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DOUGLAS S. ROBERTS
R. SCOTT RUTH
JULIE ROME STEINMEYER

OF COUNSEL
W. ROBERT FOKES

MEMORANDUM

TO: Clair Fancy

FROM: Doug Roberts DR

RE: BACT Analysis for Mulberry Cogen. Project

DATE: December 23, 1993

==========

Per your request we have typed up the BACT determination for the Mulberry Cogeneration Project. A copy of the document is attached along with the original marked up copy you gave us. Also enclosed is a disk with the document in Wordperfect 5.1. You may need to conform the type face.

It appears there is a discrepancy in the permit over the date for compliance with the lower NOx limits. The table of permitted emissions in the permit states the new limits apply on December 31, 1997 (incorrectly labeled originally as Dec. 31, 1987). The final determination (attached) and preliminary determination have the date as April 30, 1997. This leaves an eight month difference in the dates. While we did not make such a change, it may be appropriate for the Department to correct the revised BACT determination to reflect the date of December 31, 1997 for both the new NOx (and CO) limits and the date to switch to 100% natural gas.

We would like to publish notice of this within a day or two of its issuance. If you could send over the needed notice early, we can get KBN to arrange for publication. We assume it will be like an original intent to issue permit action with some changes to text to reflect it is an amended PSD permit.

Thanks for all your help on this. Please call Gary Sams or Laura Stewart at our firm when the permit is ready and we will pick it up. I will be out of the office the week of Dec. 27th.

Encls.

Final Determination

The Technical Evaluation and Preliminary Determination for the permit to construct a cogeneration and CO_2 recovery facility approximately 3.7 miles southwest of Bartow in Polk County, Florida, was distributed on September 22, 1992. The Notice of Intent to Issue was published in the Polk County Democrat on October 8, 1992. Copies of the evaluation were available for public inspection at the Department's Tallahassee and Tampa offices.

On October 26, 1992, a letter was received from the EPA concurring with the Department's proposed action. Comments were received from the applicant on October 13 and November 4, 1992, requesting minor modifications of certain specific conditions. The Department made the following changes in response to those comments:

Specific Condition No. 2 - The emission limits were modified to show fuel oil use as backup after the first three years of operation. Oil use is limited to 30 days per year after December 31, 1997.

Specific Condition No. 3 - Fuel consumption rates and hours of operation were modified to show fuel oil use as backup after the first three years of operation and limited use (30 days per year) after December 31, 1997.

BACT Determination - Minor revisions were made to the last paragraph of the NO_x section to clarify that SCR may be required if the emission limits are not achieved by ~~April 30, 1997.~~ DECEMBER 31, 1997

The final action of the Department will be to issue construction permit AC53-211670 (PSD-FL-187) as modified.

William Malenius
Polk Power Partners
23923 South Pointe Drive
Laguna Hills, California 92653

Re: Polk County - A.P.
Polk Power Partners, L.P.
Mulberry Cogeneration Project
PSD-FL-187; Permit Modification

Dear Mr. Malenius:

The Department received a request from Mr. Douglas S. Roberts on November -, 1993, for administrative changes to the prevention of significant deterioration permit (PSD-FL- 187) issued to Polk Power Partners for the above referenced project. That request sought formal approval of various project changes that had received previous preliminary approval by the Department. The Department concurs with that request as authorized herein. The Department modifies the permit to delete references to the carbon dioxide recovery plant which is no longer proposed to be constructed as part of the project. The emissions identified as associated with the CO2 plant and the secondary heat recovery steam generator jointly are now assigned solely to the secondary heat recovery steam generator. The Department authorizes an increase in the carbon monoxide emissions from the Project at such time as the nitrogen oxide emissions from the plant are reduced.

The proposed changes are acceptable to the Department and will not result in the increase in permitted annual emissions of any pollutant subject to PSD regulations. As an administrative change, this revision will not require additional public participation procedures.

The Department grants the following amendments to the above referenced permit:

SPECIFIC CONDITION NO. 2

Change From:

2. Emissions from these facilities shall not exceed the limits listed below (based on operation at 59°F):

			Through 12/31/97		After 12/31/97 (See notes) 9	
Pollutant	Source	Fuel	lbs/hr	tons/yr	lbs/hr	tons/yr
NO_x	HRSG Stack	Gas	87.8	384.5	52.7	230.7
	CO_2 Plant Stack[1]	Gas	19.9	87.1	18.3	80.0
	HRSG Stack	Oil	164.0	718.2	164.0	59.0
	CO_2 Plant Stack[1]	Oil	23.4	102.4	23.4	8.4
SO_2	HRSG Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
	CO_2 Plant Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
VE	HRSG Stack	Gas	10% Opacity		10% Opacity	
	CO_2 Plant Stack	Gas	10% Opacity		10% Opacity	
	HRSG Stack	Oil	20% Opacity		20% Opacity	
	CO_2 Plant Stack	Oil	20% Opacity		20% Opacity	
VOC	CO_2 Plant Stack	--	18.2	79.6	17.7	77.6
CO	HRSG Stack	Gas	42.9	187.8	42.9	187.8
	CO_2 Plant Stack[a]	Gas	11.9	52.0	11.9	52.0
	HRSG Stack	Oil	75.3	329.9	75.3	27.1
	CO_2 Plant Stack[a]	Oil	13.4	58.5	13.4	4.8

Notes: (1) Oil may be used as backup fuel for up to 30 days per year.
(2) NO_x limits after 12/31/97 based on 15 ppmvd.
(3) Opacity limit will allow one 6-minute period per hour of not more than 27% opacity.

[1] Or secondary HRSG Stack.

Change To:

2. Emissions from these facilities shall not exceed the limits listed below (based on operation at 59°F):

Pollutant	Source	Fuel[5]	Through 12/31/97[3] lbs/hr	Through 12/31/97[3] tons/yr	After 12/31/97 [1][2][3][4] lbs/hr	After 12/31/97 [1][2][3][4] tons/yr
NO_x	HRSG Stack	Gas	87.8	384.5	52.7	230.7
	Secondary HRSG Stack	Gas	19.9	87.1	18.3	80.0
	HRSG Stack	Oil	164.0	718.2	164.0	59.0
	Secondary HRSG Stack	Oil	23.4	102.4	23.4	8.4
SO_2	HRSG Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
	Secondary HRSG Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
VE	HRSG Stack	Gas	10% Opacity		10% Opacity	
	Secondary HRSG Stack	Gas	10% Opacity		10% Opacity	
	HRSG Stack	Oil	20% Opacity		20% Opacity	
	Secondary HRSG Stack	Oil	20% Opacity		20% Opacity	
CO	HRSG Stack	Gas	42.9	187.8	**53**	**232**
	Secondary HRSG Stack	Gas	11.9	52.0	**12.6**	**55.2**
	HRSG Stack	Oil	75.3	329.9	75.3	27.1
	Secondary HRSG Stack	Oil	13.4	58.5	13.4	4.8

Note: (1) Oil may be used as backup fuel for up to 30 days per year.

(2) NO_x limits **for combustion turbine firing natural gas** after 12/31/97 based on 15 ppmvd.

(3) Opacity limit will allow one 6-minute period per hour of not more than 27% opacity.

(4) CO limits during natural gas firing are based on CO emission basis of 25 ppmvd from the combustion turbine. CO emission limits applicable prior to December 31, 1997, upon unit achieving NO_x emissions limits based on emission basis of 15 ppmvd during natural gas firing.

(5) Although only natural gas will be combusted in the duct burner and vented through the secondary HRSG stack, a portion of the exhaust flow from the combustion turbine which serves as combustion air to the secondary HRSG will also be vented through the secondary HRSG stack.

2. SPECIFIC CONDITIONS NO. 3

Change From:

3. The cogeneration facility shall be permitted to fire natural gas and No. 2 fuel oil until December 31, 1997, after which the primary fuel will be natural gas. Fuel consumption rates (based on operation at 20°F) and hours of operation for the turbine and duct burner shall not exceed those listed below:

	Natural Gas			No. 2 Fuel Oil		
	M ft^3/hr	MM ft^3/yr	hrs/yr	Mlb/hr	M lb/yr	hrs/yr
Turbine	1,013.4	8,877.4	8,760	55.6	379.9	6,833[1]
Duct Burner	104.2	912.8	8,760	0	0	0

[1] After December 31, 1997, fuel oil can be used permanently as backup fuel for no more than 720 hours per year.

Change To:

3. The cogeneration facility shall be permitted to fire natural gas and No. 2 fuel oil until December 31, 1997, after which the primary fuel will be natural gas. Fuel consumption rates (based on operation at 20°F) and hours of operation for the turbine and duct burner shall not exceed those listed below:

	Natural Gas			No. 2 Fuel Oil		
	M ft^3/hr	MM ft^3/yr	hrs/yr	lb/hr	M lb/yr	hrs/yr
Turbine	1,013.4	8,877.4	8,760	55.6	379.9	6,833[1]
Duct Burner	104.2	450.2[2]	8,760	0	0	0

[1] After December 31, 1997, fuel oil can be used permanently as backup fuel for no more than 720 hours per year.

[2] **Effective annual fuel consumption based on the duct burner operating for 4,320 hours and firing at the maximum hourly fuel consumption rate.**

3. SPECIFIC CONDITION NO. 4

Change From:

4. Before this construction permit expires, the cogeneration facility and CO_2 Recovery Plant stacks shall be sampled or tested as applicable according to the emission limits in Specific Condition No. 2. Annual compliance tests shall be conducted each year thereafter. Compliance tests shall be run at 96 percent to 100 percent of the maximum capacity achievable for the

average ambient temperature during the compliance tests. The turbine manufacturer's capacity vs. temperature (ambient) curve shall be included with the compliance test results. Tests shall be conducted using the following reference methods:

NO_x: EPA Method 20
SO_2: Fuel supplier's sulfur analysis
VE: EPA Method 9
CO: EPA Method 10
VOC: EPA Method 25A

Change To:
4. Before this construction permit expires, the cogeneration facility and **secondary HRSG** stacks shall be sampled or tested as applicable according to the emission limits in Specific Condition No. 2. Annual compliance tests shall be conducted each year thereafter. Compliance tests shall be run at 96 percent to 100 percent of the maximum capacity achievable for the average ambient temperature during the compliance tests. The turbine manufacturer's capacity vs. temperature (ambient) curve shall be included with the compliance test results. Tests shall be conducted using the following reference methods:

NO_x: EPA Method 20
SO_2: Fuel supplier's sulfur analysis
VE: EPA Method 9
CO: EPA Method 10

All other conditions remain as issued. This letter must be attached to the PSD-FL-187 permit and shall become a part of the permit.

