



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 22, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. William R. Malenius
Director of Project Development
Orange Cogeneration Limited Partnership
23046 Avenida De La Carlota
Laguna Hills, CA 92653

Dear Mr. Malenius:

Re: Revision of Construction Permits
AC53-233852A and AC53-233851B (PSD-FL-206B)

The Department has reviewed KBN Engineering and Applied Sciences, Inc.'s October 10, 1994 letter requesting a change in the emission standards in the referenced permits for the combustion turbines (AC53-233851B) to be built for Orange Cogeneration Limited Partnership in Bartow, Polk County, Florida. Clarification of the emission limits for these units was also requested. In response to this request, the Department is proposing to revise the construction permit to change the units of the nitrogen oxides concentration standard to parts per million volume dry, corrected to 15 percent oxygen (ppmvd @ 15% O₂). The allowable emissions of all air pollutants from these units in pounds per hour and tons per year, which are a function of the combustion turbines air inlet temperature, are not being changed. The Department has retained the requirement for installation of nitrogen oxides and oxygen continuous emission monitors. Data from these instruments will indicate if the combustion turbines are properly operated and maintained. The Department is also retaining the requirement for compliance tests on both natural gas and biogas fuels as neither emissions or equivalency to natural gas can be estimated from an analysis of the fuels. In addition, the permit (AC53-233852A) for the auxiliary boiler is being revised to reflect changes in the testing requirements of the BACT.

Mr. William R. Malenius
AC53-233852A and AC53-233851B (PSD-FL-206B)
Permit Amendment
December 22, 1994
Page 2 of 2

Please submit the proof of publication of the attached Notice of Intent to Issue Permit and any written comments you wish to have considered concerning the Department's proposed action to Mr. John Brown on the Bureau of Air Regulation.

Sincerely,



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

CHF/WH/bjb/mc

Attachment

cc: Bill Thomas, SWD
Ken Kosky, KBN
Jewell Harper, EPA
L. Novak, PCESD
John Bunyak, NPS

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- Addressee's Address
- Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
 Mr. William R. Malenius
 Director of Project Development
 Orange Cogeneration Limited
 Partnership
 23046 Avenida De La Carlota
 Suite 400
 Laguna Hills, CA 92653

4a. Article Number
 P 872 563 679

4b. Service Type
 Registered Insured
 Certified COD
 Express Mail Return Receipt for Merchandise

7. Date of Delivery
 1-3-95

5. Signature (Addressee)
Carl J. [Signature]

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 *U.S. GPO: 1992-323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 872 563 679



Receipt for Certified Mail

No Insurance Coverage Provided
 Do not use for International Mail
 (See Reverse)

PS Form 3800, JUNE 1991

Sent to Mr. William R. Malenius	
Street and No. 23046 Avenida De La Carlota	
P.O., State and ZIP Code Laguna Hills, CA 92653 Ste 400	
Postage	\$
Certified Fee	
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date Mailed: 12-29-94 Permit: AC 53-233852A -233851B PSD-FL-206B	

(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;

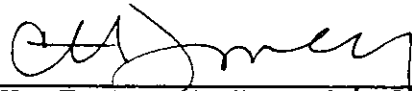
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and,

(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 intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application/request 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 receipt of this intent 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, Florida Administrative Code.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE REVISED PERMITS and all copies were mailed by certified mail before the close of business on 12-29-94 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Jeri J. [Signature]
Clerk

12-29-94
Date

Copies furnished to:

- B. Thomas, SWD
- J. Harper, EPA
- J. Bunyak, NPS
- L. Novak, PCESD
- K. Kosky, P.E., KBN

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF INTENT TO ISSUE REVISED PERMITS

AC53-233852A and AC53-233851B (PSD-FL-206B)

The Department of Environmental Protection gives notice of its intent to revise the air pollution source construction permits [AC53-233852A and AC53-233851B (PSD-FL-206B)] issued to Orange Cogeneration Limited Partnership, 23046 Avenida De La Carlota, Suite 400, Laguna Hills, CA 92653. The permits are for a natural gas/equivalent biogas fired cogeneration facility containing two combustion turbines, an auxiliary boiler, and associated equipment. It will be located in Bartow, Polk County, Florida.

The revision is to change the allowable nitrogen oxides emission standard for the combustion turbines from a concentration at 15 percent oxygen and ISO standard ambient conditions (ppmvd @ 15% O₂ at ISO) to the observed concentration corrected to 15 percent oxygen (ppmvd @ 15% O₂). Also, changes are being made to the permits to reflect changes made in the revised Best Available Control Technology (BACT) determination.

