

Check Sheet

Company Name: Ft. Pierce Utilities Authority
Permit Number: ACSB-185836
PSD Number:
County:
Permit Engineer:
Others involved:

Application:

- ☒ Initial Application
- ☒ Incompleteness Letters
- ☒ Responses
- ☐ Final Application (if applicable)
- ☐ Waiver of Department Action
- ☐ Department Response
- ☐ Other

Intent:

- ☒ Intent to Issue
- ☒ Notice to Public
- ☒ Technical Evaluation
- ☒ BACT Determination
- ☒ Unsigned Permit
- ☐ Correspondence with:
 - ☒ EPA
 - ☐ Park Services
 - ☐ County
 - ☐ Other
- ☒ Proof of Publication
- ☐ Petitions - (Related to extensions, hearings, etc.)
- ☐ Other

withdrawn

Final Determination:

- ☐ Final Determination
- ☐ Signed Permit
- ☐ BACT Determination
- ☐ Other

Post Permit Correspondence:

- ☐ Extensions
- ☐ Amendments/Modifications
- ☐ Response from EPA
- ☐ Response from County
- ☐ Response from Park Services
- ☐ Other

File

I N T E R O F F I C E M E M O R A N D U M

Date: 29-Jun-1993 07:56am EST
From: Thomas Tittle WPB
TITTLE T
Dept: Southeast District Office
Tel No: 407/433-2650
SUNCOM: SC 232-2650

TO: Claire Lardner TAL (LARDNER_C)
CC: Preston Lewis TAL (LEWIS_P)
CC: Clair Fancy TAL (FANCY_C)
CC: Isidore Goldman WPB (GOLDMAN_I)
CC: Mark Sittig WPB (SITTIG_M)

Subject: Ft. Pierce Utilities

Fort Pierce Utilities has no standing for an objection to the operation permit any longer. As you recall they objected to the language in their renewal and we made the changes specified in the order. Their original objections did not address the frequency of testing (which is what they are objecting to now) nor fuel analysis in lieu of testing for SO2. We should not allow any extensions for filing (since the last one we are under was not justified either).

When we met with them in our office we made it clear that further modifications would be considered under a normal permit modification application even though they already had their opportunity to make objections to their permit. They have indicated that they are awaiting conclusion of the upcoming tests and results before making their requests for permit modification. Remember that they failed the PM test and then passed upon retesting. If the tests show that they comply with their PM limit for natural gas handily (50% or less of allowable probably), we would look favorably to changing the frequency of testing from "annually" to "prior to renewal" for PM on natural gas.

I N T E R O F F I C E M E M O R A N D U M

Date: 28-Jun-1993 02:15pm EST
From: Preston Lewis TAL
 LEWIS_P
Dept: Air Resources Management
Tel No: 904/488-1344
SUNCOM:

TO: Claire Lardner TAL (LARDNER_C)
CC: Thomas Tittle WPB (TITTLE_T)
CC: Isidore Goldman WPB (GOLDMAN_I)
CC: Mark Sittig WPB (SITTIG_M)
CC: Clair Fancy TAL (FANCY_C)

Subject: Ft Pierce Utilities

In response to to your 6/25/93 memo to Goldman/Fancy/Sittig, Issy tells me that he is waiting on Ft Pierce to provide some replacement test data. I assume that this is a renewal of an **operating** permit and the permit requires testing before renewal.

Tom Tittle is handling this project - SC 232-2650. He is not in today but should be in tomorrow, should you need him. I will be happy to help in CHF's absence.

INTEROFFICE MEMORANDUM

Date: 25-Jun-1993 03:37pm ES
From: Claire Lardner TAL
LARDNER_C
Dept: Office General Counsel
Tel No: 904/488-9730
SUNCOM:

*(407) 433-2650
232-2650
Don Sittig*

TO: Isidore Goldman WPB
TO: Clair Fancy TAL
TO: Mark Sittig WPB

(GOLDMAN_I)
(FANCY_C)
(SITTIG_M)

Subject: ft pierce utilities

*Waiting on
test to
replace a
test*

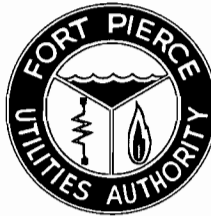
DATE June 25, 1993
RE FORT PIERCE UTILITIES AUTHORITY
DER FILE NO: AO 56-190275

Received second request for extension of time [want until end of
july]
please let me know if this is okay - asap - would like to send out
by tuesday
they say certain terms/conditions are unacceptable - please let me
know what they are

Thanks

Claire

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

August 28, 1990

Florida Department of Environmental Regulation
2600 Blainstone Road
Tallahassee, Florida 32399

Attention: Mr. Barry Andrews

Dear Mr. Andrews:

REFERENCE AIR PERMITS: Unit #6 - AO-56-113534
 Unit #7 - AO-56-112679
 Unit #8 - AO-56-112678
 Unit #9 - AO-56-175955

In accordance with our meeting with you on July 24, 1990 and subsequent discussions, we are submitting six(6) copies of the Prevention of Significant Deterioration (PSD) Application for our H. D. King Unit 9. We have also enclosed one paper copy and one disk copy of the computer modeling runs.

A check in the amount of \$5,000 is enclosed for the required application fee.

If you have any questions regarding the application or supporting data, please feel free to call Mr. Steve Day of Black & Veatch at (913) 339-2880.

Sincerely,

Harry Schindehette, P.E.
Director of Utilities

jbm
Enclosure

cc: Jack Miller
Steve Day
Harry Lamb

M. Harley
C. Halladay
B. Andrews
G. Harper, EPA
J. Brooks, SE Dist

RECEIVED

AUG 31 1990

DER BAQM

1990 AUG 31 AM 8:27
RECEIVED
DER - MAIL ROOM



FORT PIERCE UTILITIES AUTHORITY

CHECK
NUMBER \$
VOID AFTER 90 DAYS

079152

PAY

PAY
EXACTLY 5,000.00 DOLLARS
DATE

63-121
670

AMOUNT

8 28 90 5,000.00

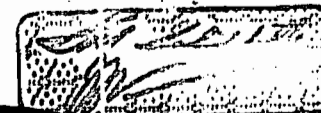
TO THE
ORDER OF



Florida Department of Environmental
Regulation
2600 Blaiirstone Road
Tallahassee, Florida 32399

Sun Bank
Treasure Coast, N.A.
Fort Pierce, Florida

THE UTILITIES REVENUE FUND



DETACH BEFORE DEPOSITING

PURCH. ORDER NO.	INVOICE NO.	AMOUNT	PURCH. ORDER NO.	INVOICE NO.	AMOUNT
Air Permits					

AC 56-185 836
PSD-FL-154

FORT PIERCE UTILITIES AUTHORITY
H. D. KING UNIT 9

PREVENTION OF SIGNIFICANT DETERIORATION
(PSD)

APPLICATION

8/90

8/31/90

Application

#1 add info
#2 add info
#3 add info

9/28/90

11/21/90

1/4/91

Response

10/29/90

12/06/90

1/06/91

B&V PROJECT 16589
AUGUST 1990

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1.0 INTRODUCTION

On May 1, 1990, the Fort Pierce Utilities Authority (FPUA) was issued a permit (AO 56-175955) by the Florida Department of Environmental Regulation (FDER) for the operation of a 31.6 MW combined cycle gas turbine at the H. D. King power plant in Fort Pierce, Florida. This combined cycle system (Unit 9 and 5) consists of a 23.4 MW natural gas fired combustion turbine generator, steam generator, and an 8.2 MW condensing steam turbine. Unit 9 commenced operation in early 1989; the final operating permit was issued in early 1990.

In the Unit 9 construction permit, the operating hours for the existing H. D. King Units 6, 7, and 8 were restricted such that the net increase of all regulated pollutants were below Prevention of Significant Deterioration (PSD) significant emission increases. Therefore, Unit 9 was previously not subject to PSD regulations. Due to increased electricity demands, it is now necessary to remove the operational limitation for Units 6, 7, and 8 that were imposed in the original Unit 9 permit. If the Unit 9 permit operational restrictions on Unit 6, 7, and 8 are removed, then Unit 9 requires repermitting subject to PSD regulations.

*restriction on
operating
hours
removed
by permit
amendment
on 11/9/90*

This report describes the PSD applicability and modeling methodology for air quality permitting of the Unit 9 combined cycle system. The permit methodology assumes that Units 6, 7, and 8 can operate at the levels described in their respective permits (AO-56-113534, AO-56-112679, and AO-56-112678). The purpose of this analysis is to demonstrate that the combustion turbine will not cause or contribute to an exceedance of any national or state ambient air quality standards and will not consume more than the applicable amount of Prevention of Significant Deterioration (PSD) air quality increment. A Workplan which described the proposed methodology to be followed in this analysis was discussed with the appropriate FDER staff on July 24, 1990.

1.0 INTRODUCTION

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2.0 PROJECT DESCRIPTION

The FPUA Project is located in St. Lucie County, Florida, on land currently owned by the FPUA. The land is zoned M-1 and is adjacent to the Indian River. A project site location map is shown in Figure 2-1. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are: 566.8 kilometers (East) and 3,036.3 kilometers (North). The project site arrangement is shown in Figure 2-2.

The combined cycle system includes a 23.4 MW combustion turbine (CT), a steam generator, and an 8.2 MW condensing steam turbine. The CT will burn natural gas as the primary fuel. No. 2 fuel oil (distillate) will only be used as emergency backup fuel. Emergency fuel is defined in Subpart GG, Standard of Performance for Stationary Gas Turbines, 40 CFR 60.331.



Base Map Source: USGS.
Fort Pierce, FL Quadrangle, 1983

PROJECT SITE LOCATION

Figure 2-1

FIGURE 2-2. SITE ARRANGEMENT

2-3

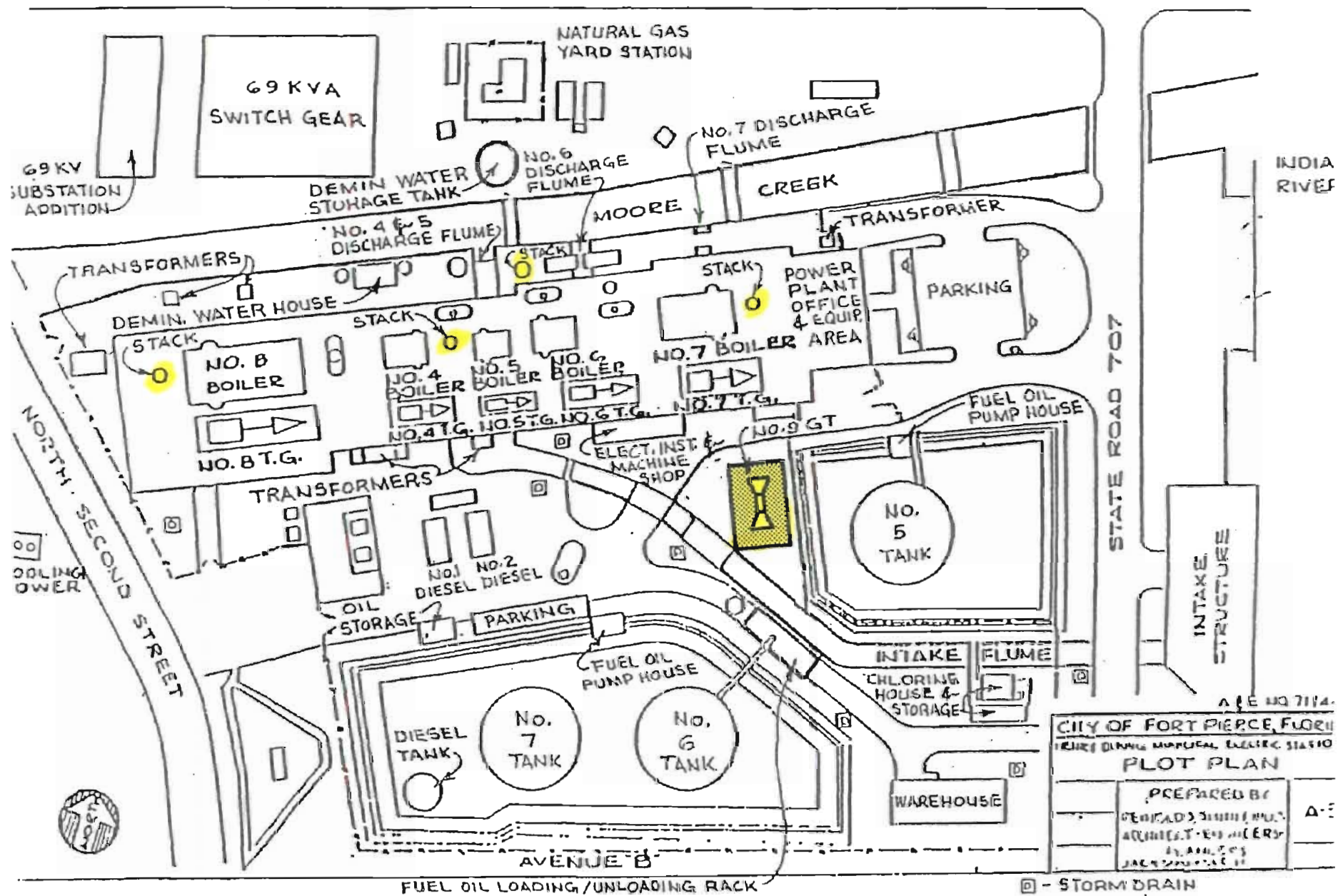
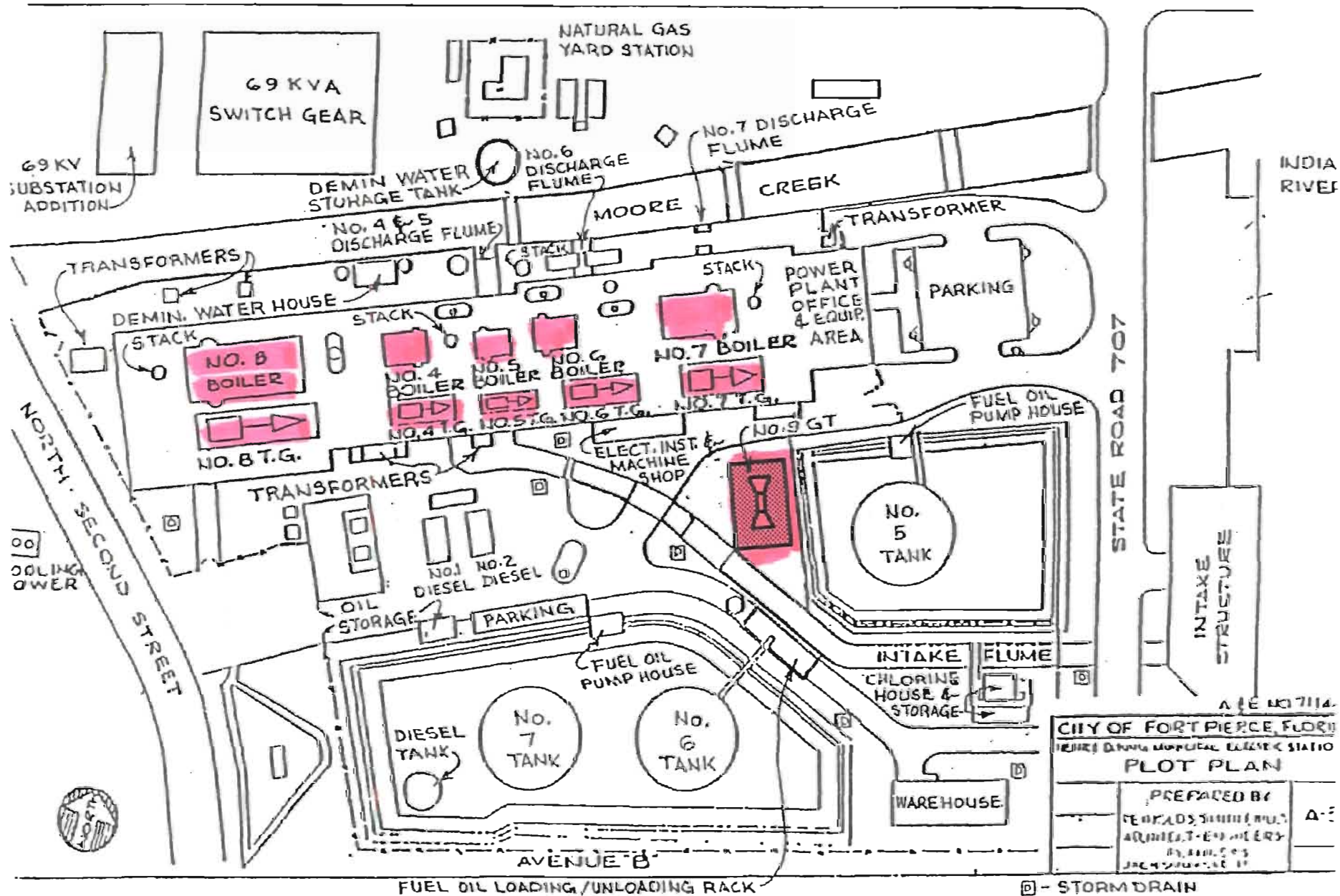


FIGURE 2-2. SITE ARRANGEMENT

2-3



3.0 APPLICABILITY ANALYSIS

For PSD regulations to be applicable, a source must be considered a new major stationary source or a major modification to an existing facility. In addition, the source must be located in an area which is designated as "attainment" or "unclassifiable" for at least one pollutant emitted by the source and regulated under the Clean Air Act. If a source is determined to be subject to PSD regulations, then each regulated pollutant that is emitted in excess of designated "significant emission rates" is subject to additional PSD review. Additional review includes a Best Available Control Technology (BACT) analysis, an Ambient Air Quality Impact Analysis (AAQIA), and additional impacts analysis, as appropriate.