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 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, 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 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, F.A.C.

Sincerely,

Virginia Wetherell
Secretary

cc: Jewell A. Harper, EPA
William Thomas, SWD
James W. Coleman, Jr., NPS
D. Martin, Polk County
Ken Kosky, KBN

HOPPING BOYD GREEN & SAMS

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OF COUNSEL
W. ROBERT FOKES

December 22, 1993

BY HAND DELIVERY

Clair Fancy, Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Rd.
Tallahassee, Fla. 32399

RE: Mulberry Cogeneration Project;
PSD-FL-187

Dear Clair:

On behalf of Polk Power Partners, I am renewing the request in my letter of November 18, 1993, for the Department to amend the PSD permit for the above referenced project. To assist the Department's actions on this request, a draft letter approving the request is attached. This draft letter contains revised language for Footnote 4 of revised Specific Condition 2 from that contained in the November 18th request concerning the CO emission rate once the unit reaches a NOx emission rate based upon a 15 PPMVD NOx emission basis.

By copy of this letter, I am submitting to Patti Adams a check payable to the Department for $250.00 as the fee for this request.

We appreciated the opportunity to meet with you, John Brown and John Reynolds yesterday to discuss this request. Your willingness to issue this revision expeditiously is also greatly appreciated. We are prepared to publish the required notice as soon as the Department issues the revision. Should there be any questions concerning this matter, please do not hesitate to contact either Ken Kosky (903/331-9000) or me.

Sincerely,

Douglas S. Roberts

cc: John Brown
John Reynolds
Patti Adams (w/check)
B. Thomas, SW Dist
C. Halladay
J. Harper, EPA
J. Runyak, NPS
L. Martin, Polk Co.

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JULIE ROME STEINMEYER

OF COUNSEL
W. ROBERT FOKES

November 16, 1993

RECEIVED

NOV 16 1993

Division of Air
Resources Management

Clair Fancy, Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Mulberry Cogeneration Project
PSD-FL-187

Dear Mr. Fancy:

On behalf of Polk Power Partners, L.P. (Polk Power), I am writing concerning the above-referenced prevention of significant deterioration (PSD) permit. Polk Power is in the process of obtaining financing for the project and is requesting corrections and updates of the permit to reflect the permitted facilities and the applicable emission limits. Such changes are needed to satisfy the lenders that the permits for the Mulberry Project are complete and current.

Deletion of Carbon Dioxide Plant.

As conceived and described in the PSD permit, the Mulberry Cogeneration Project consisted of a 125 MW combined cycle electrical power plant unit and a carbon dioxide recovery plant which would serve as the thermal host for the cogeneration plant. Recent economic factors have caused Polk Power to eliminate the planned CO2 plant. To qualify as a cogeneration facility, steam from Mulberry project will now serve an ethanol production plant to be located adjacent to the project site. This ethanol plant will be developed by a legally separate entity not under the control of Polk Power. Necessary permits are now being obtained separately for that ethanol plant. It would therefore be appropriate to now revise the PSD permit for the Mulberry Project to delete references to the CO2 plant, including the reference to the CO2 plant in the table of permitted emissions.

Recent design changes to the plant identified the necessity for a separate stack for the secondary heat recovery steam

generator (duct burner). This change was described in a February 19, 1993 letter to you from Ken Kosky of KBN Engineering and Applied Sciences and was approved by the Department by letter on March 19, 1993. This secondary HRSG stack is an alternate to the CO2 plant stack, as identified in the KBN letter and in the revised table of emissions. In revising the table of permitted emissions in Specific Condition 2, the CO2 stack and its emissions should now be labeled solely as the "secondary HRSG stack".

Carbon Monoxide Emission Rates

As you are aware, NOx and CO emission rates in combined cycle units move in opposite directions from one another, such that if NOx emissions are reduced, CO emissions often increase. The current permitted emissions for the Mulberry project establish one set of NOX and CO emissions through December 31, 1997 and a lower set of NOx (but not CO) emissions after December 31, 1997. The PSD permit initially limits NOx emissions to 87.8 lbs/hr, based on an emission rate of 25 PPM NOx, and CO to 42.9 lbs/hr, based on an emission rate of 20 PPM. The permit then establishes a limit of 52.7 lbs/hr NOx based on an emission rate of 15 PPM after December 31, 1997. However, the permitted emissions for CO after December 31, 1997, were not changed to account for this lower NOx emission rate.

In a second letter to you from KBN (attached) dated August 17, 1993, the Department was requested to approve a change in the CO emissions from the unit when the emission limit for NOx is reduced in December 1997. This was based upon subsequent information from General Electric that the unit could only meet 25 PPM CO when NOx emissions are at 15 PPM.

In a reply letter dated August 19, 1993 (attached), signed by John Brown on your behalf, the Department deferred making any further changes to the permit until the initial performance tests were completed, at which time the Department would adjust permit limits.

Polk Power requests that the Department grant the above requested change in CO emissions at this time and not defer such revisions until the completion of the performance tests. Based on past experience, the financial lenders for this project will require that the permits reflect the design emissions for the project at the time financial closing for this Project occurs. Leaving the permitted emission limits for CO unchanged at this time may cause the lenders to withhold financing since the permit will include a CO emission limit the project is known to be unable to meet when NOx emissions are reduced in the future. Polk Power therefore requests that the Department modify the PSD permit to approve the change in the CO emissions, consistent with the values

requested in the August 17, 1993, KBN letter, to be applicable upon the change in the permitted NOx emissions, whenever that change may occur.

Revised Permit Conditions

Polk Power requests that the Department issue a formal letter modification of the PSD permit to reflect the recent design changes, including deletion of the CO2 plant, addition of the secondary HRSG stack and the changed CO emissions as requested. Several recent letters from the Department have approved these changes. However, it would seem appropriate to issue a formal change to the permit that incorporates all of these approved changes.

To facilitate your issuance of such a letter, a draft letter is enclosed (along with a disk version in WordPerfect 5.1), which reflects the several changes to the PSD permit that have been proposed and we believe concurred in by the Department. The suggested revised conditions also reflect deletion of VOC limits for the CO2 plant as a result of the elimination of the CO2 plant and its VOC producing processes and reduced limits on hours of operation of the secondary HRSG consistent with the recent identified design changes. None of these changes will result in a significant increase in permitted emissions from the Project.

We appreciate your attention to this request and the Department's past cooperation in this permitting effort. Polk Power realizes many of these changes and requests may seem minor and somewhat annoying. However, it reflects the circumstances that arise when obtaining significant financial investment in projects such as this.

Should you have any questions concerning this matter, please do not hesitate to call either Ward Marshall of Central and Southwest Services (214/777-1374, Ken Kosky or Bob McCann of KBN (904/331-9000) or myself.

Sincerely,

Douglas S. Roberts

Attachments

cc: Preston Lewis, DEP

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

November 18, 1993

Mr. Douglas S. Roberts
Hopping Boyd Green & Sams
P.O. Box 6526
Tallahassee, Florida 32314

Dear Mr. Roberts:

The Department received your November 16 letter making another request for increased carbon monoxide (CO) limits for the Polk Power Partners, L.P./Mulberry Cogeneration Project (PSD-FL-187). Since the original request was based on information not available at the time the permit was issued, the Department agreed on August 19, 1993, to adjust the CO limits higher if necessary based on results of the compliance test. That agreement should provide sufficient assurance to lenders that the facility will not be faced with unattainable limits in the operation permit. We are not aware of any case involving financing being withheld where the Department has agreed to adjust emission limits as required by the test data.

As indicated in Specific Condition No. 9 of the permit, the Department's practice is to address deviations from the original design at the time the operation permit is issued. Otherwise, considerable paperwork and staff time would be consumed making modifications that would be made anyway in the process of issuing the operation permit. Moreover, if the construction permit is modified, another public notice and comment period would be required due to emissions being higher than previously stated in the permit.

In summary, neither Polk Power Partners, L.P., nor their lenders should doubt that the Department will adjust limits so that the Mulberry Cogeneration Facility can be operated and in a manner that is environmentally responsible.

Sincerely,

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

CHF/JR/bb

c: K. Kosky, P.E., KBN

August 27, 1993

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

Polk Power Partners

Subject: Mulberry Cogeneration Project
DER File No. AC53-211670, PSD-FL-187
Request for Change in Permit Specific Condition

Dear Clair:

In my letter to you dated August 17, 1993, a request was made to change the carbon monoxide (CO) emission limitation for the combustion turbine when firing natural gas. Also, a discussion was presented that addressed the potential reduction of the maximum allowable nitrogen oxides (NO_x) emission rate to 15 parts per million corrected to dry conditions (ppmvd) and 15 percent oxygen prior to December 31, 1997, (the current permit conditions limit NO_x emissions to 25 ppmvd prior to December 31, 199,7 and to 15 ppmvd after December 31, 1997). Although discussions with GE (the combustion turbine vendor selected for the project) have indicated the potential emission rate of 15 ppmvd may be achievable when the turbine is initially operated, GE provides no guarantee that the emission limit will be met throughout the period from initial operation in November, 1994 to December, 1997. As a result, this potential reduction in NO_x emission rate is not considered a viable option for this project.

Based on this correspondence, the proposed change to the air construction permit is limited to the CO emission limitation for the combustion turbine when firing natural gas as requested on August 17, 1993. No change to the NO_x emission rate is proposed at this time. Attachment 1 contains the requested change to the CO emission limit (see Note 4).

If you have any questions or concerns regarding the requested change, please don't hesitate to call me. Again, on behalf of Polk Power Partners, L.P. and KBN, we appreciate you and your staff's review of this requested change to the permit.