This revision does not change the allowable mass emission standard (lbs/hr and TPY) of any air pollutant emitted by this facility. The facility is subject to the Prevention of Significant Deterioration (PSD) regulations. The emission standards/limitations are established by a BACT determination. The impact of the emissions will not cause or contribute to a violation of any ambient air quality standard or PSD increment.

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 (F.S.). 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 their 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, F.S.

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 intent. 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 receipt of this intent 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, Florida Administrative Code.

The application/request 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 Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619-8218

Any person may send written comments on the proposed action to Mr. John Brown at the Department of Environmental Protection, Mail Station 5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination. Further, a public hearing can be requested by any person(s). Such requests must be submitted within 30 days of this notice.



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:
**Orange Cogeneration Limited
Partnership**
23046 Avenida De La Carlota
Suite 400
Laguna Hills, CA 92653

**Permit Number: AC53-233851B
PSD-FL-206B**
Expiration Date: April 1, 1998
County: Polk
**Latitude/Longitude: 27°52'15"N
81°49'31"W**
Project: Two Combustion Turbines

This revised permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-212 and 62-4, Florida Administrative Code (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto and specifically described as follows:

Installation of two natural gas/biogas fired GE LM 6000 (or equivalent) combustion turbines (CT), two heat recovery steam generators and one steam turbine. An auxiliary boiler (AC53-233852) is being permitted separately. The CTs will be equipped with a staged combustion technology dry low-NO_x system to control nitrogen oxides (NO_x) emissions. Each CT will be equipped with a 100 ft. high, 11 ft. diameter stack that will handle approximately 300,000 actual cubic feet per minute of flue gas at 230°F. The cogeneration facility will be located on Clear Springs Road, Bartow, Polk County, Florida.

The UTM coordinates of this facility are Zone 17, 418.75 km East and 3083.0 km North.

The emissions unit(s)/sources 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. Application received July 1, 1993.
2. Department's July 22, 1993 letter.
3. KBN's August 5, 1993 letter.
4. KBN's August 29, 1993 letter.
5. Tables 1 and 2, Allowable Emission Rates.
6. KBN's October 28, 1993 letter.
7. KBN's October 29, 1993 letter.
8. Department's February 18, 1994 letter.
9. KBN's March 11, 1994 letter.
10. Department's March 29, 1994 letter.
11. KBN's June 22, 1994 letter.
12. KBN's October 10, 1994 letter.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

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, F.S. 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), F.S., 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 F.S. and Department rules, unless specifically authorized by an order from the Department.

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.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

GENERAL CONDITIONS:

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.

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 F.S. or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, F.S. 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 F.S. after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by F.S. or Department rules.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

GENERAL CONDITIONS:

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-730.300, 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.
- 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.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

GENERAL CONDITIONS:

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:

This permit replaces permit No. AC53-233851/PSD-FL-206 and amended construction permit No. AC53-233851A/PSD-FL-206A.

Construction Requirements

1. Dry low-NO_x combustion technology systems shall be installed and operated on each combustion turbine (CT).
2. A system to continuously monitor the fuel consumption, nitrogen oxides emissions, and oxygen content of the flue gas shall be installed on each CT.
3. The heat recovery steam generator (HRSG) installed on each CT shall not be equipped with an auxiliary/duct burner.
4. Each CT stack shall be equipped with stack sampling facilities (sample ports, work platforms, access, and electrical power) that meet the specifications given in Rule 62-297.345, F.A.C.

Operation Limitations

5. The CTs shall comply with all requirements of 40 CFR 60, Subpart GG (July, 1993), Standard of Performance for Stationary Gas Turbines, which is adopted by reference in Rule 62-296.800(2)(a), F.A.C.
6. The facility is allowed to operate continuously, 8760 hours per year.
7. Only natural gas/biogas fuel shall be used for fuel at this facility.
8. Each CT shall have a maximum heat input of 368.3 MMBtu/hr, when using dry low NO_x technology to control NO_x emissions.
9. The operation of this facility shall not create a nuisance or discharge air pollutants that cause or contribute to objectionable odors pursuant to Rule 62-296.320(2), F.A.C.

ORANGE COGENERATION LIMITED PARTNERSHIP
 AC53-233851B (PSD-FL-206B)
 42 MW COMBINED CYCLE GAS TURBINES

Table 1 - Allowable Emission Rates^b for each Combustion Turbine

Pollutant ^a	Control ^e	Concentration	Allowable Emissions Standards/Limitations			
			Compl. Date	Maximum Corrected ^c lbs/hr	TPY	Basis for Limit
NO _x	DLN	25 ppmvd at 15% O ₂ ^d	initial	37.0	161.9	BACT
	DLN	15 ppmvd at 15% O ₂ ^d	1/1/98	22.1	97.0	BACT
CO	GC ^f	30 ppmvd		27.8	127.0	BACT
PM/PM ₁₀	GC ^f			5	21.9	BACT
VOC	GC ^f	10 ppmvd		3.98	17.4	BACT

^a Pollutant emissions are based on 8,760 hours per year operation firing natural gas or biogas.

