0	-	-	-	-
No.3 Lime Slaker	14.0	12.8	-	-	-	-

*Note that emissions for the recovery boilers, smelt dissolving tanks, and lime slakers are the same as in the PSD construction permit application (see Attachment A). The emissions for the lime kilns are based on 1983-84 operating hours, but today's control technology/emission limits. See Attachment B for details.

Best Available Copy

Mr. C.H. Fancy, P.E.
February 16, 1990
page 4

We hope this information will be adequate to proceed with processing the proposed amendment. Please let us know if you require any additional information. We would be happy to meet with the Department to help expedite the handling of this matter.

Sincerely,

L.A. Stanley
General Manager

ah

CC: Steve Smallwood
Dale Twachtmann
James L.Manning
Richard Maguire
Mike Riddle
Curt Barton
Al Koleff
P. Raval
B. Andrews
M. Linn
G. [illegible], P.E., NE Dist
J. Aronson, EPA
C. Shaver NPS
CHF/BT/[illegible]/BT

ATTACHMENT A

(Table 4-3 from Original Recovery Boiler PSD Appliciation)

Table 4-3 Baseline Emissions (1983-1984) from Existing Recovery Boilers and Smelt Dissolving Tanks at Seminole Kraft

Pollutant	Annual Baseline Emissions (TPY)						
	RB1	RB2	RB3	SDT1	SDT2	SDT3	Totals
Particulate Matter (TSP)	143.8	144.4	139.0	31.3	48.4	42.9	549.8
Particulate Matter (PM10)	107.9	108.3	104.3	28.0	43.3	38.4	430.2
Sulfur Dioxide	429.5	519.8	531.7	2.5	3.0	3.1	1,489.6
Nitrogen Oxides	94.4	112.7	114.0	-	-	-	321.1
Carbon Monoxide	674.9	816.8	835.5	-	-	-	2,327.2
Volatile Organic Compounds	100.0	119.4	120.8	-	-	-	340.2
Total Reduced Sulfur	25.2	31.3	32.8	2.6	3.1	3.2	98.2
Lead	.012	0.13	0.12	-	-	-	0.37
Mercury	-	-	-	-	-	-	-
Beryllium	0.0090	0.0098	0.0090	-	-	-	0.0278
Sulfuric Acid Mist	6.18	6.76	6.19	-	-	-	19.1
Inorganic Arsenic	-	-	-	-	-	-	-
Fluorides	-	-	-	-	-	-	-
Asbestos	-	-	-	-	-	-	-
Vinyl Chloride	-	-	-	-	-	-	-

Note: TPY = tons per year

ATTACHMENT B

Basis for Lime Kiln Creditable Emissions

Particulate Emissions - actual data from 1983-84 Annual Report PM_{10} - used AP-42 Table 10.1-4 and particulate emissions from 1983-84 Annual Report.

NO_x used NCASI Technical Bulletin No. 107, April 1988

Kiln No.	mmBTU/Year 83	mmBTU/Year 84	Tons No_x/Year 83	Tons No_x/Year 84	Average
1	156150	89535	12.5	7.16	9.8
2	241883	322084	37.5	49.9	43.7
3	267245	308848	41.4	47.9	44.6
				Total	98.1

TRS emissions calculated from actual gas flow rates in 1983-84 and at 20 ppm TRS as H_2S. This would correspond to permit limit today.

CO used AP-42 Table 10.1-1 (0.1 lbs/ADUP)

Year	Pulp Produced (Tons-ADUP/Year)		CO Emissions (TPY)
1983	410,238		20.5
1984	436,032		21.8
		Avg.	21.2

For SO_2-use data compiled in 1989's operating permit application.

Kiln	SO_2 Emission Rate	Avg. Hours of Operation	SO_2 (TPY)
No.1	0.16 lb/hr	3882	0.31
No.2	0.06 lb/hr	6829	0.21
No.3	0.24 lb/hr w/noncondensibles	7462	0.90
		Total	1.42

ATTACHMENT 17

DEPARTMENT OF HEALTH, WELFARE
& BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services

CITY OF JACKSONVILLE, FLORIDA ®

March 22, 1990

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

Re: Seminole Kraft Corporation (SKC) letter dated February 16, 1990

Dear Mr. Fancy:

The Bio-Environmental Services Division staff has carefully reviewed the requested permit revisions in the above-captioned letter. It is the recommendation of our Division that the permit modification be denied for the following reasons:

A. Inserting a statement in a construction permit to address the issue of not constructing the source for which the permit was issued is not appropriate. Rule 17-2.210 (1), Florida Administrative Code (FAC) provides that "...The construction permit shall be issued for a period of time sufficient to allow construction or modification of the source..." Since SKC has stated in a Variance Request that construction will not take place, the new recovery boiler permit is not required, nor should it be allowed to continue, since available ambient increment is used by the permit for a source which, by admission of the applicant, will not be constructed.

   Rule 17-2.210 FAC (Permits Required) requires applicable permits for sources of air pollution, however; based on information available to BESD, the proposed recycling operation will not be expected to be a source of air pollution and, therefore, will not be required to obtain a construction permit.

B. Creditable Emissions - The shutdown of sources at SKC for the construction of the new recovery boiler and the Applied Energy Systems (AES) co-generation facility has been an integral part of the permitting process for both of the new projects. Direct emission reductions, modeling to determine ambient pollutant concentrations, and permit stipulations have all involved the shutdown of these sources. A permit to construct the recovery boiler has been issued and accepted by the applicant, which includes the use of creditable emissions.

   Based upon the information which is available to the BESD at this time, there are no creditable emissions for future use.

RECEIVED
MAR 29 1990
DER - BAQM

It is noted that BESD does not see this decision as an impediment to the future construction of a steam-producing boiler at the Seminole Kraft facility, should the need arise. A new boiler would be subject to the New Source Performance Standards (NSPS) and possibly subject to the Prevention of Significant Deterioration (PSD) or New Source Review requirements, thus adequately protecting air quality standards.

C. Compliance with Total Reduced Sulfur rule — It is suggested that if SKC does proceed with the recycling project and does not construct the new recovery boiler, a determination should be made as to the compliance status of the Seminole Kraft Corporation facility in regard to compliance with the May 12, 1989, TRS compliance date stated in Rule 17-2.960, FAC.

If BESD may be of further assistance in this matter, please advise.

Very truly yours,

Jerry E. Woods for

James L. Manning, P.E.
Deputy Director

cc: Andy Kutyna, P.E., DER
BESD File 2155 A

JLM:gw

ATTACHMENT 18

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: File: Seminole Kraft Corporation - Recovery Boiler
AC 16-168607
PSD-FL-141

FROM: Bruce Mitchell RBM

DATE: June 1, 1990

SUBJ: Amendment to Mr. Terry Cole's letter dated May 21, 1990

In a phone conversation with Mr. Terry Cole, it was agreed to change the date in the proposed condition No. 15.b. from June 1, 1990 to June 15, 1990.

BM/plm

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

Please call Patty Adams when signed 8-1344

TO: Dale Twachtmann

for FROM: Steve Smallwood

DATE: June 6, 1990

SUBJ: Amendment to Construction Permits: AC 16-168607
PSD-FL-141
Seminole Kraft Corporation - Recovery Boiler

For your approval and signature is a letter amending the above referenced construction permits prepared by the Bureau of Air Regulation. The amendment will establish an additional contingency, which is to convert the mill to 100% recycle fiber, that the permittee can use to demonstrate compliance with the 111(d) TRS regulations.

There is no controversy associated with this amendment. I recommend your approval and signature.

SS/BM/plm

RECEIVED
JUN 6 1990
Office of the Secretary

Check Sheet

Company Name: Seminole Kraft Corporation
Permit Number: AC 16-168607, -608, -609
PSD Number: PSD FL-41
Permit Engineer:

Application:

3 ☑ Initial Application
- ☑ Incompleteness Letters
- ☑ Responses
- ☐ Waiver of Department Action
- ☐ Department Response
- ☐ Other

Cross References:
- ☑ 14479
- ☐
- ☐

Intent:

☑ Intent to Issue
☑ Notice of Intent to Issue
☑ Technical Evaluation
☑ BACT or LAER Determination
3 ☑ Unsigned Permit
Correspondence with:
- ☑ EPA
- ☐ Park Services
- ☑ Other

☑ Proof of Publication
- ☐ Petitions - (Related to extensions, hearings, etc.)
- ☐ Waiver of Department Action
- ☑ Other

Final Determination:

☑ Final Determination
☑ Signed Permit
☑ BACT or LAER Determination
- ☐ Other

Post Permit Correspondence:
- ☐ Extensions/Amendments/Modifications
- ☐ Other

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

June 14, 1990

Mr. Dale Twachtmann, Secretary
Florida Dept. of Environment Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Notice of Intent to Convert to Recycle Fiber Operation

Dear Secretary Twachtmann:

This letter will provide notice, pursuant to the Amendment to Seminole Kraft Corporation's construction permit dated June 6, 1990, that Seminole Kraft Corporation plans to convert the Seminole Kraft mill to a 100% recycle fiber operation.

We appreciate the Department's cooperation in this matter and will periodically brief you on the progress of the project.

Sincerely,

L.A. Stanley

L.A. Stanley
General Manager

ah

CC: Mike Riddle
Curt Barton
Terry Cole

RECEIVED
JUN 20 1990

RECEIVED
JUN 18 1990
Office of the Secretary

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 4 1990

4APT-AEB

RECEIVED
APR 09 1990
DER - BAQM

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Seminole Kraft Corporation (PSD-FL-141)

Dear Mr. Fancy:

This is to acknowledge receipt of a package from your office transmitting a request from Seminole Kraft Corporation to modify their prevention of significant deterioration (PSD) permit, dated February 16, 1990. As discussed between Mr. Pradeep Raval of your staff and Mr. Gregg Worley of my staff on March 30, 1990, we have the following comments.

CREDITABLE EMISSIONS REDUCTIONS

The source has requested that conditions be placed in the PSD permit to allow them the flexibility to convert to 100% recycled fiber in lieu of constructing the new recovery boiler. In the event that the source makes the decision to convert to recycled fiber, the source would like to retain emissions credit for the units which would be shut down at the facility (i.e., the existing kraft pulp mill). The credit for shutting down any units may be retained but we must emphasize that such credit must be based on actual operating data from the two years previous to the shutdown, unless another time period is determined to be more representative of actual operating conditions. The information submitted by Seminole Kraft is based on the years 1983-84. Apparently the source used the operating hours of this time period along with presently permitted allowable emission rates to arrive at their creditable emission reductions. This is not acceptable. We would suggest that it would be prudent of FDER to require testing of the units prior to shutdown for the pollutants which are to be credited. In any case, the actual emission rates must be used rather than the permitted allowable rates unless the actual emissions exceed the allowable emissions.

In a related matter, we do not think it is wise to include as a permit condition the language suggested by the source in provision 15 (d) which specifies what credits are available prior to the shutdown of the units. It appears that such a provision would lock FDER into accepting those numbers as creditable emissions no matter what the source operation was prior to shutdown. The fact that emissions resulting from federally enforceable shutdowns are creditible does not need to be established in a permit; the fact that such emissions are creditable is already established in federal and Florida regulations. In addition, the contemporaneous time period for which the emissions are creditable is established in regulations. Thus, it is redundant to state that "...the following emissions reductions will be available to Seminole Kraft for five (5) years from the date construction on this alternative is complete or November 12, 1992, whichever is earlier." By establishing a federally enforceable shutdown date at the completion of construction or November 12, 1992, whichever is earlier, it is understood that emissions credit is available for a period of five years from that point.

EFFECT ON THE AES CEDAR BAY PROJECT

The AES project which is currently under review for permitting plans to use the ambient impacts of shutting down several units at Seminole Kraft in their air quality analysis. How will the proposed permit amendment by Seminole Kraft affect the AES project?

Thank you for the opportunity to review and comment on this proposal by Seminole Kraft. If you have any questions or comments on this matter, please do not hesitate to contact Mr. Gregg Worley of my staff at 404/347-2864.

Sincerely yours,

Jewell A. Harper

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

OERTEL, HOFFMAN, FERNANDEZ & COLE, P. A.

ATTORNEYS AT LAW

M. CHRISTOPHER BRYANT
R. L. CALEEN, JR.
C. ANTHONY CLEVELAND
TERRY COLE
MARTHA J. EDENFIELD
SEGUNDO J. FERNANDEZ
KENNETH F. HOFFMAN
KENNETH G. OERTEL
HAROLD F. X. PURNELL
PATRICIA A. RENOVITCH
SCOTT SHIRLEY
THOMAS G. TOMASELLO
W. DAVID WATKINS

SUITE C
2700 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

MAILING ADDRESS:
POST OFFICE BOX 6507
TALLAHASSEE, FLORIDA 32314-6507

TELEPHONE (904) 877-0099
FACSIMILE (904) 877-0981

JOHN H. MILLICAN
ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

J. P. SUBRAMANI, PH.D., P. E.
ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

May 21, 1990

RECEIVED
MAY 21 1990
DER - BAQM

Mr. Bruce Mitchell
Engineer IV
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Corporation
Construction Permit No. AC16-168607

Dear Bruce:

On behalf of Seminole Kraft this will amend the letter of February 16, 1990 dealing with the above construction permit. We request that the suggested amendment to paragraph 15 be changed as follows:

15. Seminole Kraft Corporation has indicated to the Department that as an alternative to replacing the three existing kraft recovery boilers with a new recovery boiler, it may choose to convert the mill to a 100% recycle fiber operation and close down the kraft pulp mill, recovery boilers and associated facilities. In the event that Seminole Kraft chooses this alternative, the following conditions apply:

a. The existing three recovery boilers and three smelt dissolving tanks, will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this same date.

b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by June 1, 1990.

c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle fiber project is completed and in operation.

d. To be inserted by DER.

We appreciate you cooperation in this matter. Please let me know if you have any questions.

Sincerely,

Terry

Terry Cole

TC:slw

cc: Curt Barton
Larry Stanley
Mike Riddle
B. Mitchell
A. Kutyna
B. Pace, BESD
CHF/BA

OERTEL, HOFFMAN, FERNANDEZ & COLE, P. A.
ATTORNEYS AT LAW

M. CHRISTOPHER BRYANT
R. L. CALEEN, JR.
C. ANTHONY CLEVELAND
TERRY COLE
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TELEPHONE (904) 877-0099
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JOHN H. MILLICAN
ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

J. P. SUBRAMANI, PH.D., P. E.
ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

May 21, 1990

RECEIVED
MAY 21 1990
DER-BAQM

Mr. Bruce Mitchell
Engineer IV
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Corporation
Construction Permit No. AC16-168607

Dear Bruce:

On behalf of Seminole Kraft this will amend the letter of February 16, 1990 dealing with the above construction permit. We request that the suggested amendment to paragraph 15 be changed as follows:

15. Seminole Kraft Corporation has indicated to the Department that as an alternative to replacing the three existing kraft recovery boilers with a new recovery boiler, it may choose to convert the mill to a 100% recycle fiber operation and close down the kraft pulp mill, recovery boilers and associated facilities. In the event that Seminole Kraft chooses this alternative, the following conditions apply:

  a. The existing three recovery boilers and three smelt dissolving tanks, will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this same date.

  b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by June 1, 1990.

Best Available Copy

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c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle fiber project is completed and in operation.

d. To be inserted by DER.

We appreciate you cooperation in this matter. Please let me know if you have any questions.

Sincerely,

Terry

Terry Cole

TC:slw

cc: Curt Barton
Larry Stanley
Mike Riddle
[illegible]
[illegible]
[illegible], BESD
[illegible]

OERTEL, HOFFMAN, FERNANDEZ & COLE, P. A.

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ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

May 21, 1990

RECEIVED
MAY 21 1990
DER - BAQM

Mr. Bruce Mitchell
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Florida Department of
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Tallahassee, Florida 32399-2400

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a. The existing three recovery boilers and three smelt dissolving tanks, will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this same date.

b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by June 1, 1990.

BEST AVAILABLE COPY

Mr. Bruce Mitchell
May 21, 1990
Page 2

c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle fiber project is completed and in operation.

d. To be inserted by DER.

We appreciate you cooperation in this matter. Please let me know if you have any questions.

Sincerely,

Terry

Terry Cole

TC:slw

cc: Curt Barton
Larry Stanley
Mike Riddle
[illegible]
[illegible]
[illegible], BESD
CEF/BA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 4 1990

4APT-AEB

RECEIVED
APR 09 1990
DER - BAQM

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Seminole Kraft Corporation (PSD-FL-141)

Dear Mr. Fancy:

This is to acknowledge receipt of a package from your office transmitting a request from Seminole Kraft Corporation to modify their prevention of significant deterioration (PSD) permit, dated February 16, 1990. As discussed between Mr. Pradeep Raval of your staff and Mr. Gregg Worley of my staff on March 30, 1990, we have the following comments.

CREDITABLE EMISSIONS REDUCTIONS

The source has requested that conditions be placed in the PSD permit to allow them the flexibility to convert to 100% recycled fiber in lieu of constructing the new recovery boiler. In the event that the source makes the decision to convert to recycled fiber, the source would like to retain emissions credit for the units which would be shut down at the facility (i.e., the existing kraft pulp mill). The credit for shutting down any units may be retained but we must emphasize that such credit must be based on actual operating data from the two years previous to the shutdown, unless another time period is determined to be more representative of actual operating conditions. The information submitted by Seminole Kraft is based on the years 1983-84. Apparently the source used the operating hours of this time period along with presently permitted allowable emission rates to arrive at their creditable emission reductions. This is not acceptable. We would suggest that it would be prudent of FDER to require testing of the units prior to shutdown for the pollutants which are to be credited. In any case, the actual emission rates must be used rather than the permitted allowable rates unless the actual emissions exceed the allowable emissions.

In a related matter, we do not think it is wise to include as a permit condition the language suggested by the source in provision 15 (d) which specifies what credits are available prior to the shutdown of the units. It appears that such a provision would lock FDER into accepting those numbers as creditable emissions no matter what the source operation was prior to shutdown. The fact that emissions resulting from federally enforceable shutdowns are creditible does not need to be established in a permit; the fact that such emissions are creditable is already established in federal and Florida regulations. In addition, the contemporaneous time period for which the emissions are creditable is established in regulations. Thus, it is redundant to state that "...the following emissions reductions will be available to Seminole Kraft for five (5) years from the date construction on this alternative is complete or November 12, 1992, whichever is earlier." By establishing a federally enforceable shutdown date at the completion of construction or November 12, 1992, whichever is earlier, it is understood that emissions credit is available for a period of five years from that point.

EFFECT ON THE AES CEDAR BAY PROJECT

The AES project which is currently under review for permitting plans to use the ambient impacts of shutting down several units at Seminole Kraft in their air quality analysis. How will the proposed permit amendment by Seminole Kraft affect the AES project?

Thank you for the opportunity to review and comment on this proposal by Seminole Kraft. If you have any questions or comments on this matter, please do not hesitate to contact Mr. Gregg Worley of my staff at 404/347-2864.

Sincerely yours

Jewell A. Harper

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

DEPARTMENT OF HEALTH, WELFARE
& BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services

CITY OF JACKSONVILLE, FLORIDA ®

March 22, 1990

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

Re: Seminole Kraft Corporation (SKC) letter dated February 16, 1990

Dear Mr. Fancy:

The Bio-Environmental Services Division staff has carefully reviewed the requested permit revisions in the above-captioned letter. It is the recommendation of our Division that the permit modification be denied for the following reasons:

A. Inserting a statement in a construction permit to address the issue of not constructing the source for which the permit was issued is not appropriate. Rule 17-2.210 (1), Florida Administrative Code (FAC) provides that "...The construction permit shall be issued for a period of time sufficient to allow construction or modification of the source..." Since SKC has stated in a Variance Request that construction will not take place, the new recovery boiler permit is not required, nor should it be allowed to continue, since available ambient increment is used by the permit for a source which, by admission of the applicant, will not be constructed.

   Rule 17-2.210 FAC (Permits Required) requires applicable permits for sources of air pollution, however; based on information available to BESD, the proposed recycling operation will not be expected to be a source of air pollution and, therefore, will not be required to obtain a construction permit.

B. Creditable Emissions - The shutdown of sources at SKC for the construction of the new recovery boiler and the Applied Energy Systems (AES) co-generation facility has been an integral part of the permitting process for both of the new projects. Direct emission reductions, modeling to determine ambient pollutant concentrations, and permit stipulations have all involved the shutdown of these sources. A permit to construct the recovery boiler has been issued and accepted by the applicant, which includes the use of creditable emissions.

   Based upon the information which is available to the BESD at this time, there are no creditable emissions for future use.

It is noted that BESD does not see this decision as an impediment to the future construction of a steam-producing boiler at the Seminole Kraft facility, should the need arise. A new boiler would be subject to the New Source Performance Standards (NSPS) and possibly subject to the Prevention of Significant Deterioration (PSD) or New Source Review requirements, thus adequately protecting air quality standards.

C. Compliance with Total Reduced Sulfur rule — It is suggested that if SKC does proceed with the recycling project and does not construct the new recovery boiler, a determination should be made as to the compliance status of the Seminole Kraft Corporation facility in regard to compliance with the May 12, 1989, TRS compliance date stated in Rule 17-2.960, FAC.

If BESD may be of further assistance in this matter, please advise.

Very truly yours,

Jerry E. Woodz for

James E. Manning, P.E.
Deputy Director

cc: Andy Kutyna, P.E., DER
BESD File 2155 A

JLM:gw

[illegible]
[illegible]
[illegible]
[illegible]

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

March 20, 1990

Mr. Pradeep Ravel, P.E.
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Subject: Additional Information requested in phone conversation with Curt Barton.

Dear Mr. Ravel:

Enclosed are copies of the support documents you requested from Mr. Barton.

If you need other information, please contact us.

Sincerely,

Michael L. Riddle
Environmental Supervisor

pt

attachments

cc: Curt Barton
Terry Cole
John Fowler
L.A. Stanley

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

February 16, 1990

RECEIVED

MAR 16 1990

DER - BAQM

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

This letter is to request an amendment to construction permit No. AC16-168607 (Kraft Recovery Boiler) for our mill in Jacksonville. As indicated earlier, Seminole Kraft has engaged in extensive engineering studies related to the proposed new recovery boiler installation as well as examining how best to position the mill for the future. These studies have concluded that the mill is a high cost operation in its current configuration and would remain so even after the installation of the new recovery boiler currently estimated to cost $130,000,000.

Accordingly, three months ago, Seminole Kraft began an investigation to determine what technology alternatives to the recovery boiler project might provide an improved environment to the City of Jacksonville and a mill that would be more competitive in domestic and foreign markets in the future.

An alternative has been tentatively selected that will provide the business with the stability required to insure a long term viable operation. This alternative provides for reconfiguration of the existing mill to enable it to use 100% recycled fiber instead of virgin fiber to produce 1,200 tons per day of linerboard on our existing No.2 paper machine. The kraft pulp mill, old recovery boilers and associated facilities will be permanently shut down and the No.1 paper machine will be placed on cold standby. This alternative will result in the elimination of all regulated TRS (odor) emission sources prior to the stated November 12, 1992 deadline as well as substantial reductions in particulate emissions. This conversion will increase the use of recycled fiber at the mill from about 100 TPD to about 1,400 TPD and will substantially increase Florida's waste paper recycle rate.

78 months after 5/12/86
17-2.960(1)(d) 2.b.ii.

As we discussed, the best approach to providing regulatory approval of this alternative appears to be an amendment to the specific conditions in the new recovery boiler construction permit. We believe this new condition should relieve Seminole Kraft of the obligation of building a new recovery boiler if Seminole chooses to shut down the kraft pulping operation, old recovery boilers and related facilities by supplying recycled fiber to the paper machine instead of virgin wood pulp from the kraft pulp mill. In addition, this new condition would require Seminole Kraft to turn in the operating permits for the old recovery boilers once the recycle operation is up and running and to make the old recovery boiler incapable of operation. We believe this specific condition should also provide the mechanism for retaining the recovery boiler creditable emission reductions for potential use by Seminole Kraft pursuant to 17-2.500(2)(e) 3 & 4. As noted, our No.1 paper machine (presently making bag paper) will be placed on cold standby for the time being. However we hope to develop a project to use recycle fiber on the No.1 paper machine in the future and if AES cannot supply the required steam, we would like to use the creditable emissions from the recovery boilers for a power boiler to supply steam to the No.1 paper machine.

Finally, this specific condition should provide for notice to DER of Seminole Kraft's final decision to pursue this alternative or proceed with the new recovery boiler by a date certain.

To facilitate development of the language for this amendment, we have prepared the draft specific condition shown below for your consideration.

15. Seminole Kraft Corporation has indicated to the Department that as an alternative to replacing the three existing kraft recovery boilers with a new recovery boiler, it may choose to convert the mill to a 100% recycle fiber operation and close down the kraft pulp mill, recovery boilers and associated facilities. In the event that Seminole Kraft chooses this alternative, the following conditions apply:

    a. The existing kraft pulp mill, including three recovery boilers, three smelt dissolving tanks, digester system, three lime kilns and three multiple effect evaporators, will be permanently shut down and be made incapable of operation by November 12, 1992. Operating permits for these sources shall be turned into the BESD office by this same date.

b. Notice of Seminole Kraft's decision to proceed with construction of a new recovery boiler or to convert the mill to 100% recycle fiber operation shall be provided to DER and BESD by May 1, 1990.

c. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation, it shall submit semi-annual progress reports to DER and BESD by June 30 and December 31 of each year until the recycle fiber project is completed and in operation.

d. If Seminole Kraft chooses to convert the mill to 100% recycle fiber operation and shuts down the kraft pulp mill sources listed in a. above, the following creditable emission reductions are available to Seminole Kraft for five (5) years from the date construction on this alternative is complete or November 12, 1992, whichever is earlier.

CREDITABLE EMISSION REDUCTIONS (TPY)
(1983-84)*

Source	TSP	PM_{10}	SO_2	NO_x	CO	TRS
3 existing Recovery Boilers	427.2	320.5	1481	321.1	2327.2	89.3
3 Existing Smelt Dissolving Tanks	122.6	109.7	8.6	-	-	8.9
3 Existing Lime Kilns	74.1	72.6	1.4	98.1	21.2	17.3
No.1 & No.2 Lime Slaker (shut down in 1988)	140.5	133.0	-	-	-	-
No.3 Lime Slaker	14.0	12.8	-	-	-	-

*Note that emissions for the recovery boilers, smelt dissolving tanks, and lime slakers are the same as in the PSD construction permit application (see Attachment A). The emissions for the lime kilns are based on 1983-84 operating hours, but today's control technology/emission limits. See Attachment B for details.

We hope this information will be adequate to proceed with processing the proposed amendment. Please let us know if you require any additional information. We would be happy to meet with the Department to help expedite the handling of this matter.

Sincerely,

L.A. Stanley

L.A. Stanley
General Manager

ah

CC: Steve Smallwood
Dale Twachtmann
James L.Manning
Richard Maguire
Mike Riddle
Curt Barton
Al Koleff
P. Raval
B. Andrews
M. Finn
A. Kutyna, NE Dist
N. Aronson, EPA
C. Shaver, NPS
CHF/JKP/BT

ATTACHMENT A

(Table 4-3 from Original Recovery Boiler PSD Appliciation)

Table 4-3 Baseline Emissions (1983-1984) from Existing Recovery Boilers and Smelt Dissolving Tanks at Seminole Kraft

Pollutant	Annual Baseline Emissions (TPY)						
	RB1	RB2	RB3	SDT1	SDT2	SDT3	Totals
Particulate Matter (TSP)	143.8	144.4	139.0	31.3	48.4	42.9	549.8
Particulate Matter (PM10)	107.9	108.3	104.3	28.0	43.3	38.4	430.2
Sulfur Dioxide	429.5	519.8	531.7	2.5	3.0	3.1	1,489.6
Nitrogen Oxides	94.4	112.7	114.0	-	-	-	321.1
Carbon Monoxide	674.9	816.8	835.5	-	-	-	2,327.2
Volatile Organic Compounds	100.0	119.4	120.8	-	-	-	340.2
Total Reduced Sulfur	25.2	31.3	32.8	2.6	3.1	3.2	98.2
Lead	.012	0.13	0.12	-	-	-	0.37
Mercury	-	-	-	-	-	-	-
Beryllium	0.0090	0.0098	0.0090	-	-	-	0.0278
Sulfuric Acid Mist	6.18	6.76	6.19	-	-	-	19.1
Inorganic Arsenic	-	-	-	-	-	-	-
Fluorides	-	-	-	-	-	-	-
Asbestos	-	-	-	-	-	-	-
Vinyl Chloride	-	-	-	-	-	-	-

Note: TPY = tons per year

ATTACHMENT B

Basis for Lime Kiln Creditable Emissions

Particulate Emissions - actual data from 1983-84 Annual Report
PM_{10} - used AP-42 Table 10.1-4 and particulate emissions from 1983-84 Annual Report.
NO_x used NCASI Technical Bulletin No. 107, April 1988

Kiln No.	mmBTU/Year		Tons No_x/Year		Average
	83	84	83	84	
1	156150	89535	12.5	7.16	9.8
2	241883	322084	37.5	49.9	43.7
3	267245	308848	41.4	47.9	44.6
				Total	98.1

TRS emissions calculated from actual gas flow rates in 1983-84 and at 20 ppm TRS as H_2S. This would correspond to permit limit today.

CO used AP-42 Table 10.1-1 (0.1 lbs/ADUP)

Year	Pulp Produced (Tons-ADUP/Year)		CO Emissions (TPY)
1983	410,238		20.5
1984	436,032		21.8
		Avg.	21.2

For SO_2-use data compiled in 1989's operating permit application.

Kiln	SO_2 Emission Rate	Avg. Hours of Operation	SO_2 (TPY)
No.1	0.16 lb/hr	3882	0.31
No.2	0.06 lb/hr	6829	0.21
No.3	0.24 lb/hr w/noncondensibles	7462	0.90
		Total	1.42

PM
1-7-91
Jacksonville, FL

General File

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

RECEIVED
JAN 9 1991
DER - BAQM

January 4, 1990

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

Subject: **Progress Report on OCC Conversion as Required for Construction Permits AC16-168607 and AC16-144791.**

Dear Mr. Fancy:

This letter is to comply with Specific Condition 15(c) of Construction Permit AC16-168607 and Specific Condition 11 of Construction Permit AC16-144791 that Seminole Kraft provide the Department with semi-annual progress reports to DER and BESD regarding our progress toward converting the mill to 100% recycle fiber.

As indicated earlier, Seminole has decided to convert the mill to 100% recycle fiber operation. We have ordered all long delivery equipment including:

1- New paper machine rolls
2- Repulpers for OCC
3- Cleaners for OCC
4- Flotation and dispersions systems for OCC
5- New paper machine winder
6- New pumps and motors

Engineering is progressing well and we expect to begin construction by March 1, 1991 as scheduled. We still anticipate startup in the summer of 1992.

Please let us know if you have any questions.

Sincerely,

Michael L. Riddle
Manager, Technical Services

/pt

cc: James Manning - BESD
Ernest Fry - FDER - Northeast District

IQS Innovation Quality Service

January 4, 1990

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JAN 04 1990

DER - BAQM

Mr. Hamilton S. Oven
Administrator, Siting Coordination Section
Division of Air Resources Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Buck:

This letter is to serve as formal notification of the withdrawal of the kraft recovery boiler, multiple effect evaporators, smelt dissolving tanks and associated facilities from the Cedar Bay Cogeneration Project's Site Certification Application. This deletion is at the request of Rich Maguire, counsel for the City of Jacksonville, and Betsy Hewitt, counsel for the FDER, since these sources are being permitted separately.

The SCA sections primarily affected by this action include the Preface, 3.4 Air Emissions and control, 5.6 Air Quality Impacts, 10.1.4 Coastal Zone Management Certification, 10.6.1 Application to Operate/Construct Air Pollution Sources, and 10.9 Kraft Recovery Boiler BACT Analysis.

Seminole Kraft Corporation remains a joint applicant with AES Cedar Bay. This deletion is intended to simplify the review of the SCA, the certification hearing, and the preparation of the conditions of certification.

Sincerely,

Jeffrey V. Swain

Jeffrey V. Swain
Project director

AES/CedarBay Inc.

1001 North 19th Street • Arlington, Virginia 22209 • (703) 522-1315 • Telecopier—(703) 528-4510

United States Department of the Interior
FISH AND WILDLIFE SERVICE

MAILING ADDRESS:
Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225

STREET LOCATION:
134 Union Blvd.
Lakewood, Colorado 80228

IN REPLY REFER TO:

RW Air Quality
Mail Stop 60130

RECEIVED

DEC 26 1989

DER - BAQM

Mr. C.H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

We have reviewed the information you forwarded to us regarding the proposed modification to Seminole Kraft Corporation's (Seminole) kraft pulp and paper mill in Jacksonville, Florida. The mill is located approximately 55 km southeast of Okefenokee Wilderness Area, a class I area administered by the U.S. Fish and Wildlife Service. We appreciate your continued cooperation in notifying us of projects that have the potential to impact the air quality or air quality related values of our class I lands.

We understand that total mill-wide emissions as a result of the modification will decrease for carbon monoxide -160 tons per year (TPY), particulate matter -12.6 TPY, lead -0.16 TPY, beryllium -0.012 TPY, sulfuric acid mist -5.8 TPY, and volatile organic compounds (VOCs) -92.3 TPY. Emissions of sulfur dioxide will increase 6.4 TPY, and nitrogen oxides (NO_x) will increase 349.1 TPY. Under the PSD regulations only the increase in NO_x is considered to be significant, and consequently PSD review is required for that pollutant.

Seminole performed an analysis of the class I nitrogen dioxide (NO_2) increment. It predicted that 0.016 ug/m^3 of the annual increment would be consumed. This represents less than one percent of the allowable PSD NO_2 increment of 2.5 ug/m^3. Based on this relatively minor increase in the existing NO_2 level at Okefenokee Wilderness Area, the NO_x emissions resulting from the proposed modification should not significantly impact the air quality related values of the wilderness area.

We recommended to your staff that the NO_x emission limitation for the new recovery boiler proposed by Seminole be at least as stringent as that required for other recovery boilers proposed elsewhere. We are pleased to see that in the draft permit the State has lowered the NO_x limit from the 180 ppm proposed by Seminole to 75 ppm, a rate comparable to the other recovery boilers. This is consistent with EPA's "top down" approach, and we commend the State for requiring the lower limit.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
POST OFFICE BOX 25486
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

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CH Fancy, PE, Deputy Chief
Bureau of Air Quality Mgmt
FL Dept. Environmental Reg.
Twin Towers Office Bldg
2600 Blair Stone Rd
Tallahassee, FL 32399-2400

TAKE PRIDE IN AMERICA

115

Seminole and the State conducted a visibility screening analysis using the VISCREEN model from the Environmental Protection Agency's Workbook for Plume Visual Impact Screening and Analysis (September 1988). It was concluded that the proposed facility would not cause an adverse impact on visibility in Okefenokee Wilderness Area. This conclusion is too broad for the type of model that was used. VISCREEN is a plume visual impact screening model intended for use in evaluating the potential for visibility impairment due to plume impacts. In this case the results allow a conclusion that there is low potential for visibility impairment due to plumes in the class I area as a result of emission from the proposed modification.

Regardless of the VISCREEN results for plume impacts, the potential of the proposed source to contribute to the most insidious visibility problem in the south and east still exists. Regional haze is a problem that impairs visibility in the wilderness area and the surrounding region. Visibility in the eastern U.S. has degraded steadily since the early 1950's, with the most dramatic changes occurring in the summer months (Husar et al. 1981). Near a source (within 100km), such as an urban center, powerplant or other industrial facility, haze is a mixture of gases and secondary aerosols. Gaseous "precursor" emissions from a source are converted through very complex reactions into secondary aerosols. Sulfur oxides convert into sulfuric acid and ammonium sulfate, nitrogen oxides convert to nitric acids and ammonium nitrate, and hydrocarbons become organic aerosols (Malm et al. 1989). In most cases, it is not presently possible to estimate the contribution of an individual source to regional haze. However, monitoring and modeling studies that are being conducted presently may provide a means of assessing the contribution of individual sources to regional haze. In the meantime, we encourage the State of Florida to take all steps possible to reach national and State visibility goals by limiting pollutants, such as SO_2, NO_x and VOCs, that contribute to visibility degradation not only in the class I area but in the whole region.

If you have any questions regarding this matter, please contact Bud Rolofson of our Air Quality Office at (303) 969-2071.

Sincerely,

Ralph F. Fries

Ralph F. Fries
Acting Assistant Regional Director
Refuges and Wildlife, Region 6

cc: P. Rawal
B. Andrews
M. Linn
CHF/BT

PM
12-21-89
Jax, FL

File Copy

DEPARTMENT OF HEALTH, WELFARE
& BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services

CITY OF JACKSONVILLE, FLORIDA ®

December 21, 1989

RECEIVED

DEC 22 1989

DER - BAQM

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

RE: CONSTRUCTION PERMITS - SEMINOLE KRAFT CORPORATION
KRAFT RECOVERY BOILER (AC16-168607)
SMELT DISSOLVING TANK (AC16-168608)
MULTIPLE EFFECT EVAPORATOR (AC16-168609)

Dear Mr. Fancy:

Bio-Environmental Services Division (BESD) has reviewed Seminole Kraft Corporation's (SKC) letter dated November 30, 1989, submitted as comments to the Intent to Issue of the above referenced construction permits. BESD provides the following comments regarding SKC's letter:

1. BESD does not object to allowing submission of written reports of compliance testing within 45 days of test completion. However, reports must be received by BESD no later than the final compliance date, November 12, 1992.

2. The existing sources must be permanently shut down and the operating permits must be surrendered by the final compliance date. These sources should be disabled such that they are inoperable at any time. BESD does not object to the deletion of "and dismantle".

3. Rule 17-2.100(122) defines modification.

4. Pursuant to SKC's TRS compliance plan dated October 16, 1987, final compliance will be accomplished not later than November 12, 1992. To achieve compliance, BESD requires that all written reports demonstrating final compliance be received no later than November 12, 1992. Any expiration date set beyond November 12, 1992 would place SKC in violation of their TRS Compliance Plan.

5. BESD concurs with the DER BACT determination for NO_X.

Any questions in this matter should be directed to the undersigned at 904/630-3666.

Very truly yours,

Ronald L. Roberson

Ronald L. Roberson
Associate Engineer

RLR/ns

cc: Mr. A. Kutyna, P.E., DER
BESD File 2155-A
BESD Air Permitting File
Mr. L. A. Stanley, Seminole Kraft Corporation

Disc 2/23

BT/JP
Pradeep Raval
Barry Andrews
Max Linn

12-26-89 Rm

Stone Container Corporation

Technology and Engineering

Containerboard and Paper Division

2150 Parklake Drive
Suite 400
Atlanta, Georgia 30345
404 621-6700

RECEIVED
DEC 21 1989
DER - BAQM

December 15, 1989

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

Dear Mr. Fancy:

This is a follow-up to the meeting at your offices on December 13, 1989 regarding the permit for Seminole Kraft's new recovery boiler. At that meeting, your staff indicated that the Department felt the draft permit should be modified to require continuous emission monitoring for NO_x and that compliance with the NO_x emission limit of 75 ppm (8% O_2) would be tied in some fashion to the continuous emission monitor rather than just the traditional compliance test. As indicated at the meeting, we do not believe this is appropriate.

First, Seminole Kraft only agreed to lowering the BACT NO_x emission limit to 75 ppm because your staff previously indicated that the Department might be willing to place a re-opener clause in the permit for NO_x should the 75 ppm (based on a compliance test, not CEMs data) prove to be unattainable. Based on discussions at the meeting, the Department now believes a re-opener is inappropriate although you did indicate a request to raise the NO_x emission limit in the future would be given serious consideration. As stated previously, we still feel there is considerable doubt regarding the achievability of the 75 ppm NO_x emission limit even though several recent construction permits have established BACT emission limits at or below this level. Until these new recovery boilers actually begin operation and have run compliance tests, no one will really know if 75 ppm or lower is generally achievable.

Secondly, if we do not really know if the 75 ppm NO_x emission limit is achievable using a single compliance test, we certainly have no reason to believe a new recovery boiler could meet 75 ppm using a continuous emission monitor. Further, none of the recent construction permits issued has required a NO_x continuous emission monitor and, hence, none of these permits requires those recovery boilers to meet 75 ppm NO_x or lower based on CEMs. We have checked with the following companies regarding recent recovery boiler permits and NO_x CEMs were not required.

Stone Container Corporation

Containerboard and Paper Division
2150 Parklake Drive
Suite 400
Atlanta, Georgia 30345

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

Champion; Courtland, Alabama - No NO_x CEMs required
Louisiana Pacific; Samoa, California - No NO_x CEMs required
Mead; Cottonton, Alabama - No NO_x CEMs required
Consolidated; Wisconsin Rapids, WI - No NO_x CEMs required
James River; St. Francisville, La - No NO_x CEMs required
James River; Camas, Washington - No NO_x CEMs required
Union Camp, Eastover, SC - No NO_x CEMs required
Willamette, Bennetsville, SC - No NO_x CEMs required

NO_x compliance on all of these recovery boilers was either not specified or was the traditional compliance test. Some only required an initial compliance test with no ongoing frequency other than at the state's discretion.

Accordingly, Seminole Kraft continues to have reservations regarding the 75 ppm NO_x emission limit even using a traditional compliance test and even more serious concerns if continuous emission monitoring is used in any way to determine compliance. We request that DER drop continuous emission monitoring for NO_x from further consideration.

Please let us know if you have any questions.

Very truly yours,

STONE CONTAINER CORPORATION

Curtis A. Barton

Curtis A. Barton
Manager, Environmental Affairs

CAB/ss

cc: L.A. Stanley
M. Riddle
T. Cole
A. Koleff
P. Raval
CHF/BT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET. N.E.
ATLANTA. GEORGIA 30365

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DER - BAQM

REF: 4APTM/APB/sch

DEC 6 1989

Mr. C.H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Technical Evaluation and Preliminary Determination for Seminole Kraft (PSD-FL-141)

Dear Mr. ~~Fancy~~: Clair

We have reviewed your November 22, 1989, submittal of the above referenced Prevention of Significant Deterioration (PSD) package and offer the following comments which were discussed on November 29, 1989, between Mr. Pradeep Raval of your staff and Mark Armentrout of my staff.

We concur with the Florida Department of Environmental Regulations's (DER) BACT determination for oxides of nitrogen (NO_x) from the new recovery boiler.

Permit No. AC 16-168607 (Recovery Boiler), Specific Condition 3, is written twice. We also recommend that the fuel oil limitation contained in this provision be made enforceable by removing the "anticipated amount" and replacing this language with an enforceable cap on annual usage. There also appears to be typographical error in this provision in specifying the maximum heat input. Rather than 1,125,000 Btu/hr, the limit should be 1,125,000,000 Btu/hr (1,125 mmBtu/hr).

We appreciate the opportunity to provide comments on this PSD package. If you have any questions, please contact Mark Armentrout of my staff, at (404) 347-2864.

Sincerely yours,

Thomas J. Hansen for

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

cc: Mr. L.A. Stanley
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218

copied: P. Raval
B. Andrews
M. [illegible]
A. Kutyna, NE Dist
S. Pace, BESD
C. Shaver, NPS
CHF/BT

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
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Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

December 4, 1989

RECEIVED
DEC 06 1989
DER - BAQM

Mr. Clair H. Fancy, P.E.
Fl. Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399

Dear Mr. Fancy:

Enclosed is the legal notice of publication for the notice of intent to issue the recovery boiler, multiple effect evaporator, and smelt dissolving tank permit No.2 AC16-168607, AC16-168609, AC16-168608 and PSD-FL-141.

If you have any questions, please contact me.

Sincerely,

L.A. Stanley

L.A. Stanley
General Manager

ah

attachment

cc: P. Rawal
A. Kutyna, NE Dist.
S. Pace, BESD
J. Aronson, EPA
C. Shaver, NPS

Seminole Kraft Corporation

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

JACKSONVILLE FL DEC -4'89

Mr. Clair H. Fancy P.E.
Fla. Dept. of Environmental Regulations
2600 Blair Stone Road
Tallahassee, FL 32399

FLORIDA PUBLISHING COMPANY

Publisher

JACKSONVILLE, DUVAL COUNTY, FLORIDA

STATE OF FLORIDA
COUNTY OF DUVAL

Before the undersigned authority personally appeared Victoria Evans ______ who on oath says that he is Retail Advertising Assistant of The Florida Times-Union, a daily newspaper published at Jacksonville in Duval County, Florida; that the attached copy of advertisement, being a Legal Notice

in the matter of Notice of Intent to Issue

in the ______ Court,

was published in THE FLORIDA TIMES-UNION in the issues of Nov. 29, 1989

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

Sworn to and subscribed before me this ....29th.......... day of ...Nov...... A.D. 1989

Victoria Evans

....
Notary Public,
State of Florida at Large.

My Commission Expires ....

DA 444

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue construction permits to Seminole Kraft Corporation (SKC), 9469 Eastport Road, Jacksonville, Florida 32218, to replace the three existing kraft recovery boilers (RBs), Nos. 1, 2 and 3; three existing smelt dissolving tanks (SDTs), Nos. 1, 2, and 3; and three existing sets of multiple effects evaporators (MEEs), Nos. 1, 2, and 3; with a new RB, a new SDT, and a new set of MEEs. SKC is proposing these changes to comply with the TRS (total reduced sulfur compounds) Compliance Plan previously submitted. The project will be located at the existing Seminole Kraft facility in Jacksonville, Duval County, Florida.

There will be a net increase in the emissions of nitrogen oxides (NOx) from the recovery boiler for which a Best Available Control Technology (BACT) determination was required. The Class I NOx increment consumed is 0.016 ug/m3, of the allowable 2.5 ug/m3 (representing about 0.6%, annual basis). There is no Class II NOx increment consumed by this project. The maximum combined pollutant concentrations from the proposed project and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination/hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

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

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

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

Division of Bio-Environmental Services
421 Church Street, Room 412
Jacksonville, Florida 32206

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

November 30, 1989

Mr. Clair H. Fancy. P.E.
Bureau of Air Regulation
Florida DER
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

Seminole Kraft Corporation has reviewed Florida DER's preliminary determination to issue a construction permit for a new recovery boiler (AC16-168607), smelt dissolving tank (AC16-168608) and multiple effect evaporator (AC16-168609) at our mill in Jacksonville. We would like to provide the Department with a number of comments regarding the proposed permits.

First, we would like to make a number of comments that apply to conditions which are similar (although not the same number) in all three permits. All three permits contain the specific condition that written reports of compliance testing be submitted to the BESD office within 30 days of test completion. All our existing permits provide 45 days for such submittal. We request the Department modify specific condition 10 or 11 in each permit to allow 45 days. This is particularly important for the SO_2 and NO_x testing required by these permits which will be conducted by outside contractors which are very busy and cannot always be depended on to give quick report turn around.

Each permit also contains a condition that we permanently shut down and dismantle the old sources that each new source is replacing. We understand that these old sources must be permanently shut down and that the operating permits for these old sources must be surrendered to the Department. However, we have no plans to immediately demolish these sources due to the very large expense of such an undertaking. Therefore, we request that the Department remove the words "and dismantled" from this specific condition in each of these permits.

Further each permit contains a specific condition that requires prior approval to be obtained for any change in the method of operation, raw material and chemicals processed, equipment, or operating hours pursuant to F.A.C. Rule 17-2.100. We request the Department revise this permit condition pursuant to Rule 17-2.100(119), so that prior approval is required only when there are actual emission increases associated with such changes.

We note that the expiration date for these construction permits is November 12, 1992 which is the final compliance date under the TRS rule. We understand that a compliance test demonstrating compliance with this rule must be completed by November 12, 1992. However, this construction permit should be allowed to run an adequate time beyond that date to allow submission of the application for an operating permit and the compliance test report as well as the time allowed in the rules for the Department to issue the operating permit for these new sources. Therefore, at a minimum, this construction permit expiration date should be extended from November 12, 1992, to April 1, 1993 (45 days for submitting compliance report and application for operating permit plus the 90 days allowed for the Department to issue an operating permit). This change in expiration date in each permit will allow us to comply with specific condition 13 or 14 (depending on which permit) which requires that we make application for an operating permit 90 days prior to the expiration date of the construction permit.

Specific Condition 13 or 14 in each permit requires that we file an application for an operating permit at least ninety (90) days prior to the expiration date of the construction permit for each source or, within forty-five (45) days after completion of the compliance test, whichever occurs first. Assuming the expiration date is changed to April 1, 1993, as indicated above, we have no problem with the 90 day requirement. However, we do not believe DER's rules require that an application for an operating permit be submitted within 45 days of performing a compliance test and, therefore, we request that DER remove this requirement from Specific Condition 13 or 14 of each construction permit.

We have a number of comments which only apply to the recovery boiler permit. First, as previously discussed with Mr. Andrews, we have a great deal of concern regarding the Department's BACT determination for NO_x. We certainly agree that recovery boiler technology has apparently improved to the point that the 180 ppm for NO_x indicated in our application is unnecessarily high. However, while we and the Department are aware that recovery boiler permits have been issued over the last year that contain NO_x limits in the 50 to 75 ppm range, there is great concern on the part of the recovery boiler manufacturers that these extremely low NO_x levels will not be achievable in some circumstances as the chemistry of individual mill recovery systems are quite different. We have notified all potential recovery boiler suppliers that we now require the NO_x emissions to meet 75 ppm (8% O_2), but we do not yet have written responses from each indicating their agreement to warranty such a low level and what caveats will come with such warranties. Accordingly, as discussed with Mr. Andrews, Seminole Kraft requests that the Department add a reopener clause to the NO_x BACT determination which would allow us to request a modification to the NO_x limit if after best efforts to meet this very stringent limit, we and the recovery boiler manufacturer conclude the 75 ppm limit is not achievable.

There is an apparent typo in the Specific Condition #3. The heat input should read 1,125,000,000 BTU/hour. We also note that Specific Condition #3 appears twice.

In Specific Condition #7, the Department is requiring a recorder for the read out from the CEMS. We plan to use a microprocessor to collect CEMS data and hard copy will be recorded using a computer printout. We assume this will satisfy the requirement for a recorder.

Specific Condition #7 requires the Oxygen monitor to have the span set at 20% O_2. We believe this should be 20.8% or 21% to more accurately reflect the O_2 content of ambient air.

The following comment pertains to smelt dissolving tank permit Specific Condition #3 which requires that visible emissions from the smelt dissolving tank be less than 20% opacity. As the Department knows, this is a wet source and, as such, opacity is not really meaningful. Therefore, we request that DER delete the opacity requirement from the smelt dissolving tank permit or alternatively add to Specific Condition #3 as shown below:

> Visible Emissions (VE):
>
> If the Department observes visible emissions using EPA Method 9 pursuant to F.A.C. Rule 17-2.700(6)(b)9 in excess of 20% opacity, it shall be considered good

> reason to believe that the applicable mass emission standard is in danger of being violated. The permittee shall be required to run a special compliance test in accordance with F.A.C. Rule 17-2.700(2)(b). Such test shall be conducted within 14 days after the Department has notified the permittee of the applicability of this permit condition.

The following comments apply to the multiple effect evaporator permit. We note Specific Condition #3 requires that the TRS gases from the multiple effect evaporator be combusted in the No.2 or No.3 lime kiln and further, that these gases be subjected to a minimum temperature of 1200°F for at least 0.5 second. Indeed, the TRS rule only requires that these gases be incinerated in a lime kiln and that the lime kiln TRS emissions continue to meet the 20 ppm TRS limitation applied to them by the TRS rule. Therefore, we request that DER remove the requirement that the TRS gases from the multiple effect evaporators be subjected to 1200°F for 0.5 second as this is not authorized by DER regulations.

Finally, we have noted a calculation error in DER's BACT determination for NO_x. DER should have used a heat value for black liquor (wet basis) of 4522 BTU/lb and a feed rate of 248,800 lb/hr (wet basis). This produces a heat input of 1,125,000,000 BTU/hr. Then the NO_x emissions/mmBTU = 369.3/1,125 = 0.33 lb NO_x/mmBTU.

We appreciate this opportunity to comment on these proposed construction permits. Please let us know if you have any questions.

Sincerely,

L.A. Stanley
General Manager

ah

CC: Bill Thomas
Pradeep Ravel
Barry Andrews
Terry Cole
Curt Barton
Mike Riddle
A. Kutyna, NE Dist.
J. Pace, BESD
A. Aronson, EPA
C. Shaver, NPS
CHF/BT

PM
11-6-89
Atlanta, Ga

File Copy

AC 16-168607
168608
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PSD-FL-141

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET. N.E.
ATLANTA. GEORGIA 30365

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4APT-APB-cdw
NOV 3 1989

Mr. David A. Buff, M.E., P.E.
Principal Engineer
KBN Engineering and Applied Sciences, Inc.
Post Office Box 14288
5700 S.W. 34th Street
Gainesville, Florida 32604

Dear Mr. Buff:

We have received your October 2, 1989, letter in which you requested our position regarding the use of leftover netting credits from a modification at Seminole Kraft's pulp mill located in Jacksonville, Florida. To fully address your questions, we have requested the assistance of the New Source Review Section at our Headquarters Office of the Environmental Protection Agency (EPA). Enclosed with this letter, please find a copy of our October 27, 1989, memorandum to EPA Headquarters. Also note that we have requested Headquarters to answer other related questions in addition to the ones raised in your October 2 letter.

On a related issue, we would like to express our concerns with the proposed modification in general. As our information indicates, Seminole Kraft has jointly applied with AES Cedar Bay, Inc., (Cedar Bay) to perform several modifications: Namely, to construct a new kraft recovery boiler and smelt tank (while simultaneously shutting down three old recovery boilers and smelt tanks) and also to construct a new power facility using circulating fluidized bed (CFB) boilers. The new recovery boiler/smelt tank would be owned and operated by Seminole Kraft while the new power facility would be owned and operated by Cedar Bay. Our review of the application for the Site Certification submitted jointly by Seminole kraft and Cedar Bay indicates that netting credits from the shutdown of existing pulp mill sources are being used for both the new recovery boiler/smelt tank and the new power facility modifications. EPA Region IV disagrees with this action because netting credits can only be applied within a "facility", which is defined under federal regulations as: "all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office stock numbers 4101-0066 and 003-005-00176-0, respectively.)"

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
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Mr. Clair Fancy, P.E., Deputy Chief
Bureau ~~of Air Quality~~ Management
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

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The modifications to the Seminole Kraft pulp mill are categorized under the "Major Group" 26-Paper and Allied Products. The cogeneration project is categorized under the "Major Group" 49-Electric, Gas, and Sanitary Services. Moreover, it is clearly stated in the Site Certification Application that the new recovery boiler/smelt tank will be owned and operated by Seminole Kraft, and the new power facility will be owned and operated by Cedar Bay. Based on these facts, we have concluded that Seminole Kraft and Cedar Bay are two separate and distinct facilities and may not "net" interchangeably under the Prevention of Significant Deterioration (PSD) rules. However, for purposes of nonattainment new source review (NSR) requirements, offset credit may be used by either facility as long as the reductions in volatile organic compound (VOC) emissions are made federally enforceable. Offset credit should not be confused with "netting" as defined under both sets of regulations, i.e., in determining applicability.)"

In summary, please be advised that we are attempting to obtain a written determination from our Headquarters Office in answering your question. We will transmit a copy of their response to you upon our receipt.

If you have any questions concerning this matter, please call Mark Armentrout of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

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

Enclosure

cc: Clair Fancy
Florida DER

BT / CHF
Pradeep Raval
Barry Andrews
Max Linn
Steve Pace - BESD
Mort Benjamin NE Dist.

11-9-89 RAN

YELLOW FILE COPY.

MEMORANDUM

DATE: OCT 27 1989

SUBJECT: Use of Leftover Netting Credits

FROM: Bruce P. Miller, Chief
Air Programs Branch

TO: Gary McCutchen, Chief
New Source Review Section (MD-15)

We have been asked by KBN Engineering and Applied Sciences, Inc., a consulting firm representing the Seminole Kraft Company, to provide EPA's policy for addressing leftover emission credits not used during a netting transaction. Based on our conversations with other Regional Offices, it would appear that there is some inconsistency in EPA's position on this matter.

As you will see from the attached letter from KBN (October 2, 1989), Seminole Kraft is proposing to construct a new recovery boiler and smelt dissolving tank at its existing kraft pulp mill located in Jacksonville, Florida. As part of the project, three existing recovery boilers and smelt dissolving tanks will be shut down to generate contemporaneous emission decreases. From the table attached with KBN's letter, there will be a net decrease of several pollutants and a significant net emissions increase for only oxides of nitrogen. The Florida Department of Environmental Regulation (DER) has taken the position that the leftover emission decreases may not be carried over to be used in future netting/offsetting transactions and that the slate is wiped clean for those pollutants. This is based on their interpretation of 40 CFR 51.166(b)(3)(iii) which states that... "An increase or decrease in actual emissions is creditable only if the reviewing authority has not relied on it in issuing a permit for the source under regulations approved pursuant to this section, which permit is in effect when the increase in actual emissions from the particular change occurs."

In your review of this matter, we ask that you address the following questions:

1. Can the facility use the leftover contemporaneous emission reductions in future netting transactions? If yes, can these emission credits be sold or otherwise used by a separate facility (with a different major SIC number) under any circumstances? For example, if a new major power plant under separate ownership would locate on Seminole kraft property for the purpose of supplying power both to the pulp mill and to other facilities, could the leftover emission credits be used by the power plant under any circumstances?

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2. If Seminole Kraft is allowed to use the leftover emission credits in future netting transactions, is the five year netting timeframe opened for all pollutants even though a future modification may be major for only a limited number of pollutants? For example, if a future project involves an increase of 35 tons of sulfur dioxide and 50 tons of particulate matter per year, would the facility be required to perform a PSD review for sulfur dioxide because of the previous contemporaneous increase of 6.4 tons per year?

Since we must provide KBN and the Florida DER a response to these issues as soon as possible, we request that you respond to these questions by November 10, 1989. If you need any additional information, please contact Mark Armentrout of my staff at (FTS) 257-2864.

Attachment

[illegible]/CDW/10/23/89 DOC: 24-MB-GM

KBN

October 5, 1989

RECEIVED

OCT 11 1989

DER - BAQM

Mr. Clair Fancy
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: Seminole Kraft Corporation

Dear Mr. Fancy:

Enclosed you will find revised Table 5-6, from the PSD permit application for the new recovery boiler evaporators and smelt dissolving tank. The subtitles were accidently reversed in the report.

Please excuse any confusion this may have caused.

Sincerely,

David A. Buff

David A. Buff, P.E.

cc: Curt Barton, Stone Container
Terry Cole, Ortel & Hoffman

mla

copied: P. Laval
M. Linn
B. Andrews
M. Benjamin, NE Dist
S. Pace, BESD
N. Aronson, EPA
C. Shaver, NPS

KBN ENGINEERING AND APPLIED SCIENCES, INC.
P.O. Box 14288 5700 SW 34th Street Gainesville, FL 32604 904/375-8000 Telex: 984689 KBN ENG UD

GAINESVILLE, FL 326
PM
19 OCT
1989

89026

Mr. Clair Fancy
Florida Department of Environmental Reg.
2600 Blair Stone Road
Tallahassee, FL 32301

KBN ENGINEERING AND APPLIED SCIENCES, INC.
P.O. Box 14288 5700 SW 34th Street Gainesville, FL 32604

Table 5-6. Predicted Annual NO_x Impacts ($\mu g/m^3$) at Discrete Receptors within the Okefenokee Class I NWR

Existing Recovery Boiler

	Receptor Number 1	2	3	4	5	6	7
1983	.011	.011	.009	.008	.009	.010	.007
1984	.015	.015	.013	.012	.010	.009	.006
1985	.012	.013	.013	.014	.012	.010	.007
1986	.015	.015	.016	.010	.007	.006	.005
1987	.015	.015	.011	.011	.008	.009	.007

Proposed Recovery Boiler

	Receptor Number 1	2	3	4	5	6	7
1983	.021	.023	.019	.020	.020	.020	.015
1984	.027	.030	.025	.023	.020	.019	.015
1985	.022	.027	.023	.027	.024	.019	.014
1986	.023	.027	.030	.026	.018	.015	.011
1987	.027	.026	.024	.023	.019	.018	.015

Clair - For your files

Oertel, Hoffman, Fernandez & Cole, P. A.

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JOHN H. MILLICAN
ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

J. P. SUBRAMANI, PH.D., P. E.
ENVIRONMENTAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

RECEIVED
SEP 14 1989
DER - BAQM

September 14, 1989

Mr. Steve Smallwood, P.E., Director
Division of Air Resources Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Recovery Boiler PSD Application

Dear Steve:

On behalf of Seminole Kraft Corporation (Seminole), I want to thank you and Barry Andrews for meeting with me on September 11 to discuss Seminole's permit applications for a new recovery boiler and associated facilities in Jacksonville. The permit applications are currently under review by the Department. In particular, we discussed the impending urgency for Seminole's requested permits to be expedited in order to meet the November 1992 TRS compliance deadline and the September 8 letter from Mr. Bill Thomas of your staff to Seminole, a copy of which is attached. You stated in your telephone conversation today that the Department now considers Seminole's application complete. This letter will summarize the basis for that conclusion.

1. Contrary to Bill Thomas' letter of September 8, the Department considers Seminole's applications are complete since it has provided requisite information within 30 days after filing its original applications on August 11. We sincerely appreciate the assistance and cooperation provided by Clair Fancy, Barry Andrews, Pradeep Ravel, Bruce Mitchell and other members of your staff for meeting with us on June 6 and August 31 and providing a quick review of the permit applications.

2. All of the items identified in Mr. Thomas' letter of September 8 were discussed at the August 31 meeting. Our response to pertinent items was provided both orally on August 31 and in writing on September 8, and further clarified in writing

on September 11. Copies of these responses are also attached. Based on these, the Department considers that the net emission credit issue and the question of BACT determination on NOx, as identified in Mr. Thomas' letter, are not relevant to the completeness of Seminole's permit applications. However, Seminole is willing to provide additional information that your staff may need in determining appropriate BACT for NOx during the permit review process.

3. The Department will expedite the processing of Seminole's permit applications within the constraints of available resources. As I stated at our meeting and in our telephone conservation today, Seminole has diligently pursued and taken necessary steps to comply with the Department rule on TRS as early as possible. More than two years ago, it entered into agreement with AES to replace its power boilers and recovery boilers. Because of the delays that are being experienced in the approval of AES power plant site certification application, Seminole has again spent a considerable amount of time and effort to obtain the necessary permits and proceed with the construction for no other reason than to comply with the Department TRS rule by November 1992.

Once again, I thank you for your time and attention to this matter.

Sincerely,

JPSubramani

J. P. Subramani

JPS:slw

Attachments

cc: Clair Fancy
Pradeep Ravel
Ernest Frey
Jim Manning
L. A. Stanley
Curt Barton
Terry Cole

Florida Department of Environmental Regulation

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

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

September 8, 1989

RECEIVED

SEP 12 1989

OERTEL, HOFFMAN, FERNANDEZ & COLE, P.A.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. L. A. Stanley
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218

Dear Mr. Stanley:

Re: Seminole Kraft Recovery Boiler Project
AC 16-168607, -168608, -168609, PSD-FL-141

The Department has reviewed your application package dated August 10, 1989, and deemed it incomplete. Please submit the following information including all assumptions, calculations and reference material:

1. Please list all the contemporaneous emission changes at the Seminole Kraft facility, i.e., increases or decreases in emissions since September 1984.

2. What will be the net (before and after) SO_2 and TRS emission changes from the lime kilns as a result of the installation of the new set of multiple effect evaporators?

3. Please explain the differences in emission estimates for the recovery boiler submitted by Seminole Kraft and AES.

4. The net mass emission decreases from the Seminole Kraft Recovery Boiler project will not be creditable towards future projects, in accordance with the provisions of Rule 17-2.500 of the Florida Administrative Code. If you intend to apply those emission decreases to the AES project, then correspondingly you have to apply BACT to all the applicable pollutants for the sources which emit those pollutants, as done in the AES application package (BACT for CO, NOx, SO_2, Pb, Hg, Be, and Fluorides).

5. Please address the issues raised by EPA in the letter dated August 28, 1989 (copy attached).

Mr. L. A. Stanley
Page Two
September 8, 1989

If you have any questions, please call Pradeep Raval (permitting), Barry Andrews (BACT), or Max Linn (modeling) at (904)488-1344 or write to me at the above address.

Sincerely,

H. Thomas

for C. H. Fancy, P.E.
Bureau of Air Regulation

CHF/PR/t

cc: M. Benjamin, NE District
K. Mehta, BESD
W. Aronson, EPA
C. Shaver, NPS
D. Buff, P.E.
K. Bartow, SKC
J. Subramani, Oertel & Hoffman

attachments

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

RECEIVED

AUG 31 198

DER - BAQM

4APT/APB-aes

AUG 29 1989

Ms. Patty Adams, Planner
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Corporation Kraft Recovery Boiler (PSD-FL-141)

Dear Ms. Adams:

We have reviewed the above application submitted to us in your August 14, 1989, letter. As discussed with Pradeep Raval of DER on August 22, 1989, we have the following comments to offer:

1. The determination of best available control technology (BACT) performed on the proposed recovery boiler for oxides of nitrogen (NO_x) did not give adequate consideration to more stringent emission limits. The applicant's rejection of lower NO_x emission limits was based on an apparent lack of vendor guarantees for the lower emission limits. This is an unacceptable argument for BACT purposes. The following sources have been found to have more stringent NO_x emission limits than proposed by Seminole Kraft:

Source	Location	*NO_x Limit
Willamette Ind.	Bennettsville, SC	150 ppm
Mead Coated Board	Cottonton, AL	112 ppm
Union Camp	Eastover, SC	150 ppm

*All limits corrected to 8% oxygen.

The applicant should be required to justify why the above emission limits are unachievable for their proposed recovery boiler.

2. Seminole Kraft has taken emission credit for particulate matter reductions from the replacement of a hydrator in 1988. The new hydrator allegedly has better particulate control and will result in a net decrease of 134.5 tons per year (TPY) for total particulate and 126.0 TPY for PM_{10}. In order to be creditable, this decrease must be federally enforceable at and after the time that actual construction on that particulate change occurred.

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Since the permit for the new hydrator was not included in the PSD application, we have no way of verifying that the requirement for reducing uncontrolled particulate emission from the new hydrator by at least 95% is federally enforceable. A copy of said permit should be included in the preliminary determination, when issued.

3. Since netting was used to escape PSD for some pollutants, the applicant should confirm that no other contemporaneous increases/decreases have occurred other than those stated in the application.

4. It appears that the applicant has not performed an analysis of the National Ambient Air Quality Standards (NAAQS) for NO_x, including the contribution from nearby sources.

Your consideration of these comments is greatly appreciated. If you have any questions, please call Mark Armentrout of my staff at (404) 347-2864.

Sincerely,

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

cc: Seminole Kraft Corporation

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

SEP 11 1989
OERTEL, HOFFMAN,
FERNANDEZ & COLE, P.A.

September 8, 1989

Mr. Clair H. Fancy
Deputy Bureau Chief
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Seminole Kraft Recovery Boiler PSD Application

Dear Mr. Fancy:

This is a follow up to our meeting to discuss our application for the new recovery boiler and associated facilities at our mill in Jacksonville. Your staff requested we set out certain additional information in writing to make our application complete and this letter is for that purpose.

First, there have been no other contemporaneous changes in emissions at the Jacksonville mill over the last five years other than those noted for the No.3 lime slaker on Table 4-4 in the application.

Secondly, there have been no emission test for SO_2, NO_x, or VOC's conducted on the recovery boilers or smelt dissolving tank vents. That is why emission factors were used for those sources in the application.

Thirdly, based on further consideration of the proposed SO_2 emissions for the new recovery boiler on the above referenced application, Seminole Kraft is modifying its proposed annual average SO_2 emissions. The revised annual average SO_2 emissions is 339.3 lbs/hr and 1,486 tons/year (TPY). This revision is based upon an annual average SO_2 concentration of 120 ppmvd @ 8% O_2.

Updated Tables 3-1 and 4-4 of the permit application are attached which reflect this change. As shown on Table 4-4, the net increase in SO_2 emissions resulting from the project is 6.4 TPY.

This level is still below the PSD significant emission rate of 40 TPY for SO_2 and, therefore, PSD review does not apply for SO_2. Because this change in annual average SO_2 emissions from that indicated in the original application is so small (9%), this change will not significantly affect the annual average SO_2 modeling results presented in Section 5.0 of the application. There will still be a significant reduction in ambient annual average SO_2 levels as a result of the project.

The information presented in these updated tables is the most current information for the new recovery boiler and smelt dissolving tank. AES Cedar Bay will soon submit Amendment 3 to their power plant site certification package which will include the same information for the recovery boiler and smelt dissolving tank. Therefore the information on these sources will be the same in both applications.

Fourthly, there will be no net emissions increase in TRS or SO_2 from the lime kilns as a result of this project as the new set of evaporators will have the same black liquor solid input rate as the existing evaporators.

Finally, as indicated at our meeting, the new recovery boiler will be equipped with continuous emission monitors for opacity and total reduced sulfur as required by the new source performance standards. These CEM systems will meet all NSPS requirements.

We believe this information should allow the department to find our application complete. Please contact us if you have any questions.

Sincerely,

L.A. Stanley
General Manager

ah

attachments

CC: Mike Riddle
Curt Barton
Terry Cole
Pradeep Ravel
Ernest Frey, FDER Northeast District
Jim Manning, BESD
Ron Roberson, BESD

Table 3-1. Maximum Emissions from Proposed Recovery Boiler and Smelt Dissolving Tank

Pollutant	New Recovery Boiler			New Smelt Dissolving Tank			Total (TPY)
	Basis	lb/hr	TPY	Basis	lb/hr	TPY	
Particulate Matter (TSP)	0.044 gr/dscf @ 8% O_2	107.0	468.7	0.2 lb/ton BLS	17.1	74.9	543.6
Particulate Matter (PM10)	74.8% of PM(TSP)	80.8	350.6	89.5% of PM(TSP)	15.3	67.0	417.6
Sulfur Dioxide	180 ppmvd @ 8% O_2, max. 120 ppmvd @ 8% O_2, annual average	514.0 339.3	-- 1,486.0	0.2 lb/ton ADUP and 80% removal	2.28	10.0	1,496.0
Nitrogen Oxides	180 ppmvd @ 8% O_2	369.3	1,617.5	--	--	--	1,617.5
Carbon Monoxide	400 ppmvd @ 8% O_2	494.8	2,167.2	--	--	--	2,167.2
Volatile Organic Compounds	80 ppmvd @ 8% O_2	58.6	247.9	--	--	--	247.9
Total Reduced Sulfur	5 ppmvd @ 8% O_2 +	7.51+	32.9	0.032 lb/ton BLS	2.73	12.0	44.9
Lead	3,900 lb/10^{12} dscf	0.047	0.21	--	--	--	0.21
Mercury	non-detectable	--	--	--	--	--	--
Beryllium	300 lb/10^{12} dscf	0.0036	0.016	--	--	--	0.016
Sulfuric Acid Mist	0.81 ppm actual	3.0	13.3	--	--	--	13.3
Inorganic Arsenic	non-detectable	--	--	--	--	--	--
Fluorides	--	--	--	--	--	--	--
Asbestos	--	--	--	--	--	--	--
Vinyl Chloride	--	--	--	--	--	--	--

+ Maximum 12-hour emissions.

Table 4-4. PSD Source Applicability Summary

Regulated Pollutant	Previous Contemporaneous Emissions Reductions (TPY)	Reduction Due to Existing Recovery Boilers and Smelt Tanks (TPY)	Increase Due to New Recovery Boiler and Smelt Tank (TPY)	Net Increase in Emissions (TPY)	PSD Significant Emission (TPY)	PSD Review Applies?
Particulate Matter (TSP)	134.5	549.8	543.6	-140.7	25	No
Particulate Matter (PM10)	126.0	430.2	417.6	-138.6	15	No
Sulfur Dioxide	--	1,489.6	1,496.0	6.4	40	No
Nitrogen Oxides	--	321.1	1,617.5	1,296.4	40	Yes
Carbon Monoxide	--	2,327.2	2,167.2	-160.0	100	No
Volatile Organic Compounds	--	340.2	247.9	-92.3	40	No
Total Reduced Sulfur	--	98.2	44.9	-53.3	10	No
Lead	--	0.37	0.21	-0.16	0.6	No
Mercury	--	--	--	--	0.1	No
Beryllium	--	0.028	0.016	-0.012	0.004	No
Sulfuric Acid Mist	--	19.1	13.3	-5.8	7	No
Inorganic Arsenic	--	--	--	--	0	No
Fluorides	--	--	--	--	3	No
Asbestos	--	--	--	--	0.007	No
Vinyl Chloride	--	--	--	--	1	No

Note: TPY = tons per year.

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

September 11, 1989

Mr. Clair H. Fancy
Deputy Bureau Chief
Florida Department of Environmental Regulation
1600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

This is a second follow-up to our meeting to discuss our application for a new recovery boiler and associated facilities at our mill in Jacksonville. This letter will specifically respond to EPA's comments on the BACT determination for NO_x.

EPA indicated that our application did not give adequate consideration to a more stringent emission limit for oxides of nitrogen (NO_x) and references three (3) sources which have more stringent NO_x emission limits. First, we would point out that none of these three sources are operational. All three are recent permits and these recovery boilers will not start up until next year. Therefore, none of the referenced recovery boilers has demonstrated the ability to meet the indicated emission limits.

Secondly, we have contacted the Mead Corporation regarding their new recovery boiler at Cottonton, Alabama which is now under construction and will not be started up until late 1990. They indicated that the 112 ppm (8% O_2) was provided by Tampella, the recovery boiler manufacturer. Mead also indicated that their SO_2 emission limit of 114 ppm (8% O_2) was also supplied by Tampella. We note that although Tampella indicated lower NO_x emissions than we indicated in our application, Tampella also indicated higher SO_2 emissions than we have shown in our application. We are compelled to point out that recovery boiler combustion controls tend to be set up to minimize one of these two parameters at the expense of the other. In our case, we are choosing to minimize SO_2 emissions due to the so called ambient "modeled SO_2" problem in Jacksonville.

Thirdly, as pointed out in our BACT analysis, emission guarantees vary among recovery boiler manufacturers. We selected 180 ppm in order to maintain flexibility in the procurement process plus providing a small allowance for performance deterioration. Since submitting our application, we have learned that Tampella has chosen not to bid on our new recovery boiler in Jacksonville. Accordingly, the recovery boiler with the lowest NO_x emissions referenced by EPA will not even be available to Seminole Kraft.

Finally, we do not believe this issue (what is the proper BACT emission limit for NO_x) is a matter to be resolved during a completeness determination. Instead, we believe this is an issue to be worked out during the permit development process through further discussion between DER and Seminole Kraft.

We believe this further information will allow DER to find our recovery boiler application complete. Please contact us if you have any further questions.

Sincerely,

L.A. Stanley
General Manager

ah

CC: Curt Barton
Terry Cole
Ernest Frey
Jim Manning
Pradeep Ravel
Mike Riddle
Ron Roberson

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
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904 751-6400

September 12, 1989

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SEP 13 1989
DER - BAQM

Mr. Clair H. Fancy
Deputy Bureau Chief
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

Attached is another copy of our Sept. 11, 1989 letter regarding BACT analysis for NO_x. The first letter contained a typo regarding Mead's SO_2 limit. Mead's SO_2 limit should have been 144 ppm rather than 114 ppm.

Sincerely,

L.A. Stanley
General Manager

ah

attachment

CC: Curt Barton
Terry Cole
Ernest Frey
Jim Manning
Pradeep Ravel
Mike Riddle
Ron Roberson

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

September 11, 1989

Mr. Clair H. Fancy
Deputy Bureau Chief
Florida Department of Environmental Regulation
1600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

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EPA indicated that our application did not give adequate consideration to a more stringent emission limit for oxides of nitrogen (NO_x) and references three (3) sources which have more stringent NO_x emission limits. First, we would point out that none of these three sources are operational. All three are recent permits and these recovery boilers will not start up until next year. Therefore, none of the referenced recovery boilers has demonstrated the ability to meet the indicated emission limits.