Sincerely,

Kennard F. Kosky, P.E.
President
Registration No. 14996

cc: Mr. William R. Malenius, Ark Energy, Inc.
Mr. Ward C. Marshall, Central and South West Services, Inc.
J. Reynolds

91193A3/1

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street
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5680 West Cypress Street, Suite I
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Jacksonville, Florida 32216
904-296-9663 FAX 904-296-0146

One Church Street, Suite 801
Rockville, Maryland 20850
301-738-1100
FAX 301-738-1105

ATTACHMENT 1

SPECIFIC CONDITIONS:

2. Emissions from these facilities shall not exceed the limits listed below (based on operation at 59°F):

Pollutant	Source	Fuel	Through 12/31/97 lbs/hr	Through 12/31/97 tons/yr	After 12/31/97 (See notes) 9 lbs/hr	After 12/31/97 (See notes) 9 tons/yr
NO_x	HRSG Stack	Gas	87.8	384.5	52.7	230.7
	CO_2 Plant Stack[a]	Gas	19.9	87.1	18.3	80.0
	HRSG Stack	Oil	164.0	718.2	164.0	59.0
	CO_2 Plant Stack[a]	Oil	23.4	102.4	23.4	8.4
SO_2	HRSG Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
	CO_2 Plant Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
VE	HRSG Stack	Gas	10% Opacity		10% Opacity	
	CO_2 Plant Stack	Gas	10% Opacity		10% Opacity	
	HRSG Stack	Oil	20% Opacity		20% Opacity	
	CO_2 Plant Stack	Oil	20% Opacity		20% Opacity	
VOC	CO_2 Plant Stack	–	18.2	79.6	17.7	77.6
CO	HRSG Stack	Gas	42.9	187.8	53	232
	CO_2 Plant Stack[a]	Gas	11.9	52.0	12.6	55.2
	HRSG Stack	Oil	75.3	329.9	75.3	27.1
	CO_2 Plant Stack[a]	Oil	13.4	58.5	13.4	4.8

Notes: (1) Oil may be used as backup fuel for up to 30 days per year.
(2) NO_x limits after 12/31/97 based on 15 ppmvd.
(3) Opacity limit will allow one 6-minute period per hour of not more than 27% opacity.
(4) CO limits after 12/21/97 based on CO emission rate of 25 ppmvd from the combustion turbine and is coincident with NO_x limit of 15 ppmvd.

[a] Or secondary HRSG Stack.

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

August 19, 1993

Mr. Kennard F. Kosky, P.E.
President
KBN Engineering and Applied Sciences, Inc.
1034 Northwest 57th Street
Gainesville, Florida 32605

Re: Permit No. AC53-211670, PSD-FL-187
Mulberry Cogeneration Project

Dear Mr. Kosky:

This is in reply to your August 17 letter requesting revised emission limits for the Mulberry combustion turbine project. The requested changes are based on recent information from the turbine manufacturer and would result in an increase in allowable emissions of 47.4 TPY of CO and a decrease of 153.8 TPY of NO_X.

Although we understand the reasons for requesting the changes now, we recommend waiting until the performance test has been completed. At that time the Department will adjust the limits as called for by the data. This approach avoids the need for further changes later. Your letter will remain on file as a pending request for adjustment of the limits prior to issuing the operation permit.

Sincerely,

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

CHF/JR/bb

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Mr. Kennard F. Kosky, P.E.
President
KBN Engineering & Applied Sciences
1034 Northwest 57th Street
Gainesville, Florida 32605

4a. Article Number

P 230 524 385

4b. Service Type

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5. Signature (Addressee)

Alysa Lancaster

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

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PS Form **3800**, June 1991

August 17, 1993

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

Subject: Mulberry Cogeneration Project
DER File No. AC53-211670, PSD-FL-187
Request for Change in Permit Specific Condition

Dear Clair:

This correspondence is submitted on behalf of Polk Power Partners, L.P. to request a change in the carbon monoxide (CO) emission limitation for the combustion turbine when firing natural gas and provide a potential reduction of the maximum allowable nitrogen oxides (NO_x) emission rate when the unit becomes operational. These changes affect Specific Condition No. 2 of the air construction permit (AC53-211670).

CARBON MONOXIDE EMISSIONS FOR NATURAL GAS FIRING

The request for this change is based on recent performance information obtained for the General Electric PG7111(EA) combustion turbine when it achieves a maximum NO_x emission rate of 15 parts per million (ppm), corrected for dry conditions (ppmvd) and 15 percent oxygen (O_2). At this NOx emission level, GE expects only a maximum CO emission rate of 25 ppmvd. As a result, the CO emission limit would be revised from the current limit of 20 ppmvd to 25 ppmvd and would be in effect when the NO_x emission rate is equal to or less than 15 ppmvd, corrected to 15 percent O_2 (i.e., after December 31, 1997). Prior to December 31, 1997, the CO emission limit of 20 ppmvd is achievable with a NO_x emission limit of 25 ppmvd, corrected to 15 percent O_2, respectively.

The net change in maximum allowable CO emissions is approximately 44.2 TPY for the HRSG stack (i.e., 232 TPY at 25 ppmvd compared to 187.8 TPY at 20 ppmvd) and 3.2 TPY for the CO_2 stack (or secondary boiler) (i.e., 55.2 TPY with the turbine's emissions at 25 ppmvd compared to 52.0 TPY at 20 ppmvd) These increases in CO emissions are not significant and do not significantly change conclusions drawn from the economic, environmental, and energy analyses performed as part of the Best Available Control Technology (BACT) review for this project. Combustion design is still proposed as BACT as a result of the technical and economic consequences of using catalytic oxidation on combustion turbines. Catalytic oxidation is considered unreasonable for the following reasons:

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street
Gainesville, Florida 32605
904-331-9000
FAX 904-332-4189

5680 West Cypress Street, Suite I
Tampa, Florida 33607
813-287-1717
FAX 813-287-1716

1801 Clint Moore Road, Suite 105
Boca Raton, Florida 33487
407-994-9910
FAX 407-994-9393

6821 Southpoint Drive North,
Suite 216
Jacksonville, Florida 32216
904-296-9663 FAX 904-296-0146

One Church Street, Suite 801
Rockville, Maryland 20850
301-738-1100
FAX 301-738-1105

1. Catalytic oxidation will not produce a measurable reduction in air quality impacts from those produced using combustion controls. The maximum air quality impacts produced from either the oxidation catalyst or combustion design control techniques are below the significant impact levels for CO.

2. Based on an estimated annualized cost of a CO oxidation catalyst of $1,041,267 (see Table 4-9 in the air construction permit application), the cost effectiveness is approximately $5,570/ton of CO removed (i.e., oxidation catalyst will remove 187 TPY more than combustion design). The cost effectiveness is based on 50 percent operation on gas and 50 percent operation on oil, both at 10 ppmvd, for a maximum total emissions of 94 TPY (i.e., 47 TPY for both gas and oil). With combustion design controls and based on 50 percent operation on gas at 25 ppmvd and 50 percent operation on oil at 35 ppmvd, the maximum emissions are 281 TPY (i.e., 116 TPY on gas and 165 TPY on oil).

Indeed, recent BACT decisions for combustion turbines have set limits in the 30 ppmvd range. The recent air construction permit for the Cane Island Combustion Turbine Project for Kissimmee Utility Authority (AC49-205703/PSD-FL-182) established the CO emission limit as 54 lb/hr, equivalent to 25 ppmvd, for the GE 7EA turbine. This CO limit was established when the proposed unit is limited to NO_x emissions of either 15 or 25 ppmvd.

POTENTIAL REDUCTION IN NITROGEN OXIDES EMISSIONS

From discussions with GE, the combustion turbine may achieve a maximum NO_x emission rate of 15 ppmvd, corrected to 15 percent O_2, when the turbine is initially operated. As a result, a change in the specific permit condition would be submitted to DER to limit the NO_x emission rate from 25 ppmvd to 15 ppmvd. If this occurs, the total reduction in NO_x emissions from the HRSG stack would be approximately 153.8 TPY each year (i.e., 384.5 TPY at 25 ppmvd minus 230.7 TPY at 15 ppmvd) until after December 31, 1997 (when 15 ppmvd is required to be achieved). However, the CO emission limit would need to be revised from the current limit of 20 ppmvd to 25 ppmvd for the reasons previously cited. Again, the combustion design is still considered as BACT as a result of the technical and economic consequences of using catalytic oxidation on combustion turbines. The cost of an oxidation catalyst would be significant and not cost-effective given the proposed CO emission limit of 25 ppmvd when firing gas and 35 ppmvd when firing distillate oil.

Should the combustion turbine achieve a maximum NO_x emission rate of 15 ppmvd, corrected to 15 percent O_2, when initially operated in November, 1994, the revision to Specific Condition No. 2 is attached that would allow a CO emission rate of 25 ppmvd and limit the NO_x emission rate to 15 ppmvd, corrected to 15 percent O_2 prior to December 31, 1997 (see Attachment 1).

We will contact you in several days to discuss any questions or concerns you may have with regards to these requested changes. On behalf of Polk Power Partners, L.P. and KBN, we greatly appreciated you and your staff's review of these requested changes to the permit. Your continued cooperation is appreciated.

Sincerely,

Kennard F. Kosky, P.E.
President
Registration No. 14996

ATTACHMENT 1

SPECIFIC CONDITIONS:

2. Emissions from these facilities shall not exceed the limits listed below (based on operation at 59°F):

Pollutant	Source	Fuel	Through 12/31/97 lbs/hr	Through 12/31/97 tons/yr	After 12/31/97 (See notes) [9] lbs/hr	After 12/31/97 (See notes) [9] tons/yr
NO_x	HRSG Stack	Gas	87.8[b]	384.5[b]	52.7	230.7
	CO_2 Plant Stack[a]	Gas	19.9[b]	87.1[b]	18.3	80.0
	HRSG Stack	Oil	164.0	718.2	164.0	59.0
	CO_2 Plant Stack[a]	Oil	23.4	102.4	23.4	8.4
SO_2	HRSG Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
	CO_2 Plant Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
VE	HRSG Stack	Gas	10% Opacity		10% Opacity	
	CO_2 Plant Stack	Gas	10% Opacity		10% Opacity	
	HRSG Stack	Oil	20% Opacity		20% Opacity	
	CO_2 Plant Stack	Oil	20% Opacity		20% Opacity	
VOC	CO_2 Plant Stack	--	18.2	79.6	17.7	77.6
CO	HRSG Stack	Gas	42.9[b]	187.8[b]	53	232
	CO_2 Plant Stack[a]	Gas	11.9[b]	52.0[b]	12.6	55.2
	HRSG Stack	Oil	75.3	329.9	75.3	27.1
	CO_2 Plant Stack[a]	Oil	13.4	58.5	13.4	4.8

Notes: (1) Oil may be used as backup fuel for up to 30 days per year.
(2) NO_x limits after 12/31/97 based on 15 ppmvd.
(3) Opacity limit will allow one 6-minute period per hour of not more than 27% opacity.
(4) CO limits after 12/21/97 based on CO emission rate of 25 ppmvd from the combustion turbine and is coincident with NO_x limit of 15 ppmvd.

[a] Or secondary HRSG Stack.