^b Allowable emissions, lbs/hr, at different inlet temperatures shall not exceed the rates given in the manufacturer's data required by specific condition No. 15.

^c Maximum emission rates not to be exceeded.

^d The NO_x maximum concentration will be lowered to 15 ppmvd at 15% O₂ by 1/1/98 using appropriate combustion technology improvements. Should this level of control not be achieved when the initial compliance demonstration stack tests are performed, the permittee must provide the Department with a plan and schedule to meet this standard. NO_x emission concentrations are to be corrected to 15 percent oxygen to demonstrate compliance with the NO_x emissions standard.

^e Dry Low-NO_x (DLN) combustors.

^f Good Combustion.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

SPECIFIC CONDITIONS:

Emission Limitation

10. Prior to January 1, 1998, the maximum NO_x concentration, 1-hour average, from each CT/HRSG unit, shall not exceed 25 parts per million by volume dry corrected to 15 percent oxygen (25 ppmvd @ 15% O₂), as determined by the procedures in Specific Conditions Nos. 16, 17 and 18.

11. After December 31, 1997, the maximum NO_x concentration, 1-hour average, from each CT/HRSG unit, shall not exceed 15 ppmvd @ 15% O₂, as determined by the procedures in Specific Conditions Nos. 16, 17 and 18. Should the NO_x standard of 15 ppmvd @ 15% O₂ not be achieved during the initial compliance tests, the permittee will provide the Department with a plan and schedule to meet this standard. The permittee shall obtain prior approval from the Department for any air pollution control equipment not addressed in this permit that is needed to meet the NO_x emission standard.

12. The maximum emission rates for particulate matter (PM/PM₁₀), volatile organic compounds (VOC), NO_x, and carbon monoxide (CO) shall not exceed any of the rates listed in Table 1, Allowable Emission Rates.

13. Visible emissions shall not exceed 10 percent opacity, 6 minute average.

14. The emission rates for sulfur dioxide (SO₂) and sulfuric acid (H₂SO₄) mist, listed in the following table, shall be used for inventory purposes only.

Maximum Emission Rates for Each Combustion Turbine
For Inventory and PSD Tracking Purposes Only

Pollutant	Combustion Turbine	
	<u>Dry Low NO_x Combustion</u>	
	lb/hr	TPY
SO ₂	1.11	4.87
H ₂ SO ₄ mist	0.085	0.37

15. Manufacturer's curves for the emission rate correction to other temperatures at different loads shall be provided to DEP for review by January 1, 1995. Until new curves are approved by the Department or the combustion turbines meet the NO_x emission standard of 15 ppmvd @ 15% (whichever occurs first), the stack, operator, and emission data for the proposed combustion turbines in

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

SPECIFIC CONDITIONS:

Table 2-4 (October 28, 1993) will be used. The data will be used to determine compliance with the maximum allowable emission rates of the regulated air pollutants at different air inlet temperatures for these turbines.

Compliance Determination

16. Testing of emissions shall be conducted at 95-100% of the manufacturer's rated heat input based on the average air inlet temperature for the CT during the test. Compliance for NO_x emission limits shall be determined by calculating the concentration of NO_x (ppmvd at 15% O₂) and using the turbine manufacturer's thermal throughput rating for the average air inlet temperature by multiplying the permitted emission limit by the ratio of the tested heat input to the maximum heat input (MMBtu/hr) at this temperature. Compliance with the visible emissions, NO_x, SO₂, CO, PM/PM₁₀, and VOC emission standards shall be determined within 60 days of achieving maximum production but not later than 180 days after initial firing of each CT (40 CFR 60.8). Compliance with the visible emissions limitation and the NO_x and SO₂ emission standards shall be determined annually thereafter. Tests shall be conducted on both natural gas and biogas fuels. If the initial tests or fuel analyses show the emissions of air pollutants from the combustion turbines are independent of the fuel (natural gas or biogas fuel), then annual compliance tests can be conducted while the combustion turbines are burning either fuel.

17. Compliance shall be determined by the following test methods listed in 40 CFR 60, Appendix A (July, 1993).

<u>Pollutant</u>	<u>EPA Method</u>
PM/PM ₁₀ *	5 or 17**
NO _x	20
CO	10
VOC	18 or 25A
Visible Emissions	9

NOTE: No other test methods may be used for compliance testing unless prior Department written approval has been received.