3.1 CURRENT AIR QUALITY STATUS

The project site is located in St. Lucie County. This area is currently designated as attainment or unclassifiable with regard to carbon monoxide (CO), particulate matter (PM₁₀), nitrogen oxides (NO_x), ozone (VOCs) and sulfur dioxide (SO₂).

An area is designated as "attainment" for a pollutant if ambient air quality standards for that pollutant are being met and "nonattainment" if they are not. An area is designated as "unclassifiable" for a pollutant if the attainment status cannot be determined. Unclassifiable areas will be considered in attainment for this PSD analysis.

The nearest nonattainment area is Palm Beach County, which is designated nonattainment for ozone. This area, located over 50 km from the H. D. King site, is not anticipated to be significantly impacted by the proposed project.

3.2 SOURCE APPLICABILITY

A major stationary source is defined as any one of 28 source categories listed in 40 CFR 52.21 which emits, or has the potential to emit, 100 tons per year or more of any regulated pollutant. In addition, any stationary source not listed in 40 CFR 52.21 which emits 250 tons per

year (tpy) or more of any regulated pollutant is also considered a major stationary source. The existing Unit 6, 7, and 8 boilers can be categorized in one of the 28 listed source categories. These boilers emit at least 100 tpy of a criteria pollutant and are thus considered to be a major existing source.

A major modification is defined as any physical or operational change in a major stationary source that would result in a significant net emissions increase of any regulated pollutant. The previous permit for Unit 9 restricted the operational hours of Units 6, 7, and 8 such that the net emission increases were below PSD significant levels. The emission calculations were based on net emission increases from Unit 9 minus the net emission decreases resulting from the operational limitations of Units 6, 7, and 8.

Due to increased energy demands, it is necessary to remove operational restrictions on Units 6, 7, and 8. Therefore, the emission credit can no longer be taken for the contemporaneous decreases in emissions for these units. Thus, the net increases from Unit 9 alone must be compared to the PSD significant emission rates.

The significant emission rates and Unit 9 emissions are given in Table 3-1. The annual emissions are based on Unit 9 operating at maximum load for 8,760 hours per year. The NO_x emissions are based on 42 parts per million on a dry volume basis (ppmvd), referenced to 15 percent oxygen. As shown in the table, Unit 9 emissions of NO_x exceed the PSD significant emission rate. Therefore, the project is considered to be a major modification to an existing major source and is subject to PSD regulations.

3.3 POLLUTANT APPLICABILITY

Once a source is determined to be subject to PSD regulations, each regulated pollutant must be assessed for PSD program applicability. The significant emission rate criteria used to determine source applicability are also used to establish pollutant applicability. Table 3-1 shows that only NO_x has the potential to be emitted at levels above the PSD significant emission rates. Thus, NO_x is subject to further PSD review, including a BACT assessment and an AAQIA.

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(ORIGINAL APPLICATION 87)
 $\frac{8760}{6720} \times 172.5 = 224.9$
 vs. 288.4

TABLE 3-1. SIGNIFICANT AND UNIT 9 ANNUAL EMISSION RATES

<u>Pollutant</u>	<u>Significant Emission Rates</u> tpy	<u>Unit 9 Estimated Annual Emissions^a</u> tpy	<u>Applicable Pollutant</u> Yes/No
Carbon Monoxide (CO)	100	41.6	No
Nitrogen Oxide (NO _x)	40	288.4	Yes
Sulfur Dioxide (SO ₂)	40	0.9	No
Particulate (TSP)	25	11.0	No
Particulate (PM ₁₀)	15	11.0 ^b	No
Ozone (VOC)	40	17.5	No
Lead	0.6	<<0.6	No
Asbestos	0.007	<<0.007	No
Beryllium	0.0004	<<0.0004	No
Mercury	0.1	<<0.1	No
Fluorides	3	<<3	No
Sulfuric Acid Mist	7	0.027	No
Vinyl Chloride	1.0	<<1.0	No
Total Reduced			
Sulfur (TRS)	10	<< 10	No
Reduced Sulfur	10	<< 10	No
Hydrogen Sulfide	10	<< 10	No

^aEmissions are based on 8,760 hours per year of natural gas firing at full load.

^bAssumes all particulate less than 10 microns.

4.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

4.1 INTRODUCTION

The existing Fort Pierce Utilities Authority H. D. King Electric Generating Plant Unit 9 consists of one 23.4 MW General Electric Frame 5 combustion turbine. The combustion turbine is followed by a heat recovery steam generator (HRSG) manufactured by the Henry Vogt Machine Company. Steam from the HRSG is directed to the 8.2 MW Unit 5 steam turbine for repowering.

The primary fuel for the Unit 9 combustion turbine is natural gas. However, distillate fuel oil may be burned as an emergency back-up fuel. Since distillate fuel oil will only be burned during emergencies this Best Available Control Technology analysis will only consider the combustion of natural gas. Section 3.0 concluded that when natural gas is burned for the maximum project operation (8,760 hours per year), the project's nitrogen oxide emissions are subject to the provisions of the PSD program.

The existing operating permit for Unit 9 limits NO_x emissions to New Source Performance Standards for combustion turbines (40 CFR 60 Subpart GG) of 75 parts per million dry volume (ppmdv) at 15 percent oxygen, corrected for fuel nitrogen content and turbine heat rate, or 84 ppmv at 15 percent oxygen, whichever is more stringent. Nitrogen oxide emissions from the existing combustion turbine are controlled by steam injection.

Under the federal Clean Air Act, BACT represents the maximum degree of pollutant reduction determined on a case-by-case basis considering technical, economic, energy, and environmental considerations. However, BACT cannot be less stringent than the emission limits established by any applicable New Source Performance Standards (NSPS).

This BACT analysis follows the general requirements of EPA's draft "top down" BACT guidance document. This approach requires that the BACT analysis start by assuming the use of the Lowest Achievable Emission Rate (LAER) control alternative. Other, less efficient emission control technologies are similarly evaluated when LAER is determined to be unreasonable considering the above factors.

4.2 NITROGEN OXIDES EMISSIONS CONTROL

During combustion, two types of NO_x are formed; fuel NO_x and thermal NO_x . Fuel NO_x emissions are formed through the oxidation of a portion of the nitrogen contained in the fuel. Thermal NO_x emissions are generated through the oxidation of a portion of the nitrogen contained in the combustion air. Nitrogen oxides formation can be limited by lowering combustion temperatures, and staging combustion (a reducing atmosphere followed by an oxidizing atmosphere).

4.2.1 Alternative NO_x Emission Reduction Systems

A review of the Environmental Protection Agency's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations (1985 edition and subsequent supplements) indicates that the lowest NO_x emission limit established to date for a combustion turbine is 4.5 ppmdv (at 15 percent oxygen) for a combustion turbine with a heat recovery steam generator located in California. That permit value was based on the use of water injection into the combustion turbine and a selective catalytic reduction (SCR) system contained within the heat recovery steam generator (combined cycle operation). Therefore, the LAER NO_x emission control alternative for use with combustion turbines is established as water or steam injection followed by an SCR system.

Injection of steam into the Unit 9 turbine combustion chamber is capable of limiting NO_x emissions to 42 ppmdv (at 15 percent oxygen) when burning natural gas. Addition of an SCR system downstream of the Unit 9 combustion turbine has the potential to limit NO_x emissions to 9 ppmdv (at 15 percent oxygen).

In addition to combustion controls and addition of an SCR system, NO_x emissions from other types of combustion sources have also been controlled through installation of selective non-catalytic reduction (SNCR) systems such as Thermal DeNO_x . However, a SNCR system requires gas temperatures of at least 1,500 F for NO_x reduction. The temperature at the outlet of a combustion turbine is too low (950 F to 1,100 F) for such systems. Since raising the flue gas exit temperature to 1,500 F would require supplemental heating of the flue gas, thereby increasing total emissions from increased

fuel usage, this alternative is judged technically unacceptable for application on a combustion turbine.

4.2.1.1 Selective Catalytic Reduction. 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. The SCR process can achieve up to 90 percent reduction of NO_x with a new catalyst. However, an aged catalyst will provide a maximum of between 80 and 85 percent NO_x reduction.

The optimum flue gas temperature range for SCR operation is approximately 650 to 750 F. Flue gas from the combustion turbines will typically be 950 F to 1100 F. Therefore, an SCR would be installed in an intermediate point of the existing heat recovery steam generator boiler where a temperature of approximately 700 F occurs. The existing Unit 9 HRSG does not include adequate space to incorporate an SCR system. For an SCR system to be installed downstream of the Unit 9 combustion turbine it will be necessary to split and expand the existing HRSG.

4.2.1.2 Steam Injection. Use of steam injection in the combustion zones of a combustion turbine can limit the amount of NO_x formed. Existing operation of the Unit 9 combustion turbines uses steam injection. Thermal NO_x formation is avoided due to lower combustion temperatures resulting from the steam injection. The degree of reduction in NO_x formation is somewhat proportional to the amount of steam injected into the turbine.

Since the combustion turbine NSPS was last revised in 1982, combustion turbines have improved their tolerance to the water or steam necessary to control NO_x emissions below the current NSPS level. However, there is still a point at which the amount of water or steam injected into the turbine seriously degrades the turbine's reliability and operational life. With the existing turbine design for Unit 9 this generally occurs below a NO_x emission level of about 42 ppmv (at 15 percent oxygen) when firing natural gas and 65 ppmv when firing distillate oil. These NO_x emission levels can be achieved with little additional cost and without significant impact on reliability or power output over those costs required to comply with the current NSPS.

NESCAUM BACT
9 ppmv NO_x - gas
25 ppmv NO_x - oil

4.2.2 Capital and Operating Costs of Alternatives

Table 4-1 presents the capital and levelized annual cost of installing an SCR system within the existing HRSG. Annual operating costs and NO_x emissions are based on natural gas firing for a maximum of 8,760 hours per year in the turbines.

The differential capital costs for the SCR system include the costs of the ammonia storage/injection system, the catalytic reactors, HRSG modifications and balance of plant equipment. In addition to the 1991 equipment costs of the two alternatives, the total capital costs include a contingency charge, escalation, indirect costs, and interest during construction.

Levelized annual costs include operating personnel, maintenance costs (primarily catalyst replacement), ammonia additive, energy, lost generating capacity and fixed charges on capital investment. The differential energy cost and lost generating capacity for the SCR alternative is the result of the reduced net output of the turbine and the energy requirements of associated equipment. Levelized annual costs are based on the following parameters.

- o Remaining plant life of 25 years.
- o Operator cost of \$45,000 per man-year.
- o Catalyst life of three years.
- o Ammonia cost of \$250 per ton.
- o Energy cost of 70 mills/kwh.
- o Demand cost of \$800 per kw.
- o Escalation rate of 6 percent.
- o Present worth discount rate of 8.0 percent.
- o Levelization factor of 1.75.

The 1993 total capital cost for addition of an SCR system to Unit 9 is \$3.2 million. The levelized annual cost for addition of SCR is \$0.98 million per year. This levelized annual cost results in a removal cost of approximately \$4,500 per ton of NO_x reduction (218 tons per year).

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND LEVELIZED ANNUAL COSTS

	SCR SYSTEM	
	\$1,000	
Capital Costs:		
SCR System	930	
HRSG Modifications	590	- Exclude - Cannot include cost of modification at this point per Dave Andrews.
System Erection	520	
Differential Balance of Plant	70	
1991 Capital Cost	~~2,110~~	1,520
Contingency (15 percent)	~~320~~	228
Direct Capital Cost	~~2,430~~	1,748
Escalation (6 percent)	~~150~~	105
Indirects (16 percent)	~~410~~	296
Interest During Construction (8 percent)	240	172
1993 Total Capital Cost	~~3,230~~	2,321
Levelized Annual Costs*:		
Operating Personnel	60	→
Maintenance	420	→
Ammonia	70	→
Energy	40	→
Lost Generation	40	→
1993 Annual Operating Cost	630	630
Fixed Charges on Capital (13.6 percent)	350	252
1993 Total Annual Cost	980	882
Nitrogen Oxides Emission Rate, ppm _{dv}		
	9	9
Annual NO _x Emission Reduction, tpy		
	218	218
NO _x Emission Reduction Cost, \$/ton		
	4,500	4041

*Annual costs are based on a 100 percent capacity factor.

4.2.3 Other Considerations

Compared to the existing combustion turbine with steam injection, the energy requirements of the SCR system would reduce the output of the combustion turbines by approximately one percent.

The use of an SCR system could result in a negative environmental impact due to the release of quantities of unreacted ammonia to the atmosphere. Ammonia and a number of amine compounds are recognized hazardous air pollutants. This represents a potential adverse human health effect, since prolonged exposure to these compounds can increase chances of contracting a number of debilitating diseases. Although ammonia emissions are not regulated nationally, a number of sources are limited to ammonia emissions as low as 10 ppm. Unreacted ammonia emissions from an SCR system could average 7 to 10 ppm, and could create objectionable odor and health hazards.

Ammonia is also a hazardous material. Accordingly, this material must be handled and stored with extreme care. Additionally, some catalytic elements are toxic, and because they have to be replaced periodically, hazardous waste disposal procedures may be necessary.

4.2.4 Conclusions

Installation of an SCR system on Unit 9 designed to meet a NO_x emission limitation of 9 ppmdv would cost Fort Pierce Utilities Authority approximately \$3.3 million. Addition of an SCR system increases total levelized annual costs for the project by \$1.01 million resulting in a removal cost of \$4,640 per ton of NO_x removed while burning natural gas (8760 hrs/yr). The use of SCR would reduce the effective output of the turbine generator by approximately one percent. In addition, the use of an SCR system could result in adverse environmental effects due to unreacted ammonia being released to the atmosphere causing a potential human health hazard. Project emissions of 42 ppmdv do not result in any violation of ambient air quality standards. Therefore, based on economic, energy, and environmental considerations, NO_x BACT proposed for this combustion turbine facility is the use of steam injection to achieve NO_x emissions of 42 ppmdv

COULD HAVE
COST LESS IF
PROVISIONS HAD BEEN
MADE IN HRSG!
COULD HAVE
BEEN
\$4000
/TON

DOUBTFUL ON THE
HEALTH HAZARD.

THE CHEMICAL INDUSTRY
ROUTINELY HANDLES
NH₃.

(at 15 percent oxygen) when burning natural gas. Additionally, it is recommended that during emergency situations where distillate oil must be used NO_x emissions be limited to 65 ppmv (at 15 percent oxygen) through the use of steam injection.

5.0 MODELING METHODOLOGY

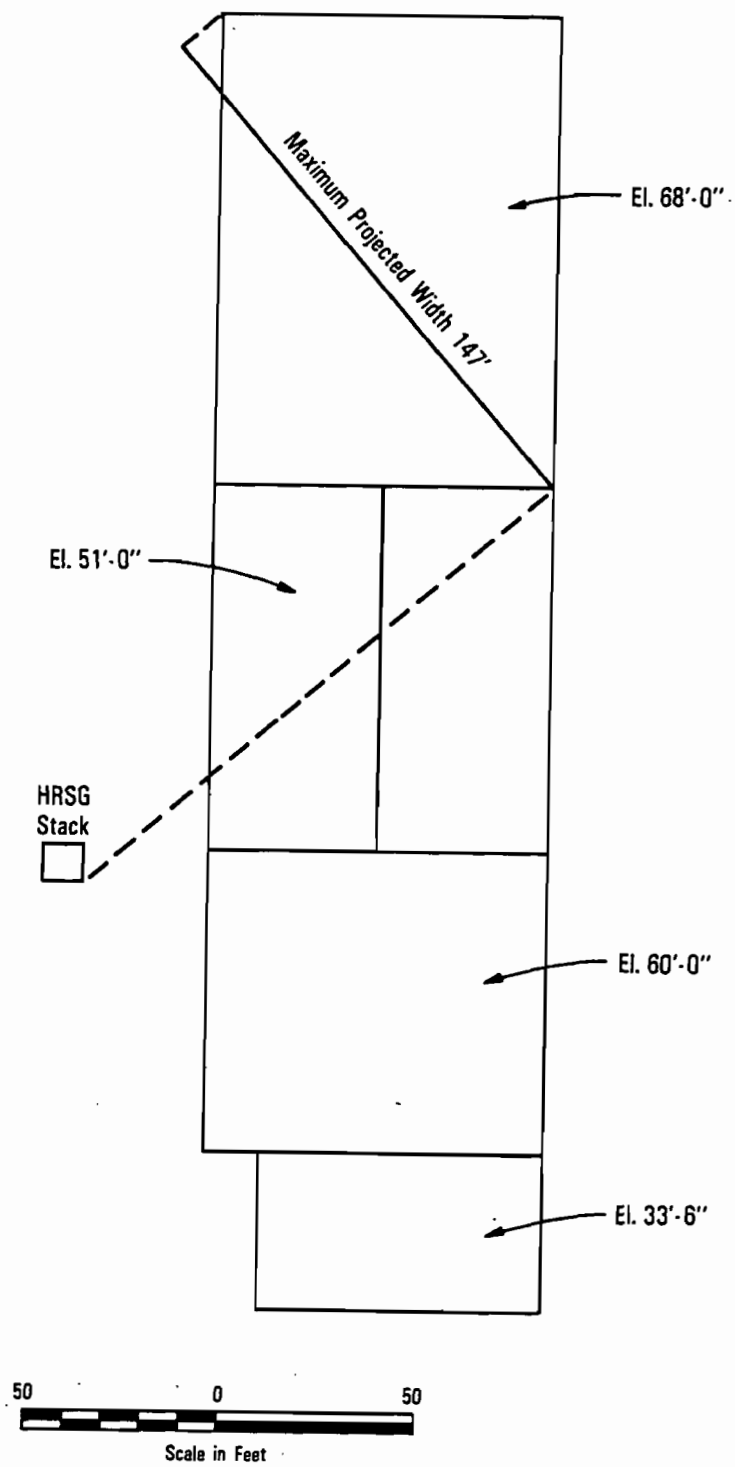
This section describes the modeling methodology for determining the ambient air quality impacts for Unit 9. The methodology is based on FDER and EPA guidelines and used EPA approved dispersion models. The dispersion models have been revised to include the most recent changes associated with EPA dispersion modeling guidelines. The modeling methodology includes a discussion of the GEP stack height, source data, appropriate dispersion models, receptor locations, meteorological data, and the definition of modeling assumptions used in the preliminary modeling analysis.