[b] Should the combustion turbine achieve a maximum NO_x emission rate of 15 ppmvd, corrected to 15 percent O_2, when initially operated, the NO_x and CO limits would be identical to those conditions specified after 12/31/97.

August 17, 1993

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

Subject: Mulberry Cogeneration Project
DER File No. AC53-211670, PSD-FL-187
Request for Change in Permit Specific Condition

Dear Clair:

This correspondence is submitted on behalf of Polk Power Partners, L.P. to request a change in the carbon monoxide (CO) emission limitation for the combustion turbine when firing natural gas and provide a potential reduction of the maximum allowable nitrogen oxides (NO_x) emission rate when the unit becomes operational. These changes affect Specific Condition No. 2 of the air construction permit (AC53-211670).

CARBON MONOXIDE EMISSIONS FOR NATURAL GAS FIRING

The request for this change is based on recent performance information obtained for the General Electric PG7111(EA) combustion turbine when it achieves a maximum NO_x emission rate of 15 parts per million (ppm), corrected for dry conditions (ppmvd) and 15 percent oxygen (O_2). At this NOx emission level, GE expects only a maximum CO emission rate of 25 ppmvd. As a result, the CO emission limit would be revised from the current limit of 20 ppmvd to 25 ppmvd and would be in effect when the NO_x emission rate is equal to or less than 15 ppmvd, corrected to 15 percent O_2 (i.e., after December 31, 1997). Prior to December 31, 1997, the CO emission limit of 20 ppmvd is achievable with a NO_x emission limit of 25 ppmvd, corrected to 15 percent O_2, respectively.

The net change in maximum allowable CO emissions is approximately 44.2 TPY for the HRSG stack (i.e., 232 TPY at 25 ppmvd compared to 187.8 TPY at 20 ppmvd) and 3.2 TPY for the CO_2 stack (or secondary boiler) (i.e., 55.2 TPY with the turbine's emissions at 25 ppmvd compared to 52.0 TPY at 20 ppmvd). These increases in CO emissions are not significant and do not significantly change conclusions drawn from the economic, environmental, and energy analyses performed as part of the Best Available Control Technology (BACT) review for this project. Combustion design is still proposed as BACT as a result of the technical and economic consequences of using catalytic oxidation on combustion turbines. Catalytic oxidation is considered unreasonable for the following reasons:

POWER ENGINEERING AND ARCHITECTURAL SERVICES, INC.

KBN

April 14, 1993

RECEIVED

APR 16 1993

Division of Air
Resources Management

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

Re: Mulberry Cogeneration Project
DER File No. AC53-211670
PSD-FL-187
Computer Modeling Printouts/Analysis of Separate Stack for the Secondary HRSG Stack Analysis

Dear Clair:

Enclosed are the computer modeling printouts and a diskette copy of the modeling input and output files in support of the separate stack analysis performed for the above-referenced project. The results of this analysis were submitted to the Department in a letter report dated February 19, 1993. Included with the enclosed printouts is a summary and description of the modeling files included on the diskette.

Please contact me or Gail Rampersaud if you have any questions concerning the enclosed material.

Sincerely,

Robert C. McCann Jr.

Robert C. McCann, Jr.
Principal Scientist

RCM/dmpm

Enclosures

cc: William Malenius, Ark Energy
Ward Marshall, Central and South West Services
Gary Sams, Hopping Boyd Green & Sams
Roger Anderson, KBN
Gail Rampersaud, KBN
Ken Kosky, KBN
File (2)

904-336-5600

91193A2/2

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

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3. Article Addressed to:
Ken Kosky, PE
KBN Engineering + App. Sc.
1034 NW 57th St.
Gainesville, Fl 32605

4a. Article Number
P 062 921 977

4b. Service Type
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5. Signature (Addressee)

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

6. Signature (Agent)
R Mitchell

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

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PS Form 3800, June 1991

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

March 19, 1993

Mr. Kennard F. Kosky, P.E.
President
KBN Engineering and Applied Sciences, Inc.
1034 N.W. 57th Street
Gainesville, Florida 32605

Dear Mr. Kosky:

This is in response to your recent letter notifying the Department of a design change for the Mulberry Cogeneration Project (PSD-FL-187) consisting of a separate stack for the secondary HRSG. This design change will involve no increase in emissions or result in a substantially different ambient impact. The secondary HRSG stack will have no impact as far as the construction permit emission limits are concerned since normal compliance testing will not involve this secondary stack. It will be in use only during atypical operating situations. Consequently, a construction permit modification is not required for this design change. However, it is required that this and all other substantive changes in the final design and construction be reported in the operation permit application.

If you have further questions, please contact Preston Lewis or John Reynolds at (904) 488-1344.

Sincerely,

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

CHF/JR/kbw

cc: W. Thomas, SWD
D. Martin, Polk County

February 19, 1993

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

Re: Mulberry Cogeneration Project
DER File No. AC53-211670
PSD-FL-187
Specific Condition Request

Dear Clair:

This correspondence is submitted on behalf of Polk Power Partners, L.P. to notify the Department Florida Department of Environmental Regulation (FDER) of a design change for the facility (stack addition).

The design for the facility permitted by FDER includes stacks for the primary heat recovery steam generator (HRSG) and carbon dioxide (CO_2) plant. The emissions from the CO_2 plant include a portion of the emissions from the combustion turbine, the emissions generated by the secondary HRSG, and emissions associated with the CO_2 absorption process. A stack for the secondary HRSG was not originally included in the design. Based on the final design requirements for the facility, a separate stack for the secondary HRSG is necessary. Emissions will occur at the secondary HRSG stack when:

1. The power plant, including the combustion turbine and duct burner are operating and the CO_2 plant may be either down or experiencing additional problems; or

2. The duct burner is operating alone.

For air quality impact assessments, the highest emissions will occur when the power plant is in operation (CO_2 plant not operating). The secondary HRSG stack would be operated only as necessary during such conditions that would not exceed 180 days per year. The emissions from the facility would not change. A footnote to the specific conditions of the permit (see Attachment 1) would be sufficient to allow emissions from a secondary HRSG stack.

Since the addition of a stack will affect the manner by which emissions from the facility are discharged to the atmosphere, the air quality impacts may change even though no increase in emissions will occur. To address this issue, air quality modeling analyses have been performed and are attached (see Attachment 2). The analyses demonstrate that the facility's impacts are not significantly different from those presented in the air construction permit application. Based on these results, the facility's impacts are expected to comply with the applicable ambient air quality standards (AAQS), prevention of significant deterioration (PSD) increments, and Florida's no threat levels (NTLs) for toxic air pollutants.

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

On behalf of Polk Power Partners, L.P., and KBN, we greatly appreciated the efforts in completing the permits. Your continued cooperation is appreciated.

Sincerely,

Kennard F. Kosky, P.E.
President
Registration No. 14996

KFK/ehj

cc: W. Malenius, Ark Energy
W. Marshall, Central and South West Services
R. Anderson, KBN
G. Sams, HBG&S
J. Reynolds/C. Halladay
B. Thomas, SW Dist.
J. Harper, EPA
J. Bunyak, NPS
J. Martin, Polk Co.

91193A2/1

ATTACHMENT 1

SPECIFIC CONDITIONS:

2. Emissions from these facilities shall not exceed the limits listed below (based on operation at 59°F):

Pollutant	Source	Fuel	Through 12/31/97 lbs/hr	Through 12/31/97 tons/yr	After 12/31/97 (See notes) 2 lbs/hr	After 12/31/97 (See notes) 2 tons/yr
NO_x	HRSG Stack	Gas	87.8	384.5	52.7	230.7
	CO_2 Plant Stack[a]	Gas	19.9	87.1	18.3	80.0
	HRSG Stack	Oil	164.0	718.2	164.0	59.0
	CO_2 Plant Stack[a]	Oil	23.4	102.4	23.4	8.4
SO_2	HRSG Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
	CO_2 Plant Stack	Oil	0.1% Sulfur Max.		0.1% Sulfur Max.	
VE	HRSG Stack	Gas	10% Opacity		10% Opacity	
	CO_2 Plant Stack	Gas	10% Opacity		10% Opacity	
	HRSG Stack	Oil	20% Opacity		20% Opacity	
	CO_2 Plant Stack	Oil	20% Opacity		20% Opacity	
VOC	CO_2 Plant Stack	--	18.2	79.6	17.7	77.6
CO	HRSG Stack	Gas	42.9	187.8	42.9	187.8
	CO_2 Plant Stack[a]	Gas	11.9	52.0	11.9	52.0
	HRSG Stack	Oil	75.3	329.9	75.3	27.1
	CO_2 Plant Stack[a]	Oil	13.4	58.5	13.4	4.8

Notes: (1) Oil may be used as backup fuel for up to 30 days per year.
(2) NO_x limits after 12/31/97 based on 15 ppmvd.
(3) Opacity limit will allow one 6-minute period per hour of not more than 27% opacity.

[a] Or secondary HRSG Stack.

ATTACHMENT 2
AIR QUALITY IMPACT ANALYSES FOR THE PROPOSED COMBUSTION TURBINE AND DUCT BURNER WITH SEPARATE STACKS FOR THE MULBERRY COGENERATION FACILITY

1.0 INTRODUCTION

KBN Engineering and Applied Sciences, Inc. (KBN) has performed air quality impact analyses to determine the maximum concentrations for the operation of the combustion turbine (CT) and duct burner with separate stacks for the integrated cogeneration facility proposed by Polk Power Partners, L.P., dba Polk Power Partners, L.P., Ltd. The modeling analyses assumed that the exhaust gases from the duct burner are vented through a stack separate from the CT and CO_2 stacks and that the CO_2 plant is not in operation (i.e., no emissions occur at the CO_2 plant). Air quality impacts have been performed already for the facility, which is referred to as the Mulberry Cogeneration Facility, as part of the air construction permit application for the CT and CO_2 plant. The results presented in the present analysis supplement the previous analyses and compare the maximum concentrations predicted for the operation of the CT and duct burner alone with those predicted for the CT and CO_2 plant. These results are also compared to the significance levels and *de minimis* monitoring levels under the prevention of significant deterioration (PSD) regulations to determine if additional analyses would be required due to emissions from the duct burner stack (i.e., analyses that were not performed for the permit application). For toxic air pollutants, the maximum predicted concentrations are compared to the no threat levels (NTL) established by the Florida Department of Environmental Regulation (FDER).

The following sections present the approaches, methods, and results of the air quality impact analyses.