* Assumption is that all PM is PM₁₀.

** Stack flue gas temperature must be less than 320°F to use Method 17.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

SPECIFIC CONDITIONS:

Monitoring

18. NO_x and oxygen monitoring to meet the requirements of 40 CFR 60, Subpart GG, shall be accomplished using a continuous emission monitoring (CEM) system. The CEM system shall meet the requirements of 40 CFR 60, Appendix B. The requirements of 40 CFR 75, Appendices A and B, can be substituted for those of 40 CFR 60 provided the minimum criteria of 40 CFR 60 are met. NO_x monitoring to indicate compliance with the BACT limit shall be based on one hour average emissions determined on ppmvd @ 15% O₂.

Administrative Requirement

19. Prior to January 1, 1998, the permittee shall provide a report showing how the allowable NO_x emissions of 15 ppmvd @ 15% O₂ ISO conditions is achieved by the CTs.

20. The permittee shall provide the Southwest District office with the following notifications required by 40 CFR 60.7:

- When construction commenced within 30 days of commencement of construction
- Anticipated date of initial starting 30 to 60 days prior to startup
- Actual date of startup up within 15 days after the starting
- Notification of the date of the compliance tests not less than 30 days prior to the test

21. Pursuant to Rule 62-210.370(2), F.A.C., Air Operating Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur content and the lower heating value of the fuel being fired, fuel usage, hours of operation, and air emissions. Annual reports shall be sent to the Department's Southwest District office by March 1 of each calendar year.

22. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation prior to 60 days before the expiration of the permit (Rule 62-4.090, F.A.C.).

23. An application for an operation permit must be submitted to the Department's Southwest District office at least 90 days prior to the expiration date of this construction permit. 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

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233851B
(PSD-FL-206B)
Expiration Date: April 1, 1998

SPECIFIC CONDITIONS:

construction permit, and compliance test reports as required by this permit (Rules 62-4.055 and 62-4.220, F.A.C.).

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Virginia B. Wetherell, Secretary



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:
Orange Cogeneration Limited
Partnership
23046 Avenida De La Carlota
Suite 400
Laguna Hills, CA 92653

Permit Number: AC53-233852A
PSD-FL-206B
Expiration Date: April 1, 1996
Latitude/Longitude: 27°52'15"N
81°49'31"W
Project: Auxiliary Boiler
County: Polk

This revised permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-212 and 62-4, Florida Administrative Code (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto and specifically described as follows:

Installation of a 100 million British thermal unit per hour (MMBtu/hr) natural gas/equivalent biogas fired tube boiler equipped with a 65 foot high, 3.67 foot diameter stack designed to produce approximately 83,000 pounds per hour of saturated steam at 205 pounds per square inch gauge (psig) pressure. The heat input is based on the High Heating Value (HHV) of the fuel. The auxiliary boiler will be located on Clear Springs Road, Bartow, Polk County, Florida 33830.

The UTM coordinates of this facility are Zone 17, 418.75 kmE and 3083.0 kmN.

The emission unit/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. Application received July 1, 1993.
2. Department's July 22, 1993 letter.
3. KBN's August 5, 1993 letter.

PERMITTEE:
Orange Cogeneration Limited
Partnership

Permit Number: AC53-233852A
Expiration Date: April 1, 1996

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, F.S. 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), F.S., 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 F.S. and Department rules, unless specifically authorized by an order from the Department.

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.

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Partnership

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GENERAL CONDITIONS:

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.

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 F.S. or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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Partnership

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GENERAL CONDITIONS:

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

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-730.300, 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.
- 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.

PERMITTEE:
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Partnership

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GENERAL CONDITIONS:

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:

Construction Requirements

1. The auxiliary boiler shall be equipped with low-NO_x burners.
2. The boiler stack shall be equipped with stack sampling facilities (sample ports, work platforms, access, electrical power) that meet the specifications given in Rule 62-297.345, F.A.C.

Operation Limitations

3. The auxiliary boiler shall comply with all applicable requirements of 40 CFR 60, Subpart Dc.
4. The boiler is allowed to operate continuously, 8760 hours per year.
5. Only natural gas/equivalent biogas fuel shall be burned in this boiler.
6. The maximum heat input to the boiler, which is based on the high heating value (HHV) of the fuel, shall not exceed 100 MMBtu/hr.
7. The maximum allowable sulfur content (total) of the natural gas/biogas burned in the boiler shall not exceed 1 grain per 100 cubic feet (1 gr/100 CF) of gas.