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Thirdly, as pointed out in our BACT analysis, emission guarantees vary among recovery boiler manufacturers. We selected 180 ppm in order to maintain flexibility in the procurement process plus providing a small allowance for performance deterioration. Since submitting our application, we have learned that Tampella has chosen not to bid on our new recovery boiler in Jacksonville. Accordingly, the recovery boiler with the lowest NO_x emissions referenced by EPA will not even be available to Seminole Kraft.

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Sincerely,

L.A. Stanley
General Manager

ah

CC: Curt Barton
    Terry Cole
    Ernest Frey
    Jim Manning
    Pradeep Ravel
    Mike Riddle
    Ron Roberson

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

September 9, 1989

Mr. Clair H. Fancy
Deputy Bureau Chief
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Seminole Kraft Recovery Boiler PSD Application

Dear Mr. Fancy:

This is a follow up to our meeting to discuss our application for the new recovery boiler and associated facilities at our mill in Jacksonville. Your staff requested we set out certain additional information in writing to make our application complete and this letter is for that purpose.

First, there have been no other contemporaneous changes in emissions at the Jacksonville mill over the last five years other than those noted for the No.3 lime slaker on Table 4-4 in the application.

Secondly, there have been no emission test for SO_2, NO_x, or VOC's conducted on the recovery boilers or smelt dissolving tank vents. That is why emission factors were used for those sources in the application.

Thirdly, based on further consideration of the proposed SO_2 emissions for the new recovery boiler on the above referenced application, Seminole Kraft is modifying its proposed annual average SO_2 emissions. The revised annual average SO_2 emissions is 339.3 lbs/hr and 1,486 tons/year (TPY). This revision is based upon an annual average SO_2 concentration of 120 ppmvd @ 8% O_2.

Updated Tables 3-1 and 4-4 of the permit application are attached which reflect this change. As shown on Table 4-4, the net increase in SO_2 emissions resulting from the project is 6.4 TPY.

This level is still below the PSD significant emission rate of 40 TPY for SO_2 and, therefore, PSD review does not apply for SO_2. Because this change in annual average SO_2 emissions from that indicated in the original application is so small (9%), this change will not significantly affect the annual average SO_2 modeling results presented in Section 5.0 of the application. There will still be a significant reduction in ambient annual average SO_2 levels as a result of the project.

The information presented in these updated tables is the most current information for the new recovery boiler and smelt dissolving tank. AES Cedar Bay will soon submit Amendment 3 to their power plant site certification package which will include the same information for the recovery boiler and smelt dissolving tank. Therefore the information on these sources will be the same in both applications.

Fourthly, there will be no net emissions increase in TRS or SO_2 from the lime kilns as a result of this project as the new set of evaporators will have the same black liquor solid input rate as the existing evaporators.

Finally, as indicated at our meeting, the new recovery boiler will be equipped with continuous emission monitors for opacity and total reduced sulfur as required by the new source performance standards. These CEM systems will meet all NSPS requirements.

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Sincerely,

L.A. Stanley

L.A. Stanley
General Manager

ah

attachments

CC: Mike Riddle
Curt Barton
Terry Cole
Pradeep Ravel
Ernest Frey, FDER Northeast District
Jim Manning, BESD
Ron Roberson, BESD

Copied BT/CHF
Barry
Chu
W. Aomarl
C. Shaver
BA.
9-13-89

Table 3-1. Maximum Emissions from Proposed Recovery Boiler and Smelt Dissolving Tank

Pollutant	New Recovery Boiler			New Smelt Dissolving Tank			Total
	Basis	lb/hr	TPY	Basis	lb/hr	TPY	(TPY)
Particulate Matter (TSP)	0.044 gr/dscf @ 8% O_2	107.0	468.7	0.2 lb/ton BLS	17.1	74.9	543.6
Particulate Matter (PM10)	74.8% of PM(TSP)	80.8	350.6	89.5% of PM(TSP)	15.3	67.0	417.6
Sulfur Dioxide	180 ppmvd @ 8% O_2, max. 110 ppmvd @ 8% O_2, annual average	514.0 339.3	-- 1,486.0	0.2 lb/ton ADUP and 80% removal	2.28	10.0	1,496.0
Nitrogen Oxides	180 ppmvd @ 8% O_2	369.3	1,617.5	--	--	--	1,617.5
Carbon Monoxide	400 ppmvd @ 8% O_2	494.8	2,167.2	--	--	--	2,167.2
Volatile Organic Compounds	80 ppmvd @ 8% O_2	56.6	247.9	--	--	--	247.9
Total Reduced Sulfur	5 ppmvd @ 8% O_2 +	7.51+	32.9	0.032 lb/ton BLS	2.73	12.0	44.9
Lead	3,900 lb/10^{12} dscf	0.047	0.21	--	--	--	0.21
Mercury	non-detectable	--	--	--	--	--	--
Beryllium	300 lb/10^{12} dscf	0.0036	0.016	--	--	--	0.016
Sulfuric Acid Mist	0.81 ppm actual	3.0	13.3	--	--	--	13.3
Inorganic Arsenic	non-detectable	--	--	--	--	--	--
Fluorides	--	--	--	--	--	--	--
Asbestos	--	--	--	--	--	--	--
Vinyl Chloride	--	--	--	--	--	--	--

+ Maximum 12-hour emissions.

Table 4-4. PSD Source Applicability Summary

Regulated Pollutant	Previous Contemporaneous Emissions Reductions (TPY)	Reduction Due to Existing Recovery Boilers and Smelt Tanks (TPY)	Increase Due to New Recovery Boiler and Smelt Tank (TPY)	Net Increase in Emissions (TPY)	PSD Significant Emission (TPY)	PSD Review Applies?
Particulate Matter (TSP)	134.5	549.8	543.6	-140.7	25	No
Particulate Matter (PM10)	126.0	430.2	417.6	-138.6	15	No
Sulfur Dioxide	--	1,489.6	1,496.0	6.4	40	No
Nitrogen Oxides	--	321.1	1,617.5	1,296.4	40	Yes
Carbon Monoxide	--	2,327.2	2,167.2	-160.0	100	No
Volatile Organic Compounds	--	340.2	247.9	-92.3	40	No
Total Reduced Sulfur	--	98.2	44.9	-53.3	10	No
Lead	--	0.37	0.21	-0.16	0.6	No
Mercury	--	--	--	--	0.1	No
Beryllium	--	0.028	0.016	-0.012	0.004	No
Sulfuric Acid Mist	--	19.1	13.3	-5.8	7	No
Inorganic Arsenic	--	--	--	--	0	No
Fluorides	--	--	--	--	3	No
Asbestos	--	--	--	--	0.007	No
Vinyl Chloride	--	--	--	--	1	No

Note: TPY = tons per year.

KBN

RECEIVED
SEP 11 1989
DER - BAQM

September 1, 1989
89030

Mr. Pradeep Raval
Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Recovery Boiler PSD Application - August 1989

Dear Mr. Raval:

Concerning the above referenced PSD application submitted to FDER in August, a typographical error has been found on Table 4-4. The error involves only SO_2, under the columns entitled "Increase Due to New Recovery Boiler and Smelt Tank" and "Net Increase in Emissions".

The previous 1,367.2 TPY increase due to the proposed RB/SDT only is now 1,372.2 TPY (consistent with Table 3-1), and the net increase in emissions is now -117.4 TPY.

I apologize for any inconvenience this typographical error may have caused. Please call if you have any questions.

Sincerely,

David A. Buff

David A. Buff, P.E.
Principle Engineer

cc: Curt Barton, Stone & Webster
Mike Riddle, Seminole Kraft
Terry Cole, Oertel & Hoffmanl
B. Andrews
S. Chu
M. Benjamin, NE Dist.
R. Robinson, BESD
H. Aronson, EPA
C. Shaver, NPS
CHF/BT

KBN ENGINEERING AND APPLIED SCIENCES, INC.
P.O. Box 14288 5700 SW 34th Street Gainesville, FL 32604 904/375-8000 Telex: 984689 KBN ENG UD

331-7100

KBN

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

KBN ENGINEERING AND APPLIED SCIENCES, INC.
P.O. Box 14288 5700 SW 34th Street Gainesville, FL 32604

Table 4-4. PSD Source Applicability Summary

Regulated Pollutant	Previous Contemporaneous Emissions Reductions (TPY)	Reduction Due to Existing Recovery Boilers and Smelt Tanks (TPY)	Increase Due to New Recovery Boiler and Smelt Tank (TPY)	Net Increase in Emissions (TPY)	PSD Significant Emission (TPY)	PSD Review Applies?
Particulate Matter (TSP)	134.5	549.8	543.6	-140.7	25	No
Particulate Matter (PM10)	126.0	430.2	417.6	-138.6	15	No
Sulfur Dioxide	--	1,489.6	1,372.2	-117.4	40	No
Nitrogen Oxides	--	321.1	1,617.5	1,296.4	40	Yes
Carbon Monoxide	--	2,327.2	2,167.2	-160.0	100	No
Volatile Organic Compounds	--	340.2	247.9	-92.3	40	No
Total Reduced Sulfur	--	98.2	44.9	-53.3	10	No
Lead	--	0.37	0.21	-0.16	0.6	No
Mercury	--	--	--	--	0.1	No
Beryllium	--	0.028	0.016	-0.012	0.004	No
Sulfuric Acid Mist	--	19.1	13.3	-5.8	7	No
Inorganic Arsenic	--	--	--	--	0	No
Fluorides	--	--	--	--	3	No
Asbestos	--	--	--	--	0.007	No
Vinyl Chloride	--	--	--	--	1	No

Note: TPY = tons per year.

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. L. A. Stanley
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, FL 32218

4. Article Number
P 938 762 674

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Address
X

6. Signature — Agent
X Ed Gail Enmen

7. Date of Delivery

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

SEP 11 1989 NORTH JACKSONVILLE, FL

PS Form 3811, Mar. 1988 ★ U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

P 938 762 674

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

Sent to Mr. L. A. Stanley, Seminole Kraft Corp.	
Street and No. 9469 Eastport Road	
P.O., State and ZIP Code Jacksonville, FL 32218	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 9-8-89 Permit: AC 16-168607, 08, 09 PSD-FL-141	

PS Form 3800, June 1985

Florida Department of Environmental Regulation

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

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

September 8, 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. L. A. Stanley
Seminole Kraft Corporation
9469 Eastport Road
Jacksonville, Florida 32218

Dear Mr. Stanley:

Re: Seminole Kraft Recovery Boiler Project
AC 16-168607, -168608, -168609, PSD-FL-141

The Department has reviewed your application package dated August 10, 1989, and deemed it incomplete. Please submit the following information including all assumptions, calculations and reference material:

1. Please list all the contemporaneous emission changes at the Seminole Kraft facility, i.e., increases or decreases in emissions since September 1984.

2. What will be the net (before and after) SO_2 and TRS emission changes from the lime kilns as a result of the installation of the new set of multiple effect evaporators?

3. Please explain the differences in emission estimates for the recovery boiler submitted by Seminole Kraft and AES.

4. The net mass emission decreases from the Seminole Kraft Recovery Boiler project will not be creditable towards future projects, in accordance with the provisions of Rule 17-2.500 of the Florida Administrative Code. If you intend to apply those emission decreases to the AES project, then correspondingly you have to apply BACT to all the applicable pollutants for the sources which emit those pollutants, as done in the AES application package (BACT for CO, NOx, SO_2, Pb, Hg, Be, and Fluorides).

5. Please address the issues raised by EPA in the letter dated August 28, 1989 (copy attached).

Mr. L. A. Stanley
Page Two
September 8, 1989

If you have any questions, please call Pradeep Raval (permitting), Barry Andrews (BACT), or Max Linn (modeling) at (904)488-1344 or write to me at the above address.

Sincerely,

H A Thomas

for C. H. Fancy, P.E.
Bureau of Air Regulation

CHF/PR/t

cc: M. Benjamin, NE District
K. Mehta, BESD
W. Aronson, EPA
C. Shaver, NPS
D. Buff, P.E.
K. Bartow, SKC
J. Subramani, Oertel & Hoffman

attachments

BEST AVAILABLE COPY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

RECEIVED
AUG 31 1989
DER - BAQM

4APT/APB-aes

AUG 28 1989

Ms. Patty Adams, Planner
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Corporation Kraft Recovery Boiler (PSD-FL-141)

Dear Ms. Adams:

We have reviewed the above application submitted to us in your August 14, 1989, letter. As discussed with Pradeep Raval of DER on August 22, 1989, we have the following comments to offer:

1. The determination of best available control technology (BACT) performed on the proposed recovery boiler for oxides of nitrogen (NO_x) did not give adequate consideration to more stringent emission limits. The applicant's rejection of lower NO_x emission limits was based on an apparent lack of vendor guarantees for the lower emission limits. This is an unacceptable argument for BACT purposes. The following sources have been found to have more stringent NO_x emission limits than proposed by Seminole Kraft:

Source	Location	*NO_x Limit
Willamette Ind.	Bennettsville, SC	150 ppm
Mead Coated Board	Cottonton, AL	112 ppm
Union Camp	Eastover, SC	150 ppm

*All limits corrected to 8% oxygen.

The applicant should be required to justify why the above emission limits are unachievable for their proposed recovery boiler.

2. Seminole Kraft has taken emission credit for particulate matter reductions from the replacement of a hydrator in 1988. The new hydrator allegedly has better particulate control and will result in a net decrease of 134.5 tons per year (TPY) for total particulate and 126.0 TPY for PM_{10}. In order to be creditable, this decrease must be federally enforceable at and after the time that actual construction on that particulate change occurred.

BEST AVAILABLE COPY

Since the permit for the new hydrator was not included in the PSD application, we have no way of verifying that the requirement for reducing uncontrolled particulate emission from the new hydrator by at least 95% is federally enforceable. A copy of said permit should be included in the preliminary determination, when issued.

3. Since netting was used to escape PSD for some pollutants, the applicant should confirm that no other contemporaneous increases/decreases have occurred other than those stated in the application.

4. It appears that the applicant has not performed an analysis of the National Ambient Air Quality Standards (NAAQS) for NO_x, including the contribution from nearby sources.

Your consideration of these comments is greatly appreciated. If you have any questions, please call Mark Armentrout of my staff at (404) 347-2864.

Sincerely,

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

cc: Seminole Kraft Corporation

PM
8-28-89
Atlanta, GA

file copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

RECEIVED

AUG 31 1989

DER - BAQM

4APT/APB-aes

AUG 28 1989

Ms. Patty Adams, Planner
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Seminole Kraft Corporation Kraft Recovery Boiler (PSD-FL-141)

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

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ATLANTA GA. AUG 28 '89

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Ms. Patty Adams, Planner
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

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Your consideration of these comments is greatly appreciated. If you have any questions, please call Mark Armentrout of my staff at (404) 347-2864.

Sincerely,

Bruce P. Miller

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

cc: Seminole Kraft Corporation

copied: P. Rgual
B. Andrews
S. Chu
J. Cole
R. Roberson
CHF/BT

Seminole Kraft Corporation

Jacksonville Mill

9469 Eastport Road
P.O. Box 26998
Jacksonville, Florida 32218-0998

904 751-6400

August 10, 1989

RECEIVED

AUG 11 1989

DER - BAQM

Mr. Clair H. Fancy
Deputy Bureau Chief
Division of Air Resources Management
Florida Department of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

As discussed at our meeting on June 6, 1989, because AES is continuing to experience delays with their Power Plant Site Certification Application; Seminole Kraft is submitting the attached permit applications to insure meeting the November, 1992 TRS compliance deadline. As you will note, this is a complete stand alone package which includes a PSD review with appropriate air quality modeling and best available central technology analysis. The package includes permit applications for a new recovery boiler, smelt dissolving tank and multiple effect evaporators.

We are extremely interested in working with the Department in any way to expedite the review of this package for completeness to avoid any delays in the permitting process. To that end we would like to hold a review meeting with the Department to receive your staff's comments prior to the final completeness determination. We believe such a meeting would allow us to provide any additional information for completeness without stopping the 90 day clock. If possible we would like to hold such a meeting near the end of August, 1989.

Also attached is a check in the amount of $6,200 to cover the permit fees for this application. This amount is based on individual sources as shown below:

Recovery Boiler -	$5,000
Smelt Dissolving Tanks -	$1,000
Multiple Effect Evaporators -	$200
TOTAL -	$6,200

We appreciate the Department's cooperation on this matter and look forward to working together to expedite the processing of these permit applications. As indicated previously it is extremely important that final permits be issued by the end of 1989 so that Seminole Kraft can meet the November, 1992 TRS compliance deadline. In order to meet this deadline the recovery boiler must be ordered by January 1, 1990. Please let us know if you have any questions.

Sincerely,

Seminole Kraft Corporation

Curtis A. Barton

Curtis A. Barton
Manager Environmental Affairs

cc: Steve Pace - BESD
Terry Cole
John Millican
Larry Stanley

PSD PERMIT APPLICATION

NEW RECOVERY BOILER, EVAPORATORS AND SMELT DISSOLVING TANK

SEMINOLE KRAFT CORPORATION

AUGUST 1989

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0 INTRODUCTION

This PSD application is submitted on behalf of Seminole Kraft Corporation of Jacksonville, Florida. This PSD application is for a new kraft recovery boiler, a new smelt tank and a new set of evaporators. These new pieces of equipment will replace three old recovery boilers, three old smelt tanks and three old evaporator sets.

As indicated previously to the FDER, this application is being placed in parallel with similar applications which were filed as part of the power plant siting certification application previously filed by AES. The intent of these applications is to obtain separate construction permits for the new recovery boiler, smelt tank and evaporator set in order to assure that Seminole Kraft will meet the DER & BESD imposed November 12, 1992 TRS compliance deadline for the recovery boiler which delays in the power plant site certification may now preclude.

Seminole Kraft requests expedited handling of this application as it is imperative the construction permits for these new sources be issued by the end of 1989 for Seminole Kraft to meet the November 12, 1992 TRS compliance deadline.

2.0 EXECUTIVE SUMMARY

This Prevention of Significant Deterioration (PSD) application is submitted on behalf of Seminole Kraft Corporation of Jacksonville, Florida. The project involves the construction of a new recovery boiler, a new smelt dissolving tank and a new set of evaporators. These new sources will replace existing sources which include three old recovery boilers, three old smelt dissolving tanks and three old sets of evaporators. This project is being carried out primarily to bring the mill into compliance with Florida's TRS rules and, more specifically, to comply with the TRS Compliance Plan previously submitted by Seminole Kraft Corporation.

That compliance plan indicated that Seminole Kraft was choosing to bring the recovery boilers into compliance with the Florida TRS regulations by shutting down the old recovery boilers and constructing a new, state-of-the-art, low-odor recovery boiler which will meet new source performance standards. The new smelt dissolving tanks and new set of evaporators will also be state-of-the-art and will meet new source performance standards.

A review of the proposed emissions from these new sources and the emissions from the old sources which will be shut down demonstrates that <u>there will be a net decrease in emissions of all regulated pollutants except NO_x</u> (See Table 4-4 for PSD Source Applicability Summary). Ambient air quality modeling of the impacts of the existing emissions from the sources which will be shut down and the new sources to be installed demonstrates <u>an ambient air quality improvement will result for particulates (total and PM10), SO_2 and NO_x</u> (refer to Section 5.2). Further, given the results for the pollutants noted, <u>an improvement in ambient air quality for all regulated pollutants can be expected as a result of this project</u>. This will be particularly true for TRS because this project will reduce recovery boiler emissions by more than 60 percent and the new GEP stack height will further reduce the ambient impact of these lower TRS emissions.

In addition to meeting new source performance standards, best available control technology (BACT) analysis was conducted for all applicable pollutants. As there was a net decrease in emissions of all regulated pollutants except NO_x, a BACT analysis was conducted for NO_x. This analysis concluded that BACT for NO_x emissions from the recovery boiler should be based on combustion temperatures and staged combustion.

As these new sources are replacing existing sources of a similar nature, the solid and liquid wastes generated at the facility will remain substantially the same. Accordingly, there will be no incremental or adverse impact on the solid and liquid waste streams or the mill's existing wastewater treatment system.

For the reasons cited above, this project will have a favorable environmental impact and should be approved by Florida Department of Environmental Regulation and Bio Environmental Services Division.

3.0 PROJECT DESCRIPTION

In October 1987, Seminole Kraft submitted a final TRS Compliance Plan to DER and BESD. With respect to recovery boiler TRS emissions, Seminole Kraft Corporation indicated they would replace the existing kraft recovery boilers with a new state-of-the-art, low odor recovery boiler complete with all auxiliaries.

This new recovery boiler will meet new source performance standards for opacity, TRS and particulate emissions as well as best available control technology (BACT) for all applicable pollutants. Compliance with the latest recommendations of the American Paper Institute (API) and the Black Liquor Recovery Boiler Advisory Committee (BLRBAC) will also be followed. The boiler will be designed to process 4,100,000 pounds of black liquor solids (BLS) per day. Steam conditions at the non-return valve outlet will be 1250 psig and 900°F. The boiler shall be supplied with a two chamber, dry bottom electrostatic precipitator with each chamber sized for 70% of the boiler gas flow at maximum continuous rating. The smelt dissolving tanks for the new recovery boiler will also meet federal new source performance standards (NSPS) using a venturi scrubber.

Also included in the recovery boiler complex, is a new set of evaporators and concentrators which will replace the existing evaporators. This equipment is expected to be arranged as a sextuple effect, falling film set of evaporators. Concentrators shall be provided to fully evaporate weak black liquor up to 70% black liquor solids for firing in the new recovery furnace. The noncondensible gases from this new set of evaporators will be collected and incinerated in the lime kilns.

The location of the Seminole Kraft mill is shown in Figure 3-1. A plot plan of the facility, showing the existing and new recovery boilers and smelt tanks, is presented in Figure 3-2.

Air construction permit applications for the proposed recovery boiler and smelt tank are contained in Appendix 1. Emission calculations for all regulated pollutants from the proposed recovery boiler and smelt dissolving tank are presented in Appendix 2. Maximum emissions are based upon the following:

New Recovery Boiler:

Particulate Matter (TSP) - 0.044 gr/dscf @ 8% O_2 (NSPS)
Particulate Matter (PM10) - 74.8% of PM(TSP) emissions
Sulfur dioxide - Max 24-hour - 180 ppmvd @ 8% O_2
Max annual average - 110 ppmvd @ 8% O_2
Nitrogen oxides - 180 ppmvd @ 8% O_2
Carbon monoxide - 400 ppmvd @ 8% O_2
Volatile organic compounds - 80 ppmvd @ 8% O_2
Total reduced sulfur - 5 ppmvd @ 8% O_2 (NSPS)

New Smelt Dissolving Tanks:

Particulate Matter (TSP) - 0.2 lb/ton BLS (NSPS)
Particulate Matter (PM10) - 89.5% of PM(TSP) emissions
Sulfur dioxide - 80% removal efficiency in wet scrubber.
Total reduced sulfur - 0.0480 lb/3000 lb BLS (Florida emission limit more-restrictive than NSPS).

Emissions of other regulated pollutants were also determined where emission factors were available in the published literature. A summary of the maximum emissions from the proposed sources is presented in Table 3-1.

Stack parameters associated with the proposed sources are presented in Table 3-2. The new recovery boiler stack will be of Good Engineering Practice (GEP) stack height. The GEP height is based upon the height of the new recovery boiler building of 210 ft and building dimensions of 85 ft x 121 ft. The maximum projected width of the building is 125 ft. Based upon these dimensions, the GEP stack height is calculated as follows:

$$GEP = H + 1.5\ L$$
$$H = 210\ ft$$
$$L = 125\ ft$$
$$GEP = 210 + (1.5 \times 125)$$
$$= 397\ ft$$

The new smelt dissolving tank vent will be located 240 ft above grade level, which is less than the GEP height.

Table 3-1. Maximum Emissions from Proposed Recovery Boiler and Smelt Dissolving Tank

Pollutant	New Recovery Boiler Basis	lb/hr	TPY	New Smelt Dissolving Tank Basis	lb/hr	TPY	Total (TPY)
Particulate Matter (TSP)	0.044 gr/dscf @ 8% O_2	107.0	468.7	0.2 lb/ton BLS	17.1	74.9	543.6
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Sulfur Dioxide	180 ppmvd @ 8% O_2, max. 110 ppmvd @ 8% O_2, annual average	514.0 311.0	-- 1,362.2	0.2 lb/ton ADUP and 80% removal	2.28	10.0	1,372.2
Nitrogen Oxides	180 ppmvd @ 8% O_2	369.3	1,617.5	--	--	--	1,617.5
Carbon Monoxide	400 ppmvd @ 8% O_2	494.8	2,167.2	--	--	--	2,167.2
Volatile Organic Compounds	80 ppmvd @ 8% O_2	56.6	247.9	--	--	--	247.9
Total Reduced Sulfur	5 ppmvd @ 8% O_2 +	7.51+	32.9	0.032 lb/ton BLS	2.73	12.0	44.9
Lead	3,900 lb/10^{12} dscf	0.047	0.21	--	--	--	0.21
Mercury	non-detectable	--	--	--	--	--	--
Beryllium	300 lb/10^{12} dscf	0.0036	0.016	--	--	--	0.016
Sulfuric Acid Mist	0.81 ppm actual	3.0	13.3	--	--	--	13.3
Inorganic Arsenic	non-detectable	--	--	--	--	--	--
Fluorides	--	--	--	--	--	--	--
Asbestos	--	--	--	--	--	--	--
Vinyl Chloride	--	--	--	--	--	--	--

+ Maximum 12-hour emissions.

Table 3-2. Stack Parameters Associated with Proposed Recovery Boiler and Smelt Dissolving Tank.

Parameter	Units	New Recovery Boiler	New Smelt Dissolving Tank
Stack Height	ft	397	240
Stack Diameter	ft	11.25	5.0
Volmeteric Flow Rate	acfm	399,938	55,000
Stack Temperature	°F	400	160
Exhaust Gas Velocity	ft/sec	67.0	47.0

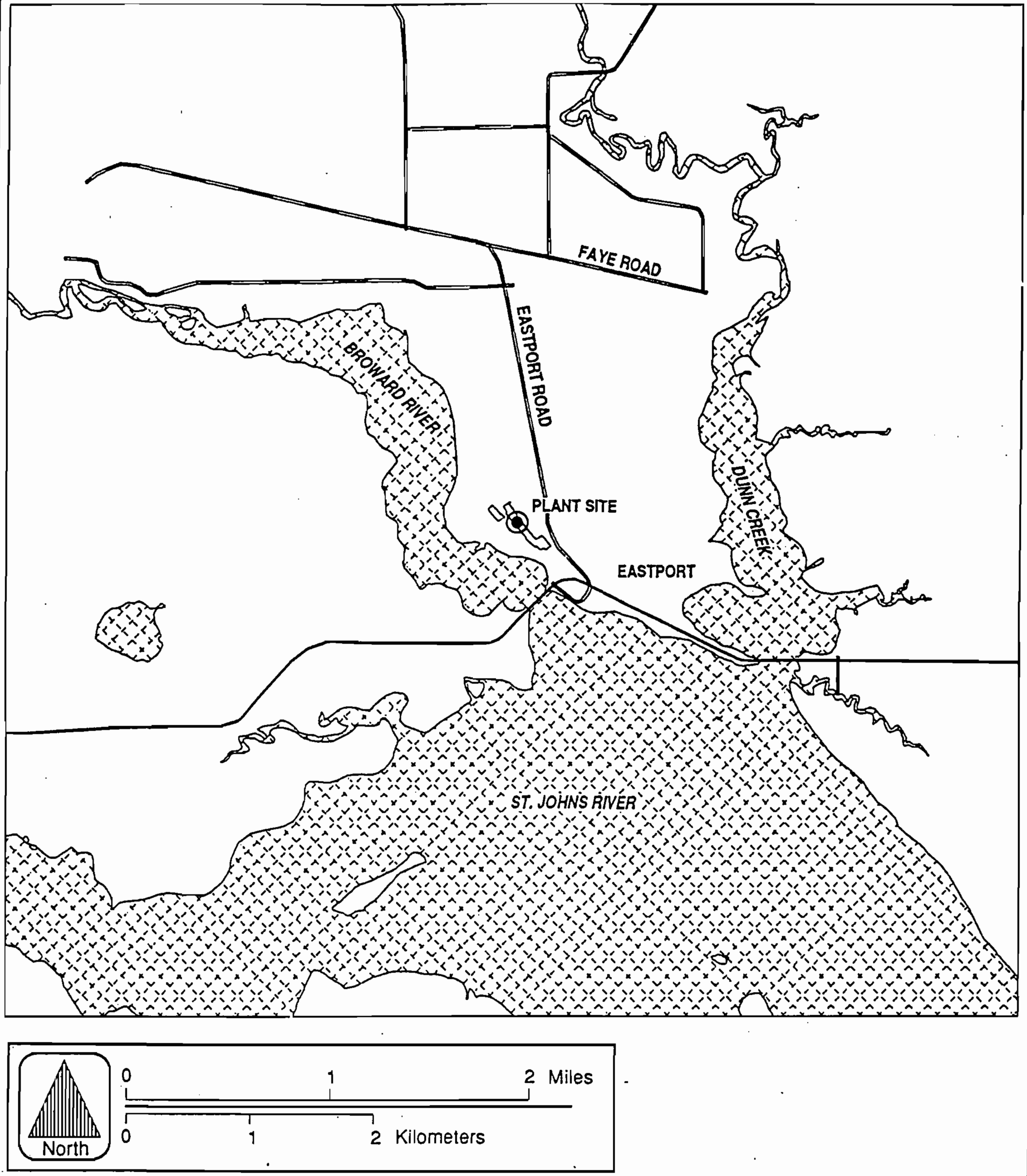

FIGURE 3-1.
PROJECT SITE LOCATION

SEMINOLE KRAFT

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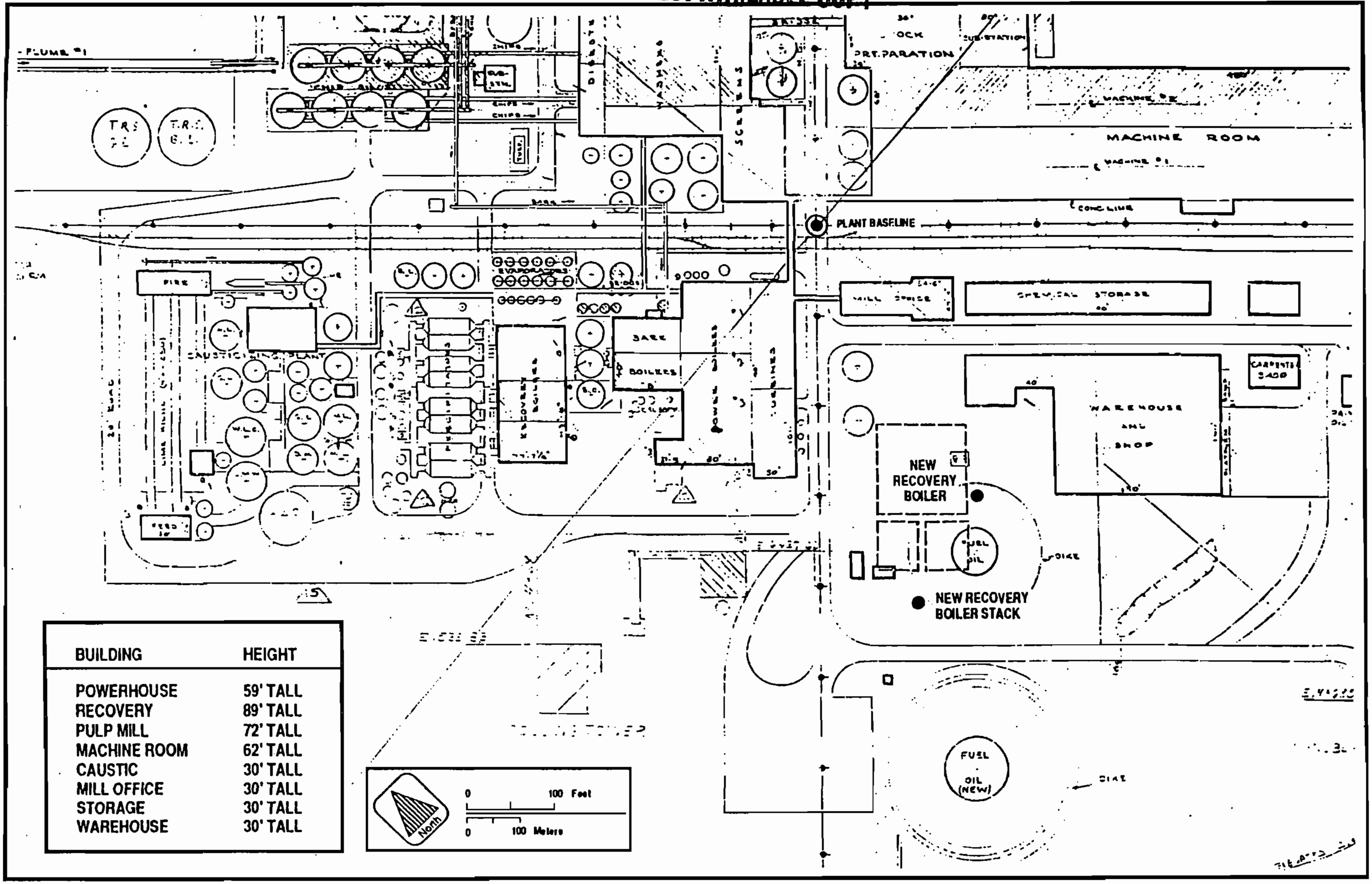


BUILDING	HEIGHT
POWERHOUSE	59' TALL
RECOVERY	89' TALL
PULP MILL	72' TALL
MACHINE ROOM	62' TALL
CAUSTIC	30' TALL
MILL OFFICE	30' TALL
STORAGE	30' TALL
WAREHOUSE	30' TALL

FIGURE 3-2. PLOT PLAN OF MAJOR STRUCTURES AT SEMINOLE KRAFT

SEMINOLE KRAFT

4.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to the Seminole Kraft recovery boiler project. These regulations must be satisfied before the proposed facility can operate.

4.1 NATIONAL AND STATE AAQS

The existing applicable USEPA and Florida ambient air quality standards (AAQS) are presented in Table 4-1. Primary USEPA AAQS were promulgated to protect the public health, and secondary USEPA AAQS were promulgated to protect the public welfare from any known or anticipated adverse affects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

4.2 PSD REQUIREMENTS

4.2.1 General Requirements

Under USEPA and state of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and preconstruction permit issued. Florida's State Implementation plan (SIP), which contains PSD regulations, has been approved by the USEPA, and therefore PSD and approval authority has been granted to the Florida Department of Environmental Regulation (FDER).

A "major facility" is defined as any one of 28 named source categories which has the potential to emit 100 tons per year (TPY) or more, or any other stationary facility which has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

A "major modification" is defined under PSD regulations as a change at an existing major facility which increases emissions by greater than "significant amounts." PSD significant emission rates are shown in Table 4-2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality. The state of Florida has adopted PSD regulations which are essentially identical to the federal regulations [Florida Administration Code (FAC), Chapter 17-2.510]. Major facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in "significant" amounts:

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

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

4.2.2 <u>Increments/Classifications</u>

In promulgating the 1977 CAA Amendments, Congress specified that certain increases above an air quality "baseline concentration" level of sulfur dioxide (SO_2) and total suspended particulate matter [PM(TSP)] concentrations would constitute "significant deterioration." The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres, and national parks larger than 6,000 acres) or as Class II (all areas not designated as Class I). Class III areas, which would be allowed greater deterioration than Class II areas, have not been designated. USEPA then promulgated as regulations the requirements for classifications and area designations.

On October 17, 1988, the USEPA promulgated regulations to prevent significant deterioration due to emissions of nitrogen oxides (NO_x) and established PSD increments for nitrogen dioxide (NO_2) concentrations. The USEPA class designations and allowable PSD increments are presented in Table 4-1. The Florida DER has adopted the USEPA class designations and allowable PSD increments for SO_2 and PM(TSP) but has not yet adopted the NO_2 increments.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition in the PSD regulations, as amended August 7, 1980, baseline concentration means the ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

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

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

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975 for SO_2 and PM(TSP) concentrations and February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975 in the cases of SO_2 and PM(TSP), and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the "trigger date" on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The "trigger date", which is August 7, 1977, for SO_2 and PM(TSP), and February 8, 1988, for NO_2.

The minor source baseline date for SO_2 and PM(TSP) has been set as December 27, 1977, for the entire state of Florida (FAC Rule 17-2.450).

4.2.3 Control Technology Review

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to control emissions from the source [FAC Rule 17-2.500(s)(c)]. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 4-2).

BACT is defined in FAC Rule 17-2.100(25) as:

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

> BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation.

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

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

Historically, a "bottom-up" approach consistent with the BACT Guidelines and Workshop Manual has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until BACT level is selected. However, USEPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the USEPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program including the adoption of a new "top-down" approach to BACT decision making.

The top-down approach requires an applicant to start with the most stringent control alternative, e.g., Lowest Achievable Emission Rate (LAER), and either provide an analysis that justifies its rejection based on technical or economic infeasibility, or propose it as BACT.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emissions limit that have been applied elsewhere to the same source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it.

Rejection of control alternatives may be based on technical or economical infeasiblity. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified.

4.2.4 Air Quality Monitoring Requirements

In accordance with requirements of 40 CFR 52.21(m) and FAC Rule 17-2.500(f), any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 4-2).

Ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be utilized if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in USEPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration" (USEPA, 1987a).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that the Department may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the de minimis levels presented in Table 4-2 [FAC Rule 17-2.500(3)(e)].

4.2.5 Source Impact Analysis

A source impact analysis must be performed for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 4-2). The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated USEPA models must normally be used in performing the impact analysis. Specific applications for other than USEPA-approved models require USEPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the USEPA publication "Guideline on Air Quality Models" (Revised) (USEPA, 1987b). The source impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impacts due to the new or modified source is below significance levels, as presented in Table 4-1.

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

4.2.6 <u>Additional Impact Analysis</u>

In addition to air quality impact analyses, federal and state of Florida PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21; FAC Rule 17-2.500(5)(e)]. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 4-2).

4.2.7 Good Engineering Practice Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP, or any other dispersion technique. On July 8, 1985, USEPA promulgated final stack height regulations (USEPA, 1985). Identical regulations have been adopted by FDER (FAC Rule 17-2.270). GEP stack height is defined as the highest of:

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

   $H_g = H + 1.5L$

   where: H_g = GEP stack height,

   H = Height of the structure or nearby structure, and

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

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

4.3 NONATTAINMENT RULES

Based on the current nonattainment provisions (FAC Rule 17-2.510), all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review if the proposed facility or source has the potential to emit 100 TPY or more of the nonattainment pollutant, or the modification results in a significant net emission increase at the facility for the nonattainment pollutant.

For major facilities or major modifications which locate in an attainment or unclassifiable area, the nonattainment review procedures apply if the source or modification is located within the area of influence of a nonattainment area. The area of influence is defined as an area which is outside the boundary of a nonattainment area but within the locus of all points that are 50 km outside the boundary of the nonattainment area. Based on FAC, Section 17-2.510(2)(a)2.a, all VOC sources which are located within an area of influence are exempt from the provisions of new source review for nonattainment areas. Sources which emit other nonattainment pollutants and are located within the area of influence are subject to nonattainment review unless the maximum allowable emissions from the proposed source do not have a significant impact within the nonattainment area.

Facilities subject to the nonattainment rules are required to: (1) meet an emission limitation which specifies the lowest achievable emission rate for such sources, (2) certify that all existing major sources owned or operated by the applicant in the same state are in compliance with all applicable emission limitations and standards under the Act, (3) obtain emission offsets such that there will be reasonable progress toward attainment of the applicable national AAQS, and (4) demonstrate that the emission offsets would provide a positive net air quality benefit in the affected area [not applicable for volatile organic compounds (VOC) or NO_x].

In the case of ozone nonattainment areas (VOC is the regulated pollutant), an initial New Source Allowance (NSA) has been set for each county designated as nonattainment. The NSA is the level of total cumulative VOC emissions available for new source growth in the nonattainment area. The requirements of LAER and emission offsets do not apply to a new or modified facility provided sufficient NSA remains in the county.

4.4 PSD SOURCE APPLICABILITY

4.4.1 Pollutant Applicability

The Seminole Kraft plant is located in Duval County, which has been designated as an attainment area by FDER for all pollutants except ozone and PM(TSP). Duval County has been designated as nonattainment for ozone by USEPA and FDER. As a result, emissions of VOC from the proposed sources will not be subject to PSD review. The central city portion of Jacksonville has been designated as a nonattainment area for PM(TSP). However, the Seminole Kraft mill is located outside of this nonattainment area, and nonattainment provisions would apply only if the impact of the proposed increase in emissions would significantly impact on the nonattainment area. As will be demonstrated in Section 5.0, Seminole Kraft's proposed increase in emissions will have a less than significant impact on the PM(TSP) nonattainment area. Therefore, nonattainment review for PM(TSP) will not be required. Therefore, PM(TSP) will be treated as a PSD pollutant.

The existing Seminole Kraft mill is classified as an existing "major facility" because emissions of several regulated pollutants exceed 100 TPY. Since the existing facility is an existing major facility, PSD review is required for any pollutant for which the net increase in emissions exceeds the PSD significant emission rate presented in Table 4-2. The maximum emissions from the proposed recovery boiler and smelt dissolving tank were presented in Section 3.0. The shutdown of the existing three recovery boilers and smelt tanks will result in creditable emission offsets. These creditable emission reductions are quantified in Appendix 3, and are summarized in Table 4-3.

The period of operation selected as most representative of normal plant operation was the 1983-1984 calendar years. This period of operation is different than that selected originally for the AES Power Plant Site Certification Application. After further review of mill records, it has been determined that the 1979-80 period selected by AES is not representative of mill operation since 1982. More specifically, when oil prices sky rocketed from $20 to $30 per barrel in 1980-81, the mill made operational adjustments to cope with these rising energy costs. These adjustments consisted of reducing oil usage in the mill's power boilers by maximizing steam production from the recovery boilers and bark boilers. In addition, wood waste fuel use was maximized in the bark boilers to minimize the quantity of oil used in these boilers. This can be seen in the table below which presents annual pulp production and fuel oil burned in the mill's boilers for the period 1979-1988.

Year	Pulp Production (tons ADUP)	Fuel Oil Burned+ (10^6 gallons)
1979	464,198	36.5
1980	478,134	34.4
1981	441,520	34.5
1982	345,698	25.7
1983	410,238	25.5
1984	436,032	23.6
1985	273,614*	14.6
1986	Mill Shutdown	Mill Shutdown
1987	281,352*	24.9
1988	415,904	28.8

+ Power Boilers, Bark Boilers and Recovery Boilers
* The mill was only in operation for approximately 9 months during these years.

As can be noted, fuel oil use in the mill's boilers drops significantly between 1981 and 1982. Accordingly, the 1979-80 period previously selected is not deemed representative of mill operation since 1982 and a period after 1981 should be selected.

Based on review of mill operation after 1981, the two year period 1983-1984, which is the last two consecutive full calendar years of operation before the mill was shutdown in 1985, is considered to be most representative of normal plant operation. The year 1982 was not considered representative of normal source operation due to market conditions, as reflected in the low production rate shown in the table above. Since the mill started up again in 1987, normal production rates have not been achieved. The average mill production in 1983-1984 was 423,125 tons air unbleached pulp (ADUP) while average production in calendar years 1987-1988 was only 348,628 tons ADUP. As a result, the period 1983-1984 is considered more representative of normal operation compared to the last two years of operation (1987-1988).

For the PSD pollutant applicability analysis, actual emissions from the existing recovery boilers and smelt tanks were based upon actual plant production and source tests conducted during the 1983-1984 period, AP-42 emission factors, and other published emission factors.

The maximum permitted production capacity of the mill is 1987 TPD ADUP. This is based on the Nos. 1 and 2 Batch Digester System capacity as stated in operating permit A016-116140. Applicable portions of that permit are reproduced in Figure 4-1. Therefore, maximum production capacity of the facility will not increase as a result of this project.

In mid-1988, Seminole Kraft shut down its existing lime slaker and replaced it with a new lime slaker with better particulate control. This change resulted in a net decrease in particulate emissions, which are contemporaneous and creditable. The emission reduction due to the shutdown of the old lime slaker, quantified in Appendix 4, is 141.5 TPY for PM(TSP) and 133.0 TPY for PM10. The increase in emissions from the new lime slaker, quantified in the permit application for the slaker, is 7.0 TPY for both PM(TSP) and PM10. The net decrease in emissions was 134.5 TPY for PM(TSP) and 126.0 TPY for PM10.

The PSD pollutant applicability analysis for the proposed Seminole Kraft project is presented in Table 4-4. As indicated, there is a net increase in emissions for only NO_x. As a result, PSD review applies for only NO_x emissions.

4.4.2 Ambient Monitoring

Based upon the PSD pollutant applicability analysis presented above, a preconstruction ambient monitoring analysis is required only for NO_x.

However, if the net increase in impacts of this pollutant are less than the PSD de minimis monitoring concentration (14 $\mu g/m^3$, annual average), an exemption from the preconstruction ambient monitoring requirements can be granted. As will be presented in Section 5.2, there is predicted to be no increase in annual average NO_x impacts due to the proposed project. Annual average NO_x impacts at all locations are predicted to improve as a result of the proposed project.

4.4.3 Nonattainment Review

Nonattainment review is required for ozone if the net increase in VOC emissions due to the proposed modification exceeds the significant emission rate of 40 TPY, and sufficient New Source Allowance is not available. As shown in Table 4-4, the proposed project will result in a net decrease in VOC emissions. As a result, the proposed project is not subject to nonattainment review for VOC.

Nonattainment review for PM(TSP) is required if the impact of the proposed sources on the nonattainment area is greater than significant levels. As demonstrated in Section 5.2, there will be no increase in PM(TSP) impacts due to the proposed project. PM(TSP) impacts at all locations are predicted to improve as a result of the proposed project.

Table 4-1. National and State AAQS, Allowable PSD Increments, and Significance Levels (ug/m^3)

Pollutant	Averaging Time	AAQS National Primary Standard	AAQS National Secondary Standard	AAQS State of Florida	PSD Increments Class I	PSD Increments Class II	Significant Impact Levels
Particulate Matter (TSP)	Annual Geometric Mean	NA	NA	NA	5	19	1
	24-Hour Maximum+	NA	NA	NA	10	37	5
Particulate Matter (PM10)	Annual Arithmetic Mean	50	50	50	NA	NA	1
	24-Hour Maximum*	150	150	150	NA	NA	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum+	365	NA	260	5	91	5
	3-Hour Maximum+	NA	1,300	1300	25	512	25
Carbon Monoxide	8-Hour Maximum+	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum+	40,000	40,000	40,000	NA	NA	2000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5**	25**	1
Ozone	1-Hour Maximum++	235	235	235	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

\+ Maximum concentration not to be exceeded more than once per year.
* Achieved when the expected number of exceedances per year is less than 1.0.
** The State of Florida has not yet adopted the PSD Increments for NO_2 concentrations.
++ Achieved when the expected number of days per year with concentrations above the standard is less than 1.0.

NA = Not applicable, i.e., no standard exists.

Note: Particulate matter (TSP) refers to total suspended particulate matter
Particulate matter (PM10) refers to particulate matter with aeroynamic diameter less than or equal to 10 microns.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.
40 CFR 50
40 CFR 52.21
FAC, Chapter 17-2.400

Table 4-2. PSD Significant Emission Rates and De Minimis Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	De Minimis Monitoring Concentration ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter (TSP)	NAAQS, NSPS	25	10, 24-hour
Particulate Matter (PM10)	NAAQS	15	10, 24-hour
Nitrogen Oxides	NAAQS, NSPS	40	14, Annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY+
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	*
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Asbestos	NESHAP	0.007	*
Beryllium	NESHAP	0.0004	0.001, 24-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Vinyl Chloride	NESHAP	1	15, 24-hour
Benzene	NESHAP	0	*
Radionuclides	NESHAP	0	*
Inorganic Arsenic	NESHAP	0	*

*No ambient measurement method.
+Increases in VOC emissions.

Notes: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below de minimis monitoring concentrations.
NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.

Sources: 40 CFR 52.21.
Chapter 17-2, Florida Administrative Code

Table 4-3. Baseline Emissions (1983-1984) from Existing Recovery Boilers and Smelt Dissolving Tanks at Seminole Kraft.

Pollutant	Annual Baseline Emissions (TPY)						
	RB1	RB2	RB3	SDT1	SDT2	SDT3	TOTALS
Particulate Matter (TSP)	143.8	144.4	139.0	31.3	48.4	42.9	549.8
Particulate Matter (PM10)	107.9	108.3	104.3	28.0	43.3	38.4	430.2
Sulfur Dioxide	429.5	519.8	531.7	2.5	3.0	3.1	1,489.6
Nitrogen Oxides	94.4	112.7	114.0	--	--	--	321.1
Carbon Monoxide	674.9	816.8	835.5	--	--	--	2,327.2
Volatile Organic Compounds	100.0	119.4	120.8	--	--	--	340.2
Total Reduced Sulfur	25.2	31.3	32.8	2.6	3.1	3.2	98.2
Lead	0.12	0.13	0.12	--	--	--	0.37
Mercury	--	--	--	--	--	--	--
Beryllium	0.0090	0.0098	0.0090	--	--	--	0.0278
Sulfuric Acid Mist	6.18	6.76	6.19	--	--	--	19.1
Inorganic Arsenic	--	--	--	--	--	--	--
Fluorides	--	--	--	--	--	--	--
Asbestos	--	--	--	--	--	--	--
Vinyl Chloride	--	--	--	--	--	--	--

Note: TPY = tons per year.

Table 4-4. PSD Source Applicability Summary

Regulated Pollutant	Previous Contemporaneous Emissions Reductions (TPY)	Reduction Due to Existing Recovery Boilers and Smelt Tanks (TPY)	Increase Due to New Recovery Boiler and Smelt Tank (TPY)	Net Increase in Emissions (TPY)	PSD Significant Emission (TPY)	PSD Review Applies?
Particulate Matter (TSP)	134.5	549.8	543.6	-140.7	25	No
Particulate Matter (PM10)	126.0	430.2	417.6	-138.6	15	No
Sulfur Dioxide	--	1,489.6	1,367.2	-122.4	40	No
Nitrogen Oxides	--	321.1	1,617.5	1,296.4	40	Yes
Carbon Monoxide	--	2,327.2	2,167.2	-160.0	100	No
Volatile Organic Compounds	--	340.2	247.9	-92.3	40	No
Total Reduced Sulfur	--	98.2	44.9	-53.3	10	No
Lead	--	0.37	0.21	-0.16	0.6	No
Mercury	--	--	--	--	0.1	No
Beryllium	--	0.028	0.016	-0.012	0.004	No
Sulfuric Acid Mist	--	19.1	13.3	-5.8	7	No
Inorganic Arsenic	--	--	--	--	0	No
Fluorides	--	--	--	--	3	No
Asbestos	--	--	--	--	0.007	No
Vinyl Chloride	--	--	--	--	1	No

Note: TPY = tons per year.

Figure 4-1

Permittee:	**I.D. Number:**	31-16-0067-(24, 25)
	Permit/Certification Number:	AO16-116140
Seminole Kraft Corporation	**Date of Issue:**	February 5, 1987
	Expiration Date:	September 24, 1989
	Revised:	January 10, 1989

SPECIFIC CONDITIONS: mev

1. Permittee shall notify the Bio-Environmental Services Division (BESD) fifteen (15) days prior to source testing in accordance with Rule 17-2.700(2)(a)5., Florida Administrative Code (FAC), and Rule 2.501, Jacksonville Environmental Protection Board (JEPB).

2. Copies of the test report(s) shall be submitted to BESD within forty-five (45) days of completion of testing in accordance with Rule 17-2.700(7)(b), FAC, and Rule 2.501, JEPB.

3. Tests for compliance will be performed with the control device (No. 2 and 3 Lime Kiln) operating at 90 - 100% of the maximum lime kiln operating rate and with digester systems 1 and 2 operating as near the maximum production rate as possible, but in no case shall the operating rate of the digesters be less than 85% of the maximum production rate. When operation is restricted to a lower capacity because of testing at such a level, BESD, upon advanced notification, will allow operation at higher capacities if such operation is for demonstrating compliance at a higher capacity.

4. Any revision(s) to a permit (and application) shall be submitted and approved prior to implementing.

5. Control equipment (non-condensible gas [NCG] collection and transport system and lime kilns) shall be provided with a method of access that is safe and readily accessible. Stack sampling ports and platforms shall be required on the NCG system in accordance with Rule 17-2.700(4), FAC, and Rule 2.207, JEPB.

6. Permittee shall submit an annual operation report to BESD for this source on the form supplied for each calendar year on or before March 1 in accordance with Rule 17-4.140, FAC.

7. The applicable emission limiting rules shall be as follows:

Pt. No.	Pollutant	[1]FAC	[2]JEPB	Other
24	Total Reduced Sulphur (TRS)	17-2.600(4)(c)1.	2.202	
25	TRS	17-2.600(4)(c)1.	2.202	

8. The maximum allowable emissions at the final compliance date shall be as follows:

Pt. No.	Pollutant	Other
24	TRS	20 ppm*
25	TRS	20 ppm*

*As measured in emissions from Lime Kiln No. 2 or No. 3

9. Operation of each digester system shall be limited to 8760 hours per year.

10. The maximum production rate of the Nos. 1 and 2 batch digester systems shall not exceed 1987 TPD ADP (tons per day of air dried pulp and based on a nominal utilization rate of 580,000 lbs/hr wood chips [dry] and 898,000 lbs/hr of black/white liquor).

5.0 SOURCE IMPACT ANALYSIS

5.1 ANALYSIS APPROACH AND ASSUMPTIONS

5.1.1 General Modeling Approach

Based upon the pollutant applicability analysis presented in Section 3.0, only NO_x requires a source impact analysis. The methodology for the NO_x impact analysis is presented in this section. Although not specifically required by PSD regulations, the change in SO_2 and PM(TSP) air quality due to the proposed project were also evaluated.

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

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

This approach is consistent with the air quality standards, which permit a short-term average concentration to be exceeded once per year at each receptor.

Model predictions for all averaging periods were performed using the Industrial Source Complex Short-Term (ISCST) model. A brief description of the ISCST model is given in Section 5.1.2.

5.1.2 Model Selection

The ISC dispersion model (USEPA, 1988a) was used to evaluate existing and proposed recovery boiler/smelt tank impacts from the Seminole Kraft facility. This model is contained in USEPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 6 (USEPA, 1988b). The ISC model was selected primarily for the following reasons:

1. USEPA and FDER have approved the general use of the model for air quality dispersion analysis because the model assumptions and methods are consistent with those in the Guideline on Air Quality Models (USEPA, 1987).
2. The ISC model is capable of predicting the impacts from stack, area, and volume sources that are spatially distributed over large areas and located in flat or gently rolling terrain.
3. The results from the ISC model are appropriate for addressing compliance with AAQS and PSD increments.

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

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

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

In this analysis, the ISCST model was used to calculate both short-term and annual average concentrations because these concentrations are readily obtainable from the model output. Major features of the ISCST model are presented in Table 5-1.

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

For modeling analyses that will undergo regulatory review, such as PSD permit applications, the following model features are recommended by USEPA (1987) and are referred to as the regulatory options in the ISCST model:

1. Final plume rise at all receptor locations,
2. Stack-tip downwash,
3. Buoyancy-induced dispersion,
4. Default wind speed profile coefficients for rural or urban option,
5. Default vertical potential temperature gradients,

6. Calm wind processing, and
7. A decay half life of 4 hours for SO_2 concentration calculations in urban areas.

In this analysis, the USEPA regulatory options were used to address maximum impacts from the Seminole Kraft facility. Based on a review of the land use around the Seminole Kraft facility, the rural mode was selected because of the general lack of, or minimal residential, industrial and commercial development within 3 km of the site.

5.1.3 Meteorological Data

Meteorological data used in the ISCST model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations from the National Weather Service (NWS) station at Jacksonville International Airport and twice-daily radiosonde soundings from the NWS station at Waycross, Georgia. The NWS station in Jacksonville was selected for use in the study because it is the closest primary weather station to the study area with similar surrounding topographical features and land-water boundaries. The 5-year period of meteorological data consisted of the years 1983 to 1987.

5.1.4 Emission Inventory

PROPOSED RECOVERY BOILER AND SMELT DISSOLVING TANK

The emission inventory for the proposed recovery boiler and smelt dissolving tank consists of the maximum emissions and stack parameters presented in Section 3.0. For NO_x, only the annual averaging time is of interest, and maximum NO_x emissions from the recovery boiler (369.3 lb/hr) were modeled. There are no emissions of NO_x from the smelt tank. For SO_2 emissions from the proposed recovery boiler, maximum emissions (514.0 lb/hr) were modeled for the 3-hour and 24-hour averaging times, while maximum annual average emissions (1362.2 TPY or 311.0 lb/hr) were modeled for the annual averaging time. Emissions of SO_2 are not significant from the proposed smelt tank (2.3 lb/hr), and therefore these emissions were not modeled. In the case of PM(TSP) emissions from the recovery boiler, maximum emissions (107.0 lb/hr) were modeled for both the 24-hour and annual averaging times. For the smelt tank, maximum emissions of 17.1 lb/hr were modeled for both averaging times.

Since the proposed recovery boiler stack is of GEP height, building downwash was not considered for this source. The smelt dissolving tank vent stack is less than GEP height, and therefore building downwash was considered in the modeling analysis for this source. Since the vent will be located on the proposed recovery boiler building, the dimensions of this building were used in the analysis. It was assumed that the maximum projected width of the building of 150 feet affected the vent for all wind directions. The height of the building will be 210 feet. The new recovery boiler building will be the tallest building located at the Seminole Kraft site.

EXISTING RECOVERY BOILERS AND SMELT DISSOLVING TANKS

Emissions of NO_x, SO_2, and PM(TSP) from the existing three recovery boilers and smelt dissolving tanks for the modeling analysis were based upon permitted emissions or maximum operating rates. Supporting calculations are shown in Appendix 5. The maximum emission rates and stack parameters for these existing sources are presented in Table 5-2. As in the case of the proposed smelt tank, the existing smelt tank does not emit NO_x, and SO_2 emissions are insignificant (10.8 lb/hr) and were not modeled.

Based upon a review of the buildings existing at Seminole Kraft and the heights of the existing recovery boiler stacks and smelt tank vents, these sources will be affected by building downwash. The existing buildings and building dimensions affecting each of these stacks per radial direction are presented in Table 5-3. A plot plan of the facility, showing these sources and the building heights, is presented in Figure 5-1.

5.1.5 Receptors

GENERAL RECEPTOR GRID

To determine the maximum SO_2 ground-level ambient concentrations due to operation of both the existing and proposed recovery boilers and smelt tanks, the modeling approach was to use a 14-ring polar receptor grid. The ring distances were placed at downwind distances of 0.1, 0.2, 0.3, 0.4, 0.6, 1.0, 1.3, 1.6, 2.0, 2.5, 3.0, 3.5, and 4.0 km. The spacing interval and number of rings were selected to obtain all maximum concentrations with a minimum amount of additional refinement.

All applicable times for SO_2, NO_x and PM(TSP) were evaluated. The net air quality change was obtained spatially by subtracting the maximum predicted baseline air quality concentrations from the predicted future concentrations receptor by receptor (504 receptors total).

Receptor locations falling within the Seminole Kraft property boundary were not considered in the modeling analysis. The property line distances for each 10° of azimuth were developed based on a plot plan of the Seminole Kraft facility. Although the actual model runs include rings that are partially or totally contained within the property boundary, such receptors were not included in determining the maximum impacts. The downwind distance to the property boundary along each azimuth from the site origin used in the modeling is presented in Table 5-4.

DISCRETE RECEPTORS

Three discrete receptors were evaluated in the modeling analysis. These three locations are in areas where the FDER previously modeled and obtained SO_2 exceedances. These locations, in UTM coordinates, are as follows:

437.3, 3353.5 km
438.6, 3360.6 km
438.3, 3360.8 km

CLASS I AREA IMPACTS

PSD increment consumption was determined for NO_x at the Okefenokee National Wildlife Refuge (NWR), a Class I area approximately 55 kilometers northwest of the plant site. The impacts were modeled at seven receptors placed along the boundary of the NWR. The UTM's of these receptors are as follows:

Receptor #	UTM-E (KM)	UTM-N (KM)	Distance (KM)
1	390	3410	71
2	392	3400	63
3	390	3395	61
4	391	3390	58
5	390	3384	56
6	383	3382	61
7	370	3383	74

PSD increment consumption is determined by subtracting the predicted maximum concentration due to the existing recovery boilers/smelt tanks from the maximum concentration due to the proposed sources, at each receptor.

5.1.6 <u>Graphical Output</u>

Graphical output (isopleths) for both the existing and proposed recovery boiler and smelt tank impacts for each pollutant and averaging time were developed. All isopleths consist of a series of concentration contours covering a basemap of the Seminole Kraft site. The basemap is a square, 8 kilometers on a side, centered at the Seminole Kraft site.

5.2 AIR QUALITY IMPACT ANALYSIS RESULTS

Maximum existing and proposed recovery boiler/smelt dissolving tank air quality impacts were determined at off-property receptors. The replacement of the existing equipment with the proposed equipment will result in an improvement in air quality for all Class II areas nearby the facility (i.e., surrounding the facility). There will be a very small amount of NO_x increment consumed at the Class I Okefenokee NWR.

5.2.1 Nitrogen Dioxide

PSD CLASS II IMPACTS

Maximum proposed and existing NO_x impacts due to the recovery boilers are presented in Table 5-5 for each year modeled. The existing maximum annual impact is 1.2 $\mu g/m^3$. The maximum annual predicted impact for the proposed recovery boiler is 0.23 $\mu g/m^3$. Review of the NO_x impact results show that there is a predicted improvement in NO_x air quality at all receptors off-site of the plant property (i.e., available PSD NO_x increment increases everywhere in the vicinity of the plant).

Figures 5-1 and 5-2 show the spacial distribution of NO_x impacts for the existing and proposed recovery boilers, respectively. As shown in the prior tables, there is an improvement in air quality throughout the site vicinity, as expressed is lower contour values for the proposed recovery boiler (Figure 5-2).

CLASS I IMPACTS

Maximum NO_x Class I impacts for each year modeled are presented in Table 5-6. From comparison of the existing and proposed impacts, the maximum NO_x PSD increment consumed is 0.015 $\mu g/m^3$, which is less than one percent of the allowable PSD NO_x increment of 2.5 $\mu g/m^3$, annual average.

5.2.2 Sulfur Dioxide

Maximum predicted SO_2 impacts in the vicinity of Seminole Kraft are presented for each year and for each averaging time in Table 5-7. The maximum annual impacts are 5.1 $\mu g/m^3$ for the existing recovery boilers and 0.19 $\mu g/m^3$ for the proposed recovery boilers. Similarly, the 24-hour maximum impacts are 65.2 $\mu g/m^3$ existing versus 4.4 $\mu g/m^3$ proposed, and the 3 hour maximum impactd are 209 $\mu g/^3$ for the existing and 22 $\mu g/m^3$ for the proposed sources. Similarly, significant decreases in SO_2 concentration were predicted at the three FDER exceedance locations for all averaging times. These results are presented in Table 5-8.

Isopleths of the existing recovery boilers SO_2 annual impacts are shown in Figure 5-3. Proposed SO_2 annual impacts from the proposed recovery boilers are presented in Figure 5-4. Maximum 24-hour existing and proposed source concentrations are presented in Figure 5-5 and 5-6, respectively. Figure 5-7 and 5-8 present the 3-hour comparisons. As evident from a comparison of existing and proposed facility impacts for each averaging time, there are significant site vicinity concentration reductions in all areas.

5.2.3 Particulate Matter

Maximum annual and 24-hour TSP concentrations for the existing and proposed recovery boilers and smelt tanks are presented by year in Table 5-9. The maximum annual impacts are 9.8 $\mu g/m^3$ for the existing and 6.1 $\mu g/m^3$ for the proposed sources. Significant concentration reductions are presented graphically for the site vicinity in Figures 5-9 through 5-12. Figure 5-9 and 5-10 presents the annual TSP impacts for the existing and proposed sources, respectively. The 24-hour maximum impacts for the existing sources are presented in Figure 5-11, while the proposed sources' 24-hour maximum impacts are shown in Figure 5-12.

5.3 ADDITIONAL IMPACTS ANALYSIS

5.3.1 Impacts Upon Vegetation and Soils

Based upon the air dispersion modeling analysis presented in Section 5.2, the proposed project will result in a net air quality improvement at all locations. As a result, there will be no discernible effect upon vegetation or soils in the vicinity of the site or in the Okefenokee PSD Class I area.

5.3.2 Impacts Upon Visibility

Impacts upon visibility in the PSD Class I area (Okefenokee NWR) were predicted with the EPA Level-1 visibility screening model (EPA, 1989). Input parameters to the model and model results are shown in Figure 5-14. As shown, the predicted impacts upon visibility are below the Level-1 screen criteria for the visibility parameters. As a result, no impact upon visibility are predicted.

5.3.3 Impacts Due To Associated Growth

Since the proposed recovery boiler and smelt tanks are replacement units for the existing recovery boilers and smelt tanks, no increase in permanent employment, infrastructure or other associated support activities will occur at the facility. As a result, there will be no significant impacts due to associated growth.

Table 5-1. Major Features of the ISCST Model

ISCST Model Features
o Polar or Cartesian coordinate systems for receptor locations
o Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
o Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975)
o Procedures suggested by Huber and Snyder (1976), Huber (1977), Schulman and Scire (1980), for evaluating building wake effects
o Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
o Separation of multiple point sources
o Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
o Capability of simulating point, line, volume and area sources
o Capability to calculate dry deposition
o Variation with height of wind speed (wind speed-profile exponent law)
o Concentration estimates for 1-hour to annual average
o Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm
o Consideration of time-dependent exponential decay of pollutants
o The method of Pasquill (1976) to account for buoyancy-induced dispersion
o A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
o Procedure for calm-wind processing

Source: EPA, 1988a

Table 5-2. Maximum Emissions and Stack Parameters, Existing Recovery Boilers and Smelt Tanks

NEDS Point No.	Source	Height (ft.)	Height (m)	Diameter (ft.)	Diameter (m)	Velocity (fpm)	Velocity (m/s)	Temperature (°F)	Temperature (°K)	Emissions NO_x	Emissions SO_2	Emissions PM(TSP)
9-	No.1 RB	126	38.4	8.5	2.59	3480	17.88	160	344	24.1	105.4	43.3
10-	No.2 RB	126	38.4	9.0	2.74	3425	17.40	160	344	30.8	134.8	55.4
11-	No.3 RB	126	38.4	9.0	2.74	3425	17.40	160	344	30.8	134.8	55.4
12-	No.1 SDT	120	36.6	3.5	1.07	780	3.96	160	344	-	3.0	16.2
13-	No.2 SDT	124	37.8	4.0	1.22	841	4.27	160	345	-	3.9	18.9
14-	No.3 SDT	124	37.8	4.0	1.22	841	4.27	160	345	-	3.9	18.9

Note: All three recovery boilers were combined into one effective source with stack parameters equal to those for No. 2 and No. 3 recovery boilers. All three smelt dissolving tanks were combined into one effective source with stack parameters equal to those for No. 2 and No. 3 smelt dissolving tanks.

RB = Recovery Boiler
SDT = Smelt Dissolving Tank

Table 5-3. Building Parameters Associated With Existing Recovery Boilers and Smelt Tanks

Radial Direction	Nos. 1, 2 and 3 Recovery Boilers: Influencing Building	Height (ft)	Height (m)	Width (ft)	Width (m)	Nos. 1, 2 and 3 Smelt Tanks: Influencing Building	Height (ft)	Height (m)	Width (ft)	Width (m)
10	Recovery Blrs.	90	27	160	49	Recovery Blrs.	90	27	160	49
20	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
30	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
40	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
50	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
60	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
70	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
80	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
90	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
100	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
110	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
120	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
130	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
140	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
150	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
160	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
170	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
180	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
190	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
200	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
210	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
220	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
230	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
240	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
250	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
260	RB ESP's	40	12	180	55	Recovery Blrs.	90	27	160	49
270	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
280	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
290	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
300	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
310	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
320	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
330	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
340	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
350	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49
360	Recovery Brls.	90	27	160	49	Recovery Blrs.	90	27	160	49

Table 5-4. Distance to Nearest Property Boundary, Seminole Kraft

Direction (Deg)	Distance (ft)	Distance (m)	Direction (Deg)	Distance (ft)	Distance (m)
360	2125	650	180	1013	310
350	1950	600	170	1100	335
340	1800	550	160	1175	360
330	1650	500	150	1325	400
320	1600	490	140	2225	680
310	1550	470	130	2300	700
300	1425	430	120	1325	400
290	1600	490	110	1150	350
280	1650	500	100	1050	320
270	1600	490	90	1013	310
260	1500	460	80	1000	300
250	1400	430	70	1013	310
240	875	270	60	1050	320
230	925	280	50	1150	350
220	888	270	40	1300	400
210	900	270	30	1550	470
200	950	290	20	1950	590
190	975	300	10	2132	650

Note: Distance and direction are relative to plant baseline.

Table 5-5. Predicted Annual NO_x Impacts for Existing and Proposed Recovery Boilers

	Proposed Recovery Boiler/Smelt Dissolving Tank	
	Annual Concentration($\mu g/m^3$)	Location (m, degree)
1983	0.18	3500,130
1984	0.20	3500,310
1985	0.18	3000,300
1986	0.22	3000,110
1987	0.23	3500,120

	Existing Recovery Boilers/Smelt Dissolving Tanks	
	Annual Concentration($\mu g/m^3$)	Location (m, degree)
1983	0.8	800,130
1984	0.5	1000,310
1985	0.8	800,110
1986	0.9	1300,300
1987	1.2	800,120

Table 5-6. Predicted Annual NO_x Impacts ($\mu g/m^3$) at Discrete Receptors within the Okefenokee Class I NWR

Proposed Recovery Boilers

	Receptor Number 1	2	3	4	5	6	7
1983	.011	.011	.009	.008	.009	.010	.007
1984	.015	.015	.013	.012	.010	.009	.006
1985	.012	.013	.013	.014	.012	.010	.007
1986	.015	.015	.016	.010	.007	.006	.005
1987	.015	.015	.011	.011	.008	.009	.007

Existing Recovery Boiler

	Receptor Number 1	2	3	4	5	6	7
1983	.021	.023	.019	.020	.020	.020	.015
1984	.027	.030	.025	.023	.020	.019	.015
1985	.022	.027	.023	.027	.024	.019	.014
1986	.023	.027	.030	.026	.018	.015	.011
1987	.027	.026	.024	.023	.019	.018	.015

Table 5-7. Predicted Maximum SO2 Impacts of Proposed and Existing Recovery Boilers and Smelt Dissolving Tanks

Year	Annual Average		24-Hour Average*		3-Hour Average*	
	Impact ($\mu g/m^3$)	Location (m,°)	Impact ($\mu g/m^3$)	Location (m,°)	Impact ($\mu g/m^3$)	Location (m,°)
Proposed Recovery Boiler/Smelt Dissolving Tank						
1983	0.15	3500,130	3.7	2500,250	15.2	4000,310
1984	0.17	3500,310	4.2	1000,260	20.2	1000,250
1985	0.15	3000,300	4.4	1000,800	22.0	800,70
1986	0.19	3000,110	4.3	2500,300	21.0	1000,130
1987	0.19	3500,120	4.2	1000,90	17.7	1300,100
Existing Recovery Boilers/Smelt Dissolving Tanks						
1983	3.5	800,130	65.2	600,310	182.3	600,330
1984	4.2	1000,310	56.5	300,220	165.5	300,220
1985	3.3	800,110	43.8	600,120	172.9	600,350
1986	3.8	1300,300	40.8	600,320	209.0	600,310
1987	5.1	800,120	52.4	300,220	166.8	600,120

* HSH impacts are presented

Table 5-8. Predicted Maximum SO_2 Impacts at FDER Excedence Areas for Existing and Proposed Source.

Year	Annual Average Impact ($\mu g/m^3$)	Annual Average Location (m,°)	24-Hour Average Impact ($\mu g/m^3$)	24-Hour Average Location (m,°)	3-Hour Average Impact ($\mu g/m^3$)	3-Hour Average Location (m,°)

Proposed Recovery Boiler/Smelt Dissolving Tank

	1			2			3		
	Annual	3-Hour	24-Hour	Annual	3-Hour	24-Hour	Annual	3-Hour	24-Hour
1983	.06	5.3	1.6	.10	7.3	2.4	.11	7.2	2.8
1984	.05	4.3	1.3	.09	8.8	2.5	.11	9.1	2.2
1985	.05	4.3	1.3	.09	8.5	2.2	.10	9.1	2.0
1986	.05	4.4	1.2	.08	6.3	1.6	.09	6.3	1.6
1987	.07	4.7	1.2	.10	8.6	1.9	.11	8.5	1.8

Existing Recovery Boiler/Smelt Dissolving Tank

	1			2			3		
	Annual	3-Hour	24-Hour	Annual	3-Hour	24-Hour	Annual	3-Hour	24-Hour
1983	.31	14.0	3.7	.92	30.6	14.7	1.06	34.8	11.6
1984	.25	14.1	2.8	.64	25.1	9.8	.78	32.8	9.4
1985	.25	15.4	3.0	.75	26.4	7.8	.91	31.6	9.0
1986	.28	13.5	3.7	.76	29.1	9.1	.86	26.7	10.3
1987	.34	15.8	4.5	.86	9.6	9.4	.97	27.5	10.3

* HSH Impacts are presented.