2.0 EMISSION DATA AND AIR QUALITY IMPACTS METHODS

An air quality modeling analysis was performed to determine the maximum pollutant concentrations, including the regulated pollutants of sulfur dioxide (SO_2), particulate matter (PM), nitrogen dioxide (NO_2), carbon monoxide (CO), beryllium (Be), and toxic air pollutants, from the operation of the CT and duct burner. This analysis included modeling with the Industrial Source Complex Short-Term (ISCST) model using the emissions from the proposed combustion turbine using distillate fuel oil for the maximum emission case (i.e., 20°F) and minimum exit gas flow rate (i.e., 100°F). Emission data for fuel oil were used because the emissions for natural gas, the other fuel proposed for this project, were lower and would result in lower ambient impacts. The

with other sources or submittal of preconstruction monitoring data are not warranted for these pollutants.

For SO_2, although the maximum impacts with the CT and duct burner operating alone are predicted to be greater than the significance and *de minimis* levels, these results are similar to those produced with the CO_2 plant in operation. The permit application for the CT and CO_2 plant did include air quality modeling analyses with other sources and preconstruction monitoring data. Since the addition of the proposed stack for the duct burner does not produce a significant increase in impacts from the previous model results, no additional modeling is warranted. The proposed facility's impacts are still expected to comply with ambient air quality standards (AAQS) and maximum allowable PSD increments.

For NO_2, the maximum impacts with the CT and duct burner operating alone are predicted to be greater than the significance level for the annual averaging period. These results are conservative (i.e., higher than expected) since they assume that the duct burner is in operation for the entire year while the CO_2 plant is shutdown. By operating the duct burner for no more than 180 days per year when the CO_2 plant is shutdown, the annual average NO_2 impacts are expected to be less than the significance level of 1 $\mu g/m^3$.

Maximum impacts of toxic air pollutants predicted for the proposed facility with the CT and duct burner in operation are presented in Table 4. These results show that the maximum impacts are below the Florida NTL.

4.0 CONCLUSIONS

The proposed facility's impacts are expected to comply with AAQS, maximum allowable PSD increments, and Florida's NTL with the CO_2 plant operating or shutdown. For all pollutants except SO_2 and NO_2, the maximum concentrations are predicted to be less than significance levels and *de minimis* monitoring levels and, therefore, additional modeling analyses with other sources or submittal of preconstruction monitoring data are not warranted.

For SO_2, the maximum impacts with the CT and duct burner operating alone are similar to those produced with the CO_2 plant in operation (i.e., also greater than the significance and *de minimis* levels). Since the addition of the proposed stack for the duct burner does not produce a

other fuel proposed for this project, were lower and would result in lower ambient impacts. The duct burner was assumed to have a maximum heat input rate of 99 pounds per million British thermal units (10^6 Btu/hr) and use natural gas only. The design information and stack parameters of the duct burner are presented in Table 1-A (the design information, stack parameters, and emissions for the CT are presented in the permit application). The maximum emission rates from the duct burner for the applicable pollutants are presented in Tables 1-B through 1-E. Summaries of the total project's emissions for the CT using fuel oil and duct burner, including each unit's contribution, for ambient temperatures of 20, 59, and 100°F are presented in Tables 2-A through 2-D.

The impacts were predicted using the ISCST2 (Version 92273) model at 360 receptors surrounding the proposed facility. The receptors were located in a radial grid, which was the same as that used in the permit application. The grid consisted of 36 receptors along the plant property and 324 receptors along 36 radials with each radial spaced at 10-degree increments. Along each radial, receptors were located at distances of 300; 500; 700; 1,000; 1,500; 2,000; 3,000; 4,000; and 5,000 meters (m) from the CT stack. The impacts were predicted using a 5-year meteorological record (1982 through 1986) of surface and mixing height data from the National Weather Service (NWS) stations in Tampa and Ruskin, respectively.

The proposed duct burner's stack will be 125 feet (ft) tall and located near the CT stack. Similar to the proposed CT's stack of 125 ft, the proposed duct burner's stack will be less than good engineering practice (GEP) height. As a result, building downwash effects were included in the modeling using the same building data assigned to the CT's stack.

3.0 MODEL RESULTS

Maximum impacts predicted for the proposed facility with the CT and duct burner in operation using 5 years of meteorological data are presented in Table 3. These results indicate that, except for PM, there is a slight increase in predicted impacts with the emissions from the stacks of the CT and duct burner compared to the impacts from stack emissions of the CT and CO_2 plant. For PM, the maximum impacts are lower for the facility with the CT and duct burner operating only (i.e., CO_2 plant not operating) than when the CO_2 plant is operating.

For all pollutants except SO_2 and NO_2, the maximum concentrations are predicted to be less than significance levels and *de minimis* monitoring levels. Therefore, additional modeling analyses

significant increase in impacts from the previous model results, no additional modeling is warranted.

For NO_2, although the maximum impacts with the CT and duct burner operating alone are predicted to be greater than the significance level for the annual averaging period, these results assume that the duct burner is in operation for the entire year while the CO_2 plant is shutdown. By operating the duct burner for no more than 30 days per year when the CO_2 plant is shutdown, the annual average NO_2 impacts are expected to be less than the significance level of 1 $\mu g/m^3$.

Table 1-A. Design Information and Stack Parameters for Mulberry Cogeneration Project--Duct Burner, Natural Gas

Data	Duct Burner Data at Ambient Temperature				
	20°F	40°F	59°F	80°F	100°F
General:					
Power (kW)	NA	NA	NA	NA	NA
Heat Rate (Btu/kwh)	NA	NA	NA	NA	NA
Heat Input (MMBtu/hr)	99.0	99.0	99.0	99.0	99.0
Fuel Natural Gas (lb/hr)	5,128.7	5,128.7	5,128.7	5,128.7	5,128.7
(cf/hr)	104,211	104,211	104,211	104,211	104,211
Fuel:					
Heat Content,LHV (Btu/lb)	19,303	19,303	19,303	19,303	19,303
(Btu/cf)	950.0	950.0	950.0	950.0	950.0
From CT and Duct Burner Exhaust:					
Volume Flow (acfm)	41,273	41,273	41,273	41,273	41,273
Volume Flow (scfm)	28,674	28,674	28,674	28,674	28,674
Mass Flow (lb/hr)^a	125,000	125,000	125,000	125,000	125,000
Temperature (°F)	300	300	300	300	300
Moisture (% Vol.)					
Oxygen (% Vol.)					
Molecular Weight	28.00	28.00	28.00	28.00	28.00
By-pass Stack:					
Volume Flow (acfm)	41,273	41,273	41,273	41,273	41,273
Temperature (°F)	300	300	300	300	300
Diameter (ft)	6.50	6.50	6.50	6.50	6.50
Velocity (ft/sec)	20.7	20.7	20.7	20.7	20.7
Stack Height (ft)	125	125	125	125	125

^a Based on 120,000 lb/hr from CT; 5,000 lb/hr from duct burner.

Table 1-B. Maximum Criteria Pollutant Emissions for Mulberry Cogeneration Project--Duct Burner, Natural Gas

Pollutant	Duct Burner Data at Ambient Temperature				
	20°F	40°F	59°F	80°F	100°F
Particulate:					
Basis, lb/MMBtu	0.01	0.01	0.01	0.01	0.01
lb/hr	0.99	0.99	0.99	0.99	0.99
TPY	4.3	4.3	4.3	4.3	4.3
Sulfur Dioxide:					
Basis, gr S/100 cf	1.0	1.0	1.0	1.0	1.0
lb/hr	0.30	0.30	0.30	0.30	0.30
TPY	1.3	1.3	1.3	1.3	1.3
Nitrogen Oxides:					
Basis, lb/MMBtu	0.13	0.13	0.13	0.13	0.13
lb/hr	12.87	12.87	12.87	12.87	12.87
TPY	56.4	56.4	56.4	56.4	56.4
Carbon Monoxide:					
Basis, lb/MMBtu	0.1	0.1	0.1	0.1	0.1
lb/hr	9.9	9.9	9.9	9.9	9.9
TPY	43.4	43.4	43.4	43.4	43.4
VOCs:					
Basis, lb/MMBtu	0.03	0.03	0.03	0.03	0.03
lb/hr	2.97	2.97	2.97	2.97	2.97
TPY	13.0	13.0	13.0	13.0	13.0
Lead:					
Basis, lb/10E+12 Btu	Neg.	Neg.	Neg.	Neg.	Neg.
lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPY	0.000	0.000	0.000	0.000	0.000

Table 1-C. Maximum Other Regulated Pollutant Emissions for Mulberry Cogeneration Project--Duct Burner, Natural Gas

Pollutant	Units	Duct Burner Data at Ambient Temperature				
		20°F	40°F	59°F	80°F	100°F
Arsenic	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beryllium	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride	lb/10E+12 Btu (2)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sulfuric Acid	% of SO_2	5	5	5	5	5
Mist	lb/hr	2.40E-02	2.40E-02	2.40E-02	2.40E-02	2.40E-02
	TPY	1.05E-01	1.05E-01	1.05E-01	1.05E-01	1.05E-01

Sources: (1) EPA, 1990; (2) EPA, 1980.

Table 1-D. Maximum Nonregulated Pollutant Emissions for Mulberry Cogeneration Project--Duct Burner, Natural Gas

Pollutant	Units	Duct Burner Data at Ambient Temperature 20°F	40°F	59°F	80°F	100°F
Manganese	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	lb/10E+12 Btu (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	pg/J (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	pg/J (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Polycyclic Organic Matter	pg/J (1)	0.48	0.48	0.48	0.48	0.48
	lb/hr	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04
	TPY	4.84E-04	4.84E-04	4.84E-04	4.84E-04	4.84E-04
Formaldehyde	lb/10E+12 Btu (1)	38	38	38	38	38
	lb/hr	3.76E-03	3.76E-03	3.76E-03	3.76E-03	3.76E-03
	TPY	1.65E-02	1.65E-02	1.65E-02	1.65E-02	1.65E-02
Carbon Dioxide	% Exhaust Gas	8.04	0.00	0.00	0.00	0.00
	lb/hr	1.42E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	6.23E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: Multiply by 2.324 to convert picogram/Joule (pg/J) to lb/10E+12 Btu.

Source: (1) EPA, 1990.

Table 1-E. Maximum Emissions for Additional Nonregulated Pollutant--Duct Burner, Natural Gas

Pollutant		Duct Burner Data at Ambient Temperature				
		20°F	40°F	59°F	80°F	100°F
Antimony	pg/J (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	pg/J (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Colbalt	pg/J (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	pg/J (1)	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chlorine	ppm	Neg.	Neg.	Neg.	Neg.	Neg.
	lb/hr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TPY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: Multiply by 2.324 to convert picogram/Joule (pg/J) to lb/10E+12 Btu.