PERMITTEE:
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SPECIFIC CONDITIONS:

8. The operation of this boiler shall not emit air pollutants that cause or contribute to objectionable odors.
9. Visible emissions shall not exceed 15 percent opacity.
10. Emissions from the boiler shall not exceed any of the following limits:

Pollutant	lb/MMBtu	lbs/hr	TPY
NO _x	0.13	13.0	56.9
CO	0.10	10.0	43.8
VOC	0.04	4.3	18.8

11. Sulfur dioxide (SO₂) emissions from the boiler shall not exceed 0.003 lb/MMBtu, 0.30 lb/hr, and 1.3 TPY. An analysis of the fuel showing the sulfur content does not exceed 1 grain of total sulfur per 100 cubic feet of gas will be accepted as proof of compliance with the sulfur dioxide emission limit. Total sulfur content of the gas shall be determined by test method ASTM D 1072-80 (40 CFR 60.17 (July, 1993)).

12. Particulate matter (PM/PM₁₀) emissions from the boiler shall not exceed 0.01 lb/MMBtu, 1.0 lb/hr, and 4.4 TPY. No PM/PM₁₀ stack test is required if the visible emissions limitation is less than 15 percent opacity.

Testing Requirements

13. Testing of emissions shall be conducted with the source operating at permitted capacity. Capacity is defined as 90-100% of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then sources may be tested at less than 90% of the maximum operating rate allowed by the permit. In this case, subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. Compliance with the visible emissions limitation and the NO_x, CO, and VOC emission standards shall be determined within 60 days of achieving maximum production, but not later than 180 days after initial firing of the boiler. Compliance with the visible emissions limitation and the NO_x emission standards shall be determined annually thereafter.

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Expiration Date: April 1, 1996

SPECIFIC CONDITIONS:

14. Compliance shall be determined by the following test methods listed in 40 CFR 60, Appendix A (July, 1993).

<u>Pollutant</u>	<u>EPA Method</u>
PM/PM ₁₀ *	5 or 17**
NO _x	7E
CO	10
VOC	18 or 25A
Visible Emissions	9

NOTE: No other test methods may be used for compliance testing unless prior Department written approval has been received.

*** Assumption is that all PM is PM₁₀.**

**** Stack flue gas temperature must be less than 320°F for Method 17.**

15. The permittee shall provide the Department's Southwest District office with the following notifications required by 40 CFR 60.7:

- When construction commenced within 30 days of commencement of construction.
- Anticipated date of initial startup, 30 to 60 days prior to startup.
- Actual date of startup within 15 days after the startup.
- Notification of the date of the compliance tests not less than 30 days prior to the tests.

16. Pursuant to Rule 62-210.370(2), F.A.C., Air Operating Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur content and the lower heating value of the fuel being fired, fuel usage, hours of operation, air emission limits, etc. Annual reports shall be sent to the Department's Southwest District office by March 1 of each calendar year.

17. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation prior to 60 days before the expiration of the permit (Rule 62-4.090, F.A.C.).

18. An application for an operation permit must be submitted to the Department's Southwest District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the

PERMITTEE:
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Expiration Date: April 1, 1996

SPECIFIC CONDITIONS:

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 (Rules 62-4.055 and 62-4.220, F.A.C.).

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Virginia B. Wetherell, Secretary

Revised Best Available Control Technology (BACT) Determination
Orange Cogeneration Limited Partnership
Polk County
AC53-233852A and AC53-233851B (PSD-FL-206B)

The applicant proposes to construct a 103 gross megawatt (MW) natural gas/biogas fired cogeneration facility in Bartow, Polk County, Florida. Major components of the cogeneration facility are: two combustion turbines (CT), each with a heat recovery steam generator (HRSG), an auxiliary boiler, steam turbine generator, and associated equipment. Both CTs will consume up to 776 million British thermal units per hour (MMBtu/hr) of gas fuel based on the lower heating value (LHV) of the fuel and produce 78 MW of electricity. The HRSGs, which do not use supplemental fuel, produce approximately 100,000 lbs/hr of steam and generate 25 MW of electricity. The fire-tube auxiliary boiler will consume 100 MMBtu/hr of gaseous fuel and produce approximately 83,000 lbs/hr of steam.

The following table lists the estimated maximum emissions from the cogeneration facility.

Pollutant	Two CTs		Auxiliary Boiler	
	lbs/hr	TPY	lbs/hr	TPY
Sulfur dioxide (SO ₂)	2.34	10.3	0.3	1.3
Particulate Matter (PM/PM ₁₀)	10	43.8	1.0	4.4
Nitrogen Oxide (NO _x)	77.0	336.9	13.0	56.9
Carbon Monoxide (CO)	55.6	243.9	10.0	43.8
Volatile Organic Compounds (VOC)	7.96	34.9	4.3	18.8
Sulfuric Acid Mist	0.18	0.79	0.023	0.1

The cogeneration facility requires a BACT determination for NO_x, CO, PM, and VOC. In addition, the auxiliary boiler requires a BACT determination for PM and SO₂.