Table 5-9. Predicted Maximum PM(TSP) Impacts of Proposed and Existing Recovery Boilers and Smelt Dissolving Tanks

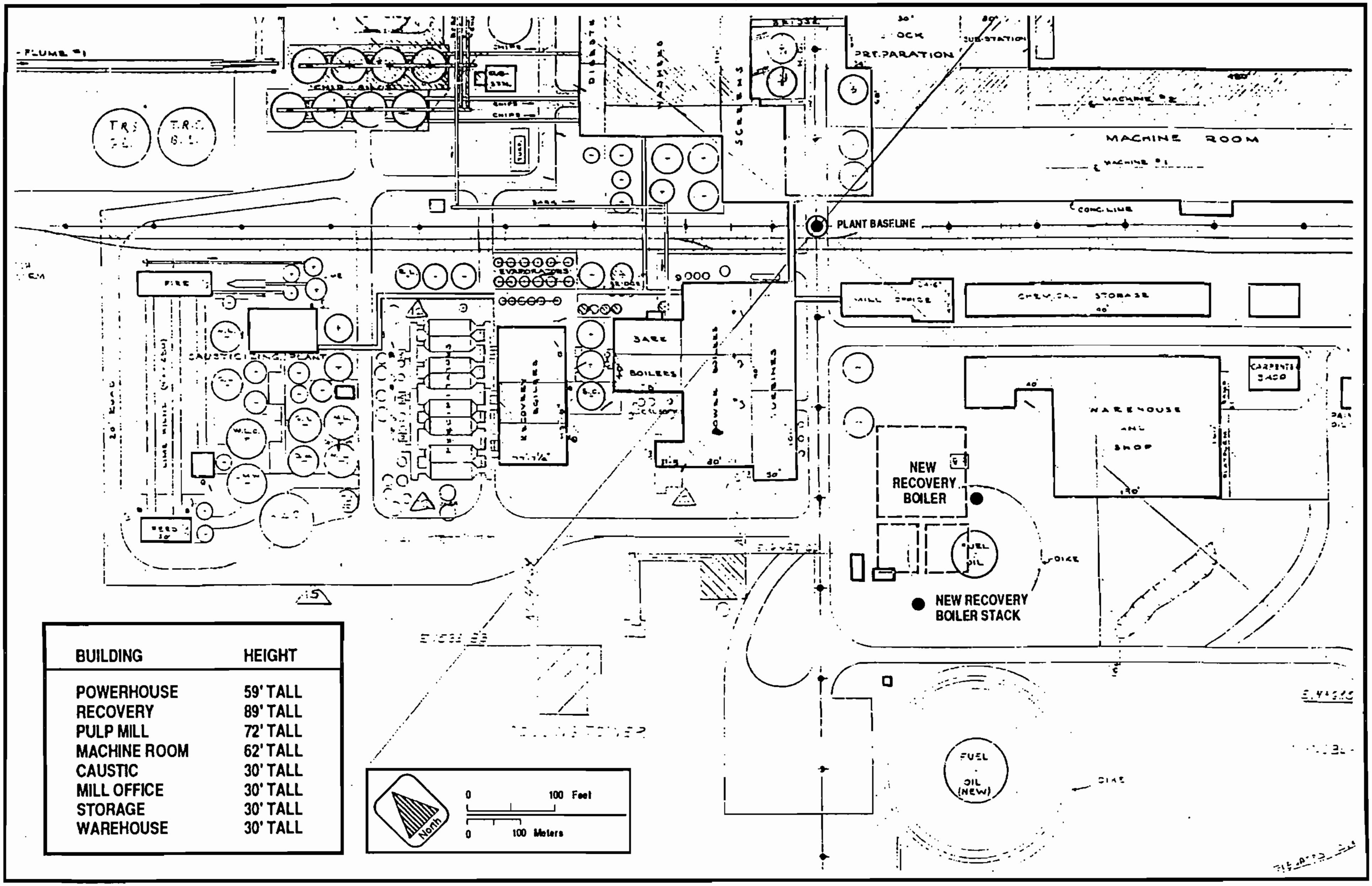
Proposed Recovery Boiler/Smelt Dissolving Tank

	Annual		24-Hour*	
Year	Concentration (ug/m^3)	Location (m,deg)	Concentration (ug/m^3)	Location (m,deg)
1983	0.63	600,220	6.1	600,220
1984	0.57	400, 60	6.1	600,220
1985	0.59	400, 60	5.1	600,230
1986	0.70	400, 60	5.1	400, 70
1987	0.66	600,130	6.0	600,190

Existing Recovery Boilers/ Smelt Dissolving Tanks

	Annual		24-Hour*	
Year	Concentration (ug/m^3)	Location (m,deg)	Concentration (ug/m^3)	Location (m,deg)
1983	9.8	300,240	85.4	300,240
1984	9.0	300,240	90.8	300,210
1985	8.3	400,240	72.1	400,240
1986	9.0	300,200	98.2	300,200
1987	9.1	300,240	87.1	300,210

* HSH Impact are presented



BUILDING	HEIGHT
POWERHOUSE	59' TALL
RECOVERY	89' TALL
PULP MILL	72' TALL
MACHINE ROOM	62' TALL
CAUSTIC	30' TALL
MILL OFFICE	30' TALL
STORAGE	30' TALL
WAREHOUSE	30' TALL

Figure 5-1 PLOT PLAN OF MAJOR STRUCTURES AT SEMINOLE KRAFT

SEMINOLE KRAFT

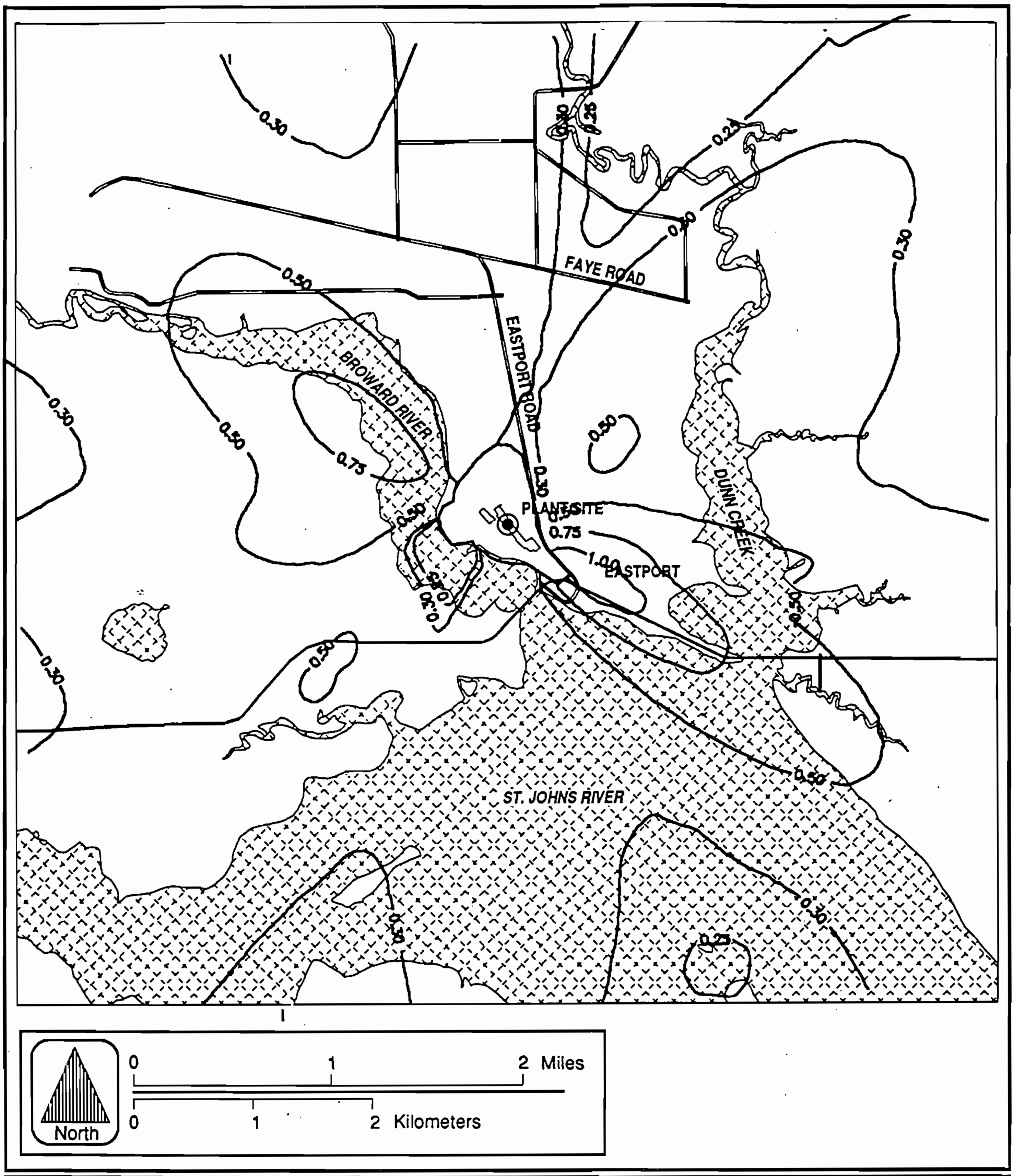


Figure 5-2 ANNUAL NO_x CONCENTRATIONS (ug/m^3)
FROM THE EXISTING RECOVERY BOILERS

SEMINOLE KRAFT

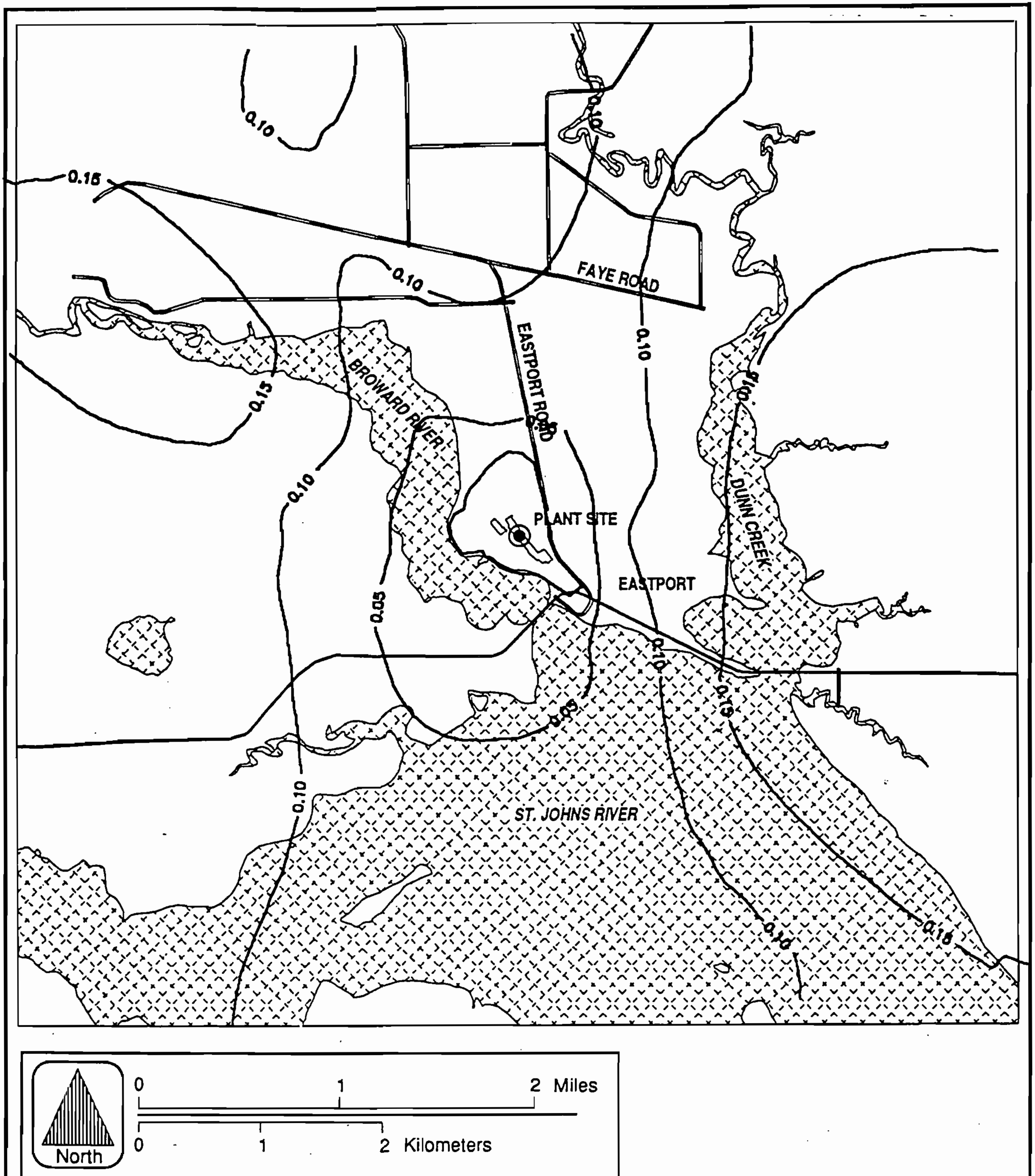


Figure 5-3 ANNUAL NO_x CONCENTRATIONS (ug/m³) FROM THE PROPOSED RECOVERY BOILER

SEMINOLE KRAFT

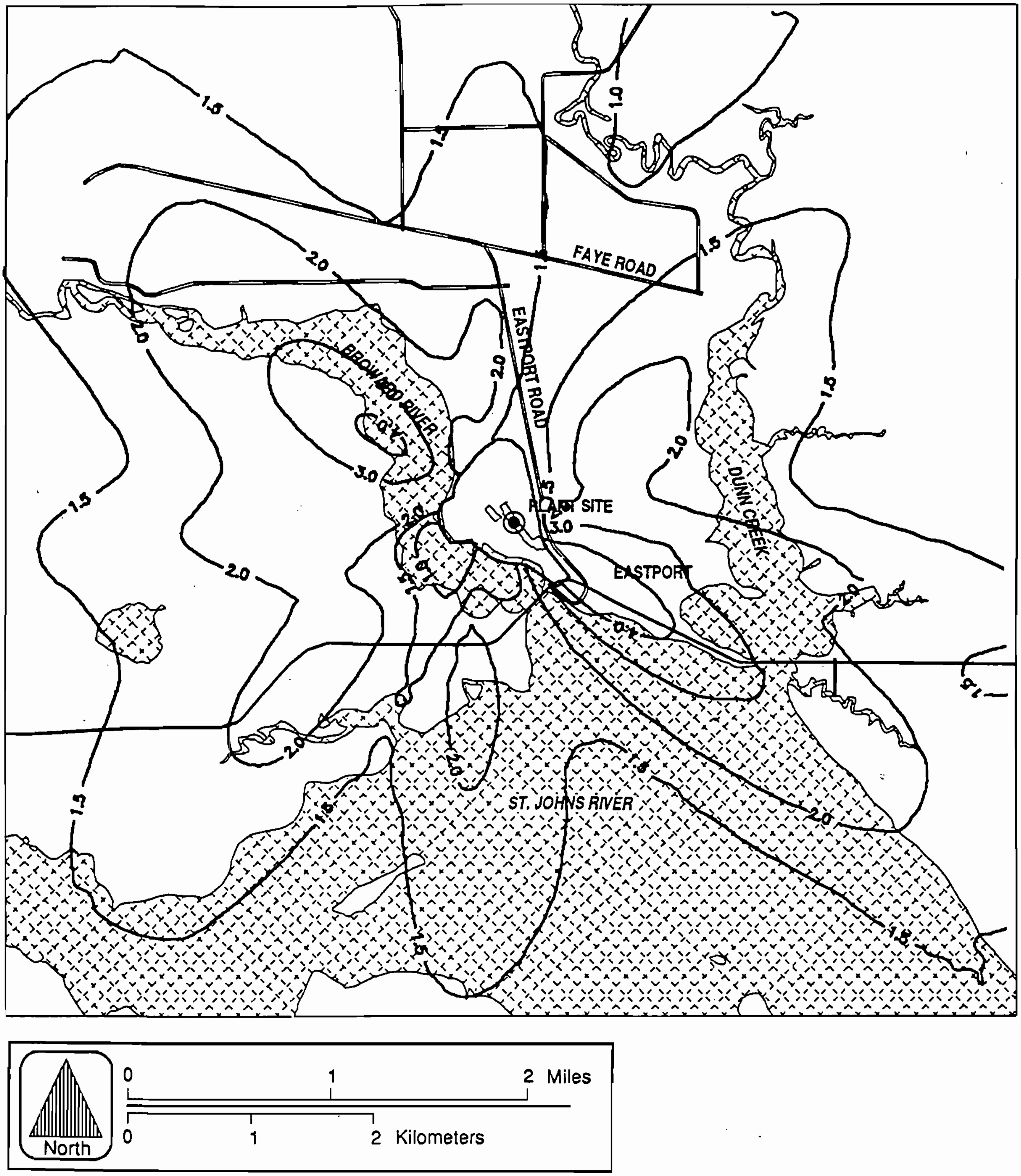


Figure 5-4 ANNUAL SO_2 CONCENTRATIONS ($\mu g/m^3$) FROM THE EXISTING RECOVERY BOILERS

SEMINOLE KRAFT

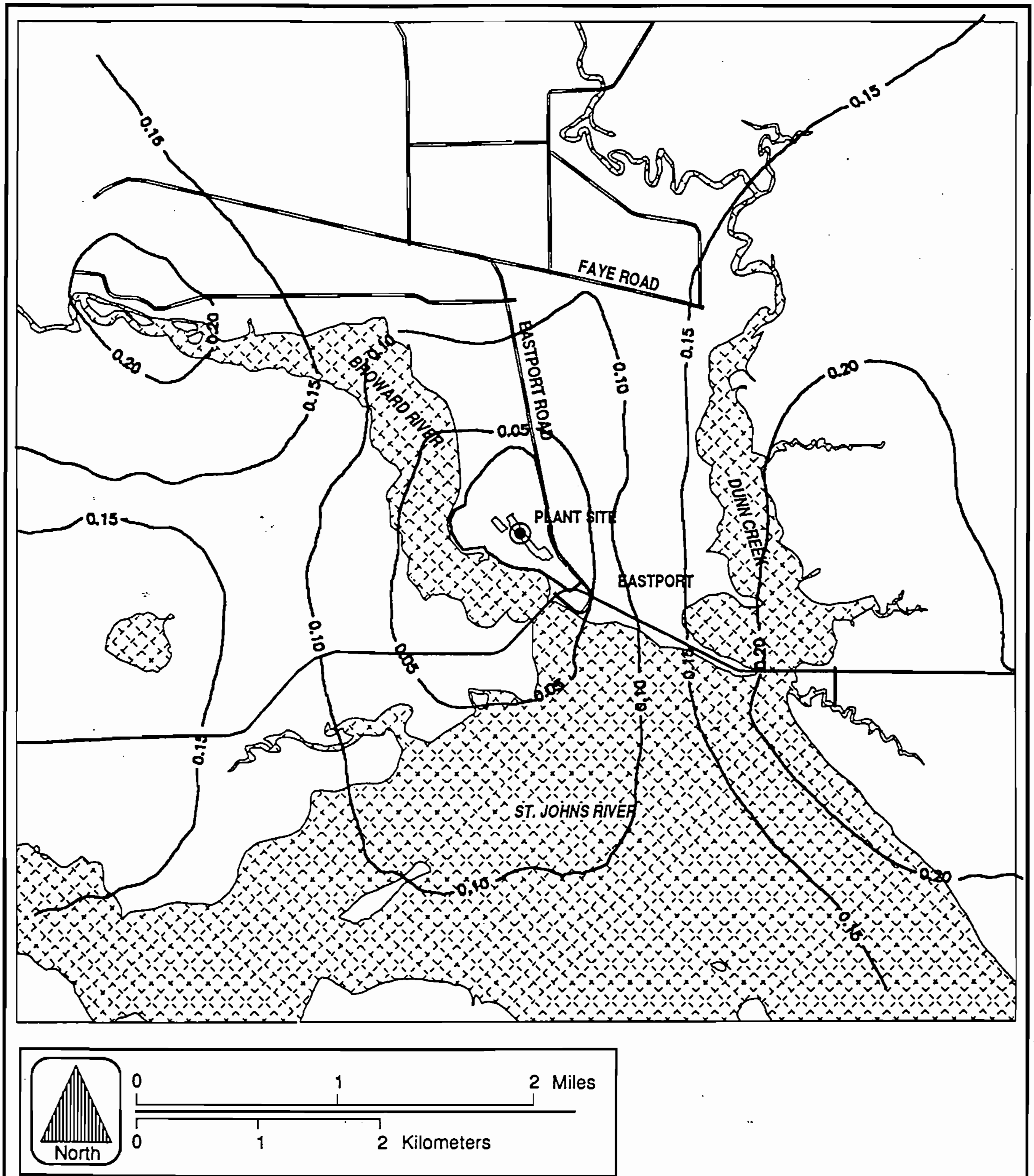


Figure 5-5 ANNUAL SO_2 CONCENTRATIONS (ug/m³) FROM THE PROPOSED RECOVERY BOILER

SEMINOLE KRAFT

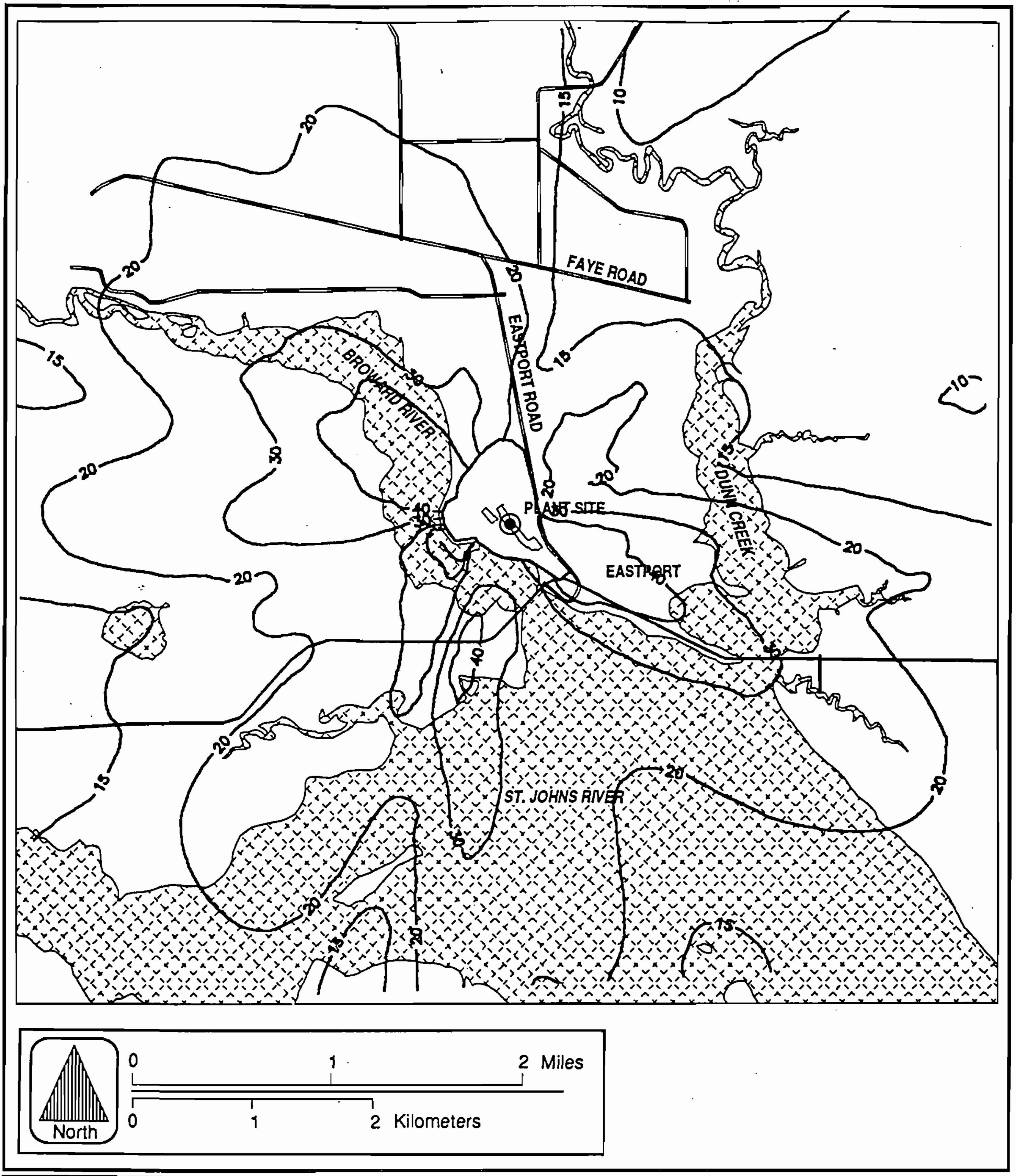


Figure 5-6 24-HOUR SO_2 MAXIMUM CONCENTRATIONS (ug/m³) FROM THE EXISTING RECOVERY BOILERS

SEMINOLE KRAFT

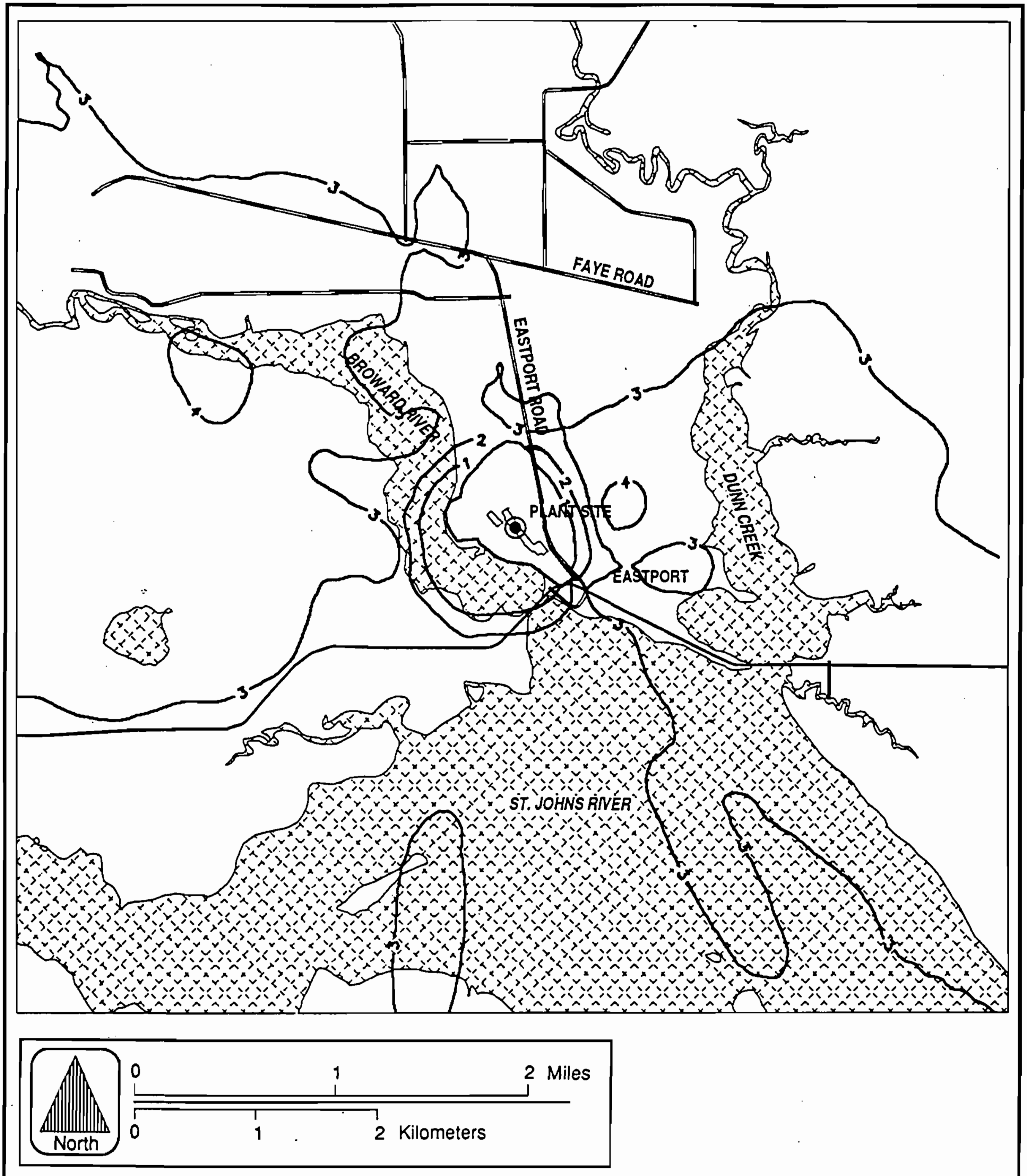


Figure 5-7 24-HOUR SO_2 MAXIMUM CONCENTRATIONS (ug/m^3) FROM THE PROPOSED RECOVERY BOILER

SEMINOLE KRAFT

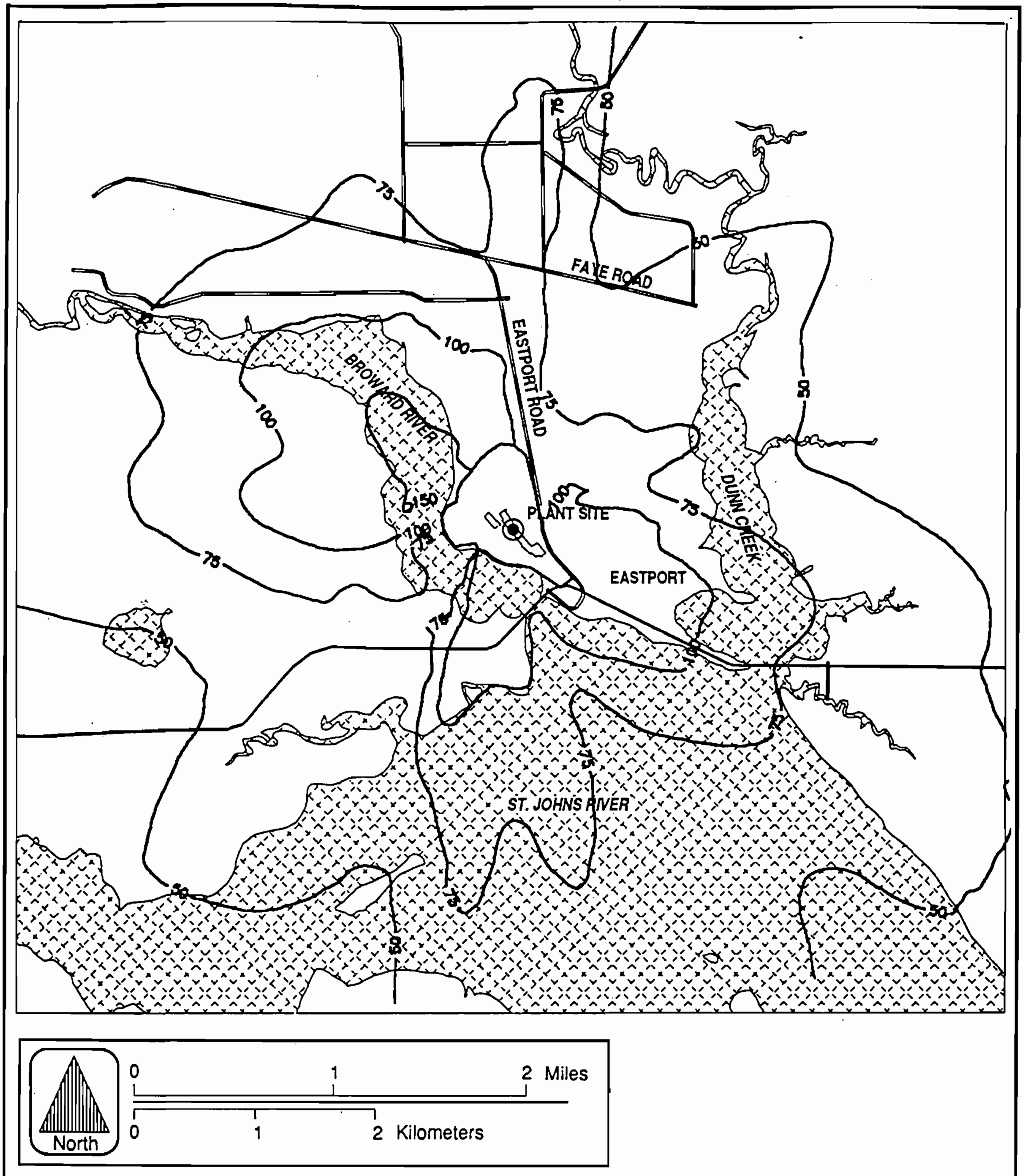


Figure 5-8 3-HOUR SO_2 MAXIMUM CONCENTRATIONS (ug/m^3) FROM THE EXISTING RECOVERY BOILERS

SEMINOLE KRAFT

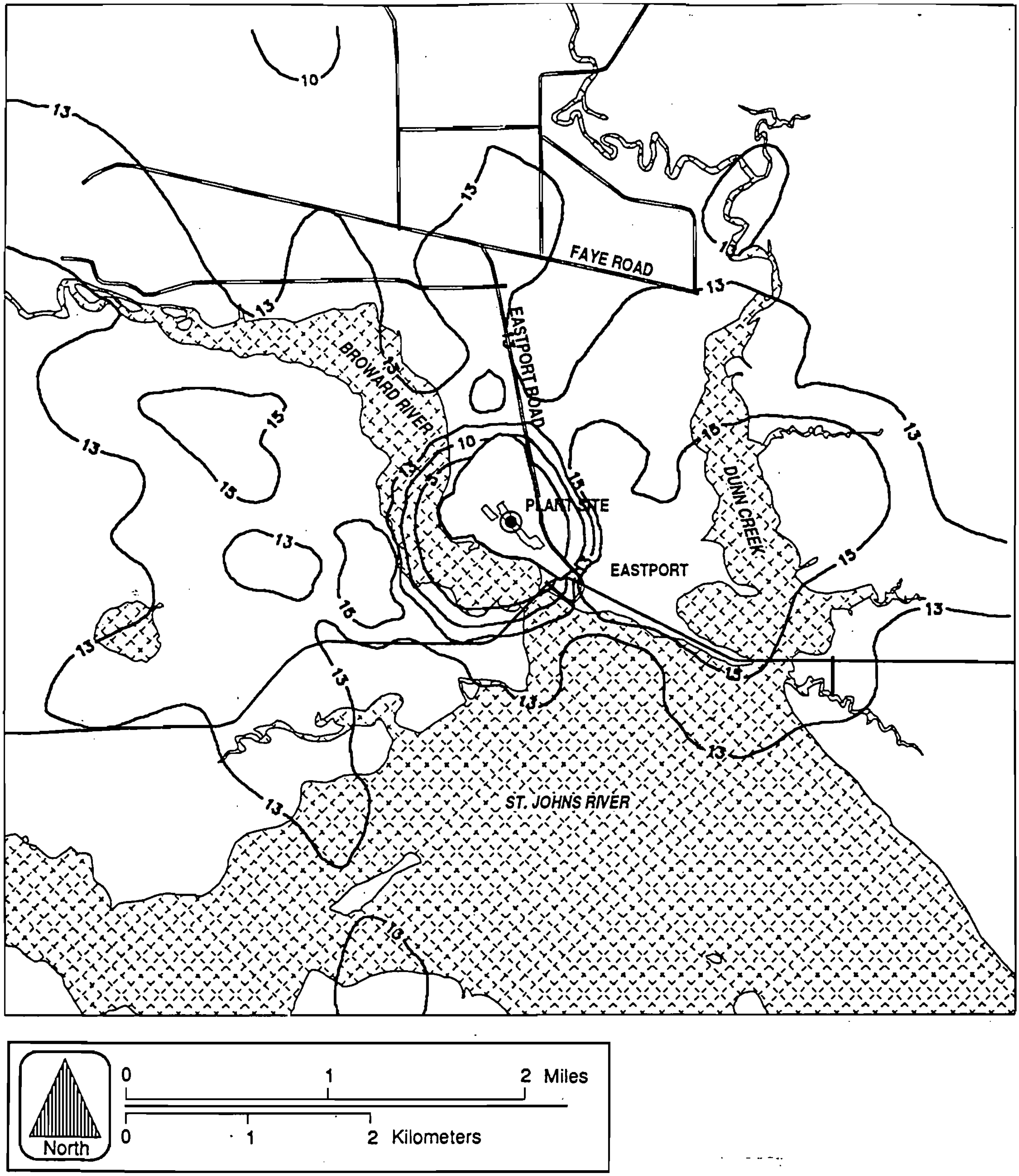


Figure 5-9 3-HOUR SO_2 MAXIMUM CONCENTRATIONS (ug/m³) FROM THE PROPOSED RECOVERY BOILER

SEMINOLE KRAFT

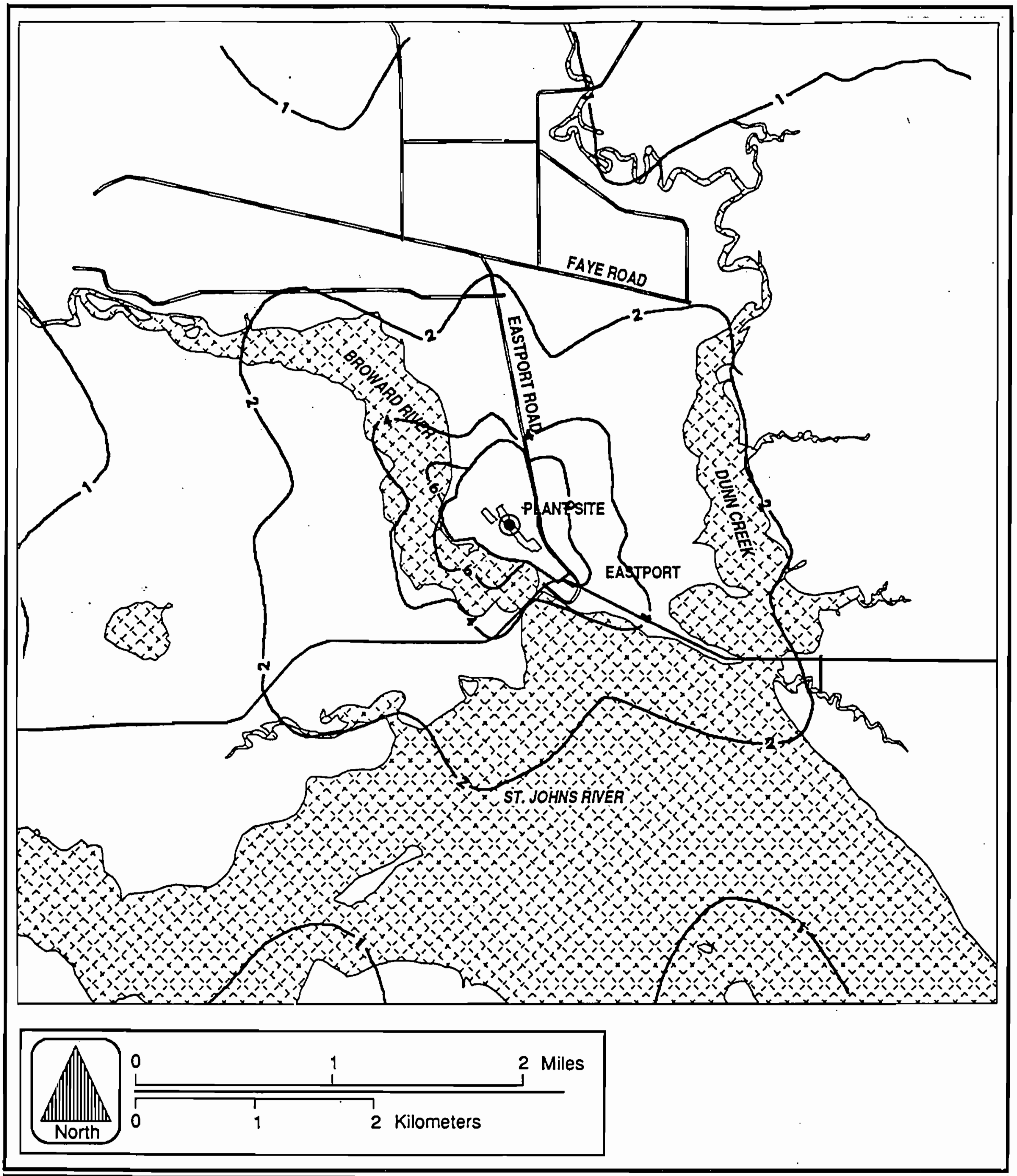


Figure 5-10 ANNUAL TSP CONCENTRATIONS (ug/m³) FROM THE EXISTING RECOVERY BOILERS AND SMELT DISSOLVING TANKS

SEMINOLE KRAFT

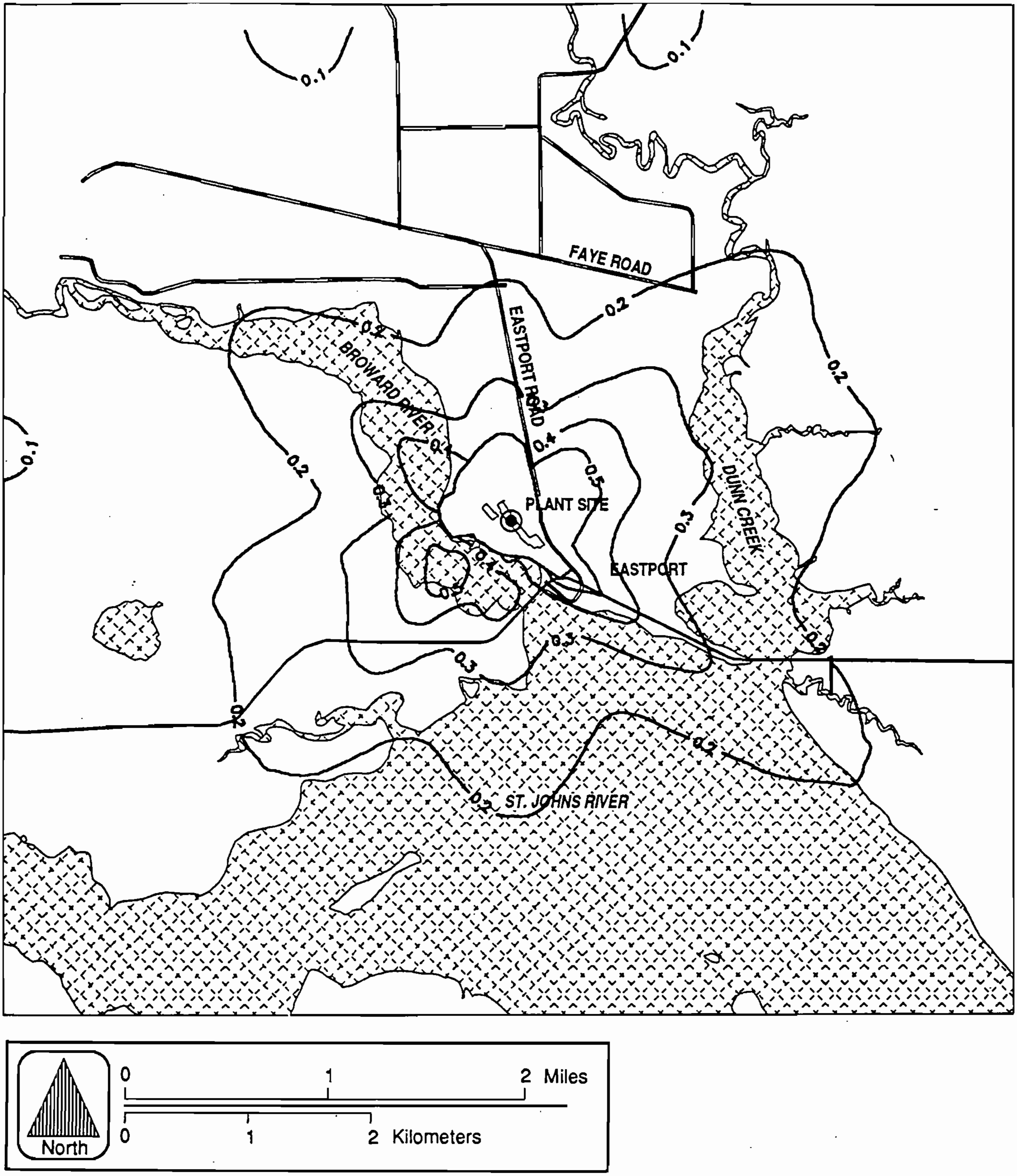


Figure 5-11 ANNUAL TSP CONCENTRATIONS (ug/m³) FROM THE PROPOSED RECOVERY BOILER AND SMELT DISSOLVING TANKS

SEMINOLE KRAFT

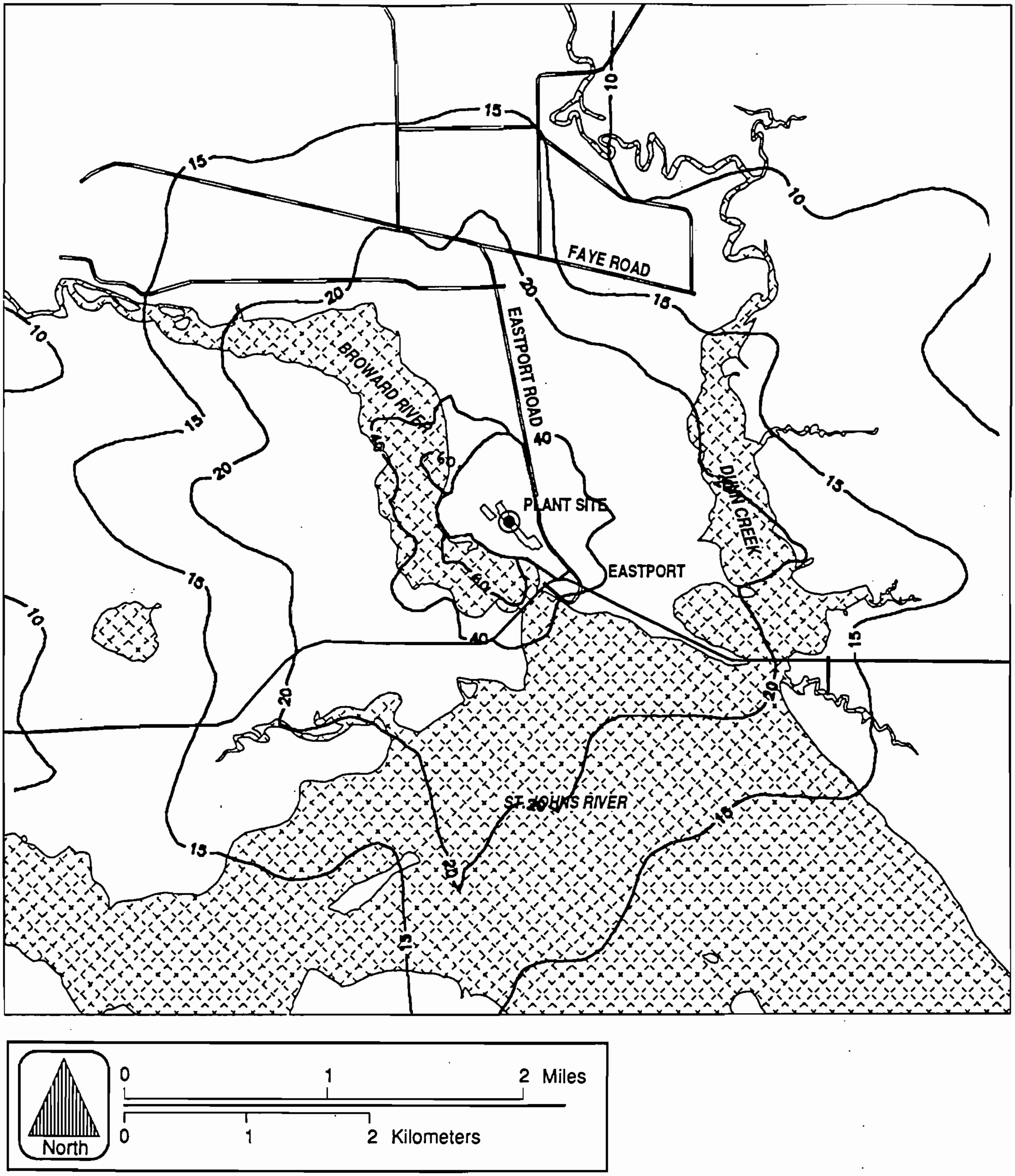


Figure 5-12 24-HOUR TSP MAXIMUM CONCENTRATIONS (ug/m³) FROM THE EXISTING RECOVERY BOILERS AND SMELT DISSOLVING TANKS

SEMINOLE KRAFT

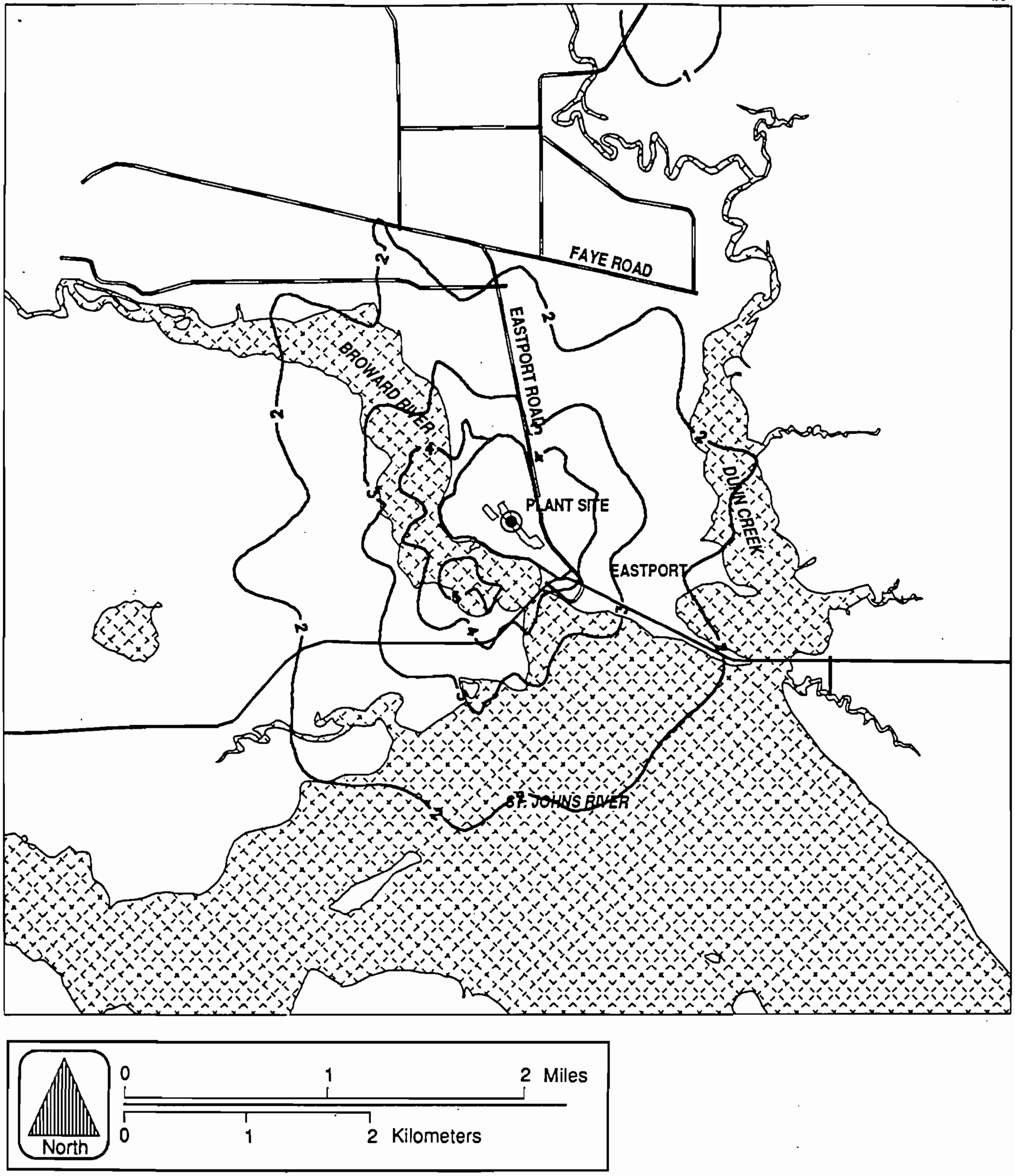


Figure 5-13 24-HOUR TSP MAXIMUM CONCENTRATIONS (ug/m³) FROM THE PROPOSED RECOVERY BOILER AND SMELT DISSOLVING TANKS

SEMINOLE KRAFT

Visual Effects Screening Analysis for
Source: Seminole Kraft Recovery
Class I Area: Okefenokee NWR

*** Level-1 Screening ***

Input Emissions for

Particulates	124.20	LB /HR
NOx (as NO2)	370.00	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	25.00 km
Source-Observer Distance:	55.70 km
Min. Source-Class I Distance:	55.70 km
Max. Source-Class I Distance:	73.80 km
Plume-Source-Observer Angle:	11.25 degrees
Stability: 6	
Wind Speed: 1.00 m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	55.7	84.	2.00	1.110	.05	.005
SKY	140.	84.	55.7	84.	2.00	.269	.05	-.008
TERRAIN	10.	84.	55.7	84.	2.00	.216	.05	.003
TERRAIN	140.	84.	55.7	84.	2.00	.051	.05	.002

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	65.	52.0	104.	2.00	1.172	.05	.005
SKY	140.	65.	52.0	104.	2.00	.279	.05	-.009
TERRAIN	10.	55.	49.8	114.	2.00	.281	.05	.004
TERRAIN	140.	55.	49.8	114.	2.00	.068	.05	.003

Figure 5-14 RESULTS OF LEVEL I VISIBILITY SCREENING ANALYSIS

SEMINOLE KRAFT

6.0 BEST AVAILABLE CONTROL TECHNOLOGY

The 1977 Clean Air Act Amendments establish revised conditions for the approval of preconstruction permit applications under the PSD program. One of these requirements is that the best available control technology (BACT) be installed for all pollutants regulated under the Act. Under the revised Act, BACT determinations must be made on a case-by-case basis considering technical, economic, energy and environmental impacts for various BACT alternatives. To bring consistency to the BACT process, the EPA developed the so called "top-down" approach to BACT determinations.*

The first step in a top-down BACT analysis is to determine, for each applicable pollutant, the most stringent control alternative available for a similar source or source category. If it can be shown that this level of control is infeasible on the basis of technical, economic, energy, or environmental impacts for the source in question, then the next most stringent level of control is identified and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any technical, economic, energy or environmental consideration.

6.1 BASIS OF ANALYSIS

Certain assumptions are made to permit the evaluation of BACT alternatives. The following summarizes the requirements and assumptions on which this BACT evaluation is based.

- Federal and state ambient air quality standards, emission limitations, significant deterioration increments and the requirements of other applicable regulations will be met.

---

* EPA's Top Down policy is currently being contested in Federal District Court in the District Court in the District of Columbia. This suit seeks to declare this policy invalid and enjoin EPA from enforcement of this policy.

- Federal NSPS do not set emission limits for SO_2, NO_x or CO emissions from kraft recovery boilers, smelt tanks or multieffect evaporators.
- Black liquor solids do not contain significant quantities of lead, beryllium, fluoride or mercury.
- The BACT analysis is based on the black liquor analysis listed in Table 6-1.
- Due to the mutually dependent formation characteristics of NO_x and CO emissions from recovery boilers, it is not possible to consider BACT for these emissions independently. Nitrogen oxides are formed by the oxidation of nitrogen contained in the fuel (fuel NO_x) and in the combustion air (thermal NO_x). Nitrogen oxide emissions are limited by lowering combustion temperatures, minimizing excess combustion air and staging combustion. Carbon monoxide emissions are formed by incomplete combustion of the fuel. Increasing combustions temperatures, increasing excess air and better fuel/air mixing during combustion minimize CO emissions. Therefore, limiting NO_x emissions by lowering combustions temperatures and excess combustion air are counterproductive relative to CO emissions.

6.2 KRAFT RECOVERY BOILER

As noted earlier, a BACT analysis must be performed for all applicable pollutants. The only applicable pollutant for the kraft recovery boiler is nitrogen oxide. This analysis supports the selection of BACT for the Seminole Kraft recovery boiler for those applicable pollutants.

A review of information contained in the BACT/LAER Clearinghouse documents indicates that the lowest NO_x emission requirement is 0.073 lb/MMBtu (approximately 39 ppm) for a proposed KRB located in Texas. In discussions with EPA Region VI, it was found that this plant has never been built and that the permit has expired. The minimum NO_x emission limit that is being met through actual operation is approximately 140 ppm at a KRB located in North Charleston, South Carolina.

In general, kraft recovery boilers have relatively low NO_x emissions. Low combustion temperatures and staged combustion (creating a reducing atmosphere in the lower portion of the boiler) inhibit the formation of NO_x. The combustion temperature above the primary air injection is estimated to be approximately 1,800°F. This relatively low combustion temperature is maintained by adjusting the furnace bed height and decreasing the primary air temperature.
KRB manufacturers are willing to guarantee various maximum NO_x emission rates. Emission guarantees vary, not only because of manufacturer differences, but also because of different black liquor fuel qualities. To maintain flexibility in procurement of equipment for this new recovery boiler, it is necessary to propose the lowest NO_x emission guarantee common to all potential manufacturers, plus a small allowance for performance deterioration. Manufacturers indicate that on the basis of the design black liquor fuel analysis listed in Table 6-1, they can reliably meet a NO_x emission requirement of 180 ppm with appropriate combustion controls as a 24 hour average.

In addition to combustion controls, NO_x emissions might be controlled by a postcombustion NO_x reduction system. Review of BACT/LAER Clearinghouse documents did not indicate any kraft recovery boilers using NO_x reduction systems operating downstream of a kraft recovery boiler. However, to comply with the requirements for a "top-down" BACT analysis, NO_x reduction systems will be considered for use downstream of the KRB.

Performance of a selective catalytic reduction (SCR) system downstream of a kraft recovery boiler is difficult to predict. This NO_x reduction system relies heavily on a vanadium pentoxide catalyst to ensure a complete efficient reaction of the ammonia with the NO_x. The presence of sodium compounds is likely to cause a multitude of catalyst fouling (plugging) problems. In addition, the formation of ammonia bisulfate would compound the uncertainty associated with this NO_x reduction system. Therefore, it appears that this NO_x reduction system is poorly suited for installation on a KRB and will not be considered further.

A Thermal DeNOx system does not rely on the use of a catalyst, but relies mainly on the chemical/temperature reaction between ammonia and NO_x. A large amount of uncertainty is associated with the use of this NO_x reduction technology downstream of a KRB, but it might be a more effective NO_x control technology than a SCR system. Ammonia bisulfate deposits downstream of the boiler are still likely to present operational and maintenance problems. In addition, there is serious concern that the catalytic effects in the presence of sodium compounds might have an adverse effect on the reaction efficiency of the chemical reduction process.

However, despite the uncertainties, for the purposes of this evaluation it will be assumed that a Thermal DeNOx system could be adapted for this application. A Thermal DeNOx system designed for sixty percent (60%) NO_x reduction would result in a NO_x emission of approximately 72 ppm.

Table 6-2 lists the estimated capital and levelized annual costs for a Thermal DeNox system located downstream of a kraft recovery furnace. A Thermal DeNOx system designed for 60% NO_x reduction would add approximately $3.5 million to the capital cost and $2.0 million to the annual cost of the kraft recovery boiler. Capital costs include costs for additive storage, ammonia additive injection system and balance-of-plant costs. Annual costs include fixed charges on capital investment, operating personnel, ammonia additive, maintenance and energy. Annual costs do not account for any costs associated with reduced reduction efficiency in the recovery boiler, which could be substantial.

A levelized annual cost of $2.0 million results in an incremental NO_x emissions reduction cost of $2,000 per ton of NO_x reduced. The Thermal DeNOx system would consume electrical energy equivalent to approximately one percent of the recovery boiler fuel consumption rate.

The consideration of environmental factors also supports the selection of combustion controls as BACT. Use of a Thermal DeNOx system will result in the emission of various amine compounds formed by the unreacted ammonia exiting these NO_x reduction systems. This represents a potential adverse human health effect, since many amine compounds are known or suspected carcinogens. Although ammonia emissions are not regulated nationally, at least one district in California recently set a limit of 10 ppm. Unreacted ammonia emissions from a Thermal DeNox system would be between 30 and 40 ppm.

Therefore, based on economics, energy and environmental considerations, a NO_x emission limit of 180 ppmvd corrected to eight percent oxygen, is proposed as BACT for the Seminole Kraft recovery boiler.

The following is a summary of BACT for the Seminole Kraft recovery boiler.

- Nitrogen Oxides - A KRB designed to meet a 180 ppm (corrected to 8% oxygen) NO_x emission limit.

6.3 SMELT DISSOLVING TANK

As indicated earlier, a BACT analysis must be performed for NO_x emissions only. As presented in Section 3.0 the NO_x emissions from the smelt dissolving tank are negligible. Therefore, a BACT analysis for the smelt dissolving tank is not required.

6.4 MULTIPLE EFFECT EVAPORATOR

The emissions of NO_x from this source are negligible. Therefore, a BACT analysis for the multiple effect evaporator is not required.

Table 6-1. Design Black Liquor Analysis

Ultimate Analysis	Typical %
Carbon	25.99
Hydrogen	2.72
Sulfur	2.60
Moisture	30.00
Nitrogen	0.04
Chlorine	0.42
Oxygen	23.60
Sodium	14.15
Potassium	0.48
Higher Heating Value	4,522 Btu/lb

Table 6-2. Nitrogen Oxides Reduction System Capital & Annual Costs

	Thermal DeNOx ($1,000)		
Capital Costs			
NO_x Reduction Equipment	$1,730	$	
Differential Balance-of-Plant	400		
1988 Capital Cost		2,130	
Contingency	210		
1988 Direct Capital Cost		2,340	
Escalation	240		
Direct Capital Cost		2,580	
Indirects	410		
Interest During Construction	550		
1992 Total Capital Cost			$3,540
Levelized Annual Operating Cost			
Operating Personnel	$ 210		
Maintenance	350		
Additive	330		
Energy	590		
1992 Annual Operating Cost		$1,480	
Fixed Charges on Capital	550		
1992 Total Annual Cost		$2,030	

7.0 SOLID AND LIQUID WASTE

The solid and liquid waste from this project will not materially change the solid and liquid wastes at the mill because these new sources are basically replacing old sources which generated similar wastes. See discussion below for details.

7.1 SOLID WASTES

There will be no solid waste generated by the new recovery boiler and the particulate collected by the electrostatic precipitator will be reused in the process. There is also no solid waste generated by the smelt dissolving tanks and the particulate collected by the venturi scrubber is returned to the process. Finally, there is no solid waste generated by the multiple effect evaporators.

7.2 LIQUID WASTES

Recovery boiler blowdown will be treated in the existing wastewater treatment system at the mill. The quantity and quality of the recovery boiler blowdown is expected to be substantially similar to that from the three old recovery boilers which are being replaced by this project and which is presently being treated in the existing wastewater treatment system. The only liquid waste from the smelt dissolving tanks is the venturi scrubber water which will be reused in the process. The clean condensate from the multiple effect evaporators will be reused in the mill and the contaminated condensate will be discharged to the mill's existing waste water treatment system. The quantity and quality of the contaminated condensate will be substantially the same as the contaminated condensate from the three existing evaporator sets which are being replaced by this project and which is presently being treated in the existing wastewater treatment system.

Sanitary Wastewater from the new recovery boiler/multiple effect evaporator area will be discharged to the existing sanitary wastewater treatment system. The quantity and quality will be substantially the same as the sanitary wastewater from the existing recovery boiler/evaporator area which will be shutdown when the new facilities startup. Hence, no change is expected in the quantity or quality of the sanitary wastewater at the mill.

REFERENCES

Auer, A.H. 1978. Correlation of Land Use and Cover with Meteorological Anomalies. J. Applied Meteorology, Vol. 17.

Briggs, G.A. 1969. Plume Rise, USAEC Critical Review Series, TID-25075, National Technical Information Service, Springfield, Virginia.

Briggs, G.A. 1971. Some recent analyses of plume rise observations, In: Proceedings of the Second International Clean Air Congress, Academic Press, New York.

Briggs, G.A. 1972. Discussion on Chimney Plumes in Neutral and Stable Surroundings. Atoms. Environ. 6:507-510.

Briggs, G.A. 1974. Diffusion Estimation for Small Emissions. In: ERL, ARL USAEC Report ATDL-106, U.S. Atomic Energy Commission, Oak Ridge, Tennessee.

Briggs, G.A. 1975. Plume rise predictions. In: Lectures on Air Pollution and Environmental Impact Analysis, American Meteorological Society, Boston, Massachusetts.

Huber, A.H. 1977. Incorporating building/terrain wake effects on stack effluents. Preprint Volume for the Joint Conference on Applications of Air Pollution Meteorology, American Meteorological Society, Boston, Massachusetts.

Huber, A.H. and W.H. Snyder. 1976. Building wake effects on short stack effluents. Preprint Volume for the Third Symposium on Atmospheric Diffusion and Air Quality, American Meteorological Society, Boston, Massachusetts.

Pasquill, F. 1976. Atmospheric Dispersion Parameters in Gaussian Plume Modelings, Part II. Possible Requirements for Changes in the Turner Workbook Values. EPA Report No. EPA 600/4/76-030b. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

Schulman, L.L., and J.S. Scire. 1980. Buoyant Line and Point Source (BLP) Dispersion Model User's Guide. Document P-7304B, Environmental Research and Technology, Inc., Concord, Mass.

U.S. Environmental Protection Agency. 1987. Guideline on Air Quality Models (Revised). (Includes Supplement A). EPA Report No. EPA 450/2-78-027R.

U.S. Environmental Protection Agency. 1988a. Industrial Source Complex (ISC) Dispersion Model User's Guide (Second Edition, Revised). EPA Report No. EPA 450/4-88-002a.

U.S. Environmental Protection Agency. 1988b. EPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 6, Change 3, January 4, 1988. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

Appendix 1

Air Construction Permit Applications

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8-11-89
Rec'pt.#117645

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

AC 16-164607

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

SOURCE TYPE: Kraft Recovery Boiler [x] New[1] [ ] Existing[1]

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

COMPANY NAME: Seminole Kraft Corporation COUNTY: Duval

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

SOURCE LOCATION: Street 9469 Eastport Road City Jacksonville

UTM: East 441.9 North 3365.5

Latitude 30 ° 25 ' 17 "N Longitude 81 ° 36 ' 19 "W

APPLICANT NAME AND TITLE: Seminole Kraft Corporation

APPLICANT ADDRESS: 9469 Eastport Road, Jacksonville, Florida 32218

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Seminole Kraft Corporation

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

*Attach letter of authorization

Signed: L.A. Stanley

L.A. Stanley, General Manager
Name and Title (Please Type)

Date: 8/8/89 Telephone No. 904/751-6400

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

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

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

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David Buff
Name (Please Type)

KBN Engineering & Applied Sciences, Inc.
Company Name (Please Type)

P.O. Box 14288, Gainsville, Florida 32604
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 8/10/89 Telephone No. 904/375-8000

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This project is the installation of a new Kraft Recovery Boiler to replace three (3) old recovery boilers. See Project Description for more details

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

Start of Construction January, 1990 Completion of Construction November 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The electrostatic precipitator will cost approximately $5.0 MM

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

See existing recovery boiler permits (attached).

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

if power plant, hrs/yr NA ; if seasonal, describe: Not Seasonal

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

1. Is this source in a non-attainment area for a particular pollutant? yes

   a. If yes, has "offset" been applied? *

   b. If yes, has "Lowest Achievable Emission Rate" been applied? NA

   c. If yes, list non-attainment pollutants. Ozone

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

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

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

   a. If yes, for what pollutants? NA

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

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

*On-site source reductions yield net emission reduction for VOC.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
See III-E				

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

1. Total Process Input Rate (lbs/hr): 170,833 (Dry Solids Basis)

2. Product Weight (lbs/hr): ______

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

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Please see Section 3, Table 3-1 and Appendix 2							22

[1]See Section V, Item 2. - See Section 4 of report

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

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

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Electrostatic Precipitator	Particulate	99+%	NA	See Attachment A

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Black Liquor	--	248,800	1,125,000 Btu/Hr.
No. 6 Fuel Oil (startup), Shutdown & malfunction)		750,000 gal/yr	

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

Fuel Analysis: Black Liquor (No. 6 fuel oil)

Percent Sulfur: 2.6 (wet basis) (2.27) Percent Ash: 14.63 (wet basis)

Density: 7.88 AP 42 lbs/gal Typical Percent Nitrogen: 0.04

Heat Capacity: 4,522 BTU/lb (150,000 AP-42) BTU/gal

Other Fuel Contaminants (which may cause air pollution): See Section 6 of report.

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

Annual Average None Maximum

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

No solid waste will be generated. Boiler blowdown will be treated in wastewater treatment system just like the boiler blowdown from the old recovery boiler which will be shut down.

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

Stack Height: 397 ft. Stack Diameter: 11.25 ft.

Gas Flow Rate: 399,938 ACFM 202,328 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 17.6 % Velocity: 67.1 FPS

SECTION IV: INCINERATOR INFORMATION

NA

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ____________________

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

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

Manufacturer ____________________

Date Constructed __________ Model No. __________

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

Stack Height: ______ ft. Stack Diamter: __________ Stack Temp. ______

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

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

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

[ ] Other (specify) __________

Brief description of operating characteristics of control devices: ____________

NA

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

NA

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

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

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

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). See Section 4 of the report

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

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

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Attachment B

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

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

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[x] Yes [ ] No

Contaminant	Rate or Concentration
Particulate	0.044 gr/dscf 8% O_2
Total Reduced Sulfur	5.0 ppmvd corrected to 8% O2
Opacity	35%

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

[ ] Yes [xx] No Case-by-case determination

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
See Section 6 of the report	

D. Describe the existing control and treatment technology (if any).
NA - This is a new installation

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

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

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

See Section 6 of the Report

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

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

j. Applicability to manufacturing processes:

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

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected: See Section 6 of the Report (Also see Attachment A)

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

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

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data No preconstruction monitoring required. See Sections 4 & 5 of the report

1. ________no. sites ________ TSP ________( ) SO^2* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

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

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________________

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

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

C. Computer Models Used

1. ________________________________ Modified? If yes, attach description.

2. ________________________________ Modified? If yes, attach description.

3. ________________________________ Modified? If yes, attach description.

4. ________________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________________	grams/sec
SO^2	________________________	grams/sec

E. Emission Data Used in Modeling

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

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ATTACHMENT A

Design Information
Electrostatic Precipitator
New Kraft Recovery Boiler
Seminole Kraft Corporation

General

The electrostatic precipitator will have two independent chambers, with multi-fields and dry bottom, each chamber will be capable of 70% of boiler MCR capacity (4.1 x 10^6 lb BLS/day). The precipitator shall remove particulate from the flue gases leaving the kraft recovery boiler to meet the particulate and visible emission requirements in EPA new source performance standards.

Boiler Capacity

The boiler is designed to handle 4,100,000 pounds of dry black liquor solids per day at 70% solids concentration in the feed stream. No. 6 fuel oil will be used for startup, shutdown, upset and malfunction.

Precipitator

The precipitator will be installed upstream of the induced draft fan. The flue gas flow will be from the boiler to the economizer, to the precipitator and then to the I.D. fan. The precipitator will be arranged with a horizontal inlet and vertical down outlet. The precipitator will be supported at an elevation so that the bottom support level will be approximately 30 feet above grade.

Performance Data

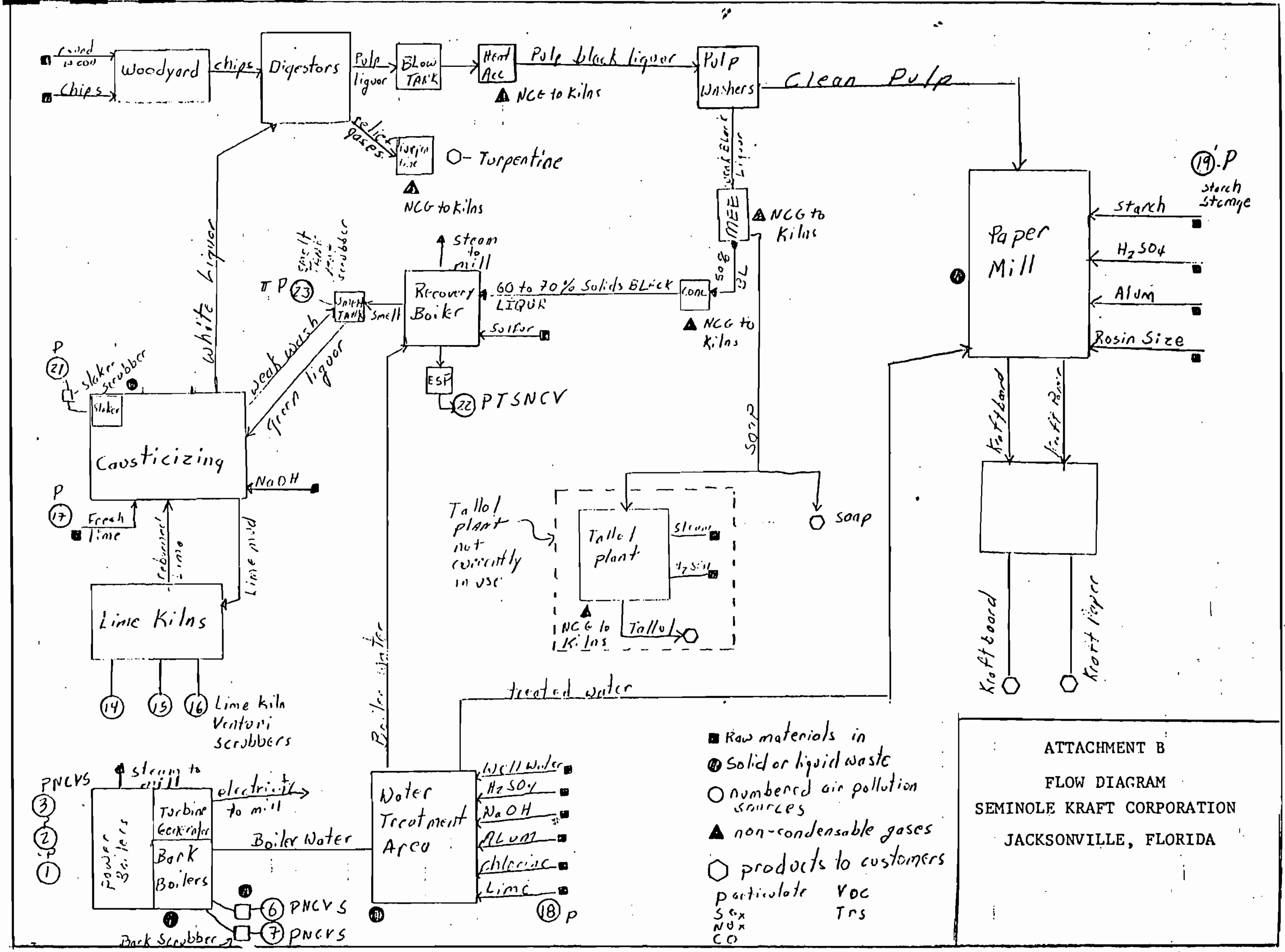
Temperature	400°F
Flue Gas Weight	1,041,834 lb/hr
ACFM at Precipitator Inlet (400°F and 1" w.c.)	399,938 ACFM
DSCFM (68°F)	203,328 DSCFM
Water Vapor Content % by weight	17.6
Dust Load to Precipitator	8 gr/DSCF
Dust Load From Precipitator	.044 gr/DSCF
Opacity	35%

Electrical Supply

480 volt - 60 hertz - 3 phase
120 volt - 60 hertz - 1 phase

Equipment Information

- The precipitator will have a dry bottom.
- Discharge electrodes will be rigid frame or rigid electrode design.
- Turning vanes or distribution plates, will insure adequate gas distribution.
- Electromagnetic rappers will be provided for the discharge electrodes, collecting plates and distribution devices.