The air quality modeling output files supporting the PSD Permit Application will be submitted to the FDER on diskette and as hardcopy.

5.1 GEP STACK HEIGHT DETERMINATION

A Good Engineering Practice (GEP) stack height is defined as the height at which emissions are not significantly influenced by building downwash. The GEP stack height is calculated as the height of a nearby building plus 1.5 times the lesser of the building height or maximum projected width. A nearby building is defined as one which is located within five times the lesser of its height or maximum projected width from the stack. The resultant GEP stack height is the highest calculated stack height based on all influencing building dimensions.

Emissions from the Unit 9 stack will be influenced by the structures associated with the existing H. D. King facility. The building dimensions and GEP determination are shown in Figure 5-1. The GEP stack height of 170 feet is based on the steam turbine building height of 68 feet, and a maximum projected width that exceeds the height. The bypass and HRSG stacks for Unit 9 are constructed at 60 feet. Because the stack height is less than the calculated GEP height, the effect of building downwash on pollutant dispersion will be incorporated in the modeling analysis. In fact, since the stack height is less than the dominant building height, direction-specific building heights and widths must be used in the refined modeling analysis. Appendix A shows the output of Trinity Consultant's "BRZWAKE" program, which was used to determine direction-specific building dimensions.



GEP STACK HEIGHT DETERMINATION

Figure 5-1

5.2 PROPOSED SOURCE DATA

Unit 9 will fire natural gas as the primary fuel with distillate used as emergency backup fuel. Modeling was based on natural gas firing assuming 8,760 hours of operation per year at maximum design capacity. Unlike steam generating plants, gas turbines typically operate at maximum (100 percent) load and generally do not operate at reduced load conditions.

The bypass stack will operate only when the HRSG is being serviced. The flue gas exiting the bypass stack is hotter than the HRSG flue gas. Increased thermal buoyancy associated with the bypass stack will enhance plume rise and subsequent dispersion. Thus, impacts from the bypass stack are expected to be less than those from HRSG operation. Therefore, only impacts from HRSG operation were modeled in this analysis.

Modeling parameters for Unit 9 operating in combined cycle and firing natural gas are given in Table 5-1.

5.3 MODEL SELECTION AND DESCRIPTION

For most air quality modeling assessments, it is desirable to use both screening-level and refined dispersion modeling techniques. In this analysis, screening-level modeling was used to determine impacts in the building cavity region. Refined dispersion modeling was used to identify the maximum ambient pollutant impacts, the location of those impacts, and the area which will be significantly impacted by the source.

5.3.1 Screening Modeling

The EPA approved "Screen" model was used to determine the impacts in the building cavity region. This model assumes worst case meteorological conditions to predict maximum 1-hour pollutant impacts. If the cavity region is on FPUA property, then the cavity impacts need not be considered. However, if the cavity region extends beyond the property boundary, then the impacts must be considered in the AAQIA.

5.3.2 Refined Modeling

In order to assess the Unit 9 impacts, the modeling analyses incorporated simple terrain, rural land use, calculation of short-term and annual impacts, and building downwash effects. EPA guideline documents

PREVIOUS PERMIT
EST. HOURLY EMISSIONS

SO ₂	NO _x	CO	PM	VOC
0.2	51.3	32.9	4.0	3.6

TRY DIFF
BETWEEN PRESENT PROPOSAL & PREVIOUS PERMIT TURBINE EMISSION

SO ₂ + 0.3
NO _x + 116.1
CO - 68.8
PM - 2.5
VOC + 5.4

P. 5-4 HOURLY EMISSIONS ALL BASED ON AP-42

MW 31.6 Combined Cycle

MW 23.4 Turbine

AP-42:

SO ₂	NO _x	CO	PM	VOC
0.2 - 1.2	15.12	42.1	15.1	15.4

NATURAL GAS = (GAS GRAV.) (P_{AIR}) = (0.605) (0.0765 $\frac{lb}{ft^3}$) = 0.0463 $\frac{lb}{ft^3}$
PIPELINE CONTRACTS SELDOM SPECIFY MAXIMUM H₂S AND SULFUR
LIMITS ABOVE 0.1 $\frac{gr}{100 ft^3}$ & 1.0 $\frac{gr}{100 ft^3}$, RESPECTIVELY. SULFUR

CONCENTRATION COULD BE AS HIGH AS $\frac{940 gr}{10^6 ft^3} + \frac{10,000 gr}{10^6 ft^3} = \frac{10,940 gr}{10^6 ft^3}$

$$\frac{340 \frac{MMBtu}{hr}}{929.6 \frac{Btu}{ft^3}} = 0.366 \frac{MMBtu}{ft^3} \left(\frac{2000 \frac{gr}{ft^3}}{1000000 \frac{ft^3}{ft^3}} \right) \left(\frac{1}{7000 \frac{gr}{lb}} \right) \left(\frac{1}{0.0463 \frac{lb}{ft^3}} \right) (100) = 0.0066\%$$

$$SO_2 = (940 \times 0.0066) = 0.564 \frac{lb}{1,000,000 ft^3}$$

$$\left(\frac{10,940 gr}{1,000,000 ft^3} \times \frac{1}{7000 \frac{gr}{lb}} \right) \left(\frac{1}{0.0463 \frac{lb}{ft^3}} \right) (100) = 0.0034\%$$

$$SO_2 = (940 \times 0.0034) = 3.173 \frac{lb}{1,000,000 ft^3}$$

TABLE 5-1. SOURCE DATA FOR THE UNIT 9 COMBUSTION TURBINE FIRING
NATURAL GAS

<u>Model Parameters</u>	<u>Unit 9</u>
Stack Height, feet	60
Stack Exit Diameter, feet	11.2
Stack Flow Volume, acfm	418,540
Stack Exit Velocity, fpm	4,271
Stack Exit Temperature, F	491
Ambient Temperature, F	20
<u>Emissions*</u>	
SO ₂ emissions, lb/h	0.2**
NO _x emissions, lb/h	65.9***
CO emissions, lb/h	9.5
TSP/PM ₁₀ emissions, lb/h	2.5
VOC emissions, lb/h	4
<u>Model Coordinates, km</u>	
(East - x)	0
(North - y)	0
<u>Source Coordinates, km</u>	
(East - x)	566.8
(North - y)	3036.3

70°
SHOULD BE 80°F

NEED EXPLANATION OF
HOW EMISSIONS IN-
CONSISTENT WITH
PREVIOUS PERMIT ARRIVED
AT.

*Emissions based on manufacturer's performance estimates with natural gas firing.

**The SO₂ emission rate is based on a sulfur content of 2,000 grains of sulfur per million cubic feet of natural gas (AP-42), a heat content of 929.6 Btu/ft³, and a heat input of 340 MBtu/h.

***The NO_x emission rate is based on 42 ppmvd referenced to 15 percent oxygen.

recommend that the Industrial Source Complex Short-Term (ISCST) dispersion model be used for these modeling situations. EPA has issued guidelines to assist in determining what model options should be used. The following assumptions were made for the modeling analyses:

- o The site was considered rural based on actual land use within 3 km.
- o Standard EPA default modeling options were applied.
- o Terrain elevations were not used.
- o Schulman-Scire building downwash with direction-specific building heights and widths were considered.
- o The highest modeled concentrations were used to represent the annual impacts.

Preliminary modeling (see Section 6.0) for determining the Unit 9 significant impact areas and maximum impacts was based on a nominal emissions rate (1 g/s) and a ratio of actual pollutant emissions. That is, individual pollutant impacts were determined by multiplying the nominal impacts by the actual pollutant emission rates (g/s).

5.4 RECEPTOR LOCATIONS

Initial modeling for the Unit 9 stack was performed with receptors placed along the 36 standard radial directions surrounding the Unit 9 stack at the following downwind distances: 100 meter intervals from 100 to 1,000 meters, 250 meter intervals from 1,250 to 3,000 meters, and 1,000 meter intervals from 4,000 to 10,000 meters. Furthermore, discrete receptors were placed at the boundaries that restrict public access along the 36 radial directions.

5.5 METEOROLOGICAL DATA

Five consecutive years of meteorological data from a nearby National Weather Service station can be considered to be representative of the dispersion patterns at the site. Specifically, West Palm Beach surface and upper air data for the period 1982 through 1986 were obtained from the FDER and were used for the analysis.

6.0 AIR QUALITY IMPACT ANALYSES

6.1 CAVITY ANALYSIS

The "Screen" model cavity analysis showed that the cavity region extends 33 meters downwind from the source. Since this distance is well within the facility property boundary, cavity impacts were not considered in the ambient impact analysis.

6.2 PRELIMINARY MODELING

Unit 9 was modeled with ISCST and the five years of meteorological data. The modeling was based on the stack parameters and modeling assumptions given in Section 5.0. The results of the modeling were used to determine if a pollutant's impact exceeds PSD significant impact levels, determine whether preconstruction monitoring is required, and establish pollutant significant impact areas.

The results of the preliminary modeling are given in Table 6-1. As demonstrated in Section 3-2, it was only necessary to model NO_x . As shown, the annual NO_x impact (9.6 ug/m^3) is predicted to exceed the PSD significant impact level (1 ug/m^3) but not the monitoring threshold (14 ug/m^3). The maximum impact for each year occurred along the plant boundary. Since the annual NO_x impact exceeds the significance level, interacting source modeling must be performed.

For each applicable pollutant, the extent of the significant impact area must be defined. The radii of significant impact is determined by extending the receptor array outward until the predicted pollutant concentration at a receptor distance is less than the appropriate significance level. The highest modeled annual concentrations were used to determine the significant impact area.

The significant impact area for NO_x was found to extend only 300 meters from the HRSG stack. This radius is small because of the extreme downwash associated with the nearby H. D. King structures.

TABLE 6-1. RESULTS OF THE PRELIMINARY MODELING ANALYSIS

	Unit 9
	NO _x
	Annual
	<u>Impact</u>
Significant Impact Criteria	1 ug/m3
Monitoring Criteria	14 ug/m3
Maximum Impact*	9.6 ug/m3
Location	
Distance	0.88 km
Direction	260 deg
Year	1984

* Maximum nominal impacts for 1 g/s are 1.15697 ug/m³ (annual).

6.3 POTENTIAL INTERACTING SOURCES

Since the annual NO_x impact is greater than the PSD significant impact criteria, potential interacting sources must be assessed. The FDER provided copies of the Air Pollution Information System Master Detail Report ("the inventory") for St. Lucie, Indian River, and Martin counties. All sources in these counties that satisfied one of the following conditions were considered potential interacting sources.

- o All sources within the Unit 9 NO_x significant impact area (300 meters).
- o All sources within 50 kilometers of Unit 9 which have annual NO_x emissions greater than 100 tons per year and show a significant impact in the Unit 9 significant impact area.
- o All sources within 10 kilometers of Unit 9 which have annual NO_x emissions greater than 1 ton per year and show a significant impact in the Unit 9 significant impact area.

From the inventory, it is apparent that the only NO_x sources within the 300 meter significant impact area are associated with the FPUA H.D. King power plant. Consequently, the H.D. King Unit 6, 7, and 8 boilers were used in the National Ambient Air Quality Standards (NAAQS) interacting source modeling. However, since the inventory does not indicate that these sources are subject to PSD regulations, they were not used in the PSD increment modeling. The source parameters for these boilers were extracted from the inventory and are listed in Table 6-2.

All 100 ton per year sources within 50 kilometers and 1 ton per year sources within 10 kilometers were extracted from the inventory and are listed below by facility.

- o City of Vero Beach Steam Power Plant
- o Tropicana Products
- o Fort Pierce Lawnwood Regional Medical Center
- o Minton Sun Citrus Processing Plant
- o Fort Pierce Contracting Corporation Asphalt Plant

These facilities were modeled using ISCST and the source parameters listed in the inventory to determine if the significant impact level was exceeded at the FPUA facility. Where possible, the maximum allowable

IT APPEARS THAT
PREVIOUS PERMIT
MAY BE INTERPRETED
TO CONSIDER 6, 7, 8,
~~2, 3~~ IN PSD
MODELING.

TABLE 6-2. NAAQS INTERACTING SOURCES

<u>Parameter^a</u>	<u>FPUA Unit 6</u>	<u>FPUA Unit 7</u>	<u>FPUA Unit 8</u>
East Coordinate ^b (m):	-18.6	6.7	-68.0
North Coordinate ^b (m):	36.3	33.8	18.3
Volumetric Flow (acfm)	42,735	83,333	125,847
Stack Exit Diameter (ft)	5	7.1	8.0
Stack Exit Velocity (fps)	36.3	35.1	41.7
Stack Height (ft)	148	128	150
Exit Temperature (F)	325	253	275
NO _x Emission Rate ^c (lb/h)	1.3	104.4	173.2

^aSource parameters extracted from FDER source inventory.

^bStack coordinates relative to FPUA Unit 9 stack.

^cHourly emission rates as stated in FPUA Unit 9 permit.

278.9
4.35
7800900

pounds per hour NO_x emission rate was used in the modeling. However, since the allowable emission rate was not listed in the inventory, the actual NO_x emission rate was used for the Tropicana and Fort Pierce Contracting Corporation sources. The modeling showed that the highest annual NO_x impact from these facilities was 0.08 ug/m^3 . Since this impact is well below the PSD significance level of 1.0 ug/m^3 , these sources were not included in the NAAQS or PSD increment modeling.

6.4 PSD INCREMENT ANALYSIS

PSD regulations were promulgated as a result of the 1977 Clean Air Act Amendments to ensure that air quality in defined areas does not significantly deteriorate or exceed NAAQS while providing a margin for future growth. Currently SO_2 , NO_x , and TSP are regulated by the PSD program. The EPA is currently proposing PSD regulations for PM_{10} .

The proposed site is located in a PSD Class II area. Since Unit 9 has significant ambient impacts for NO_x , compliance with the NO_x Class II PSD increment (25 ug/m^3) must be demonstrated. As stated in Section 6.3, only the FPUA sources have the potential to significantly interact with Unit 9 impacts. These sources are not considered PSD increment consuming sources. Thus, only the Unit 9 impact was compared to the PSD Class II NO_x increment. As shown in Table 6-1, the Unit 9 annual NO_x impact is 9.6 ug/m^3 , which is 38.4 percent of the available PSD Class II increment. Consequently, the addition of Unit 9 does not cause an exceedance of PSD Class II increments.

The nearest mandatory PSD Class I area is the Everglades National Park, located approximately 150 kilometers south-southwest of the site. A Class I analysis was not necessary because this area is more than 100 km from the site.

6.5 NAAQS ANALYSIS

To predict the total impact on ambient air quality, a refined air quality assessment must be performed for applicable pollutants. This analysis must show compliance with the applicable NAAQS.

The NAAQS concentration was determined by adding the Unit 9 and additional source impacts to a representative background level. To show compliance with NAAQS, the combined NO_x annual impacts must be less than 100 ug/m³. Identification of interacting NO_x sources for use in demonstrating NAAQS compliance was performed as described in Section 6.3. A representative NO_x background concentration of 24 ug/m³ was obtained from the FDER. This value represents the annual arithmetic mean measured at the West Palm Beach monitor in 1989. Data from the West Palm Beach monitor are considered conservatively high since West Palm Beach is significantly more urbanized than Fort Pierce.

NAAQS modeling was performed following the modeling methodology described in Section 5.0. FPUA Units 6, 7, and 8 were included as the only significant interacting sources. Table 6-3 shows the results of the NAAQS modeling. The maximum combined source impact was 11.3 ug/m³, which occurred along the property boundary. This value was added to the 24 ug/m³ background value to get a total concentration of 35.3 ug/m³. This value is only 35.3 percent of the annual NO_x standard. Consequently, the Unit 9 annual NO_x impacts do not exceed the NAAQS.

TABLE 6-3. NAAQS MODELING RESULTS

	NAAQS Modeling <u>Summary</u>
Maximum Impact Location	
Distance	0.88 km
Direction	260 deg
Meteorological Year	1984
Combined Source	
Maximum Impact	11.3 ug/m3
Background Concentration	24 ug/m3
Total Concentration (Combined Maximum Impact plus Background)	35.3 ug/m3
NAAQS Primary NO _x Standard	100 ug/m3
Percent of Standard	35.3 percent

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 VISIBILITY

The nearest PSD Class I area is the Everglades National Park. The Everglades National Park is located approximately 150 kilometers south-southwest of the project site. Since this area is not within 100 kilometers of the plant site, no visibility assessment is considered necessary.

7.2 SOILS AND VEGETATION

Ambient air quality standards have been established to protect public health and welfare from any adverse effect of air pollutants. It is not expected that the estimated effects of the proposed project will significantly add to the background pollutant concentrations. Therefore, no adverse effects on soils and terrestrial vegetation is expected.

7.3 GROWTH

The operation of the Unit 9 combustion turbine at the H. D. King Power Plant is not expected to induce any secondary growth in the surrounding area.

IS THIS ADEQUATE?