Date of Receipt of a BACT Application

July 1, 1993

BACT Requested by the Applicant

Pollutant Control

Proposed Limit

Air Pollution

Combustion Turbine

PM 0.01 gr/scf*
 NO_x 25 ppmvd @ 15%**
 15 ppmvd @ 15%**

Clean Fuel (gas) and
 Dry Low-NO_x Combustors

CO	30 ppmvd	Combustion Controls
VOC	10 ppmvd	Combustion Controls

Auxiliary Boiler

PM	0.01 lbs/MMBtu	Clean Fuel (gas)
NO _x	0.13 lbs/MMBtu	Low-NO _x burners
SO ₂	1 grain/100 CF natural gas	Clean Fuel (natural gas)
CO	0.10 lbs/MMBtu	Combustion Control
VOC	0.043 lbs/MMBtu	Combustion Control

*grains per standard cubic foot

**parts per million by volume dry at 15 percent oxygen

Applicant is committed to meeting 15 ppmvd @ 15% O₂ with dry low-NO_x combustors after December 31, 1997.

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 62-212, 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.

The air pollutant emissions from cogeneration facilities can be grouped into categories based upon what control equipment and techniques are available to control emissions from these facilities. Using this approach, the emissions can be classified as follows:

- o Combustion Products (e.g., particulates matter). Controlled generally by good combustion of clean fuels.
- o Products of Incomplete Combustion (e.g., CO). Control is largely achieved by proper combustion techniques.
- o Acid Gases (e.g., NO_x). Controlled generally by gaseous control devices.

Although all of the pollutants addressed in the BACT analysis may be subjected to a specific emission limiting standard as a result of PSD review, the control of "nonregulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., particulates, sulfur dioxide, sulfuric acid mist, etc.), if a reduction in "nonregulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT Pollutant Analysis for the Combustion Turbines (CTs)

Nitrogen Oxides (NO_x)

The emissions of nitrogen oxides represent a significant proportion of the total emissions generated by this project, and need to be controlled if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NO_x control. The control technologies evaluated were selective catalytic reduction (SCR), wet injection (WI), dry low-NO_x combustor, NO_xOUT process, thermal DeNO_x, and selective noncatalytic reduction (SNCR).

NO_xOUT (urea with catalyst), thermal DeNO_x (ammonia with catalyst), and selective noncatalytic reduction system (ammonia without catalyst) to reduce NO_x emissions from the CT were not feasible because of process constraints (flue gas temperature too low and oxygen content too high).

SCR, dry low-NO_x combustor technology, and wet injection controls were considered feasible.

The applicant has stated that BACT for nitrogen oxides will be met

by using advanced combustor design to limit emissions to 25 ppmvd @ 15% O₂, when burning natural gas/biogas. After December 31, 1997, a limit of 15 ppmvd @ 15% O₂ will be met. Should 15 ppmvd NO_x @ 15% O₂ not be achieved during the initial compliance tests, the permittee will provide the Department with a plan and schedule to meet this standard.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NO_x emission limit established to date for a combustion turbine is 4.5 ppmvd at 15% oxygen. This level of control was accomplished through the use of water injection and a SCR system.

SCR is a post-combustion method for control of NO_x emissions. The SCR process combines vaporized ammonia with NO_x in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. With a new catalyst, the SCR process can achieve up to 90% reduction of NO_x. As the catalyst ages, the maximum NO_x reduction will decrease.

The effect of exhaust gas temperature on NO_x reduction depends on the specific catalyst formulation and reactor design. Generally, SCR units can be designed to achieve effective NO_x control over a 100-300°F operating window within the bounds of 450-800°F, although recently developed zeolite-based catalysts are claimed to be capable of operating at temperatures as high as 950°F.

Most commercial SCR systems operate over a temperature range of about 600-750°F. At levels above and below this window, the specific catalyst formulation will not be effective and NO_x reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces.

Increased water vapor content in the exhaust gas (as would result from water or steam injection in the gas turbine combustor) can shift the operating temperature window of the SCR reactor to slightly higher levels.