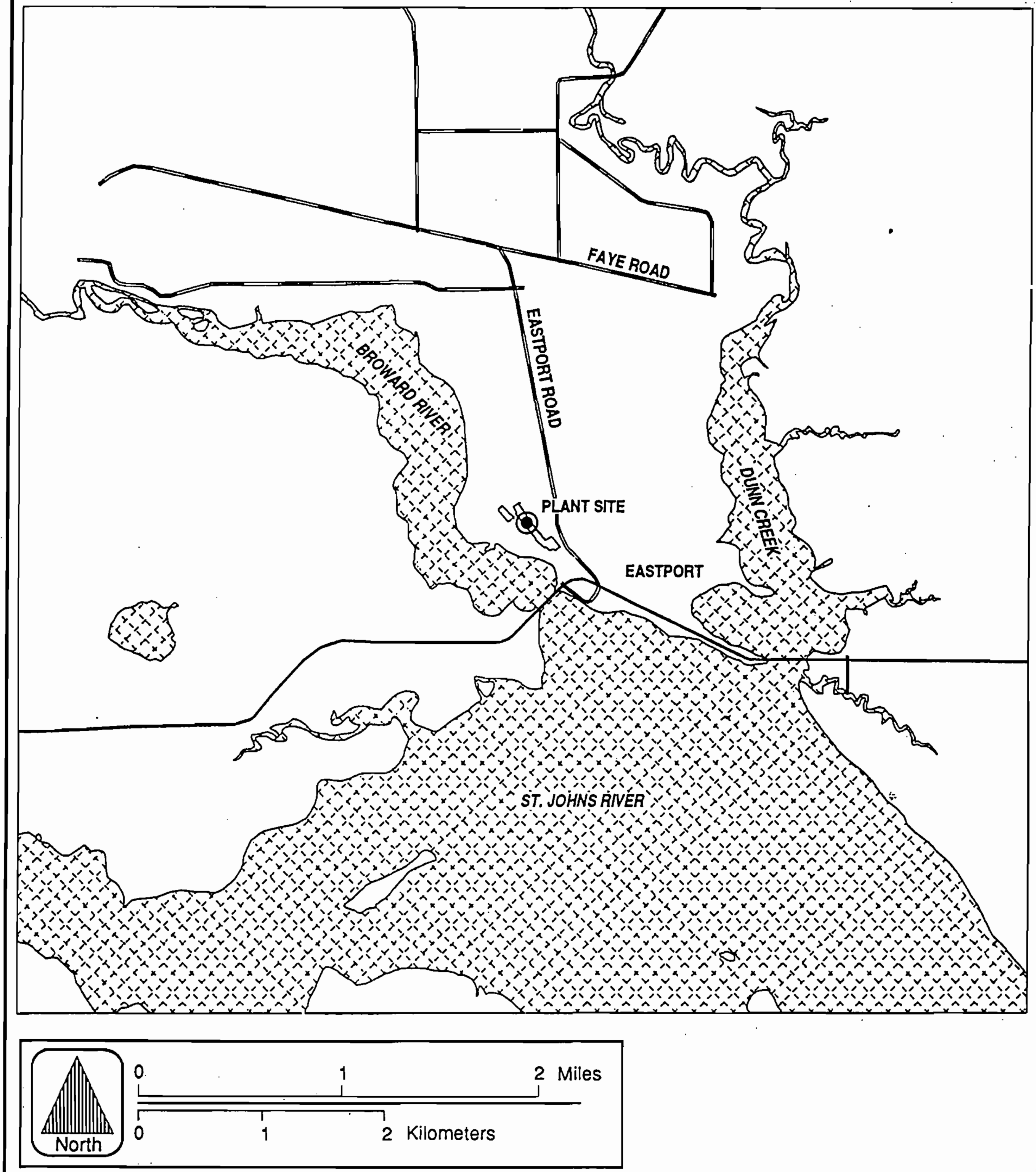


ATTACHMENT B

FLOW DIAGRAM

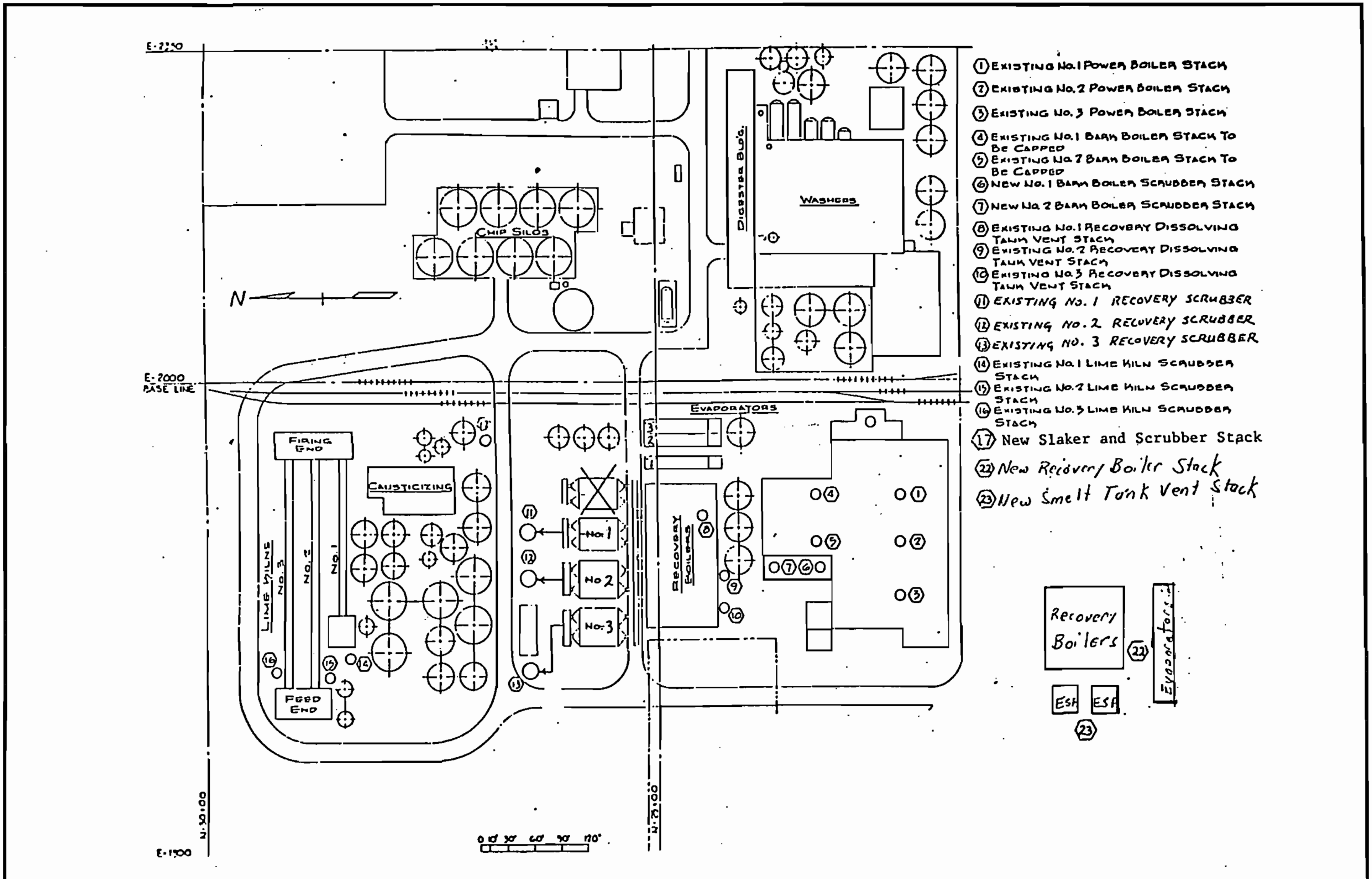
SEMINOLE KRAFT CORPORATION

JACKSONVILLE, FLORIDA



ATTACHMENT C
PROJECT SITE LOCATION

SEMINOLE KRAFT



ATTACHMENT D
AIR EMISSION SOURCE DIAGRAM
SEMINOLE KRAFT CORPORATION, JACKSONVILLE, FLORIDA

SEMINOLE KRAFT

1,000 pd
8-11-89
Recpt. #117645

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207
(904) 396-6959

DEPARTMENT OF ENVIRONMENTAL REGULATION
STATE OF FLORIDA

AC16-168608

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ERNEST E. FREY
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Smelt Dissolving Tank [x] New[1] [ ] Existing[1]

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

COMPANY NAME: Seminole Kraft Corporation COUNTY: Duval

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

SOURCE LOCATION: Street 9469 Eastport Road City Jacksonville

UTM: East 7441.9 km North 3365.6 Km

Latitude 30 ° 25 ' 18 "N Longitude 81 ° 36 ' 18 "W

APPLICANT NAME AND TITLE: Seminole Kraft Corporation

APPLICANT ADDRESS: 9469 Eastport Road, Jacksonville, FL 32218

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Seminole Kraft Corporation

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

*Attach letter of authorization

Signed: L A Stanley

L.A. Stanley, General Manager
Name and Title (Please Type)

Date: 8/8/89 Telephone No. 904/751-6400

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

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

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

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David Buff
Name (Please Type)

KBN Engineering & Applied Sciences, Inc.
Company Name (Please Type)

P.O. Box 14288, Gainsville, Florida 32604
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 8/10/89 Telephone No. 904/375-8000

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This project is the installation of a new smelt tank in conjunction with a new recovery boiler. See project description for more details.

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

Start of Construction January, 1990 Completion of Construction November, 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The Venturi Scrubber will cost approximately $150,000 - $200,000.

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

See existing semlt tank permits (attached).

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

if power plant, hrs/yr _____; if seasonal, describe: NA

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

1. Is this source in a non-attainment area for a particular pollutant? yes

   a. If yes, has "offset" been applied? *

   b. If yes, has "Lowest Achievable Emission Rate" been applied? No

   c. If yes, list non-attainment pollutants. Ozone

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

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

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

   a. If yes, for what pollutants? NA

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

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

*On-site source reductions yield new emission reductions for VOC.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
NA				

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

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

2. Product Weight (lbs/hr):____________________

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

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
See Section 3	, Table 3.1 &	Appe	ndix 2 of the	Report			23

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

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

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Venturi Scrubber	Particulate	99%	NA	Estimate*

* Will meet NSPS, detailed design not complete, will provide design information when available

E. Fuels NA

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

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

Fuel Analysis:

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

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

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

Annual Average None Maximum None

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

No solid wastes or wastewater will be generated.

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

Stack Height: 240 ft. Stack Diameter: 5 ft.

Gas Flow Rate: 55,000 ACFM 35,000 DSCFM Gas Exit Temperature: 160 °F.

Water Vapor Content: 25 % Velocity: 47 FPS

SECTION IV: INCINERATOR INFORMATION

NA

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ______

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

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

Manufacturer ______

Date Constructed ______ Model No. ______

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

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

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

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

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

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ____________________

NA

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

NA

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

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

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

   See Section 4 of the report

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

   See Section 4 of the report

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

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

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Attachment B

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

   See Attachment C

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

   See Attachment D

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[x] Yes [ ] No

Contaminant	Rate or Concentration
Particulate	0.2 lbs/ton BLS (dry wgt.)
TRS	0.033 lbs/ton BLS (dry wgt.)

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

[ ] Yes [x] No Case-by-case determination

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
See Section 6 of the Report	

D. Describe the existing control and treatment technology (if any). NA - This is a new installation.

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

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

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

See Section 6 of the report

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

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

j. Applicability to manufacturing processes:

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

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

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

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data No preconstruction monitoring required. See Sections 4 & 5 of the report.

1. ________ no. sites ________ TSP ________ ( ) SO^2* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

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

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. ____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________________

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

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

C. Computer Models Used

1. ________________________________ Modified? If yes, attach description.

2. ________________________________ Modified? If yes, attach description.

3. ________________________________ Modified? If yes, attach description.

4. ________________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	________________ grams/sec
SO^2	________________ grams/sec

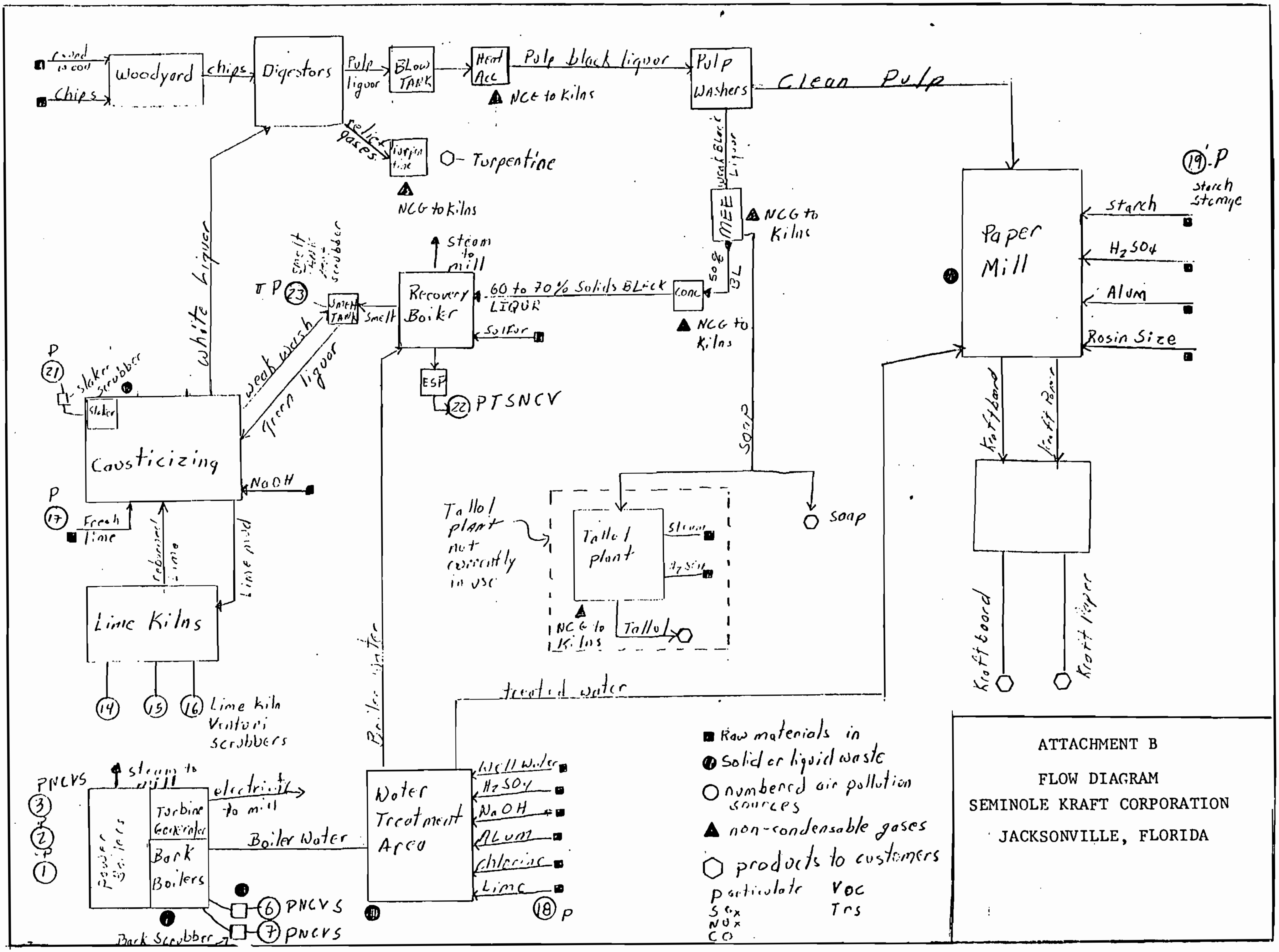
E. Emission Data Used in Modeling

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

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

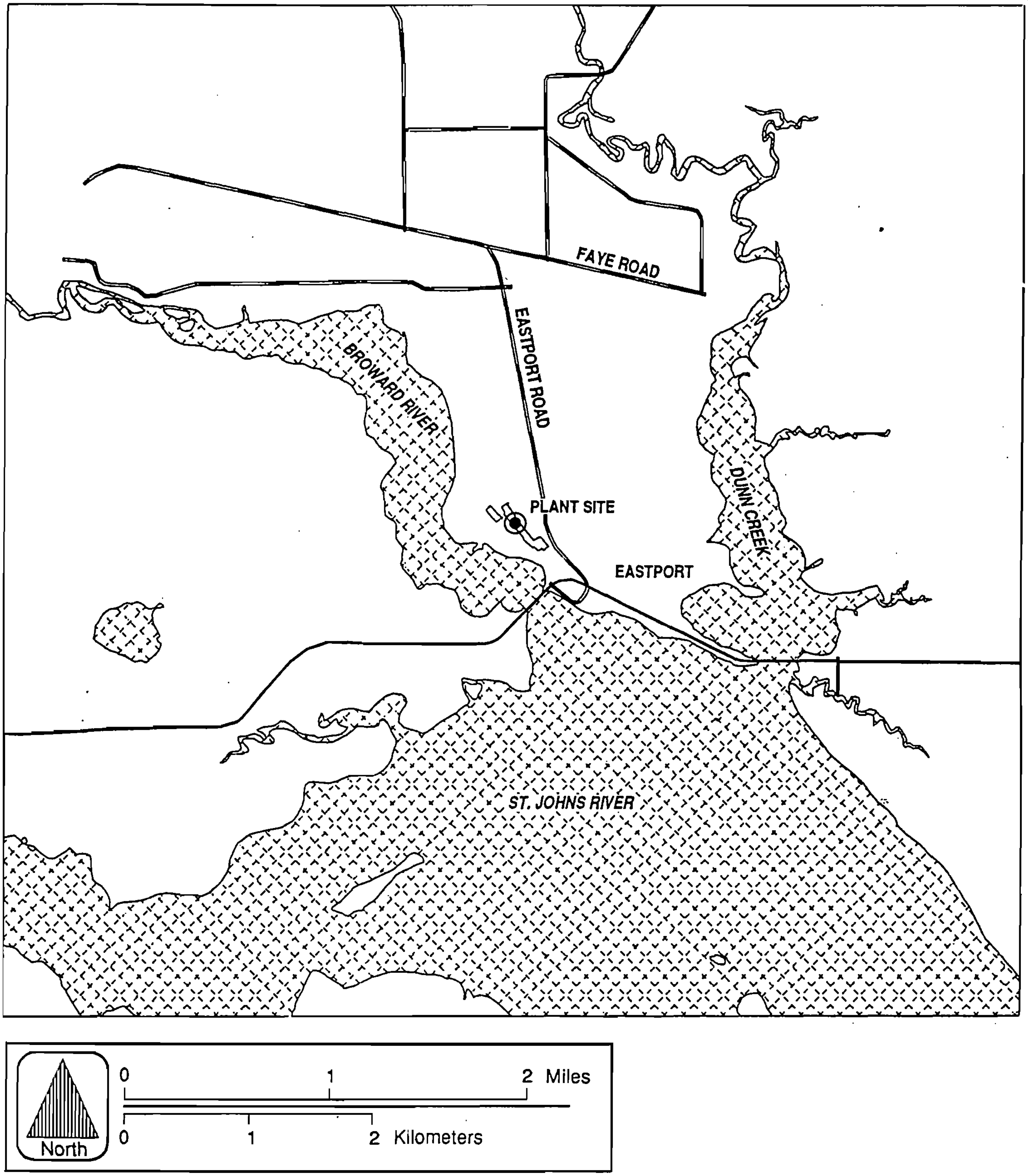


ATTACHMENT B

FLOW DIAGRAM

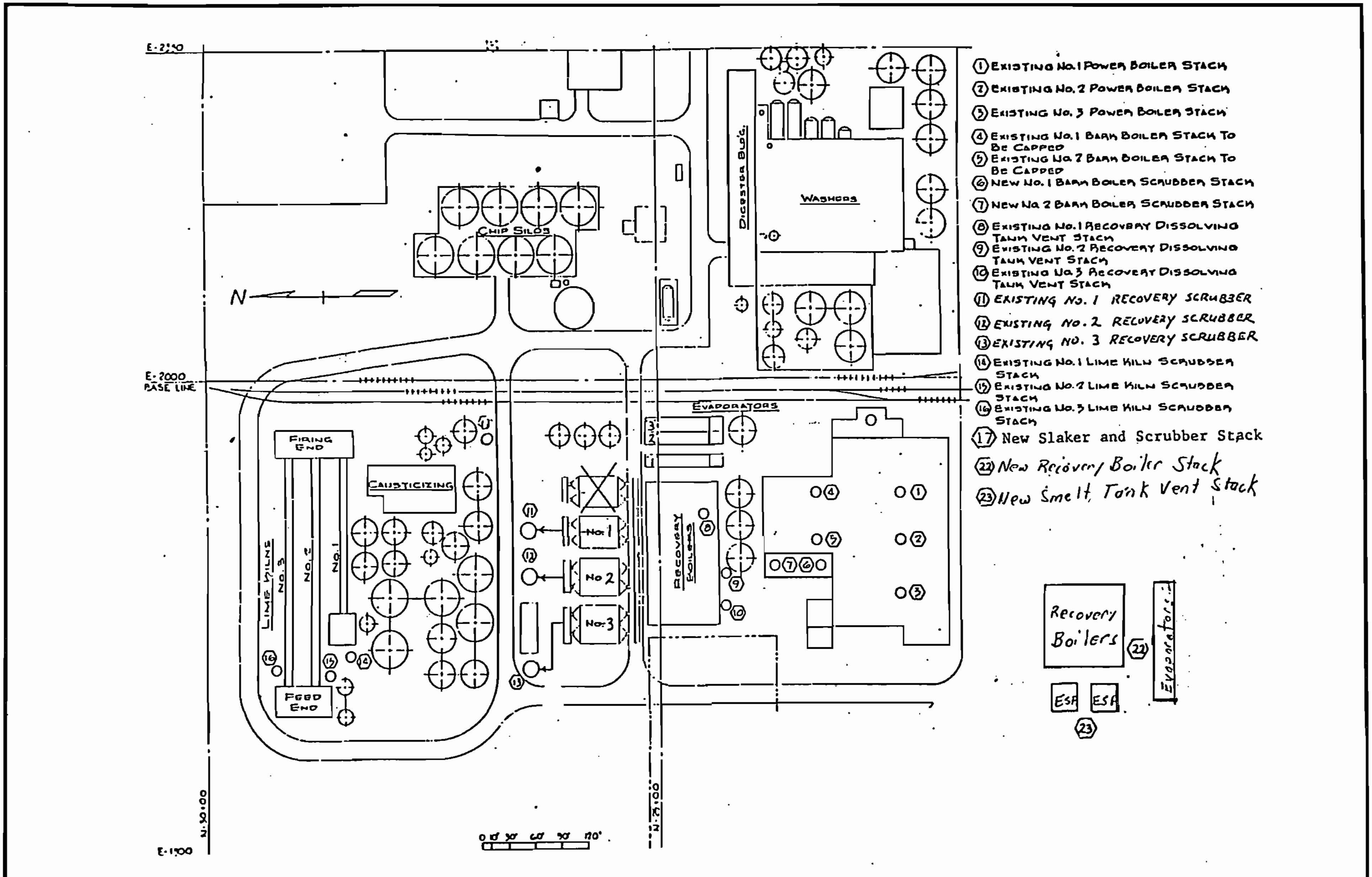
SEMINOLE KRAFT CORPORATION

JACKSONVILLE, FLORIDA



ATTACHMENT C
PROJECT SITE LOCATION

SEMINOLE KRAFT



ATTACHMENT D
AIR EMISSION SOURCE DIAGRAM
SEMINOLE KRAFT CORPORATION, JACKSONVILLE, FLORIDA

SEMINOLE KRAFT

Best Available Copy

$200 pd.
8-11-89
Recpt. # 117645

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207
(904) 396-6959

DEPARTMENT OF ENVIRONMENTAL REGULATION
STATE OF FLORIDA

AC 16-168609

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ERNEST E. FREY
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Multiple Effect Evaporator [x] New[1] [ ] Existing

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

COMPANY NAME: Seminole Kraft Corporation COUNTY: Duval

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Lime Kiln Stack (#2 & 3)

SOURCE LOCATION: Street 9469 Eastport Road City Jacksonville

UTM: East 7441.75 North 3365.60

Latitude 30 ° 25 ' 15 "N Longitude 81 ° 36 ' 00 "W

APPLICANT NAME AND TITLE: Seminole Kraft Corporation

APPLICANT ADDRESS: 9469 Eastport Road, Jacksonville, Florida 32218

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Seminole Kraft Corporation

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

*Attach letter of authorization

Signed: L A Stanley

L.A. Stanley, General Manager
Name and Title (Please Type)

Date: 8/8/89 Telephone No. 904/751-6400

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

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

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

DER Form 17-1.202(1)
Effective October 31, 1982

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David Buff
Name (Please Type)

KBN Engineering & Applied Sciences
Company Name (Please Type)

P.O. Box 14288, Gainsville, Florida 32604
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 8/10/89 Telephone No. 904/375-8000

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

The project consists of a new set of multiple effect evaporators to replace three (3) old sets of multiple effect evaporators.

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

Start of Construction January, 1990 Completion of Construction November, 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

NA - Will use existing Lime Kilns to incinerate noncondensible gas from new evaporator as was done with three (3) old sets of evaporators.

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

See existing evaporator permits (attached).

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

if power plant, hrs/yr NA ; if seasonal, describe: ____________________

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

1. Is this source in a non-attainment area for a particular pollutant? Yes

a. If yes, has "offset" been applied? *

b. If yes, has "Lowest Achievable Emission Rate" been applied? NA

c. If yes, list non-attainment pollutants. Ozone

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

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

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

a. If yes, for what pollutants? NA

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

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

*On-site source reductions yield net emission reductions for VOC.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
NA				

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

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

2. Product Weight (lbs/hr): ______

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

Name of Contaminant	Emission[1] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
TRS	NA-Incinerated in Lime Kiln		17-2.600(4)(c)	Incinerated in Lime Kiln	4,569,106	2285	15 & 16

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

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

$$\text{TRS} = 1987\ \frac{\text{Tons}}{\text{Day}} \times 6.35\ \frac{\text{lbs}}{\text{Ton}} \times 365\ \text{days} = 4{,}569{,}106\ \text{lb/yr}$$

$$= 2285\ \frac{\text{Ton}}{\text{Yr}}$$

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

if power plant, hrs/yr NA ; if seasonal, describe: ______________________________

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

1. Is this source in a non-attainment area for a particular pollutant? Yes

   a. If yes, has "offset" been applied? *

   b. If yes, has "Lowest Achievable Emission Rate" been applied? NA

   c. If yes, list non-attainment pollutants. Ozone

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

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

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

   a. If yes, for what pollutants? NA

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

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

*On-site source reductions yield net emission reductions for VOC.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
NA				

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

1. Total Process Input Rate (lbs/hr): 184,500 (Dry Black Liquor Solids)

2. Product Weight (lbs/hr): 184,500 (Dry Black Liquor Solids)

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

Name of Contaminant	Emission[1] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
TRS	NA-Incinerated in Lime Kiln		17-2.600(4)(c)	Incinerated in Lime Kiln	4,569,106	2285	15 & 16

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

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

$$TRS = 1987 \frac{Tons}{Day} \times 6.35 \frac{lbs}{Ton} \times 365 \text{ days} = 4,569,106 \text{ lb/yr}$$

$$= 2285 \frac{Ton}{Yr}$$

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Incineration in	TRS	100%	NA	See Attachment A
Lime Kiln				

E. Fuels NA

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

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

Fuel Analysis: NA

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

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

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

Annual Average ______ Maximum ______

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

Clean condensate is reused anc contaminated condensate will be discharged to treatment system. This is identical to disposal of condensates from the evaporators which are being replaced & there will be no increase of load or other adverse effects on the treatment system.

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

Stack Height: 75 ft. Stack Diameter: 3.7 ft.

Gas Flow Rate: 22,000 ACFM 14,300 DSCFM Gas Exit Temperature: 150 °F.

Water Vapor Content: 25 % Velocity: 34 FPS

SECTION IV: INCINERATOR INFORMATION

NA

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

Description of Waste ______

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

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

Manufacturer ______

Date Constructed ______ Model No. ______

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

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

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

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

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

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ____________________

NA
____

____

____

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

____

NA
____

____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

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

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

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). See Section 4 of report

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

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

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Attachment B

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

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

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[X] Yes [ ] No

Contaminant	Rate or Concentration
Total reduced sulfur	5.0 ppmvd corrected to 10% O_2

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

[ ] Yes [X] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
See Section 6 of the report.	

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

1. Control Device/System: Lime Kiln
2. Operating Principles: Incinceration
3. Efficiency:* 100%
4. Capital Costs: Zero; this is existing equipment

*Explain method of determining

5. Useful Life: Indefinite

6. Operating Costs: Unknown Increment

7. Energy: Unknown Increment

8. Maintenance Cost: Unknown Increment

9. Emissions:

Contaminant	Rate or Concentration
Total Reduced Sulfur	

10. Stack Parameters See Section III.H.

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See Section 6 of the report

1.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

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

j. Applicability to manufacturing processes:

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

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected: See Section 6 of this Application Form.

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

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

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data See Section 4 & 5 of the report

1. ________no. sites ________ TSP ________( ) SO^2* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

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

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ______/____/____ to _____/____/____
month day year month day year

2. Surface data obtained from (location)____

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

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

C. Computer Models Used

1. ____ Modified? If yes, attach description.

2. ____ Modified? If yes, attach description.

3. ____ Modified? If yes, attach description.

4. ____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	____________________________________	grams/sec
SO^2	____________________________________	grams/sec

E. Emission Data Used in Modeling

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

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

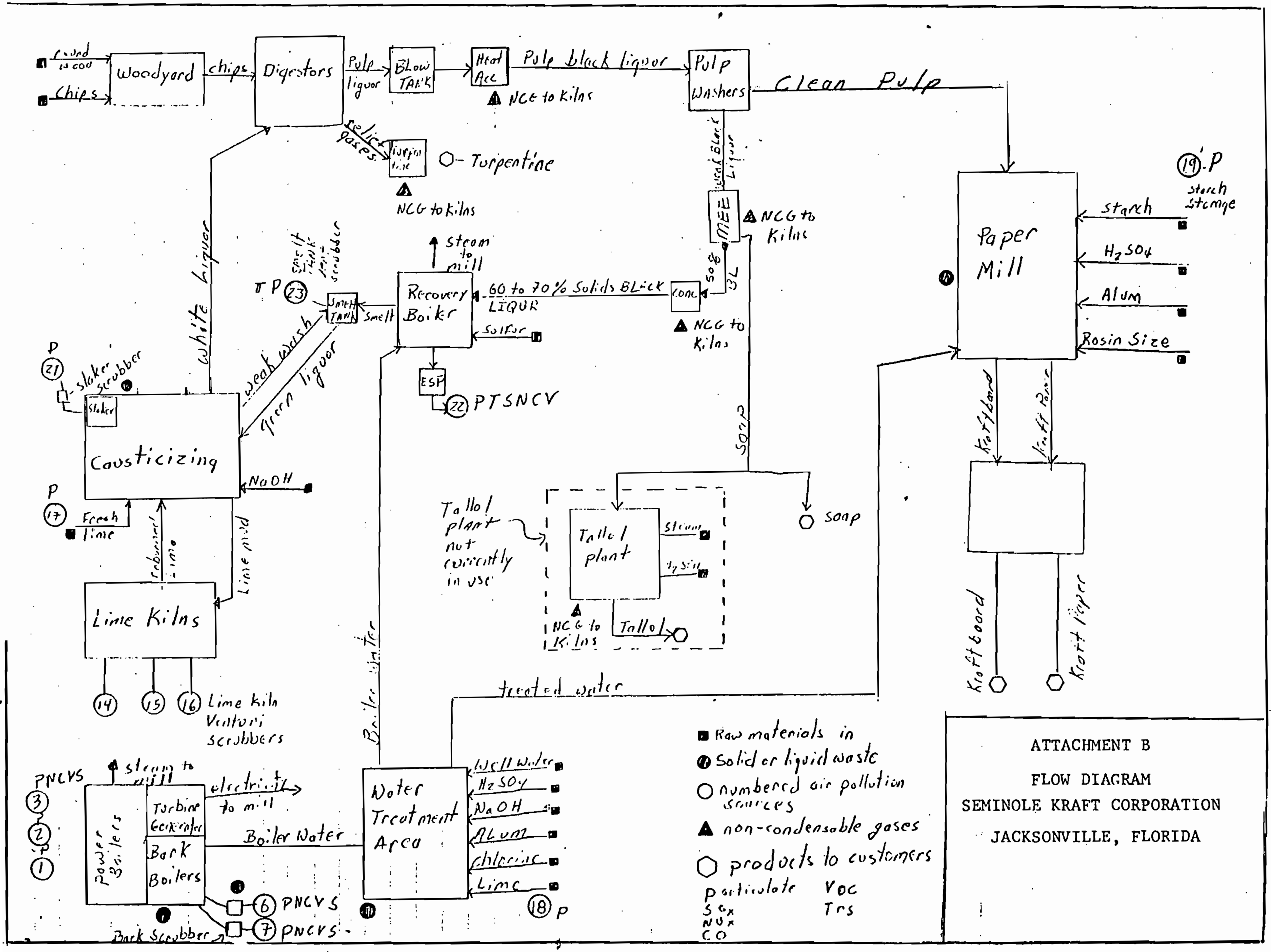
H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ATTACHMENT A

MULTIPLE-EFFECT EVAPORATOR TRS EMISSION CONTROL

TRS emission from the existing multiple-effect evaporators are incineratored in the #2 and #3 lime kiln. These old evaporators will be replaced with a single set of multiple effect evaporators. The TRS emissions in the non-condensible gases from the new set of evaporators will be incinerated in the #2 and #3 Lime kiln.

The use of lime kilns to achieve complete destruction of TRS compounds is a recognized technology that is well documented. As stated in EPA 450/3-83-017, "Review of New Source Performance Standards for Kraft Pulp Mills", incineration in lime kilns adequately achieves the 1200° F and 0.5 second retention time required to completely destroy TRS compunds. This is because a temperature of 1200° F or above is necessary to calcine the lime mud to CaO, and lime kilns (such as Seminole's) typically have at least two to three seconds of retention time. EPA further recognized this fact in their reviews of the standards for pulp mills (49 FR 2452 and 51 FR 18538), and deleted the requirement to monitor the lime kiln temperatures. Thus, it is appropriate to assume 100% destruction of all TRS compounds from the new Multiple-Effect Evaporator in the lime kiln.

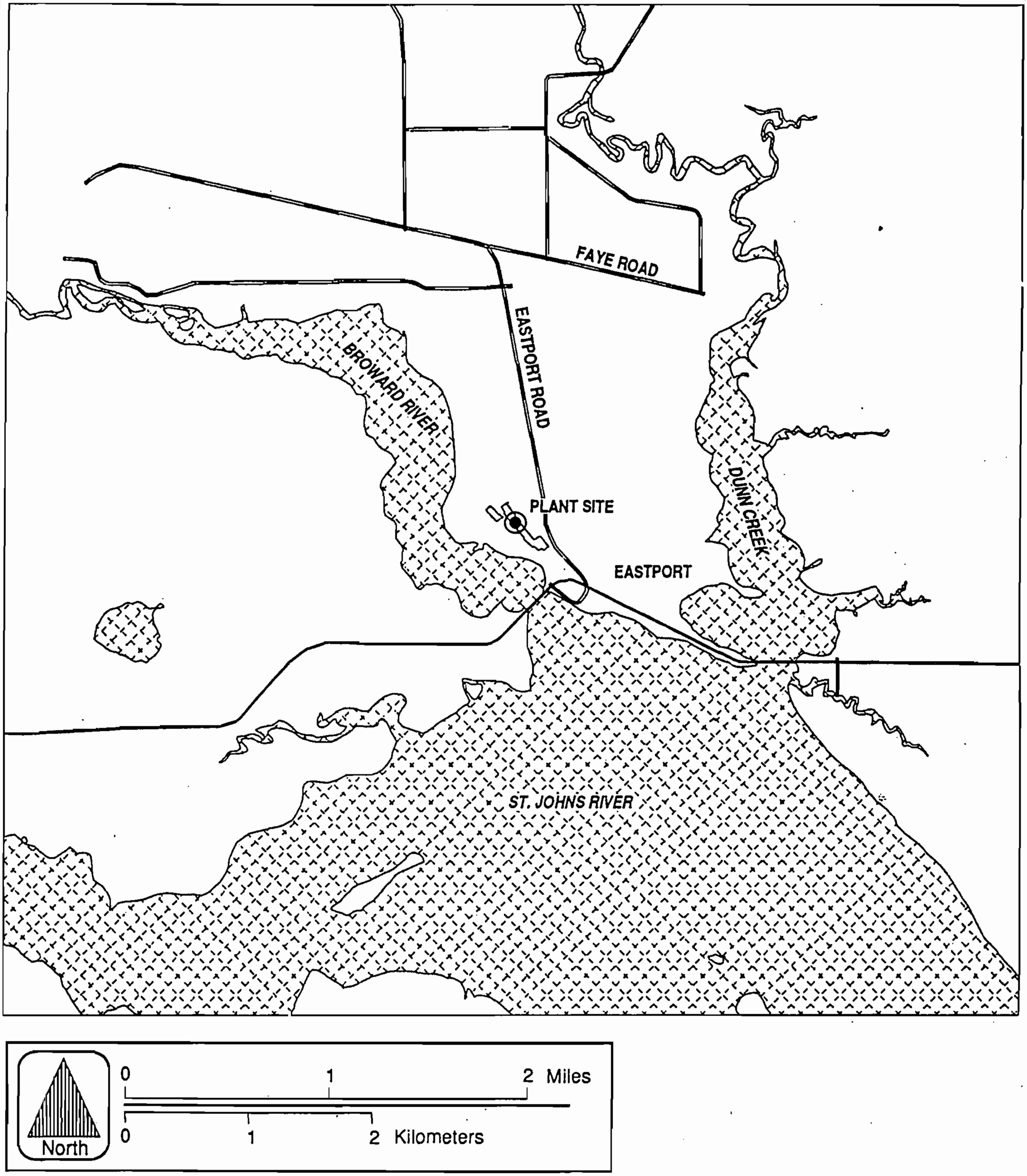


ATTACHMENT B

FLOW DIAGRAM

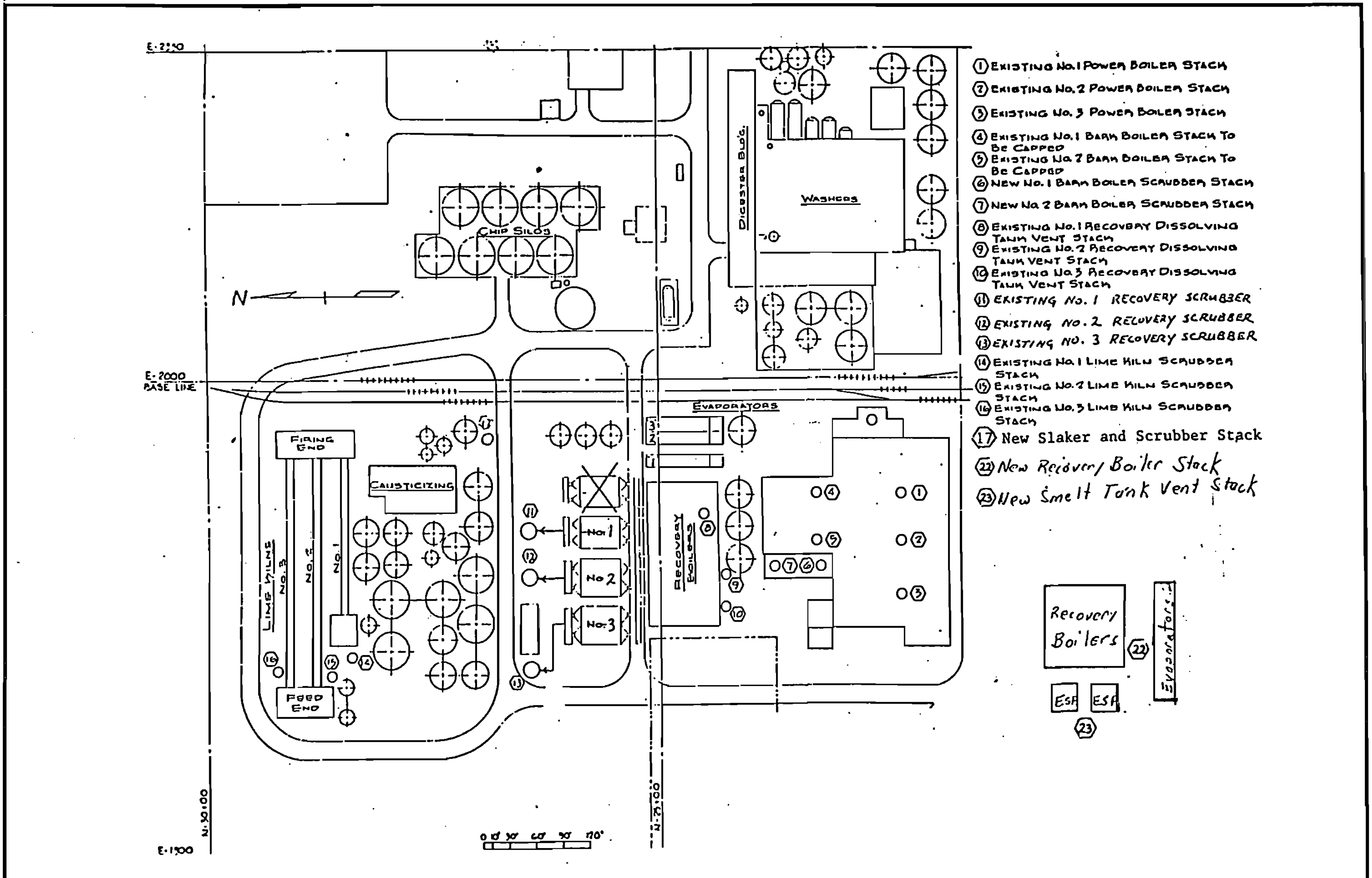
SEMINOLE KRAFT CORPORATION

JACKSONVILLE, FLORIDA



ATTACHMENT C
PROJECT SITE LOCATION

SEMINOLE KRAFT



ATTACHMENT D
AIR EMISSION SOURCE DIAGRAM
SEMINOLE KRAFT CORPORATION, JACKSONVILLE, FLORIDA

SEMINOLE KRAFT

Appendix 2

Emission Calculations

New Recovery Boiler
and
Smelt Dissolving Tank

A. Design Information - New Recovery Boiler

Maximum Black Liquor Solids (BLS) input = 4.1×10^6 lb/day

= 170,833.3 lb/hr

Maximum heat input = $1,125 \times 10^6$ Btu/hr

Recovery Boiler exhaust gas flow = 399,938 acfm @ 400°F, 17.6% H_2O

= 202,328 dscfm

oxygen content = 2.8%

Smelt tank exhaust gas flow = 55,000 acfm @ 160°F

B. EMISSION CALCULATIONS - NEW RECOVERY BOILER

1. PM(TSP)

NSPS is 0.044 gr/dscf @ 8% O_2

Adjust standard to actual O_2 content of gas stream (2.8%)

gr/dscf @ 2.8% O_2 = 0.044 / [(20.9 - 8.0)/(20.9 - 2.8)]

= 0.044 / 0.713

= 0.0617 gr/dscf @ 2.8% O_2

Air flow @ 2.8% O_2 = 202,328 dscfm

202,328 dscfm x 0.0617 gr/dscf x 60 min/hr / 7,000 gr/lb

= 107.0 lb/hr

107.0 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 468.7 TPY

Florida standard is 3 lb/3000 lb BLS [FAC, Rule 17-2.600(4) (b)]

170,833.3 lb/hr x 3 lb/3000 = 170.8 lb/hr

Therefore, NSPS is more restrictive than Florida rule.

2. PM10

From AP-42, Table 10.1-3, for Recovery Boiler without a direct contact evaporator but with an ESP, 74.8% of particulate emissions are less than or equal to 10μm.

468.7 TPY x 0.748 = 350.6 TPY

3. $\underline{SO_2}$

Maximum 24-hr average:

Maximum 24-hr average emissions are based upon an SO_2 concentration of 180 ppmvd @ 8% O_2.

Actual stack oxygen content = 2.8%; moisture = 17.6%

Correct SO_2 concentration to 2.8% O_2 and 17.6% moisture.

180 ppmv @ 8% O_2 / [(20.9 - 8.0) / (20.9 - 2.8)]

= 180/(12.9/18.1) = 180/0.71 = 254 ppmvd @ 2.8% O_2

254 ppmvd x (1 - 0.176) = 210 ppmv @ 2.8% O_2, 17.6% moisture

PV = mRT   m = PV/RT

molecular weight SO_2 = 64

R = 1,545/64 = 24.141 ft-lb_f/lb_m-°R

P = 2,116.8 lb_f/ft^2

m = 2,116.8 lb_f/ft^2 x 399,938 ft^3/min x 60 min/hr / 24.141
    ft-lb_f/lb_m-°R / (400 + 460)°R x 210/10^6
  = 514.0 lb/hr

Maximum Annual Average:

Maximum annual average emissions will be limited to 110 ppmvd @ 8% O_2

110/0.713 x (1 - 0.176) = 127.1 ppmv @ 2.8% O_2, 17.6% moisture

m = 2,116.8 x 399,938 x 60 / 24.141 / (400 + 460) x 127.1/10^6
  = 311.0 lb/hr

311.0 lb/hr x 8,760 / 2,000 = 1,362.2 TPY

4. $\underline{NO_x}$

Maximum annual average emissions will be limited to 180 ppmvd @ 8% O_2.

Calculations are same as for SO_2 except molecular weight is different

Molecular weight NO_2 = 46

R = 1,545/46 = 33.59

180 ppmvd @ 8% O_2 = 210 ppmv @ 2.8% O_2, 17.6% moisture

$m = 2,116.8 \times 399,938 \times 60 / 33.59 / (400 + 460) \times 210/10^6$
$= 369.3$ lb/hr

369.3 lb/hr x 8,760 /2,000 = 1,617.5 TPY

5. CO

Maximum CO emissions will be limited to 400 ppmvd @ 8.0% O_2

400 ppmvd @ 8.0% O_2 /0.713 x (1- 0.176)
= 462.3 ppmv @ 2.8% O_2, 17.6% moisture

MW CO = 28
R = 55.18
$m = 2,116.8 \times 399,938 \times 60 / 55.18 (400 + 460) \times 462.3/10^6$
$= 494.8$ lb/hr

494.8 lb/hr x 8,760 / 2,000 = 2,167.2 TPY

6. VOC

Maximum VOC emissions will be limited to 80 ppmvd @ 8.0% O_2
80 ppmvd @ 8.0% O_2 / 0.713 x (1 - 0.176)
= 92.5 ppmv @ 2.8% O_2, 17.6% mositure

MW VOC (as CH_4) = 16
R = 1,545/16 = 96.56
$M = 2,116.8 \times 399,938 \times 60 / 96.56 / (400 + 460) \times 92.5/10^6$
$= 56.6$ lb/hr

56.6 lb/hr x 8,760 / 2,000 = 247.9 TPY

7. TRS

Maximum TRS emissions (12-hr average) will be limited to 5 ppmvd @ 8.0% O_2, equivalent to the NSPS. This is also equivalent to the Florida emission regulation.

5 ppmvd @ 8.0% O_2 / 0.713 x (1 - 0.176) = 5.78 ppmv @ 2.8% O_2, 17.6% moisture

MW TRS (as H_2S) = 34

R = 45.44

m = 2,116.8 x 399,938 x 60 / 45.44 / (400 + 460) x 5.78/10^6

= 7.51 lb/hr

7.51 lb/hr x 8,760 / 2,000 = 32.9 TPY

8. $\underline{H_2SO_4}$

Based upon the NCASI Handbook of Chemical Specific Information for SARA Section 313 Form R Reporting, the average H_2SO_4 mist concentration in the exhaust gases of recovery boilers is 0.81 ppm.

MW H_2SO_4 = 98

R = 1,545/98 = 15.77

m = 2,116.8 x 399,938 x 60 / 15.77 / (400 + 460) x 0.81/10^6

= 3.03 lb/hr

3.03 lb/hr x 8,760 / 2,000 = 13.3 TPY

9. Other Regulated Pollutants

Emissions are based on emission factors stated in attached NCASI letter dated February 17, 1989.

Lead : 3,900 lb/10^{12} dscf

202,238 dscfm x 3,900 lb/10^{12} dscf x 60 min/hr = 0.047 lb/hr

0.047 lb/hr x 8,760 / 2,000 = 0.21 TPY

Mercury: Non-detectable

Beryllium: 300 lb/10^{12} dscf

202,238 x 300/10^{12} x 60 = 0.0036 lb/hr

0.0036 lb/hr x 8,760 / 2,000 = 0.016 lb/hr

Arsenic: non-detectable

C. EMISSION CALCULATIONS - NEW SMELT TANK

1. PM(TSP)

NSPS is 0.2 lb/ton BLS input

170,833.3 lb/hr BLS x 0.2 lb/2000 lb BLS = 17.1 lb/hr

17.1 x 8,760/2,000 = 74.9 TPY

2. PM10

The new smelt tank will be equipped with a venturi scrubber. AP-42 provides particle size information for smelt tanks equipped with venturi scrubbers (Table 10.1-7). PM10 is stated to be 89.5% of total particulate emissions.

17.1 lb/hr x 0.895 = 15.3 lb/hr

74.9 TPY x 0.895 = 67.0 TPY

3. SO_2

Maximum SO_2 emissions from the smelt tank are based upon the AP-42 factor for uncontrolled emissions, and an estimated minimum removal efficiency in the smelt tank scrubber. The uncontrolled factor is 0.2 lb/ton air dried unbleached pulp (ADUP). Seminole Kraft will use weak wash (pH of approximately 11) in the venturi scrubber for TRS controls and will have a high degree of air/scrubber water contact due to the high efficiency design. SO_2 removal efficiency is estimated to be at least 80%. The equivalent pulp production capacity of the new recovery boiler is calculated as follows:

170,833.3 lb/hr BLS x 1 ton ADUP/3000 lb BLS
= 56.94 tons/hr ADUP

Maximum SO_2 emissions:

56.94 tons/hr ADUP x 0.2 lb/ton x (1 - 0.80) = 2.28 lb/hr

2.28 lb/hr x 8,760 / 2,000 = 10.0 TPY

4. TRS

NSPS is 0.033 lb/ton BLS as H_2S

The Florida emission limit is 0.0480 lb/3000 lb BLS, which is equivalent to 0.032 lb/ton BLS. Thus, the Florida rule is slightly more stringent than the NSPS.

170,833.3 lb/hr BLS x 0.032 lb/ton x ton/2000 lb
= 2.73 lb/hr

2.73 lb/hr x 8,760 / 2,000 = 12.0 TPY

5. OTHER REGULATED POLLUTANTS

Emissions of other regulated pollutants (i.e. NO_x, CO, VOC, Pb, Hg, Be H_2SO_4 mist, inorganic As, Fl, asbestos and vinyl chloride) are not known to occur from smelt dissolving tank vents. There are no know published emissions factors for these pollutants.

TABLE 10.1-3. CUMULATIVE PARTICLE SIZE DISTRIBUTION AND SIZE SPECIFIC EMISSION FACTORS FOR A RECOVERY BOILER WITHOUT A DIRECT CONTACT EVAPORATOR BUT WITH AN ESP[a]

EMISSION FACTOR RATING: C

Particle size (um)	Cumulative mass % ≤ stated size		Cumulative emission factor (kg/Mg of air dried pulp)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
15	-	78.8	-	0.8
10	-	74.8	-	0.7
6	-	71.9	-	0.7
2.5	78.0	67.3	90	0.6
1.25	40.0	51.3	46	0.5
1.00	30.0	42.4	35	0.4
0.625	17.0	29.6	20	0.3
Total	100	100	115	1.0

[a]Reference 7. Dash = no data.

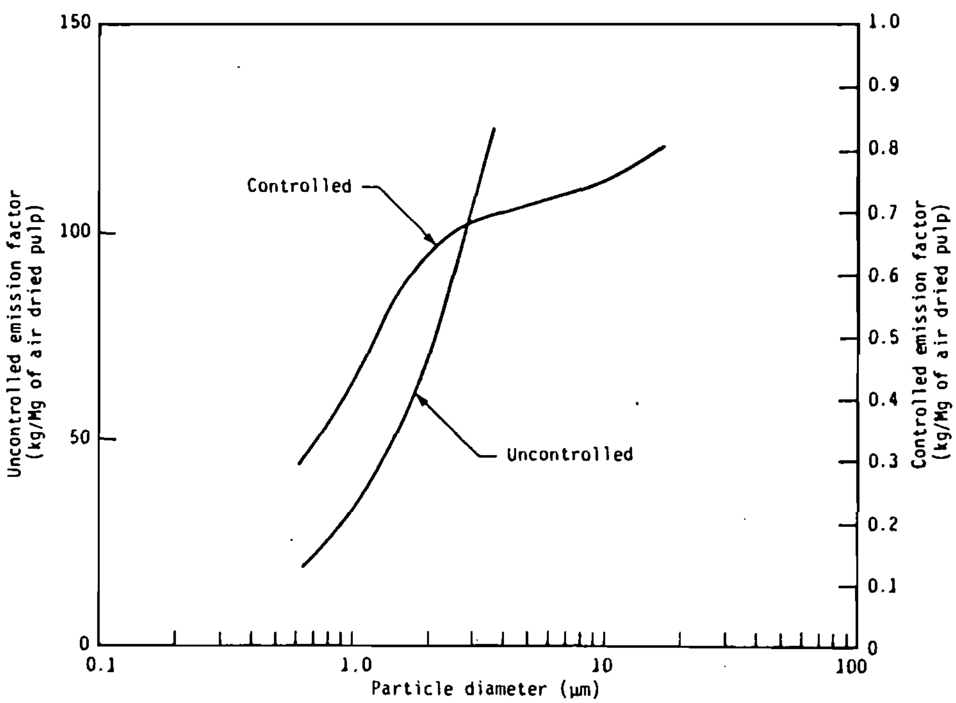


Figure 10.1-3. Cumulative particle size distribution and size specific emission factors for recovery boiler without direct contact evaporator but with ESP.

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NCASI HANDBOOK OF CHEMICAL SPECIFIC INFORMATION

FOR

SARA SECTION 313 FORM R REPORTING

CHEMICAL SPECIFIC INFORMATION - SARA SECTION 313 REPORTING

MARCH, 1989

SULFURIC ACID
(CAS No. 007664-93-9)

A. Purchased Sources - Tank trucks, tank cars, drums, wet end chemicals

B. Uses - ClO_2 generation, pH control, ion exchange resin regeneration, tall oil acidulation, effluent treatment systems, wet end chemicals

C. Inadvertent Formation - Combustion of sulfur containing fuels and gases

D. Estimating Manufacture, Processing and Use

(1) Amount Manufactured (Form R, 3.1) - Sulfuric acid is coincidentally manufactured in the kraft pulping process in the following amounts:

(a) Emissions of Sulfuric Acid from Coal and Oil Fired Boilers Burning Sulfur Containing Fuels - It has been estimated that 0.45 percent of the sulfur contained in the fuel is converted to sulfuric acid and emitted to air (Reference No. 1).

(b) Emissions of Sulfuric Acid from Kraft Recovery Furnaces - The average sulfuric acid content of recovery furnace vent gases is 0.81 ppm (Reference No. 2). This can be multiplied with the vent gas flow rate for the recovery furnace to estimate sulfuric acid emissions.

(2) Amount Processed (Form R, 3.2) - The SARA Section 313 regulations define "processing" as an incorporative activity. Sulfuric acid is generally not processed in this industry.

(3) Amount Otherwise Used (Form R, 3.3) - This would be the sum of all the sulfuric acid used at the manufacturing site. A 10,000 lb/yr reporting threshold applies for this category.

E. Potential Release Points

(1) Air Emissions - Power boiler stacks, recovery furnace stacks, tall oil plant vent gases, storage tank vents.

(2) Water - Final effluent.

Estimated sulfuric acid emissions

$$= (2.2 \times 10^6 \text{ lbs SO2/yr}) \times \frac{32 \text{ lb S}}{64 \text{ lb } SO_2} \times \frac{98 \text{ lb } H_2SO_4}{32 \text{ lb S}} \times (0.0045 \text{ lb/lb})$$

= 15,160 lb/yr

(ii) Emissions of Sulfuric Acid from Kraft Recovery Furnaces - The average sulfuric acid content of recovery furnace vent gases was found to be 0.81 ppm (Reference No. 2). This can be multiplied with the vent gas flow rate for the recovery furnace to estimate sulfuric acid emissions.

Sample Calculation:

1000 TPD kraft recovery furnace operated 365 days/yr. Recovery furnace vent gas flow rate = 300,000 SDCF/ton pulp.

Sulfuric acid emissions

$$= \left(\frac{300{,}000 \text{ SDCF}}{\text{ton pulp}}\right) (1000 \text{ tpd}) (365 \text{ d/yr})) \left(\frac{0.81 \times 10^{-6} \text{ SDCF } H_2SO_4}{\text{SDCF vent gas}}\right)$$

= 88,695 SDCF/yr

$$= \frac{(88{,}695 \text{ SDCF/yr})(98 \text{ lb/lb mole})}{(385 \text{ SDCF/lb mole})}$$

= 22,577 lb/yr

(iii) Emission of Sulfuric Acid from Tall Oil Plants - These plants are equipped with scrubbers and no significant amount of H_2SO_4 is expected to be emitted from this source.

(2) Discharges to Water (Form R, 5.3) - Pulp and paper mill effluents are at a pH of 6 or higher. Consequently, no free sulfuric acid is expected to be present in the final effluent.

(3) Releases to Land (Form R, 5.5) - None

REFERENCES

(1) "Workshop Proceedings on Primary Sulfate Emissions from Combustion Sources," Volumes 1 and 2, EPA-600/9-78-020b, August, 1978.

(2) "A Study of SO_x Measurement Procedures and Their Use at Kraft Recovery Furnaces," NCASI Air Quality Improvement Technical Bulletin No. 106, April, 1980.

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File: Hazardous Emissions
dd: None

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NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.
260 MADISON AVE. NEW YORK, N.Y. 10016 (212) 532-9000

Dr. John E. Pinkerton
Program Director
Air Quality
(212) 532-9047

February 17, 1989

Mr. Curtis A. Barton, Mgr. of
Eng. Regulatory Affairs
Stone Container Corp.
2150 Parklake Drive #400
Atlanta, GA 30345

Dear Curt:

I reviewed our files for information on emissions of arsenic, asbestos, chromium, polycyclic organic matter, and chlorine (as HCl) from kraft recovery furnaces. The only data we are aware of are summarized in the attached table. The data are from an EPA contractor study carried out over ten years ago, and represent a limited number of measurements at a single recovery furnace.

EPA recently published an extensive compilation of 'air toxic' emission factors (cover page attached). There are no factors listed in the document for the five compounds for kraft recovery furnaces.

Hope this information will be of some help in preparing the permit application for Jacksonville.

Best regards,

John Pinkerton

John E. Pinkerton

JEP:mh

cc: A. Jain (w/att.)

Rule of thumb:
300,000 to 350,000 dscf/ton pulp for a KRF.

TABLE 3. EMISSION FACTORS FOR TRACE ELEMENTS AND ORGANIC COMPOUNDS FROM COMBUSTION SOURCES

Element	Emission Factor ($lb/10^{12}$ Btu)						Flue Gas Concentration ($lb/10^{12}$ dscf)
	Wood	Resid. Oil	Bituminous Coal				
	Uncont. (Ref.1)	Uncont. (Ref.1)	ESP (Ref.1)	MC (Ref.1)	MC (Ref.2)	FF (Ref.2)	Kraft Recov Furnace (ESP.) (Ref.3)
Arsenic	30	30	55	480	3000	1	<1000
Barium	40	70	30	210	210	5	9400
Beryllium	<1	5	5	5	15	<1	300
Bromine	nm	15	nm	nm	5	1	nm
Cadmium	5	15	<1	1	15	1	1100
Chlorine	nm	7200	nm	nm	170000	nm	nm
Chromium	15	50	15	200	1400	150	9400
Copper	250	800	310	800	270	5	200
Fluorine	nm	350	nm	nm	8200	25	nm
Lead	120	80	90	400	1410	5	3900
Manganese	730	30	50	100	250	20	2000
Mercury	nm	3	5	15	15	5	nd
Nickel	70	1000	1000	130	3300	170	4300
Selenium	5	60	5	45	50	2	100
Zinc	1800	150	170	95	2200	10	5200
Compound							
Benzo(a) Pyrene	10	<1	-	10	nm	nm	10
Biphenyl	75	1	-	nm	nm	nm	nm
Napthalene	630	10	-	45	<1	2	nm

Note: nm means not measured, nd means not detected
mc - multiple cyclone control, ESP - electrostatic precipitator, FF - baghouse

References

1. Emissions Assessment of Conventional Stationary Combustion Systems, Vol. V: Industrial Combustion Sources - Rpt. GCA-TR-79-62-G, Prepared for U.S. EPA Office of Research and Development (April, 1981)

2. Emission Assessment of Conventional Stationary Combustion Systems, Vol. III: External Combustion Sources for Electricity Generation. EPA Contract No. 68-02-2197, Prepared for U.S. EPA Office of Research and Development (November, 1980)

3. Application of Combustion Modifications to Industrial Combustion Equipment, U.S. EPA, EPA-600/7-79-015a (Jan. 1979)

TABLE 10.1-7. CUMULATIVE PARTICLE SIZE DISTRIBUTION AND SIZE SPECIFIC EMISSION FACTORS FOR A SMELT DISSOLVING TANK WITH A VENTURI SCRUBBER[a]

EMISSION FACTOR RATING: C

Particle size (um)	Cumulative mass % ≤ stated size		Cumulative emission factor (kg/Mg of air dried pulp)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
15	90.0	89.9	3.2	0.09
10	88.5	89.5	3.1	0.09
6	87.0	88.4	3.0	0.09
2.5	73.0	81.3	2.6	0.08
1.25	47.5	63.5	1.7	0.06
1.00	54.0	54.7	1.4	0.06
0.625	25.5	38.7	0.9	0.04
Total	100	100	3.5	0.09

[a]Reference 7.

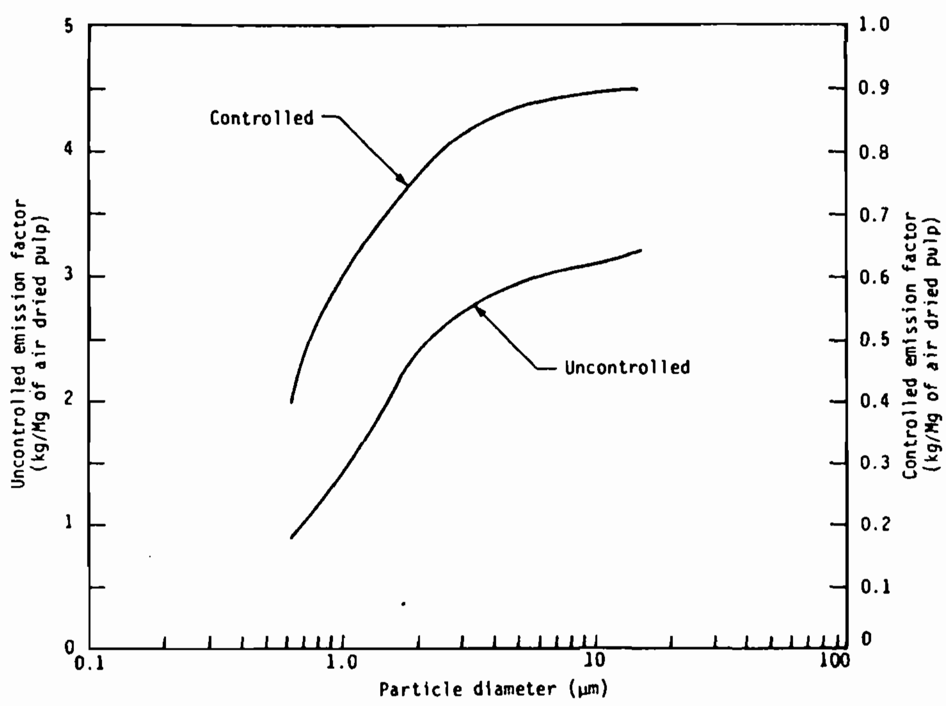


Figure 10.1-7. Cumulative particle size distribution and size specific emission factors for smelt dissolving tank with venturi scrubber.

TABLE 10.1-1. EMISSION FACTORS FOR SULFITE PULPING[a]

EMISSION FACTOR RATING: A

Source	Type of control	Particulate		Sulfur dioxide (SO_2)		Carbon monoxide (CO)		Hydrogen sulfide ($S^=$)		RSH, RSR, RSSR ($S^=$)	
		kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton
Digester relief and blow tank	Untreated[b]	-	-	-	-	-	-	0.02	0.03	0.6	1.2
Brown stock washer	Untreated[b]	-	-	-	-	-	-	0.01	0.02	0.2[c]	0.4[c]
Multiple effect evaporator	Untreated[b]	-	-	-	-	-	-	0.55	1.1	0.05	0.1
Recovery boiler and direct evaporator	Untreated[d]	90	180	3.5	7	5.5	11	6[e]	12[e]	1.5[e]	3[e]
	Venturi scrubber[f]	24	48	3.5	7	5.5	11	6[e]	12[e]	1.5[e]	3[e]
	ESP	1	2	3.5	7	5.5	11	6[e]	12[e]	1.5[e]	3[e]
	Auxiliary scrubber	1.5-7.5[g]	3-15[g]					6[e]	12[e]	1.5[e]	3[e]
Noncontact recovery boiler without direct contact evaporator	Untreated	115	230	-	-	5.5	11	0.05[h]	0.1[h]	-	-
	ESP	1	2	-	-	5.5	11	0.05[h]	0.1[h]	-	-
Smelt dissolving tank	Untreated	3.5	7	0.1	0.2	-	-	0.1[j]	0.2[j]	0.15[j]	0.3[j]
	Mesh pad	0.5	1	0.1	0.2	-	-	0.1[j]	0.2[j]	0.15[j]	0.3[j]
	Scrubber	0.1	0.2	-	-	-	-	0.1[j]	0.2[j]	0.15[j]	0.3[j]
Lime kiln	Untreated	28	56	0.15	0.3	0.05	0.1	0.25[m]	0.5[m]	0.1[m]	0.2[m]
	Scrubber or ESP	0.25	0.5	-	-	0.05	0.1	0.25[m]	0.5[m]	0.1[m]	0.2[m]
Turpentine condenser	Untreated	-	-	-	-	-	-	0.005	.01	0.25	0.5
Miscellaneous[n]	Untreated	-	-	-	-	-	-	-	-	0.25	0.5

[a]References 8-10. Factors expressed in unit weight of air dried unbleached pulp (ADP). RSH = Methyl mercaptan. RSR = Dimethyl sulfide. RSSR = Dimethyl disulfide. ESP = Electrostatic precipitator. Dash = No data.

[b]If noncondensible gases from these sources are vented to lime kiln, recovery furnace or equivalent, the reduced sulfur compounds are destroyed.

[c]Apply with system using condensate as washing medium. When using fresh water, emissions are 0.05 (0.1).

[d]Apply when cyclonic scrubber or cascade evaporator is used for direct contact evaporation, with no further controls.

[e]Usually reduced by 50% with black liquor oxidation and can be cut 95 - 99% when oxidation is complete and recovery furnace is operated optimally.

[f]Apply when venturi scrubber is used for direct contact evaporation, with no further controls.

[g]Use 7.5 (15) when auxiliary scrubber follows venturi scrubber, and 1.5 (3) when it follows ESP.

[h]Apply when recovery furnace is operated optimally to control total reduced sulfur (TRS) compounds.

[j]Usually reduced to 0.01 g/kg (0.02 lb/ton) ADP when water low in sulfides is used in smelt dissolving tank and associated scrubber.

[m]Usually reduced to 0.015 g/kg (0.03 lb/ton) ADP with efficient mud washing, optimal kiln operation and added caustic in scrubbing water. With only efficient mud washing and optimal process control, TRS compounds reduced to 0.04 g/kg (0.08 lb/ton) ADP.

[n]Includes knotter vents, brownstock seal tanks, etc. When black liquor oxidation is included, emissions are 0.3 (0.6).

Appendix 3

Baseline Emission Calculations

Recovery Boilers Nos. 1, 2 and 3
Smelt Dissolving Tank Nos. 1, 2 and 3

A. RECOVERY BOILER NOS. 1, 2 AND 3

1. PM(TSP)

Baseline PM(TSP) emissions were derived from the 1983 and 1984 Annual Operation Report Form submitted by Jacksonville Kraft (former operators of the mill) to Florida Department of Environmental Regulation. Copies of the pertinent forms are included at the end of this appendix. PM(TSP) emissions reported on the forms were based upon particulate source tests conducted on the boilers in 1983 and 1984.

	1983	1984	Average
RB 1 -	143.3 TPY	144.3 TPY	143.8 TPY
RB 2 -	127.6 TPY	161.1 TPY	144.4 TPY
RB 3 -	148.3 TPY	129.6 TPY	139.0 TPY

2. PM10

AP-42 contains particle size information for particulate emissions from recovery boilers with a direct contact evaporator and controlled by an ESP (Table 10.1-2). Data for controlled emissions are not provided for particle sizes greater than 6μm. However, the available data can be extrapolated to provide a reasonable estimate of PM10 emissions. Extrapolation of the data (refer to attached AP-42 references) results in the following: 75% of total particulate emissions are less than or equal to 10μm. Based on this estimate, baseline emissions are calculated from PM(TSP) emissions as follows:

RB 1 - 143.8 TPY x 0.75 = 107.9 TPY
RB 2 - 144.4 TPY x 0.75 = 108.3 TPY
RB 3 - 139.0 TPY x 0.75 = 104.3 TPY

3. SO_2

Baseline emissions are based upon the emission factor given in AP-42 for a recovery boiler with a direct contact evaporator (Table 10.1-1). The factor is 7 lb SO_2/ton air dried unbleached pulp (ADUP). From the 1983 and 1984 operating records, Seminole Kraft produced 410,238 tons ADUP in 1983 and 436,032 tons ADUP in 1984.

Average pulp production = 423,135 tons ADUP

423,135 tons ADUP x 7 lb/ton / 2,000 lb/ton
= 1,481.0 TPY (total for all three RB's)

The total emissions can be apportioned to each RB on the basis of black liquor solids (BLS) burned in each:

BLS burned in 1983:	RB 1 - 160,897 tons	(29.0%)
	RB 2 - 194,933 tons	(35.1%)
	RB 3 - 199,694 tons	(35.9%)
	Total - 555,524 tons	(100.0%)

RB 1 - 1,481.0 TPY x 0.290 = 429.5 TPY
RB 2 - 1,481.0 TPY x 0.351 = 519.8 TPY
RB 3 - 1,481.0 TPY x 0.359 = 531.7 TPY

4. $\underline{NO_x}$

Baseline NO_x emissions are based upon a National Council on Air and Stream Improvement (NCASI) publication (NCASI Technical Bulletin No. 105, 1979). Several recovery boilers were tested for NO_x emissions. Boiler 6 appeared to be most similar to Seminole Kraft boilers:

C.E. - 1984
Direct Contact Evaporator, 60,000 lb/hr BLS - Some oil firing
NOx - avg. 45 ppm wet, 0.11 lb/10^6 Btu

Boiler 4 also similar - built 1975, no oil firing
70,500 lb/hr BLS
NO_x - avg. 39 ppm wet, 0.073 lb/10^6 Btu

Very limited source testing conducted by Jacksonville Kraft in 1985 also indicated about a 40 ppm level of NO_x in the recovery boiler exhaust gases.

Use average of 0.09 lb/10^6 Btu, or about 42 ppm
BLS = 6,183 Btu/lb
0.09 lb/10^6 Btu x 6,183 Btu/lb = 1.67 lb/3,000 lb BLS

Based upon BLS fired in each recovery boiler in 1983 and 1984:

	1983	1984	Average
RB 1	160,897 tons BLS	178,197 tons BLS	169,547 tons BLS
RB 2	194,933 tons BLS	209,948 tons BLS	202,441 tons BLS
RB 3	199,694 tons BLS	209,948 tons BLS	204,821 tons BLS

RB 1 - 169,547 tons BLS x 2,000 x 1.67/3,000 / 2,000 lb/ton = 94.4 TPY

RB 2 - 202,441 tons BLS x 2,000 x 1.67/3,000 / 2,000 lb/ton = 112.7 TPY

RB 3 - 204,821 tons BLS x 2,000 x 1.67/3,000 / 2,000 lb/ton = 114.0 TPY

5. CO

Baseline emissions are based upon AP-42 factor of 11 lb/ton ADUP and total production in 1983-1984:

423,135 tons ADUP x 11 lb/ton / 2,000 lb/ton = 2,327.2 TPY

Proportion to each boiler:

RB 1 - 2,327.2 TPY x 0.290 = 674.9 TPY

RB 2 - 2,327.2 TPY x 0.351 = 816.8 TPY

RB 3 - 2,327.2 TPY x 0.359 = 835.5 TPY

6. VOC

Baseline VOC emissions from the recovery boilers were based upon a NCASI study conducted in 1981 (Technical Bulletin No. 112). Two direct contact evaporator recovery boilers were tested for total gaseous non-methane organics. Average emissions for the two boilers (Boilers B and D) were 0.59 lb/1,000 lb BLS.

RB 1 - 169,547 tons BLS x 2,000 x 0.59/1,000 / 2,000 lb/ton = 100.0 TPY

RB 2 - 202,441 tons BLS x 2,000 x 0.59/1,000 / 2,000 lb/ton = 119.4 TPY

RB 3 - 204,821 tons BLS x 2,000 x 0.59/1,000 / 2,000 lb/ton = 120.8 TPY

7. TRS

Baseline TRS emissions from the recovery boilers were obtained from the 1983 and 1984 Annual Air Operation Report Form submitted by

Jacksonville Kraft. TRS emissions were determined from compliance tests and the hours of operation of the boiler in each year.

	1983	1984	Average
RB 1 -	23.9 TPY	26.5 TPY	25.2 TPY
RB 2 -	30.19 TPY	32.5 TPY	31.3 TPY
RB 3 -	30.93 TPY	34.7 TPY	32.8 TPY

8. H_2SO_4

NCASI has estimated H_2SO_4 emissions from Kraft Recovery furnaces in their NCASI Handbook of Chemical Specific Information for SARA Section 313 Form R Reporting. The average H_2SO_4 concentration in the exhaust gases from recovery boilers is reported to be 0.81 ppm. Baseline emissions from Seminole Kraft recovery boilers are based upon this level of H_2SO_4 mist, the actual measured gas flow rate, and the hours of operation of each boiler in 1983 and 1984.

$PV = mRT$

$m = PV/RT$

moleular weight, H_2SO_4 = 98

$R = 1{,}545\ ft\text{-}lb_f/lb_m\text{-}^{\circ}R\ /\ 98 = 15.77$

$T = 68^{\circ}F = 528\ ^{\circ}R$

$P = 2{,}116.8\ lb_f/ft^2$

Measured Stack Gas Flows (dscfm):

	1983	1984	Average
RB 1	122,458	133,098	127,778
RB 2	126,944	172,130	149,537
RB 3	134,308	127,892	131,000

Operating hours:

	1983	1984	Average
RB 1	7,426	8,225	7,826
RB 2	7,035	7,577	7,306
RB 3	7,207	8,075	7,641

RB 1 - 127,778 dscfm x 60 min/hr x 2,116.8 / 15.77 / 528 x $0.81/10^6$
= 1.58 lb/hr
1.58 lb/hr x 7,826 hr / 2,000 lb/ton = 6.18 TPY

RB 2 - 149,537 dscfm x 60 x 2,116.8 / 15.77 / 528 x $0.81/10^6$
= 1.85 lb/hr
1.85 lb/hr x 7,306 hr/yr / 2,000 = 6.76 TPY

RB 3 - 131,100 dscfm x 60 x 2,116.8 / 15.77 / 528 x $0.81/10^6$
= 1.62 lb/hr
1.62 lb/hr x 7,641 hr/yr / 2,000 = 6.19 TPY

9. Other Regulated Pollutants

Review of published literature revealed only one study which investigated emissions of non-criteria pollutants from recovery boilers (see attached NCASI letter dated February 17, 1989). The emission factors from this reference are as follows:

Lead : 3,900 lb/10^{12} dscf
Mercury : non-detectable
Beryllium: 300 lb/10^{12} dscf
Arsenic : non-detectable

Baseline emissions calculated on basis of 1983-1984 operation (see H_2SO_4 mist calculations above).

RB 1 - Lead - 3,900 lb/10^{12} dscf x 127,778 dscfm x 60 min/hr x 7,826 hr/yr / 2,000 lb/ton = 0.12 TPY

Beryllium - 300/10^{12} x 127,778 x 60 x 7,826 / 2,000 = 0.0090 TPY

RB 2 - Lead - 3,900/10^{12} x 149,537 x 60 x 7,306 / 2,000 = 0.13 TPY

Beryllium - 300/10^{12} x 149,537 x 60 x 7,306 / 2,000 = 0.0098 TPY

RB 3 - Lead - 3,900/10^{12} x 131,100 x 60 x 7,641 / 2,000 = 0.12 TPY

Beryllium - 300/10^{12} x 131,100 x 60 x 7,641 / 2,000 = 0.0090 TPY

Emissions of other regulated pollutants (i.e., fluorides, asbestos and vinyl chloride) are not known to be emitted from recovery boilers. There are no known published emission factors for these pollutants.