Table 2-A. Emissions for CT and Duct Burner Stack Exhausts--Criteria Pollutants

Pollutant	Fuel Oil at 20°F			Ratio CT/DB Emission	Fuel Oil at 59°F			Ratio CT/DB Emission	Fuel Oil at 100°F			Ratio CT/DB Emission
	CT	Duct Burner	Total		CT	Duct Burner	Total		CT	Duct Burner	Total	
Particulate:												
lb/hr	14.31	1.68	15.99	8.51	14.24	1.75	15.99	8.16	14.16	1.83	15.99	7.72
TPY	62.67	7.36	70.04	8.51	62.39	7.64	70.04	8.16	62.01	8.03	70.04	7.72
Sulfur Dioxide:												
lb/hr	100.78	5.16	105.95	19.51	90.30	5.08	95.38	17.76	78.17	4.96	83.13	15.77
TPY	441.42	22.62	464.04	19.51	395.51	22.27	417.77	17.76	342.40	21.71	364.10	15.77
Nitrogen Oxides:												
lb/hr	173.81	21.26	195.07	8.17	155.72	21.12	176.84	7.37	134.79	20.90	155.69	6.45
TPY	761.27	93.13	854.40	8.17	682.05	92.52	774.57	7.37	590.40	91.55	681.94	6.45
Carbon Monoxide:												
lb/hr	78.77	13.70	92.47	5.75	71.53	13.69	85.22	5.22	62.81	13.64	76.45	4.60
TPY	345.01	60.02	405.04	5.75	313.31	59.97	373.28	5.22	275.12	59.75	334.87	4.60
VOCs:												
lb/hr	9.65	3.44	13.08	2.81	8.76	3.43	12.19	2.55	7.69	3.43	11.12	2.24
TPY	42.25	15.05	57.30	2.81	38.36	15.04	53.41	2.55	33.69	15.02	48.70	2.24
Lead:												
lb/hr	8.76E-03	4.23E-04	9.18E-03	20.71	7.85E-03	4.16E-04	8.26E-03	18.87	6.79E-03	4.05E-04	7.20E-03	16.78
TPY	3.84E-02	1.85E-03	4.02E-02	20.71	3.44E-02	1.82E-03	3.62E-02	18.87	2.98E-02	1.77E-03	3.15E-02	16.78

Table 2-B. Emissions for CT and Duct Burner Stack Exhausts--Other Regulated Pollutants

Pollutant	Units	Fuel Oil at 20°F			Ratio CT/DB Emission	Fuel Oil at 59°F			Ratio CT/DB Emission	Fuel Oil at 100°F			Ratio CT/DB Emission
		CT	Duct Burner	Total		CT	Duct Burner	Total		CT	Duct Burner	Total	
Arsenic													
	lb/hr	4.13E-03	2.00E-04	4.33E-03	20.71	3.70E-03	1.96E-04	3.90E-03	18.87	3.21E-03	1.91E-04	3.40E-03	16.78
	TPY	1.81E-02	8.74E-04	1.90E-02	20.71	1.62E-02	8.60E-04	1.71E-02	18.87	1.40E-02	8.37E-04	1.49E-02	16.78
Beryllium													
	lb/hr	2.46E-03	1.19E-04	2.58E-03	20.71	2.20E-03	1.17E-04	2.32E-03	18.87	1.91E-03	1.14E-04	2.02E-03	16.78
	TPY	1.08E-02	5.20E-04	1.13E-02	20.71	9.65E-03	5.12E-04	1.02E-02	18.87	8.36E-03	4.98E-04	8.86E-03	16.78
Mercury													
	lb/hr	2.95E-03	1.43E-04	3.09E-03	20.71	2.64E-03	1.40E-04	2.78E-03	18.87	2.29E-03	1.36E-04	2.43E-03	16.78
	TPY	1.29E-02	6.24E-04	1.36E-02	20.71	1.16E-02	6.14E-04	1.22E-02	18.87	1.00E-02	5.98E-04	1.06E-02	16.78
Fluoride													
	lb/hr	3.20E-02	1.54E-03	3.35E-02	20.71	2.87E-02	1.52E-03	3.02E-02	18.87	2.48E-02	1.48E-03	2.63E-02	16.78
	TPY	1.40E-01	6.76E-03	1.47E-01	20.71	1.25E-01	6.65E-03	1.32E-01	18.87	1.09E-01	6.47E-03	1.15E-01	16.78
Sulfuric Acid Mist													
	lb/hr	8.12E+00	4.16E-01	8.54E+00	19.51	7.28E+00	4.10E-01	7.69E+00	17.76	6.30E+00	3.99E-01	6.70E+00	15.77
	TPY	3.56E+01	1.82E+00	3.74E+01	19.51	3.19E+01	1.79E+00	3.37E+01	17.76	2.76E+01	1.75E+00	2.93E+01	15.77

Table 2-C. Emissions for CT and Duct Burner Stack Exhausts--Nonregulated Pollutants

Pollutant	Units	Fuel Oil at 20°F			Ratio CT/DB Emission	Fuel Oil at 59°F			Ratio CT/DB Emission	Fuel Oil at 100°F			Ratio CT/DB Emission
		CT	Duct Burner	Total		CT	Duct Burner	Total		CT	Duct Burner	Total	
Manganese													
	lb/hr	6.34E-03	3.06E-04	6.64E-03	20.71	5.68E-03	3.01E-04	5.98E-03	18.87	4.92E-03	2.93E-04	5.21E-03	16.78
	TPY	2.78E-02	1.34E-03	2.91E-02	20.71	2.49E-02	1.32E-03	2.62E-02	18.87	2.15E-02	1.28E-03	2.28E-02	16.78
Nickel													
	lb/hr	1.67E-01	8.08E-03	1.75E-01	20.71	1.50E-01	7.94E-03	1.58E-01	18.87	1.30E-01	7.73E-03	1.37E-01	16.78
	TPY	7.33E-01	3.54E-02	7.68E-01	20.71	6.56E-01	3.48E-02	6.91E-01	18.87	5.68E-01	3.39E-02	6.02E-01	16.78
Cadmium													
	lb/hr	1.03E-02	4.99E-04	1.08E-02	20.71	9.26E-03	4.81E-04	9.75E-03	18.87	8.01E-03	4.77E-04	8.49E-03	16.78
	TPY	4.53E-02	2.19E-03	4.74E-02	20.71	4.05E-02	2.15E-03	4.27E-02	18.87	3.51E-02	2.09E-03	3.72E-02	16.78
Chromium													
	lb/hr	4.67E-02	2.26E-03	4.90E-02	20.71	4.19E-02	2.22E-03	4.41E-02	18.87	3.63E-02	2.16E-03	3.84E-02	16.78
	TPY	2.05E-01	9.89E-03	2.15E-01	20.71	1.83E-01	9.72E-03	1.93E-01	18.87	1.59E-01	9.46E-03	1.68E-01	16.78
Copper													
	lb/hr	2.76E-01	1.33E-02	2.89E-01	20.71	2.47E-01	1.31E-02	2.60E-01	18.87	2.14E-01	1.27E-02	2.26E-01	16.78
	TPY	1.21E+00	5.83E-02	1.26E+00	20.71	1.08E+00	5.73E-02	1.14E+00	18.87	9.36E-01	5.58E-02	9.92E-01	16.78
Vanadium													
	lb/hr	6.86E-02	3.31E-03	7.19E-02	20.71	6.15E-02	3.26E-03	6.47E-02	18.87	5.32E-02	3.17E-03	5.64E-02	16.78
	TPY	3.00E-01	1.45E-02	3.15E-01	20.71	2.69E-01	1.43E-02	2.83E-01	18.87	2.33E-01	1.39E-02	2.47E-01	16.78
Selenium													
	lb/hr	2.31E-02	1.12E-03	2.42E-02	20.71	2.07E-02	1.10E-03	2.18E-02	18.87	1.79E-02	1.07E-03	1.90E-02	16.78
	TPY	1.01E-01	4.88E-03	1.06E-01	20.71	9.06E-02	4.80E-03	9.54E-02	18.87	7.85E-02	4.68E-03	8.31E-02	16.78
Polycyclic Organic Matter	lb/hr	2.74E-04	1.24E-04	3.98E-04	2.22	2.46E-04	1.23E-04	3.69E-04	1.99	2.13E-04	1.23E-04	3.36E-04	1.73
	TPY	1.20E-03	5.42E-04	1.74E-03	2.22	1.08E-03	5.41E-04	1.62E-03	1.99	9.32E-04	5.39E-04	1.47E-03	1.73
Formaldehyde													
	lb/hr	3.98E-01	2.30E-02	4.22E-01	17.32	3.57E-01	2.27E-02	3.80E-01	15.74	3.09E-01	2.22E-02	3.31E-01	13.94
	TPY	1.75E+00	1.01E-01	1.85E+00	17.32	1.56E+00	9.94E-02	1.66E+00	15.74	1.35E+00	9.71E-02	1.45E+00	13.94
Carbon Dioxide													
	lb/hr	1.58E+05	2.99E+04	1.88E+05	5.30	1.41E+05	1.54E+04	1.57E+05	9.19	1.21E+05	1.49E+04	1.36E+05	8.15
	TPY	6.94E+05	1.31E+05	8.25E+05	5.30	6.19E+05	6.73E+04	6.86E+05	9.19	5.32E+05	6.53E+04	5.97E+05	8.15

Table 2-D. Emissions for CT and Duct Burner Stack Exhausts--Additional Nonregulated Pollutants