Although technically feasible, the applicant has rejected using SCR on the combined cycle because of economic, energy, and environmental impacts. The applicant has identified the following limitations:

- a) Reduced power output.
- b) Emissions of unreacted ammonia (slip).
- c) Disposal of hazardous waste generated (spent catalyst).
- d) Ammonium bisulfate and ammonium sulfate particulate emissions (ammonium salts) due to the reaction of NH₃ with SO₃ present in the exhaust gases.
- e) The energy impacts of SCR will reduce potential electrical power generation by 0.8 percent.

- f) Incremental cost effectiveness for the application of SCR technology to the Orange Cogeneration L.P. project was considered to be \$7,970 when emissions are at 25 ppm and \$23,510 when emissions are at 15 ppm. Since SCR has been determined to be BACT for gas turbines, the EPA has clearly stated that there must be unique circumstances to consider the rejection of such control on the basis of economics.

In a letter from EPA Region IV to the Department regarding the permitting of a combined cycle facility (Tropicana Products, Inc.), the following statement was made:

"In order to reject a control option on the basis of economic considerations, the applicant must show why the costs associated with the control are significantly higher for this specific project than for other similar projects that have installed this control system or in general for controlling the pollutant."

The cost associated with controlling NO_x emissions must take into account the potential operating problems that can occur with using SCR.

A concern associated with the use of SCR on combustion turbines is the formation of ammonium bisulfate. For the SCR process, ammonium bisulfate can be formed due to the reaction of sulfur in the fuel and the ammonia injected. The ammonium bisulfate formed has a tendency to plug the tubes of the heat recovery steam generator leading to operational problems. As this is the case, SCR has been judged to be technically infeasible in some previous BACT determinations. This salt also increases particulate matter (PM/PM₁₀) emissions.

For natural gas/equivalent biogas firing operation, NO_x emissions can be controlled with up to a 90 percent efficiency using a 1 to 1 or greater ammonia injection ratio. When the injection ratio is lowered, there is not a problem with ammonium bisulfate formation since essentially all of the ammonia is able to react with the nitrogen oxides present in the combustion gases. Based on this strategy, SCR has been both proposed and established as BACT with NO_x emission limits ranging from 11.7 to 25 ppmvd depending on the efficiency of control established.

The applicant has indicated that the total levelized annual operating cost to install SCR on two CTs for this project at 100 percent capacity factor and burning natural gas/equivalent biogas is \$1,648,000. A SCR would reduce the NO_x emissions by 207 TPY during the first 2 years of operation when the CTs emit 25 ppmvd @ 15% O₂. Thereafter, when dry-low NO_x controls are used, a SCR would reduce NO_x emissions by 120 TPY. When these reductions are taken into consideration, the total cost with SCR is \$21,900 per

ton of NO_x removed. This calculated cost is higher than has previously been approved as BACT.

A review of the latest Department BACT determinations show limits of 15 ppmvd (natural gas) using dry low-NO_x combustor technology for gas turbines. Most combustion turbine manufacturers are currently developing programs using both steam/water injection and dry low-NO_x combustor technology to achieve a NO_x emission control level of 9 ppm when firing natural gas. Therefore, this technology will likely be available by 1998.

BACT Determination for NO_x for the CTs by the Department

NO_x Control

The information that the applicant presented and Department calculation indicate that the cost per ton of controlling NO_x for this turbine [\$21,900 per ton] is high compared to other BACT determinations which require SCR. Based on the information presented by the applicant, the Department believes that the use of SCR for NO_x control is not justifiable as BACT at this time.

A review of the permitting activities for combustion turbine proposals across the nation indicates that SCR has been required and most recently proposed for installations with a variety of operating conditions (i.e., natural gas, fuel oil, and various capacity factors). Although, the cost and other concerns expressed by the applicant are valid, the Department, in this case, is willing to accept water/steam injection and dry low-NO_x combustor technology design as BACT for this project for a limited time (up to 12/31/97).

It is the Department's understanding that combustion turbine manufacturers are developing programs using either steam/water injection or dry low NO_x combustor technology to achieve a NO_x emission control level of 9 ppm when firing natural gas.

Based on this, the Department has determined to revise and lower the allowable BACT limit for this project to 15 ppmvd at 15% O₂ and is to be achieved no later than 1/1/98.

Carbon Monoxide (CO)

CO emissions are caused by incomplete combustion of the fossil fuel. The applicant investigated the use of combustion control and catalytic oxidation to control CO emission. With combustion control, CO emissions would be 30 ppmvd (236 TPY). With catalytic oxidation, CO emissions would be 10 ppmvd (78 TPY). The annualized cost of the catalyst system is \$834,700 or \$5,280 per ton of CO removed.

BACT Determination for CO for the CTs by the Department

Because catalytic oxidation would increase operation cost by \$5,280 per ton of CO removed, and have no significant reduction in ambient air quality, the Department accepts an emission limit for CO of 30 ppmvd obtained through combustion control as BACT for these CTs.