B. SMELT DISSOLVING TANK NOS. 1, 2 AND 3

1. PM(TSP)

Baseline PM(TSP) emissions were derived from the 1983 and 1984 Annual Operation Report Form submitted by Jacksonville Kraft to Florida Department of Environmental Regulation. Copies of the pertinent forms are included at the end of this appendix. PM(TSP) emissions reported on the forms were based upon particulate source tests conducted on the smelt dissolving tanks in 1983 and 1984.

	1983	1984	Average
SDT 1 -	22.8 TPY	39.7 TPY	31.3 TPY
SDT 2 -	44.9 TPY	51.9 TPY	48.4 TPY
SDT 3 -	33.5 TPY	52.3 TPY	42.9 TPY

2. PM10

AP-42 contains particle size information for particulate emissions from smelt dissolving tanks (Table 10.1-2). Data for controlled particulate emissions show PM10 emissions are 89.5% of total particulate emissions. Baseline PM10 emissions are calculated from PM(TSP) emissions as follows:

SDT 1 - 31.3 TPY x 0.895 = 28.0 TPY
SDT 2 - 48.4 TPY x 0.895 = 43.3 TPY
SDT 3 - 42.9 TPY x 0.895 = 38.4 TPY

3. SO_2

Baseline emissions are based upon the emission factors given in AP-42 for a smelt dissolving tank. AP-42 provides emission factors for uncontrolled emissions, and for mesh pad and scrubber particulate control systems. The existing Seminole Kraft SDTs have a spray chamber followed by a mesh demister pad. The AP-42 factor for this type of control is 0.2 lb/ton ADUP. Seminole Kraft also uses weak wash as the scrubbing media, with pH of approximately 11. This will further reduce SO_2 emissions, and the removal efficiency is estimated at 80%.

Total SO_2 emission = 423,135 tons ADUP x 0.2 lb/ton x (1- 0.80) / 2,000 lb/ton = 8.5 TPY

Prorate to each SDT based upon recovery boiler operation:

RB 1 - 8.5 TPY x 0.290 = 2.5 TPY

RB 2 - 8.5 TPY x 0.351 = 3.0 TPY

RB 3 - 8.5 TPY x 0.359 = 3.1 TPY

4. TRS

Baseline TRS emissions from the smelt dissolving tanks are based upon the 1983-1984 operating data and the current Florida emission regulation of 0.0480 lb/3000 lb BLS:

555,524 tons BLS x 2,000 x 0.0480 lb/3000 lb / 2,000 = 8.9 TPY

Prorate to each SDT:

SDT 1 - 8.9 TPY x 0.290 = 2.6 TPY

SDT 2 - 8.9 TPY x 0.351 = 3.1 TPY

SDT 3 - 8.9 TPY x 0.359 = 3.2 TPY

5. OTHER REGULATED POLLUTANTS

Emissions of other regulated pollutants (i.e., NOx, CO, VOC, Pb, Hg, Be, H_2SO_4 mist, inorganic As, Fl, asbestos and vinyl chloride) are not know to occur from smelt dissolving tank vents. These are no known published emission factors for the pollutants.

TABLE 10.1-2. CUMULATIVE PARTICLE SIZE DISTRIBUTION AND SIZE SPECIFIC EMISSION FACTORS FOR A RECOVERY BOILER WITH A DIRECT CONTACT EVAPORATOR AND AN ESP[a]

EMISSION FACTOR RATING: C

Particle size (um)	Cumulative mass % ≤ stated size		Cumulative emission factor (kg/Mg of air dried pulp)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
15	95.0	-	86	-
10	93.5	-	84	-
6	92.2	68.2	83	0.7
2.5	83.5	53.8	75	0.5
1.25	56.5	40.5	51	0.4
1.00	45.3	34.2	41	0.3
0.625	26.5	22.2	24	0.2
Total	100	100	90	1.0

[a]Reference 7. Dash = no data.

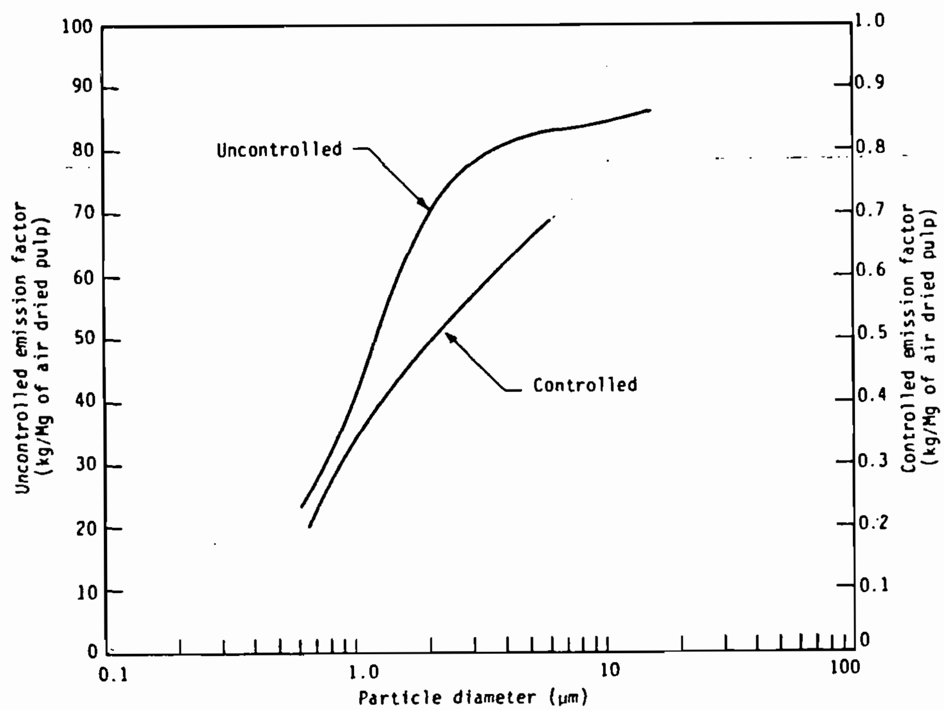
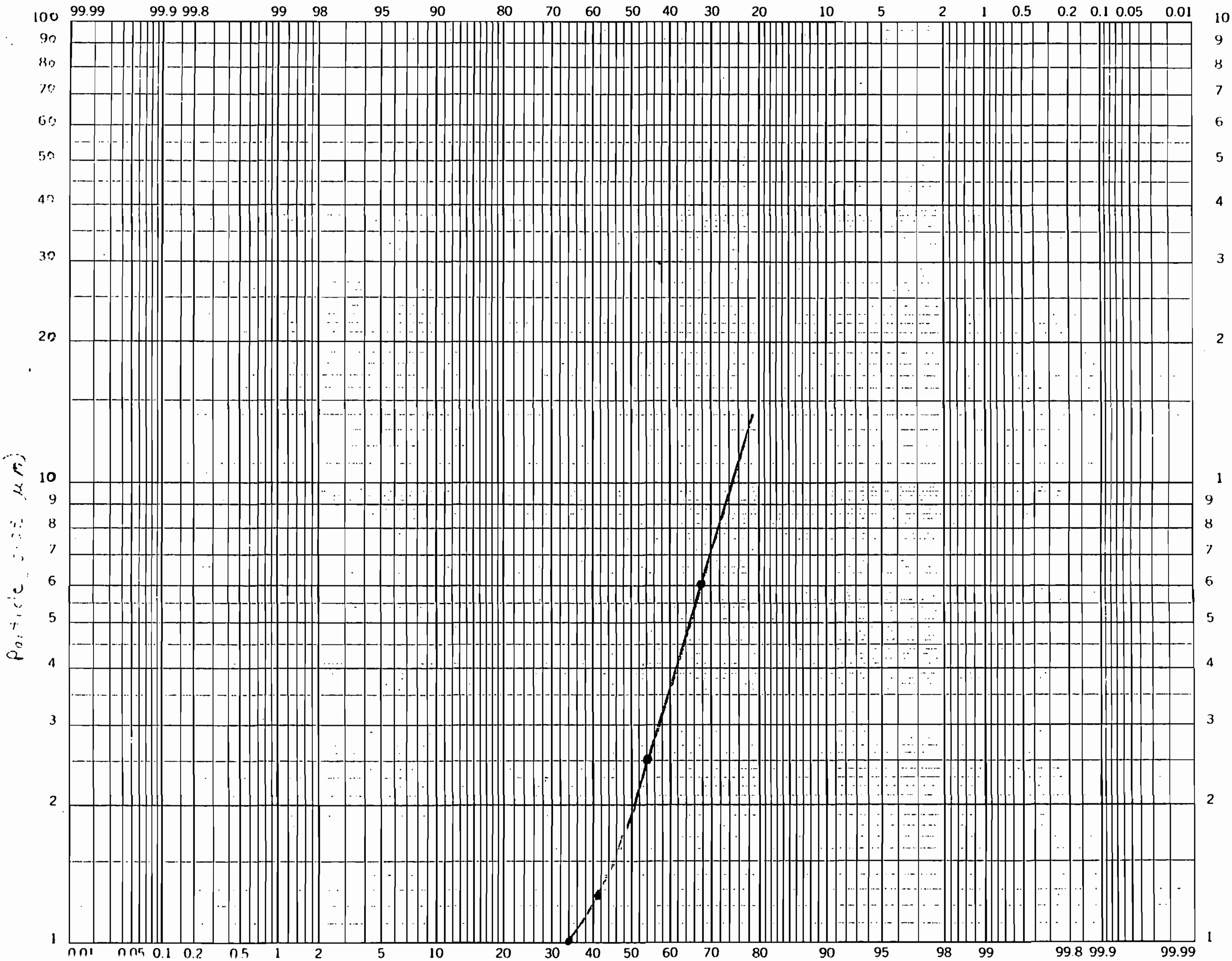


Figure 10.1-2. Cumulative particle size distribution and size specific emission factors for recovery boiler with direct contact evaporator and ESP.

K&E PROBABILITY X 2 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 8040



ncasi technical bulletin

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

A STUDY OF NITROGEN OXIDES EMISSIONS FROM KRAFT RECOVERY FURNACES

ATMOSPHERIC QUALITY IMPROVEMENT

TECHNICAL BULLETIN NO. 105

DECEMBER 1979

Encl. #4

TABLE 3 OXIDES OF NITROGEN FIELD MEASUREMENTS FOR KRAFT RECOVERY UNITS SAMPLED

Location & Furnace Type	NOx (3) Hour Average Mean (ppm)	(lb/10^6 Btu)	(ng/J)[1]	NOx (3) Hour Average Range (ppm)	(lb/10^6 Btu)	(ng/J)[1]
1 : N.D.	36.2 (27.5)*	0.067	29.0	28.7-44.0	0.053-0.082	23.0-35.3
2 : N.D.	37.4 (28.7)*	0.077	33.2	26.3-43.6	0.054-0.090	23.2-38.6
3 : N.D.	63.5 (50.9)*	0.130	56.0	54.7-70.9	0.111-0.141	47.8-60.8
4 : D.	39.2 (31.2)*	0.073	31.5	30.6-47.9	0.057-0.090	24.6-38.5
5 : D.	45.1 (44.4)*	0.111	47.7	39.9-51.6	0.098-0.127	42.1-54.5
6 : D.	41.5 (39.1)*	0.114	49.1	33.9-47.8	0.084-0.130	36.3-55.8

1 - 1 lb/10^6Btu = 430 nanograms/Joule heat input

* - Adjusted to 8 percent excess oxygen. The other ppm concentration data corresponds to actual stack excess oxygen levels as specified in TABLE 2.

ncasi technical bulletin

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

A STUDY OF KRAFT RECOVERY FURNACE TOTAL GASEOUS NON-METHANE ORGANIC EMISSIONS

ATMOSPHERIC QUALITY IMPROVEMENT

TECHNICAL BULLETIN NO. 112

FEBRUARY 1981

TABLE 7 AVERAGE SAMPLING RESULTS

Recovery Furnace	DCE/NDCE	Average Uncorrected TGNMO	Average Corrected TGNMO	Confidence Interval ±%	Average CO
ppm					
A	NDCE	110	82	22	1070
B	DCE	210	130	32	155
C	NDCE	99	89	39	740
D	DCE	210	170	17	40
E	NDCE	86	61	36	80
$lb/10^6$ Btu					
A	NDCE	0.056	0.040	25	0.91
B	DCE	0.130	0.100	31	0.16
C	NDCE	0.056	0.035	52	0.58
D	DCE	0.130	0.110	22	0.13
E	NDCE	0.077	0.054	24	2.1
lb/1000 lb bls					
A	NDCE	0.34	0.24	24	5.40
B	DCE	0.69	$\boxed{0.55}$	28	0.85
C	NDCE	0.27	0.22	48	2.90
D	DCE	0.79	$\boxed{0.63}$	22	0.27
E	NDCE	0.45	0.32	24	12.60
lb/ton pulp					
A	NDCE	1.0	0.72	21	16
B	DCE	2.3	1.8	29	2.8
C	NDCE	0.81	0.66	46	8.7
D	DCE	2.6	2.1	21	0.9
E	NDCE	1.5	1.1	27	39

GENERAL INFORMATION

1. Company Name and Address Jacksonville Kraft Paper Company, Inc.

P.O. Box 18019, Jacksonville, Florida 32229

2. Complete all applicable sections below for calendar year 1983:

A. Kraft Pulp Mill - Tons of air-dryed unbleached pulp produced St. Regis:155,784; Jax Kraft:254,454 Total: 410,238

B. Concrete batch or concrete products plant -

(1) Cubic yards of concrete produced (used) ______.

(2) Tons of aggregate stored ______.

C. Miscellaneous paint and solvent use -

(1) lbs. of paint used ______.

(2) % solvent in paint ______.

(3) lbs. of miscellaneous solvent used ______.

D. Small boilers (not permitted) -

(1) Type fuel used (Please Circle) - #1 #2 #4 #5 #6 .

(2) % sulfur in fuel ______.

(3) Quantity used (calendar year) ______.

E. Coffee Processors - Tons of Coffee produced ______.

R. G. Carovano - Vice President & Gen. Mgr. — R. G. Carovano

(Print or Type) Name and Title of Owner or Authorized Representative — Signature

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71209
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7426

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	84,308	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

DER Form 17-1.202(6)
Effective November 30, 1982

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
________	10^3 gallons ________ Oil, ________ %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ________________________________

VI EMISSION RATE(S) (tons/yr)

22.80	Particulates	________	Sulfur Dioxide	________	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon	Other (Specify type and units) ________			

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1984 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71210
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7035

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	102,143	tons/y
		tons/y
		tons/y
		tons/y
		tons/y

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
________	10^3 gallons ________ Oil, ________ %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ________________

VI EMISSION RATE(S) (tons/yr)

44.88	Particulates	________	Sulfur Dioxide	________	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon	Other (Specify type and units) ________________			

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

Best Available Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71211
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS.7207

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	104,638	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

_________ 10^6 cubic feet Natural Gas _________ 10^3 Kerosene

_________ 10^3 gallons _________ Oil, _________ %S _________ tons Coal

_________ 10^3 gallons Propane _________ tons Carbonaceous

_________ 10^6 Black Liquor Solids _________ tons Refuse

Other (Specify type and units) _________

VI EMISSION RATE(S) (tons/yr)

33.48 Particulates _________ Sulfur Dioxide _________ Total Reduced Sulfur

_________ Nitrogen Oxide _________ Carbon Monoxide _________ Fluoride

_________ Hydrocarbon Other (Specify type and units) _________

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano — R. G. Carovano, Vice President & Gen. Mgr.

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE — TYPED NAME AND TITLE

2/28/84
DATE

Best Available Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71206
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7426

III RAW MATERIAL INPUT ~~PROCESS~~ WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	160,897	tons/y
		tons/y
		tons/y
		tons/y
		tons/y

IV PRODUCT OUTPUT (Specify applicable units)

N/A

DER Form 17-1.202(6)
Effective November 30, 1982

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
20	10^3 gallons No. 6 oil, 2.27 %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ________

VI **EMISSION RATE(S)** (tons/yr)

143.25	Particulates	________	Sulfur Dioxide	23.90	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon		Other (Specify type and units) ________		

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

Best Available Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71207
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7035

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	194,933	tons/y
		tons/y
		tons/y
		tons/y
		tons/y

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

______	10^6 cubic feet Natural Gas	______	10^3 Kerosene
20	10^3 gallons No. 6 Oil, 2.27 %S	______	tons Coal
______	10^3 gallons Propane	______	tons Carbonaceous
______	10^6 Black Liquor Solids	______	tons Refuse

Other (Specify type and units) ______

VI EMISSION RATE(S) (tons/yr)

RCM 3-13-85

127.55	Particulates	3.56	Sulfur Dioxide	30.19	Total Reduced Sulfur
0.55	Nitrogen Oxide	______	Carbon Monoxide	______	Fluoride
______	Hydrocarbon		Other (Specify type and units) ______		

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG OUTTO
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 8
prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc
2. Permit Number: A016-71208
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr

APPROX. OPERATING HRS. 7207

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	199,694	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
20	10^3 gallons No. 6 Oil, 2.27 %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ________

VI EMISSION RATE(S) (tons/yr)

148.25	Particulates	________	Sulfur Dioxide	30.93	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon	Other (Specify type and units) ________			

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

GENERAL INFORMATION

1. Mailing address update: P. O. Box 18019, Jacksonville, Florida 32229
Contact Person R. G. Carovano
Company Name Jacksonville Kraft Paper Company, Inc.
Address 9469 Eastport Road
City Jacksonville State Florida Zip 32218 Phone (904) 751 - 1400

2. Complete all applicable sections below for calendar year 1984:

A. Kraft Pulp Mill - Tons of air-dryed unbleached pulp produced 436,032.

B. Concrete batch or concrete products plant -

(1) Cubic yards of concrete produced (used)__________.

(2) Tons of aggregate stored at any given time__________.

(3) Tons of cement used__________.

C. Miscellaneous paint and solvent used -

(1) lbs. of paint used__________.

(2) % solvent in paint__________.

(3) lbs. of miscellaneous solvent used__________.

D. Small boilers -

(1) Type fuel used (Please Circle) - #1 #2 #4 #5 #6 .

(2) % sulfur in fuel__________.

(3) Quantity used (calendar year)__________.

E. Coffee Processors - Tons of coffee processed__________.

R. G. Carovano
Executive Vice President
(Print or Type) Name and Title of Owner or Authorized Representative

R. G. Carovano
Signature

Date May 6, 1985

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 84 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016 - 71209
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Approx. Operating Hours 8224.5

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	93,373	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

N/A

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

_______ 10^3 gallons _______ Oil, _______ %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI EMISSION RATE(S) (tons/yr)

39.72 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Executive Vice President
TYPED NAME AND TITLE

May 6, 1985
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1984 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016 - 71210
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Approx. Operating Hours 7577

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr).

Raw Material	Input Process Weight	
Molten Smelt	110,011	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

____	10^6 cubic feet Natural Gas	____	10^3 Kerosene
____	10^3 gallons ____ Oil, ____ %S	____	tons Coal
____	10^3 gallons Propane	____	tons Carbonaceous
____	10^6 Black Liquor Solids	____	tons Refuse

Other (Specify type and units) ____

VI EMISSION RATE(S) (tons/yr)

51.90	Particulates	____	Sulfur Dioxide	____	Total Reduced Sulfur
____	Nitrogen Oxide	____	Carbon Monoxide	____	Fluoride
____	Hydrocarbon		Other (Specify type and units) ____		

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Executive Vice President
TYPED NAME AND TITLE

May 6, 1985
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 84 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016 - 71211
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr

Approx. Operating Hours 8074.5

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process, and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight
Molten Smelt	117,235 tons/yr
	tons/yr
	tons/yr
	tons/yr
	tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

N/A

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

_______ 10^3 gallons _______ Oil, _______ %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI EMISSION RATE(S) (tons/yr)

52.32 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R G Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Executive Vice President
TYPED NAME AND TITLE

May 6, 1985
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHA
GOVERNO

VICTORIA J. TSCHINKE
SECRETAR

G. DOUG DUTTC
DISTRICT MANAGE

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 84 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016 - 71206
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Approx. Operating Hours 8224.5

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	178,197	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________ 10^6 cubic feet Natural Gas

________ 10^3 Kerosene

est. 20 10^3 gallons No. 6 Oil, 2.27 %S

________ tons Coal

________ 10^3 gallons Propane

________ tons Carbonaceous

________ 10^6 Black Liquor Solids

________ tons Refuse

Other (Specify type and units) ________

VI EMISSION RATE(S) (tons/yr)

~~144.30~~ Particulates

________ Sulfur Dioxide

26.47 Total Reduced Sulfur

________ Nitrogen Oxide

________ Carbon Monoxide

________ Fluoride

________ Hydrocarbon

Other (Specify type and units) ________

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Executive Vice President

TYPED NAME AND TITLE

May 6, 1985

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 84 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-- 71207
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Approx. Operating Hours 7577

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	209,948	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

_______ 10^6 cubic feet Natural Gas

_______ 10^3 Kerosene

est. 20 10^3 gallons No. 6 Oil, 2.27 %S

_______ tons Coal

_______ 10^3 gallons Propane

_______ tons Carbonaceous

_______ 10^6 Black Liquor Solids

_______ tons Refuse

Other (Specify type and units) _______

VI EMISSION RATE(S) (tons/yr)

161.05 Particulates _______ Sulfur Dioxide 32.52 Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Executive Vice President

TYPED NAME AND TITLE

May 6, 1985

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHA'
GOVERNO

VICTORIA J. TSCHINKE
SECRETAR

G. DOUG DUTTO
DISTRICT MANAGE

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 84 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016 - 71208
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Approx. Operating Hours 8074.5

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight
Black Liquor Solids	209,948 tons/yr
	tons/yr
	tons/yr
	tons/yr
	tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

______ 10^6 cubic feet Natural Gas

______ 10^3 Kerosene

est. 20 10^3 gallons No. 6 Oil, 2.27 %S

______ tons Coal

______ 10^3 gallons Propane

______ tons Carbonaceous

______ 10^6 Black Liquor Solids

______ tons Refuse

Other (Specify type and units) ______

VI EMISSION RATE(S) (tons/yr)

129.84 Particulates

______ Sulfur Dioxide

34.65 Total Reduced Sulfur

______ Nitrogen Oxide

______ Carbon Monoxide

______ Fluoride

______ Hydrocarbon

Other (Specify type and units) ______

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Executive Vice President
TYPED NAME AND TITLE

May 6, 1985
DATE

APPENDIX 4

Contemporaneous Emission Reductions

Old Lime Slaker

III. EXISTING LIME SLAKERS

The old lime slaker at Seminole Kraft was shut down in mid-1988. The slaker was an atmospheric hydrator and was uncontrolled. All lime produced from the three lime kilns were hydrated in the slakers. In addition, purchased lime was also processed by the hydrators.

A. PM

AP-42, Section 8.15, Lime Manufacturing, presents a PM emission factor of 0.1 lb/ton lime produced for atmospheric hydrators, or 0.125 lb/ton of lime feed to the hydrator. The emission factor is for hydrators with water sprays or wet scrubbers for particulate controls. To estimate emissions from the uncontrolled slaker, it was assumed that the emission factor is for a control device which is 95% efficient. Thus, the the uncontrolled emission factor would be 2.5 lb/ton of lime feed (i.e., 0.125/0.05). This emission factor was used to estimate actual emissions from the slakers.

Lime production from the three lime kilns in 1983-1984 and actual purchased lime amounts are presented below (in tons):

	1983	1984	Average
LK1	26,849	15,944	21,397
LK2	36,729	46,875	41,802
LK3	43,341	48,017	45,679
Purchased Lime	4,682	4,000	4,341
		TOTAL	113,219

113,219 tons x 2.5 lb/ton / 2,000 lb/ton = 141.5 TPY

B. PM10

Information related to the particle size distribution of PM emissions from slakers was not found in the available literature. Therefore, Appendix C.2 of AP-42 (10/86), Generalized Particle Size Distributions, was reviewed and was found to contain general particle size distribution data for hydration processes (Category 9). The particle size data indicates that PM10 emissions constitute approximately 94% of total PM emissions from hydration processes. These data are considered to be the best currently available to estimate PM10 emissions from lime slakers. The calculation of PM10 emissions, based upon the total PM emissions, is presented below:

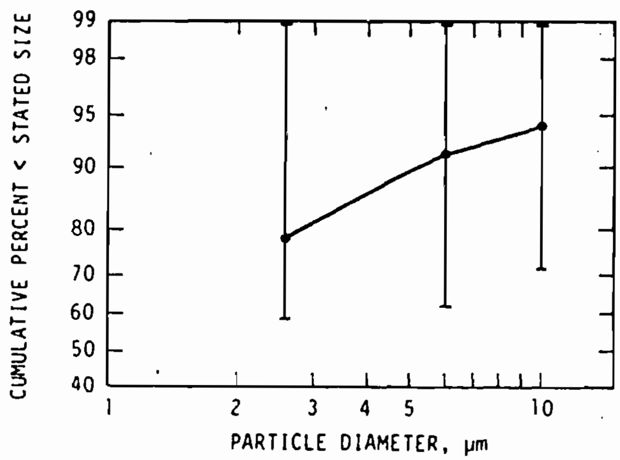
141.5 TPY x 0.94 = 133.0 TPY

TABLE C.2-2 (continued).

Category: 9
Process: Condensation, Hydration, Absorption, Prilling and Distillation
Material: All

Category 9 covers condensation, hydration, absorption, prilling, and distillation of all materials. These processes involve the physical separation or combination of a wide variety of materials such as sulfuric acid and ammonium nitrate fertilizer. (Coke ovens are included since they can be considered a distillation process which separates the volatile matter from coal to produce coke.)

REFERENCE: 1, 3



Particle size, μm	Cumulative % less than or equal to stated size (uncontrolled)	Minimum Value	Maximum Value	Standard Deviation
1.0[a]	60			
2.0[a]	74			
2.5	78	59	99	17
3.0[a]	81			
4.0[a]	85			
5.0[a]	88			
6.0	91	61	99	12
10.0	94	71	99	9

[a] Value calculated from data reported at 2.5, 6.0, and 10.0 μm. No statistical parameters are given for the calculated value.

C.2.3 How To Use The Generalized Particle Size Distributions For Controlled Processes

To calculate the size distribution and the size specific emissions for a source with a particulate control device, the user first calculates the uncontrolled size specific emissions. Next, the fractional control efficiency for the control device is estimated, using Table C.2-3. The Calculation Sheet provided (Figure C.2-2) allows the user to record the type of control device and the collection efficiencies from Table C.2-3, the mass in the size range before and after control, and the cumulative mass. The user will note that the uncontrolled size data are expressed in cumulative fraction less than the stated size. The control efficiency data apply only to the size range indicated and are not cumulative. These data do not include results for the greater than 10 µm particle size range. In order to account for the total controlled emissions, particles greater than 10 µm in size must be included.

C.2.4 Example Calculation

An example calculation of uncontrolled total particulate emissions, uncontrolled size specific emissions, and controlled size specific emission is shown on Figure C.2-1. A blank Calculation Sheet is provided in Figure C.2-2.

TABLE C.2-3 TYPICAL COLLECTION EFFICIENCIES OF VARIOUS PARTICULATE CONTROL DEVICES.[a,b]
(percent)

Type of collector	Particle size, µm		
	0 - 2.5	2.5 - 6	6 - 10
Baffled settling chamber	NR	5	15
Simple (high-throughput) cyclone	50	75	85
High-efficiency and multiple cyclones	80	95	95
Electrostatic precipitator (ESP)	95	99	99.5
Packed-bed scrubber	90	95	99
Venturi scrubber	90	95	99
Wet-impingement scrubber	25	85	95
Fabric filter	99	99.5	99.5

[a] The data shown represent an average of actual efficiencies. The efficiencies are representative of well designed and well operated control equipment. Site specific factors (e.g., type of particulate being collected, varying pressure drops across scrubbers, maintenance of equipment, etc.) will affect the collection efficiencies. The efficiencies shown are intended to provide guidance for estimating control equipment performance when source-specific data are not available.
[b] Reference: 10
NR = Not reported.

Appendix 5

Basis of Maximum Emissions
from
Existing Sources

Seminole Kraft - Maximum Emissions - Existing Sources

1. No. 1 Recovery Boiler - Pt. 09

From: 1988 operating data:

415,904 tons ADUP produced

BLS burned = 176,568 + 206,331 + 215,547
= 598,446 tons BLS

lb BLS/ton ADUP = 598,446 x 2,000/415,904
= 2,878 lb BLS/tons ADUP

Permit: # A016-159612

PM - 43.3 lb/hr allowable

SO_2: AP-42 factor = 7 lb/ton ADUP

43,333 lb/hr BLS max x ton ADUP/2,878 lb BLS
x 7 lb SO_2/ton ADUP
= 105.4 lb/hr SO_2
= 13.3 g/s

NO_x: Factor = 1.67 lb NO_x /3,000 lb BLS (refer to baseline emission calculations)

43,333 lb/hr BLS x 1.67/3,000 = 24.1 lb/hr = 3.04 g/s

2. No. 2 Recovery Boiler - Pt. 10

Permit # A016-159615

PM - 55.4 lb/hr allowable

SO_2 - 55,417 lb/hr BLS /2,878 x 7 lb/ton = 134.8 lb/hr
= 17.0 g/s

NO_x: 55,417 lb/hr BLS x 1.67/3,000 = 30.8 lb/hr = 3.89 g/s

3. No. 3 Recovery Boiler - Pt. 11

Permit # A016-159616

PM - 55.4 lb/hr allowable

SO_2 - 55,417 lb/hr BLS x 1.67/3,000=134.8 lb/hr = 17.0 g/s

NO_x: Same as No. 2 Recovery Boiler

4. No. 1 Smelt Dissolving Tank - Pt. 12

Permit # A016-155786

PM allowable = 16.2 lb/hr

SO_2: AP-42 - 0.2 lb/ton ADUP

43,333/2,878 x 0.2 = 3.0 lb/hr = 0.4 g/s

5. No. 2 Smelt Dissolving Tank - Pt. 13

Permit # A016-155787

PM allowable - 18.9 lb/hr

SO_2 - 55,417/2,878 x 0.2 = 3.9 lb/hr = 0.5 g/s

6. No. 3 Smelt Dissolving Tank - Pt. 14
Permit # A016-155788
PM allowable - 18.9 lb/hr
SO_2 - 55,417/2,878 x 0.2 = 3.9 lb/hr = 0.5 g/s

ncasi technical bulletin

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

CEA

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A STUDY OF NITROGEN OXIDES EMISSIONS FROM LIME KILNS

ATMOSPHERIC QUALITY IMPROVEMENT
TECHNICAL BULLETIN No. 107

APRIL 1980

ncasi

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM-IMPROVEMENT, INC.
260 MADISON AVE. NEW YORK, N.Y. 10016 (212) 532-9000

Russell O. Blosser
Technical Director
(212) 532-9001

ATMOSPHERIC QUALITY IMPROVEMENT
TECHNICAL BULLETIN NO. 107

April 28, 1980

A STUDY OF NITROGEN OXIDES EMISSIONS FROM LIME KILNS

The source emission estimates required for completion of the ambient air quality modelling requirements in satisfying the provisions of EPA's Prevention of Significant Deterioration regulations for new construction have identified the need for a reliable information base for estimating NO_x emissions from combustion sources in the forest products industry. During the past year an extensive field measurement program was initiated to generate information on NO_x emissions from wood residue-fired boilers, kraft recovery furnaces and lime kilns.

The attached technical bulletin reports on the findings of the first phase of a study of NO_x emissions from lime kilns. The field work was conducted under the direction of Kenneth T. Hood and Reid A. Miner, Research Engineers at the West Coast and Southern Regional Centers respectively, assisted by Thomas F. Briody, Russell J. Korvola and Michael E. Franklin, and C. M. Tipton, I. D. Lynch, D. B. Davenport and H. S. Oglesby at these centers. Mr. Hood assembled the sampling apparatus used in the study and assembled the report from which the technical bulletin was prepared.

The study showed that the three-hour mean NO_x emission rates from the five lime kilns studied ranged from 0.07 to 1.13 lbs NO_x per million Btu fired. The NO_x emission rates observed for lime kilns were highly variable and at one gas-fired kiln were found to be related to combustion zone temperature. Combustion zone temperature was measured at only one test site. In this case combustion zone temperatures of about 1850°C were required for minimum NO_x emissions.

Combustion zone temperature alone does not appear to be the sole reason for the range of NO_x emission factors observed, based on the data from one kiln. The temperature-NO_x emission relationships at this kiln suggest that temperatures unsatisfactory for producing CaO would not have been maintained in those two kilns producing NO_x emissions of about 0.2 lbs per million Btu. Further study is required to better understand the relationships of combustion zone temperature and NO_x emission potential. Planning for such work is underway and will be initiated soon.

This technical bulletin is the third of three reports on NO_x emissions from combustion sources in the forest products industry. The first, Atmospheric Quality Improvement Technical Bulletin No. 102, entitled "A Study of Nitrogen Oxides Emissions from Wood Residue Boilers," was distributed earlier. The second, Atmospheric Quality Improvement Technical Bulletin No. 105, entitled "A Study of Nitrogen Oxides Emissions from Kraft Recovery Furnaces" was also distributed earlier. Additional field studies are now underway to clarify kraft recovery furnace size-NO_x emission rates indicated for large furnaces in the earlier study.

Your questions and comments on this technical bulletin should be addressed to Mr. Kenneth T. Hood at the West Coast Regional Center, Mr. Reid Miner at the Southern Regional Center, or to me at the address above.

Yours very truly,

Russell O. Blosser
Technical Director

ROB:gs
Attach.

TABLE OF CONTENTS

A STUDY OF NITROGEN OXIDES EMISSIONS FROM LIME KILNS

I INTRODUCTION

The United States Environmental Protection Agency has designated nitrogen dioxide (NO_2) as a criteria pollutant. Reliable estimates of oxides of nitrogen (NOx) emissions are also required for carrying out the modelling of combustion source emissions necessary for satisfying Prevention of Significant Deterioration regulations. Since available information is limited relative to the potential for emission of NOx from combustion processes associated with the manufacture of pulp and paper and power generation from boilers fired on wood residue, the establishment of a larger data base is desirable.

The NCASI is currently conducting a national program in cooperation with individual member mills designed to provide information on oxides of nitrogen emissions from "kraft recovery units" (defined as both the recovery furnace and boiler sections) (115), lime kilns and wood residue-fired power boilers (114). This particular bulletin will discuss the emission rate of NOx from kraft mill lime kilns. The lime kiln sites sampled in the Northwest United States included two kilns firing oil and one kiln firing oil and natural gas during separate sampling intervals. Two test sites located in the Southeast United States represented one oil fired kiln and one natural gas fired kiln.

II BACKGROUND AND LITERATURE REVIEW

A comprehensive literature search representative of recent publications associated with NOx formation kinetic theory, measurement techniques, field sampling methodology, source control strategies, previously reported field results and the effects of these gases to the ambient was performed and is presented in NCASI Atmospheric Quality Improvement Technical Bulletin No. 102 (114) entitled, "A Study of Nitrogen Oxides Emissions from Wood Residue Boilers." The entire listing of literature references from the wood residue boiler bulletin are reproduced in the bibliography of this report for convenience.

Galeano and Leopold (43) reported on findings determined from EPA Method 7 oxides of nitrogen "grab sampling" conducted on a kraft mill lime kiln. The lime kiln was rated at 250 tons per day (assumed to be calcium oxide product) and operated at 23 percent excess air (approximately 3.9% oxygen in the flue gas). The combustion temperatures ranged between 2300°F to 2530°F as measured with a "Leeds and Northrup optical pyrometer" which "detected the hottest combustion zone temperatures". The NOx testing at this source was conducted both before and after a venturi scrubber.

The measurements were similar at each location and were found to average 188 ppm NOx (157 to 213 ppm) and 200 ppm NOx (113 to 260 ppm) for the inlet and outlet of the scrubber, respectively.

Results from an unpublished mill report (124) indicated a range of roughly 50 to 100 ppm (0.15 to 0.35 pounds per million Btu) nitric oxide when adjusted to ten percent oxygen in the flue gas. These values were measured with a continuous chemiluminescence monitor during time intervals which approximated the normal range of the oil (No. 6) fired kiln's operating conditions. This included use of minimum primary air and the existing seven-hole burner tip. Abnormal kiln conditions such as a variety of primary and secondary air variations, high and low fuel firing levels, and use of a modified four-hole burner tip were also investigated to determine the influence on nitrogen oxide production. Varying these parameters produced either higher NOx emissions, in the case of alternate burner tips, or inconclusive results.

Based on the very limited oxides of nitrogen evaluations conducted previously on lime kiln oil and gas fired sources, there was evidence of significant variability in emission levels. As will be discussed, the use of optical and possibly radiation pyrometers to adjust combustion zone temperatures may offer, within the normal range of kiln operation, a potential NOx control mechanism. One such site study has been undertaken by NCASI personnel and is presented in this report. Future investigations into lime kiln NOx emissions will incorporate both optical and radiation pyrometers to measure flame temperature and determine the NOx emission level based on the mode of kiln operation.

III DESCRIPTION OF OXIDES OF NITROGEN MONITORING SYSTEM

A. General

The basic monitor was the Monitor Labs Nitrogen Oxides Analyzer Model 8440E. The unit was a gas phase device utilizing the chemiluminescence principle for continuous detection and reporting of Nitric Oxide (NO), Nitrogen Dioxide (NO_2), and Oxides of Nitrogen (NOx) on a ppm dry basis. The operation of the monitor was based on the chemiluminescence of an activated NO_2 species (NO_2*) that was produced by a chemical reaction between ozone and NO (41).

The monitor was somewhat unique in that dual sub-atmospheric reaction cells (which resulted in minimal measurement error as described in recent investigations) (120,121), or detector systems were incorporated into the design with an independent cell for the measurement of NO and NOx. Thus, the data produced by the monitor was spontaneous and not averaged. Optical and electronic stability was insured through temperature controls and an optical chopper. An ISOFLO pneumatic system controls each gas stream's flow rate to the respective reaction cells. These flow controllers served to transport the gas sample through the reaction cells with the chemiluminescence emission from the reaction chambers halted and transmitted alternately to the photomultiplier tubes at the rate of 35 times per second by the optical chopper. A phase sensitive amplifier processed the photomultiplier signal which was then converted to a voltage output for recorder utilization.

The monitor was packaged as two separate modules connected electronically and physically with pneumatic flow lines. The Analyzer module consisted of the reaction cells and photomultiplier tube (PMT) assemblies, the ISOFLO flowrate control assembly, PMT power, signal processing electronics, the front panel readout display and recorder outputs. The Sample Conditioner module included the preliminary pneumatic network which employed a sample filter, sample and ozone scrubber, a reaction cell vacuum regulator, and vacuum pump. A schematic diagram of the two module monitor was presented in Figure 1 (57).

B. Principle of Operation of the Model 8440E NOx Monitor

The dual channel chemiluminescence analysis system included two detection assemblies, each of which employed a reaction cell, optical chopper, and a PMT unit. The reaction cell itself consisted of three functional subsystems. These subsystems corresponded to first, the concentric ozone and sample nozzles, second, the sub-atmospheric reaction chamber, and third, the exhaust ports. The operation of the monitor was dependent on the chemiluminescence of an activated molecular nitrogen dioxide species which was produced by the reaction between NO and O_3 in the evacuated reaction chamber (22). Gas containing the nitric oxide molecules entered the reaction chamber by way of a concentric nozzle while the ozone was directed to the reaction chamber via the center nozzle. A small portion of the NO molecules react with ozone to form the activated NO_2* species. A broad-band radiation, from 500 to 3000 nm with a maximum intensity at approximately 1100 nm, was emitted as activated NO_2* molecules decreased to a lower energy state (23). The manufacturer (57) indicated that the current produced by the photomultiplier tube was directly proportional to the intensity of the chemiluminescent emission.

The use of a MOLYCON (68) converter to chemically reduce the NO_2 fraction in the sample to NO was utilized in the monitor. This allowed a determination of the total oxides of nitrogen through a sample and detector system which was, except for the converter, identical to that used for the NO measurement. The NO_2 content was obtained by electronically subtracting the NO response from the total NOx response which represented the sum of the NO and NO_2 in the sampled gas.

C. Monitoring System Adaptation to Source NOx Measurements

The apparatus used for source NOx sampling is depicted in Figure 2. Several of the components noted as "optional" in the schematic were not found to be required for accurate sampling of

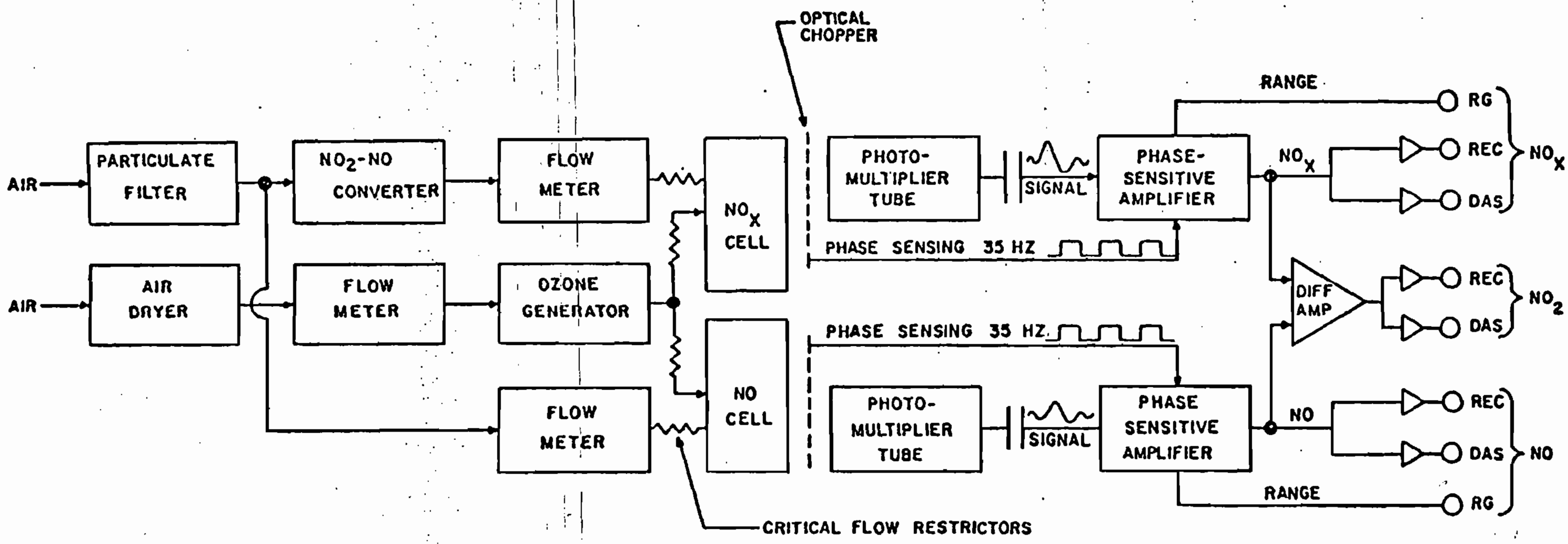

FIGURE 1. BLOCK DIAGRAM, DUAL CHANNEL NOx ANALYZER, MONITOR LABS INC. MODEL 8440E (57)

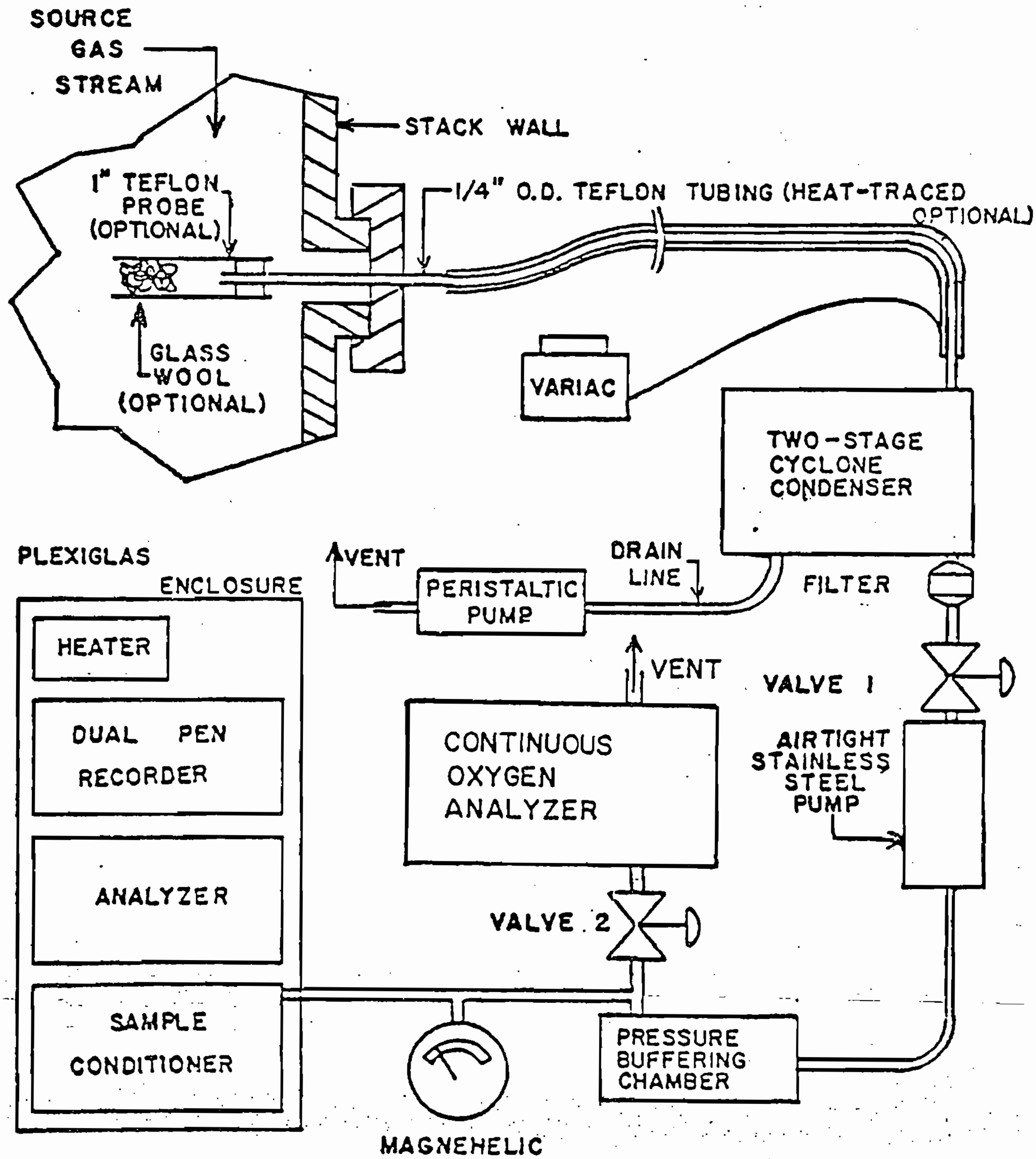

FIGURE 2. SCHEMATIC OF NOx SOURCE MEASUREMENT SYSTEM

some of the sources. The system was designed for consistent operation for vacuum or pressure source gas conditions through the use of a high flow sampling rate and a vented "buffering chamber." This was necessitated by the sensitivity of the monitor to swings in sampling pressure. A constant two inches water pressure was maintained in the inlet line to the Sample Conditioner module of the monitor through the use of the two valves depicted. The in-line filter located after the condenser eliminated the problem of particulate which might foul either valve No. 1 or the stainless steel pump. An additional pump was located on the cyclone condenser drop-out line to insure minimal water/gas contact and to protect the monitor against possible moisture carry-over. The two NOx monitor modules and a two-pen recorder were housed in a heated plexiglas enclosure to minimize dirt infiltration into the circuitry and to maintain monitor operation within the manufacturer specified temperature constraints of 50 to 104°F. The two-pen heat writing recorder allowed unattended data collection for both nitric oxide (NO) and total oxides of nitrogen (NOx).

Teflon probes, fittings and sample lines were used for all sections of the transport system preceding the condenser. Since the sample gas temperature dropped below 100°C at all sites tested within a short distance from the stack, no NO_2 to NO catalytic conversion was judged to occur at the 304 stainless steel condenser. The relatively high sample flow rate and limited time in the gas handling system served to minimize the potential for NO_2 absorption within the system. The stainless steel incorporated into the gas handling system after the condenser was limited to the No. 1 valve, the air-tight pump and three fittings. The balance of the transport system was teflon instead of stainless steel for convenience in making adjustments to the sampling network.

D. Calibration of Source NOx Monitor

The span gas employed for purposes of instrument calibration was obtained from Airco Industrial Gases and contained in aluminum cylinders. Two standards were used, one at 100 and the other at 500 ppm nitric oxide (NO) packed in dry nitrogen. These gases were considered equivalent to primary standards or standard reference materials (SRM's) by the National Bureau of Standards (NBS). If desired by the purchaser, three verification tests, which included chemiluminescent detection and the phenoldisulfonic acid method, were performed by Airco to determine the exact nitric oxide concentration in each cylinder.

Full sampling system spans were conducted through the use of calibrated cylinder gas equipped with a two-stage regulator connected to a valved flowmeter. Although the monitor operated with a one second time constant, the total time interval required for the system to purge and respond to the full calibration gas concentration was approximately 15 minutes. For purposes of quality assurance, the sample system calibration was also augmented with spiking trials at sometime during the testing at a majority of the sites.

These trials were carried out by pulling approximately half the usual combustion gas sample flow measured by the monitor with the balance of the flow supplied from calibrated cylinder span gas. Through careful attention to sample line pressures and the chronological measurement by the NOx monitor of (a) undiluted stack gas, (b) stack gas diluted with ambient air, (c) stack gas diluted with calibrated standard span gas, (d) undiluted calibration span gas, and (e) undiluted stack gas, the spike trials determined that the calibration span and stack gas oxides of nitrogen mixtures were conserved at each testing site through the sample conditioning system. As an example, this procedure was conducted at the site designated as No. 4A in the following manner. The NOx monitoring system was calibrated and placed on-line measuring exhaust gas from the oil fired lime kiln for about four hours. With the monitor indicating a steady level of NOx emissions corresponding to 155 ppm, the stack gas was diluted with 45 percent ambient air (as determined with calibrated flowmeters on the stack gas sample line and the dilution sample line) which produced an instrument response of 85 ppm NOx. The dilution line was then attached to a cylinder of calibrated nitric oxide (NO) span gas of 500 ppm and at the same 45 percent flow rate. The resulting instrument response was 295 ppm. The calculated response corresponded to 310 ppm for a difference of 4.8 percent based on the higher value between the calculated and measured concentration levels, respectively. Accuracy in flow measurements and data transposition were considered the primary reasons for the calculated NOx levels being higher than the measured values. The measurement of undiluted span gas insured instrument calibration stability, while detection of undiluted stack gas as the last step in the spiking procedure determined that there was no change in exhaust gas NOx concentration. In all cases the difference was less than ten percent of the higher value between the combined stack and span gas mixture NOx measurement and that value of NOx calculated from undiluted stack and span gas concentrations by knowing the percent flow rate of each.

IV DESCRIPTION OF INDIVIDUAL LIME KILN SYSTEMS STUDIED

A total of five lime kilns were sampled as part of the oxides of nitrogen study. Three of the kilns (Nos. 1, 2, and 4 as represented in Table 1) were located in the Northwest United States with the balance (Nos. 3 and 5) in the Southeast. Three of the lime kilns were fired on oil alone, one kiln fired natural gas and one utilized oil followed by natural gas during the study interval.

Limited operational and design characteristics found for the six lime kilns are presented in Table 1. This information includes the type of fuel fired at each site sampled for NOx. The design calcium oxide production rate, each kiln's physical dimensions, and the quantity of No. 6 fuel oil or natural gas fired at each source are parameters detailed for each NOx test interval. The particulate control device in service at each site is indicated with the position of the sample site with respect to the control device specified for each of the lime kiln systems.

TABLE 1. DESIGN AND OPERATING CHARACTERISTICS FOR LIME KILNS STUDIED

Location and Fuel Type	Rated CaO Capacity (TPD)	Kiln Length (feet)	Kiln Diameter (feet)	Mean Oil (gpm) or Natural Gas (SCFH) Fired	Sampling Site[1]
1: Oil	138	276	9	4.1	V.S.O.
2: Oil	250	262	12	8.1	P.S.O.
3: Oil	80	170	9 Similar to SKC No 1 Kiln	4.3	V.S.O.
4A: Oil	130	250	9 Similar to SKC No 2+3 Kiln	5.3	V.S.O.
4B: Gas	130	250	9	33,400	V.S.O.
5: Gas	125	175	11 to 10*	53,000	V.S.O.

1. V.S.O. Venturi scrubber outlet.
   P.S.O. Peabody scrubber outlet.

* Diameter at cold end.

(1) Kiln No. 1 - Lime kiln No. 1 was fired on oil during the testing interval, manufactured by Traylor and began operation in September, 1948. The mean equivalent production rate for the testing period was 360 air dried tons of pulp per day. The kiln had a length of 275 feet, 7.5 inches with a diameter of 9 feet and a "pitch" of one-half inch per foot.

(2) Kiln No. 2 - The oil fired kiln identified as No. 2 was manufactured by Vulcan and started operation in December, 1970. The kiln had a mean equivalent production rate of 735 air dried tons of pulp per day. The pitch was 0.5183 inches per foot for the 12 foot diameter and 262 foot long kiln.

(3) Kiln No. 3 - The kiln labeled as No. 3 was an Allis-Chalmers oil fired rotary system that was installed in 1952. The equivalent pulp production during the sampling period for the rated 80 tons of calcium oxide product per day system was 350 tons of pulp per day. The kiln was 170 feet long and had a diameter of 9 feet.

(4) Kiln No. 4 - The rotary lime kiln represented as No. 4A and 4B was manufactured by Allis-Chalmers, installed by Sandwell International Inc. and began operation on oil and natural gas in 1968. The burner for the system was an Allis-Chalmers size 10 combustion gas or steam atomizing oil burner capable of a heat release of roughly 65 million Btu per hour when fired on either natural gas or No. 6 oil fuel. The oil pump and heater had a capacity of heating 11 gpm of oil from 120 to 140°F. The mean equivalent production rate for the study interval at this kiln was 348 tons of pulp per day.

(5) Kiln No. 5 - Lime kiln No. 5 was an Allis-Chalmers gas fired rotary kiln that was installed in 1958. The burning zone temperatures of this system were monitored by a flame pyrometer which enabled a temperature/NOx production relationship to be developed as will be subsequently detailed. An average of 430 tons of pulp per day was considered the equivalent production rate for this kiln during the NOx test period.

(6) Kiln Exhaust Gas Conditions - Exit gas conditions measured during the NOx kraft mill lime kiln sampling intervals are presented in Table 2. This information includes the number of hours sampled which averaged 42 hours for each of the sites studied. The parameter noted as the combustion gas temperature represented the hottest source position preceding the scrubbers used for particulate control, which could be measured and recorded for temperature continuously at each lime kiln site. These values were similar for the various sites with the exception of location No. 5. The average presented in the table for this site corresponded to the actual burning or combustion zone temperature and will be discussed at length later in this report. Exhaust gas flow, percent excess oxygen, and percent excess carbon dioxide are specified for all of the installations. In some cases the combustion exhaust gas flows were not measured during the actual NOx sampling time period which necessitated the use of estimates from previous measurements taken for similar fuel firing rates.

TABLE 2. LIME KILN EXHAUST GAS PARAMETERS MEASURED DURING SAMPLING INTERVAL

Location and Fuel Type	NOx Testing Interval (hours)	Mean Combustion Gas Temp. (°F)	Mean Combustion Gas Flow (SDCFM)	Mean Flue Gas Oxygen Percent	Mean Carbon Dioxide Percent
1: Oil	33	1077[1]	23,400	5.2	16.8
2: Oil	52	765[2]	19,370	5.1	17.7
3: Oil	38	N.A.	15,500	8.1	12.8
4A: Oil	69	891[3]	13,580	4.9	18.9
4B: Gas	19	893[3]	10,260	4.9	18.9
5: Gas	42	2053[4]	20,700[5]	8.5	12.4

N.A. Not available.
1. Chain section hot end temperature.
2. Cold end temperature.
3. Chain section middle temperature.
4. Combustion or burning zone temperature.
5. Based upon 10 tests made by the mill.

V. DISCUSSION AND PRESENTATION OF RESULTS FROM OXIDES OF NITROGEN FIELD MEASUREMENTS

A. General

EPA New Source Performance Standards (NSPS), (31,32,33,34) have specified fossil-fuel fired steam generator (for which construction was commenced after August 17, 1971) nitrogen oxide limits for various fuel types. The interval chosen for NOx averaging was "any three-hour period during which the average emission (the arithmetic average of three contiguous one-hour periods) exceed the applicable standards".

While there is no NOx NSPS for kraft mill lime kilns, the existing (34) liquid fossil fuel (oil) NOx standard for steam generators is 0.30 pounds per million Btu heat input (130 ng/J) with the gaseous fossil fuel standard being 0.20 pounds NOx per million Btu (86 ng/J). A level of 0.70 pounds NOx per million Btu (300 ng/J) was indicated for solid fossil fuel. Fuel such as lignite was related to a standard of 0.60 pounds NOx per million Btu (260 ng/J). Lignite derived from specific locations, given as North Dakota, South Dakota, or Montana and fired in a cyclone combustion system must meet a 0.80 pounds NOx per million Btu (340 ng/J) level regardless of auxiliary fuel use.

The EPA standards (117,118) (adopted June 11, 1979 without revisions) apply to "all electric utility steam generating units (a) capable of firing more than 73 MW (250 million Btu per hour) heat input of fossil fuel (approximately 25 MW of electrical energy output), and (b) for which construction was commenced after September 18, 1978" are as follows. The liquid fuel (except shale oil and liquid fuel derived from coal) NOx standard chosen is 0.30 pounds per million Btu heat input (130 ng/J) with the gaseous fuel (except gaseous fuel derived from coal) standard noted as 0.20 pounds NOx per million Btu (86 ng/J). A level of 0.50 pounds NOx per million Btu (210 ng/J) was indicated for the firing of subbituminous coal, shale oil, or any solid, liquid, or gaseous fuel derived from coal. Any fuel combusted in a slag tap furnace having more than 25 percent, by weight, lignite which has been mined in North Dakota, South Dakota or Montana was assigned a standard of 0.80 pounds NOx per million Btu (340 ng/J). The combustion of all other solid fuel was related to a standard of 0.60 pounds NOx per million Btu (260 ng/J).

The limitation of NOx as NO_2 (119) for the simultaneous combustion of any combination of the fuels mentioned above must follow a proration formula incorporating the applicable standard of all the fuels fired in a boiler.

$$E_{NO_2} = \frac{w(86) + x(130) + y(210) + z(260)}{100}$$

where:

E_{NO_2} = is the applicable standard for nitrogen oxides when multiple fuels are combusted simultaneously (ng/J heat input);

w = is the percentage of total heat input derived from the combustion of fuels subject to the 86 ng/J heat input standard;

x = is the percentage of total heat input derived from the combustion of fuels subject to the 130 ng/J heat input standard;

y = is the percentage of total heat input derived from the combustion of fuels subject to the 210 ng/J input standard; and

z = is the percentage of total heat input derived from the combustion of fuels subject to the 260 ng/J heat input standard.

Since the NOx emissions on any source are determined as nitrogen dioxide (NO_2) on a parts per million (ppm) concentration basis, the data must be converted to the appropriate units of pounds NOx as NO_2 per million Btu heat input. This can be accomplished through the measurement of (a) excess oxygen, (b) the combustion gas flow rate, and (c) the quantity and heat content of the fuel burned. As specified in the Federal Register (116), the TRS and particulate matter concentrations determined after a kraft mill lime kiln control device must be adjusted to ten percent excess oxygen content whether it is greater or less than ten percent. This adjustment addresses the need to normalize pollutant emission concentration data for various degrees of gas stream dilution through transport ducts, fans and control devices. For this reason, the NOx three-hour average concentration data in this bulletin is presented on both a measured stack concentration and also adjusted to ten percent oxygen. At all sites tested, the stack flue gas oxygen level at the point of measurement was less than ten percent oxygen.

B. Lime Kiln Sites

The oxides of nitrogen emission results for the five kilns sampled are presented in Table 3. As specified in the Federal Register (34), the data was compiled into first, hourly averages and then into three-hour averages. The mean and range for each site are noted in the table. The NOx concentration in parts per million, measured at stack conditions, is directly above the NOx concentration mean adjusted to ten percent excess oxygen. Both the three-hour mean and range are given in Table 3 with units of pounds NOx per million Btu heat input and nanograms NOx per Joule

TABLE 3 OXIDES OF NITROGEN FIELD MEASUREMENTS FOR LIME KILNS SAMPLED

Location & Fuel Type	NOx (3) Hour Average Mean (ppm)	NOx (3) Hour Average Mean ($lb/10^6$ Btu)	NOx (3) Hour Average Mean (ng/J)[1]	NOx (3) Hour Average Range (ppm)	NOx (3) Hour Average Range ($lb/10^6$ Btu)	NOx (3) Hour Average Range (ng/J)[1]
1: Oil	185 (130)*	0.850	365	165-215	0.750-0.990	325-425
2: Oil	80 (55)*	0.155	65	35-145	0.065-0.285	30-120
3: Oil	50 (45)*	0.160	70	25-65	0.085-0.215	35-90
4A: Oil	150 (100)*	0.310	135	110-260	0.230-0.545	100-235
4B: Gas	145 (100)*	0.290	125	95-195	0.195-0.390	85-165
5: Gas	310 (275)*	0.780	335	145-430	0.334-1.125	150-485

1. 1 $lb/10^6$ Btu = 430 nanograms per Joule heat input.
* Adjusted to 10 percent oxygen in the flue gas. The other ppm oxygen concentration data corresponds to actual stack oxygen levels shown in Table 2.

heat input for each of the five sites and six combustion modes studied. These NOx emission values correspond to the time testing interval noted in Table 2. The NOx mean and upper range found for each site in units of pounds NOx per million Btu are depicted in Figure 3. All of the lime kiln sources represented in this figure except Nos. 4B and 5 corresponded to 100 percent oil fuel firing. The two exceptions were kiln sites fired on 100 percent natural gas during the study period.

The dashed line at 0.30 pounds NOx per million Btu in Figure 3 indicates the standard for oil fired boilers. The lower dashed line at 0.20 pounds NOx per million Btu corresponds to the standard for natural gas fired boilers. As shown in the figure, three out of four of the kilns fired on oil had at least one three-hour interval over 0.30 pounds NOx per million Btu. Two of these three sites were found to have data means over the oil fired boiler standard. Both of the kilns which fired natural gas had a majority of their three-hour NOx averages which were above the standard for natural gas fired boilers.

The wide range and high three-hour average NOx emission levels found for the natural gas fired kiln at site No. 5 point toward a potential dependence of NOx concentrations over the normal range of this particular burner operation. A relationship between combustion zone temperature and NOx emission rate was obtained in a study by NCASI personnel with the use of an optical pyrometer and is presented in Figure 4. The relationship in the figure was based on a total of 37 data points. The solid portion of the curve indicates the use of linear regression techniques performed on 33 of these data points which were judged to follow a close linear distribution to give the following equation having a correlation coefficient, R, of 0.965:

$$\frac{\text{lb NOx}}{10^6\ \text{Btu}} = 2.17 \times 10^{-3}\ (\text{Temperature, °F}) - 3.58$$

The dashed portion of the center curve was a smooth fit approximation through the remaining four data points. Based on the data collected encompassing various modes of burner operation at this site, there was judged to be a potential for reduction of NOx emissions to less than 0.4 pounds per million Btu. Adjustment of the gas firing rate and the excess air levels supplied to the kiln's burner may enable the combustion zone temperature as measured by the optical pyrometer to be controlled at less than 1850°F. Below this temperature the NOx to combustion zone temperature relationship was judged to be insignificant for the limited amount of data collected. The normal combustion zone temperature for long kilns usually averages about 2000°F with as much as 2375°F required for short kilns. The minimum temperature at which calcium carbonate dissociates and the partial pressure of carbon dioxide reaches one atmosphere is 1670°F (123). Heat and radiation losses of up to 40% in combination with the energy required to evaporate 30 to 40% water carried in the lime mud charged to the kiln, makes the minimum combustion zone temperature somewhat higher than this value.

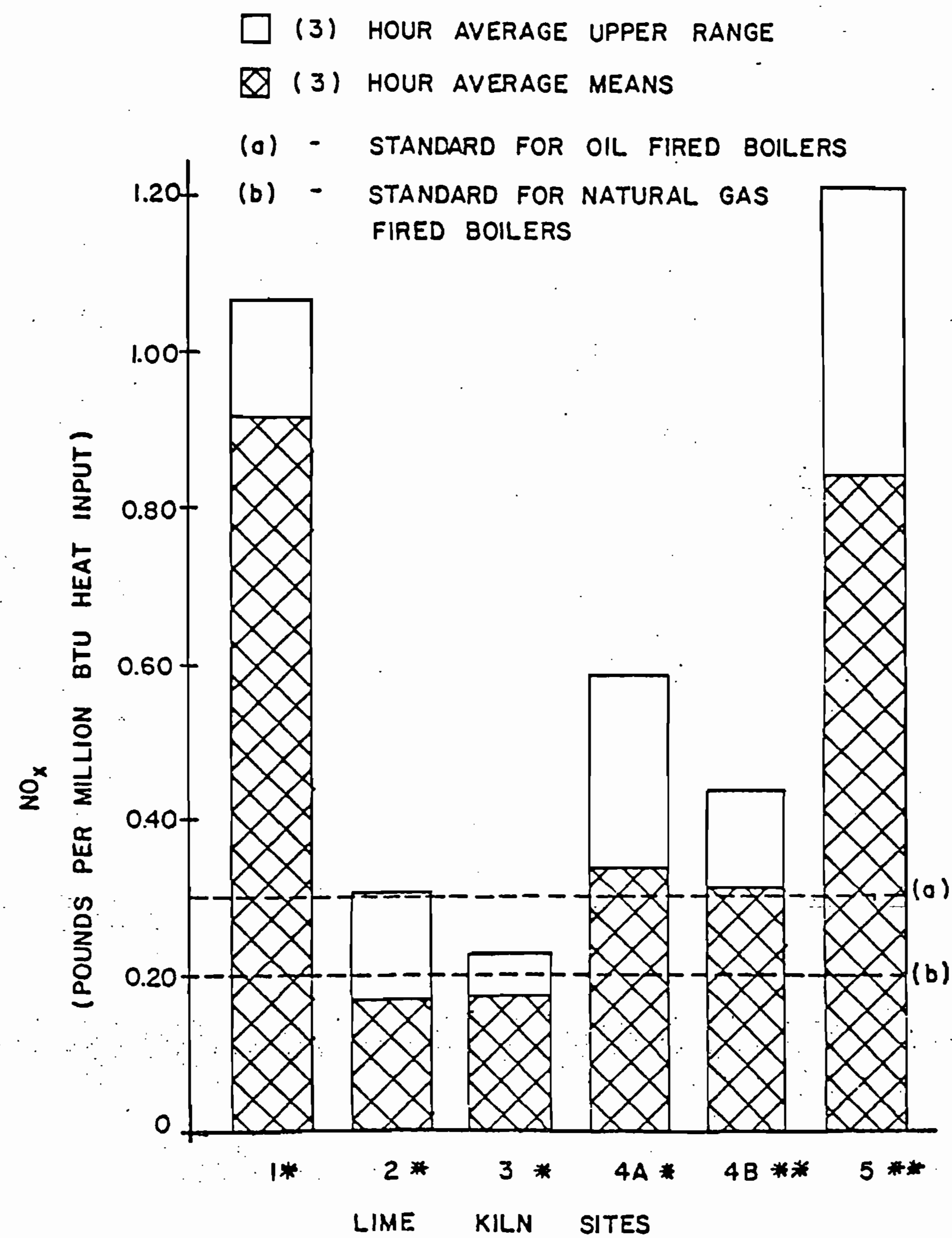

FIGURE 3. NOx EMISSION LEVELS FOR KRAFT MILL LIME KILNS SAMPLED

* OIL FIRED
** NATURAL GAS FIRED

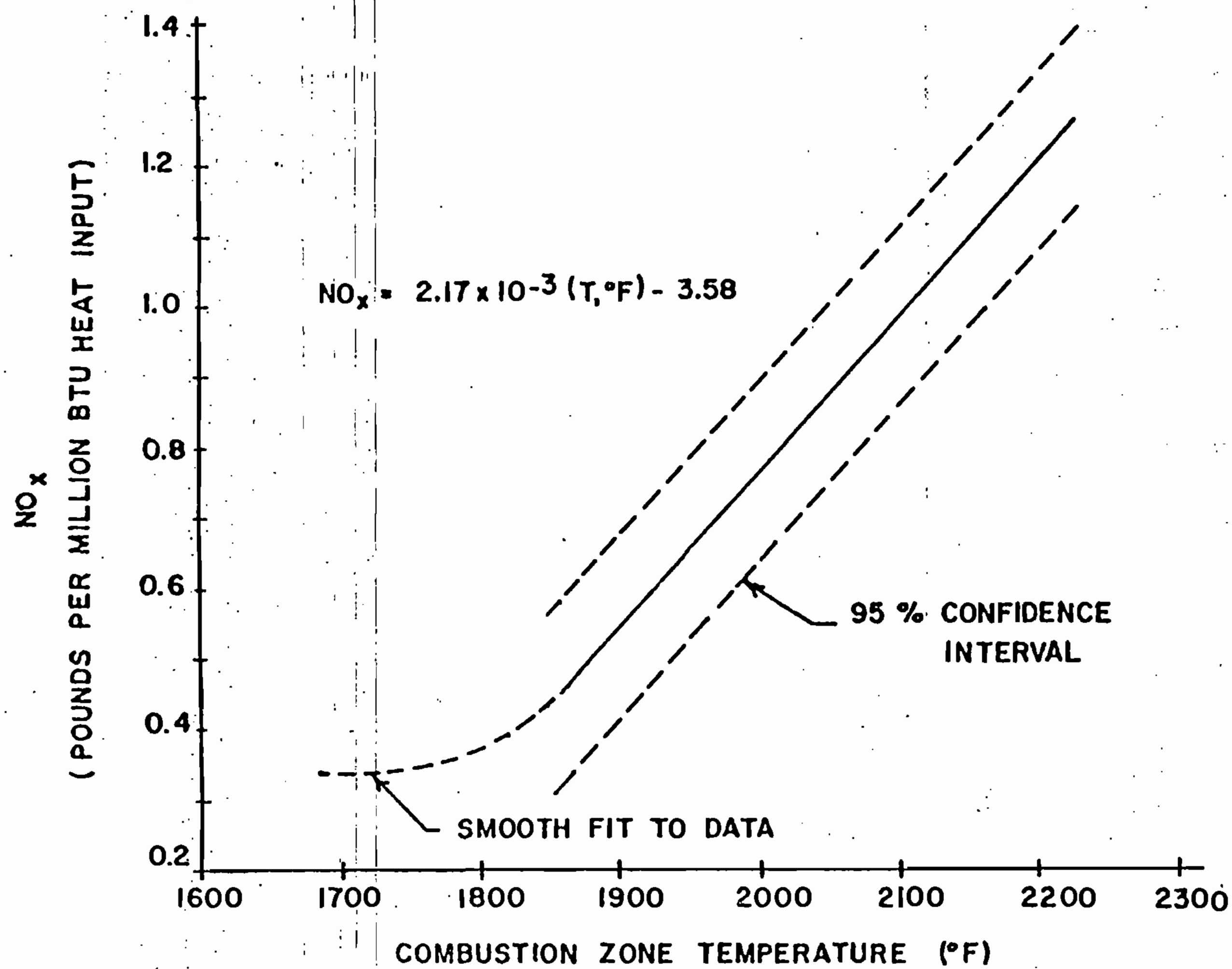

FIGURE 4. THE RELATIONSHIP BETWEEN COMBUSTION ZONE TEMPERATURE AND NOx EMISSIONS

Further work is needed to address the relationships between combustion zone temperatures and lime kiln NOx generation. The use of these temperature monitors may prove a useful tool in controlling kiln NOx emissions to consistent levels.

VI SUMMARY

(1) The information contained in this report includes oxides of nitrogen emission data generated at five kraft mill lime kiln sites in the Northwest and Southeast United States. A comprehensive literature search was performed and can be found in the NCASI Atmospheric Quality Improvement Technical Bulletin No. 102 entitled, "A Study of Nitrogen Oxides Emissions from Wood Residue Boilers." This literature search was representative of recent publications associated with NOx formation kinetic theory, measurement techniques, field sampling methodology, source control strategies, previously reported field results and the effects of these gases on the ambient.

(2) The chemiluminescence oxides of nitrogen measurement principle used in this study was discussed and presented in the literature as accurate and easily adapted to continuous sampling of combustion sources. This was in contrast to the widely accepted phenoldisulphonic acid (EPA Method 7) grab sampling method. The details of a gas handling system for use with existing, but slightly modified, chemiluminescent ambient NO/NOx monitors was also presented. The 100 percent (±10 percent) recovery of nitric oxide (NO) gas spiked into sampled combustion exhaust gas during the field trials was found to reaffirm that NOx sample line losses were insignificant for all site trials.

(3) Summarization of the data compiled in this report is presented in Table 4. This table contains a synopsis of NOx "emission factors" based on heat input and equivalent pulp production for the sites sampled. The mean and range found for the various kilns are indicated in this table based on a three contiguous hour average criteria.

(4) One natural gas fired lime kiln site afforded the opportunity to study the relationship between combustion or burner zone temperature and NOx emission levels. The data indicated that combustion zone temperatures below 1850°F were required to reduce NOx concentrations to less than 0.4 pounds per million Btu heat input. Further work is needed to address the relationships between combustion zone temperatures and lime kiln NOx generation potential.

(5) The emission of NOx from combustion sources is influenced by a number of factors including combustion temperature, instantaneous flame temperature, fuel bound nitrogen and operational parameters such as excess oxygen and the method of fuel firing. The data generated during this study indicated a three-hour mean emission rate ranging from 0.07 to 1.13 pounds of NOx per million Btu input

TABLE 4. NOx EMISSION RATE SUMMARY FOR LIME KILNS SAMPLED

Location & Fuel Type	Tons Pulp Per Day Mean	NOx (3) Hour Average Mean			NOx (3) Hour Average Range		
		($lb/10^6$ Btu)	(ng/J)	(lb/ton pulp)	($lb/10^6$ Btu)	(ng/J)	(lb/ton pulp)
1: Oil	360	0.85	365	2.1	0.75-0.99	325-425	1.8-2.4
2: Oil	735	0.16	65	0.4	0.07-0.28	30-120	0.2-0.7
3: Oil	350	0.16	70	0.4	0.08-0.21	35-90	0.2-0.5
4A: Oil	350	0.31	135	1.0	0.23-0.54	100-235	0.7-1.7
4B: Gas	350	0.29	125	0.7	0.19-0.39	85-165	0.7-1.3
5: Gas	430	0.78	335	2.6	0.34-1.12	150-485	1.1-3.7

for lime kilns firing either oil or gas fuel. This would correspond to emission rates of between 0.16 and 3.7 pounds NOx per ton of pulp.