APPENDIX A

DIRECTION-SPECIFIC BUILDING ANALYSIS

RBRZWAKE

IBM-PC VERSION (2.0)

(C) COPYRIGHT 1989, TRINITY CONSULTANTS, INC.

SERIAL NUMBER 6440 SOLD TO BLACK & VEATCH CONSULTING ENG

RUN NAME: FPHD

RUN BEGAN ON 08-09-90 AT 16:53:32

NUMBER OF SOURCES = 4

THE FOLLOWING OPTIONS HAVE BEEN CHOSEN:

CALCULATIONS ARE MADE FOR THE ISCST MODEL.

ALL STACKS MUST BE WITHIN 5L TO BE CONSIDERED FOR DIRECTION SPECIFIC DOWNWASH.

DOWNWASH IS CALCULATED IN 36 RADIAL DIRECTIONS.

BUILDINGS ARE COMBINED REPEATEDLY.

ALGORITHMS:

0 = NO DOWNWASH
1 = HUBER-SNYDER DOWNWASH
2 = SCHULMAN-SCIRE DOWNWASH

INPUT BUILDINGS

DESCRIPTION	BLDG #	BLDG HT(M)	# OF CORNERS	X(M)	Y(M)
F.O. TANK 5	1	13.23	10	39.12	1.51
				42.72	-3.44
				42.72	-9.56
				39.12	-14.51
				33.30	-16.40
				27.48	-14.51
				23.88	-9.56
				23.88	-3.44
				27.48	1.51
				33.30	3.40
F.O. TANK 6	2	12.93	10	9.72	-47.69
				13.32	-52.64
				13.32	-58.76
				9.72	-63.71
				3.90	-65.60
				-1.92	-63.71
				-5.52	-58.76
				-5.52	-52.64
				-1.92	-47.69
				3.90	-45.80
F.O. TANK 7	3	13.92	10	-18.91	-46.94
				-15.02	-52.29
				-15.02	-58.91
				-18.91	-64.26
				-25.20	-66.30
				-31.49	-64.26
				-35.38	-58.91
				-35.38	-52.29
				-31.49	-46.94
				-25.20	-44.90
GEN BUILD 68 FT	4	20.73	4	-33.53	4.88
				-38.71	30.48
				-74.68	22.86
				-69.49	-2.74
GEN BUILD 60 FT	5	18.29	4	17.37	15.54
				12.19	41.15
				-10.67	36.58
				-5.79	10.67
GEN BUILD 51 FT	6	15.54	4	-5.79	10.67
				-10.67	36.58
				-38.71	30.48
				-33.53	4.88
GEN BUILD 33.5 FT	7	10.21	4	28.65	22.86
				24.38	43.89
				12.19	41.15
				16.76	19.81

COMBINED BUILDINGS

STRUCTURE 1 HAS A HEIGHT 20.73 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 4: GEN BUILD 68 FT

STRUCTURE 2 HAS A HEIGHT 18.29 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 5: GEN BUILD 60 FT

STRUCTURE 3 HAS A HEIGHT 15.54 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 4: GEN BUILD 68 FT
BUILDING # 5: GEN BUILD 60 FT
BUILDING # 6: GEN BUILD 51 FT

STRUCTURE 4 HAS A HEIGHT 13.92 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 3: F.O. TANK 7

STRUCTURE 5 HAS A HEIGHT 13.23 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 1: F.O. TANK 5
BUILDING # 4: GEN BUILD 68 FT
BUILDING # 5: GEN BUILD 60 FT
BUILDING # 6: GEN BUILD 51 FT

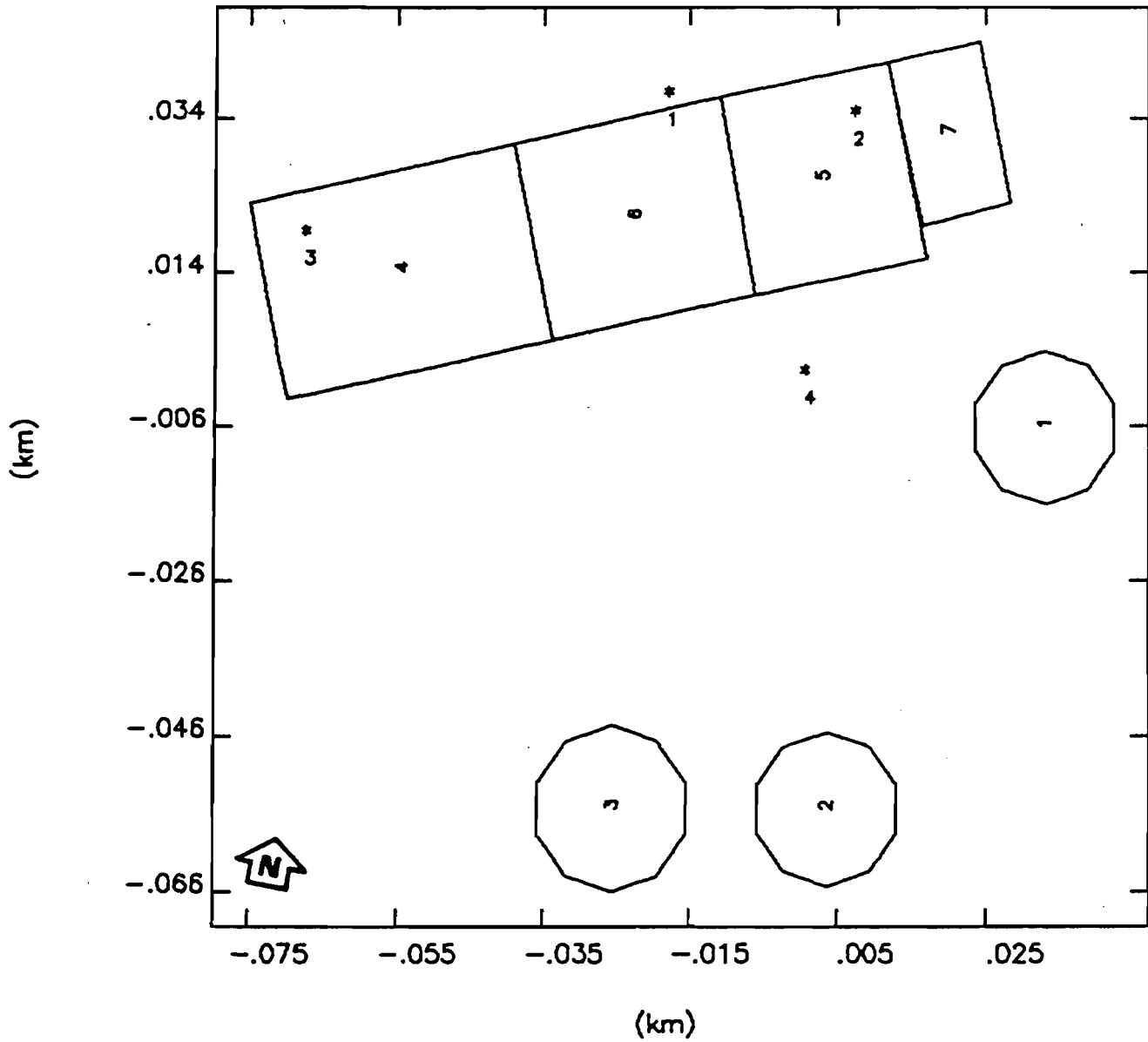
STRUCTURE 6 HAS A HEIGHT 12.93 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 2: F.O. TANK 6
BUILDING # 3: F.O. TANK 7

STRUCTURE 7 HAS A HEIGHT 10.21 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 1: F.O. TANK 5
BUILDING # 4: GEN BUILD 68 FT
BUILDING # 5: GEN BUILD 60 FT
BUILDING # 6: GEN BUILD 51 FT
BUILDING # 7: GEN BUILD 33.5 FT

INPUT STACKS

STACK ID #	STACK #	STACK HT(M)	X(M)	Y(M)
1	1	45.11	-18.60	36.30
2	2	39.01	6.70	33.80
3	3	45.72	-68.00	18.30
4	4	18.29	.00	.00

FORT PIERCE PLANT SITE



STACK ID # 1, STACK # 1

THE DOMINANT STRUCTURE WITHIN 5L IS

STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH

DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	1	20.73	43.65	51.81	1
20	1	20.73	44.82	51.81	1
30	1	20.73	44.63	51.81	1
40	1	20.73	43.08	51.81	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	1	20.73	38.06	51.81	1
110	2	18.29	34.79	45.72	1
120	2	18.29	35.39	45.72	1
130	2	18.29	34.91	45.72	1
140	2	18.29	33.37	45.72	1
150	2	18.29	30.81	45.72	1
160	2	18.29	27.32	45.72	1
170	2	18.29	23.96	45.72	1
180	2	18.29	28.04	45.72	1
190	1	20.73	43.65	51.81	1
200	1	20.73	44.82	51.81	1
210	1	20.73	44.63	51.81	1
220	1	20.73	43.08	51.81	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	1	20.73	30.97	51.81	1
260	1	20.73	27.37	51.81	1
270	1	20.73	33.22	51.81	1
280	1	20.73	38.06	51.81	1
290	2	18.29	34.79	45.72	1
300	2	18.29	35.39	45.72	1
310	2	18.29	34.91	45.72	1
320	2	18.29	33.37	45.72	1
330	2	18.29	30.81	45.72	1
340	2	18.29	27.32	45.72	1
350	2	18.29	23.96	45.72	1
360	2	18.29	28.04	45.72	1

STACK ID # 2, STACK # 2

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	2	18.29	31.27	45.72	1
20	2	18.29	33.55	45.72	1
30	2	18.29	34.80	45.72	1
40	2	18.29	35.00	45.72	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	2	18.29	33.14	45.72	1
110	2	18.29	34.79	45.72	1
120	2	18.29	35.39	45.72	1
130	2	18.29	34.91	45.72	1
140	2	18.29	33.37	45.72	1
150	2	18.29	30.81	45.72	1
160	2	18.29	27.32	45.72	1
170	2	18.29	23.96	45.72	1
180	2	18.29	28.04	45.72	1
190	2	18.29	31.27	45.72	1
200	2	18.29	33.55	45.72	1
210	2	18.29	34.80	45.72	1
220	2	18.29	35.00	45.72	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	2	18.29	29.36	45.72	1
260	2	18.29	26.89	45.72	1
270	1	20.73	33.22	51.81	1
280	2	18.29	33.14	45.72	1
290	2	18.29	34.79	45.72	1
300	2	18.29	35.39	45.72	1
310	2	18.29	34.91	45.72	1
320	2	18.29	33.37	45.72	1
330	2	18.29	30.81	45.72	1
340	2	18.29	27.32	45.72	1
350	2	18.29	23.96	45.72	1
360	2	18.29	28.04	45.72	1

STACK ID # 3, STACK # 3

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 BEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	BEP	ALGORITHM
10	1	20.73	43.65	51.81	1
20	1	20.73	44.82	51.81	1
30	1	20.73	44.63	51.81	1
40	1	20.73	43.08	51.81	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	1	20.73	38.06	51.81	1
110	1	20.73	41.74	51.81	1
120	1	20.73	44.16	51.81	1
130	1	20.73	45.23	51.81	1
140	1	20.73	44.93	51.81	1
150	1	20.73	43.27	51.81	1
160	1	20.73	40.29	51.81	1
170	1	20.73	37.40	51.81	1
180	1	20.73	41.15	51.81	1
190	1	20.73	43.65	51.81	1
200	1	20.73	44.82	51.81	1
210	1	20.73	44.63	51.81	1
220	1	20.73	43.08	51.81	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	1	20.73	30.97	51.81	1
260	1	20.73	27.37	51.81	1
270	1	20.73	33.22	51.81	1
280	1	20.73	38.06	51.81	1
290	1	20.73	41.74	51.81	1
300	1	20.73	44.16	51.81	1
310	1	20.73	45.23	51.81	1
320	1	20.73	44.93	51.81	1
330	1	20.73	43.27	51.81	1
340	1	20.73	40.29	51.81	1
350	1	20.73	37.40	51.81	1
360	1	20.73	41.15	51.81	1

STACK ID # 4, STACK # 4

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	2	18.29	31.27	45.72	2
20	2	18.29	33.55	45.72	2
30	2	18.29	34.80	45.72	2
40	2	18.29	35.00	45.72	2
50	2	18.29	34.14	45.72	2
60	2	18.29	32.24	45.72	2
70	2	18.29	29.36	45.72	2
80	1	20.73	27.37	51.81	2
90	1	20.73	33.22	51.81	2
100	1	20.73	38.06	51.81	2
110	1	20.73	41.74	51.81	2
120	1	20.73	44.16	51.81	2
130	1	20.73	45.23	51.81	2
140	1	20.73	44.93	51.81	2
150	2	18.29	30.81	45.72	2
160	2	18.29	27.32	45.72	2
170	2	18.29	23.96	45.72	2
180	2	18.29	28.04	45.72	2
190	2	18.29	31.27	45.72	2
200	2	18.29	33.55	45.72	2
210	2	18.29	34.80	45.72	2
220	2	18.29	35.00	45.72	2
230	2	18.29	34.14	45.72	2
240	2	18.29	32.24	45.72	2
250	2	18.29	29.36	45.72	2
260	1	20.73	27.37	51.81	2
270	1	20.73	33.22	51.81	2
280	1	20.73	38.06	51.81	2
290	1	20.73	41.74	51.81	2
300	1	20.73	44.16	51.81	2
310	1	20.73	45.23	51.81	2
320	1	20.73	44.93	51.81	2
330	2	18.29	30.81	45.72	2
340	2	18.29	27.32	45.72	2
350	2	18.29	23.96	45.72	2
360	2	18.29	28.04	45.72	2

STACK # 1

STACK ID: 1, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 18.29 18.29
 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 43.65 44.82 44.63 43.08 40.22 36.15 30.97 27.37 33.22 38.06 34.79 35.39
 34.91 33.37 30.81 27.32 23.96 28.04 43.65 44.82 44.63 43.08 40.22 36.15
 30.97 27.37 33.22 38.06 34.79 35.39 34.91 33.37 30.81 27.32 23.96 28.04

STACK # 2

STACK ID: 2, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
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 34.91 33.37 30.81 27.32 23.96 28.04 31.27 33.55 34.80 35.00 40.22 36.15
 29.36 26.89 33.22 33.14 34.79 35.39 34.91 33.37 30.81 27.32 23.96 28.04

STACK # 3

STACK ID: 3, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
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 43.65 44.82 44.63 43.08 40.22 36.15 30.97 27.37 33.22 38.06 41.74 44.16
 45.23 44.93 43.27 40.29 37.40 41.15 43.65 44.82 44.63 43.08 40.22 36.15
 30.97 27.37 33.22 38.06 41.74 44.16 45.23 44.93 43.27 40.29 37.40 41.15

STACK # 4

STACK ID: 4, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 18.29 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73
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 31.27 33.55 34.80 35.00 34.14 32.24 29.36 27.37 33.22 38.06 41.74 44.16
 45.23 44.93 30.81 27.32 23.96 28.04 31.27 33.55 34.80 35.00 34.14 32.24
 29.36 27.37 33.22 38.06 41.74 44.16 45.23 44.93 30.81 27.32 23.96 28.04



H.D. KING ELECTRIC GENERATING PLANT

311 North Indian River Drive (34950)
Post Office Box 1298 (34954)
Fort Pierce, Florida
(407) 464-5792

RECEIVED
OCT 30 1990
DER-BAQM

October 26, 1990

FEDERAL EXPRESS

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attn: Mr. C. H. Fancy

Dear Mr. Fancy:

Re: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9
Your Request for Construction
Permits for our Units 6, 7 & 8

As I stated in my letter of October 23rd, we reviewed the archives of the Florida Dept. of Environmental Regulation, Southeast District's office and located a Construction Permit for our Unit #8. No Construction Permits were found for Units 6 and 7, and we suspect that no Construction Permits were ever issued for these units since the permit requirement did not appear to be required until 1971 and these units were constructed in 1958 and 1964 respectively.

Sincerely,

A handwritten signature in cursive script, appearing to read "Harry Schindehette".