Pollutant	Units	Fuel Oil at 20°F			Ratio CT/DB Emission	Fuel Oil at 59°F			Ratio CT/DB Emission	Fuel Oil at 100°F			Ratio CT/DB Emission
		CT	Duct Burner	Total		CT	Duct Burner	Total		CT	Duct Burner	Total	
Antimony													
	lb/hr	2.15E-02	1.04E-03	2.25E-02	20.71	1.93E-02	1.02E-03	2.03E-02	18.87	1.67E-02	9.93E-04	1.77E-02	16.78
	TPY	9.41E-02	4.55E-03	9.87E-02	20.71	8.44E-02	4.47E-03	8.88E-02	18.87	7.30E-02	4.35E-03	7.74E-02	16.78
Barium													
	lb/hr	1.92E-02	9.28E-04	2.01E-02	20.71	1.72E-02	9.12E-04	1.81E-02	18.87	1.49E-02	8.88E-04	1.58E-02	16.78
	TPY	8.41E-02	4.06E-03	8.82E-02	20.71	7.54E-02	4.00E-03	7.94E-02	18.87	6.53E-02	3.89E-03	6.91E-02	16.78
Colbalt													
	lb/hr	8.92E-03	4.31E-04	9.35E-03	20.71	7.99E-03	4.24E-04	8.41E-03	18.87	6.92E-03	4.12E-04	7.33E-03	16.78
	TPY	3.91E-02	1.89E-03	4.09E-02	20.71	3.50E-02	1.86E-03	3.69E-02	18.87	3.03E-02	1.81E-03	3.21E-02	16.78
Zinc													
	lb/hr	6.72E-01	3.25E-02	7.05E-01	20.71	6.02E-01	3.19E-02	6.34E-01	18.87	5.21E-01	3.11E-02	5.53E-01	16.78
	TPY	2.94E+00	1.42E-01	3.09E+00	20.71	2.64E+00	1.40E-01	2.78E+00	18.87	2.28E+00	1.36E-01	2.42E+00	16.78
Chlorine													
	lb/hr	2.65E-02	1.28E-03	2.78E-02	20.71	2.38E-02	1.26E-03	2.50E-02	18.87	2.06E-02	1.23E-03	2.18E-02	16.78
	TPY	1.16E-01	5.61E-03	1.22E-01	20.71	1.04E-01	5.52E-03	1.10E-01	18.87	9.01E-02	5.37E-03	9.55E-02	16.78

Table 3. Summary of Maximum Pollutant Impacts for the Mulberry Cogeneration Project--Comparison of CT and CO2 Plant Impacts to CT and Duct Burner Stack Impacts (CT- Oil, DB-Nat.Gas) (Page 1 of 2)

Pollutant	Averaging Period	Year	Maximum Predicted Impacts ($\mu g/m^3$) 20°F CT,CO2	20°F CT,DB	100°F CT,CO2	100°F CT,DB	Regulatory Levels ($\mu g/m^3$) Significance	De minimis Monitoring	More Analysis Required for CT,DB ?
SO_2	3-hour	1982	23.9	28.1	26.8	31.0	25	NA	No^a
		1983	18.1	23.1	19.1	23.4	25	NA	
		1984	33.1	38.7	37.5	43.1	25	NA	
		1985	23.0	26.3	26.7	29.9	25	NA	
		1986	12.1	17.1	12.5	19.6	25	NA	
	24-hour	1982	4.9	6.2	5.7	7.3	5	13	No^a
		1983	5.1	7.4	6.5	8.8	5	13	
		1984	11.2	14.5	15.1	18.4	5	13	
		1985	9.0	11.1	10.2	12.7	5	13	
		1986	3.1	4.7	3.5	5.1	5	13	
	Annual	1982	0.25	0.25	0.25	0.32	1	NA	No
		1983	0.19	0.19	0.19	0.24	1	NA	
		1984	0.24	0.24	0.24	0.27	1	NA	
		1985	0.24	0.23	0.23	0.28	1	NA	
		1986	0.28	0.27	0.27	0.27	1	NA	
PM	24-hour	1982	1.90	1.11	1.98	1.54	5	10	No
		1983	2.08	1.46	2.14	2.00	5	10	
		1984	1.76	2.63	2.74	3.89	5	10	
		1985	1.86	2.01	1.92	2.75	5	10	
		1986	1.88	0.96	1.94	1.21	5	10	
	Annual	1982	0.18	0.076	0.19	0.099	1	NA	No
		1983	0.15	0.057	0.16	0.073	1	NA	
		1984	0.18	0.071	0.19	0.088	1	NA	
		1985	0.17	0.067	0.18	0.086	1	NA	
		1986	0.22	0.055	0.23	0.065	1	NA	
NO_2	Annual	1982	0.75	0.97	0.76	1.10	1	14	No^b
		1983	0.61	0.73	0.62	0.81	1	14	
		1984	0.73	0.90	0.74	0.99	1	14	
		1985	0.67	0.85	0.69	0.96	1	14	
		1986	0.83	0.69	0.85	0.71	1	14	
CO	1-hour	1982	32.3	51.2	36.6	55.6	2000	NA	No
		1983	37.3	45.9	37.0	50.9	2000	NA	
		1984	46.0	48.8	50.7	53.6	2000	NA	
		1985	31.0	50.6	33.9	57.8	2000	NA	
		1986	23.7	38.8	27.5	44.2	2000	NA	

Table 3. Summary of Maximum Pollutant Impacts for the Mulberry Cogeneration Project--Comparison of CT and CO2 Plant Impacts to CT and Duct Burner Stack Impacts (CT- Oil, DB-Nat.Gas) (Page 2 of 2)

Pollutant	Averaging Period	Year	Maximum Predicted Impacts (µg/m³) 20°F CT,CO2	20°F CT,DB	100°F CT,CO2	100°F CT,DB	Regulatory Levels (µg/m³) Significance	De minimis Monitoring	More Analysis Required for CT,DB ?
	8-hour	1982	8.9	14.2	10.2	15.4	500	575	No
		1983	10.8	20.4	11.7	21.6	500	575	
		1984	16.1	30.9	19.8	34.7	500	575	
		1985	12.3	21.9	15.3	25.2	500	575	
		1986	11.0	13.2	10.9	15.8	500	575	
Be	24-hour	1982	0.00013	0.00015	0.00014	0.00017	NA	0.001	No
		1983	0.00014	0.00018	0.00017	0.00021	NA	0.001	
		1984	0.00029	0.00035	0.00038	0.00044	NA	0.001	
		1985	0.00024	0.00027	0.00025	0.00030	NA	0.001	
		1986	0.00009	0.00011	0.00011	0.00012	NA	0.001	

Note: For 20°F condition, modeled CT exit gas temperature is 220°F and velocity is 67.8 ft/sec.
For 100°F condition, modeled CT exit gas temperature is 220°F and velocity is 55.5 ft/sec.

NA - Not applicable because pollutant has no ambient standard or measurement method.

^a Additional analyses were performed in permit application to address CT and CO_2 plant impacts.

^b Based on emissions from DB stack for 8,760 hours. If emissions from stack are limited to 180 days per year, predicted impacts will be less than the significance level.

Table 4. Summary of Maximum Pollutant Emission Rates and Concentrations for the Air Toxic Modeling Analysis For Combustion Turbine and Duct Burner Stacks (Page 1 of 3)

Pollutant	Emission Rate (lb/hr) at 20°F Temperature CT	Emission Rate (lb/hr) at 20°F Temperature DB	Emission Rate (lb/hr) at 100°F Temperature CT	Emission Rate (lb/hr) at 100°F Temperature DB	Averaging Period	Maximum Predicted Concentration ($\mu g/m^3$) 20°F Temperature CT (A)	20°F Temperature DB (B)	20°F Temperature Total (A+B)	100°F Temperature CT (C)	100°F Temperature DB (D)	100°F Temperature Total (C+D)	Florida No Threat Level ($\mu g/m^3$)
Antimony	2.15E-02	1.04E-03	1.67E-02	9.93E-04	8-hour	4.42E-03	1.11E-03	5.53E-03	5.33E-03	1.04E-03	6.37E-03	5
					24-hour	2.42E-03	6.43E-04	3.06E-03	3.25E-03	6.07E-04	3.86E-03	1.2
					Annual	4.26E-05	1.48E-05	5.74E-05	2.11E-05	4.30E-05	6.40E-05	0.3
Arsenic	4.13E-03	2.00E-04	3.21E-03	1.91E-04	8-hour	8.50E-04	2.14E-04	1.06E-03	1.02E-03	2.00E-04	1.22E-03	2
					24-hour	4.65E-04	1.24E-04	5.89E-04	6.25E-04	1.17E-04	7.42E-04	0.48
					Annual	8.20E-06	2.85E-06	1.10E-05	4.05E-06	8.27E-06	1.23E-05	0.00023
Barium	1.92E-02	9.28E-04	1.49E-02	8.88E-04	8-hour	3.95E-03	9.92E-04	4.94E-03	4.76E-03	9.30E-04	5.69E-03	5
					24-hour	2.16E-03	5.73E-04	2.74E-03	2.90E-03	5.43E-04	3.45E-03	1.2
					Annual	3.81E-05	1.32E-05	5.13E-05	1.88E-05	3.84E-05	5.72E-05	50
Beryllium	2.46E-03	1.19E-04	1.91E-03	1.14E-04	8-hour	5.06E-04	1.27E-04	6.33E-04	6.10E-04	1.19E-04	7.29E-04	0.02
					24-hour	2.77E-04	7.34E-05	3.50E-04	3.72E-04	6.95E-05	4.42E-04	0.0048
					Annual	4.88E-06	1.69E-06	6.57E-06	2.41E-06	4.92E-06	7.33E-06	0.00042
Cadmium	1.03E-02	4.99E-04	8.01E-03	4.77E-04	8-hour	2.13E-03	5.33E-04	2.66E-03	2.56E-03	5.00E-04	3.06E-03	0.5
					24-hour	1.16E-03	3.08E-04	1.47E-03	1.56E-03	2.92E-04	1.85E-03	0.12
					Annual	2.05E-05	7.10E-06	2.76E-05	1.01E-05	2.07E-05	3.08E-05	0.00056
Chlorine	2.65E-02	1.28E-03	2.06E-02	1.23E-03	8-hour	5.46E-03	1.37E-03	6.82E-03	6.58E-03	1.28E-03	7.86E-03	15
					24-hour	2.99E-03	7.91E-04	3.78E-03	4.01E-03	7.49E-04	4.76E-03	3.6
					Annual	5.26E-05	1.82E-05	7.08E-05	2.60E-05	5.30E-05	7.90E-05	0.4
Chromium III,IV	4.67E-02	2.26E-03	3.63E-02	2.16E-03	8-hour	9.61E-03	2.41E-03	1.20E-02	1.16E-02	2.26E-03	1.39E-02	5
					24-hour	5.26E-03	1.39E-03	6.66E-03	7.07E-03	1.32E-03	8.39E-03	1.2
					Annual	9.27E-05	3.21E-05	1.25E-04	4.58E-05	9.35E-05	1.39E-04	1000 [a]
Cobalt	8.92E-03	4.31E-04	6.92E-03	4.12E-04	8-hour	1.83E-03	4.60E-04	2.29E-03	2.21E-03	4.31E-04	2.64E-03	0.5
					24-hour	1.00E-03	2.66E-04	1.27E-03	1.35E-03	2.52E-04	1.60E-03	0.12
					Annual	1.77E-05	6.13E-06	2.38E-05	8.74E-06	1.78E-05	2.66E-05	NE