VII LITERATURE REFERENCES

(1) Aghassi, W.J., Cheremisinoff, P.N., "NOx Control In Central Station Boilers," Power Engineering 79 (6) 46-48 (June 1975)

(2) Allen, J.D., "Probe Sampling of Oxides of Nitrogen from Flames," Combustion and Flame 24 (1) 133-136 (February 1975)

(3) Allen, J.D., "A Review of Methods for Oxides of Nitrogen," Journal of Inst. Fuel 46 (382) 123-133 (January 1973)

(4) Allen, J.D., Billingsley, J., Shaw, J.T., "Evaluation of the Measurement of Oxides of Nitrogen in Combustion Products by the Chemiluminescence Method," J. Inst. Fuel 275-280 (December 1974)

(5) Altshuller, A.P., "Assessment of the Contribution of Chemical Species to the Eye Irritation Potential of Photochemical Smog," Journal of the Air Pollution Control Assoc. 28 (6) 594-598 (June 1978)

(6) Altshuler, S.L., "Design and Use of a Van Equipped to Measure Ambient Air Quality For Sulfur And Oxides Of Nitrogen Compounds," 68th Annual Meeting of the APCA, Paper No. 75-10.4 (June 1975)

(7) Angle, R.P., Sandhu, H.S., Schnitzler, W.J., "A Preliminary Field Study of Nitrogen Oxides in the Exhaust Plume from a Compressor Installation," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-28.6 (June 25-30, 1978)

(8) Bagwell, F.A., Rosenthal, K.E., Teixeira, D.P., Breen, B.P., Bayard deVolo, N., Kerho, S., "Utility Boiler Operating Modes for Reduced Nitric Oxide Emissions," Journal of the Air Pollution Control Assoc. 21 (11) 702-708 (1971)

(9) Bambeck, R.J., Huettemeyer, H.F., "Operating Experience with In-Situ Power Plant Stack Monitors," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-109 (June 9-13, 1974)

(10) Barrett, R.E., Putnam, A.A., "Boiler Emissions--An Inventory of Emissions by Boiler Size and Use," 69th Annual Meeting of the APCA, Paper No. 76-04.6 (June 27-July 1, 1976)

(11) Bartok, W., Crawford, A.R., Skopp, A., "Control of Nitrogen Oxide Emissions from Stationary Combustion Sources," Combustion 42 (4) 37-40 (October 1970)

(12) Benner, W.H., Urone, P., McMahon, C.K., Ryan, P., "Photochemical Potential of Forest Fire Smoke," 70th Annual Meeting of the Air Pollution Control Assoc., Paper No. 77-05.3 (June 20-24, 1977)

(13) Berger, A.W., Driscoll, J.N., Morgenstein, P., "Review and Statistical Analysis of Stack Sampling Procedures for the Sulfur and Nitrogen Oxides in Fossil Fuel Combustion," Amer. Ind. Hyg. Assoc. J. 33 (6) 397 (June 1972)

(14) Black, F.M., Sigsby, J.E., "Chemiluminescent Method for NO and NOx (NO + NO_2) Analysis," Environmental Science & Technology 8 (2) 149-152 (February 1974)

(15) Blakeslee, C.E., Burbach, H.E., "Controlling NOx Emissions from Steam Generators," Journal of the Air Pollution Control Assoc. 23 (1) 37-42 (January 1973)

(16) Blakeslee, C.E., Burbach, H.E., "Controlling NOx Emissions from Steam Generators," 65th Annual Meeting of the Air Pollution Control Assoc., Paper No. 72-75 (June 18-22, 1972)

(17) Chapman, R.L., "Continuous Stack Monitoring," Environmental Science & Technology 8 (6) 520-525 (June 1974)

(18) Chapman, R.S., M.D., "Health Effects Discussion," Journal of the Air Pollution Control Assoc. 28 (9) 887-889 (September 1978)

(19) Cheremisinoff, P., Eaton, W.B., "Combustion Control Methods to Limit NOx Emissions," Power Engineering 80 (9) 56-58 (September 1976)

(20) Clarenburg, L.A., Goumans, H.H.J.M., Pearse, J.D., Seaman, M.A., "On the Development of a Regional NOx Abatement Strategy," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-5.5 (June 25-30, 1978)

(21) Clough, P.N., Thrush, B.A., Trans. Faraday Soc. 63 915 (1976)

(22) Clyne, M.A.A., Thrush, B.A., Wayne, R.P., Trans. Faraday Soc. 60 359 (1964)

(23) Coe, E.L., Ma, J.L., "Electrostatic Precipitation and Nitrogen Oxides in Flue Gases," 65th Annual Meeting of the Air Pollution Control Assoc., Paper No. 72-106 (June 18-22, 1972)

(24) Creekmore, A.T., Sableski, J.J., "EPA's Tentative Regulations to Implement the Short-Term Standard for Nitrogen Dioxide," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-5.4 (June 25-30, 1978)

(25) Danielson, J.A., "Air Pollution Engineering Manual, Air Pollution Control District County of Los Angeles, EPA Publication No. AP-40 535-577 (May 1973)

(26) Dee, L.A., Martens, H.H., Merrill, C.I., Nakamura, J.T., Jaye, F.C., "New Manual Method for Nitrogen Oxides Emission Measurement," Analytical Chemistry 45 (8) 1477-1481 (July 1973)

(27) England, C., Houseman, J., Teixeira, D.P., Combustion and Flame 20 (3) 439-442 (June 1973)

(28) Ermenc, E.D., "Controlling Nitric Oxide Emission," Chemical Engineering 77 (12) 193-196 (June 1, 1970)

(29) Evans, M.J., Cabral-Anderson, L.J., Freeman, G., "Cell Proliferation in the Lungs of Aging Rats Exposed to NO_2," 69th Annual Meeting of the APCA, Paper No. 76-32.4 (June 27-July 1, 1976)

(30) Faith, W.L., "Oxides of Nitrogen," Chemical Engineering Progress 52 (8) 342-344 (August 1956)

(31) 41 Federal Register 51397 (November 22, 1976)

(32) 42 Federal Register 5936 (January 31, 1977)

(33) 42 Federal Register 41122 (August 15, 1977)

(34) 43 Federal Register 9278 (March 7, 1978)

(35) Ferris, B.G. Jr. M.D., "Health Effects of Exposure to Low Levels of Regulated Air Pollutants: A Critical Review," Journal of the Air Pollution Control Assoc. 28 (5) 482-497 (May 1978)

(36) Fiegley, C.E., "Some Statistical Aspects of Air Monitoring Instrument Calibration," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-14 (June 9-13, 1974)

(37) Fine, D.H., "Critical Evaluation of Stalzman Technique for NOx Analysis in the 0-100 ppm Range," Environmental Science & Technology 6 (4) 348-350 (April 1972)

(38) Fine, D.H., Slater, S.M., Sarofim, A.F., Williams, G.C., "Nitrogen in Coal as a Source of Nitrogen Oxide Emission From Furnaces," EPA Contract No. 22-69-44

(39) First, M.W., Viles, F.J., "Cleaning of Stack Gases Containing High Concentrations of Nitrogen Oxides," Journal of the Air Pollution Control Assoc. 21 (3) 122-127 (March 1971)

(40) Floyd, J.R., "The Implementation of the NSPS Continuous Emission Monitoring Regulations in EPA, Region VIII," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-35.1 (June 25-30, 1978)

(41) Fontijn, A., Sabadell, A.J., Ronco, R.J., "Homogeneous Chemiluminescent Measurement of Nitric Oxide with Ozone," Analytical Chemistry 42 (6) 575-579 (May 1970)

(42) Galeano, S.F., Kahn, D.C., Mack, R.A., "Air Pollution: Controlled Operation of a NSSC Recovery Furnace," TAPPI 54 (5) 741-744 (May 1971)

(43) Galeano, S.F., Leopold, K.M., "A Summary of Emissions of Nitrogen Oxides in the Pulp Mill," TAPPI 56 (3) 74-76 (March 1973)

(44) Gardner, D.E., Miller, F.J., Blommer, E.J., Coffin, D.L., "Experimental Studies on the Concentration-Time Relationship of NO_2 Exposure," 69th Annual Meeting of the APCA, Paper No. 76-32.5 (June 27-July 1, 1976)

(45) Giammar, R.D., Engdahl, R.B., "Technical, Economic, and Environmental Aspects of Industrial Stoker-Fired Boilers," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-28.2 (June 25-30, 1978)

(46) Glass, N.R., "Environmental Effects of Increased Coal Utilization: Ecological Effects of Gaseous Emissions from Coal Combustion," EPA-600/7-78-108, U.S. EPA (June 1978)

(47) Glassman, I., Combustion Academic Press Inc., New York, New York (1977)

(48) Habelt, W.W., Selker, A.P., "The Role of Tangential Firing and Fuel Properties in Attaining Low NOx Operation for Coal-Fired Steam Generation," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-64.1 (June 25-30, 1978)

(49) Halstead, C.J., Nation, G.H., Turner, L., Analyst 97 (1150) 55-63 (January 1972)

(50) Hamming, W.J., Dickinson, J.E., "Control of Photochemical Smog by Alteration of Initial Reactant Ratios," Journal of the Air Pollution Control Assoc. 16 (6) 317-323 (1966)

(51) Hardison, L.C., "Techniques for Controlling the Oxides of Nitrogen," Journal of the Air Pollution Control Assoc. 20 (6) 377-382 (June 1970)

(52) Healy, T.E., Urone, P., "Gas Chromatography of Oxidants Using a Flowing Liquid Colorimetric Detector," Anal. Chem. 41:1777 (1969)

(53) Heuss, J.M., Nebel, G.J., Colucci, J.M., "National Air Quality Standards for Automotive Pollutants-A Critical Review," Journal of the Air Pollution Control Assoc. 21 (9) 535-544 (September 1971)

(54) Higuchi, J.E., Hsu, A., MacPhee, R.D., "A Straightforward Dynamic Calibration Procedure for Use with NOx Instruments," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-13 (June 9-13, 1974)

(55) Hodgeson, J.A., Rehme, K.A., Martin, B.E., Stevens, R.K., "Measurements for Atmospheric Oxides of Nitrogen and Ammonia by Chemiluminescence," 65th Annual Meeting of the Air Pollution Control Assoc., Paper No. 72-12 (June 18-22, 1972)

(56) Hunter, S.C., Carter, W.A., Buening, H.J., Cherry, S.S., "Application of Combustion Modifications To Industrial Combustion Equipment," Second Symposium on Stationary Source Combustion, Paper No. 182 (August 29-September 1, 1977)

(57) Instruction Manual: Nitrogen Oxides Model 8440E Analyzer, Monitor Labs, Inc., (August 9, 1977)

(58) Jacobs, M.B., Hochheisser, S., "Continuous Sampling and Ultramicrodetermination of Nitrogen Dioxide in Air," Analytical Chemistry 30 (3) 426-428 (March 1958)

(59) James, R.E., Cunningham, J.E., "Comparison of Stack Sampling Methods for Nitrogen Oxides," 71st Annual Meeting of the Air Pollution Control Assoc., Paper No. 78-35.6 (June 25-30, 1978)

(60) Jeffries, H., Fox, D.L., Kamens, R., "Photochemical Conversion of NO to NO_2 by Hydrocarbons in an Outdoor Chamber," 68th Annual Meeting of the APCA, Paper No. 75-16.2 (June 1975)

(61) Jordan, B.C., Broderick, A.J., "Emissions of Oxides of Nitrogen from Aircraft," Journal of the Air Pollution Control Assoc. 29 (2) 119-124 (February 1979)

(62) Kaye, N.A., Newberger, M.R., "No NOx...But How? - An Industrial Case History," 67th Annual Meeting of the Air

Pollution Control Assoc., Paper No. 74-260 (June 9-13, 1974)

(63) Kijoura, R., "International Comparison and Critical Analysis of Nitrogen Dioxide Air Quality Standards," 69th Annual Meeting of the APCA, Paper No. 76-17.03 (June 27-July 1, 1976)

(64) Krumwiede, K.R., Norton, D.M., Johnston, G.W., Thompson, R.E., Breen, B.P., Quan, V., "A Probing Study of NO Formation in the Flame Zone of a 175 Mw Gas Fired Utility Boiler," 68th Annual Meeting of the APCA, Paper No. 75-23.4 (June 1975)

(65) Larsen, R.I., Gardner, D.E., Coffin, D.L., "An Air Quality Data Analysis System for Interrelating Effects, Standards and Needed Source Reductions: Part 5. Nitrogen Dioxide Mortality in Mice," 70th Annual Meeting of the Air Pollution Control Assoc., Paper No. 77-44.3 (June 20-24, 1977)

(66) Larsen, R.I., Gardner, D.E., Coffin, D.L., "An Air Quality Data Analysis System for Interrelating Effects, Standards, and Needed Source Reductions: Part 5. NO_2 Mortality in Mice," Journal of the Air Pollution Control Assoc. 29 (2) 133-137 (February 1979)

(67) Levaggi, D.A., Zerrudo, R., Karels, G., Oyung, W., Feldstein, M., "An Integrated Manual Impinger Method for the Simultaneous Determination of NOx and SOx in Source Effluents," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-192 (June 9-13, 1974)

(68) Lucero, D.P., ASTM STP 598, 301 (1976)

~~(69) Lucero, D.P., "Continuous NOx Source Analysis by a Chemiluminescent/Diffusion Technique," ISA Transactions 16 (2) 71-80 (1977)~~

(70) Lusis, M.A., "The Effects of Sample Humidity on the Response Characteristics of SO_2 and NOx Analyzer Systems: Aircraft Plume Dispersion Studies," Journal of the Air Pollution Control Assoc. 28 (1) 26-29 (January 1978)

(71) MacKinnon, D.J., "Nitric Oxide Formation at High Temperatures," Journal of the Air Pollution Control Assoc. 24 (3) 237-239 (March 1974)

(72) Margeson, J.H., Beard, M.E., Suggs, J.C., "Evaluation of the Sodium Arsenite Method for Measurement of NO_2 in Ambient Air," Journal of the Air Pollution Control Assoc. 27 553-556 (June 1977)

(73) Margolis, G., Driscoll, J.N., "Critical Evaluation of Rate-Controlling Processes in Manual Determination of Nitrogen Oxides in Flue Gases," Environmental Science & Technology 6 (8) 727-731 (August 1972)

(74) Martin, R.R., Reed, R.D., "Pollution Control Practices: How NOx is Generated," Chemical Engineering Progress 74 (12) 59-61 (December 1978)

(75) Matsuda, S., Takenchi, M., Hishinuma, T., Nakajima, F., "Selective Reduction of Nitrogen Oxides in Combustion Flue Gases," 69th Annual Meeting of the APCA, Paper No. 76-04.3 (June 27-July 1, 1976)

(76) Matsuda, S., Takeuchi, M., Hishinuma, T., Nakajima, F., Narita, T., Watanabe, Y., Imanari, M., "Selective Reduction of Nitrogen Oxides in Combustion Flue Gases," Journal of the Air Pollution Control Assoc. 28 (4) 350-353 (April 1978)

(77) McCann, C.R., Demeter, J.J., Dzubay, J., Bienstock, D., "NOx Emissions from Two-Stage Combustion of Pulverized Coal," 65th Annual Meeting of the Air Pollution Control Association, Paper No. 72-73 (June 18-22, 1972)

(78) Midgett, M.R., "How EPA Validates NSPS Methodology," Environmental Science and Technology 11 (7) 655 (July 1977)

(79) Monsanto Research Corp., "Source Assessment Overview Matrix," EPA Contract No. 68-02-1874 (September 21, 1976)

(80) Morrison, M.E., Rinker, R.G., Corcoran, W.H., "Rate and Mechanism of Gas-Phase Oxidation of parts-per-million Concentrations of Nitric Oxide, Ind. & Eng. Chem. Fundamentals 5 (2) 175 (May 1966)

(81) Morrow, N.L., Brief, R.S., Bertrand, R.R., "Air Sampling and Analysis," Chemical Engineering/Deskbook Issue 79 (10) 125-132 (May 8, 1972)

(82) "NBS Steps Up Environmental Activities," Chemical & Engineering News 52 (10) 26 (March 11, 1974)

(83) "New Tests Shine for Pollutants," Chemical Week 111 (12) 61 (September 20, 1972)

(84) Ootsuka, K., et al., "Development of New Type Catalytic NOx Removal Reactor," Paper No. 77-09.6 (June 20-24, 1977)

(85) Paskind, J., Kinosian, J.R., "Hydrocarbon, Oxides of Nitrogen and Oxidant Pollutant Relationships in the Atmosphere over California Cities," 67th Annual Meeting of the Air

Pollution Control Assoc., Paper No. 74-31 (June 9-13, 1974)

(86) Reed, R.D., "Nitrogen Oxides Problems in Industry," Chemical Engineering/Deskbook Issue 84 (22) 153-157 (October 17, 1977)

(87) Ricci, L.J., "EPA Sets its Sights on Nixing CPI's NOx Emissions, Chemical Engineering 84 (4) 33-36 (February 14, 1977)

(88) Robertson, D.J., Groth, R.H., Gardner, D.G. and Glastris, A.G., "Stability and Analyses of Nitric Oxide in Nitrogen," Journal of the Air Pollution Control Assoc. 27 (8) 779-780 (August 1977)

(89) Romano, A.J., Huszagh, D.W., Klein, J., Doering, R., Newman, L., "The Use of a Self-Cleaning, Low-Cost Dilution System in the Conditioning of Flue Gases for Unattended SO_2 or NOx Monitoring," Combustion 45 (11) 36-39 (May 1974)

(90) Samuelson, G.S., Harman, J.N., "Chemical Transformations of Nitrogen Oxides While Sampling Combustion Products," Journal of the Air Pollution Control Assoc. 27 (7) 648-655 (July 1977)

(91) Samuelson, G.S., Harman, J.N. III, "Transformation of Oxides of Nitrogen Composition While Sampling Combustion Products," Paper presented at First Chemical Congress of the North American Continental American Chemical Socieety, Mexico City, p 1-36 (December 1975)

(92) Sandberg, J.S., Levaggi, D.A., DeMandel, R.E., Sin, W., "Sulfate And Nitrate Particulates As Related To SO_2 And NOx Gases And Emissions," 68th Annual Meeting of the APCA, Paper No. 75-62.5 (June 1975)

(93) Shahed, S.M., Newhall, H.F., "Kinetics of Nitric Oxide Formation in Propane-Air and Hydrogen-Air Diluent Flames," Combustion and Flame 17 (2) 131-137 (October 1971)

(94) Shen, T.T., "Online Instruments Expedite Emission Tests," Chemical Engineering 82 (11) 109-112 (May 26, 1975)

(95) Shen, T.T., "Selection of Instrument Methods for SO_2 and NOx Source Testing," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-188 (June 9-13, 1974)

(96) Shen, T.T., Stasiuk, W.N., "Performance Characteristics of Stack Monitoring Instruments for Oxides of Nitrogen," Journal of the Air Pollution Control Assoc. 25 (1) 44-47 (January 1975)

(97) Shy, C.M., et al., "The Chattanooga School Children Study: Effects of Community Exposure to Nitrogen Dioxide. 1. Methods, Description of Pollutant Exposure, and Results of Ventilatory Function Testing," Journal of the Air Pollution Control Assoc. 20 (8) 539-545 (August 1970)

(98) Sickles, J.E. II, Ripperton, L.A., "Ozone-Precursor Relationship of Nitrogen Dioxide, Isopentane and Sunlight under Selected Conditions," 70th Annual Meeting of the Air Pollution Control Assoc., Paper No. 77-05.2 (June 20-24, 1977)

(99) Siddiqi, A.A., Tenini, J.W., Killion, L.D., "Control NOx Emissions From Fixed Fireboxes," Hydrocarbon Processing 55 (10) 94-97 (October 1976)

(100) Siegmund, C.W., Turner, D.W., "NOx Emissions from Industrial Boilers: Potential Control Methods," Journal of Engineering for Power: Transactions of the ASME 96 (1) 1-6 (January 1974)

(101) Spicer, C.W., Miller, D.F., "Nitrogen Balance in Smog Chamber Studies," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-247 (June 9-13, 1974)

(102) Stevens, R.K., Clark, T.A., Decker, C.E., Ballard, L.F., "Field Performance Characteristics of Advanced Monitors for Oxides of Nitrogen, Ozone, Sulfur Dioxide, Carbon Monoxide, Methane, and Nonmethane Hydrocarbons," 65th Annual Meeting of the Air Pollution Control Assoc., Paper No. 72-13 (June 18-22, 1972)

(103) Takagi, T., Fujii, K., Ogasawara, M., "Evaluation of Various Factors Affecting Nitric Oxide Formation and Effectiveness of Some Emission-Control Systems," Fuel 53 (2) 114-119 (April 1974)

(104) Tarbell, J.M., Petty, C.A., "Combustion Modifications for the Control Of NOx Emissions," Chemical Engineering Science 32 (10) 1177-1188 (1977)

(105) Thompson, C.R., Tingey, D.T., Reinert, R.A., "Acceptable Limits for Air Pollution Dosages and Vegetation Effects: Nitrogen Dioxide," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-227 (June 9-13, 1974)

(106) Trowell, J.M., "Gas Chromatographic Separation of Oxides of Nitrogen," Anal. Chem. 37:1152 (1965)

(107) Turner, G., "Some Considerations in Quantitative Determination of NO, NO_2, and NOx by Chemiluminesence Analyzer," 67th Annual Meeting of the Air Pollution Control Assoc., Paper No. 74-32 (June 9-13, 1974)

(108) Vogt, R.A., Laurendeau, N.M., "Preliminary Measurements of Fuel Nitric Oxide Formation in a Pulverized Coal Transport Reactor," Journal of the Air Pollution Control Assoc. 28 (1) 60-63 (January 1978)

(109) White, A., Beddowa, L.M., "The Choice of Sampling Tube Material in the Determination of Nitrogen Oxide Concentrations in Products of Combustion," J. Appl. Chem. Biotechnol. 23:759 (1973)

(110) Wolf, P.C., "Systems for Continuous Stack-Gas Monitoring," Mechanical Engineering 96 (4) 22-28 (April 1974)

(111) Wolf, P.C., "Systems for Continuous Stack-Gas Monitoring, Part 2: Gas Handling Components and Accessories," Mechanical Engineering 96 (5) 43-48 (May 1974)

(112) Woolrich, P.F., "Methods for Estimating Oxides of Nitrogen Emissions from Combustion Processes," Industrial Hygiene Journal 481-484 (December 1961)

(113) Wright, R.S., Sickles, J.E. II, Eaton, W.C., Kamens, R.M., Jeffries, H.E., "Comparison Between Two Outdoor Smog Chamber Facilities: Matched Experiments," 70th Annual Meeting of the Air Pollution Control Assoc., Paper No. 77-05.1 (June 20-24, 1977)

(114) "A Study of Nitrogen Oxides Emissions from Wood Residue Boilers," NCASI Atmospheric Quality Improvement Technical Bulletin No. 102 (November 1979)

(115) A Study of Nitrogen Oxides Emissions from Kraft Recovery Furnaces," NCASI Atmospheric Quality Improvement Techincal Bulletin No. 105 (December 1979)

(116) 41 Federal Register 42013 (September 24, 1976)

(117) 43 Federal Register 42154 (September 19, 1978)

(118) 43 Federal Register 42183 (September 19, 1978)

(119) 44 Federal Register 113 (June 11, 1979)

(120) Folsom, B.A., Courtney, C.W., "Accuracy of Chemiluminescent Analyzers Measuring Nitric Oxide in Stack Gas," Journal of the Air Pollution Control Assoc. 29 (11) 1166-1169 (November 1979)

(121) Folsom, B.A.; Courtney, C.W., "Chemiluminescent Measurement of Nitric Oxide in Combustion Products," In" Proceedings of the Third Stationary Source Combustion Symposium. Vol. II, Advanced Processes and Special Topics, EPA-600/7-79-050B, 283-314 (February 1979)

(122) Steam/Its Generation and Use, 38th Ed., Babcock and Wilcox Co., New York, New York (1972)

(123) Rydholm, S.A., Pulping Processes, Interscience Publishres, New York, New York (1965)

(124) Unpublished Northwest Kraft Mill Report Performed by KVB, Inc. (October 25 to November 12, 1980)

JACKSONVILLE KRAFT PAPER CO., INC.

P. O. Box 18019
Jacksonville, FL 32229
(904) 751-1400

February 28, 1984

Mr. Jerry E. Woosley
Assistant Engineer
Air and Water Pollution Control
515 West Sixth Street
Jacksonville, Florida 32206

Dear Mr. Woosley:

Attached are the completed annual report forms for each of our permitted sources of air pollution for the calendar year of 1983.

Very truly yours,

R. G. Carovano

R. G. Carovano
Executive Vice President
& General Manager

RGC:ln

Attachments

GENERAL INFORMATION

1. Company Name and Address Jacksonville Kraft Paper Company, Inc.

P.O. Box 18019, Jacksonville, Florida 32229

2. Complete all applicable sections below for calendar year 1983:

A. Kraft Pulp Mill - Tons of air-dryed unbleached pulp produced St. Regis:155,784; Jax Kraft:254,454 Total: 410,238

B. Concrete batch or concrete products plant -

(1) Cubic yards of concrete produced (used) ______.

(2) Tons of aggregate stored ______.

C. Miscellaneous paint and solvent use -

(1) lbs. of paint used ______.

(2) % solvent in paint ______.

(3) lbs. of miscellaneous solvent used ______.

D. Small boilers (not permitted) -

(1) Type fuel used (Please Circle) - #1 #2 #4 #5 #6 .

(2) % sulfur in fuel ______.

(3) Quantity used (calendar year) ______.

E. Coffee Processors - Tons of Coffee produced ______.

R. G. Carovano - Vice President & Gen. Mgr. — R. G. Carovano

(Print or Type) Name and Title of Owner or Authorized Representative — Signature

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71201
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Power Boiler

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7253

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight
N/A	tons/yr
	tons/yr
	tons/yr
	tons/yr
	tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

7149 10^3 gallons No. 6 Oil, 2.27 %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI **EMISSION RATE(S)** (tons/yr)

103.94 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71202
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Power Boiler

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7642

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
N/A		tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
9,004	10^3 gallons No. 6 Oil, 2.27 %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ____________________

VI **EMISSION RATE(S)** (tons/yr)

150.01	Particulates	________	Sulfur Dioxide	________	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon		Other (Specify type and units) ________		

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71203
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Power Boiler

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7319

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
N/A		tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________ 10^6 cubic feet Natural Gas   ________ 10^3 Kerosene

8,865 10^3 gallons No. 6 Oil, 2.27 %S   ________ tons Coal

________ 10^3 gallons Propane   ________ tons Carbonaceous

________ 10^6 Black Liquor Solids   ________ tons Refuse

Other (Specify type and units) ________

VI **EMISSION RATE(S)** (tons/yr)

133.94 Particulates   ________ Sulfur Dioxide   ________ Total Reduced Sulfur

________ Nitrogen Oxide   ________ Carbon Monoxide   ________ Fluoride

________ Hydrocarbon   Other (Specify type and units) ________

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71204
3. Source Address: 9469 Eastport Rd., Jacksonville, Florida 32218
4. Description of Source: No. 1 Bark Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7538

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight
N/A	tons/yr
	tons/yr
	tons/yr
	tons/yr
	tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
167.447	10^3 gallons No. 6 Oil, 2.27 %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) Bark - 124,118 tons

VI **EMISSION RATE(S)** (tons/yr)

45.79	Particulates	________	Sulfur Dioxide	________	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon		Other (Specify type and units) ________		

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71205
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Bark Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr

APPROX. OPERATING HRS. 7645

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight
N/A	tons/yr
	tons/yr
	tons/yr
	tons/yr
	tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

______ 10^6 cubic feet Natural Gas ______ 10^3 Kerosene

219.888 10^3 gallons No. 6 Oil, 2.27 %S ______ tons Coal

______ 10^3 gallons Propane ______ tons Carbonaceous

______ 10^6 Black Liquor Solids ______ tons Refuse

Other (Specify type and units) Back - 134,204 tons

VI **EMISSION RATE(S)** (tons/yr)

40.17 Particulates ______ Sulfur Dioxide ______ Total Reduced Sulfur

______ Nitrogen Oxide ______ Carbon Monoxide ______ Fluoride

______ Hydrocarbon Other (Specify type and units) ______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71209
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7426

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	84,308	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

_______ 10^3 gallons _______ Oil, _______ %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI **EMISSION RATE(S)** (tons/yr)

22.80 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1984 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71210
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Dissolving Tank

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7035

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	102,143	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

DER Form 17-1.202(6)
Effective November 30, 1982

V TOTAL FUEL USAGE including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

_____ 10^6 cubic feet Natural Gas _____ 10^3 Kerosene

_____ 10^3 gallons _____ Oil, _____ %S _____ tons Coal

_____ 10^3 gallons Propane _____ tons Carbonaceous

_____ 10^6 Black Liquor Solids _____ tons Refuse

Other (Specify type and units) _____

VI EMISSION RATE(S) (tons/yr)

44.88 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur

_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride

_____ Hydrocarbon Other (Specify type and units) _____

VII METHOD OF CALCULATING EMISSION RATES (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT
3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR
VICTORIA J. TSCHINKEL
SECRETARY
G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71211
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: ~~No. 3 Dissolving Tank~~

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS.7207

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Molten Smelt	104,638	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

DER Form 17-1.202(6)
Effective November 30, 1982

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

______ 10^6 cubic feet Natural Gas ______ 10^3 Kerosene

______ 10^3 gallons ______ Oil, ______ %S ______ tons Coal

______ 10^3 gallons Propane ______ tons Carbonaceous

______ 10^6 Black Liquor Solids ______ tons Refuse

Other (Specify type and units) ______

VI **EMISSION RATE(S)** (tons/yr)

33.48 Particulates ______ Sulfur Dioxide ______ Total Reduced Sulfur

______ Nitrogen Oxide ______ Carbon Monoxide ______ Fluoride

______ Hydrocarbon Other (Specify type and units) ______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71206
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7426

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	160,897	Dry solid tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

20 10^3 gallons No. 6 Oil, 2.27 %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI **EMISSION RATE(S)** (tons/yr)

143.25 Particulates _______ Sulfur Dioxide 23.90 Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
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VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71207
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7035

III RAW MATERIAL INPUT ~~PROCESS~~ WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	194,933	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

______	10^6 cubic feet Natural Gas	______	10^3 Kerosene
20	10^3 gallons No. 6 Oil, 2.27 %S	______	tons Coal
______	10^3 gallons Propane	______	tons Carbonaceous
______	10^6 Black Liquor Solids	______	tons Refuse

Other (Specify type and units) ______

VI **EMISSION RATE(S)** (tons/yr)

127.55	Particulates	______	Sulfur Dioxide	30.19	Total Reduced Sulfur
______	Nitrogen Oxide	______	Carbon Monoxide	______	Fluoride
______	Hydrocarbon	Other (Specify type and units) ______			

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

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R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
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VICTORIA J. TSCHINKEL
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G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71208
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Recovery Boiler Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr

APPROX. OPERATING HRS 7207

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Black Liquor Solids	199,694	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
20	10^3 gallons No. 6 Oil, 2.27 %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ________

VI **EMISSION RATE(S)** (tons/yr)

148.25	Particulates	________	Sulfur Dioxide	30.93	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon	Other (Specify type and units) ________			

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

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R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71212
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 1 Lime Kiln Scrubber

II **ACTUAL OPERATING HOURS:** 24 hrs/day 7 days/wk 52 wks/yr

APPROX. OPERATING HRS. 5160

III **RAW MATERIAL INPUT PROCESS WEIGHT:** (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
$CaCO_3$	47,945	tons/yr
Dust, recycled	3,916	tons/yr
Inerts	5,362	tons/yr
		tons/yr
		tons/yr

IV **PRODUCT OUTPUT** (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

1041 10^3 gallons No. 6 Oil, 2.27 %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI **EMISSION RATE(S)** (tons/yr)

26.45 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII **CERTIFICATION:**

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R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
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SECRETARY

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DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71213
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 2 Lime Kiln Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr

APPROX. OPERATING HRS 6000

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
$CaCO_3$	55,750	tons/yr
Dust, recycled	5,024	tons/yr
Inerts	6,250	tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

________ 10^6 cubic feet Natural Gas ________ 10^3 Kerosene

750.88 10^3 gallons No. 6 Oil, 2.27 %S ________ tons Coal

________ 10^3 gallons Propane ________ tons Carbonaceous

________ 10^6 Black Liquor Solids ________ tons Refuse

Other (Specify type and units) Pitch 949,500 gallons

VI **EMISSION RATE(S)** (tons/yr)

28.26 Particulates ________ Sulfur Dioxide ________ Total Reduced Sulfur

________ Nitrogen Oxide ________ Carbon Monoxide ________ Fluoride

________ Hydrocarbon Other (Specify type and units) ________

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from compliance testing and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

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NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
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G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71214
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: No. 3 Lime Kiln Scrubber

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 7080

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
$CaCO_3$	65,785	tons/yr
Dust, Recycled	5,929	tons/yr
Inerts	7,375	tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

DER Form 17-1.202(6)
Effective November 30, 1982

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S).

_____ 10^6 cubic feet Natural Gas _____ 10^3 Kerosene

None 10^3 gallons No. 6 Oil, 2.27 %S _____ tons Coal

_____ 10^3 gallons Propane _____ tons Carbonaceous

_____ 10^6 Black Liquor Solids _____ tons Refuse

Other (Specify type and units) Pitch 1,963,232 gallons

VI **EMISSION RATE(S)** (tons/yr)

14.23 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur

_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride

_____ Hydrocarbon Other (Specify type and units) _____

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained by compliance testing and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

_____

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71215
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: Water Treatment Lime Storage Bag House

II ACTUAL OPERATING HOURS: 24 hrs/day 1 days/wk 12 ~~wks~~ mos./yr

APPROX. OPERATING HRS. 125

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Calcium Oxide	375	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

DER Form 17-1.202(6)
Effective November 30, 1982

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

________	10^6 cubic feet Natural Gas	________	10^3 Kerosene
________	10^3 gallons ________ Oil, ________ %S	________	tons Coal
________	10^3 gallons Propane	________	tons Carbonaceous
________	10^6 Black Liquor Solids	________	tons Refuse

Other (Specify type and units) ________

VI **EMISSION RATE(S)** (tons/yr)

0.375	Particulates	________	Sulfur Dioxide	________	Total Reduced Sulfur
________	Nitrogen Oxide	________	Carbon Monoxide	________	Fluoride
________	Hydrocarbon		Other (Specify type and units) ________		

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from bag house efficiency and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71215
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: Caustic Lime Storage Bag House

II ACTUAL OPERATING HOURS: 24 hrs/day 2 days/wk 52 wks/yr

APPROX. OPERATING HRS. 1561

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Calcium Oxide	4683	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

_______ 10^3 gallons _______ Oil, _______ %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______________

VI **EMISSION RATE(S)** (tons/yr)

4.683 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______________

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from bag house efficiency and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71215
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: Starch Storage Bag House

II ACTUAL OPERATING HOURS: 6 hrs/day 5 times per year ~~days/wk~~ ______ wks/yr

APPROX. OPERATING HRS. 14

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Starch	162.5	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

_______ 10^6 cubic feet Natural Gas _______ 10^3 Kerosene

_______ 10^3 gallons _______ Oil, _______ %S _______ tons Coal

_______ 10^3 gallons Propane _______ tons Carbonaceous

_______ 10^6 Black Liquor Solids _______ tons Refuse

Other (Specify type and units) _______

VI **EMISSION RATE(S)** (tons/yr)

0.163 Particulates _______ Sulfur Dioxide _______ Total Reduced Sulfur

_______ Nitrogen Oxide _______ Carbon Monoxide _______ Fluoride

_______ Hydrocarbon Other (Specify type and units) _______

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from bag house efficiency and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1983 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71215
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: Salt Cake Storage Bag House No. 1

II PREVIOUS ACTUAL OPERATING HOURS: 24 hrs/day 4 days/wk 52 wks/yr
APPROX. OPERATING HRS. 0

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Salt Cake	None-Equipment not used due to	tons/yr
	change in process	tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

________ 10^6 cubic feet Natural Gas ________ 10^3 Kerosene

________ 10^3 gallons ________ Oil, ________ %S ________ tons Coal

________ 10^3 gallons Propane ________ tons Carbonaceous

________ 10^6 Black Liquor Solids ________ tons Refuse

Other (Specify type and units) ________

VI **EMISSION RATE(S)** (tons/yr)

None Particulates ________ Sulfur Dioxide ________ Total Reduced Sulfur

________ Nitrogen Oxide ________ Carbon Monoxide ________ Fluoride

________ Hydrocarbon Other (Specify type and units) ________

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from bag house efficiency and operating days.

VIII **CERTIFICATION:**

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.
TYPED NAME AND TITLE

2/28/84
DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 83 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Jacksonville Kraft Paper Company, Inc.
2. Permit Number: A016-71215
3. Source Address: 9469 Eastport Road, Jacksonville, Florida 32218
4. Description of Source: Salt Cake Storage Bag House No. 2

II PREVIOUS ACTUAL OPERATING HOURS: 18 hrs/day 7 days/wk 52 wks/yr
APPROX. OPERATING HRS. 948

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Salt Cake	2748	tons/yr
	This equipment not used after	tons/yr
	July 1983, due to change in	tons/yr
	process.	tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

N/A

V **TOTAL FUEL USAGE** including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1% S). N/A

________ 10^6 cubic feet Natural Gas ________ 10^3 Kerosene

________ 10^3 gallons ________ Oil, ________ %S ________ tons Coal

________ 10^3 gallons Propane ________ tons Carbonaceous

________ 10^6 Black Liquor Solids ________ tons Refuse

Other (Specify type and units) ________________________

VI **EMISSION RATE(S)** (tons/yr)

2.748 Particulates ________ Sulfur Dioxide ________ Total Reduced Sulfur

________ Nitrogen Oxide ________ Carbon Monoxide ________ Fluoride

________ Hydrocarbon Other (Specify type and units) ________________

VII **METHOD OF CALCULATING EMISSION RATES** (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

Emission rate obtained from bag house efficiency and operating days.

VIII CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

R. G. Carovano

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

R. G. Carovano, Vice President & Gen. Mgr.

TYPED NAME AND TITLE

2/28/84

DATE

SOURCE TEST REPORT
for
SULFUR DIOXIDE EMISSIONS
BASELINE EMISSIONS

NUMBER 1 LIME KILN
NUMBER 2 LIME KILN
NUMBER 3 LIME KILN

MARCH 27-28, 1989

Prepared for:

SEMINOLE KRAFT CORPORATION
9469 EAST PORT ROAD
JACKSONVILLE, FLORIDA 32218

Prepared by:

AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606
(904) 335-1889

239-89-01

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air consulting and engineering, inc.

REPORT CERTIFICATION

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Regulation requirements and all test data and plant operating data are true and correct.

Stephen L. Neck

Stephen L. Neck, P.E.

State of Florida
Registration No. 20020

April 19, 1989

Date

SEAL

2106 N.W. 67th Place, Suite 4 • Gainesville, Florida 32606 • (904) 335-1889

1.0 INTRODUCTION

On March 27-28, 1989, Air Consulting and Engineering, Inc. (ACE) conducted sulfur dioxide (SO_2) emission testing at Seminole Kraft Corporation's Lime Kilns Number 1, 2, and 3, in Jacksonville, Florida. Testing was performed to establish SO_2 baseline emission rates for each of the three kilns.

Testing was conducted using United States Environmental Protection Agency (EPA) Method 6 for determining SO_2 emissions.

2.0 SUMMARY AND DISCUSSION OF RESULTS

SO_2 emissions without non-condensible gases for Lime Kilns 1, 2, and 3, averaged 0.160 pounds per hour (lbs/Hr), 0.06 lbs/Hr, and 0.203 lbs/Hr, respectively.

Tables 1, 2, and 3, summarize SO_2 emissions and flue gas parameters. Complete emission data, field data sheets and laboratory data sheets are presented in Appendices A, B, and C, respectively.

Table 1 Sulfur Dioxide Emissions
Number 1 Lime Kiln--Baseline Emissions
Seminole Kraft Corporation
March 28, 1989

Run Number	Stack Gas Flow Rate SCFMD	Stack Gas Temperature °F	Stack Gas Moisture %	SO_2 Emission Rate lb/Hr
1	10260.2	154.1	27.20	0.17
2	9736.1	159.1	30.40	0.19
3	9780.2	159.8	31.73	0.12
Average	9925.5	157.7	29.80	0.16

Table 2 Sulfur Dioxide Emissions
Number 2 Lime Kiln--Baseline Emissions
Seminole Kraft Corporation
March 28, 1989

Run Number	Stack Gas Flow Rate SCFMD	Stack Gas Temperature °F	Stack Gas Moisture %	SO_2 Emission Rate lb/Hr
1	16662.1	143.3	21.12	0.05
2	17126.7	154.0	27.63	0.05
3	18351.4	148.8	24.27	0.08
Average	17380.1	148.7	24.34	0.06

Table 3 Sulfur Dioxide Emissions
Number 3 Lime Kiln--Baseline Emissions
Seminole Kraft Corporation
March 27, 1989

Run Number	Stack Gas Flow Rate SCFMD	Stack Gas Temperature °F	Stack Gas Moisture %	SO_2 Emission Rate lb/Hr
1	12961.9	139.4	19.03	0.370
2	13106.3	140.0	19.34	0.130
3	13791.2	139.9	19.28	0.110
Average	13267.9	139.8	19.22	0.203

3.0 PROCESS DESCRIPTION AND OPERATION--KRAFT PROCESS

In the Kraft pulping process, wood chips are cooked in batch or continuous digesters with a solution of sodium hydroxide and sodium sulfide. This process breaks down the lignin in the wood so that paper can be produced from the remaining pulp. Vapors from the digesters are passed through a condensing and decanting system in which separate streams of turpentine, condensate, and noncondensables are obtained.

The reaction of sodium sulfide and lignin constitutes the major source of odorous organic sulfur compounds. In addition, sodium sulfide and carbon dioxide react in the following manner:

$$Na_2S + CO_2 + H_2O \longrightarrow NaHCO_3 + NaHS$$

$$2NaHS + CO_2 + H_2O \longrightarrow NA_2CO_3 + 2H_2S$$

This is also a major source of odor due to the creation of H_2S.

The digestion solution (black liquor) is then washed out of the pulp. This black liquor contains 95% to 98% of the total alkali charged to the digester. This is present as sodium carbonate and organic compounds of sodium. Organic sulfur compounds are present in combination with sodium sulfide. Small amounts of sodium sulfate, salt, silica and traces of lime, iron oxide, alumina, and potash are also present. Total solids usually average about 20% at this time.

The liquor is then passed through a multi-effect evaporator, followed by direct or indirect contact evaporators to increase the solids content to between 45% and 75%. The black liquor is oxidized with air before being passed through the evaporators to increase the amount of odorous compounds sprayed to the recovery boiler. The air leaving the black liquor oxidation system is used as a combustion air constituent in the recovery boiler or lime kiln.

The concentrated black liquor is sprayed into a recovery furnace where any remaining organic compounds are broken down, the carbon is burned away, and the inorganic chemicals are melted. At the same time, the following reaction takes place:

$$Na_2SO_4 + 2C \longrightarrow Na_2S + CO_2$$

The molten chemical "smelt" is allowed to fall from the bottom of the recovery boiler into a weak solution of "dissolving liquor" coming from the causticizing plant. The chemicals dissolve immediately to give a characteristic green liquor. Impurities are allowed to settle and the liquor is then causticized by adding slaked lime [$Ca(OH)_2$], prepared from recovered $CaCO_3$. The following reaction occurs quickly, forming a slurry:

$$Na_2CO_3\,(aq) + Ca\,(OH)_2(S) \longrightarrow 2\,NaOH\,(aq) + CaCO_3(S)$$

The calcium carbonate sludge is sent to a lime kiln where the CaO is recovered for reuse in the process as $Ca(OH)_2$.

The recovery flue gases pass through the contact evaporators before reaching particulate control equipment and final atmospheric emission.

The flue gas particulate is more than 50% sodium sulfate; the remainder is carbonate, sulfite, and other sodium compounds.

The gases leaving the lime kiln contain hydrogen sulfide and particulate matter consisting mostly of lime dust and sodium salts. Thorough washing of the lime mud before calcining reduces H_2S emission and removes a great quantity of sodium salts.

Bark, previously removed from the wood, is burned in a combination boiler. The combination boiler can burn any proportion of bark and fossil fuel. The steam and electricity generated from the recovery and combination boilers provide for most, if not all, of the plant's energy needs.

A schematic of the Kraft pulping process is presented in Figure 1.

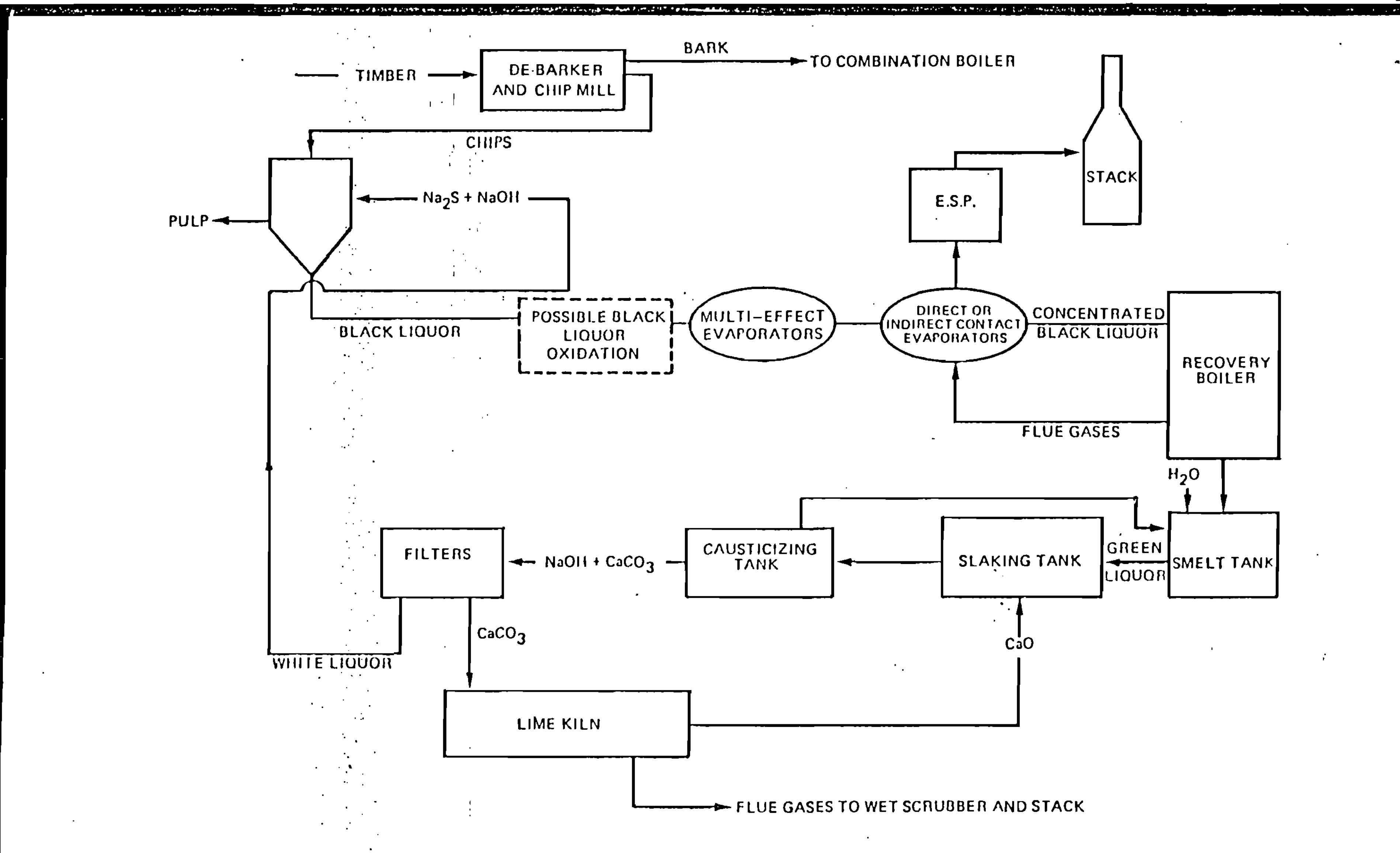


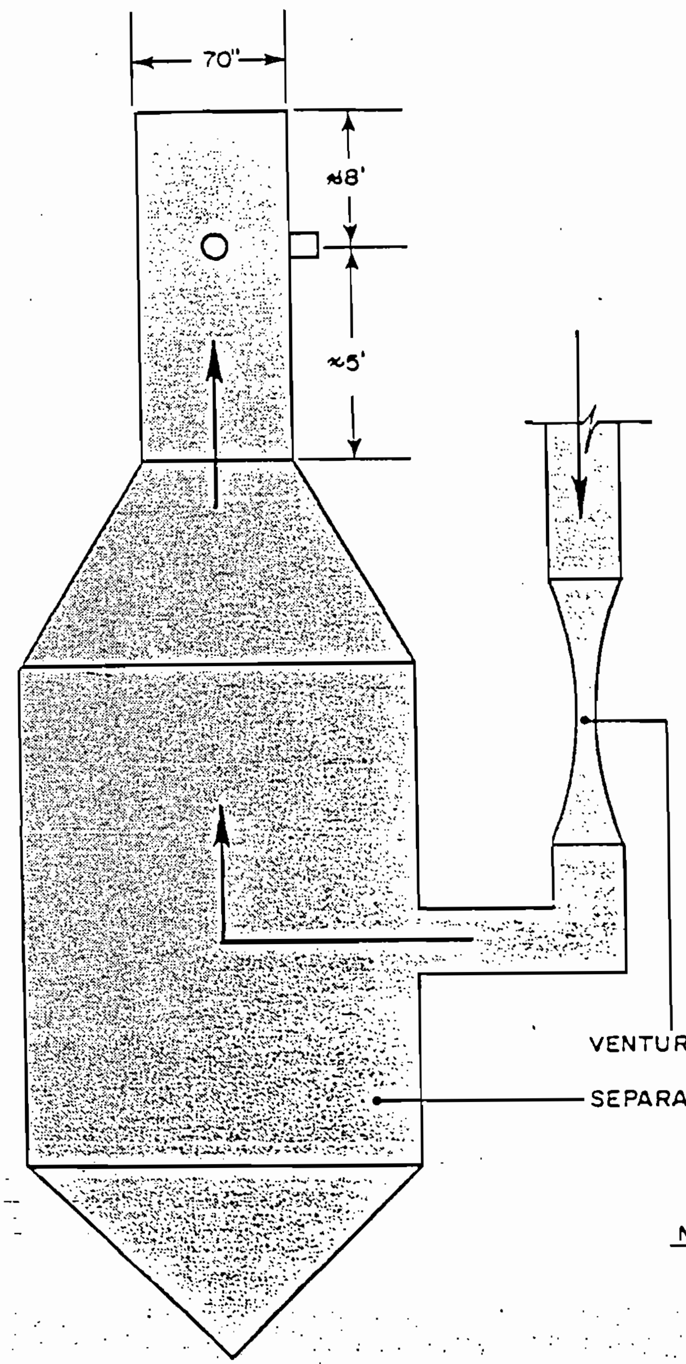
Figure 1

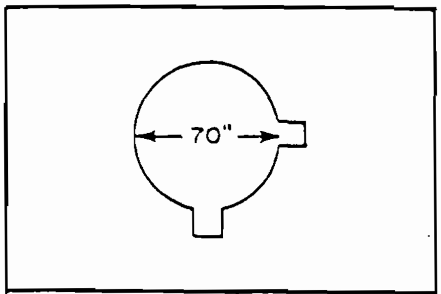
KRAFT PULPING PROCESS

AIR CONSULTING and ENGINEERING

4.0 SAMPLING POINT LOCATION

The sampling point locations and outlet duct schematics are provided in Figures 1, 2, and 3.



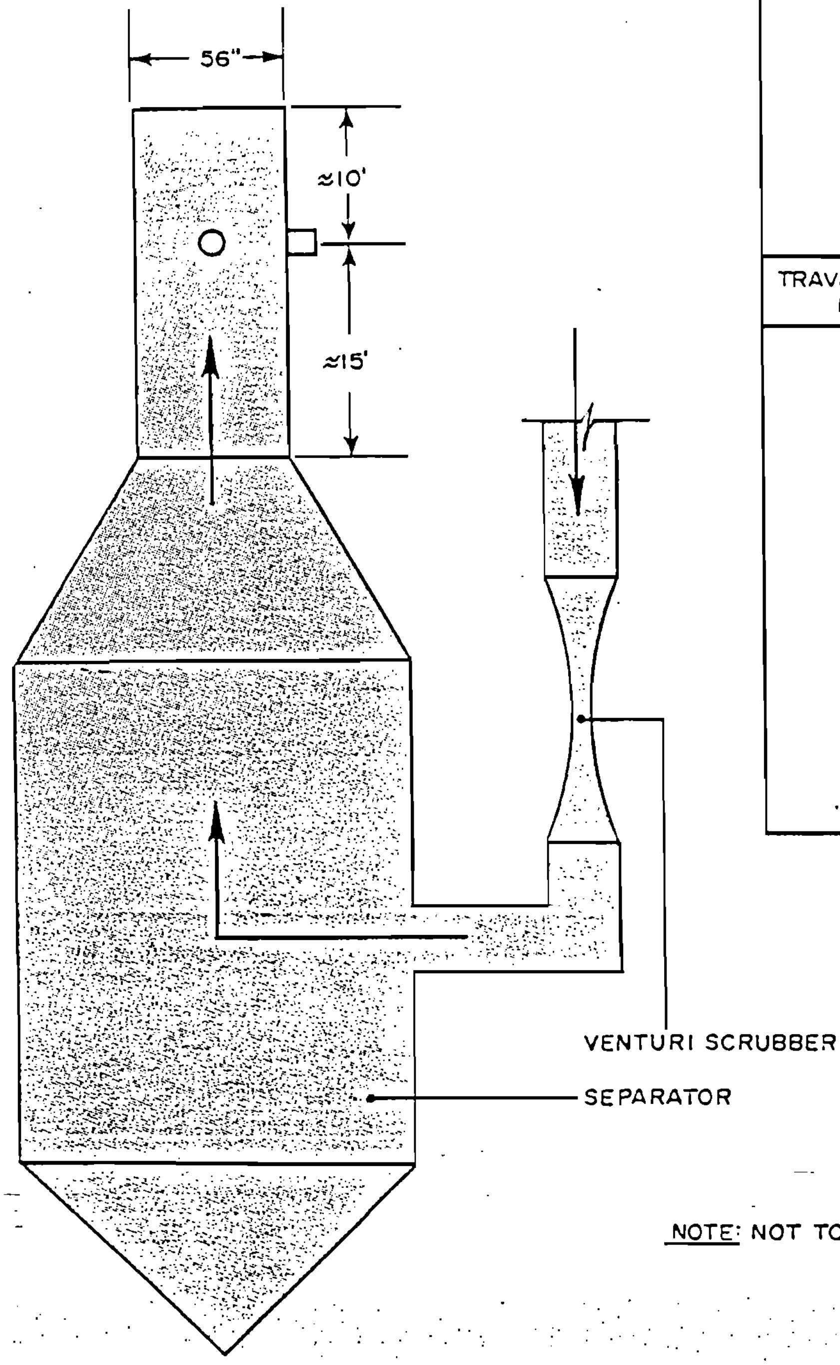


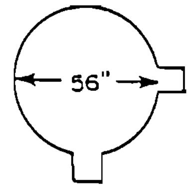
TRAVERSE POINT NUMBER	INCHES INSIDE STACK WALL
1	1.47
2	4.69
3	8.26
4	12.39
5	17.50
6	24.92
7	45.08
8	52.50
9	57.61
10	61.74
11	65.31
12	68.53

NOTE: NOT TO SCALE

FIGURE 2
SAMPLING POINT LOCATION
NO. 1 LIME KILN
SEMINOLE KRAFT CORPORATION
JACKSONVILLE, FLORIDA

AIR CONSULTING and ENGINEERING



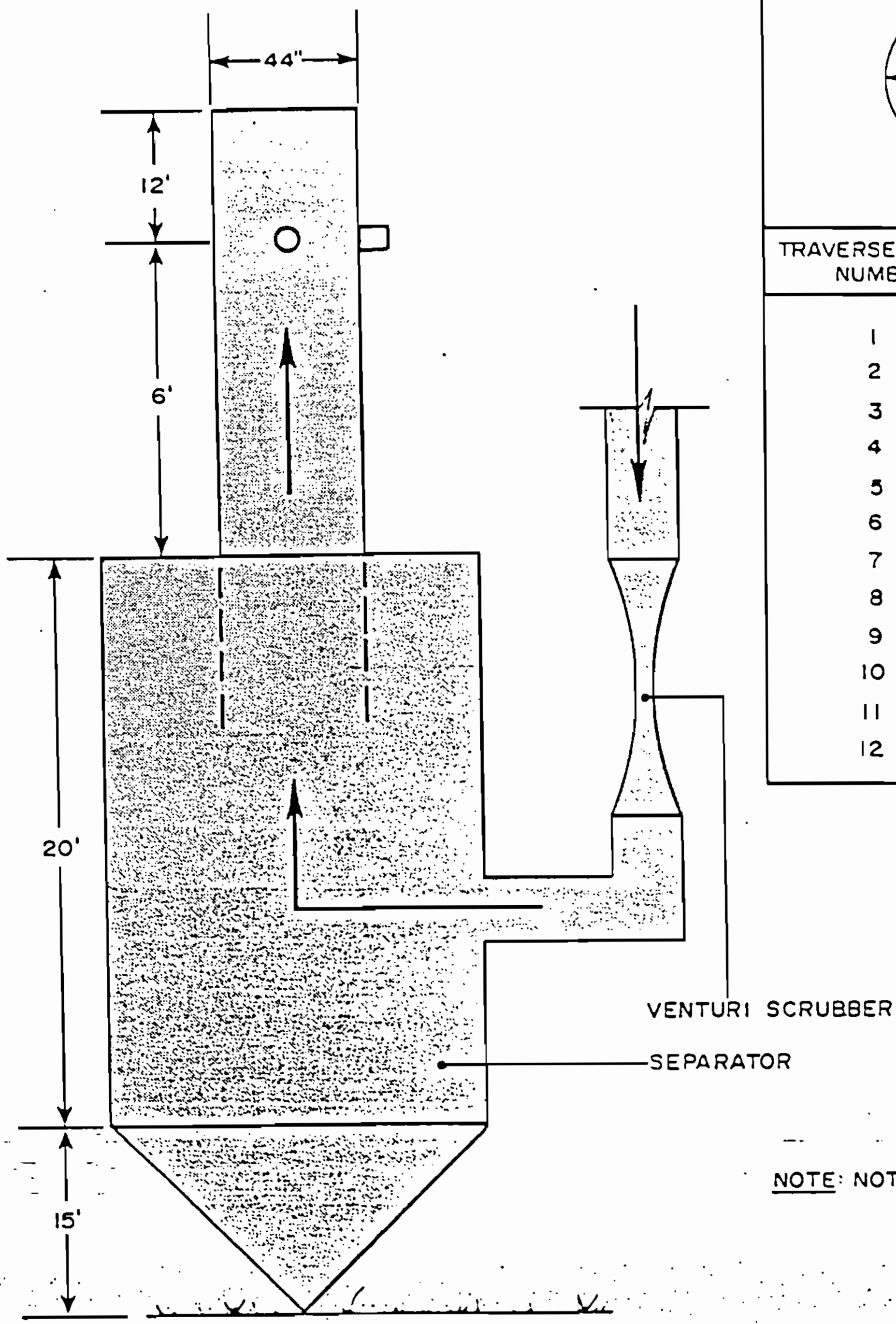


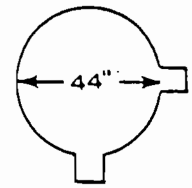
TRAVERSE POINT NUMBER	INCHES INSIDE STACK WALL
1	1.18
2	3.75
3	6.61
4	9.91
5	14.00
6	19.94
7	36.06
8	42.00
9	46.09
10	49.39
11	52.25
12	54.82

NOTE: NOT TO SCALE

FIGURE 3
SAMPLING POINT LOCATION
NO. 2 LIME KILN
SEMINOLE KRAFT CORPORATION
JACKSONVILLE, FLORIDA

AIR CONSULTING
and
ENGINEERING





TRAVERSE POINT NUMBER	INCHES INSIDE STACK WALL
1	1.00
2	2.95
3	5.19
4	7.79
5	11.00
6	15.66
7	28.34
8	33.00
9	36.21
10	38.81
11	41.05
12	43.00

NOTE: NOT TO SCALE

FIGURE 4
SAMPLING POINT LOCATION
NO. 3 LIME KILN
SEMINOLE KRAFT CORPORATION
JACKSONVILLE, FLORIDA

AIR CONSULTING
and
ENGINEERING

5.0 FIELD AND ANALYTICAL PROCEDURES

EPA Method 6--Sulfur Dioxide Sampling and Analysis

Field Apparatus

The sampling and analytical procedures used follow the procedures as outlined in 40CFR60, Appendix A, Method 6, revised as of July 1, 1986. This sampling train was modified for use with large, Greenburg-Smith impingers instead of midget impingers. The sampling equipment consisted of the following:

1. Borosilicate Glass Probe--Fitted with ground glass ball joint and heated to maintain 250°F ±25°F.

2. Heated Filter--An EPA Method 5 filter supported on a stainless steel frit in a Pyrex glass holder maintained at 250°F ±25°F.

3. Impingers--Four Smith-Greenburg impingers; the first and second were charged with 100 ml each of 3 percent hydrogen peroxide (H_2O_2), the third was left empty; and the fourth is charged with a pre-weighed amount of silica gel.

4. Control Box--Module containing a vacuum gauge, thermometer capable of measuring temperature to within ±5 percent, dry gas meter with an accuracy of ±2 percent, valves and related equipemnt to regulate flow.

A schematic of the sampling train is shown in Figure 5.

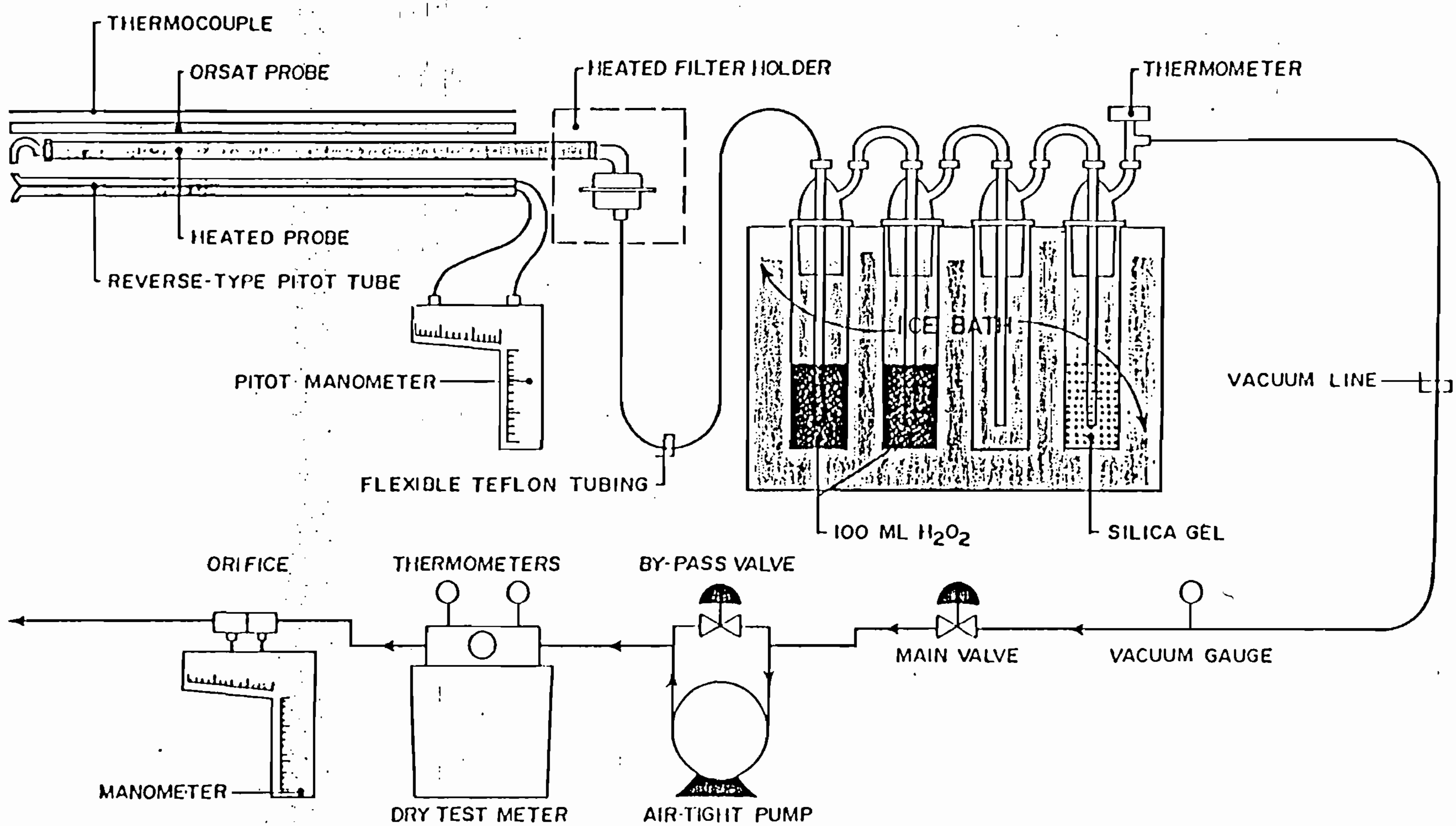


FIGURE 5.
EPA METHOD 6 SAMPLING TRAIN

AIR CONSULTING
and
ENGINEERING

Upon arrival at the plant, the control box was checked for leaks, the impingers were charged and connected in line and the probe attached. The sampling train was then leak-checked at 15 inches of mercury ("Hg) for leaks. Care was taken during the release of vacuum to prevent backup of the sampling reagents. Crushed ice was packed around the impingers and the probe was place in the stack. The stack was sampled at 3 points for a minimum of seven minutes per point. A flow rate of approcimately one-half cubic foot per minute was held for the entire sample period.

Upon completion of the run, a final leak-check was performed at the highest vacuum encountered during testing.

Sample Recovery

The probe was detached from the train and the ice bath drained. The impinger catch was then measured for moisture gain. The H_2O_2 and distilled water washings from the first and second impingers were collected, and stored in a clean sample bottle for later analysis. The volume level in the sample bottle was marked prior to transfer to the laboratory.

Analytical Procedures

The sample was carefully transferred to the laboratory site and the volume checked. Then samples were then diluted to 1000 ml with distilled water. A suitable aliquot was taken and mixed with isopropanol alcohol to achieve a 80/20 IPA/sample ratio after addition of two to four drops of thorin indicator. The solution was then titrated with nominal 0.0100 N barium perchlorate to a pink end point. This was repeated until samples agreed within one percent or 0.2 ml.

APPENDIX A

COMPLETE EMISSION DATA

AND

SAMPLE CALCULATIONS

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/28/89
Stack:	NUMBER 1 LIME KILN	Run 1	From 0858 - 0958

Y Factor	1.008		Nozzle Diameter	0.250	In
Total Time	60.00	Min	Nozzle Area	0.000341	Ft^2
Stack Area	26.725	Ft^2	Barometric Pressure	30.37	In Hg
Stack Temperature	154.1	°F	Meter Temperature	87.3	°F
Stack Pressure	30.37	In Hg	Meter Orifice Diff	1.250	In H_2O
Stack Avg √ Vel Head	0.161	In H_2O	Meter Volume	33.786	CF
			Condensate Vol	265.20	ml

1.	Volume Water Vapor Sampled	12.483	SCF
2.	Volume Standard Dry Gas Sampled	33.437	SCF
3.	Total Standard Sample Volume	45.920	SCF
4.	Percent Moisture	27.200	
5.	Percent Dry Air	72.800	
6.	Molecular Weight of Dry Flue Gas	29.878	
7.	Molecular Weight of Wet Flue Gas	26.647	
8.	Specific Gravity Flue Gas	0.92	
9.	Percent Oxygen [O_2]	11.75	
10.	Percent Carbon Dioxide [CO_2]	8.80	
11.	Percent Excess Air	127.374	
12.	Velocity of Flue Gas	10.071	FPS
13.	Actual Volumetric Flow Rate	16149.6	ACFM
14.	Dry Volumetric Flow Rate	11756.9	ACFMD
15.	Standard Volumetric Flow Rate	10260.2	SCFMD
20.	SO2 Concentration	0.00000028	Lbs/SCF
21.	SO2 Emission Rate	0.17	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	1.71	
23.	SO2 Parts per Million [Wet Basis]	1.24	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/28/89
Stack:	NUMBER 1 LIME KILN	Run 2	From 1016 - 1116

Y Factor	1.008	Nozzle Diameter	0.250 In
Total Time	60.00 Min	Nozzle Area	0.000341 Ft^2
Stack Area	26.725 Ft^2	Barometric Pressure	30.37 In Hg
Stack Temperature	159.1 °F	Meter Temperature	94.5 °F
Stack Pressure	30.37 In Hg	Meter Orifice Diff	1.250 In H_2O
Stack Avg √ Vel Head	0.162 In H_2O	Meter Volume	34.430 CF
		Condensate Vol	311.50 ml

1.	Volume Water Vapor Sampled	14.662	SCF
2.	Volume Standard Dry Gas Sampled	33.632	SCF
3.	Total Standard Sample Volume	48.294	SCF
4.	Percent Moisture	30.400	
5.	Percent Dry Air	69.600	
6.	Molecular Weight of Dry Flue Gas	31.172	
7.	Molecular Weight of Wet Flue Gas	27.168	
8.	Specific Gravity Flue Gas	0.94	
9.	Percent Oxygen [O_2]	6.50	
10.	Percent Carbon Dioxide [CO_2]	18.20	
11.	Percent Excess Air	48.583	
12.	Velocity of Flue Gas	10.077	FPS
13.	Actual Volumetric Flow Rate	16158.7	ACFM
14.	Dry Volumetric Flow Rate	11246.5	ACFMD
15.	Standard Volumetric Flow Rate	9736.1	SCFMD
20.	SO2 Concentration	0.00000032	Lbs/SCF
21.	SO2 Emission Rate	0.19	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	1.91	
23.	SO2 Parts per Million [Wet Basis]	1.33	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/28/89
Stack:	NUMBER 1 LIME KILN	Run 3	From 1133 - 1233

Y Factor	1.008	Nozzle Diameter	0.250 In
Total Time	60.00 Min	Nozzle Area	0.000341 Ft^2
Stack Area	26.725 Ft^2	Barometric Pressure	30.37 In Hg
Stack Temperature	159.8 °F	Meter Temperature	98.8 °F
Stack Pressure	30.37 In Hg	Meter Orifice Diff	1.250 In H_2O
Stack Avg √ Vel Head	0.166 In H_2O	Meter Volume	33.756 CF
		Condensate Vol	327.00 ml

1.	Volume Water Vapor Sampled	15.392	SCF
2.	Volume Standard Dry Gas Sampled	32.720	SCF
3.	Total Standard Sample Volume	48.112	SCF
4.	Percent Moisture	31.73*	
5.	Percent Dry Air	68.300	
6.	Molecular Weight of Dry Flue Gas	31.444	
7.	Molecular Weight of Wet Flue Gas	27.188	
8.	Specific Gravity Flue Gas	0.94	
9.	Percent Oxygen [O_2]	4.50	
10.	Percent Carbon Dioxide [CO_2]	20.40	
11.	Percent Excess Air	29.361	
12.	Velocity of Flue Gas	10.328	FPS
13.	Actual Volumetric Flow Rate	16561.0	ACFM
14.	Dry Volumetric Flow Rate	11311.2	ACFMD
15.	Standard Volumetric Flow Rate	9780.2	SCFMD
20.	SO2 Concentration	0.00000020	Lbs/SCF
21.	SO2 Emission Rate	0.12	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	1.22	
23.	SO2 Parts per Million [Wet Basis]	0.83	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/28/89
Stack:	NUMBER 2 LIME KILN	Run 1	From 1317 - 1428

Y Factor	1.008	Nozzle Diameter	0.250 In
Total Time	60.00 Min	Nozzle Area	0.000341 Ft^2
Stack Area	17.104 Ft^2	Barometric Pressure	30.30 In Hg
Stack Temperature	143.3 °F	Meter Temperature	100.8 °F
Stack Pressure	30.30 In Hg	Meter Orifice Diff	1.250 In H_2O
Stack Avg √ Vel Head	0.380 In H_2O	Meter Volume	34.631 CF
		Condensate Vol	193.60 ml

1.	Volume Water Vapor Sampled	9.113	SCF
2.	Volume Standard Dry Gas Sampled	33.371	SCF
3.	Total Standard Sample Volume	42.484	SCF
4.	Percent Moisture	21.12*	
5.	Percent Dry Air	78.900	
6.	Molecular Weight of Dry Flue Gas	30.048	
7.	Molecular Weight of Wet Flue Gas	27.509	
8.	Specific Gravity Flue Gas	0.95	
9.	Percent Oxygen [O_2]	11.20	
10.	Percent Carbon Dioxide [CO_2]	10.00	
11.	Percent Excess Air	116.628	
12.	Velocity of Flue Gas	23.216	FPS
13.	Actual Volumetric Flow Rate	23825.1	ACFM
14.	Dry Volumetric Flow Rate	18798.0	ACFMD
15.	Standard Volumetric Flow Rate	16662.1	SCFMD
20.	SO2 Concentration	0.00000005	Lbs/SCF
21.	SO2 Emission Rate	0.05	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	0.29	
23.	SO2 Parts per Million [Wet Basis]	0.23	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/28/89
Stack:	NUMBER 2 LIME KILN	Run 2	From 1449 - 1549

Y Factor	1.008		Nozzle Diameter	0.250	In
Total Time	60.00	Min	Nozzle Area	0.000341	Ft^2
Stack Area	17.104	Ft^2	Barometric Pressure	30.28	In Hg
Stack Temperature	154.0	°F	Meter Temperature	96.5	°F
Stack Pressure	30.28	In Hg	Meter Orifice Diff	1.250	In H_2O
Stack Avg √ Vel Head	0.426	In H_2O	Meter Volume	34.014	CF
			Condensate Vol	275.10	ml

1.	Volume Water Vapor Sampled	12.949	SCF
2.	Volume Standard Dry Gas Sampled	33.008	SCF
3.	Total Standard Sample Volume	45.957	SCF
4.	Percent Moisture	27.63*	
5.	Percent Dry Air	72.400	
6.	Molecular Weight of Dry Flue Gas	30.492	
7.	Molecular Weight of Wet Flue Gas	27.050	
8.	Specific Gravity Flue Gas	0.94	
9.	Percent Oxygen [O_2]	9.50	
10.	Percent Carbon Dioxide [CO_2]	13.20	
11.	Percent Excess Air	87.098	
12.	Velocity of Flue Gas	26.487	FPS
13.	Actual Volumetric Flow Rate	27181.6	ACFM
14.	Dry Volumetric Flow Rate	19679.5	ACFMD
15.	Standard Volumetric Flow Rate	17126.7	SCFMD
20.	SO2 Concentration	0.00000004	Lbs/SCF
21.	SO2 Emission Rate	0.05	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	0.27	
23.	SO2 Parts per Million [Wet Basis]	0.19	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/28/89
Stack:	NUMBER 2 LIME KILN	Run 3	From 1602 - 1702

Y Factor	1.008	Nozzle Diameter	0.250 In
Total Time	60.00 Min	Nozzle Area	0.000341 Ft^2
Stack Area	17.104 Ft^2	Barometric Pressure	30.28 In Hg
Stack Temperature	148.8 °F	Meter Temperature	96.2 °F
Stack Pressure	30.28 In Hg	Meter Orifice Diff	1.250 In H_2O
Stack Avg √ Vel Head	0.437 In H_2O	Meter Volume	34.512 CF
		Condensate Vol	333.50 ml

1.	Volume Water Vapor Sampled	15.698	SCF
2.	Volume Standard Dry Gas Sampled	33.510	SCF
3.	Total Standard Sample Volume	49.208	SCF
4.	Percent Moisture	24.27*	
5.	Percent Dry Air	75.700	
6.	Molecular Weight of Dry Flue Gas	30.344	
7.	Molecular Weight of Wet Flue Gas	27.340	
8.	Specific Gravity Flue Gas	0.95	
9.	Percent Oxygen [O_2]	9.80	
10.	Percent Carbon Dioxide [CO_2]	12.20	
11.	Percent Excess Air	90.808	
12.	Velocity of Flue Gas	26.911	FPS
13.	Actual Volumetric Flow Rate	27617.5	ACFM
14.	Dry Volumetric Flow Rate	20906.5	ACFMD
15.	Standard Volumetric Flow Rate	18351.4	SCFMD
20.	SO2 Concentration	0.00000008	Lbs/SCF
21.	SO2 Emission Rate	0.08	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	0.46	
23.	SO2 Parts per Million [Wet Basis]	0.35	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/27/89
Stack:	NUMBER 3 LIME KILN	Run 4	From 1403 - 1503

Y Factor	1.008		Nozzle Diameter	0.250	In
Total Time	60.00	Min	Nozzle Area	0.000341	Ft^2
Stack Area	10.560	Ft^2	Barometric Pressure	30.48	In Hg
Stack Temperature	139.4	°F	Meter Temperature	97.2	°F
Stack Pressure	30.48	In Hg	Meter Orifice Diff	1.250	In H_2O
Stack Avg $\sqrt{}$ Vel Head	0.469	In H_2O	Meter Volume	34.034	CF
			Condensate Vol	174.20	ml

1.	Volume Water Vapor Sampled	8.200	SCF
2.	Volume Standard Dry Gas Sampled	33.203	SCF
3.	Total Standard Sample Volume	41.403	SCF
4.	Percent Moisture	19.03*	
5.	Percent Dry Air	81.000	
6.	Molecular Weight of Dry Flue Gas	30.536	
7.	Molecular Weight of Wet Flue Gas	28.159	
8.	Specific Gravity Flue Gas	0.98	
9.	Percent Oxygen [O_2]	9.40	
10.	Percent Carbon Dioxide [CO_2]	13.50	
11.	Percent Excess Air	85.810	
12.	Velocity of Flue Gas	28.146	FPS
13.	Actual Volumetric Flow Rate	17833.0	ACFM
14.	Dry Volumetric Flow Rate	14444.7	ACFMD
15.	Standard Volumetric Flow Rate	12961.9	SCFMD

20.	SO2 Concentration	0.00000048	Lbs/SCF
21.	SO2 Emission Rate	0.37	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	2.89	
23.	SO2 Parts per Million [Wet Basis]	2.34	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/27/89
Stack:	NUMBER 3 LIME KILN	Run 5	From 1518 - 1618

Y Factor	1.008		Nozzle Diameter	0.250	In
Total Time	60.00	Min	Nozzle Area	0.000341	Ft^2
Stack Area	10.560	Ft^2	Barometric Pressure	30.48	In Hg
Stack Temperature	140.0	°F	Meter Temperature	90.0	°F
Stack Pressure	30.48	In Hg	Meter Orifice Diff	1.250	In H_2O
Stack Avg √ Vel Head	0.476	In H_2O	Meter Volume	33.636	CF
			Condensate Vol	176.50	ml

1.	Volume Water Vapor Sampled	8.308	SCF
2.	Volume Standard Dry Gas Sampled	33.245	SCF
3.	Total Standard Sample Volume	41.553	SCF
4.	Percent Moisture	19.34*	
5.	Percent Dry Air	80.700	
6.	Molecular Weight of Dry Flue Gas	30.544	
7.	Molecular Weight of Wet Flue Gas	28.130	
8.	Specific Gravity Flue Gas	0.98	
9.	Percent Oxygen [O_2]	9.20	
10.	Percent Carbon Dioxide [CO_2]	13.60	
11.	Percent Excess Air	82.284	
12.	Velocity of Flue Gas	28.595	FPS
13.	Actual Volumetric Flow Rate	18117.6	ACFM
14.	Dry Volumetric Flow Rate	14620.9	ACFMD
15.	Standard Volumetric Flow Rate	13106.3	SCFMD
20.	SO2 Concentration	0.00000017	Lbs/SCF
21.	SO2 Emission Rate	0.13	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	1.02	
23.	SO2 Parts per Million [Wet Basis]	0.82	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

AIR CONSULTING AND ENGINEERING, INC.