Harry Schindehette, P.E.
Director of Utilities

HL/HS:m

Enclosure

cc: Jack Miller

Harry Lamb

M. Parley
C. Galladay
J. Goldman
J. Harper, EPA
B. Andrews



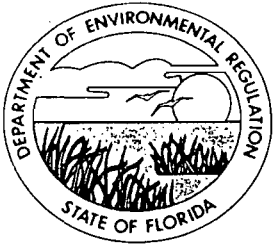
AIRBILL
PACKAGE
TRACKING NUMBER

6553362664

6553362664

RECIPIENT'S COPY

Date		10-29-90		RECIPIENT'S COPY	
From (Your Name) Please Print		Your Phone Number (Very Important)		To (Recipient's Name) Please Print	
Larry Schindehette		(407) 464-5600		C. H. Fancy	
Company		Department/Floor No.		Company	
t. Pierce Utilities Authority				Florida Department of Environmental Reg	
Street Address				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)	
11 No. Indian River Drive				Twin Towers Office Building	
City		State		City	
t. Pierce		FL		Tallahassee	
ZIP Required		34950		State	
				ZIP Required	
				2600 Blair Stone Road	
				FL	
				32399-2400	
YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)				IF HOLD FOR PICK-UP, Print FEDEX Address Here	
				Street Address	
				City	
				State	
				ZIP Required	
PAYMENT 1 ☐ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card					
5 ☐ Cash					
SERVICES (Check only one box)		DELIVERY AND SPECIAL HANDLING		Emp. No.	
Priority Overnight Service (Delivery by next business morning)		1 ☐ HOLD FOR PICK-UP (Fill in Box H)		Date	
Standard Overnight Service (Delivery by next business afternoon)		2 ☐ DELIVER WEEKDAY		☐ Cash Received	
11 ☐ YOUR PACKAGING 51 ☐		3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations)		☐ Return Shipment	
16 ☐ FEDEX LETTER 56 ☐ FEDEX LETTER *		4 ☐ DANGEROUS GOODS (Extra charge) (CSS not available for Dangerous Goods Shipments)		☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold	
12 ☐ FEDEX PAK 52 ☐ FEDEX PAK *		5 ☐ CONSTANT SURVEILLANCE SVC. (CSS) (Extra charge) (Release Signature Not Applicable)		Street Address	
13 ☐ FEDEX BOX 53 ☐ FEDEX BOX		6 ☐ DRY ICE Lbs		City	
14 ☐ FEDEX TUBE 54 ☐ FEDEX TUBE		7 ☐ OTHER SPECIAL SERVICE		State	
Economy Service (formerly Standard Air) (Delivery by second business day)		8 ☐		Zip	
Heavyweight Service (for Extra Large or any package over 150 lbs.)		9 ☐ SATURDAY PICK-UP (Extra charge)		Received By:	
70 ☐ HEAVYWEIGHT **		10 ☐		X	
30 ☐ ECONOMY SERVICE		11 ☐ DISCOUNT		Date/Time Received	
80 ☐ DEFERRED HEAVYWEIGHT **		12 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)		FedEx Employee Number	
*Declared Value Limit \$100. **Call for delivery schedule.				1 ☐ Regular Stop 2 ☐ Drop Box	
				3 ☐ On-Call Stop 4 ☐ Stop	
				5 ☐ Stop	
				Release Signature:	
				Date/Time	
				10/29/90	
				18/93/173	
				REVISION DATE 11/88	
				PART #118500 SRCEF 1/9	
				FORMAT #014	
				014	
				© 1989 FEC PRINTED IN U.S.A.	



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

November 22, 1991

Peter Cunningham, Esq.
Gary Perko, Esq.
Hopping, Boyd, Green & Sams
123 S. Calhoun Street
P.O. Box 6526
Tallahassee, Florida 32314

RECEIVED

NOV 25 1991

Division of Air
Resources Management

RE: Ft. Pierce Utilities
OGC cases 91-1025, 91-1610
DAOH cases 91-3768, 91-6989

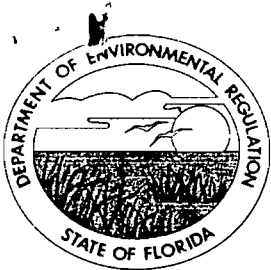
Dear Mr. Cunningham:

I have received your proposed stipulation for settlement of OGC case 91-1610, DOAH case 91-6989, (Units 6, 7, and 8 of the facility), and have reviewed the proposal with Stephanie Brooks and Preston Lewis. We have made some proposed changes for your consideration. Specifically, we have added visible emission limits for those times during which a unit may burn oil; have separated the pounds per hour limits to show each unit; have retained the language of the original permit that gas is the only permitted fuel for normal operation; have reworded condition 4 to retain the original language while adding the 15 day exception; and have added a new condition 10 to require keeping unit logs, which will be necessary for our compliance activities since separate permits are requested for the facility.

I would also like to point out that the Department cannot agree to any of these changes unless the settlement includes dismissal of the Unit 9 petition along with dismissal of the Units 6,7, and 8 petition. Your letter and proposed stipulation aren't clear on this point, since your letter refers to one case number while your proposed stipulation refers to the other. Please revise the proposed stipulation to reflect both cases, unless there is some objection. Based upon our conversation on the 8th, I understood that both cases

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP		ACTION NO
		ACTION DUE DATE
1. TO: (NAME, OFFICE, LOCATION)	Initial	
Preston Lewis / AIR	Date	
2.	Initial	
	Date	
3.	Initial	
	Date	
4.	Initial	
	Date	
REMARKS:		INFORMATION
F.Y.I.		Call
Ft Pierce Oil		Stephanie
		on
		Ft Pierce
		SO ₂ #6 unit
RECEIVED NOV 25 1991 Division of Air Resources Management		Review & Respond
		Prepare Response
		For My Signature
		For Your Signature
		Let's Discuss
		Set Up Meeting
		Investigate & Report
		Initial & Forward
		Distribute
		Concurrence
For Processing		
Initial & Return		
FROM:	DATE	11-22-91
Pat Comer	PHONE	8-9730



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

April 15, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Fort Pierce
P. O. Box 1298
Fort Pierce, Florida 33448

Dear Mr. Schindehette:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to construct and operate a 31.6 MW combined cycle gas turbine system.

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

Sincerely,

Barry D. Fancy

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

CHF/PL/plm

Attachments

c: Stephanie Brooks, SED
Jewell Harper, EPA
Steven M. Day, P.E.

H. Lamb - Ft. Pierce Utilities
J. Miller - Black & Veatch



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: Barry Andrews
FROM: Stephanie Brooks *[Signature]*
DATE: April 23, 1991
RE: Ft. Pierce Utilities Unit No. 9

1. Add the word attached to clarify (e.g., "below")
Table 1 (Attached)

2. Specific Condition #3 and Specific Condition #5
Visible Condition shall not exceed 10% but they have to
stack test after the initial test only if the VE
exceeds 10%?

3. Specific Condition #21
Typo
Point not Paint

SB/k7

DEPARTMENT OF ENVIRONMENTAL REGULATION

**ROUTING AND
TRANSMITTAL SLIP**

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)

Initial

Date

2.

Initial

Date

3.

Initial

Date

4.

Initial

Date

REMARKS:

INFORMATION

Review & Return

Review & File

Initial & Forward

DISPOSITION

Review & Respond

Prepare Response

For My Signature

For Your Signature

Let's Discuss

Set Up Meeting

Investigate & Report

Initial & Forward

Distribute

Concurrence

For Processing

Initial & Return

FROM:

DATE

PHONE

4-24-91
SC 232-2650
407-433-2650



P.O. Box 69
Fort Pierce, St. Lucie County, Florida 34954-0069

RECEIVED

STATE OF FLORIDA
COUNTY OF ST. LUCIE

JUN 1 1991

Before the undersigned authority personally appeared David T. Rutledge or Kathleen K. LeClair, who on ~~oath~~ ^{Bureau of Air Regulation} says that he/she is publisher, business manager of the Tribune, a daily newspaper published at Fort Pierce in St. Lucie County, Florida; that the attached copy of the advertisement, being a Notice of Intent to Issue in the matter of DER Permit to Ft. Pierce

Utilities Authority
was published in said newspaper in the issues of 6/3/91

Affiant further says that The Tribune is a newspaper published at Fort Pierce, in said St. Lucie County, Florida, and that the said newspaper has heretofore been continuously published in St. Lucie County, Florida, each day and has been entered as second class mail matter at the post office in Fort Pierce, in said St. Lucie County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed before me
This 3rd day of June, 1991
A.D.

(SEAL) Notary Public in and for the State of Florida
Commission Exp. Feb. 6, 1993
BONDED THRU GENERAL INS. UND.

NO. 04478
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT
TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a PSD permit to Fort Pierce Utilities Authority, P.O. Box 1298, Fort Pierce, St. Lucie County, Florida 33448, to operate a 31.6 MW combined cycle gas turbine system and to change restrictions on existing units. A determination of Best Available Control Technology (BACT) was required. The maximum degree of increment consumed for nitrogen dioxide is 2.0% of the Class II proposed annual mean. For sulfur dioxide, the maximum consumption is also 2.0%. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

cc: P. Lewis
B. Andrews
C. Holladay
S. Brooks
J. Harper

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

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

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

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

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

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

The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at: Department of Environmental Regulation, Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Department of Environmental Regulation, Southeast District, 1900 S. Congress Avenue, Suite A, West Palm Beach, Florida 33406.

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

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

PUBLISH: June 3, 1991

P 407 852 663

RECEIPT FOR CERTIFIED MAIL

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

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

Sent to Mr. Harry Schindehette, P.E.	
Street and No. Ft. Pierce Utilities P. O. Box 3191	
P.O., State and ZIP Code Ft. Pierce, FL 34948	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 4-15-91 Permit: AC 56-185836 PSD-FL-154	

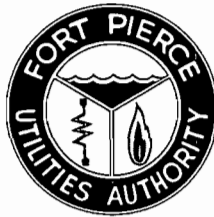
SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt-fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check boxes for additional services requested. 1. ☐ Show to whom delivered, date, and addressee's address. 2. ☐ Restricted Delivery (Extra charge)		4. Article Number P 407 852 663 Type of Service: ☐ Registered ☒ Certified ☐ Express Mail ☐ Insured ☐ COD ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.	
3. Article Addressed to: Mr. Harry Schindehette, P.E. Director of Utilities City of Fort Pierce P. O. Box 3191 Ft. Pierce, FL 34948		8. Addressee's Address (ONLY if requested and fee paid)	
5. Signature — Addressee X		6. Signature — Agent X	
7. Date of Delivery APR 17 1991		8. Addressee's Address (ONLY if requested and fee paid)	

U.S.G.P.O. 1989-238-915

PS Form 3811, Apr. 1989

DOMESTIC RETURN RECEIPT

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

January 15, 1991

RECEIVED
JAN 16 1991

DER-BAQM

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. C. H. Fancy

RE: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9

Dear Mr. Fancy:

This letter is in response to your comment letter dated January 4, 1991.

As stated in our December 5, 1990 letter, we are requesting that Unit 9 be permitted to burn natural gas only. The 1990 NO_x compliance test for Unit 9 was conducted on December 27, 1990 and will be provided under separate cover as soon as the results are received from the testing contractor.

We emphasize that this permit application is for Unit 9 only. It was previously demonstrated that, for Unit 9, only NO_x has the potential to be emitted at levels above the PSD significant emission rates. Therefore, a review of SO₂ and particulate matter impacts from Units 6, 7, and 8 is not applicable to the Unit 9 permit application.

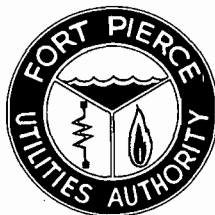
Units 6, 7, and 8 are currently permitted to burn natural gas and fuel oil. Applications to renew these permits request a continuation of this authority. A separate emergency order has been requested which would relax the Units 6, 7, and 8 SO₂ and particulate limitations found in the existing Unit 9 permit. The SO₂ and particulate matter modeling requested in support of this emergency order has been completed for Units 6, 7, and 8. The results of this modeling were provided in our January 4, 1991 response to DER's December 26, 1990 letter. It demonstrated combined maximum impacts well below the AAQS.

Construction on Unit 8 began prior to January 6, 1975 and operational testing began in March of 1976. Based on FAC 17-2.500(4)(b)3.b., Unit 8 is a baseline source, not an increment consumer. Consequently, Unit 8 impacts have not (nor need not) be separately modeled.

Best Available Copy

FEDERAL EXPRESS QUESTIONS? CALL 800-238-5355 TOLL FREE		AIRBILL PACKAGE TRACKING NUMBER	
297M 9364264593		9364264593	
Date 1-15-91		RECIPIENT'S COPY	
From (Your Name) Please Print Larry Schindehette Company PIERCE UTILITIES AUTHORITY Street Address 66 S 6TH ST City PIERCE State FL ZIP Required 34590		To (Recipient's Name) Please Print C. H. Fancy Company Fla. Dept. Environmental Reg. Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip * Codes) 2600 Blair Stone RD/ Twin Towers Ofc. B City Tallahassee, Fla. State FL ZIP Required 32399-240	
Your Phone Number (Very Important) 407 464-5600 Department / Floor No.		Recipient's Phone Number (Very Important) 904 488-1320 Department / Floor No.	
YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)			
PAYMENT ☒ Bill Sender ☐ Bill Recipient's FedEx Acct. No. ☐ Bill 3rd Party FedEx Acct. No. ☐ Bill Credit Card ☐ Cash/Check		IF HOLD FOR PICK-UP, Print, FEDEX Address Here Street Address City State ZIP Required	
SERVICES (Check only one box) Priority Overnight Service (Delivery by next business morning) Standard Overnight Service (Delivery by next business afternoon) 11 ☐ YOUR PACKAGING 51 ☐ 16 ☐ FEDEX LETTER 56 ☐ FEDEX LETTER 12 ☐ FEDEX PAK 52 ☐ FEDEX PAK 13 ☐ FEDEX BOX 53 ☐ FEDEX BOX 14 ☐ FEDEX TUBE 54 ☐ FEDEX TUBE Economy Two-Day Service (formerly Standard Air) (Delivery by second business day) Heavyweight Service (for Extra Large or any package over 150 lbs.) 30 ☐ ECONOMY TWO-DAY SVC. 70 ☐ HEAVYWEIGHT 80 ☐ DEFERRED HEAVYWEIGHT *Declared Value Limit \$100. **Call for delivery schedule.		DELIVERY AND SPECIAL HANDLING (Check services required) 1 ☐ HOLD FOR PICK-UP (Fill in Box #) 2 ☐ DELIVER WEEKDAY 3 ☐ DELIVER SATURDAY (Extra charge) 4 ☐ DANGEROUS GOODS (Extra charge) 5 ☐ 6 ☐ DRY ICE Lbs. 7 ☐ OTHER SPECIAL SERVICE 8 ☐ 9 ☐ SATURDAY PICK-UP (Extra charge) 10 ☐ 11 ☐ 12 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)	
PACKAGES WEIGHT in Pkgs. OZ. YOUR DECLARED VALUE Total Total Total DIM SHIPMENT (Chargeable Weight) Received At 1 ☐ Regular Stop 3 ☐ Drop Box 2 ☐ Ch-Call Stop 4 ☐ B.S.C. 5 ☐ Station FedEx Emp. No.		Emp. No. Date ☐ Cash Received ☐ Return Shipment ☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold Street Address City State Zip Received By X Date/Time Received FedEx Employee Number Release Signature Date/Time	
Federal Express Use Base Charges Declared Value Charge Other 1 Other 2 Total Charges		REVISION DATE 8/90 PART #119501 FXEM 10 90 FORMAT #041 041 © 1990 F.E.C. PRINTED IN U.S.A.	

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

January 4, 1991

RECEIVED

JAN 8 1991

Florida Department of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32399

DER-BAQM

Attention: Mr. C. H. Fancy, P.E.

SUBJECT: Emergency Order for Burning Oil
in Units 6, 7 and 8

REFERENCE AIR PERMITS: Unit 6 - AO-56-113534
Unit 7 - AO-56-112679
Unit 8 - AO-56-112678
Unit 9 - AO-56-175955

We have received your letter of December 26, 1990 responding to our letter of December 10, 1990 regarding the subject.

The responses to your questions and requests for additional information are as follows.

Question 1. What grade fuel will be burned in the Units? What is the maximum sulfur content of the fuel? What is the maximum ash content?

Response: No. 6 fuel oil will be fired in Units 6, 7, and 8 during emergency conditions.

Currently, two separate supplies of No. 6 fuel oil are being stored onsite with maximum sulfur contents corresponding to 2.75 and 0.80 lb SO₂/MBtu. These compliance fuels satisfy the Florida Administrative Code (FAC) SO₂ emission rates for Units 7 and 8, respectively.

The FAC does not specify an SO₂ limit for boilers the size of Unit 6. Instead the FAC states that the limit must be established by a Best Available Control Technology (BACT) determination. The BACT analysis for Unit 6 was recently submitted to the FDER and concluded that the lower sulfur No. 6 fuel oil represented BACT. Consequently, Units 6 and 8 will burn the 0.80 lb SO₂/MBtu No. 6 fuel oil and Unit 7 will burn the 2.75 lb SO₂/MBtu fuel oil.