Volatile Organic Compounds (VOC)

VOC emissions are caused by incomplete combustion of fossil fuel. The applicant proposes to meet an emission limit of 10 ppmvd through the use of clean fuel (natural gas) and combustion controls. This is similar to the BACT applied to other similar sources.

BACT Determinations for VOC for the CTs by the Department

The Department accepts an emission limit for VOC of 10 ppmvd obtained through the use of clean fuel (natural gas) and combustion control as BACT for these CTs.

Particulate Matter (PM/PM₁₀)

PM/PM₁₀ emissions are caused by incomplete combustion and traces of solids in the fuel. Proper combustion of clean fuel will emit only trace amounts of PM/PM₁₀. Each proposed CT will emit 5 lbs/hr of PM/PM₁₀ or about 0.01 grains per standard cubic foot (gr/dscf). This is similar to the PM/PM₁₀ emissions that can be met with the best air pollution control device, a baghouse.

BACT Determination for PM/PM₁₀ for the CTs by the Department

The Department accepts an emission limit for PM/PM₁₀ of 5 lbs/hr and a visible emissions limit of 10 percent opacity as BACT for each CT.

BACT Pollutant Analysis for the Auxiliary Boiler

Nitrogen Oxides (NO_x)

Nitrogen oxide emissions from boilers can be controlled by selective catalytic reduction (SCR), flue gas recirculation (FGR), and low-NO_x combustors.

The applicant proposes to meet a NO_x emission limit of 0.13 lbs/MMBtu through the use of low-NO_x combustors. This emission limit is below the new source performance standard for large boilers. The cost of using SCR or FGR would exceed \$5,000 per ton NO_x removed.

BACT Determination for NO_x for the Auxiliary Boiler by the Department

The Department accepts an emission limit for NO_x of 0.13 lbs/MMBtu as BACT for this auxiliary boiler.

Particulate Matter (PM/PM₁₀), Carbon Monoxide (CO), and Volatile Organic Compounds (VOC)

PM/PM₁₀, CO and VOC are the products of incomplete combustion of fossil fuel. The applicant proposes to meet emission limits of 0.01 lbs PM/MMBtu, 0.10 lbs CO/MMBtu, 0.04 lbs VOC/MMBtu through the use of clean fuel (natural gas/biogas) and good combustion control. Visible emissions shall not exceed 15 percent opacity.

BACT Determination for PM/PM₁₀, CO, and VOC for the Auxiliary Boiler by the Department

The Department accepts the use of clean fuel (natural gas/biogas) and good combustion controls to meet the proposed emission limits for PM/PM₁₀, CO, and VOC as BACT for this auxiliary boiler.

Sulfur Dioxide (SO₂)

Sulfur dioxide emissions are caused by the oxidation of sulfur in the fuel. Natural gas/biogas contains only trace amounts of sulfur - 1 grain per 100 cubic feet (gr/100 CF). This will result in an estimated sulfur dioxide emission of 0.30 lbs/hr. Cleaner fuel is not available and add on controls for SO₂ are not justified at this low emission rate.

BACT Determination for SO₂ for the Auxiliary Boiler by the Department

Natural gas/equivalent biogas fuel containing a maximum of 1 gr/100 CF is accepted as BACT for SO₂ control for this auxiliary boiler.

Summary of the Revised BACT Determination by Department

<u>Pollutant</u>	<u>Emission Limits</u>	<u>EPA Test Methods</u>
COMBUSTION TURBINE		
NO _x	25 ppmvd @ 15% O ₂ until Dec. 31, 1997	20
	15 ppmvd @ 15% O ₂ after Dec. 31, 1997	20
CO	30 ppmvd	10
VOC	10 ppmvd	18 or 25A

PM/PM ₁₀ *	5 lbs/hr	5 or 17**
Visible Emissions	10% Opacity	9
AUXILIARY BOILER		
NO _x	0.13 lbs/MMBtu	7E
PM/PM ₁₀ *	0.01 lbs/MMBtu	5 or 17**
CO	0.10 lbs/MMBtu	10
VOC	0.04 lbs/MMBtu	18 or 25A
SO ₂	1 gr sulfur/100 CF gas	fuel sulfur analysis
Visible Emissions	15% Opacity	9

* Assumption is that all PM is PM₁₀.

** Stack flue gas temperature must be less than 320°F.

Details of the Analysis May be Obtained by Contacting:

Martin Costello, P.E., BACT Coordinator
 Department of Environmental Protection
 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

 Virginia B. Wetherell, Secretary
 Dept. of Environmental Protection

 Date

 Date