Complete Emission Results

Plant:	SEMINOLE KRAFT CORPORATION		
Location:	JACKSONVILLE, FLORIDA	Date:	3/27/89
Stack:	NUMBER 3 LIME KILN	Run 6	From 1633 - 1733

Y Factor	1.008		Nozzle Diameter	0.250	In
Total Time	60.00	Min	Nozzle Area	0.000341	Ft^2
Stack Area	10.560	Ft^2	Barometric Pressure	30.48	In Hg
Stack Temperature	139.9	°F	Meter Temperature	88.1	°F
Stack Pressure	30.48	In Hg	Meter Orifice Diff	1.250	In H_2O
Stack Avg √ Vel Head	0.501	In H_2O	Meter Volume	33.827	CF
			Condensate Vol	178.40	ml

1.	Volume Water Vapor Sampled	8.397	SCF
2.	Volume Standard Dry Gas Sampled	33.549	SCF
3.	Total Standard Sample Volume	41.947	SCF
4.	Percent Moisture	19.28*	
5.	Percent Dry Air	80.700	
6.	Molecular Weight of Dry Flue Gas	30.584	
7.	Molecular Weight of Wet Flue Gas	28.151	
8.	Specific Gravity Flue Gas	0.98	
9.	Percent Oxygen [O_2]	9.00	
10.	Percent Carbon Dioxide [CO_2]	13.90	
11.	Percent Excess Air	79.264	
12.	Velocity of Flue Gas	30.083	FPS
13.	Actual Volumetric Flow Rate	19060.4	ACFM
14.	Dry Volumetric Flow Rate	15381.8	ACFMD
15.	Standard Volumetric Flow Rate	13791.2	SCFMD
20.	SO2 Concentration	0.00000013	Lbs/SCF
21.	SO2 Emission Rate	0.11	Lbs/Hr
22.	SO2 Parts per Million [Dry Basis]	0.77	
23.	SO2 Parts per Million [Wet Basis]	0.62	

Probe/Nozzle Wash	0.0	mg
Filter	0.0	mg
Total	0.0	mg

* Moisture Calculated from Saturation Vapor Pressure

APPENDIX B

FIELD DATA SHEETS

STACK SAMPLING FIELD DATA SHEET

Engineering

2601 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606

TEST NO. ______

PAGE ______ OF ______

PLANT Seminole Kraft SOURCE No. 1 Lime Kiln

PLANT LOCATION Jacksonville, Florida

TYPE OF SAMPLING TRAIN EPA-6

TYPE OF SAMPLES SO_2

DATE 3-28-89 RUN NO. 1

TIME START 0858 TIME END 0958

SAMPLE TIME ______ min/pt 60 Total min

BAR PRESS. 30.37 "Hg STACK PRESS. 30.37 "Hg

ASSUMED MOISTURE ______ % FDA ______

WEATHER Clear TEMP. ______ °F

METER BOX NO. 1 ΔH ______ Y 1.008

NOMOGRAPH C_f ______ PITOT CORR. FACTOR .84

NOZZLE CALIBRATION ______ ______ ______ = .25

STACK DIMENSIONS 70

STACK AREA 26.725 (EFFECTIVE ______ ft²)

STACK HEIGHT ______ ft.

STACK DIAMETER: UPSTREAM ______ DOWNSTREAM ______

PORT SIZE ______ in. NIPPLE LENGTH ______

U CORD LENGTH: 150

REMARKS: ______

2398018

MAT'L PROCESSING RATE ______

GAS METER READINGS: FINAL 201.602 ft.³

INITIAL 167.816 ft.³

NET 33.786 ft.³

IMPINGERS VOL. GAIN 251 ml.

SILICA GEL NO. 12 WT. GAIN 14.2

FILTER NO. ______ TOTAL CONDENSATE 265.2 ml.

ORSAT	1	2	3	4	AVG
% CO_2		9.0	8.6		8.8
% O_2	~~4.0~~	11.5	12.0		11.75
% CO					
% N_2					

F_O ______ F_O RANGE -

LEAK CHECKS: METER BOX/PUMP ✓

ORSAT BAG ✓ GAS SAMPLE SYSTEM ✓

ORSAT ANALYZER ✓

PRE-TEST 0.00 CFM 15 "Hg POST-TEST 0.00 CFM 14.5 "Hg

BOX OPERATOR Neck PROBE HOLDER Prows

PYROMETER NO. 1 PITOT TUBE NO. 75

PITOT TUBE LEAK CHECK: PRETEST O.K.

POST-TEST(+) 4.1 H_2O 15 SEC

POST-TEST(-) 4.1 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
	1.47 45.08		169.29	.03	1.25	1.25	162	239	65	83	4.5
	4.19 ~~5.15~~ 52.5	0903	170.68	.03	1.25	1.25	161	274	61	83	4.5
	8.26 57.6		172.08	.03	1.25	1.25	161	270	56	83	4.5
	12.39 61.74	0908	173.47	.02	1.25	1.25	161	274	55	84	5.0
	17.5 65.31		174.83	.015	1.25	1.25	161	273	56	84	5.0
	24.92 68.53	0913	176.22	.015	1.25	1.25	160	267	58	85	5.0

Air Consulting and Engineering

2106 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606

PAGE ________ OF ________

RUN NO. ________

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7		0918	177.67	.01	1.25	1.25	160	265	60	85	5.5
8		0918	178.95	.015	1.25	1.25	159	265	62	85	5.5
9			180.35	.02	1.25	1.25	156	273	65	86	6.0
10		0923	181.72	.015	1.25	1.25	154	265	70	86	6.0
11			183.15	.02	1.25	1.25	153	264	71	87	6.5
12		0928	184.55	.02	1.25	1.25	151	265	72	87	6.5
2-1		[illegible]	185.96	.05	1.25	1.25	150	266	68	88	6.5
2		0933	187.—	.05	1.25	1.25	148	269	67	88	7.0
3			188.—	.04	1.25	1.25	148	266	65	89	7.0
4		0938	190.25	.03	1.25	1.25	148	263	65	89	7.5
5			191.65	.025	1.25	1.25	150	264	64	89	7.5
6		0943	193.07	.02	1.25	1.25	150	267	59	90	7.5
7			194.47	.02	1.25	1.25	150	265	56	90	8.0
8		0948	195.88	.025	1.25	1.25	150	268	54	90	8.0
9			197.30	.03	1.25	1.25	151	267	53	91	8.5
10		0953	198.74	.035	1.25	1.25	151	267	53	91	8.5
11			200.17	.04	1.25	1.25	152	268	53	91	9.0
12		0958	201.602	.04	1.25	1.25	152	268	53	91	9.0

STACK SAMPLING FIELD DATA SHEET

Engineering

2601 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606

TEST ID ______

PAGE ______ OF ______

PLANT Seminole Kraft SOURCE No. 1 Kiln
PLANT LOCATION Jacksonville, FL.
TYPE OF SAMPLING TRAIN EPA-6
TYPE OF SAMPLES SO_2
DATE 3-28-89 RUN NO. 2
TIME START 1016 TIME END 1116
SAMPLE TIME ______ min/pt 60 Total min
BAR PRESS. 30.37 "Hg STACK PRESS. 30.37 "Hg
ASSUMED MOISTURE ____ % FDA ______
WEATHER Clear TEMP. ____ °F
METER BOX NO. 1 ΔH ______ Y 1.008
NOMOGRAPH C_f ______ PITOT CORR. FACTOR .84
NOZZLE CALIBRATION ______ ______ ______ = .25
STACK DIMENSIONS 70
STACK AREA 26.725 (EFFECTIVE ______ ft²)
STACK HEIGHT ______ ft.
STACK DIAMETER: UPSTREAM ______ DOWNSTREAM ______
PORT SIZE ______ in. NIPPLE LENGTH ______
U CORD LENGTH: 150'
REMARKS: ______

MAT'L PROCESSING RATE 4.5"/hr Mud Storage Drop.
GAS METER READINGS: FINAL ~~20~~236.330 ft³
INITIAL 201.900 ft³
NET 34.430 ft³
IMPINGERS VOL. GAIN 303 ml.
SILICA GEL NO. 27 WT. GAIN 8.5
FILTER NO. ______ TOTAL CONDENSATE 311.5 ml.

ORSAT	1	2	3	4	AVG
% CO_2				18.2	~~6.5~~
% O_2				6.5	~~18.2~~
% CO					
% N_2					

F_O ______ F_O RANGE ______

LEAK CHECKS: METER BOX/PUMP ______
ORSAT BAG ✓ GAS SAMPLE SYSTEM ✓
ORSAT ANALYZER ✓
PRE-TEST 0.00 CFM 15 "Hg POST-TEST 0.00 CFM 16 "Hg
BOX OPERATOR Neck PROBE HOLDER Drows
PYROMETER NO. 1 PITOT TUBE NO. 75
PITOT TUBE LEAK CHECK: PRETEST ✓
POST-TEST(+) 3.2 H_2O 15 SEC
POST-TEST(-) 4.2 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			203.34	.03	1.25	1.25	157	229	60	92	4.0
2		1021	204.80	.03	1.25	1.25	158	243	57	92	4.0
3			206.20	.02	1.25	1.25	158	251	55	93	4.5
4		1026	207.60	.015	1.25	1.25	158	245	57	93	5.0
5			209.00	.015	1.25	1.25	158	241	50	93	5.0
6		1031	210.37	.015	1.25	1.25	159	235	47	93	5.0

4.5 10/60
MWD

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RUN NO. ________

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7			211.76	.015	1.25	1.25	159	239	45	94	5.5
8		1036	213.18	.015	1.25	1.25	160	236	45	94	5.5
9			214.57	.015	1.25	1.25	159	233	45	94	6.0
10		1041	215.93	.020	1.25	1.25	159	236	44	95	6.0
11			217.30	.02	1.25	1.25	159	232	44	95	6.5
12		1046	218.68	.02	1.25	1.25	159	237	44	95	7.0
2-1			220.04	.045	1.25	1.25	159	237	44	95	7.0
2		1051	221.44	.05	1.25	1.25	159	234	44	95	8.0
3			222.80	.04	1.25	1.25	159	230	44	95	8.0
4		1056	224.20	.03	1.25	1.25	160	238	44	95	8.0
5			225.61	.02	1.25	1.25	160	235	45	95	9.0
6		1101	227.02	.02	1.25	1.25	159	233	45	95	9.0
7			228.40	.02	1.25	1.25	160	237	45	96	9.5
8		1106	229.74	.025	1.25	1.25	160	234	45	96	9.5
9			231.15	.03	1.25	1.25	159	236	46	96	10.0
10		1111	232.55	.035	1.25	1.25	160	229	46	96	10.5
11			234.95	.065	1.25	1.25	160	236	47	96	11.0
12		1116	236.~~3~~30	.055	1.25	1.25	160	239	47	96	11.0

STACK SAMPLING FIELD DATA SHEET

Engineering

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TEST ID ______

PAGE 1 OF 2

PLANT Seminole Kraft SOURCE No 1 Lime Kiln

PLANT LOCATION Jacksonville, Florida

TYPE OF SAMPLING TRAIN EPA-6

TYPE OF SAMPLES SO_2

DATE 3-28-89 RUN NO. 3

TIME START 1133 TIME END 1233

SAMPLE TIME ______ min/pt 60 Total min

BAR PRESS. 30.37 "Hg STACK PRESS. 30.37 "Hg

ASSUMED MOISTURE ______ % FDA ______

WEATHER Clear TEMP. ______ °F

METER BOX NO. 1 ΔH ______ Y 1.008

NOMOGRAPH C_f ______ PITOT CORR. FACTOR .84

NOZZLE CALIBRATION ______ ______ ______ = .25

STACK DIMENSIONS 70

STACK AREA ______ (EFFECTIVE ______ ft^2)

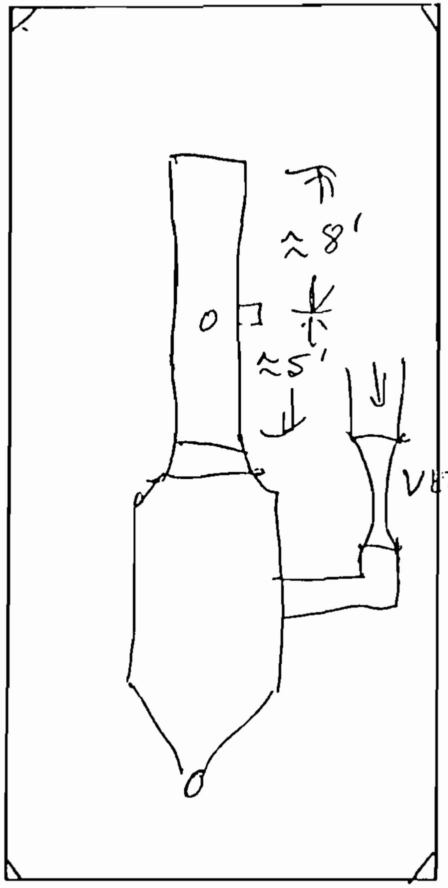
STACK HEIGHT ______ ft.

STACK DIAMETER: UPSTREAM ______ DOWNSTREAM ______

PORT SIZE ______ in. NIPPLE LENGTH ______

U CORD LENGTH: 150

REMARKS: ______



MAT'L PROCESSING RATE ______

GAS METER READINGS: FINAL 269.423 ft^3

INITIAL 235.667 ft^3

NET 33.756 ft^3

IMPINGERS VOL. GAIN 318 ml.

SILICA GEL NO. 13 WT. GAIN 9.0

FILTER NO. ______ TOTAL CONDENSATE 327.0 ml.

ORSAT

	1	2	3	4	AVG
% CO_2					20.4
% O_2					4.5
% CO					
% N_2					

F_O ______ F_O RANGE -

LEAK CHECKS: METER BOX/PUMP ✓

ORSAT BAG ✓ GAS SAMPLE SYSTEM ✓

ORSAT ANALYZER ______

PRE-TEST 0.00 CFM 15 "Hg POST-TEST 0.00 CFM 16 "Hg

BOX OPERATOR Neck PROBE HOLDER Prows

PYROMETER NO. 1 PITOT TUBE NO. 75

PITOT TUBE LEAK CHECK: PRETEST O.K

POST-TEST(+) ______ H_2O ______ SEC

POST-TEST(-) ______ H_2O ______ SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			237.17	.03	1.25	1.25	161	225	68	96	4.0
2		1138	238.60	.03	1.25	1.25	161	257	68	96	4.0
3			240.01	.025	1.25	1.25	161	259	64	96	4.5
4		1143	241.-	.02	1.25	1.25	161	257	59	96	4.5
5			242.81	.02	1.25	1.25	161	256	55	96	5.0
6		1148	244.21	.015	1.25	1.25	161	256	52	96	5.0

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RUN NO. 3

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O)		STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
					CALC.	ACTUAL					
1-7			245.59	.015	1.25	1.25	162	256	49	97	5.5
8		1153	246.98	.015	1.25	1.25	161	257	48	97	5.5
9			248.40	.015	1.25	1.25	160	254	47	97	6.0
10		1158	249.80	.015	1.25	1.25	159	254	46	97	6.0
11			251.20	.03	1.25	1.25	160	261	46	98	6.5
12		1203	252.60	.03	1.25	1.25	159	261	46	98	6.5
			~~2539~~								
2-1			253.96	.05	1.25	1.25	159	256	46	98	7.0
2		1208	255.39	.045	1.25	1.25	160	257	46	99	7.5
3			256.78	.045	1.25	1.25	159	259	46	100	7.5
4		1213	258.19	.04	1.25	1.25	160	261	46	100	8.0
5			259.59	.03	1.25	1.25	159	259	46	101	8.0
6		1218	261.00	.025	1.25	1.25	159	260	46	102	8.5
7			262.40	.02	1.25	1.25	159	258	46	102	9.0
8		1223	263.80	.03	1.25	1.25	159	257	46	102	9.0
9			265.18	.03	1.25	1.25	158	255	45	102	10.0
10		1228	266.60	.03	1.25	1.25	159	257	45	102	10.0
11			268.00	.04	1.25	1.25	159	256	46	102	10.5
12		1233	269.423	.04	1.25	1.25	159	256	46	102	10.5

STACK SAMPLING FIELD DATA SHEET

Engineering

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TEST ID ____

PLANT Seminole Kraft SOURCE No. 2 Lime Kiln

PLANT LOCATION Jacksonville, Florida

TYPE OF SAMPLING TRAIN EPA-6

TYPE OF SAMPLES SO_2

DATE 3-28-89 RUN NO. 1

TIME START 1317 TIME END 1428

SAMPLE TIME ____ min/pt 60 Total min

BAR PRESS. 30.30 "Hg STACK PRESS. 30.30 "Hg

ASSUMED MOISTURE ____ % FDA ____

WEATHER Clear TEMP. ____ °F

METER BOX NO. 1 ΔH ____ Y 1.008

NOMOGRAPH C_f ____ PITOT CORR. FACTOR .84

NOZZLE CALIBRATION ____ ____ ____ = .25

STACK DIMENSIONS 56

STACK AREA 17.104 (EFFECTIVE ____ ft^2)

STACK HEIGHT ____ ft.

STACK DIAMETER: UPSTREAM ____ DOWNSTREAM ____

PORT SIZE ____ in. NIPPLE LENGTH ____

U CORD LENGTH: 150'

REMARKS: ____

2398901C

MAT'L PROCESSING RATE ____

GAS METER READINGS: FINAL 304.331 ft^3

INITIAL 269.700 ft^3

NET 34.631 ft^3

IMPINGERS VOL. GAIN 184 ml.

SILICA GEL NO. 38 WT. GAIN 9.6

FILTER NO. ____ TOTAL CONDENSATE 193.6 ml.

ORSAT

	1	2	3	4	AVG
% CO_2					10.0
% O_2					11.2
% CO					
% N_2					

F_O ____ F_O RANGE -

LEAK CHECKS: METER BOX/PUMP ✓

ORSAT BAG ____ GAS SAMPLE SYSTEM ✓

ORSAT ANALYZER ✓

PRE-TEST 0.00 CFM 14 "Hg POST-TEST 0.00 CFM 18 "Hg

BOX OPERATOR Necis PROBE HOLDER Prows

PYROMETER NO. 1 PITOT TUBE NO. 75

PITOT TUBE LEAK CHECK: PRETEST ____

POST-TEST(+) 2.6 H_2O 15 SEC

POST-TEST(-) 2.2 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)		CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
	1.18	36.06	1.15	271.12	.13	1.25	1.25	147	229	68	102	3.5
	3.75	42.0	1322	272.75	.12	1.25	1.25	145	231	66	101	4.0
	6.61	46.09		274.10	.13	1.25	1.25	143	237	64	101	4.0
	9.91	49.39	1327	275.551	.14	1.25	1.25	147	233	65	101	4.0
	14.0	52.25		277.00	.14	1.25	1.25	144	235	62	101	4.0
	19.94	54.82	1332	278.45	.18	1.25	1.25	146	230	52	101	4.0

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RUN NO. 1

#2 LIME KILN SEMINOLE KRAFT

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7			279.90	.185	1.25	1.25	144	228	48	101	4.0
8		1337	281.37	.19	1.25	1.25	143	231	45	101	4.0
9			282.82	.17	1.25	1.25	144	229	44	101	4.0
10		1342	284.28	.16	1.25	1.25	145	232	44	101	4.5
11			285.75	.16	1.25	1.25	145	235	43	101	4.5
12		1347	287.20	.16	1.25	1.25	145	236	43	101	4.5
2-1			288.65	.13	1.25	1.25	145	234	43	102	5.0
2		1352	290.10	.135	1.25	1.25	144	235	44	102	5.0
3			291.55	.135	1.25	1.25	145	231	43	102	5.0
4		1357	293.01	.135	1.25	1.25	145	237	43	102	5.0
5			294.57	.14	1.25	1.25	144	238	44	101	5.0
6	DOWN 1403 →	1402	295.95	.15	1.25	1.25	144	238	44	101	5.0
7	(LOST LOAD) UP 1412	1414	297.45	.17	1.25	1.25	138	237	45	100	5.0
8		~~1407~~ 1418	298.85	.16	1.25	1.25	138	235	46	99	5.0
9			300.10	.145	1.25	1.25	138	225	45	99	10.0
10		~~1412~~ 1421	301.35	.12	1.25	1.25	139	233	45	99	10.0
11			302.81	.10	1.25	1.25	141	230	46	99	10.0
12		1428 ~~1412~~ 1424	304.331	.10	1.25	1.25	139	234	46	99	10.0

STACK SAMPLING FIELD DATA SHEET

Engineering

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TEST ID ______

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PLANT Seminole Kraft SOURCE No. 2 Lime Kiln
PLANT LOCATION Jacksonville, Florida
TYPE OF SAMPLING TRAIN EPA-6
TYPE OF SAMPLES SO_2
DATE 3-28-89 RUN NO. 3
TIME START 1602 TIME END 1702
SAMPLE TIME ______ min/pt 60 Total min
BAR PRESS. 30.28 "Hg STACK PRESS. 30.28 "Hg
ASSUMED MOISTURE ______ % FDA ______
WEATHER Clear TEMP. ______ °F
METER BOX NO. 1 ΔH ______ Y 1.008
NOMOGRAPH C_f ______ PITOT CORR. FACTOR .84
NOZZLE CALIBRATION ______ ______ ______ = .25
STACK DIMINSIONS 56
STACK AREA 17.104 (EFFECTIVE ______ ft²)
STACK HEIGHT ______ ft.
STACK DIAMETER: UPSTREAM ______ DOWNSTREAM ______
PORT SIZE ______ in. NIPPLE LENGTH ______
U CORD LENGTH: 150'
REMARKS: ______

MAT'L PROCESSING RATE ______
GAS METER READINGS: FINAL 373.442 ft.³
INITIAL 338.930 ft.³
NET 34.512 ft.³
IMPINGERS VOL. GAIN 221 ml.
SILICA GEL NO. 35 WT. GAIN 12.5
FILTER NO. ______ TOTAL CONDENSATE 333.5 ml.

ORSAT	1	2	3	4	AVG
% CO_2					12.2
% O_2					7.8
% CO					
% N_2					

F_O ______ F_O RANGE ______
LEAK CHECKS: METER BOX/PUMP ✓
ORSAT BAG ______ GAS SAMPLE SYSTEM ✓
ORSAT ANALYZER ✓
PRE-TEST 0.00 CFM 11 "Hg POST-TEST 0.00 CFM 15 "Hg
BOX OPERATOR Neck PROBE HOLDER Prows
PYROMETER NO. 1 PITOT TUBE NO. 21
PITOT TUBE LEAK CHECK: PRETEST ______
POST-TEST(+) 4.4 H_2O 15 SEC
POST-TEST(−) 2.9 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			340.27	~~.18~~ .16	1.25	1.25	150	225	71	95	6.5
2		1607	341.73	.17	1.25	1.25	150	266	68	95	6.5
3			343.17	.19	1.25	1.25	149	269	62	95	7.0
4		1612	344.61	.20	1.25	1.25	148	271	61	95	7.0
5			346.06	.21	1.25	1.25	149	268	59	95	7.0
6		1617	347.48	.235	1.25	1.25	149	272	58	95	7.0

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RUN NO. 3
NO. 2 LIME KILN

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7			348.93	.25	1.25	1.25	149	269	58	95	7.5
8		1622	350.36	.225	1.25	1.25	150	271	57	95	7.5
9			351.80	.20	1.25	1.25	146	265	57	95	7.5
10		1627	353.–	.19	1.25	1.25	149	273	57	95	8.0
11			354.68	.17	1.25	1.25	149	270	58	96	8.0
12		1632	356.14	.15	1.25	1.25	148	271	58	96	8.0
2-1			357.58	.175	1.25	1.25	146	267	58	96	8.0
2		1637	359.00	.19	1.25	1.25	148	269	58	96	8.0
3			360.45	.19	1.25	1.25	150	269	60	96	8.5
4		1642	361.90	.185	1.25	1.25	149	273	60	96	8.5
5			363.34	.20	1.25	1.25	146	271	61	96	8.5
6		1647	364.78	.205	1.25	1.25	149	272	62	97	9.0
7			366.23	.22	1.25	1.25	150	269	62	97	9.5
8		1652	367.68	.22	1.25	1.25	149	268	63	98	9.5
9			369.–	.21	1.25	1.25	149	270	64	98	10.0
10		1657	370.55	.16	1.25	1.25	150	268	64	98	10.0
11			371.97	.155	1.25	1.25	149	266	65	99	10.0
12		1702	373.442	.15	1.25	1.25	149	266	65	99	10.0

STACK SAMPLING FIELD DATA SHEET

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TEST ID 2

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PLANT Seminole Kraft SOURCE No. 2 Lime Kiln

PLANT LOCATION Jacksonville, Florida

TYPE OF SAMPLING TRAIN EPA-6

TYPE OF SAMPLES SO_2

DATE 3-28-89 RUN NO. ~~1~~ 2

TIME START 1449 TIME END 1549

SAMPLE TIME ____ min/pt 60 Total min

BAR PRESS. 30.28 "Hg STACK PRESS. 30.28 "Hg

ASSUMED MOISTURE ____ % FDA ____

WEATHER Clear TEMP. ____ °F

METER BOX NO. 1 ΔH 1.96 Y 1.008

NOMOGRAPH C_f ____ PITOT CORR. FACTOR .84

NOZZLE CALIBRATION ____ ____ ____ = .25

STACK DIMENSIONS 56

STACK AREA 17.104 (EFFECTIVE ____ ft^2)

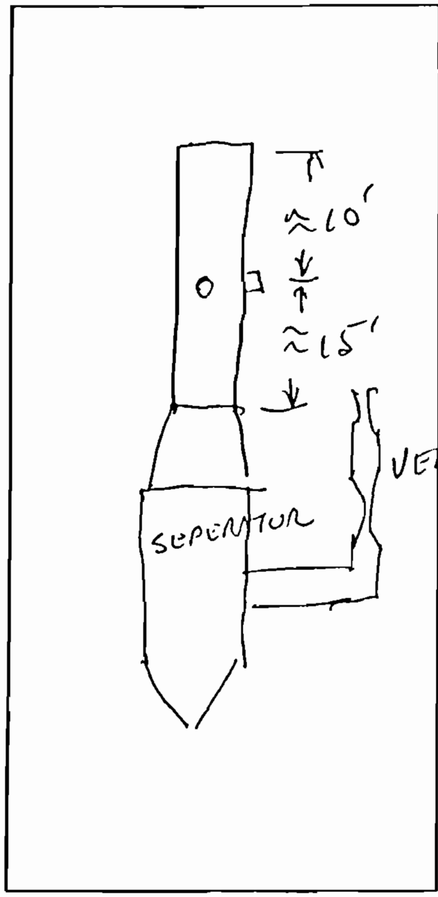
STACK HEIGHT ____ ft.

STACK DIAMETER: UPSTREAM ____ DOWNSTREAM ____

PORT SIZE ____ in. NIPPLE LENGTH ____

U CORD LENGTH: 150

REMARKS: ____



Venturi

MAT'L PROCESSING RATE ____

GAS METER READINGS: FINAL 338.614 ft^3

INITIAL 304.600 ft^3

NET 34.014 ft^3

IMPINGERS VOL. GAIN ~~10~~ 265 ml.

SILICA GEL NO. 19 WT. GAIN 10.1

FILTER NO. ____ TOTAL CONDENSATE 275.1 ml.

ORSAT	1	2	3	4	AVG
% CO_2					~~9.5~~ 13.2
% O_2					9.5
% CO					
% N_2					

F_O ____ F_O RANGE -

LEAK CHECKS: METER BOX/PUMP ✓

ORSAT BAG ____ GAS SAMPLE SYSTEM ✓

ORSAT ANALYZER ——

PRE-TEST 0.00 CFM 17 "Hg POST-TEST 0.00 CFM 13 "Hg

BOX OPERATOR Neer PROBE HOLDER Prows

PYROMETER NO. 1 PITOT TUBE NO. 75

PITOT TUBE LEAK CHECK: PRETEST ____

POST-TEST(+) 3.3 H_2O 15 SEC

POST-TEST(-) 3.6 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			306.08	.17	1.25	1.25	149	226	68	97	3.5
2		1454	307.56	.18	1.25	1.25	149	227	66	97	3.5
3			309.02	.18	1.25	1.25	149	228	60	97	4.0
4		1459	310.43	.20	1.25	1.25	152	233	58	97	4.0
5			311.87	.20	1.25	1.25	152	264	57	97	4.0
6		1504	313.30	.22	1.25	1.25	152	270	56	97	4.5

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RUN NO. 2

#2 LIMEKILN 3-28-89

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O") CALC.	METER ORIFICE PRESS. DIFF. ("H_2O") ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7			314.75	.225	1.25	1.25	154	271	56	97	4.5
8		1509	316.21	.225	1.25	1.25	154	274	56	97	4.5
9			317.61	.20	1.25	1.25	154	273	56	97	5.0
10		1514	319.01	.175	1.25	1.25	156	272	56	97	5.0
11			320.40	.145	1.25	1.25	157	272	56	97	5.0
12		1519	321.77	.11	1.25	1.25	156	273	56	97	5.0
			~~323.12~~		~~1.25~~	~~1.25~~			~~56~~	~~97~~	~~5.0~~
2-1			323.12	.15	1.25	1.25	156	278	56	97	5.0
2		1524	324.57	.170	1.25	1.25	154	275	56	96	5.0
3			325.82	.18	1.25	1.25	155	277	56	96.	5.0
4		1529	327.14	.175	1.25	1.25	156	273	56	96	5.5
5			328.55	.175	1.25	1.25	156	274	57	96	6.0
6		1534	329.95	.195	1.25	1.25	157	274	56	96	6.0
7			331.42	.21	1.25	1.25	156	272	56	96	6.0
8		1539	332.87	.23	1.25	1.25	153	272	56	96	6.5
9			334.30	.21	1.25	1.25	155	271	56	96	6.5
10		1544	335.75	.18	1.25	1.25	155	267	56	96	6.5
11			337.18	.155	1.25	1.25	155	268	56	96	6.5
12		1549	338.614	.13	1.25	1.25	154	266	55	96	6.5

STACK SAMPLING FIELD DATA SHEET

Consulting and Engineering
2601 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606

TEST ID ______

PAGE ____ OF ____

PLANT Seminole Kraft SOURCE No. 3 Lime Kiln

PLANT LOCATION Jacksonville, Florida

TYPE OF SAMPLING TRAIN EPA 6

TYPE OF SAMPLES SO_2

DATE 3-27-85 RUN NO. 4

TIME START 1403 TIME END 1503

SAMPLE TIME ____ min/pt 60 Total min

BAR PRESS. 30.48 "Hg STACK PRESS. 30.48 "Hg

ASSUMED MOISTURE ____ % FDA ____

WEATHER Clear TEMP. ____ °F

METER BOX NO. 1 ΔH ____ Y 1.008

NOMOGRAPH C_f ____ PITOT CORR. FACTOR .84

NOZZLE CALIBRATION ____ ____ ____ = .25

STACK DIMENSIONS 44

STACK AREA 10.56 (EFFECTIVE ____ ft²)

STACK HEIGHT ____ ft.

STACK DIAMETER: UPSTREAM ____ DOWNSTREAM ____

PORT SIZE ____ in. NIPPLE LENGTH ____

U CORD LENGTH: ____

REMARKS: ____

MAT'L PROCESSING RATE No NCG

GAS METER READINGS: FINAL 99.752 ft.³

INITIAL 65.718 ft.³

NET 34.034 ft.³

IMPINGERS VOL. GAIN 166 ml.

SILICA GEL NO. 41 WT. GAIN 8.2

FILTER NO. ____ TOTAL CONDENSATE 174.2 ml.

ORSAT

	1	2	3	4	AVG
% CO_2	13.4	13.5	13.5		13.5
% O_2	9.4	9.5	9.4		9.4
% CO					
% N_2					

F_O ____ F_O RANGE -

LEAK CHECKS: METER BOX/PUMP ____

ORSAT BAG ____ GAS SAMPLE SYSTEM ____

ORSAT ANALYZER ____

PRE-TEST 0.00 CFM 15 "Hg POST-TEST 0.00 CFM 14 "Hg

BOX OPERATOR Neek PROBE HOLDER Orser

PYROMETER NO. 1 PITOT TUBE NO. 75

PITOT TUBE LEAK CHECK: PRETEST O.K

POST-TEST(+) 4.4 H_2O 15 SEC

POST-TEST(-) 4.1 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			67.16	.27	1.25	1.25	139	258	68	103	6.0
2		1408	68.62	.26	1.25	1.25	140	257	63	103	6.0
3			70.05	.26	1.25	1.25	140	258	58	102	6.0
4		1413	71.48	.24	1.25	1.25	140	260	57	102	6.0
5			72.88	.27	1.25	1.25	140	262	58	102	6.0
6		1418	74.38	.34	1.25	1.25	139	261	58	101	6.0

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PAGE ______ OF ______

RUN NO. ______

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7			75.66	.24	1.25	1.25	139	259	59	100	6.5
8		1423	77.08	.19	1.25	1.25	139	259	59	99	6.5
9			78.54	.15	1.25	1.25	141	257	59	99	7.0
10		1428	79.96	.14	1.25	1.25	140	255	60	98	7.0
11			81.40	.13	1.25	1.25	140	258	60	98	7.0
12		1433	82.80	.13	1.25	1.25	139	257	60	97	7.0
			~~84.30~~								
2-1			84.30	.25	1.25	1.25	139	257	60	96	7.5
2		1438	85.67	.26	1.25	1.25	139	257	60	95	7.5
3		1	87.10	.24	1.25	1.25	139	257	60	95	7.5
4		1443	88.53	.24	1.25	1.25	140	257	60	95	8.0
5			89.96	.29	1.25	1.25	140	256	60	95	8.0
6		1448	91.46	.34	1.25	1.25	139	254	60	95	8.0
7			92.80	.29	1.25	1.25	139	253	60	94	8.0
8		1453	94.17	.20	1.25	1.25	139	253	60	94	8.0
9			95.58	.18	1.25	1.25	139	255	61	93	8.5
10		1458	97.00	.16	1.25	1.25	139	256	61	93	8.5
11			98.36	.16	1.25	1.25	139	257	61	92	8.5
12		1503	99.752	.16	1.25	1.25	139	257	61	92	8.5

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STACK SAMPLING FIELD DATA SHEET

TEST ID ______ PAGE ______ OF ______

PLANT Seminole Kraft SOURCE No. 3 Lime Kiln
PLANT LOCATION Jacksonville, Florida
TYPE OF SAMPLING TRAIN EPA-6
TYPE OF SAMPLES SO_2
DATE 3-27-89 RUN NO. 5
TIME START 1518 TIME END 1618
SAMPLE TIME ______ min/pt 60 Total min
BAR PRESS. 30.48 "Hg STACK PRESS. 30.48 "Hg
ASSUMED MOISTURE ______ % FDA ______
WEATHER Clear TEMP. ______ °F
METER BOX NO. 1 ΔH ______ Y 1.008
NOMOGRAPH C_f ______ PITOT CORR. FACTOR .84
NOZZLE CALIBRATION ______ ______ = .25
STACK DIMENSIONS 44" Ø
STACK AREA 10.56 (EFFECTIVE ______ ft²)
STACK HEIGHT ______ ft.
STACK DIAMETER: UPSTREAM ______ DOWNSTREAM ______
PORT SIZE ______ in. NIPPLE LENGTH ______
U CORD LENGTH: 150
REMARKS: ______

MAT'L PROCESSING RATE NCG OFF
GAS METER READINGS: FINAL 133.592 ft³
INITIAL 99.956 ft³
NET 33.636 ft³
IMPINGERS VOL. GAIN ~~168~~ 169 ml.
SILICA GEL NO. 20 WT. GAIN 7.5
FILTER NO. ______ TOTAL CONDENSATE 176.5 ml.

ORSAT	1	2	3	4	AVG
% CO_2	13.6	13.6	13.6		13.6
% O_2	9.2	9.2	9.2		9.2
% CO					
% N_2					

F_0 ______ F_0 RANGE ______
LEAK CHECKS: METER BOX/PUMP ______
ORSAT BAG ______ GAS SAMPLE SYSTEM ______
ORSAT ANALYZER ______
PRE-TEST 0.00 CFM ______ "Hg POST-TEST 0.00 CFM 13 "Hg
BOX OPERATOR Neek PROBE HOLDER Gabez
PYROMETER NO. 1 PITOT TUBE NO. 75
PITOT TUBE LEAK CHECK: PRETEST ______
POST-TEST(+) 4.1 H_2O 15 SEC
POST-TEST(–) 4.1 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			101.47	.23	1.25	1.25	140	230	66	90	3.5
2		1523	102.95	.24	1.25	1.25	139	240	57	90	3.5
3			104.38	.25	1.25	1.25	139	257	53	90	3.5
4		1528	105.80	.22	1.25	1.25	140	247	53	90	3.5
5			107.20	.24	1.25	1.25	140	248	53	90	3.5
6		1533	108.60	.29	1.25	1.25	141	250	53	90	4.0

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PAGE ______ OF ______

RUN NO. ______

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O)		STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
					CALC.	ACTUAL					
1-7			110.—	.29	1.25	1.25	140	250	53	90	4.0
8		1538	111.35	.22	1.25	1.25	140	251	53	90	4.0
9			112.—	.20	1.25	1.25	140	253	52	90	4.0
10		1543	114.01	.18	1.25	1.25	140	250	52	90	4.0
11			115.33	.17	1.25	1.25	140	250	52	90	4.0
12		1548	116.70	.17	1.25	1.25	140	247	52	90	4.5
2-1			118.13	.26	1.25	1.25	140	249	51	90	5.0
2		1553	119.54	.25	1.25	1.25	140	250	57	90	5.0
3			120.95	.24	1.25	1.25	140	247	51	90	5.0
4		1558	122.33	.25	1.25	1.25	140	247	51	90	5.0
5			123.77	.28	1.25	1.25	140	248	51	90	5.0
6		1603	125.17	.33	1.25	1.25	140	254	51	90	5.5
7			126.56	.27	1.25	1.25	140	250	51	90	5.5
8		1608	127.94	.21	1.25	1.25	140	250	51	90	5.5
9			129.35	.18	1.25	1.25	141	252	51	90	6.0
10		1613	130.68	.17	1.25	1.25	141	255	51	90	6.0
11			132.20	.17	1.25	1.25	140	254	52	90	6.0
12		1618	133.592	.17	1.25	1.25	140	256	51	90	6.0

STACK SAMPLING FIELD DATA SHEET

Air Consulting and Engineering

2106 N.W. 67th PLACE, SUITE 4
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TEST ID ______

PAGE ______ OF ______

PLANT Seminole Kraft SOURCE No. 3 Lime Kiln

PLANT LOCATION Jacksonville, Florida

TYPE OF SAMPLING TRAIN EPA-6

TYPE OF SAMPLES SO_2

DATE 3-27-89 RUN NO. 6

TIME START 1633 TIME END 1733

SAMPLE TIME 1 min/pt 60 Total min

BAR PRESS. 30.48 "Hg STACK PRESS. 30.48 "Hg

ASSUMED MOISTURE ____ % FDA .20 "H_2O

WEATHER Clear TEMP. ____ °F

METER BOX NO. 1 ΔH ____ Y 1.008

NOMOGRAPH C_f ____ PITOT CORR. FACTOR .84

NOZZLE CALIBRATION ____ ____ ____ = .25

STACK DIMENSIONS 44

STACK AREA 10.56 (EFFECTIVE ____ ft^2)

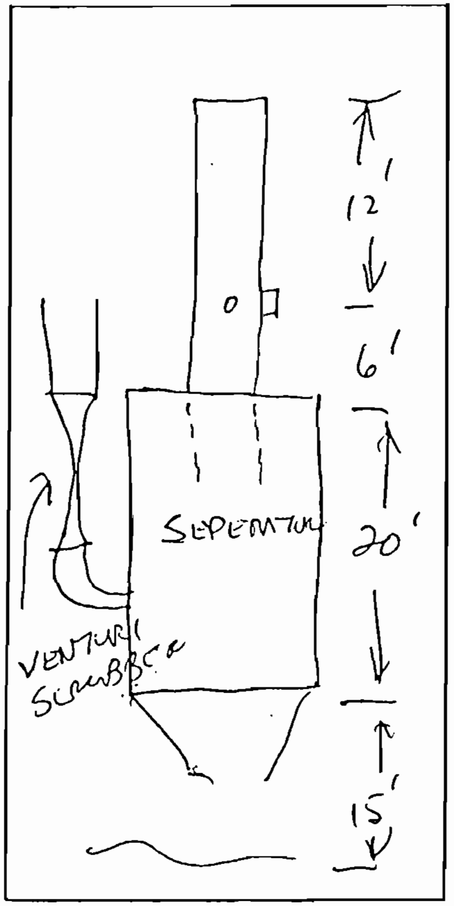
STACK HEIGHT ____ ft.

STACK DIAMETER: UPSTREAM ____ DOWNSTREAM ____

PORT SIZE ____ in. NIPPLE LENGTH ____

U CORD LENGTH: 150

REMARKS: ____



MAT'L PROCESSING RATE No NCG

GAS METER READINGS: FINAL 167.568 ft^3

INITIAL 133.741 ft^3

NET 33.827 ft^3

IMPINGERS VOL. GAIN 168 ml.

SILICA GEL NO. 14 WT. GAIN 10.4

FILTER NO. ____ TOTAL CONDENSATE 178.4 ml

ORSAT

	1	2	3	4	AVG
% CO_2	13.5	14.1	14.1		13.9
% O_2	9.4	8.8	8.8		9.0
% CO					
% N_2					

F_O ____ F_O RANGE ____

LEAK CHECKS: METER BOX/PUMP ____

ORSAT BAG ____ GAS SAMPLE SYSTEM ____

ORSAT ANALYZER ____

PRE-TEST 0.00 CFM ____ "Hg POST-TEST 0.00 CFM 15 "Hg

BOX OPERATOR Neck PROBE HOLDER Grabez

PYROMETER NO. ____ PITOT TUBE NO. ____

PITOT TUBE LEAK CHECK: PRETEST ____

POST-TEST(+) 4.1 H_2O 15 SEC

POST-TEST(-) 4.5 H_2O 15 SEC

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN.)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP (°F)	SAMPLE BOX TEMP (°F)	LAST IMPINGER TEMP (°F)	DRY GAS METER TEMP (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			135.14	.27	1.25	1.25	139	258	68	88	6.0
2		1638	136.55	.27	1.25	1.25	139	256	64	88	7.0
3			137.96	.29	1.25	1.25	140	254	60	88	7.0
4		1643	139.[illegible]	.30	1.25	1.25	141	254	58	88	7.0
5			140.81	.33	1.25	1.25	140	250	58	87	7.0
6		1648	142.23	.39	1.25	1.25	140	251	58	87	7.5

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Air Consulting and Engineering

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PAGE ______ OF ______

RUN NO. ______

PORT AND TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE STACK WALL (IN)	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF. ("H_2O) CALC.	METER ORIFICE PRESS. DIFF. ("H_2O) ACTUAL	STACK GAS TEMP. (°F)	SAMPLE BOX TEMP. (°F)	LAST IMPINGER TEMP. (°F)	DRY GAS METER TEMP. (°F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-7			143.63	.34	1.25	1.25	139	253	58	87	7.5
8		1653	145.05	.30	1.25	1.25	140	255	57	88	7.5
9			146.44	.23	1.25	1.25	140	255	57	88	7.5
10		1658	147.85	.24	1.25	1.25	141	252	58	88	7.5
11			149.25	.21	1.25	1.25	140	252	58	89	8.0
12		1703	150.67	.20	1.25	1.25	140	254	58	89	8.0
2-1			152.05	.25	1.25	1.25	140	253	59	89	8.5
2		1708	153.46	.24	1.25	1.25	141	251	59	89	8.5
3			154.90	.24	1.25	1.25	141	251	59	88	8.5
4		1713	156.30	.25	1.25	1.25	140	254	59	88	8.5
5			157.70	.29	1.25	1.25	140	255	60	88	8.5
6		1718	159.10	.32	1.25	1.25	140	255	60	89	9.0
7			160.—	.24	1.25	1.25	139	251	59	89	9.0
8		1723	161.90	.20	1.25	1.25	141	250	60	88	9.0
9			163.30	.17	1.25	1.25	140	249	60	88	9.5
10		1728	164.74	.17	1.25	1.25	139	253	61	88	10.0
11			166.15	.17	1.25	1.25	139	253	61	88	10.0
12		1733	167.568	.18	1.25	1.25	139	252	61	88	10.0

APPENDIX C

LABORATORY ANALYSES

AIR CONSULTING AND ENGINEERING

SO_2
LAB DATA

Plant Name Seminole Kraft Date Analyzed 4/6/89
Analyzed By Dagma Meck

Stack	Sample No.	V.T.	V.T.B.	N.	V.Soln.	V.A.
#1 Lime Kiln						
	R-1	0.6/0.5	0.1	.01	596	20 ml
	R-2	0.6/0.6	↓	↓	604	↓
	R-3	0.4/0.4	↓	↓	626	↓

V.T. = Volume of Barium perchlorate titrant used for sample (ml)
V.T.B. = Volume of Barium perchlorate titrant used for blank (ml)
N. = Normality of Barium perchlorate
V.Soln. = Total solution volume
V.A. = Volume of sample aliquot titrated (ml)

AIR CONSULTING AND ENGINEERING

SO_2
LAB DATA

Plant Name Seminole Kraft Date Analyzed 4/6/89

Analyzed By Dagmar Neck

Stack	Sample No.	V.T.	V.T.B.	N.	V.Soln.	V.A.
#2 Lime Kiln						
	R-1	0.2/0.2	0.1	0.01	4~~70~~	20
	R-2	0.2/0.15			552	
	R-3	0.25/0.25			485	

V.T. = Volume of Barium perchlorate titrant used for sample (ml)
V.T.B. = Volume of Barium perchlorate titrant used for blank (ml)
N. = Normality of Barium perchlorate
V.Soln. = Total solution volume
V.A. = Volume of sample aliquot titrated (ml)

AIR CONSULTING AND ENGINEERING

SO_2
LAB DATA

Plant Name Seminole Kraft Date Analyzed 4/6/89

Analyzed By Dagmar [illegible]

Stack	Sample No.	V.T.	V.T.B.	N.	V.Soln.	V.A.
#3 Lime Kiln						
	R-1	1.05/1.05	0.1	0.01	445	20ml
	R-2	0.7/0.7	|	|	445	|
	R-3	0.45/0.5	|	|	475	|
	R-4	1.15/1.1	|	|	440	|
	R-5	0.45/0.45	|	|	455	|
	R-6	0.4/0.35	↓	↓	440	↓

V.T. = Volume of Barium perchlorate titrant used for sample (ml)
V.T.B. = Volume of Barium perchlorate titrant used for blank (ml)
N. = Normality of Barium perchlorate
V.Soln. = Total solution volume
V.A. = Volume of sample aliquot titrated (ml)

APPENDIX D

QUALITY AND ASSURANCE AND CHAIN OF CUSTODY

STANDARD METER CALIBRATION

Air Consulting and Engineering, Inc. (ACE) uses a dry gas meter for the calibration standard. This meter has been calibrated against a wet test meter in triplicate. This data was used to generate a standard meter calibration curve (see next page). Field meter calibrations are corrected to this curve using the following formula:

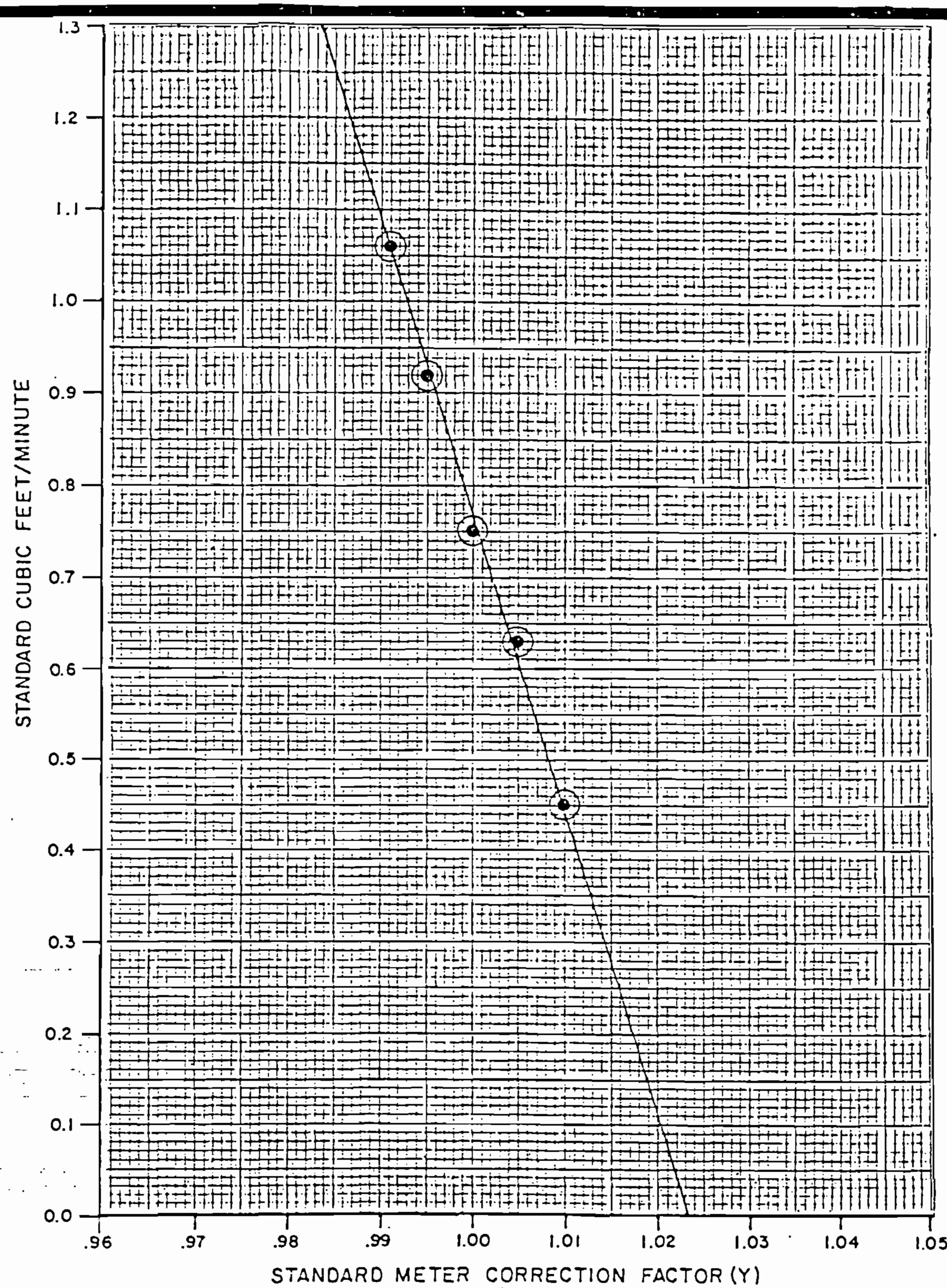
$$Y_a \times Y_s = Y$$

Y_a = actual ratio of field meter to standard meter

Y_s = ratio of standard meter to wet test meter at a given flow rate (from Calibration Curve)

Y = corrected ratio of field meter

The dry standard meter was calibrated on February 16, 1989, and is checked and/or recalibrated at least annually.



STANDARD METER CALIBRATION CURVE

FEBRUARY 16, 1989

AIR CONSULTING and ENGINEERING

AIR CONSULTING & ENGINEERING — STANDARD METER CALIBRATION.

DATE 2-16-89

LEAK CHECK 0.000 CFM at 15 In. Hg.

METER BOX NUMBER 691751

BAROMETRIC PRESSURE 30.30 In. Hg.

STD GAS METER TEMPERATURE 77 °F/ ASTM GLASS THERMOMETER TEMPERATURE 77 °F

WET ΔH	STD ΔH	GAS VOLUME, WET TEST METER			GAS VOLUME, STD GAS METER			TEMP WET TEST METER (°F)	TEMP OF STD. METER (°F)	TIME (Minutes)
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3			
-0.1	-1.6	0	5.455	5.455	283.530	288.932	5.402	79	77	12
-0.1	-1.6	0	5.450	5.450	288.952	294.353	5.401	79	77	12
-0.1	-1.6	0	5.443	5.443	294.353	299.743	5.390	79	77	12
-0.2	-2.5	0	5.632	5.632	300.315	305.934	5.619	79	77	9
-0.2	-2.5	0	5.618	5.618	305.934	311.545	5.611	79	77	9
-0.2	-2.5	0	5.620	5.620	311.545	317.150	5.605	79	77	9
-0.2	-3.5	0	5.264	5.264	317.717	323.007	5.290	79	77	7
-0.2	-3.5	0	5.283	5.283	323.007	328.309	5.302	79	77	7
-0.2	-3.5	0	5.248	5.248	328.309	333.589	5.280	79	77	7
-0.2	-5.2	0	5.529	5.529	334.112	339.731	5.619	78	77	6
-0.2	-5.2	0	5.532	5.532	339.731	345.341	5.610	78	77	6
-0.2	-5.2	0	5.532	5.530	345.341	350.961	5.620	78	77	6
-0.2	-6.7	0	5.303	5.303	351.410	356.838	5.428	78	77	5
-0.2	-6.7	0	5.295	5.295	356.838	362.258	5.420	78	77	5
-0.2	-6.7	0	5.290	5.290	362.258	367.678	5.420	78	77	5

CALIBRATED BY: George F. Gabel

	Y	SCFM	Y	SCFM	Y	SCFM	Y	SCFM	Y	SCFM
Test 1	1.010	0.451	1.005	0.621	1.000	0.746	0.995	0.916	0.992	1.055
Test 2	1.009	0.451	1.004	0.620	1.002	0.749	0.997	0.917	0.992	1.053
Test 3	1.010	0.450	1.006	0.620	0.999	0.744	0.995	0.916	0.991	1.052
Average	1.010	0.451	1.005	0.620	1.000	0.746	0.996	0.916	0.992	1.053

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AIR CONSULTING & ENGINEERING — ANNUAL METER CALIBRATION

DATE 10-13-88 LEAK CHECK 0.000 CFM at 10 In. Hg.

METER BOX NUMBER 1 BAROMETRIC PRESSURE 30.24 In. Hg.

DRY GAS METER TEMPERATURE 64 °F/ASTM GLASS THERMOMETER TEMPERATURE 64 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP STD METER	TEMP OF DRY METER	TIME (Minutes)	TIMER
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3				
-0.05	0.5	366.719	371.917	5.198	275.225	280.318	5.093	65	66	14	14
-0.12	1.0	372.350	377.634	5.284	280.740	285.9[illegible]	5.161	65	65	10	10
-0.15	1.5	377.854	383.111	5.257	286.115	291.281	5.166	65	67	8	8
-0.21	2.0	358.621	366.022	7.401	267.158	274.539	7.381	65	66	10	10
-0.33	3.0	383.756	389.311	5.555	291.917	297.387	5.470	67	69	6	6
-0.42	4.0	390.556	395.886	5.330	298.613	303.872	5.259	68	70	5	5

Delta-H	SCFM	Y_m	Y_w	Y
1.992	0.377	1.021	1.004	1.025
1.970	0.537	1.022	0.999	1.021
1.903	0.668	1.018	0.996	1.014
2.004	0.753	1.000	0.993	0.993
1.923	0.938	1.013	0.988	1.001
1.937	1.079	1.009	0.986	0.995
Mean: 1.955				1.008

CALIBRATED BY: G. F. Gebel

AIR CONSULTING & ENGINEERING — POST TEST CALIBRATION

DATE 4-12-89 METER BOX NUMBER 1 LEAK CHECK 0.000 CFM at 17 In. Hg.

CLIENT SEMINOLE KRAFT SOURCE LIME KILN 1,2,3 THERMOCOUPLE NUMBER 75 PYROMETER NUMBER 1

FLIGHT SERVICE Pb 30.22 In. Hg. ACE BAROMETER Pb 30.22 In. Hg.

ASTM GLASS THERMOMETER 145 °F / THERMOCOUPLE 145 °F ASTM GLASS THERMOMETER 56 °F / METER TEMP 56 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER INITIAL	FINAL	ACTUAL ft^3	GAS VOLUME, DRY GAS METER INITIAL	FINAL	ACTUAL ft^3	TEMP. STANDARD METER	TEMP. OF DRY METER	TIME (Minutes)	MAX. VACUUM In. Hg
.14	1.25	886.500	892.418	5.918	859.279	865.278	5.999	60	60	10	11
.14	1.25	892.418	898.359	5.941	865.278	871.314	6.036	60	60	10	11
.14	1.25	898.359	903.695	5.336	871.314	876.736	5.422	60	60	9	11

	DELTA H	Ya	SCFM	Ys	Y
	1.947	0.9835	0.6069	1.0050	0.9884
	1.932	0.9813	0.6093	1.0050	0.9862
	1.940	0.9812	0.6080	1.0050	0.9861
MEAN:	1.939	0.9820		1.0050	0.9869

CALIBRATED BY: Gregory R. Crowe

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PYROMETER CALIBRATION

Date 9-1-88 Pyrometer No. METER BOX # 1

Source (Specify)	Glass Thermometer With NBS Mercury (°F)	Pyrometer (°F)	Degree Difference	% Difference
OVEN	258	260	2	0.28
AMBIENT	78	77	1	0.19
ICE BATH	39	42	3	0.60

FDER - Maximum 5° difference

EPA $\left[\frac{(\text{Ref. temp. °F} + 460) - (\text{Pyrometer temp. °F} + 460)}{\text{Ref. temp. °F} + 460}\right] 100 \leq 1.5\%$

Calibrated by [signature]

air Consulting and Engineering

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 3-15-89 PITOT TUBE 75

Pitot tube assembly level? YES yes ______ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

α_1 = 0 ° (<10°), α_2 = 1 ° (<10°), β_1 = 4 ° (<5°),

β_2 = 0 ° (<5°)

γ = 1 °, θ = 2 °, A = ______ in. = (Pa + Pb)

z = A sin γ = ______ in. ; <0.32 <1/8 in.

w = A sin θ = ______ in. ; <0.08 <1/32 in.

P_A .519 in. P_b .496 in. $\overline{D_t}$ = ______

Calibration required? ✓ yes ______ no

THERMOCOUPLE CALIBRATION

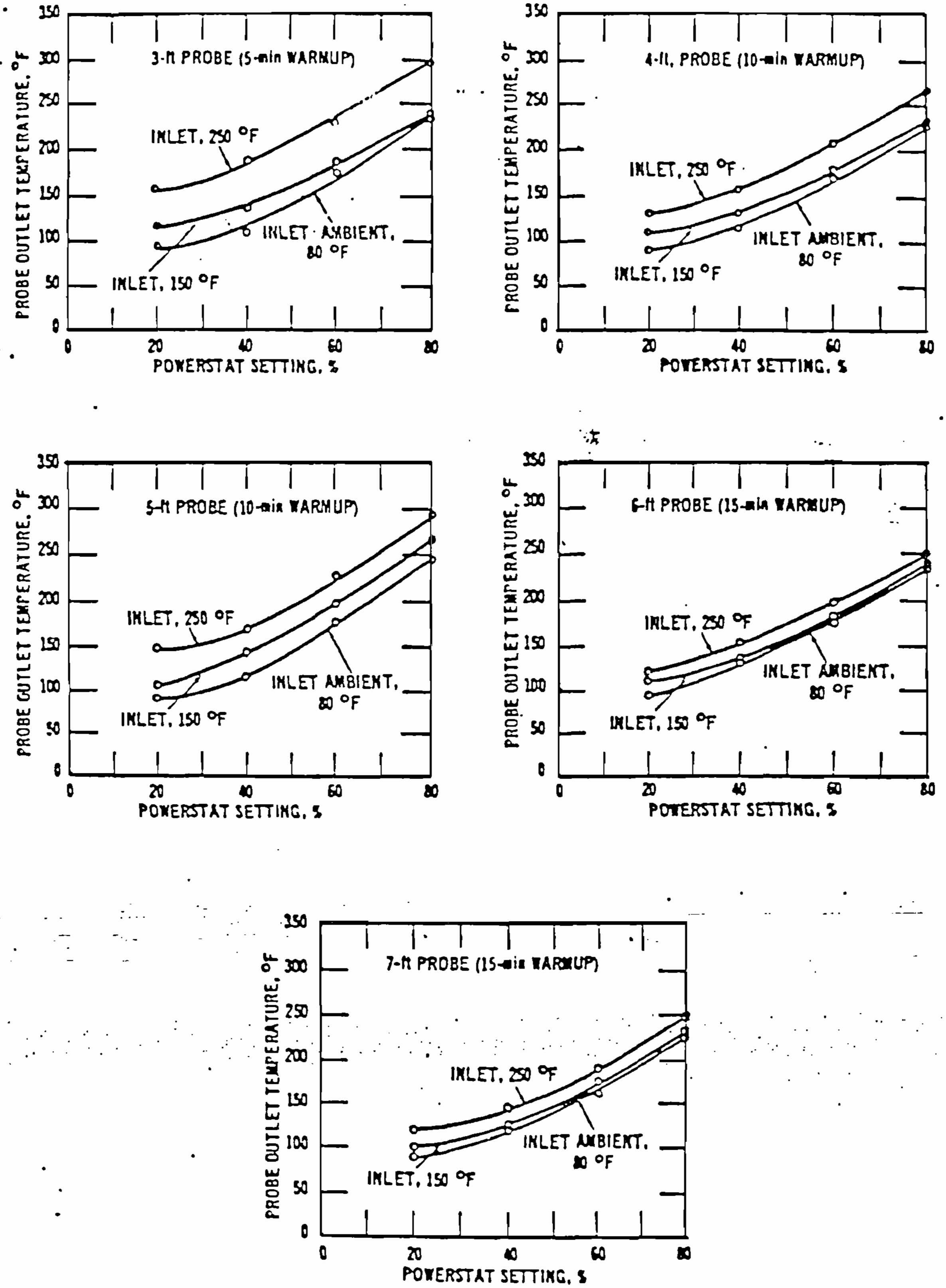
Date 3-15-89 Thermocouple No. 75

Source (Specify)	ASTM Glass Thermometer With Mercury (°F)	Pyrometer (°F)	Degree Difference	% Difference
AMBIENT	84	83	1	
OVEN	310	310	0	
ICE BATH	39	39	0	

FDER - Maximum 5° difference

EPA $\left[\frac{(\text{Ref. temp. °F} + 460) - (\text{Pyrometer temp. °F} + 460)}{\text{Ref. temp. °F} + 460}\right] 100 \leq 1.5\%$

Calibrated by Gregory R. Brown



NOTE: Flow rate held constant at 0.75; 50% change in flow rate has little effect on probe temperature.

Probe temperatures.

APPENDIX E

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

ACE

Stephen L. Neck, P.E.	Project Manager Field Team Leader
Gregory R. Prows	Field Participant Post Test Calibration
J. Colleen Hodge	Report Graphics
Dagmar Neck	Laboratory Analysis Report Preparation
Karie L. Philman	Computer Analysis Document Production

SEMINOLE KRAFT CORPORATION

Becky Bradeen	Test Coordinator
Raymont Pevy	Production Data
Richard Mattson	Production Data

SOURCE EMISSION TEST REPORT
SEMINOLE KRAFT CORPORATION
JACKSONVILLE, FLORIDA

AUGUST 30- SEPTEMBER 2nd, 1989

SULFUR DIOXIDE EMISSIONS
LIME KILN #2 & #3

PREPARED BY:

TECHNICAL SERVICES, INC.
2471 SWAN STREET
POST OFFICE BOX 52329
JACKSONVILLE, FLORIDA 32201

Harvey C. Gray, Jr.

HARVEY C. GRAY, JR.

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TABLE I

SULFUR DIOXIDE EMISSIONS SUMMARY
LIME KILN #2

SEMINOLE KRAFT CORPORATION
JACKSONVILLE, FLORIDE

DATE	TIME	VOLUMETRIC FLOW		SULFUR DIOXIDE EMISSION		
		ACFM[1]	SCFMD[2]	LBS/FT^3	LBS/HR	PPM (VOL)
9/2/89	1030 - 1158	20,609	13,988	5.584 X 10^{-6}	4.69	33.7
9/2/89	1237 - 1405	20,609	13,988	7.907 X 10^{-6}	6.64	47.8
9/2/89	1441 - 1613	20,609	13,988	8.027 X 10^{-6}	6.78	48.5
AVERAGE		20,609	13,988	7.173 X 10^{-6}	6.04	43.3

10% O_2 4 ppm TRS

[1] ACFM--------Actual Cubic Feet per Minute, stack conditions.

[2] SCFMD-------Standard Cubic Feet per Minute, Dry. Standard Conditions are 68°F and 29.92 in Hg pressure.

TABLE II

SULFUR DIOXIDE EMISSIONS SUMMARY
LIME KILN #3

SEMINOLE KRAFT
JACKSONVILLE, FLORIDA

DATE	TIME	VOLUMETRIC FLOW ACFM[1]	VOLUMETRIC FLOW SCFMD[2]	SULFUR DIOXIDE EMISSION LBS/FT[3]	SULFUR DIOXIDE EMISSION LBS/HR	SULFUR DIOXIDE EMISSION PPM (VOL)
8/30/89	1035 - 1204	17,321	11,546	12.227×10^{-6}	8.51	74.2
8/30/89	1238 - 1409	17,321	11,546	9.835×10^{-6}	6.81	59.4
8/30/89	1437 - 1612	17,321	11,546	4.315×10^{-6}	2.99	26.1
AVERAGE		17,321	11,546	8.792×10^{-6}	6.10	53.2

4 TRS 3.80 O2

[1] ACFM----------Actual Cubic Feet per Minute, stack conditions.

[2] SCFMD---------Standard Cubic Feet per Minute, Dry. Standard Conditions are 68°F and 29.92 in Hg pressure.

INTRODUCTION

Sulfur dioxide (SO_2) was determined using EPA Method 6. Volumetric flow rates were determined using EPA Methods 2 and 3, so that mass emissions could be calculated.

We wish to express our appreciation to Mr. Mike Riddle and staff, for their valuable assistance in coordinating this project with the mill operating personnel.

RESULTS AND DISCUSSION

A summary of the Sulfur Dioxide emissions is presented in Tables I & II. Lime Kiln #2 SO_2 emissions averaged 6.04 lbs/hr or 43.3 PPM. The average SO_2 emissions for Lime Kiln #3 were 6.10 lbs/hr or 53.2 PPM.

DESCRIPTION OF METHODS EMPLOYED

Method 6—Determination of Sulfur Dioxide Emissions From Stationary Sources

[Method 6 amended by 52 FR 41424, October 28, 1987]

1. *Principle and Applicability*

1.1 Principle. A gas sample is extracted from the sampling point in the stack. The sulfuric acid mist (including sulfur trioxide) and the sulfur dioxide are separated. The sulfur dioxide fraction is measured by the barium-thorin titration method.

1.2 Applicability. This method is applicable for the determination of sulfur dioxide emissions from stationary sources. The minimum detectable limit of the method has been determined to be 3.4 milligrams (mg) of SO_2/m^3 (2.12×10^{-7} lb/ft^3). Although no upper limit has been established, tests have shown that concentrations as high as 80,000 mg/m^3 of SO_2 can be collected efficiently in two midget impingers, each containing 15 milliliters of 3 percent hydrogen peroxide, at a rate of 1.0 lpm for 20 minutes. Based on theoretical calculations, the upper concentration limit in a 20-liter sample is about 93,300 mg/m^3.

Possible interferents are free ammonia, water-soluble cations, and fluorides. The cations and fluorides are removed by glass wool filters and an isopropanol bubbler, and hence do not affect the SO_2 analysis. When samples are being taken from a gas stream with high concentrations of very find metallic fumes (such as in inlets to control devices), a high-efficiency glass fiber filter must be used in place of the glass wool plug (i.e., the one in the probe) to remove the cation interferents.

Free ammonia interferes by reacting with SO_2 to form particulate sulfite and by reacting with the indicator. If free ammonia is present (this can be determined by knowledge of the process and noticing white particulate matter in the probe and isopropanol bubbler), alternative methods, subject to the approval of the Administrator, U.S. Environmental Protection Agency, are required.

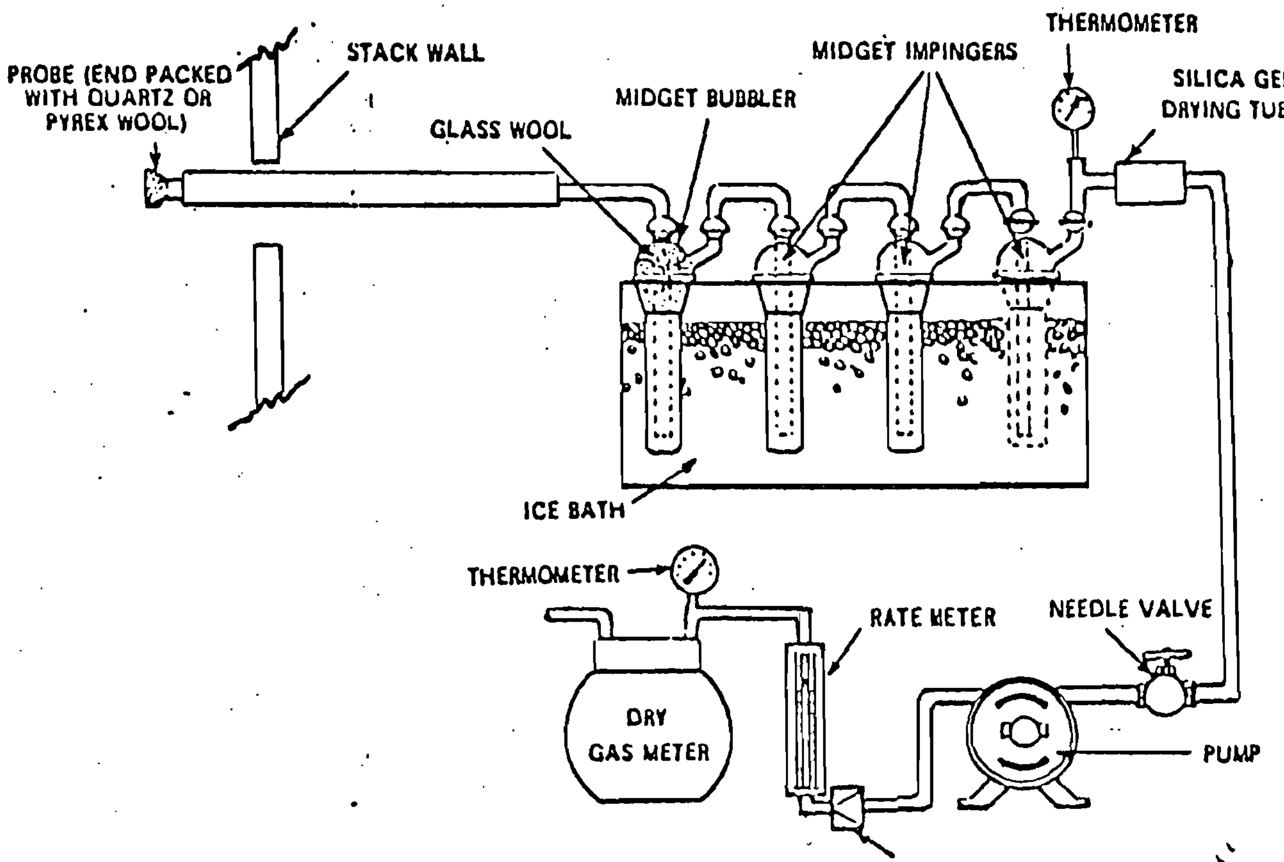

Figure 2 SO_2 sampling train.

2. *Apparatus*

2.1 Sampling. The sampling train is shown in Figure 6-1, and component parts are discussed below. The tester has the option of substituting sampling equipment described in Method 8 in place of the midget impinger equipment of Method 6. However, the Method 8 train must be modified to include a heated filter between the probe and isopropanol impinger, and the operation of the sampling train and sample analysis must be at the flow rates and solution volumes defined in Method 8.