FEDERAL EXPRESS		AIRBILL		PACKAGE TRACKING NUMBER	
9171M		4003880580		4003880580	
Date: 1-7-91		RECIPIENT'S COPY			
From (Your Name) Please Print Harry Schindehette		Your Phone Number (Very Important) (407) 464-5600		To (Recipient's Name) Please Print Mr. C. H. Fancy, P.E.	
Company PIERCE UTILITIES AUTHORITY		Department/Floor No.		Recipient's Phone Number (Very Important) (904) 488-81	
Street Address 66 S 6TH ST		City T PIERCE		Company Fla. Dept. Environmental Regulation	
State FL		ZIP Required 326950		Department/Floor No.	
City T PIERCE		State FL		ZIP Required 32399	
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)				IF HOLD FOR PICK-UP, Print FEDEX Address Here	
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☐ Cash				City	
				State	
				ZIP Required	
SERVICES		RECEIVED		Federal Express Use	
1. ☐ PRIORITY 1 Overnight Delivery		1. ☐ HOLD FOR PICK-UP (If in Box 1)		Base Charges	
2. ☐ COURIER-PAK OVERNIGHT ENVELOPE		2. ☐ DELIVER WEEKDAY		Declared Value Charge	
3. ☐ OVERNIGHT BOX		3. ☐ DELIVER SATURDAY		Other 1	
4. ☐ OVERNIGHT TUBE		4. ☐ DANGEROUS GOODS (Extra charge)		Other 2	
5. ☐ STANDARD AIR Delivery not later than second business day		5. ☐ CONSTANT TEMPERATURE SERVICE (Extra charge)		Total Charges	
		6. ☐ DRY ICE (Extra charge)		PART #111800	
		7. ☐ OTHER SPECIAL SERVICE		REVISION DATE 10/88	
		8. ☐ SATURDAY PICK-UP (Extra charge)		PRINTED IN U.S.A. FXEM	
		9. ☐ HOLIDAY DELIVERY (If observed) (Extra charge)		009	
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P 407 852 946

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1985-234-555

PS Form 3800, June 1985

Sent to Mr. Harry Schindehette	
Street and No. City of Ft. Pierce P. O. Box 3191	
P.O., State and ZIP Code Ft. Pierce, FL 34948	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 1-4-91 Permit: AC 56-185836 PSD-FL-154	

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" space on the reverse side. Be sure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check-box(es) for additional service(s) requested. 1. ☐ Show to whom delivered, date, and addressee's address. 2. ☐ Restricted Delivery (Extra charge)		4. Article Number P 407 852 946	
3. Article Addressed to: Mr. Harry Schindehette, P.E. Director of Utilities City of Fort Pierce P. O. Box 3191 Ft. Pierce, FL 34948		Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.	
5. Signature — Addressee X		8. Addressee's Address (ONLY if requested and fee paid)	
6. Signature — Agent X		7. Date of Delivery 1-7-91	

DOMESTIC RETURN RECEIPT

U.S.G.P.O. 1985-234-815

PS Form 3811, Apr. 1989

P 407 852 943

RECEIPT FOR CERTIFIED MAIL

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

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

Sent to <i>Harry Schindehette</i>	
Street and No. <i>Ft. Pierce U. A.</i>	
P.O., State and ZIP Code <i>P.O. Box 3191</i>	
Postage <i>Ft. Pierce, FL</i>	
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date <i>12-27-90</i> <i>A056-113534</i> <i>112679, 678</i> <i>175955</i>	

● SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check boxes for additional service(s) requested. 1. ☐ Show to whom delivered, date, and addressee's address. 2. ☐ Restricted Delivery (Extra charge)	
3. Article Addressed to: <i>Mr. Harry Schindehette, P.E.</i> <i>Director of Utilities</i> <i>Ft. Pierce Utilities Authority</i> <i>P.O. Box 3191</i> <i>Ft. Pierce, FL 34948</i>	
4. Article Number <i>P 407 852 943</i>	
Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise	
Always obtain signature of addressee or agent and DATE DELIVERED.	
5. Signature of Addressee <i>[Signature]</i>	
6. Signature of Agent <i>[Signature]</i>	
8. Addressee's Address (ONLY if requested and fee paid)	

P 256 395 040

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1989-234-555

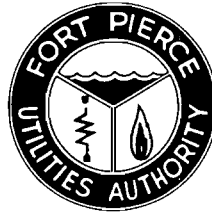
PS Form 3800, June 1985

Sender's Name <i>Harry Schindelhette</i>	
Street and No. <i>City of Ft Pierce</i>	
P.O., State and ZIP Code <i>Ft. Pierce, FL</i>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date <i>11-21-90</i> <i>AC 56-185826</i>	

● SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4: Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check boxes for additional service(s) requested. 1. ☐ Show to whom delivered, date, and addressee's address. (Extra charge) 2. ☐ Restricted Delivery. (Extra charge)		4. Article Number <i>P 256 395 040</i> Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.	
3. Article Addressed to: <i>Mr. Harry Schindelhette, P.E.</i> <i>Director of Utilities</i> <i>City of Ft. Pierce</i> <i>P.O. Box 3191</i> <i>Ft. Pierce, FL 34948</i>		8. Addressee's Address (ONLY if requested and fee paid)	
5. Signature — Addressee <i>X</i>		6. Signature — Agent <i>X</i>	
7. Date of Delivery		RECEIPT	

PS For

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P.O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

Tuesday, November 12, 1991

RECEIVED

NOV 27 1991

Division of Air
Resources Management

BY HAND DELIVERY

Mr. Clair Fancy, P.E., Bureau Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road, Room 338
Tallahassee, Florida 32399-2400

Re: **H. D. KING ELECTRIC GENERATING PLANT UNIT 9**
AC 56-185836; PSD-FL-154

Dear Mr. Fancy:

Fort Pierce Utilities Authority hereby voluntarily withdraws its application for the referenced PSD permit for Unit 9 at its H. D. King Electric Generating Plant. By letter dated August 28, 1990, FPUA originally requested the PSD permit to allow greater operational flexibility for Units 6, 7 and 8. Substantial additional information was submitted by letter dated October 23, 1990 and subsequently in response to questions from the Department. The Department issued its notice of intent on the Unit 9 permit on April 15, 1991.

In view of the requirements for additional control of nitrogen oxides emissions in the Department's proposed Unit 9 permit, and our lack of success in negotiating a mutually acceptable resolution of this issue, Fort Pierce Utilities Authority has determined that withdrawal of this application is in the best interests of the Utilities Authority and its customers at this time. Our counsel will be filing a motion to dismiss the pending administrative proceedings concerning this matter concurrently with submission of this letter.

FORT PIERCE UTILITIES AUTHORITY
"Committed to Quality"

Mr. Clair Fancy, P.E.
Bureau of Air Regulation
FDER

Tuesday, November 12, 1991

The consideration given this matter by you and your staff is appreciated.

Very truly yours,



Harry M. Schindehette, P.E.
Director of Utilities

HMS:jm

cc: Pat Comer, Esquire, FDER
Preston Lewis, FDER
Stephanie Brooks, FDER
Thomas W. Richards, P.E., FPUA
Harry P. Lamb, FPUA
Peter Cunningham, Esquire, HBG&S
J. Reynolds
C. Halladay
CHF/BA

John
Ft Pierce
operating permit #6, 7, 8 and #9 PSD
11/8/91
withdraw

Ft Pierce wants to withdraw #9
Permit application (PSD) but wants to modify 6, 7, 8
District issued one permit

even though previously there were
four units. Pat Conner agreed to modify and
issue one for each unit.

Ft Pierce #9 permit was
modified to include limited use for

conform the ~~operating~~
level 6, 7 and 8 permits to the
#9 permit modifications

Testing on the 6, 7 and 8 PM/PM10

Annually but since the
unit burns oil ^{only up to 400 hours} ~~modify~~

applicant ~~wants~~ wants to ~~forego~~
The the PM/PM10 ^{and avoid modifying} ~~handles~~ the applicant
burns up to 400 hours.

(407) 433 2666 FAX SE

Pat agrees - that 4 permits instead
of one

I believe the Ft Pierce issue
may be resolved. See me!
Denton

DRAFT

April 27, 1992

Peter Cunningham, Esq.
Gary Perko, Esq.
Hopping, Boyd, Green & Sams
123 S. Calhoun Street
P.O. Box 6526
Tallahassee, Florida 32314

RE: Ft. Pierce Utilities
OGC case 91-1610
DAOH case 91-6989

Dear Mr. Perko:

This is to respond to your letter of March 31. As we explained during our meeting of March 23, our difficulties cannot be resolved by simply plugging numbers into the permit because the numbers must remain below the PSD threshold in order for your client to avoid PSD review. In light of that comment, we have some problems with the proposal submitted on March 31. First, the proposed numbers will exceed the PSD threshold when the four units operate. The total SOx and VOC emissions for units 6, 7, and 8 must be limited to prevent PSD review when unit 9 is factored in. Your proposal to increase SOx emissions on units 6, 7, and 8 by 259 tons/yr does not accomplish this limitation requirement. Nor does your proposal to increase VOC emissions for units 6, 7, and 8 by 104 tons/yr. I realize that you intended to project a worst case limit, but it still has to be within the PSD threshold amounts.

Our second problem is really a two part one. All your numbers assumed a total of 400 hours burning oil in one unit, unit 7. The proposed permit is now structured to allow burning in all three units. If 400 hours of burning occurs in each of the three units, the emissions can be expected to be much higher. If, however, you expect, or can project, a particular number of hours in each unit up to a total of 400 for all three units combined (which may be necessary to solve the first problem), that should be specified in the permit. It has been our experience that EPA may disallow grouped emission limits such as those proposed for the combined units. We considered them because you wanted to provide flexibility in unit oil burning,

Page Two
Cunningham
April 27, 1992

but now it appears that you may have to forego some flexibility to avoid PSD. In any event, your analysis may result in a more fixed schedule of oil burning and we should then attempt to fix the annual limits for each unit, including the expected oil burning for each unit in the calculations.

Finally, there appears to be a typographical error in the per hour emissions table for VOC. Unit 6 lb/hr should be 0.0236 rather than 0.236.

I appreciate all the work you put into your proposal, but I really think that the analysis we requested in our previous meetings is necessary. We need to know realistically what emissions can be expected and we need to know how all this will fit into the PSD limitations. Maybe it will speed up the process if your client's engineering people talk directly to Stephanie and Preston. My experience has been that direct technical contact goes a long way toward resolving these kinds of questions. i look forward to hearing from you.

Sincerely,

Patricia E. Comer

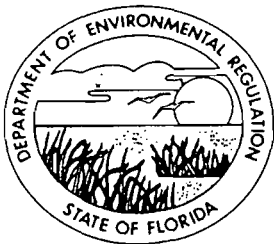
I N T E R O F F I C E M E M O R A N D U M

Date: 23-Apr-1992 04:40pm EST
From: Patricia Comer (TAL)
COMER_P
Dept: Office General Counsel
Tel No: 904/488-9730

TO: Preston Lewis (TAL) (LEWIS_P)
TO: Isidore Goldman (WPB) (GOLDMAN_I)

Subject: Fort Pierce utilities proposed letter

Please look at my proposed response to Gary Perko. I need your input ASAP. The hearing officer has decided to get involved in this to get it off her calendar.
Thanks



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

November 22, 1991

Peter Cunningham, Esq.
Gary Perko, Esq.
Hopping, Boyd, Green & Sams
123 S. Calhoun Street
P.O. Box 6526
Tallahassee, Florida 32314

RECEIVED

NOV 25 1991

Division of Air
Resources Management

RE: Ft. Pierce Utilities
OGC cases 91-1025, 91-1610
DAOH cases 91-3768, 91-6989

Dear Mr. Cunningham:

I have received your proposed stipulation for settlement of OGC case 91-1610, DOAH case 91-6989, (Units 6, 7, and 8 of the facility), and have reviewed the proposal with Stephanie Brooks and Preston Lewis. We have made some proposed changes for your consideration. Specifically, we have added visible emission limits for those times during which a unit may burn oil; have separated the pounds per hour limits to show each unit; have retained the language of the original permit that gas is the only permitted fuel for normal operation; have reworded condition 4 to retain the original language while adding the 15 day exception; and have added a new condition 10 to require keeping unit logs, which will be necessary for our compliance activities since separate permits are requested for the facility.

I would also like to point out that the Department cannot agree to any of these changes unless the settlement includes dismissal of the Unit 9 petition along with dismissal of the Units 6, 7, and 8 petition. Your letter and proposed stipulation aren't clear on this point, since your letter refers to one case number while your proposed stipulation refers to the other. Please revise the proposed stipulation to reflect both cases, unless there is some objection. Based upon our conversation on the 8th, I understood that both cases



DEPARTMENT OF ENVIRONMENTAL REGULATION

**ROUTING AND
TRANSMITTAL SLIP**

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)

Preston Lewis / AIR

Initial

Date

2.

Initial

Date

3.

Initial

Date

4.

Initial

Date

REMARKS:

F.Y.I.

74 Pierce Oil

INFORMATION

Call
Stephani
on
F & P
SO₂ #6 unit

RECEIVED

NOV 25 1991

Division of Air
Resources Management

Review & Respond

Prepare Response

For My Signature

For Your Signature

Let's Discuss

Set Up Meeting

Investigate & Report

Initial & Forward

Distribute

Concurrence

For Processing

Initial & Return

FROM:

Pat Comer

DATE

11-22-91

PHONE

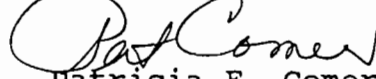
8.9730

Page Two
Cunningham
November 22, 1991

would be resolved if we could agree upon operating conditions for Units 6, 7, and 8.

I will be available most of next week, but I expect to be in hearing and deposition most of the week after. Please call me when you have had an opportunity to review our proposals.

Sincerely,



Patricia E. Comer

I. Specific Condition 2:

CHANGE FROM:

2. Emission limiting standards are as follow:

a) Units 6, 7, 8

1. Visible emissions shall not exceed 5% opacity while firing natural gas.
2. The operating emission limits for this facility's existing boilers shall not exceed the following rates:

Parameter	<u>Unit 6</u>		<u>Unit 7</u>		<u>Unit 8</u>	
	lbs/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
PM	0.4	0.0024	0.568	0.382	0.945	3.018
SOx	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NOx	1.31	0.007854	104.35	70.126	173.20	552.860
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.2

The operating permits emission limits for these boilers (units No. 6, 7, and 8) shall be modified as stated above.

3. Natural gas is the only permitted fuel for normal operation for Units 7 and 8. Unit 6 is allowed to burn natural gas with a No. 6 fuel oil (0.76% sulfur content) as a standby fuel. If the gas supply is curtailed or an emergency is declared, the facility shall obtain an emergency order for Units 7 and 8 to burn fuel oil. Visible emissions shall not exceed 15% opacity while burning fuel oil. If fuel oil usage exceeds 15 days per calendar year, the Department shall be notified and provision made for emissions testing within 30 days.

CHANGE TO:

2. Emission limiting standards are as follow:

a) Units 6, 7, 8

1. Visible emissions shall not exceed 5% opacity while firing natural gas.

For Units 6 and 7, visible emissions shall not exceed 20%

opacity when the unit is burning fuel oil, except for NOTE
PERMITTEE OPTION MUST BE SPECIFIED IN FINAL VERSION OF
PERMIT****

CHOOSE ONE OPTION:

OPTION A) one six-minute period per hour during which opacity shall not exceed 27%.

OPTION B) one two-minute period per hour during which opacity shall not exceed 40%.

For Unit 8 visible emissions shall not exceed 20% opacity when the unit is burning fuel oil, except for one six-minute period per hour during which opacity shall not exceed 27%.

2.

A) The emission limits for UNITS 6, 7, and 8 shall not exceed the following rates:

<u>PARAMETER</u>	<u>UNIT 6</u>	<u>UNIT 7</u>	<u>UNIT 8</u>
	lb/hr	lb/hr	lb/hr
PM	0.4 ^{2.80}	0.568	0.945
SOx	12.38	0.1199	0.1917
NOx	1.31	104.35	173.20
VOC	0.0236	0.266	0.441
CO	0.15	7.589	12.59

0.76%

B) The total emissions from combined UNITS 6, 7, and 8 shall not exceed:

<u>PARAMETER</u>	<u>TONS/YR</u>
PM	3.4
SOx	0.8
NOx	622.0
VOC	1.6
CO	45.3

Total combined heat input for the Units 6, 7, and 8 shall not exceed 4,534,930 MBtu per year.

3. Natural gas is the only permitted fuel for normal operation for Units 7 and 8. Unit 6 is allowed to burn natural gas with a No. 6 fuel oil (0.76% sulfur content) as a standby fuel. FPUA shall be permitted to burn residual fuel oil in Units 6, 7, and 8, when necessary in order to avoid curtailing electric power service to its customers. FPUA must notify the DER

within 24 hours after commencement of oil firing and furnish the following information:

- a. Duration or projected duration of the event.
- b. Quantity of fuel oil burned or projected to be burned.
- c. A description of significant circumstances precipitating the event, which shall include;
 - i. Availability of power for purchase
 - ii. Availability of electric transmission capacity relating to power purchases
 - iii. Availability of natural gas
 - iv. Availibility of FPUA generation sources.

When burning residual fuel oil in units 6, 7, and 8, the sulfur oxide (SOx), particulate matter (PM), and volatile organic compound (VOC) emission limits rates set forth above shall not apply and the following rates shall apply to Units 6, 7, and 8:

<u>PARAMETER</u>	<u>UNIT 6</u>	<u>UNIT 7</u>	<u>UNIT 8</u>
	lb/MBTU	lb/MBTU	lb/MBTU
SOx	0.80	2.75	0.80
PM	n/a	0.1	0.1
VOC	n/a	n/a	n/a

II. Specific Condition 4:

CHANGE FROM:

4. Testing of emission should be conducted using the fuel and/or process which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source, otherwise the Department may require the test to be repeated or require modification of the permit to reflect tested rates and/or fuels.

CHANGE TO:

4. Testing of emission should be conducted using the fuel and/or process which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source, otherwise the Department may require the test to be repeated or require modification of the permit to reflect tested rates and/or fuels. However, testing on fuel oil in Units 6, 7, or 8 shall be required only if fuel oil usage for that unit exceeds 15 days in any calendar year.

III. Specific Condition 7:

CHANGE FROM:

7. Ambient monitoring for particulate and sulfur dioxide is required for a unit when fuel oil is used.

CHANGE TO:

7. Ambient monitoring for particulate and sulfur dioxide is required for a unit when fuel oil usage of that unit exceeds fifteen (15) days per calendar year.

IV. Specific Condition 10:

ADD:

10. The facility shall maintain unit logs reflecting the following information:

- a. Number of hours per day each unit burns gas
- b. Number of hours per day each unit burns fuel oil
- c. Amount of natural gas used per unit (MBTU/million cubic feet burned)
- d. Amount of fuel oil used per unit including sulfur and ash content and heat input rate (MBTU/1000 gallons).

670
Florida Department of Environmental Regulation

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

STATE OF FLORIDA

...iles, Governor

Carol M. Browner, Secretary

September 18, 1991

Peter C. Cunningham, Esquire
Hopping Boyd Green & Sams
Attorneys and Counselors
Post Office Box 6526
Tallahassee, Florida 32314

Re: Proposed Permit AC 56-185836, PSD-FI-154
DOAH Case No. 91-3786
Fort Pierce Utilities Authority
H. D. King Generating Plant - Unit 9

Never Mailed

Dear Mr. Cunningham:

Discussions among our staff following the August 12, 1991, meeting suggest that the above case might be resolved if a sufficient reduction in NO_x emissions could be effected through Lo-NO_x burner installations for boiler Units 6, 7, and 8. We would need to know what level of NO_x reduction could be achieved for Units 6, 7, and 8 and what the costs would be.