Table 4. Summary of Maximum Pollutant Emission Rates and Concentrations for the Air Toxic Modeling Analysis For Combustion Turbine and Duct Burner Stacks (Page 2 of 3)

Pollutant	Emission Rate (lb/hr) at 20°F Temperature CT	Emission Rate (lb/hr) at 20°F Temperature DB	Emission Rate (lb/hr) at 100°F Temperature CT	Emission Rate (lb/hr) at 100°F Temperature DB	Averaging Period	Maximum Predicted Concentration (μg/m³) 20°F Temperature CT (A)	20°F Temperature DB (B)	20°F Temperature Total (A+B)	100°F Temperature CT (C)	100°F Temperature DB (D)	100°F Temperature Total (C+D)	Florida No Threat Level (μg/m³)
Copper	2.76E-01	1.33E-02	2.14E-01	1.27E-02	8-hour	5.67E-02	1.42E-02	7.09E-02	6.83E-02	1.33E-02	8.16E-02	2
					24-hour	3.10E-02	8.22E-03	3.92E-02	4.17E-02	7.78E-03	4.94E-02	0.48
					Annual	5.47E-04	1.89E-04	7.36E-04	2.70E-04	5.51E-04	8.21E-04	NE
Fluoride	3.20E-02	1.54E-03	2.48E-02	1.48E-03	8-hour	6.58E-03	1.65E-03	8.23E-03	7.93E-03	1.55E-03	9.48E-03	25
					24-hour	3.60E-03	9.54E-04	4.56E-03	4.84E-03	9.03E-04	5.74E-03	6
					Annual	6.34E-05	2.20E-05	8.54E-05	3.13E-05	6.40E-05	9.53E-05	NE
Formaldehyde	3.98E-01	2.30E-02	3.09E-01	2.22E-02	8-hour	8.20E-02	2.46E-02	1.07E-01	9.88E-02	2.32E-02	1.22E-01	12
					24-hour	4.49E-02	1.42E-02	5.91E-02	6.03E-02	1.36E-02	7.38E-02	2.88
					Annual	7.91E-04	3.27E-04	1.12E-03	3.90E-04	9.60E-04	1.35E-03	0.077
Lead	8.76E-03	4.23E-04	6.79E-03	4.05E-04	8-hour	1.80E-03	4.52E-04	2.25E-03	2.17E-03	4.24E-04	2.60E-03	0.5
					24-hour	9.86E-04	2.61E-04	1.25E-03	1.32E-03	2.47E-04	1.57E-03	0.12
					Annual	1.74E-05	6.02E-06	2.34E-05	8.58E-06	1.75E-05	2.61E-05	0.09
Manganese	6.34E-03	3.06E-04	4.92E-03	2.93E-04	8-hour	1.30E-03	3.27E-04	1.63E-03	1.57E-03	3.07E-04	1.88E-03	50
					24-hour	7.14E-04	1.89E-04	9.03E-04	9.58E-04	1.79E-04	1.14E-03	12
					Annual	1.26E-05	4.35E-06	1.69E-05	6.21E-06	1.27E-05	1.89E-05	0.4
Mercury	2.95E-03	1.43E-04	2.29E-03	1.36E-04	8-hour	6.07E-04	1.52E-04	7.60E-04	7.32E-04	1.43E-04	8.75E-04	0.5
					24-hour	3.32E-04	8.81E-05	4.20E-04	4.46E-04	8.34E-05	5.30E-04	0.12
					Annual	5.86E-06	2.03E-06	7.88E-06	2.89E-06	5.90E-06	8.80E-06	0.3
Nickel	1.67E-01	8.08E-03	1.30E-01	7.73E-03	8-hour	3.44E-02	8.64E-03	4.30E-02	4.15E-02	8.09E-03	4.96E-02	10
					24-hour	1.88E-02	4.99E-03	2.38E-02	2.53E-02	4.73E-03	3.00E-02	2.4
					Annual	3.32E-04	1.15E-04	4.47E-04	1.64E-04	3.35E-04	4.98E-04	0.0042
Polycyclic Organic Matter	2.74E-04	1.24E-04	2.13E-04	1.23E-04	8-hour	5.64E-05	1.32E-04	1.89E-04	6.80E-05	1.29E-04	1.97E-04	NE
					24-hour	3.09E-05	7.64E-05	1.07E-04	4.15E-05	7.53E-05	1.17E-04	NE
					Annual	5.44E-07	1.76E-06	2.30E-06	2.69E-07	5.33E-06	5.60E-06	NE

Table 4. Summary of Maximum Pollutant Emission Rates and Concentrations for the Air Toxic Modeling Analysis For Combustion Turbine and Duct Burner Stacks (Page 3 of 3)

Pollutant	Emission Rate (lb/hr) at 20°F Temperature CT	Emission Rate (lb/hr) at 20°F Temperature DB	Emission Rate (lb/hr) at 100°F Temperature CT	Emission Rate (lb/hr) at 100°F Temperature DB	Averaging Period	Maximum Predicted Concentration ($\mu g/m^3$) 20°F Temperature CT (A)	DB (B)	Total (A+B)	100°F Temperature CT (C)	DB (D)	Total (C+D)	Florida No Threat Level ($\mu g/m^3$)
Selenium	2.31E-02	1.12E-03	1.79E-02	1.07E-03	8-hour	4.75E-03	1.19E-03	5.94E-03	5.73E-03	1.12E-03	6.84E-03	2
					24-hour	2.60E-03	6.89E-04	3.29E-03	3.49E-03	6.53E-04	4.15E-03	0.48
					Annual	4.58E-05	1.59E-05	6.17E-05	2.26E-05	4.62E-05	6.88E-05	NE
Sulfuric Acid Mist	8.12E+00	4.16E-01	6.30E+00	3.99E-01	8-hour	1.67E+00	4.44E-01	2.11E+00	2.02E+00	4.26E-01	2.44E+00	10
					24-hour	9.10E-01	2.56E-01	1.17E+00	1.23E+00	2.46E-01	1.48E+00	2.4
					Annual	1.61E-02	5.90E-03	2.20E-02	7.98E-03	1.77E-02	2.57E-02	NE
Vanadium	6.86E-02	3.31E-03	5.32E-02	3.17E-03	8-hour	1.41E-02	3.54E-03	1.77E-02	1.70E-02	3.32E-03	2.03E-02	0.5
					24-hour	7.72E-03	2.05E-03	9.77E-03	1.04E-02	1.94E-03	1.23E-02	0.12
					Annual	1.36E-04	4.71E-05	1.83E-04	6.72E-05	1.37E-04	2.04E-04	20
Zinc	6.72E-01	3.25E-02	5.21E-01	3.11E-02	8-hour	1.38E-01	3.47E-02	1.73E-01	1.67E-01	3.25E-02	1.99E-01	50
					24-hour	7.57E-02	2.01E-02	9.58E-02	1.02E-01	1.90E-02	1.21E-01	12
					Annual	1.33E-03	4.62E-04	1.80E-03	6.59E-04	1.34E-03	2.00E-03	NE

Note: Impacts for beryllium and sulfuric acid mist were predicted by modeling these pollutants at their actual emission rates. All other impacts presented were derived by using a ratio method based on the impacts predicted for beryllium.

NE = none established.

^a Based on 40 CFR 266, Subpart H, Hazardous Waste Burned in Boilers and Industrial Furnaces, Appendix IV, Reference Air Concentration.

~~John~~
~~Director~~
Path – permit file

Central and South West Services, Inc.

1616 Woodall Rodgers Freeway
P.O. Box 660164 • Dallas, Texas 75266-0164
214-754-1000

January 13, 1993

Mr. Richard D. Garrity, Director
Florida Department of Environmental Regulation
Southwest District
4520 Oak Fair Blvd.
Tampa, FL 33610-7347

Subject: DER File No. AC53-211670 and PSD-FL-187

Dear Richard:

On December 14, 1992, Polk Power Partners, L.P. commenced construction of the Mulberry Cogeneration Project located in Polk County. The EPC contractor will be CSW Development I, Inc., 2250 Hwy 555, Bartow, Florida, 33830, (214) 754-1451.

If you have questions regarding the commencement of construction activities at the site please contact me at (214) 754-1451 or Jim Ellis (Construction Site Manager) at (813) 533-6628.

Sincerely,

Jack Fox

JF/wcm

cc:Clair Fancy, FDER

RECEIVED
JAN 14 1993
Division of Air
Resources Management

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

DEC 16 1992

4APT-AEB

Mr. Clair 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: Polk Power Partners,
Mulberry Cogeneration Project (PSD-FL-187)

Dear Mr. Fancy:

This is to acknowledge receipt of the final determination and Prevention of Significant Deterioration (PSD) permit for the above referenced facility, by your letter dated November 24, 1992. The proposed facility will be an integrated cogeneration facility, producing approximately 120,000 kilowatts net power to the transmission system and approximately 150 tons per day of liquid CO_2. The cogeneration project consists of one General Electric PG 7111EA combustion turbine, with a primary heat recovery steam generator (HRSG), a secondary HRSG, and a steam turbine generator. The CO_2 equipment includes two, 75 ton per day CO_2 recovery units.

Your determination proposes to limit NO_x emissions from the combustion turbine through water injection and dry low-NO_x combustion technology (through 4/30/97), to limit NO_x emissions from the combustion turbine through advanced dry low-NO_x combustion technology, selective catalytic reduction, or an equivalent NO_x control system (after 4/30/97), to limit SO_2 and H_2SO_4 Mist emissions from the combustion turbine through limiting the sulfur content of the No. 2 distillate fuel oil, to limit CO emissions from the combustion turbine and duct burner through efficient combustion, to limit VOC emissions through efficient combustion for the combustion turbine and through a scrubber for CO_2 absorber exhausts, and to limit PM/PM_{10}, Be, and As emissions from the combustion turbine through combustion control and the use of clean fuels.

We have reviewed the package as submitted and have no adverse comments. Thank you for the opportunity to review and comment on this package. If you have any questions or comments, please contact Mr. Scott Davis of my staff at (404) 347-5014.

Sincerely yours,

Brian L. Beals, Chief
Source Evaluation Unit
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

cc: Q. Reynolds
C. Holladay
B. Thomas, SWDIL.
J. Blomquist, NPS
D. Madden, Polk Co.
R. Hawley, NBN