The tester also has the option of determining SO_2 simultaneously with particulate matter and moisture determinations by (1) replacing the water in a Method 5 impinger system with 3 percent peroxide solution, or (2) by replacing the Method 5 water impinger system with a Method 8 isopropanol-filter-peroxide system. The analysis for SO_2 must be consistent with the procedure in Method 8.

2.1.1 Probe. Borosilicate glass, or stainless steel (other materials of construction may be used, subject to the approval of the Administrator), approximately 6-mm inside diameter, with a heating system to prevent water condensation and a filter (either in-stack or heated outstack) to remove particulate matter, including sulfuric acid mist. A plug of glass wool is a satisfactory filter.

2.1.2 Bubbler and Impingers. One midget bubbler, with medium-coarse glass frit and borosilicate or quartz glass wool packed in top (see Figure 6-1) to prevent sulfuric acid mist carryover, and three 30-ml midget impingers. The bubbler and midget impingers must be connected in series with leak-free glass connectors. Silicone grease may be used, if necessary, to prevent leakage.

At the option of the tester, a midget impinger may be used in place of the midget bubbler.

Other collection absorbers and flow rates may be used, but are subject to the approval of the Administrator. Also, collection efficiency must be shown to be at least 99 percent for each test run and must be documented in the report. If the efficiency is found to be acceptable after a series of three tests, further documentation is not required. To conduct the efficiency test, an extra absorber must be added and analyzed separately. This extra absorber must not contain more than 1 percent of the total SO_2.

2.1.3 Glass Wool. Borosilicate or quartz.

2.1.4 Stopcock Grease. Acetone-insoluble, heatable silicone grease may be used, if necessary.

2.1.5 Temperature Gauge. Dial thermometer, or equivalent, to measure temperature of gas leaving impinger train to within 1° C (2° F.)

2.1.6 Drying Tube. Tube packed with 6- to 16-mesh indicating type silica gel, or equivalent, to dry the gas sample, and to protect the meter and pump. If the silica gel has been used previously, dry at 175° C (350° F) for 2 hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to approval of the Administrator.

2.1.7 Valve. Needle valve, to regulate sample gas flow rate.

2.1.8 Pump. Leak-free diaphragm pump, or equivalent, to pull gas through the train. Install a small surge tank between the pump and rate meter to eliminate the pulsation effect of the diaphragm pump on the rotameter.

2.1.9. Rate Meter. Rotameter, or equivalent, capable of measuring flow rate to within 2 percent of the selected flow rate of about 1000 cc/min.

2.1.10 Volume Meter. Dry gas meter, sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate and conditions actually encountered during sampling, and equipped with a temperature gauge (dial thermometer, or equivalent) capable of measuring temperature to within 3° C (5.4° F).

2.1.11 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby national weather service station, in which case the station value (which is the absolute barometric pressure) shall be requested and an adjustment for elevation differences between the weather station and sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 m (100 ft) elevation increase or vice versa for elevation decrease.

2.1.12 Vacuum Gauge and Rotameter. At least 760 mm Hg (30 in. Hg) gauge and 0-40 cc/min rotameter, to be used for leak check of the sampling train.

2.2 Sample Recovey.

2.2.1 Wash bottles. Polyethylene or glass, 500 ml, two.

2.2.2 Storage Bottles. Polyethylene, 100 ml, to store impinger samples (one per sample).

2.3 Analysis.

2.3.1 Pipettes. Volumetric type, 5-ml, 20-ml (one per sample), and 25-ml sizes.

2.3.2 Volumetric Flasks. 100-ml size (one per sample) and 1000 ml size.

2.3.3 Burettes. 5- and 50-ml sizes.

2.3.4 Erlenmeyer Flasks. 250 ml-size (one for each sample, blank, and standard).

2.3.5 Dropping Bottle. 125-ml size, to add indicator.

2.3.6 Graduated Cylinder. 100-ml size.

2.3.7 Spectrophotometer. To measure absorbance at 352 nanometers.

3. Reagents

Unless otherwise indicated, all reagents must conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society. Where such specifications are not available, use the best available grade.

3.1 Sampling.

3.1.1 Water. Deionized distilled to conform to ASTM specification D1193-77, Type 3 (incorporated by reference—see §60.17]. At the option of the analyst, the $KMnO_4$ test for oxidizable organic matter may be omitted when high concentrations of organic matter are not expected to be present.

3.1.2 Isopropanol, 80 percent. Mix 80 ml of isopropanol with 20 ml of deionized, distilled water. Check each lot of isopropanol for peroxide impurities as follows: shake 10 ml of isopropanol with 10 ml of freshly prepared 10 percent potassium iodide solution. Prepare a blank by similarly treating 10 ml of distilled water. After 1 minute, read the absorbance at 352 nanometers on a spectrophotometer. If absorbance exceeds 0.1, reject alcohol for use.

Peroxides may be removed from isopropanol by redistilling or by passage through a column of activated alumina; however, reagent grade isopropanol with suitably low peroxide levels may be obtained from commercial sources. Rejection of contaminated lots may, therefore, be a more efficient procedure.

3.1.3 Hydrogen Peroxide, 3 Percent. Dilute 30 percent hydrogen peroxide 1:9 (v/v) with deionized, distilled water (30 ml is needed per sample). Prepare fresh daily.

3.1.4 Potassium Iodide Solution, 10 Percent. Dissolve 10.0 grams KI in deionized, distilled water and dilute to 100 ml. Prepare when needed.

3.2 Sample Recovery.

3.2.1 Water. Deionized, distilled, as in 3.1.1.

3.2.2 Isopropanol, 80 Percent. Mix 80 ml of isopropanol with 20 ml of deionized, distilled water.

3.3 Analysis.

3.3.1 Water. Deionized, distilled, as in 3.1.1.

3.3.2 Isopropanol, 100 Percent.

3.3.3 Thorin Indicator. 1-(o-arsonophenylazo)-2-naphthol-3,6-disulfonic acid, disodium salt, or equivalent. Dissolve 0.20 g in 100 ml of deionized, distilled water.

3.3.4 Barium Perchlorate Solution, 0.0100 N. Dissolve 1.95 g of barium perchlorate trihydrate $[Ba(ClO_4)_2 \cdot 3H_2O]$ in 200 ml distilled water and dilute to 1 liter with isopropanol. Alternatively, 1.22 g of $[BaCl_2 \cdot 2H_2O]$ may be used instead of the perchlorate. Standardize as in Section 5.5.

3.3.5 Sulfuric Acid Standard, 0.0100 N. Purchase or standardize to ±0.0002 N against 0.0100 N NaOH which has previously been standardized against potassium acid phthalate (primary standard grade).

3.3.6 Quality Assurance Audit Samples. Sulfate samples in glass vials prepared by EPA's Environmental Monitoring Systems Laboratory, Quality Assurance Division, Source Branch, Mail Drop 77A, Research Triangle Park, North Carolina 27711. Each set will consist of two vials having solutions of unknown concentrations. Only when making compliance determinations, obtain an audit sample set from the Quality Assurance Management office at each EPA regional Office or the responsible enforcement agency. (NOTE: The tester should notify the quality assurance office or the responsible enforcement agency at least 30 days prior to the test date to allow sufficient time for sample delivery.)

[3.3.6 added by 49 FR 26524, June 27, 1984]

4. Procedure

4.1 Sampling.

4.1.1 Preparation of collection train. Measure 15 ml of 80 percent isopropanol into the midget bubbler and 15 ml of 3 percent hydrogen peroxide into each of the first two midget impingers. Leave the final midget impinger dry. Assemble the train as shown in Figure 6-1. Adjust probe heater to a temperature sufficient to prevent water condensation. Place crushed ice and water around the impingers.

4.1.2 Leak-check procedure. A leak check prior to the sampling run is optional; however, a leak check after the sampling run is mandatory. The leak-check procedure is as follows:

Temporarily attach a suitable (e.g., 0-40 cc/min) rotameter to the outlet of the dry gas meter and place a vacuum gauge at or near the probe inlet. Plug the probe inlet, pull a vacuum of at least 250 mm Hg (10 in. Hg), and note the flow rate as indicated by the rotameter. A leakage rate not in excess of 2 percent of the average sampling rate is acceptable.

Note: Carefully release the probe inlet plug before turning off the pump.

It is suggested (not mandatory) that the pump be leak-checked separately, either prior to or after the sampling run. If done prior to the sampling run, the pump leak check shall precede the leak check of the sampling train described immediately above; if done after the sampling run, the pump leak-check shall follow the train leak-check. To leak check the pump, proceed as follows: Disconnect the drying tube from the probe impinger assembly. Place a vacuum gauge at the inlet to either the drying tube or the pump, pull a vacuum of 250 mm (10 in.) Hg, plug or pinch off the outlet of the flow meter and then turn off the pump. The vacuum should remain stable for at least 30 seconds.

Other leak-check procedures may be used, subject to the approval of the Administrator, U.S. Environmental Protection Agency.

4.1.3 Sample collection. Record the initial dry gas meter reading and barometric pressure. To begin sampling, position the tip of the probe at the sampling point, connect the probe to the bubbler, and start the pump. Adjust the sample flow to a constant rate of approximately 1.0 liter/min as indicated by the rotameter. Maintain this constant rate (±10 percent) during the entire sampling run. Take readings (dry gas meter, temperatures at dry gas meter and at impinger outlet and rate meter) at least every 5 minutes. Add more ice during the run to keep the temperture of the gases leaving the last impinger at 20° C (68° F) or less. At the conclusion of each run, turn off the pump, remove probe from the stack, and record the final readings. Conduct a leak check as in Section 4.1.2 (This leak check is mandatory.) If a leak is found, void the test run, or use procedures acceptable to the Administrator to adjust the sample volume for the leakage. Drain the ice bath, and purge the remaining part of the train by drawing clean ambient air through the system for 15 minutes at the sampling rate.

Clean ambient air can be provided by passing air through a charcoal filter or through an extra midget impinger with 15 ml of 3 percent H_2O_2. The tester may opt to simply use ambient air, without purification.

4.2 Sample Recovery. Disconnect the impingers after purging. Discard the contents of the midget bubbler. Pour the contents of the midget impingers into a leak-free polyethylene bottle for shipment. Rinse the three midget impingers and the connecting tubes with deionized, distilled water, and add the washings to the same storage container. Mark the fluid level. Seal and identify the sample container.

4.3 Sample Analysis. Note level of liquid in container, and confirm whether any sample was lost during shipment; note this on analytical data sheet. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results.

Transfer the contents of the storage container to a 100-ml volumetric flask and dilute to exactly 100 ml with deionized, distilled water. Pipette a 20-ml aliquot of this solution into a 250-ml Erlenmeyer flask, add 80 ml of 100 percent isopropanol and two to four drops of thorin indicator, and titrate to a pink endpoint using 0.0100 N barium perchlorate. Repeat and average the titration volumes. Run a blank with each series of samples. Replicate titrations must agree within 1 percent or 0.2 ml, whichever is larger.

(Note.—Protect the 0.0100 N barium perchlorate solution from evaporation at all times.)

[4.4 added by 49 FR 26524, June 27, 1984]

4.4 Audit Sample Analysis. Concurrently analyze the two audit samples and a set of compliance samples (Section 4.3) in the same manner to evaluate the technique of the analyst and the standards preparation. (NOTE: It is recommended that known quality control samples be analyzed prior to the compliance and audit sample analysis to optimize the system accuracy and precision. One source of these samples is the Source Branch listed in Section 3.3.6.) The same analysts, analytical reagents, and analytical system shall be used both for compliance samples and the EPA audit samples; if this condition is met, auditing of subsequent compliance analyses for the same enforcement agency within 30 days is not required. An audit sample set may not be used to validate different sets of compliance samples under the jurisdiction of different enforcement agencies, unless prior arrangements are made with both enforcement agencies.

Calculate the concentrations in mg/dscm using the specified sample volume in the audit instructions. (NOTE: Indication of acceptable results may be obtained immediately by reporting the audit results in mg/dscm and compliance results in total mg SO_2/sample by telephone to the responsible enforcement agency.) Include the results of both audit samples, their identification numbers, and the analyst's name with the results of the compliance determination samples in appropriate reports to the EPA regional office or the appropriate enforcement agency. Include this information with subsequent compliance analyses for the same enforcement agency during the 30-day period.

The concentrations of the audit samples obtained by the analyst shall agree within 5 percent of the actual concentrations. If the 5-percent specification is not met, reanalyze the compliance samples and audit samples, and include initial and reanalysis values in the test report (see NOTE in first paragraph of this section).

Failure to meet the 5-percent specification may require retests until the audit problems are resolved. However, if the audit results do not affect the compliance or noncompliance status of the affected facility, the Administrator may waive the reanalysis requirement, further audits, or retests and accept the results of the compliance test. While steps are being taken to resolve audit analysis problems, the Administrator may also choose to use the data to determine the compliance or noncompliance status of the affected facility.

5. Calibration

5.1 Metering System.

5.1.1 Initial Calibration. Before its initial use in the field, first leak check the metering system (drying tube, needle valve, pump, rotameter, and dry gas meter) as follows: place a vacuum guage at the inlet to the drying tube and pull a vacuum of 250 mm (10 in.) Hg; plug or pinch off the outlet of the flow meter, and then turn off the pump. The vacuum shall remain stable for at least 30 seconds. Carefully release the vacuum gauge before releasing the flow meter end.

Next, remove the drying tube and calibrate the metering system (at the sampling flow rate specified by the method) as follows: connect an appropriately sized wet test meter (e.g., 1 liter per revolution) to the inlet. Make three independent calibration runs, using at least five revolutions of the dry gas meter per run. Calculate the calibration factor, Y (wet test meter calibration volume divided by the dry gas meter volume, both volumes adjusted to the same reference temperature and pressure), for each run, and average the results. If any Y value deviates by more than 2 percent from the average, the metering system is unacceptable for use. Otherwise, use the average as the calibration factor for subsequent test runs.

[5.1.1 amended by 48 FR 39011, August 26, 1983]

5.1.2 Post-Test Calibration Check. After each field test series, conduct a calibration check as in Section 5.1.1 above, except for the following variations: (a) the leak check is not to be conducted, (b) three, or more revolutions of the dry gas meter may be used, and (c) only two independent runs need be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor (determined in Section 5.1.1), then the dry gas meter volumes obtained during the test series are acceptable. If the calibration factor deviates by more than 5 percent, recalibrate the metering system as in Section 5.1.1, and for the calculations, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run.

5.2 Thermometers. Calibrate against mercury-in-glass thermometers.

5.3 Rotameter. The rotameter need not be calibrated but should be cleaned and maintained according to the manufacturer's instruction.

5.4 Barometer. Calibrate against a mercury barometer.

5.5 Barium Perchlorate Solution. Standardize the barium perchlorate solution against 25 ml of standard sulfuric acid to which 100 ml of 100 percent isopropanol has been added.

Run duplicate analyses. Calculate the normality using the average of a pair of duplicate analyses where the titrations agree within 1 percent or 0.2 ml, whichever is larger.

[5.5 amended by 49 FR 26524, June 27, 1984]

6. Calculations

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after final calculation.

6.1 Nomenclature.

C_{SO_2} = Concentration of sulfur dioxide, dry basis corrected to standard conditions, mg/dscm (lb/dscf).

N = Normality of barium perchlorate titrant, milliequivalents/ml.

P_{bar} = Barometric pressure at the exit orifice of the dry gas meter, mm Hg (in. Hg).

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

T_m = Average dry gas meter absolute temperature, °K (°R).

T_{std} = Standard absolute temperature, 293° K (528° R).

V_a = Volume of sample aliquot titrated, ml.

V_m = Dry gas volume as measured by the dry gas meter, dcm (dcf).

$V_{m(std)}$ = Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (dscf).

V_{soln} = Total volume of solution in which the sulfur dioxide sample is contained, 100 ml.

V_t = Volume of barium perchlorate titrant used for the sample, ml (average or replicate titrations).

V_{tb} = Volume of barium perchlorate titrant used for the blank, ml.

Y = Dry gas meter calibration factor.

32.03 = Equivalent weight of sulfur dioxide.

6.2 Dry sample gas volume, corrected to standard conditions.

$$V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m}\right)\left(\frac{P_{bar}}{P_{std}}\right) = K_1 Y \frac{V_m P_{bar}}{T_m}$$

Equation 6-1

where:

K_1 = 0.3858° K/mm Hg for metric units.
= 17.64° R/in. Hg for English units.

6.3 Sulfur dioxide concentration.

$$C_{SO_2} = K_2 \frac{(V_t - V_{tb})\, N \left(\frac{V_{soln}}{V_a}\right)}{V_{m(std)}}$$

Equation 6-2

where:

K_2 = 32.03 mg/meq. for metric units.
= 7.061 × 10⁻⁵ lb/meq. for English units.

6.4 Relative Error (RE) for QA Audit Samples, Percent.

$$RE = \frac{C_d - C_a}{C_a \times 100} \qquad \text{Eq. 6-3}$$

Where:

C_d = Determined audit sample concentration, mg/dscm.

C_a = Actual audit sample concentration, mg/dscm.

7. *Alternative Procedures.*

7.1 Dry Gas Meter as a Calibration Standard. A dry gas meter may be used as a calibration standard for volume measurements in place of the wet test meter specified in Section 5.1, provided that it is calibrated initially and recalibrated periodically according to the same procedures outlined in Method 5, Section 7.1, with the following exception: (1) the dry gas meter is calibrated against a wet test meter having a capacity of 1 liter/rev or 3 liters/rev and having the capability of measuring volume to within ±1 percent; (2) the dry gas meter is calibrated at 1 liter/min (2 cfh); and (3) the meter box of the Method 6 sampling train is calibrated at the same flow rate.

7.2 Critical Orifices for Volume and Rate Measurements. A critical orifice may be used in place of the dry gas meter specified in Section 2.1.10, provided that it is selected, calibrated, and used as follows:

7.2.1 Preparation of Collection Train. Prepare the sampling train as shown in Figure 6-2. The rotameter and surge tank are optional but are recommended in order to detect changes in the flow rate.

Note.—The critical orifices can be adapted to a Method 6 type sampling train as follows: Insert sleeve type, serum bottle stoppers into two reducing unions. Insert the needle into the stoppers as shown in Figure 6-3.

[7.2 added by 52 FR 41424, October 28, 1987]

PROCESS DESCRIPTION

Chemical recovery and reuse is an important part of the Kraft pulping process. The spent cooking liquor which is separated from the wood pulp is concentrated in multiple effect evaporators to a concentration of 62-68% solids and then sprayed into the recovery furnace where the organic portion is burned to produce process steam and the inorganic chemicals, largely sodium carbonate and sodium sulfide collect in the base of the furnace as a molten smelt. This is dissolved in water to generate a "green liquor" solution.

The green liquor from the smelt dissolving tank is pumped to a "caustisizing" area where slaked lime [$Ca(OH)_2$] is added. This combines with the sodium carbonate to form sodium hydroxide and calcium carbonate. The calcium carbonate is removed by filtration and this filter cake is burned in the lime kiln to generate calcium oxide which in turn is slaked to generate $Ca(OH)_2$ and the cycle is repeated. The sodium hydroxide (and the sodium sulfide which remains unchanged) is used to regenerate the original "white liquor" which is used to digest additional wood chips to continue the cycle.

APPENDIX A

SO_2 FIELD DATA SHEETS

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 2 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO_2

Date 9-2-89 Run No. 1A

Moisture ___ %, FDA ___, Gas Density Factor ___

Barometric Press 30.12 "Hg, Stack Press ___ "Hg

Weather Partly Cloudy

Temp. ___ °F, W/D ___, W/S ___

Sample Box No. ___ Meter Box No. —

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ in., Probe Length 5' ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ___ in

Inside Area ___ ft²

Height ___ ft

Time Start 1030

Time End 1050

Effective Stack Area ___ ft² ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 25.378

Initial Gas Meter Reading 24.326

Total Condensate in Impingers ___

Moisture in Silica Gel ___

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: EC/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ___

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1035	24.6					82				
		1040	24.9					83				
		1045	25.1					83				
		1050	25.378					85				
								83.3				
								543.3				

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SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 2 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO_2

Date 9-2-89 Run No. 1B

Moisture ___, FTA ___, Gas Density Factor ___

Barometric Press 30.17 "Hg, Stack Press ___ "Hg

Weather P.C.

Temp. ___ °F, W/D ___, W/S ___

Sample Box No. ___ Meter Box No. —

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ in., Probe Length 5' ft

Probe Heater Setting ___

Stack Dimensions: Inside Diameter ___ in

Inside Area ___ ft^2

Height ___ ft

Time Start 1102

Time End 1122

Effective Stack Area ___ ft^2 ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 26.946

Initial Gas Meter Reading 25.878

Total Condensate in Impingers ___

Moisture in Silica Gel ___

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: DG/EC

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ___

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1107	26.1					84				
		1112	26.4					85				
		1117	26.7					85				
		1122	26.946					86				
								85				
								545				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 2 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO_2

Date 9-2-89 Run No. 1C

Moisture ___ %, FDA ___, Gas Density Factor ___

Barometric Press 30.17 "Hg, Stack Press ___ "Hg

Weather P.C.

Temp. ___ °F, W/D ___, W/S ___

Sample Box No. ___ Meter Box No. —

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ in., Probe Length 5' ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ___ in

Inside Area ___ ft²

Height ___ ft

Time Start 1138

Time End 1158

Effective Stack Area ___ ft² ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 28.352

Initial Gas Meter Reading 27.296

Total Condensate in Impingers ___

Moisture in Silica Gel ___

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: DG/EC

Leak Rate 0.000 CFM @ 10" Hg

Remarks:

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1143	27.6					89				
		1148	27.8					91				
		1153	28.1					91				
		1158	28.352					93				
								91				
								551				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 2 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO_2

Date 9-2-89 Run No. 2A

Moisture ___ %, FDA ___, Gas Density Factor ___

Barometric Press 30.1 "Hg, Stack Press ___ "Hg

Weather P. C

Temp. ___ °F, W/D ___, W/S ___

Sample Box No. ___ Meter Box No. —

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ in., Probe Length 5 ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ___ in
Inside Area ___ ft^2
Height ___ ft

Time Start 1237

Time End 1257

Effective Stack Area ___ ft^2 ___ pts. @ ___ min/pt ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 29.975 f

Initial Gas Meter Reading 28.931 f

Total Condensate in Impingers ___ m

Moisture in Silica Gel ___ g

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: ECING

Leak Rate 0.000 CFM @ 16" Hg

Remarks: ___

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PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC.	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1242	29.2					95				
		1247	29.4					95				
		1252	29.7					95				
		1257	29.975					95				
								95				
								555				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft Corp

Sample Location No. 2 Limekiln

Control Device Wet Scrubber

Type of Samples: SO2

Date 9-2-89 Run No. 2B

Moisture __ %, FMA __, Gas Density Factor __

Barometric Press 30.11 "Hg, Stack Press __ "Hg

Weather P.C.

Temp. __ °F, W/D __, W/S __

Sample Box No. __ Meter Box No. —

Meter ΔH@ __ Pitot Corr. Factor __

Nozzle Dia. __ in., Probe Length 5 ft

Probe Heater Setting 250°C

Stack Dimensions: Inside Diameter __ in

Inside Area __ ft2

Height __ ft

Time Start 1312

Time End 1332

Effective Stack Area __ ft2 __ pts. @ __ min/pt= __ min.

Mat'l Processing Rate __

Final Gas Meter Reading 31.419 ft3

Initial Gas Meter Reading 30.366 ft3

Total Condensate in Impingers __ ml

Moisture in Silica Gel __ g

Silica Gel Container No. __ Filter No. __

Orsat: CO_2 __

O_2 __

CO __

N_2 __

Excess Air __

Test Conducted by: EC/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks:

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1317	30.6					94				
		1322	30.9					96				
		1327	31.2					97				
		1332	31.419					98				
								96.3				
								556.3				

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SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 2 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO2

Date 9-2-89 Run No. 2C

Moisture ____ %, FDA ____, Gas Density Factor ____

Barometric Press 30.11"Hg, Stack Press ____ "Hg

Weather ____

Temp. ____ °F, W/D ____, W/S ____

Sample Box No. ____ Meter Box No. —

Meter ΔH@ ____ Pitot Corr. Factor ____

Nozzle Dia. ____ In., Probe Length 5 ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ____ in

Inside Area ____ ft²

Height ____ ft

Time Start 1345

Time End 1405

Effective Stack Area ____ ft² ____ pts. @ ____ min/pt ____ min.

Mat'l Processing Rate ____

Final Gas Meter Reading 32.641 ft

Initial Gas Meter Reading 31.602 ft

Total Condensate in Impingers ____

Moisture in Silica Gel ____

Silica Gel Container No. ____ Filter No. ____

Orsat: CO_2 ____

O_2 ____

CO ____

N_2 ____

Excess Air ____

Test Conducted by: EC/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ____

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1350	31.9					95				
		1355	32.1					96				
		1400	32.4					96				
		1405	32.641					96				
								95.8				
								555.8				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft Corp.
Sample/Location No. 2 Lime Kiln
Control Device wet Scrubber
Type of Samples: SO2
Date 9-2-89 Run No. 3A
Moisture ___ %, FDA ___, Gas Density Factor ___
Barometric Press ___ "Hg, Stack Press ___ "Hg
Weather ___
Temp. ___ °F, W/D ___, W/S ___
Sample Box No. ___ Meter Box No. —
Meter ΔH@ ___ Pitot Corr. Factor ___
Nozzle Dia. ___ in., Probe Length 5 ft
Probe Heater Setting 250°F
Stack Dimensions: Inside Diameter ___ in
Inside Area ___ ft²
Height ___ ft

Time Start 1441
Time End 1501

Effective Stack Area ___ ft^2 ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___
Final Gas Meter Reading 34.017 f
Initial Gas Meter Reading 32.989 f
Total Condensate in Impingers ___ m
Moisture in Silica Gel ___ g
Silica Gel Container No. ___ Filter No. ___
Orsat: CO_2 ___
O_2 ___
CO ___
N_2 ___
Excess Air ___
Test Conducted by: DG/EC
Leak Rate 0.000 CFM @ 15" Hg
Remarks: ___

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PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1446	33.2					94				
		1451	33.5					95				
		1456	33.8					96				
		1501	34.017					96				
								95.3				
								555.3				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant *Seminol Kraft*

Sample Location *No. 2 Lime Kiln*

Control Device *Wet Scrubber*

Type of Samples: *SO_2*

Date *9-2-89* Run No. *3B*

Moisture __ %, FDA __, Gas Density Factor __

Barometric Press __ "Hg, Stack Press __ "Hg

Weather __

Temp. __ °F, W/D __, W/S __

Sample Box No. __ Meter Box No. *—*

Meter ΔH@ __ Pitot Corr. Factor __

Nozzle Dia. __ In., Probe Length *5* ft

20 Probe Heater Setting *250° F*

Stack Dimensions: Inside Diameter __ in

Inside Area __ ft^2

Height __ ft

Effective Stack Area __ ft^2 __ pts. @ __ min/pt __ min.

Time Start *1515*

Time End *1535*

Mat'l Processing Rate __

Final Gas Meter Reading *35.301* f

Initial Gas Meter Reading *34.277* f

Total Condensate in Impingers __ ml

Moisture in Silica Gel __ g

Silica Gel Container No. __ Filter No. __

Orsat: CO_2 __

O_2 __

CO __

N_2 __

Excess Air __

Test Conducted by: __

Leak Rate __ CFM @ 15" Hg

Remarks: __

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD ("H_2O)	("H_2O) ORIFICE PRESS. DROP CALC.	("H_2O) ORIFICE PRESS. DROP ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	METER TEMPERATURE OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1520	34.5					95				
		1525	34.8					95				
		1530	35.0					95				
		1535	35.301					94				
								94.8				
								554.8				

Best Available Copy

SOURCE SAMPLING FIELD DATA SHEET

Plant Seminole Kraft Corp.
Sample Location No. 2 Lime Kiln
Control Device Wet Scrubber
Type of Samples: SO2
Date 9-2-89 Run No. 3C
Moisture 1.FTA Gas Density Factor
Barometric Press 30.[illegible] "Hg, Stack Press "Hg
Weather
Temp. °F, W/D W/S
Sample Box No. Meter Box No. —
Meter ΔH@ Pitot Corr. Factor
Nozzle Dia. in., Probe Length 5 ft
Probe Heater Setting 250°F
Stack Dimensions: Inside Diameter in
Inside Area ft²
Height ft

Time Start 1553
Time End 1603

Effective Stack Area ft² pts. @ min/pt= min.

Mat'l Processing Rate
Final Gas Meter Reading 36.552 ft
Initial Gas Meter Reading 35.508 ft
Total Condensate in Impingers ml
Moisture in Silica Gel g
Silica Gel Container No. Filter No.
Orsat: CO_2
O_2
CO
N_2
Excess Air
Test Conducted by: DG [illegible]
Leak Rate 0.000 CFM @ 15" Hg
Remarks:

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1558	35.8					94				
		1603	36.0					94				
		1608	36.3					93				
		1613	36.552					93				
								93.5				
								553.5				

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SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant: Seminole Kraft Corp.
Sample Location: No 3 Lime Kiln
Control Device: Wet Scrubber
Type of Samples: Sulfur Dioxide
Date: 8-20-89 Run No.: 1A
Moisture: 1, FRA, Gas Density Factor: ______
Barometric Press: 30.57 "Hg, Stack Press: ______ "Hg
Weather: ______
Temp. ______ °F, W/D ______, W/S ______
Sample Box No. ______ Meter Box No. 6
Meter ΔH@ ______ Pitot Corr. Factor ______
Nozzle Dia. ______ in., Probe Length 5 ft
Probe Heater Setting 250°
Stack Dimensions: Inside Diameter ______ in
Inside Area ______ ft^2
Height ______ ft

Time Start: 1035
Time End: 1055

Effective Stack Area ______ ft^2 ______ pts. @ ______ min/pt= ______ min.

Mat'l Processing Rate ______
Final Gas Meter Reading 52.225 f
Initial Gas Meter Reading 51.172 f
Total Condensate in Impingers ______ m
Moisture in Silica Gel ______ g
Silica Gel Container No. ______ Filter No. ______
Orsat: CO_2 ______
O_2 ______
CO ______
N_2 ______
Excess Air ______
Test Conducted by: HG/DG
Leak Rate 0.000 CFM @ 15" Hg
Remarks: ______

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PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1040	51.4					88				
		1045	51.7					88				
		1050	52.0					89				
		1055	52.225					89				
								88.5				
								548.5				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device Wet Scrubber

Type of Samples: Sulfur Dioxide

Date 8-30-89 Run No. 13

Moisture ____ %, FM ____, Gas Density Factor ____

Barometric Press ____ "Hg, Stack Press ____ "Hg

Weather ____

Temp. ____ °F, W/D ____, W/S ____

Sample Box No. ____ Meter Box No. 6

Meter ΔH@ ____ Pitot Corr. Factor ____

Nozzle Dia. ____ in., Probe Length 5 ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ____ in

Inside Area ____ ft²

Height ____ ft

Time Start 1112

Time End 1132

Effective Stack Area ____ ft² ____ pts. @ ____ min/pt= ____ min.

Mat'l Processing Rate ____

Final Gas Meter Reading 53.674

Initial Gas Meter Reading 52.683

Total Condensate in Impingers ____

Moisture in Silica Gel ____

Silica Gel Container No. ____ Filter No. ____

Orsat: CO_2 ____

O_2 ____

CO ____

N_2 ____

Excess Air ____

Test Conducted by: HG/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ____

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PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP		STACK GAS TEMP. (°F)	METER TEMPERATURE		FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
					CALC	ACTUAL		IN	OUT			
		1117	52.9					88				
		1122	53.2					88				
		1127	53.4					89				
		1132	53.674					90				
								88.8				
								548.8				

Best Available Copy

SOURCE SAMPLING FIELD DATA SHEET

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device wet Scrubber

Type of Samples: Sulfur Dioxide

Date 8-30-99 Run No. 1C

Moisture ___ %, FTA ___, Gas Density Factor ___

Barometric Press 30.07 "Hg, Stack Press ___ "Hg

Weather ___

Temp. ___ °F, W/D ___ W/S ___

Sample Box No. ___ Meter Box No. 6

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ In., Probe Length 5 ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ___ in

Inside Area ___ ft²

Height ___ ft

Time Start 1144

Time End 1204

Effective Stack Area ___ ft² ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 54.041 ft³

Initial Gas Meter Reading 53.989 ft³

Total Condensate in Impingers ___ ml

Moisture in Silica Gel ___ g

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: HG/BG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ___

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PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1149	54.2					89				
		1154	54.5					91				
		1159	54.8					91				
		1204	54.041					91				
								90.5				
								550.5				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kiln 4 (?)

Sample Location No. 3 Lime Kiln

Control Device wet Scrubber

Type of Samples: [illegible]

Date 8-30-89 Run No. 24

Moisture ____ %, FMA ____, Gas Density Factor ____

Barometric Press 30.0¼ "Hg, Stack Press ____ "Hg

Weather ____

Temp. ____ °F, W/D ____, W/S ____

Sample Box No. ____ Meter Box No. 6

Meter ΔH@ ____ Pitot Corr. Factor ____

Nozzle Dia. ____ in., Probe Length 5 ft

Probe Heater Setting 250° F

Stack Dimensions: Inside Diameter ____ in

Inside Area ____ ft^2

Height ____ ft

Time Start 1238

Time End 1258

Effective Stack Area ____ ft^2 ____ pts. @ ____ min/pt= ____ min.

Mat'l Processing Rate ____

Final Gas Meter Reading 55.403

Initial Gas Meter Reading 54.338

Total Condensate in Impingers ____

Moisture in Silica Gel ____

Silica Gel Container No. ____ Filter No. ____

Orsat: CO_2 ____

O_2 ____

CO ____

N_2 ____

Excess Air ____

Test Conducted by: HG/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ____

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1243	54.6					91				
		1248	54.9					97				
		1253	55.1					93				
		1258	55.403					93				
								92.8				
								552.3				

Best Available Copy

SOURCE SAMPLING FIELD DATA SHEET

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device Wet Scrubber

Type of Samples: Sulfur Dioxide

Date 8-20-89 Run No. 2B

Moisture ____ %, FTA ____, Gas Density Factor ____

Barometric Press 30.07 "Hg, Stack Press ____ "Hg

Weather ____

Temp. ____ °F, W/D ____, W/S ____

Sample Box No. ____ Meter Box No. 6

Meter ΔH@ ____ Pitot Corr. Factor ____

Nozzle Dia. ____ In., Probe Length 5 ft

Probe Heater Setting 250°F

Stack Dimensions: Inside Diameter ____ in

Inside Area ____ ft²

Height ____ ft

Time Start 1317

Time End 1337

Effective Stack Area ____ ft² ____ pts. @ ____ min/pt ____ min.

Mat'l Processing Rate ____

Final Gas Meter Reading 56.862 f

Initial Gas Meter Reading 55.802 f

Total Condensate in Impingers ____ m

Moisture in Silica Gel ____ g

Silica Gel Container No. ____ Filter No. ____

Orsat: CO_2 ____

O_2 ____

CO ____

N_2 ____

Excess Air ____

Test Conducted by: HG/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ____

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1322	56.1					92				
		1327	56.3					92				
		1332	56.6					92				
		1337	56.862					93				
								92.3				
								552.3				

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SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device Wet Scrubber

Type of Samples: Sulfur Dioxide

Date 8-30-89 Run No. 2C

Moisture N/A, Gas Density Factor ____

Barometric Press 30.0"Hg, Stack Press ____ "Hg

Weather ____

Temp. ____ °F, W/D ____, W/S ____

Sample Box No. ____ Meter Box No. 6

Meter ΔH@ ____ Pitot Corr. Factor ____

Nozzle Dia. ____ in., Probe Length 5 ft

Probe Heater Setting 250°

Stack Dimensions: Inside Diameter ____ in

Inside Area ____ ft^2

Height ____ ft

Effective Stack Area ____ ft^2 ____ pts. @ ____ min/pt= ____ min.

Time Start 1349

Time End 1409

Mat'l Processing Rate ____

Final Gas Meter Reading 58.267 ft

Initial Gas Meter Reading 57.211 ft

Total Condensate in Impingers ____ ml

Moisture in Silica Gel ____ gm

Silica Gel Container No. ____ Filter No. ____

Orsat: CO_2 ____

O_2 ____

CO ____

N_2 ____

Excess Air ____

Test Conducted by: HG/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ____

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1354	57.5					91				
		1359	57.7					92				
		1404	58.0					92				
		1409	58.267					93				
								92.0				
								552.0				

27

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO2

Date 8-30-89 Run No. 3A

Moisture ___ %, FDA ___, Gas Density Factor ___

Barometric Press 30.01 "Hg, Stack Press ___ "Hg

Weather ___

Temp. ___ °F, W/D ___, W/S ___

Sample Box No. ___ Meter Box No. 6

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ in., Probe Length 5 ft

Probe Heater Setting 250

Stack Dimensions: Inside Diameter ___ in

Inside Area ___ ft²

Height ___ ft

Time Start 1437

Time End 1457

Effective Stack Area ___ ft² ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 59.579 f

Initial Gas Meter Reading 58.521 f

Total Condensate in Impingers ___ ml

Moisture in Silica Gel ___ g

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: EC/BG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ___

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP CALC.	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1442	58.8					90				
		1447	59.0					91				
		1452	59.3					92				
		1457	59.579					92				
								91.3				
								557.3				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device Inlet Scrubber

Type of Samples: SO2

Date 9-30-89 Run No. 3B

Moisture ___ %, FDA ___, Gas Density Factor ___

Barometric Press 30.07 "Hg, Stack Press ___ "Hg

Weather ___

Temp. ___ °F, W/D ___, W/S ___

Sample Box No. ___ Meter Box No. 6

Meter ΔH@ ___ Pitot Corr. Factor ___

Nozzle Dia. ___ in., Probe Length 5 ft

Probe Heater Setting 250

Stack Dimensions: Inside Diameter ___ in

Inside Area ___ ft²

Height ___ ft

Time Start 1518

Time End 1538

Effective Stack Area ___ ft² ___ pts. @ ___ min/pt= ___ min.

Mat'l Processing Rate ___

Final Gas Meter Reading 60.841 f

Initial Gas Meter Reading 59.788 f

Total Condensate in Impingers ___ ml

Moisture in Silica Gel ___ g

Silica Gel Container No. ___ Filter No. ___

Orsat: CO_2 ___

O_2 ___

CO ___

N_2 ___

Excess Air ___

Test Conducted by: EC/DG

Leak Rate 0.000 CFM @ 15" Hg

Remarks: ___

29

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT³)	STACK VELOCITY HEAD ("H2O)	("H2O) ORIFICE PRESS. DROP		STACK GAS TEMP. (°F)	METER TEMPERATURE		FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
					CALC	ACTUAL		IN	OUT			
		1523	60.1					90				
		1528	60.3					90				
		1533	60.6					90				
		1538	60.841					90				
								90				
								550				

SOURCE SAMPLING FIELD DATA SHEET

Best Available Copy

Plant Seminole Kraft

Sample Location No. 3 Lime Kiln

Control Device Wet Scrubber

Type of Samples: SO_2

Date 8-30-89 Run No. 3C

Moisture 1, FTA, Gas Density Factor

Barometric Press 30.07 "Hg, Stack Press "Hg

Weather

Temp. °F, W/D W/S

Sample Box No. Meter Box No. 6

Meter ΔH@ Pitot Corr. Factor

Nozzle Dia. In., Probe Length 5 ft

Probe Heater Setting

Stack Dimensions: Inside Diameter in

Inside Area ft^2

Height ft

Time Start 1552

Time End 1612

Effective Stack Area ft^2 pts. @ min/pt= min.

Mat'l Processing Rate

Final Gas Meter Reading 62.128

Initial Gas Meter Reading 61.076

Total Condensate in Impingers

Moisture in Silica Gel

Silica Gel Container No. Filter No.

Orsat: CO_2

O_2

CO

N_2

Excess Air

Test Conducted by: EC/DG

Leak Rate 0.000 CFM @ 10" Hg

Remarks:

30

PORT AND TRAVERSE POINT NO.	INCHES INSIDE STACK WALL	CLOCK TIME	GAS METER READING (FT^3)	STACK VELOCITY HEAD ("H_2O)	("H_2O) ORIFICE PRESS. DROP CALC.	ACTUAL	STACK GAS TEMP. (°F)	METER TEMPERATURE IN	OUT	FILTER TEMP. (°F)	LAST IMPINGER TEMP. (°F)	VACUUM ("HG)
		1557	61.3					90				
		1602	61.6					89				
		1607	61.9					89				
		1612	62.128					89				
								89.3				
								549.3				

APPENDIX B

LABORATORY DATA AND CALCULATIONS

SO_2

LAB DATA

PLANT NAME Seminole Kraft Corp.

DATE ANALYZED 9-5-89

ANALYZED BY Dave Gray

STACK	SAMPLE NO.	V.T.	V.T.B.	N.	V.SOLN.	V.A.
No. 7 LK	90924-1	1.50 1.52	0.02	0.01018	50	10
	-2	1.28 1.40				
	-3	2.00 2.00				
	90924-4	1.50 1.50				
	-5	1.20 1.10				
	-6	4.00 3.95				
	90924-7	0.80 0.75				
	-8	1.00 1.00				
	-9	5.00 4.85				

V.T. = Volume of Barium perchlorate titrated used for sample (ml).

V.T.B. = Volume of Barium perchlorate titrated used for blank (ml).

N. = Normality of Barium perchlorate.

V. Soln. = Total solution volume.

V.A. = Volume of sample aliquot titrated (ml).

SO_2

LAB DATA

PLANT NAME Seminole Kraft Corp.

DATE ANALYZED 9-5-89

ANALYZED BY Dave Gray

STACK	SAMPLE NO.	V.T.	V.T.B.	N.	V.SOLN.	V.A.
Std	$0.0100N\ H_2SO_4$	9.85 9.80	0.02	0.01020	10	
No.3LK	90917-1	2.50 2.50	0.02	0.01020	50	10
	-2	3.00 3.05				
	-3	4.80 4.80				
No.3LK	90917-4	2.50 2.50	0.02	0.01020	50	10
	-5	2.90 2.80				
	-6	3.00 3.00				
No.3LK	90917-7	1.50 1.55	0.02	0.01020	50	10
	-8	1.15 1.10				
	-9	1.00 1.00				

V.T. = Volume of Barium perchlorate titrated used for sample (ml).

V.T.B. = Volume of Barium perchlorate titrated used for blank (ml).

N. = Normality of Barium perchlorate.

V. Soln. = Total solution volume.

V.A. = Volume of sample aliquot titrated (ml).

SOURCE SAMPLING NOMENCLATURE SHEET

PB - Barometric pressure, inches Hg.
PS - Stack pressure, inches Hg.
AS' - Effective area of positive stack gas flow, sq. ft.
As - Stack area, sq. ft.
NPTS - Number of traverse points where the pitot velocity head was greater than zero.
TS - Stack temperature, °R.
TM - Meter temperature, °R.
$\sqrt{H}$ - Average Square Root of velocity head, inches H_2O
ΔH - Average meter orifice pressure differential, inches H_2O.
AN - Sampling nozzle area, square feet.
CP - S-type pitot tube correction factor.
VM - Recorded meter volume sample, cubic feet (meter conditions).
VC - Condensate and silica gel increase in impingers, milliliters.
Po - Pressure at the dry test meter orifice, $\left[PB + \frac{H}{13.6}\right]$ inches Hg.
STP - Standard conditions, dry, 68°F, 29.92 inches Hg.

VWV - Conversion of condensate in milliliters to water vapor in cubic feet (STP).
VSTPD - Volume sampled, cubic feet (STP).
VT - Total water vapor volume and dry gas volume sampled, cubic feet (STP).
W - Moisture fraction of stack gas.
FDA - Dry gas fraction.
MD - Molecular weight of stack gas, lbs/lb-mole (dry conditions).
MS - Molecular weight of stack gas, lbs/lb-mole (stack conditions).
GS - Specific gravity of stack gas, referred to air.
EA - Excess air, %.
$\sqrt{HxTS}$ - Average square root of velocity head times stack temperature.
U - Stack gas velocity, feet per minute.
QS - Stack gas flow rate, cubic feet per minute (stack conditions).
QD - Stack gas flow rate, cubic feet per minute (dry conditions).
QSTPD - Stack gas flow rate, cubic feet per minute (STP).
PISO - Percent isokinetic volume sampled (method described in Federal Register).
ESTP - Particulate concentration at standard and dry conditions, grains/scf.
E_{12} - ESTP corrected to 12% CO_2, grains/scf.
E_{50} - ESTP corrected to 50% excess air, grains/scf.
EM - Mass emission rate, lbs/hr.

EQUATIONS FOR CALCULATING PARTICULATE EMISSIONS

$$VWV = (0.0472) \times (VC)$$

$$VSTPD = (17.65) \times (VM) \times (PB + \frac{\Delta H}{13.6}) \div TM$$

$$VT = (VWV) + (VSTPD)$$

$$W = (VWV) \div (VT)$$

$$FDA = (1.0) - (W)$$

FMOIST = Assumed moisture fraction

$$MD = (0.44 \times \%\ CO_2) + (0.32 \times \%\ O_2) + (0.28 \times \%\ N_2) + (0.28 \times \%\ CO)$$

$$MS = (MD \times FDA) + (18 \times W)$$

$$CS = (MS) \div (28.99)$$

$$EA = \left[(100) \times (\%\ O_2 - \frac{\%\ CO}{2})\right] \div \left[(0.266 \times \%\ N_2) - (O_2 - \frac{\%\ CO}{2})\right]$$

$$\underline{U} = (174) \times (CP) \times \sqrt{(H)} \times \sqrt{(TS \times 29.92) \div (CS \times PS)}$$

$$QS = (U) \times (AS)$$

$$QD = (QS) \times (FDA)$$

$$QSTDP = (528) \times (QD) \times (PS) \div TS \div 29.92$$

$$PISO = \left[(0.00267 \times VC \times TS) + (P_o \times TS \times VM \div TM\right] \div \left[(Time \times \underline{U} \times PS \times AN)\right]$$

$$ESTP = \frac{\left(\frac{15.43\ Grains}{GRAM}\right)(y)}{VSTPD}$$

$$E_{12} = \frac{(ESTP)\quad(12)}{(CO_2\ \%)}$$

$$E50 = \frac{(ESTP)\quad(100 + EA)}{150}$$

$$EM = (ESTP)\ (QSTPD)\ (60\ \frac{min}{hr})\ (\frac{lb}{7000\ grains})$$

CALCULATION EQUATIONS

CONCENTRATION SULFURIC ACID (Including SO_3) LB/DSCF

$$C\ H_2SO_4 = \frac{K_2\ N\ (V_t - Vtb)\left(\frac{V\ Soln.}{Va.}\right)}{V_M\ (STD)}$$

$$C\ SO_2 = \frac{K_3 \times N\ (V_t - Vtb)\left(\frac{V\ Soln}{Va.}\right)}{V_M\ (STD)}$$

WHERE:

C = Concentration LBS/DSCF

K_2 = 1.081×10^{-4} Lb/Meq.

K_3 = 7.061×10^{-5} Lb/Meq.

N = Normality of Barium Perchlorate Titrant

V_t = Volume of Barium Perchlorate Titrant used for the sample.

Vtb = Volume of Barium Perchlorate titrant used for the blank.

V soln = Total volume of sample solution.

Va = Volume of sample aliquot titrated .

V_M = Volume of gas sample measured by dry gas meter (DSCF).

LBS/DSCF x SCFMD x 60 = LBS/HOUR

LBS/DSCF x 6041500 = ppm SO_2

$7.061\times$

.0510

No. 2 Lime Kiln

Run 1A 7.061×10 $\frac{1.49 \times 0.01020 \left(\frac{50}{10}\right)}{1.029} = 5.214\times10^{-6}$ lbs/DSCF

1B " $\frac{1.32 \times 0.01020 \left(\frac{50}{10}\right)}{1.049} = 4.540\times10^{-6}$ lb/DSCF

1C " $\frac{1.98 \times 0.01020 \left(\frac{50}{100}\right)}{1.019} = 6.997\times10^{-6}$ lb/DSCF

AVG 5.584×10^{-6} lb/DSCF

Run 2A $7.061\times10^{-5}\times$ $\frac{1.48 \times 0.01020 \left(\frac{50}{10}\right)}{1.000} = 5.330\times10^{-6}$ lb/DSCF

2B $\frac{1.13 \times 0.0102 \left(\frac{50}{10}\right)}{1.006} = 4.045\times10^{-6}$ lb/DSCF

2C $\frac{3.96 \times 0.0102 \left(\frac{50}{10}\right)}{0.994} = 14.346\times10^{-6}$ lb/DSCF

AVG 7.907×10^{-6} lb/DSCF

Run 3A 7.061×10^{-5} $\frac{0.78 \times 0.01020 \left(\frac{50}{10}\right)}{0.984} = 2.855\times10^{-6}$ lb/DSCF

Run 3B $\frac{0.98 \times 0.01020 \left(\frac{50}{10}\right)}{0.981} = 3.597\times10^{-6}$ lb/DSCF

Run 3C $\frac{4.91 \times 0.01020 \left(\frac{50}{10}\right)}{1.003}$ 17.629×10^{-6} lb/DSCF

AVG 8.027×10^{-6} lb/DSCF

No. 3 Lime Kiln

lbs/DSCF

Run 1A: $\frac{7.061 \times 10^{-5} \times 2.48 \times 0.0102 \left(\frac{50}{10}\right)}{1.019} = 8.764 \times 10^{-6}$

1B: $\frac{7.061 \times 10^{-5} \times 3.01 \times 0.0102 \left(\frac{50}{10}\right)}{1.007} = 10.764 \times 10^{-6}$

1C: $\frac{7.061 \times 10^{-5} \times 4.83 \times 0.0102 \left(\frac{50}{10}\right)}{1.014} = 17.153 \times 10^{-6}$

AVG : 12.227×10^{-6}

Run 2A: $\frac{7.061 \times 10^{-5} \times 2.50 \times 0.0102 \left(\frac{50}{10}\right)}{1.023} = 8.800 \times 10^{-6}$

2B: $\frac{7.061 \times 10^{-5} \times 2.85 \times 0.0102 \left(50/10\right)}{1.019} = 10.072 \times 10^{-6}$

2C: $\frac{7.061 \times 10^{-5} \times 3.00 \times 0.0102 \left(50/10\right)}{1.016} = 10.633 \times 10^{-6}$

AVG = 9.835×10^{-6}

Run 3A: $\frac{7.061 \times 10^{-5} \times 1.53 \times 0.0102 \left(50/10\right)}{1.019} = 5.407 \times 10^{-6}$

3B: $\frac{7.061 \times 10^{-5} \times 1.13 \times 0.0102 \left(50/100\right)}{1.019} = 3.993 \times 10^{-6}$

3C: $\frac{7.061 \times 10^{-5} \times 1.00 \times 0.0102 \left(50/100\right)}{1.016} = 3.544 \times 10^{-6}$

AVG = 4.315×10^{-6}

Tel. (904) 353-5761

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 2 Lime Kiln | RUN: 1 A, B, C | DATE: 9/ 2/89

WEATHER CONDITIONS: | PB (IN HG): 30.12 | FROM: 10:30 TO:11:58

AS' (SQ FT): | TS (°R): | PS (IN HG):

$\sqrt{H}$ (IN H_2O): | ΔH (IN H_2O): | TM (°R): 1A: 543.3, 1B: 545, 1C: 551

AN (SQ FT): | VM (CF) 1A: 1.052, 1B: 1.068, 1C: 1.056 | CRX

TOTAL TIME (MIN): | NPTSX | XCXCNKXX

ORSAT: CO_2% | O_2%

N_2% | CO%

---

1. VOLUME WATER VAPOR — 1. ______ SCF
2. GAS VALUME SAMPLED - STPD 1A: 1.029, 1B: 1.042, 1C: 1.019 — 2. ______ SCFD
3. TOTAL VOLUME — 3. ______ SCF
4. MOISTURE IN STACK GAS - VOLUME FRACTION — 4. ______
5. DRY STACK GAS - VOLUME FRACTION — 5. ______
6. ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION — 6. ______
7. MOLECULAR WEIGHT OF STACK GAS - DRY BASIS — 7. ______
8. MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS — 8. ______
9. SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR — 9. ______
10. EXCESS AIR - PERCENT — 10. ______ %
11. AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$) — 11. ______
12. AVERAGE STACK VELOCITY — 12. ______ FPM
13. ACTUAL STACK GAS FLOW RATE — 13. ______ ACFM
14. ACTUAL STACK GAS FLOW RATE DRY — 14. ______ CFMD
15. STACK GAS FLOW RATE - STPD — 15. ______ SCFMD
16. PERCENT ISOKINETIC — 16. ______ %

MG	GR/SCF	GR/ACF	LBS/HR

COMMENTS: ______

TEST CONDUCTED BY: ______

Tel. (904) 353-5761

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 2 Lime Kiln — RUN: 2 A, B, C. — DATE: 9/2/89

WEATHER CONDITIONS: — PB (IN HG): 30.12 — FROM: 12:37 TO:14:05

AS' (SQ FT): — TS (°R): — PS (IN HG):

$\sqrt{H}$ (IN H_2O): — ΔH (IN H_2O): — TM (°R): 2A: 555, 2B: 556.3, 2C: 555.8

AN (SQ FT): — VM (CF) 2A: 1.044, 2B: 1.053, 2C: 1.039 — ~~CPY~~

TOTAL TIME (MIN): — ~~XXXXX~~ — ~~XXXXXXXX~~

ORSAT: CO_2% — O_2%

N_2% — CO%

1.	VOLUME WATER VAPOR	1.	SCF
2.	GAS VALUME SAMPLED - STPD 1A: 1.000, 2B: 1.006, 2C: 0.994	2.	SCFD
3.	TOTAL VOLUME	3.	SCF
4.	MOISTURE IN STACK GAS - VOLUME FRACTION	4.	
5.	DRY STACK GAS - VOLUME FRACTION	5.	
6.	ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION	6.	
7.	MOLECULAR WEIGHT OF STACK GAS - DRY BASIS	7.	
8.	MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS	8.	
9.	SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR	9.	
10.	EXCESS AIR - PERCENT	10.	%
11.	AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$)	11.	
12.	AVERAGE STACK VELOCITY	12.	FPM
13.	ACTUAL STACK GAS FLOW RATE	13.	ACFM
14.	ACTUAL STACK GAS FLOW RATE DRY	14.	CFMD
15.	STACK GAS FLOW RATE - STPD	15.	SCFMD
16.	PERCENT ISOKINETIC	16.	%

MG	GR/SCF	GR/ACF	LBS/HR

COMMENTS:

TEST CONDUCTED BY:

Tel. (904) 353-5761

TSI

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 2 Lime Kiln | RUN: 3A, B, C | DATE: 9/2/89

WEATHER CONDITIONS: | PB (IN HG): 30.12 | FROM: 14:41 TO: 16:13

AS' (SQ FT): | TS (°R): | PS (IN HG):

$\sqrt{H}$ (IN H_2O): | ΔH (IN H_2O): | TM (°R): 3A: 555.3, 3B: 554.8, 3C: 553.5

AN (SQ FT): | VM (CF) 3A: 1.028, 3B: 1.024, 3C: 1.044

TOTAL TIME (MIN):

ORSAT: CO_2% | O_2%

N_2% | CO%

---

1. VOLUME WATER VAPOR — 1.______ SCF
2. GAS VALUME SAMPLED - STPD 3A: 0.984, 3B: 0.981, 3C: 1.003 — 2.______ SCFD
3. TOTAL VOLUME — 3.______ SCF
4. MOISTURE IN STACK GAS - VOLUME FRACTION — 4.______
5. DRY STACK GAS - VOLUME FRACTION — 5.______
6. ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION — 6.______
7. MOLECULAR WEIGHT OF STACK GAS - DRY BASIS — 7.______
8. MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS — 8.______
9. SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR — 9.______
10. EXCESS AIR - PERCENT — 10.______ %
11. AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$) — 11.______
12. AVERAGE STACK VELOCITY — 12.______ FPM
13. ACTUAL STACK GAS FLOW RATE — 13.______ ACFM
14. ACTUAL STACK GAS FLOW RATE DRY — 14.______ CFMD
15. STACK GAS FLOW RATE - STPD — 15.______ SCFMD
16. PERCENT ISOKINETIC — 16.______ %

MG	GR/SCF	GR/ACF	LBS/HR

COMMENTS:______

TEST CONDUCTED BY:______

Tel. (904) 353-5761

TSI

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 3 Lime Kiln | RUN: 1A, B, C | DATE: 8/30/89

WEATHER CONDITIONS: | PB (IN HG): 30.07 | FROM: 10:35 TO: 12:04

AS' (SQ FT): | TS (°R): | PS (IN HG):

$\sqrt{H}$ (IN H_2O): | ΔH (IN H_2O): | TM (°R): 1A: 548.5, 1B: 548.8, 1C: 550.5

AN (SQ FT): | VM (CF) 1A: 1.053, 1B: 1.041, 1C: 1.052 | ~~CPX~~

TOTAL TIME (MIN): | ~~NPTSX~~ | VC (ML):

ORSAT: CO_2% | O_2%

N_2% | CO%

1.	VOLUME WATER VAPOR	1.______ SCF
2.	GAS VALUME SAMPLED - STPD 1A: 1.019, 1B: 1.007, 1C: 1.014	2.______ SCFD
3.	TOTAL VOLUME	3.______ SCF
4.	MOISTURE IN STACK GAS - VOLUME FRACTION	4.______
5.	DRY STACK GAS - VOLUME FRACTION	5.______
6.	ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION	6.______
7.	MOLECULAR WEIGHT OF STACK GAS - DRY BASIS	7.______
8.	MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS	8.______
9.	SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR	9.______
10.	EXCESS AIR - PERCENT	10.______ %
11.	AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$)	11.______
12.	AVERAGE STACK VELOCITY	12.______ FPM
13.	ACTUAL STACK GAS FLOW RATE	13.______ ACFM
14.	ACTUAL STACK GAS FLOW RATE DRY	14.______ CFMD
15.	STACK GAS FLOW RATE - STPD	15.______ SCFMD
16.	PERCENT ISOKINETIC	16.______ %

MG	GR/SCF	GR/ACF	LBS/HR

COMMENTS: ______

TEST CONDUCTED BY: ______

Tel. (904) 353-5761

TSI

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling,
Surveys, Testing and
Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 3 Lime Kiln | RUN: 2A, B, C | DATE: 8/30/89

WEATHER CONDITIONS: | PB (IN HG): 30.07 | FROM: 12:38 TO: 14:09

AS' (SQ FT): | TS (°R): | PS (IN HG):

$\sqrt{H}$ (IN H_2O): | Δ H (IN H_2O): | TM (°R): 2A: 552.3, 2B: 552.3, 2C: 552.0

AN (SQ FT): | VM (CF) 2A: 1.065, 2B: 1.060, 2C: 1.057

TOTAL TIME (MIN):

ORSAT: CO_2% | O_2%

N_2% | CO%

1. VOLUME WATER VAPOR — 1. ______ SCF
2. GAS VALUME SAMPLED - STPD 2A: 1.023, 2B: 1.019, 2C: 1.016 — 2. ______ SCFD
3. TOTAL VOLUME — 3. ______ SCF
4. MOISTURE IN STACK GAS - VOLUME FRACTION — 4. ______
5. DRY STACK GAS - VOLUME FRACTION — 5. ______
6. ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION — 6. ______
7. MOLECULAR WEIGHT OF STACK GAS - DRY BASIS — 7. ______
8. MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS — 8. ______
9. SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR — 9. ______
10. EXCESS AIR - PERCENT — 10. ______ %
11. AVERACE OF FACTOR ($\sqrt{H \quad x \quad TS}$) — 11. ______
12. AVERAGE STACK VELOCITY — 12. ______ FPM
13. ACTUAL STACK GAS FLOW RATE — 13. ______ ACFM
14. ACTUAL STACK GAS FLOW RATE DRY — 14. ______ CFMD
15. STACK GAS FLOW RATE - STPD — 15. ______ SCFMD
16. PERCENT ISOKINETIC — 16. ______ %

MG	GR/SCF	GR/ACF	LBS/HR

COMMENTS: ______

TEST CONDUCTED BY: ______

Tel. (904) 353-5761

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 3 Lime Kiln | RUN: 3A, 3B, 3C | DATE: 8/30/89

WEATHER CONDITIONS: | PB (IN HG): 36.07 | FROM: 14:37 TO: 16:12

AS' (SQ FT): | TS (°R): | PS (IN HG):

$\sqrt{H}$ (IN H_2O): | ΔH (IN H_2O): | TM (°R): 3A: 551.3, 3B: 550.0, 3C: 549.3

AN (SQ FT): | VM (CF) 3A: 1.058, 3B: 1.056, 3C: 1.052 | XXX

TOTAL TIME (MIN): | XXXXX | XXXXXXX

ORSAT: CO_2% | O_2%

N_2% | CO%

1. VOLUME WATER VAPOR — 1. ______ SCF
2. GAS VALUME SAMPLED - STPD 3A: 1.019, 3B: 1.019, 3C: 1.016 — 2. ______ SCFD
3. TOTAL VOLUME — 3. ______ SCF
4. MOISTURE IN STACK GAS - VOLUME FRACTION — 4. ______
5. DRY STACK GAS - VOLUME FRACTION — 5. ______
6. ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION — 6. ______
7. MOLECULAR WEIGHT OF STACK GAS - DRY BASIS — 7. ______
8. MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS — 8. ______
9. SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR — 9. ______
10. EXCESS AIR - PERCENT — 10. ______ %
11. AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$) — 11. ______
12. AVERAGE STACK VELOCITY — 12. ______ FPM
13. ACTUAL STACK GAS FLOW RATE — 13. ______ ACFM
14. ACTUAL STACK GAS FLOW RATE DRY — 14. ______ CFMD
15. STACK GAS FLOW RATE - STPD — 15. ______ SCFMD
16. PERCENT ISOKINETIC — 16. ______ %

MG	GR/SCF	GR/ACF	LBS/HR

COMMENTS: ______

TEST CONDUCTED BY: ______

APPENDIX C

PROCESS WEIGHTS

PROCESS WEIGHT CERTIFICATION

DATE: ______________ SAMPLING TIME: From ________ to __________

STATEMENT OF PROCESS WEIGHT:

Company Name ____

Mailing Address ____

Source Identification _____________________________________

Source Location ____

DATA ON OPERATING CYCLE TIME:

Start of Operation, Time __________________________________

End of Operation, Time ____________________________________

Elapsed Time ____

Idle Time During Cycle ____________________________________

Design Process Rating:
Process Weight Rate(Input) _______ Product(Output) ________

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE:

(Include Specifications on Fossil Fuels)

Material ________________________ RATE* ____________________

Material ________________________ RATE* ____________________

Material ________________________ RATE* ____________________

Total Process Weight Rate* ____________________

Product _________________________ Rate** ___________________

* For phosphate process expressed as actual tons/hour and as tons P_2O_5/hour.

For fossil fuel steam generators expressed as BTU/hour heat input.

** For sulfuric acid plants expressed as 100% H_2SO_4/hour.

I certify that the above statement is true to the best of my knowledge and belief.

Signature ____________________________

Title: ____________________________

PROCESS WEIGHT CERTIFICATION

DATE: ____________________ SAMPLING TIME: From __________ to __________

STATEMENT OF PROCESS WEIGHT:

Company Name ____________________

Mailing Address ____________________

Source Identification ____________________

Source Location ____________________

DATA ON OPERATING CYCLE TIME:

Start of Operation, Time ____________________

End of Operation, Time ____________________

Elapsed Time ____________________

Idle Time During Cycle ____________________

Design Process Rating:
Process Weight Rate (Input) __________ Product (Output) __________

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE:

(Include Specifications on Fossil Fuels)

Material ____________________ RATE* ____________________

Material ____________________ RATE* ____________________

Material ____________________ RATE* ____________________

Total Process Weight Rate* ____________________

Product ____________________ Rate** ____________________

* For phosphate process expressed as actual tons/hour and as tons P_2O_5/hour.

For fossil fuel steam generators expressed as BTU/hour heat input.

** For sulfuric acid plants expressed as 100% H_2SO_4/hour.

I certify that the above statement is true to the best of my knowledge and belief.

Signature ____________________

Title: ____________________

APPENDIX D

SAMPLE CHAIN OF CUSTODY

SAMPLE CHAIN OF CUSTODY

Plant Name Seminole Kraft Corp.

Location Jacksonville, Fla. - No.3 Lime Kiln

Date Sampled 8-30-89

Type of Sample Sulfur Dioxide

Sampling Time: From 1035 To 1612

Sample Recovery

Container	Description		
9 x 4oz bottles	SO_2 - Runs	Date	8-30-89
	1A, B, C	Time	1640
	2A, B, C	Location	On Site
	3A, B, C	Signed	Dave Gray

Intermediate Handling

Date N/A

Time

Signature

Analysis

Container	Date Received	Date Analyzed	Signature
Same	9-5-89	9-5-89	Dave Gray
as			
above			

SAMPLE CHAIN OF CUSTODY

Plant Name Seminole Kraft Corp.

Location Jacksonville, Fla. No. 2 Lime Kiln

Date Sampled 9-2-89

Type of Sample Sulfur Dioxide

Sampling Time: From 1030 To 1613

Sample Recovery

Container	Description		
9 x 4 oz. bottles	SO_2 Runs	Date	9-2-89
	1A, B, C	Time	1645
	2A, B, C	Location	On Site
	3 A, B, C	Signed	Dave Gray

Intermediate Handling

Date N/A

Time

Signature

Analysis

Container	Date Received	Date Analyzed	Signature
Same	9-5-89	9-5-89	Dave Gray
as			
above			

APPENDIX E

CALIBRATION DATA

TYPE S PITOT TUBE

SPECIFICATIONS AND ALIGNMENT

Pitot Tube Number 4

Baseline Coefficient, C_p 0.840

Pitot Tube Dimensions (Fig. 2-2 and 2-3)

P_a 0.503" D_t 0.375" W_s 0.01"

P_b 0.502" Z_s 0.07"

a1 1° B1 0°

a2 0° B2 0°

Pitot Tube-Sample Probe Type ________

(Figure 2-6, 2-7, 2-8 and attached form)

X ________

D_n ________

Z_p ________

W_p ________

Y ________

CALIBRATED BY: GT

Subscript s: Type S Pitot Tube Dimension Reference.

Subscript p: Sample Probe-Pitot Tube Dimension Reference.

Figure References refer to 40 CFR Ch. 1, Part 60, Appendix A, Method 2.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 9/5/89 Thermocouple Number 5

Ambient Temperature 85 ° Barometric Pressure 30.02 in Hg

Calibration R.W.M Reference: mercury in glass ✓

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
1	ICE WATER	32°F	33°F	-0.20
2	Ambient	85°F	87°F	-0.37
3	Boiling Water	212°F	214°F	-0.30

[a]Type of calibration system used

[b] $\left[\frac{(\text{ref. temp, °F} + 460) - (\text{test thermom temp, °F} + 460)}{\text{ref. temp, °F} + 460}\right] 100 \leq 1.5\%$

Quality Assurance Handbook M5-2.5

Date 8/22/89 Meter box number 6

Barometric pressure, P_b = 30.05 in. Hg Calibrated by R.W.M.

Orifice manometer setting (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter: Inlet (t_{d_i}), °F	Temperatures: Dry gas meter: Outlet (t_{d_o}), °F	Temperatures: Dry gas meter: Avg[a] (t_d), °F	Time (θ), min	Y_i	$\Delta H@_i$, in. H_2O
0.5	5.009	4.954	82.0	80.0	82.0	81.0	13.27	1.008	2.010
1.0	5.015	4.989	82.0	80.0	82.0	81.0	9.45	1.001	2.033
1.5	10.010	9.980	82.0	81.0	82.5	81.8	15.42	0.999	2.036
2.0	10.214	10.215	82.0	81.0	83.0	82.0	13.55	0.995	2.012
3.0	10.017	9.973	82.0	81.5	83.5	82.5	10.81	0.998	1.996
4.0	10.019	9.960	82.0	82.0	83.5	82.8	9.37	1.005	1.997
							Avg	1.001	2.014

ΔH, in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6})(t_w + 460)}$	$\Delta H@_i = \frac{0.0317 \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\theta}{V_w}\right]^2$
0.5	0.0368	1.008	2.010
1.0	0.0737	1.001	2.033
1.5	0.110	0.999	2.036
2.0	0.147	0.995	2.012
3.0	0.221	0.998	1.996
4.0	0.294	1.005	1.997

[a]If there is only one thermometer on the dry gas meter, record the temperature under t_d.

Dry gas meter calibration data (English units). (front side)

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test numbers ALL Date 9/5/89 Meter box number 6 Plant Seminole Kraft

Barometric pressure, P_b = 30.08 in. Hg Dry gas meter number ______ Pretest Y 1.001

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter, Inlet (t_{d_i}), °F	Temperature: Dry gas meter, Outlet (t_{d_o}), °F	Temperature: Dry gas meter, Average (t_d),[a] °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
1.0	10.024	10.026	84.0	85.0	87.0	86.0		2	1.001	
1.0	10.029	10.030	84.0	85.5	87.5	86.5		2	1.002	
	10									
									Y =	1.0015

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm$0.05Y

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

APPENDIX F

VOLUMETRIC FLOW DATA

PRELIMINARY VELOCITY TRAVERSE

PLANT Seminole Kraft Corp.
DATE 8-30-89
LOCATION No. 3 Lime Kiln
STACK I.D. 44"
BAROMETRIC PRESSURE, in.Hg 30.07
STACK GAUGE PRESSURE, in.H_2O -0.16
OPERATORS HG - DG

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in.H_2O	STACK TEMPERATURE (T_s), °F
1-1	0.16	144
-2	0.18	146
-3	0.19	147
-4	0.21	149
-5	0.23	151
-6	0.21	151
-7	0.22	150
-8	0.23	149
-9	0.22	151
-10	0.21	150
-11	0.20	149
-12	0.19	145
2-1	0.19	142
-2	0.21	144
-3	0.23	143
-4	0.25	145
-5	0.24	142
-6	0.23	141
-7	0.22	141
-8	0.21	140
-9	0.20	143
-10	0.18	146
-11	0.16	145
-12	0.15	144
	0.4519	145.8 | 605.8
AVERAGE		

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in.H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

EPA (Dur) 233

PRELIMINARY VELOCITY TRAVERSE

PLANT seminole Kraft Corp.
DATE 9-2-89
LOCATION No. 2 Lime Kiln
STACK I.D. 54"
BAROMETRIC PRESSURE, in.Hg 30.12
STACK GAUGE PRESSURE, in.H_2O -0.12
OPERATORS HG/DG

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in.H_2O	STACK TEMPERATURE (T_s), °F
1-1	0.10	140
-2	0.11	143
-3	0.12	144
-4	0.13	144
-5	0.13	145
-6	0.14	144
-7	0.12	144
-8	0.12	143
-9	0.14	143
-10	0.11	143
-11	0.11	142
-12	0.09	140
2-1	0.13	144
-2	0.14	143
-3	0.14	144
-4	0.13	143
-5	0.12	142
-6	0.14	143
-7	0.13	143
-8	0.13	144
-9	0.12	142
-10	0.11	142
-11	0.10	142
-12	0.08	140
	.3462	142.8/602.8
AVERAGE		

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in.H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

EPA (Dur) 233

Tel. (904) 353-5761

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 3 Lime Kiln	RUN:	DATE: 8/30/89
WEATHER CONDITIONS:	PB (IN HG):	FROM: TO:
AS' (SQ FT): 10.559	TS (°R): 605.8	PS (IN HG): 30.11
$\sqrt{H}$ (IN H_2O): 0.4519	ΔH (IN H_2O):	TM (°R):
AN (SQ FT):	VM (CF)	CP:
TOTAL TIME (MIN):	NPTS:	VC (ML):
ORSAT: CO_2% 21.4	O_2% 3.2	
N_2% 75.4	CO%	

1.	VOLUME WATER VAPOR	1.	SCF
2.	GAS VALUME SAMPLED - STPD	2.	SCFD
3.	TOTAL VOLUME	3.	SCF
4.	MOISTURE IN STACK GAS - VOLUME FRACTION	4. 0.242	
5.	DRY STACK GAS - VOLUME FRACTION	5. 0.757	
6.	ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION	6.	
7.	MOLECULAR WEIGHT OF STACK GAS - DRY BASIS	7. 31.552	
8.	MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS	8. 28.298	
9.	SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR	9. .976	
10.	EXCESS AIR - PERCENT	10.	%
11.	AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$)	11.	
12.	AVERAGE STACK VELOCITY	12. 1640.4	FPM
13.	ACTUAL STACK GAS FLOW RATE	13. 17321.	ACFM
14.	ACTUAL STACK GAS FLOW RATE DRY	14. 13164.	CFMD
15.	STACK GAS FLOW RATE - STPD	15. 11546.	SCFMD
16.	PERCENT ISOKINETIC	16.	%

	MG	lb/DSCF	PPM	LBS/HR
Run 1		12.227×10^{-6}	74.2	8.51
Run 2		9.835×10^{-6}	59.4	6.81
Run 3		4.315×10^{-6}	26.1	2.99

COMMENTS:

TEST CONDUCTED BY:

Tel. (904) 353-5761

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2471 SWAN STREET
P. O. BOX 52329
JACKSONVILLE, FLORIDA 32201

PLANT: Seminole Kraft Corp.

STACK: No. 2 Lime Kiln | RUN: | DATE: 9/2/89

WEATHER CONDITIONS: Partley Cloudy | PB (IN HG): 30.12 | FROM: TO:

AS' (SQ FT): 15.904 | TS (°R): 602.8 | PS (IN HG): 30.11

$\sqrt{H}$ (IN H_2O): 0.3462 | ΔH (IN H_2O): | TM (°R):

AN (SQ FT): | VM (CF) | CP: 0.84

TOTAL TIME (MIN): | NPTS: | VC (ML):

ORSAT: CO_2% 4.1 | O_2% 8.9

N_2% 87.0 | CO%

1.	VOLUME WATER VAPOR	1. ______ SCF
2.	GAS VALUME SAMPLED - STPD	2. ______ SCFD
3.	TOTAL VOLUME	3. ______ SCF
4.	MOISTURE IN STACK GAS - VOLUME FRACTION	4. 0.234
5.	DRY STACK GAS - VOLUME FRACTION	5. 0.766
6.	ASSUMED MOISTURE IN STACK GAS - VOLUME FRACTION	6.
7.	MOLECULAR WEIGHT OF STACK GAS - DRY BASIS	7. 29.012
8.	MOLECULAR WEIGHT OF STACK GAS - STACK CONDITIONS	8. 26.479
9.	SPECIFIC GRAVITY OF STACK GAS RELATIVE TO AIR	9. .913
10.	EXCESS AIR - PERCENT	10. ______ %
11.	AVERAGE OF FACTOR ($\sqrt{H \quad x \quad TS}$)	11.
12.	AVERAGE STACK VELOCITY	12. 1295.8 FPM
13.	ACTUAL STACK GAS FLOW RATE	13. 20609. ACFM
14.	ACTUAL STACK GAS FLOW RATE-DRY	14. 15869. CFMD
15.	STACK GAS FLOW RATE - STPD	15. 13988. SCFMD
16.	PERCENT ISOKINETIC	16. ______ %

MG	lb/DSCF	PPM	LBS/HR
Run 1	5.584410^{-6}	33.7	4.69
Run 2	7.907×10^{-6}	47.8	6.64
Run 3	8.027×10^{-6}	48.5	6.74

COMMENTS: ______

TEST CONDUCTED BY: ______

APPENDIX G

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

H. C. Gray	Field Testing Calibration Lab Analysis Report Preparation
D. H. Gray	Field Testing Calibration
Earl Coggins	Field Testing