Realizing that it will take some time to obtain and evaluate this information, it seems advisable to postpone the hearing process until this possibility of resolution can be fully explored. Please let us know if your client is receptive to this approach.

Sincerely,

Patricia E. Comer

PEC/JR/plm

c: Clair Fancy, BAR

*Pat Comer discussed contents
of this letter with Peter Cunningham
9/18/91
[Signature]*

HOPPING BOYD GREEN & SAMS

ATTORNEYS AND COUNSELORS

123 SOUTH CALHOUN STREET

POST OFFICE BOX 6526

TALLAHASSEE, FLORIDA 32314

(904) 222-7500

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WILLIAM L. BOYD, IV
RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
THOMAS M. DeROSE
WILLIAM H. GREEN
WADE L. HOPPING
FRANK E. MATTHEWS
RICHARD D. MELSON
WILLIAM D. PRESTON
CAROLYN S. RAEPPEL
GARY P. SAMS
ROBERT P. SMITH, JR.
CHERYL G. STUART

RICHARD W. MOORE
ANGELA R. MORRISON
MARIBEL N. NICHOLSON
DIANA M. PARKER
LAURA BOYD PEARCE
GARY V. PERKO
MICHAEL P. PETROVICH
DAVID L. POWELL
DOUGLAS S. ROBERTS
CECELIA C. SMITH

OF COUNSEL
W. ROBERT FOXES

September 10, 1991

RECEIVED

SEP 10 1991

*Called Stephanie
Brook 9/11/91*

BY HAND DELIVERY

Ms. Patricia E. Comer, Esq.
Assitant General Counsel
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Division of Air
Resources Management

Re: Fort Pierce Utilities Authority
H. D. King Electric Generating Plant
Permit No.: AO 56-190275

Dear Pat:

As discussed by telephone, Fort Pierce Utilities Authority ("FPUA") currently has through today, September 10, 1991, to file a petition for administrative proceedings on the proposed operating permit for diesels 1 and 2, and Units 6, 7, and 8. Rather than filing a petition on the proposed permit and thereby complicating the pending administrative proceedings regarding the Unit 9 permit, FPUA would prefer to resolve this matter by issuance of a final operating permit for diesels 1 and 2, and Units 6, 7, and 8 containing the attached language in lieu of that in the proposed permit (No. AO 56-190275).

As you can see, the proposed language for Specific Condition 2(a) would make the Unit 6-8 operating permit consistent with the current Unit 9 construction permit (No. AC 56-141460), as amended by Steve Smallwood's letters of November 9, 1990 (combining emission limits based on overall heat input) and June 28, 1991 (authority to burn oil in emergencies). In addition, the proposed modification would automatically adjust the Unit 6-8 emission rates to account for any any final action taken on the pending PSD permit for Unit 9.

Ms. Patricia E. Comer, Esq.
September 10, 1991
Page 2

The proposed changes to Specific Conditions 4 and 7 relate to emissions testing and monitoring. As originally proposed by the Department, these conditions would effectively require testing and monitoring on fuel oil even though Units 6-8 are authorized to burn oil only under emergency circumstances. The language proposed by FPUA would clarify the conditions by requiring testing and monitoring on fuel oil only if fuel oil usage exceeds 15 days per unit in any calendar year.

We believe the FPUA's proposal is in the interests of all concerned. By resolving the remaining issues related to Permit No. 190275, the proposed modification would reduce confusion surrounding the status of outstanding permits for the H.D. King facility. The modification would also eliminate the need to initiate proceedings on the Unit 6-8 operating permit, and thereby avoid complicating the pending administrative proceedings by introducing yet another permit into the case.

Please give us a call after you have had a chance to review the proposed language. To protect FPUA's rights in the interim, we are submitting herewith a request for an additional thirty (30) days to file for administrative proceedings on the Unit 6-8 operating permit.

Sincerely,

HOPPING BOYD GREEN & SAMS

By: 
Peter C. Cunningham
Gary V. Perko

Attorneys for FORT PIERCE
UTILITIES AUTHORITY

Attachments

cc: Preston Lewis, Division of Air Resources Management ✓
Scott Benyon, S.E. District

PROPOSED MODIFICATION OF PERMIT NO. AO 56-190275:

I. Specific Condition 2:

FROM:

2. Emission limiting standards are as follows:

a) Units 6, 7, and 8

1. Visible emissions shall not exceed 5% opacity while firing natural gas.
2. The operating permits emission limits for this facility's existing boilers shall not exceed the following rates:

Parameter	Unit 6		Unit 7		Unit 8	
	lbs/hr	ton/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.4	0.0024	0.568	0.382	0.945	3.018
SOx	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NOx	1.31	0.007854	104.35	70.126	173.20	552.860
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.2
hrs/yr	12		1344		6384	

The operating permits emission limits for these boilers (units No. 6, 7, and 8) shall be modified as stated above.

3. Natural gas is the only permitted fuel for normal operation for Units 7 and 8. Unit 6 is allowed to burn natural gas with a No. 6 fuel oil (0.76% sulfur content) as the standby fuel. If the gas supply is curtailed or an emergency is declared, the facility shall obtain an emergency order for Units 7 and 8 to burn fuel oil. Visible emissions shall not exceed 15% opacity while burning fuel oil. If fuel oil usage exceeds 15 days per calendar year, the Department shall be notified and provision made for emissions testing within 30 days.

TO:

2. Emission limiting standards are as follow:

a) Units 6, 7, and 8

1. Visible emissions shall not exceed 5% opacity while firing natural gas.
2. Unless and until the Department removes the operating restrictions on Units 6, 7, and 8 currently required by Permit No. AC 56-141460, the emission limits for Units 6, 7, and 8 shall not exceed the following rates:

Parameter	lbs/hr	tons/yr
PM	1.9	3.4
SO ₂	12.7	0.8
NO _x	278.9	622.0
VOC	0.7	1.6
CO	20.3	45.3

Total heat input for the three existing boilers (Nos. 6, 7, and 8) shall not exceed 4,534,930 MBtu per year.

The above emission limits shall be adjusted in accordance with any final action taken by the Department affecting the operation restrictions on Units 6, 7, and 8 currently required by Permit No. AC 56-141460.

3. FPUA shall be permitted to burn residual fuel oil in Units 6, 7, and 8 in order to avoid curtailing electric power service to its customers. FPUA must notify the DER within 24 hours after the commencement of oil firing and furnish the following information:
 - a. Duration or projected duration of the event.

- b. Quantity of fuel oil burned or projected to be burned.
- c. A description of significant circumstances precipitating the event. The description shall include the following information:
 1. Availability of power for purchase
 2. Availability of electric transmission capacity relating to power purchases.
 3. Availability of natural gas.
 4. Availability of FPUA generation resources.

When burning residual fuel oil in Units 6, 7, and 8, the sulfur dioxide ("SO₂"), particulate matter ("PM"), and volatile organic compound ("VOC") emission limits currently set forth in the permit shall not apply. In lieu of those emission limits, the following emission limits will apply to Units 6, 7, and 8:

	Sulfur Dioxide (lb/MBTu)	Particulate Matter (lb/MBTu)	VOC
Unit 6	0.80	n/a	n/a
Unit 7	2.75	0.1	n/a
Unit 8	0.80	0.1	n/a

II. Specific Condition 4:

FROM:

4. Testing of emissions should be conducted using the fuel and/or process input which are expected

to result in the highest emissions and within ten percent (10%) of the rated capacity of the source, otherwise the Department may require the test to be repeated or require modification of the permit to reflect tested rates and/or fuels.

TO:

4. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source; provided, however, that testing on fuel oil shall be required only if fuel oil usage exceeds 15 days per unit in any calendar year.

III. Specific Condition 7:

FROM:

7. Ambient monitoring for particulate and sulfur dioxide is required when fuel oil is used.

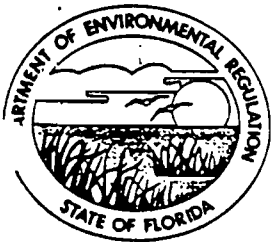
TO:

7. Ambient monitoring for particulate and sulfur dioxide is required when fuel oil usage exceeds 15 days per unit in any calendar year.

**PROPOSED OPERATING PERMIT FOR
DIESELS 1 & 2 AND UNITS 6-8
(NO. AO 56-190275)**

AND

AMENDMENT OF 6/7/91



MAY 24 1991

Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406

Lawton Chiles, Governor

Telephone No. 407/433-2650

Carol M. Browner, Secretary

MAY 23 1991

POWER PLANT

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION NOTICE OF PERMIT ISSUANCE

CERTIFIED MAIL

In the Matter of an Application
for Permit by:

DER File No. AO 56-190275
St. Lucie County
Air Program

Mr. H. P. Lamb /
Superintendent/Power Resources /
Fort Pierce Utility Authority /
311 North Indian River Drive /
Fort Pierce, Florida 33450 /

Enclosed is Permit Number AO 56-190275 to operate an air pollution source issued pursuant to Section 17-2, Florida Statutes.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of receipt of this Permit. 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 permit. 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 notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely

Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida

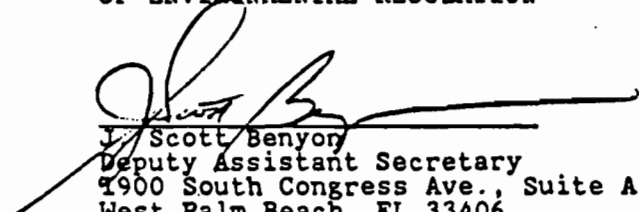
DER Permit No. AO 56-190275

filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120 68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9 110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

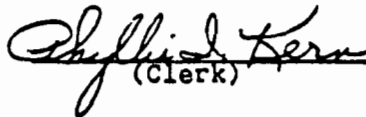

J. Scott Benyon
Deputy Assistant Secretary
1900 South Congress Ave., Suite A
West Palm Beach, FL 33406
407/433-2650

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT ISSUANCE and all copies were mailed by certified mail before the close of business on MAY 24 1991 to the listed persons.

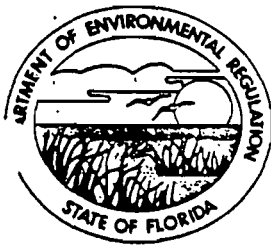
Clerk Stamp

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.

 MAY 24 1991
(Clerk) (Date)

Copies furnished to:

Harry Schindette
Preston Lewis



Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406

Lawton Chiles, Governor

Telephone No. 407/433-2650

Carol M. Browner, Secretary

PERMITTEE:

Mr. H. P. Lamb
Superintendent/Power Resources
Fort Pierce Utilities Authority
322 North Indian River Drive
Fort Pierce, Florida 334500

I.D. NUMBER: 50/WPB/56/0003

PERMIT/CERTIFICATION NUMBER: AO 56-190275 *

DATE OF ISSUE: MAY 23 1991

EXPIRATION DATE: February 28, 1996

COUNTY: St. Lucie

LATITUDE/LONGITUDE: 27°27'00"N/80°19'26"W

UTM: Zone 17; 566 8 Km. E; 3935.3 Km. N

PROJECT: Ft. Pierce Utilities Authority
Units 6 - 8, Diesels 1 and 2

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

OPERATE: An air pollution source consisting of:

- a) Two (2) General Motors Corporation, Model MP-45, diesel electric generators, burning No. 2 fuel oil at 28.9 million BTU/hr. maximum; discharging pollutants through a 3-ft. diameter stack 23 feet above ground level (peaking units);
- b) Babcock & Wilcox Boiler, Unit No. 6, 218.9 million BTU/hr. discharging pollutants through a 5-ft. diameter stack 148 feet above ground level;
- c) A Foster Wheeler Boiler, Unit No. 7, 470 million BTU/hr. maximum; discharging pollutants through a multicyclone collector and a 7.1-ft. diameter stack 147 feet above ground level, and
- d) A Foster Wheeler Boiler, Unit No. 8, 611 million BTU/hr. maximum; discharging pollutants through an 8-foot diameter stack 150 feet above ground level; equipped with continuous in-stack NO_x and O₂ monitors.

IN ACCORDANCE WITH: Application for Renewal received December 14, 1990, additional information received January 28, January 31 and February 27, 1991, AC 56-141460 issued March 14, 1988 and modified May 1, 1990; Application to Operate/Construct Air Pollution Sources received December 12, 1985 (Diesels 1 and 2); AC 56-12778 issued September 4, 1979 (Unit 8); and Application to Operate received July 21, 1980 (Units 6 and 7) (none are attached).

LOCATED AT: 311 North Indian River Drive, Fort Pierce, St. Lucie County, Florida.

TO SERVE: An electric generating utility (SIC # 4911).

SUBJECT TO: General Conditions 1-14. and Specific Conditions 1-8.

* This permit is a renewal of Permit No. AO 56-113533 issued February 28, 1986, AO 56-113534 issued February 28, 1986, AO 56-112670 issued February 14, 1986, and AO 56-112678 issued February 14, 1986.

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 403.141, 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 Florida Statutes 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.
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 reasonable times, 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 the permit, the permittee shall immediately notify and provide the Department with the following information:
 - (a) A description of and cause of noncompliance; and
 - (b) The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. 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.

GENERAL CONDITIONS:

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department, may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, 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 Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
11. This permit is transferable only upon Department approval in accordance with Rule 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. 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 date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.
14. 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 the 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 submitted or corrected promptly.

PERMITTEE:
Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida

I.D. NUMBER: 50/WPB/56/0003
PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 23, 1991
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

1. Compliance testing shall be conducted for the sources covered by this permit by September 1991 and annually thereafter in accordance with the methods specified below.

2. Emission limiting standards are as follow:

a) Units 6, 7, and 8

1. Visible emissions shall not exceed 5% opacity while firing natural gas.
2. The operating permits emission limits for this facility's existing boilers shall not exceed the following rates:

Parameter	Unit 6		Unit 7		Unit 8	
	lbs/hr	ton/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.4	0.0024	0.568	0.382	0.945	3.018
SO _x	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NO _x	1.31	0.007854	104.35	70.126	173.20	552.860
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.2

hrs/yr 12 1344 6384

The operating permits emission limits for these boilers (units No. 6, 7, and 8) shall be modified as stated above.

3. Natural gas is the only permitted fuel for normal operation for Units 7 and 8. Unit 6 is allowed to burn natural gas with a No. 6 fuel oil (0.76% sulfur content) as the standby fuel. If the gas supply is curtailed or an emergency is declared, the facility shall obtain an emergency order for Units 7 and 8 to burn fuel oil. Visible emissions shall not exceed 15% opacity while burning fuel oil. If fuel oil usage exceeds 15 days per calendar year, the Department shall be notified and provision made for emissions testing within 30 days.

b) Unit 8

1. Continuous emission monitors are required for nitrogen oxides and oxygen.
2. Quarterly excess emissions reports pursuant to 40CFR60 shall be submitted to the Southeast District Office postmarked no later than the 30th day following the end of each calendar quarter.

c) Diesels 1 and 2

Visible emissions shall not exceed 20 percent opacity while using No. 2 fuel oil.

3. Source/Emission Point	Pollutant	Test Method
Diesels 1 & 2, Boilers 6, 7, & 8	Visible Emissions	EPA Method 9
Boilers 6, 7, & 8	Particulate	EPA Method 5
	SO _x	EPA Method 6
	NO _x	EPA Method 7,7E
	VOC	EPA Method 25A
	CO	EPA Method 10

The compliance test report shall be submitted to the Department in accordance with Florida Administrative Code (F.A.C.) Rule 17-2 700(7).

PERMITTEE:
Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida

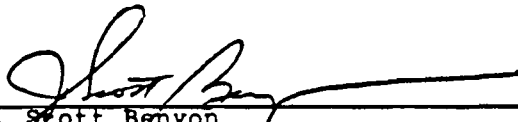
I.D. NUMBER: 50/WPB/56/0003
PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 23 1991
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

4. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source, otherwise the Department may require the test to be repeated or require modification of the permit to reflect tested rates and/or fuels.
5. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.
6. On or before March 1 of each calendar year, a completed DER Form 17-1 202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.
7. Ambient monitoring for particulate and sulfur dioxide is required when fuel oil is used.
8. Copies of all reports, tests, notifications or other submittals required by this permit shall be submitted to both the Department of Environmental Regulation, Southeast District Office and Palm Beach County Public Health Unit.
9. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 thru #14." General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

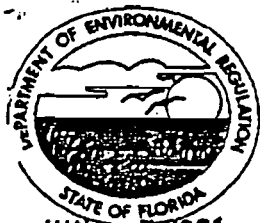
Issued this 23rd day of May, 1991

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



J. Scott Benyon
Deputy Assistant Secretary

BEST AVAILABLE COPY



JUN 7 1991

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406

Lawton Chiles, Governor

Telephone: 407/433-2650

Carol M. Browner, Secretary

Fax: 407/433-2666

St. Lucie County
AP - Ft. Pierce Utilities Authority
Permit Files

RECEIVED

JUN 10 1991

POWER PLANT

Mr. H. P. Lamb
Ft. Pierce Utilities Authority
311 N. Indian River Dr.
Ft. Pierce, Florida 33450

Dear Mr. Lamb

RE: Modification of Conditions, Permit Number AO 56-190255-
190215

We are in receipt of your request for a modification of the permit conditions. The conditions are changed as follows:

Condition #2(a):

FROM:

2. Emission limiting standards are as follows:

a) Units 6, 7, and 8

1. Visible emissions shall not exceed 5% opacity while firing natural gas.

2. The operating permits emission limits for this facility's existing boilers shall not exceed the following rates:

	Unit 6		Unit 7		Unit 8	
Parameter	lbs/hr	ton/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.4	0.0024	0.568	0.382	0.945	3.018
SO _x	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NO _x	1.31	0.007854	104.35	70.126	173.20	552.860
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.2
hrs/yr	12		1344		6384	

The operating permits emission limits for these boilers (units No. 6, 7, and 8) shall be modified as stated above.

TO:

2. The operating permits emissions limits for this facility's existing boilers (unit No. 6, unit No. 7, and unit No. 8) shall not exceed the following rates:

Parameter	Lbs/hr.	Tons/yr.
PM	1.9	3.4
SO ₂	12.7	0.8
NO _x	278.9	622.0
VOC	0.7	1.6
CO	20.3	45.3

Total heat input for the three existing boilers (Nos. 6, 7, and 8) shall not exceed 5,534,930 MBtu per year.

The operating permit's emission limits for these boilers (Nos. 6, 7, and 8) shall be modified as stated above.

IN ACCORDANCE WITH: Mr. Harry Schindehette's letter dated August 3, 1990.

Mr. H. P. Lamb
Ft. Pierce Utilities Authority
Page 2 of 3

RE: Modification of Conditions, Permit Number A0 56-190255-190275

This letter must be attached to the original permit and becomes part of that permit.

A person whose substantial interests are affected by this modification may petition for an administrative proceeding (hearing in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of receipt of this Modification. 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;

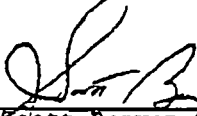
- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action;
- (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 modification. 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 notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This modification is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this modification will not be effective until further Order of the Department.

When the Order (Modification) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


J. Scott Benyon
Deputy Assistant Secretary
1900 South Congress Avenue, Suite A
West Palm Beach, FL 33406

09/10/91 13:40

FPUA DISPATCH

004

Mr. H. P. Lamb
Ft. Pierce Utilities Authority
Page 3 of 3

RE: Modification of Conditions, Permit Number AO 56-190255-
198275

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on June 7, 1991 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Carmella Bugbee
Clerk

6-7-91
Date

JSB:SSB/s20

Copies furnished to:

**RELEVANT CONDITIONS OF CURRENT
UNIT 9 CONSTRUCTION PERMIT
(NO. AC 56-141460)**

AND

**AMENDMENTS
(4/18/90, 11/9/90, AND 6/28/91)**

PERMITTEE:
Ft. Pierce Utilities
Authority

Permit Number: AC 56-141460
Expiration Date: December 1, 1989

SPECIFIC CONDITIONS:

6. Sulfur and nitrogen content of the fuel being fired in the gas turbine shall be determined and recorded as specified in the NSPS for Gas Turbines 40 CFR 60, Subpart GG, Section 60.334. The records of fuel oil usage will be kept by the company, available for regulatory agency's inspection, for a two year period.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart GG, Standards of Performance for stationary gas turbines.

8. The operating permits for this facility shall be modified as follows:

Parameter	Unit 6		Unit 7		Unit 8	
	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.04	0.003	0.568	0.382	0.945	3.017
SOx	12.38	0.074	0.119	0.080	0.191	0.612
NOx	1.31	0.008	104.350	70.126	173.200	552.860
VOC	0.02	0.001	0.266	0.179	0.441	1.407
CO	0.15	0.001	7.589	5.100	12.590	40.200
hrs/yr	12		1344		6384	

9. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, the Department must be notified, in writing 60 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit, (Rule 17-2, FAC).

10. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including the application fee, along with compliance test results and Certificate of Completion, to the Department's Southeast District

PERMITTEE:
Ft. Pierce Utilities
Authority

Permit Number: AC 56-141460
Expiration Date: December 1, 1989

SPECIFIC CONDITIONS:

office 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate, (Rules 17-2 and 17-4, FAC).

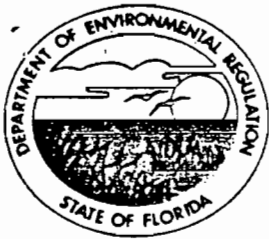
11. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application, (Rule 17-4, FAC).

12. Upon obtaining a permit to operate, the permittee will be required to submit annual reports on the actual operation and emissions of the facility. Annual reports shall be sent to the Department's Southeast District office in West Palm Beach.

Issued this 24 day of March 19 88

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION


Dale Twachtman, Secretary



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

June 28, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette
Director of Utilities
Fort Pierce Utilities Authority
Post Office Box 3191
Fort Pierce, Florida 34948

Dear Mr. Schindehette:

Re: 1) AC 56-141460, 31.6 MW Combined Cycle Gas Turbine
2) Letter Dated 11/9/90 from Smallwood to Schindehette

The Department is in receipt of Hopping Boyd Green & Sam's letter dated June 11, 1991, requesting a permit modification to burn fuel oil in existing boilers Nos. 6, 7, and 8. The Department has reviewed your proposal and has determined, based on our discussions at the June 4, 1991, meeting, to amend Specific Condition No. 8 of your permit (AC 56-141460) as requested.

Specific Condition No. 8 is amended to further include the following:

Fort Pierce Utilities Authority (FPUA) shall be permitted to burn residual fuel oil in Units 6, 7, and 8 in order to avoid curtailing electric power service to its customers. FPUA must provide written notification to the Department's Southeast District office within 24 hours after the commencement of oil firing and furnish the following information:

- a. Duration or projected duration of the event.
- b. Quantity of fuel oil burned or projected to be burned.
- c. A description of significant circumstances precipitating the event. The description shall include the following information:
 1. Availability of power for purchase.
 2. Availability of electric transmission capacity relating to power purchases.
 3. Availability of natural gas.
 4. Availability of FPUA's generation resources.

Mr. Harry Schindehette
Page Two
June 28, 1991

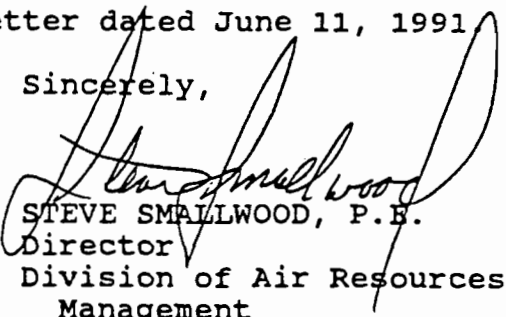
When burning residual fuel oil in Units 6, 7, and 8, the sulfur dioxide (SO₂), particulate matter (PM), and volatile organic compound (VOC) emission limits currently set forth in the permit shall not apply. In lieu of those emission limits, the following emission limits will apply to Units 6, 7, and 8:

	SO ₂ (lb/MMBtu)	PM (lb/MMBtu)	VOC
Unit 6	0.80	n/a	n/a
Unit 7	2.75	0.1	n/a
Unit 8	0.80	0.1	n/a

Attachment to be Incorporated:

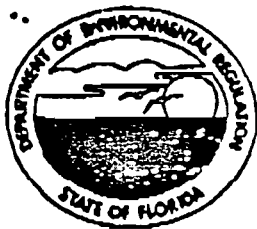
Hopping Boyd Green & Sam's letter dated June 11, 1991

Sincerely,


STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

SS/PL/plm

c: Stephanie Brooks, DER
Carol A. Forthman, OGC
Gary C. Smallridge, OGC
Peter Cunningham, HBGS
Gary V. Perko, HBGS



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

April 18, 1990

Mr. Harry Schindehette
Director of Utilities
Ft. Pierce Utilities Authority
P. O. Box 3191
Ft. Pierce, Florida 33440

Dear Mr. Schindehette:

Re: 31.6 MW Combined Cycle Gas Turbine

As per Ms. Stephanie Brooks' request, your permit AC 56-141460 will be modified as follows:

Specific Condition No. 1

FROM:

1. The maximum emission rates for the 31.6 MW combined cycle gas turbine during natural gas firing shall not exceed the limits required by 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, as follows:

Nitrogen oxides NSPS Standards = $0.0075 \left(\frac{14.4}{Y} \right) + F$

or
= .84 ppm NOx
and

Sulfur dioxide NSPS Standard = 0.015% by volume at 15% oxygen on a dry basis

Visible Emission Not to exceed 15% opacity

Fuel Oil No. 2 Not to exceed 0.5% sulfur content by weight

TO:

1. The maximum emission rates for the 31.6 MW combined cycle gas turbine during natural gas firing shall not exceed the limits required by 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, as follows:

Mr. Harry Schindehette

Page 2

April 18, 1990

Nitrogen oxides NSPS Standards = $0.0075 \frac{(14.4)}{Y} + F$

or
= 84 ppm NOx
and

Sulfur dioxide NSPS Standard = 0.015% by volume at 15% oxygen on a dry basis

Visible Emission Not to exceed 15% opacity

Fuel Oil No. 2 Not to exceed 0.5% sulfur content by weight

Carbon Monoxide Not to exceed 32.85 lbs/hr and 110.4 tons/yr

Specific Condition No. 8

FROM:

The operating permits for this facility shall be modified as follows:

Parameter	Unit 6		Unit 7		Unit 8	
	lbs/hr	ton/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.04	0.0024	0.568	0.382	0.945	3.017
SOx	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NOx	1.31	0.007854	104.35	70.126	173.20	552.86
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.20
hrs/yr	12		1344		6384	

TO:

The operating permits emission limits for this facility's existing boilers shall not exceed the following rates:

Parameter	Unit 6 Circa 1955		Unit 7 1964		Unit 8 1974 61 MW/yr	
	lbs/hr	ton/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.4	0.0024	0.568	0.382	0.945	3.017
SOx	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NOx	1.31	0.007854	104.35	70.126	173.20	552.86
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.20
hrs/yr	12 14 1/2 MW		1344 33 MW		6384 56 MW	

The operating permits emission limits for these boilers (units No. 6, 7, and 8) shall be modified as stated above.

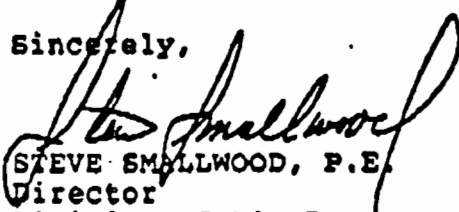
Mr. Harry Schindehette
Page 3
April 18, 1990

Attachment to be Incorporated

Ms. Stephanie Brooks' request

This letter must be attached to the above mentioned permit and shall become a part of the permit.

Sincerely,


STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

SS/TH/plm



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

November 9, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette
Director of Utilities
Ft. Pierce Utilities Authority
P. O. Box 3191
Ft. Pierce, Florida 34948

Dear Mr. Schindehette:

Re: 31.6 MW Combined Cycle Gas Turbine
AC 56-141460

The Department is in receipt of your letter dated August 3, 1990, requesting to delete the annual operating hours for existing boilers No. 6, No. 7, and No. 8 from the above mentioned permit's specific condition No. 8.

The Department has reviewed your proposal and has determined, based on our discussions at the July 24, 1990 meeting, to amend your permit (AC 56-141460) as requested. In order to allow flexibility in your facility's operation without increasing permitted emissions, we will be limiting the total annual emissions and the total annual heat input to the three boilers. Specific condition No. 8 will reflect this modification. Therefore, specific condition No. 8 of permit AC 56-141460 will be changed as follows:

FROM:

The operating permits emissions limits for this facility's existing boilers shall not exceed the following rates:

Parameter	Unit 6		Unit 7		Unit 8	
	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
Part.	0.4	0.0024	0.568	0.382	0.945	3.017
SOx	12.38	0.0743	0.1199	0.0806	0.1917	0.617
NOx	1.31	0.007854	104.35	70.126	173.20	552.86
VOC	0.0236	0.000142	0.266	0.179	0.441	1.407
CO	0.15	0.0009	7.589	5.100	12.59	40.20
hrs/yr	12		1344		6384	

Mr. Harry Schindehette
Page 2

TO:

The operating permits emissions limits for this facility's existing boilers (unit No. 6, unit No. 7, and unit No. 8) shall not exceed the following rates:

<u>Parameter</u>	<u>lbs/hr</u>	<u>tons/yr</u>
PM	1.9	3.4
SO ₂	12.7	0.8
NO _x	278.9	622.0
VOC	0.7	1.6
CO	20.3	45.3

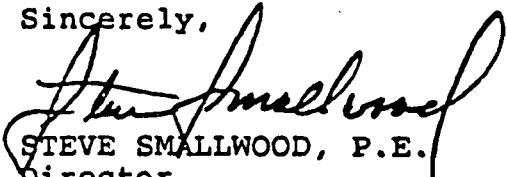
Total heat input for the three existing boilers (Nos. 6, 7, and 8) shall not exceed 4,534,930 MBtu per year.

The operating permit's emission limits for these boilers (Nos. 6, 7, and 8) shall be modified as stated above.

Attachment to be Incorporated:

- Mr. Harry Schindehette's letter dated August 3, 1990.

Sincerely,


STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

SS/TH/plm

c: Stephanie Brooks, DER

HOPPING BOYD GREEN & SAMS

ATTORNEYS AND COUNSELORS

123 SOUTH CALHOUN STREET

POST OFFICE BOX 6526

TALLAHASSEE, FLORIDA 32314

(904) 222-7500

FAX (904) 224-8551

CARLOS ALVAREZ
JAMES S. ALVES
BRIAN H. BIBEAU
KATHLEEN BLIZZARD
ELIZABETH C. BOWMAN
WILLIAM L. BOYD, IV
RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
THOMAS M. DeROSE
WILLIAM H. GREEN
WADE L. HOPPING
FRANK E. MATTHEWS
RICHARD D. MELSON
WILLIAM D. PRESTON
CAROLYN S. RAEPPLE
GARY P. SAMS
ROBERT P. SMITH, JR.
CHERYL G. STUART

RICHARD W. MOORE
ANGELA R. MORRISON
MARIBEL N. NICHOLSON
DIANA M. PARKER
LAURA BOYD PEARCE
GARY V. PERKO
MICHAEL P. PETROVICH
DAVID L. POWELL
DOUGLAS S. ROBERTS
CECELIA C. SMITH

OF COUNSEL
W. ROBERT FOXES

August 19, 1991

Patricia E. Comer, Esquire
Assistant General Counsel
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

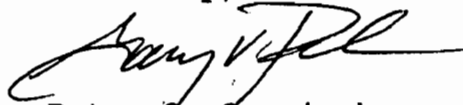
RE: Fort Pierce Utilities Authority
H.D. King Generating Plant - Unit 9
DER Permit Nos. AC56-185836, PSD-FL-154

Dear Pat:

Enclosed, please find a copy of a letter from General Electric which confirms our recent discussion concerning the unavailability of low NO_x burners for Unit 9. As you can see, General Electric currently has no firm schedule or price estimates for low NO_x burners for the Frame 5 turbine.

As discussed on Monday, Fort Pierce Utilities Authority and its consultants are currently looking into the possibility of procuring low NO_x burners for Unit 8 at the H.D. King Plant. We will keep you informed of their progress. In the meantime, please give us a call if you have any questions or comments.

Sincerely,



Peter C. Cunningham
Gary V. Perko

GVP/sdf
Enclosure
cc: Clair Fancy
Barry Andrews
Preston Lewis



GE Industrial
& Power Systems

Michael D. Morris

August 13, 1991

Subject: FT. PIERCE, FLORIDA
FRAME 5 GAS TURBINE
NOx EMISSIONS TECHNOLOGY

Mr. J. B. Miller
Black & Veatch
P. O. Box 8405
Kansas City, MO 64114

Gentlemen:

Thank you for discussing with me the existing GE Frame 5 gas turbine at Ft. Pierce. In addition to your questions about the steam injection capabilities of the existing hardware, you had inquired about the possibility of changing NOx emission control technology from the current steam injection system to a dry low NOx combustion system.

As we have discussed, GE currently offers a dry low NOx combustion system as a new unit option and as a retrofit package on several of the GE gas turbine models. However, the dry low NOx combustion system is not currently available for the Frame 5 gas turbine package for new units nor for retrofit applications. While the dry low NOx technology could be made applicable to the Frame 5 gas turbine, there is currently no firm schedule for the development of the required new technology hardware. Similar to scheduling, there is currently no firm estimate of package pricing for retrofit dry low NOx combustion systems for the Frame 5.

The Frame 5 gas turbine continues to be a viable GE product offering, although the volume of orders for this smallest of the GE gas turbine product line is relatively modest. New Frame 5 gas turbines are currently available with steam injection to control NOx to a level of 42 ppm which has proven adequate for the applications involving the Frame 5.

Should you have any questions about the Frame 5 or other GE turbine products, please let me know.

Best regards,

M. D. Morris

MDM/ka

MDM08131

BLACK & VEATCH

CONFERENCE MEMORANDUM TP-003

Fort Pierce Utilities Authority
PSD Permit Application for Unit 9

B&V Project 16589/070
B&V Files 32.0203
August 12, 1991

Preston -
We need to chat
about this and determine
what needs to be done.
Gary

Meeting was held in the Florida Department of Environmental Regulation Offices in Tallahassee, Florida on August 12, 1991. The purpose of the conference was to review FPUA's response to the DER draft permit and discuss potential methods for eliminating the need for selective catalytic reduction (SCR).

Recorded by: J. B. Miller *JBM*

DER
Pat Comer
Gary Smallridge
Preston Lewis
Steve Dow

Fort Pierce Utilities Authority
Harry Schindehette
Tom Richards
Harry Lamb

Hopping, Boyd, Green & Sams
Peter Cunningham
Gary Perko

Black & Veatch
Jack Miller
John Cochran

The meeting commenced at approximate 2:15 p.m. The major points that were discussed are outlined as follows.

1. HBG&S reviewed the situation as follows. It was noted that the administrative hearing is scheduled for December 9 and 10, 1991. It was acknowledged that selective catalytic reduction (SCR) is technically feasible, however, other Best Available Control Technology (BACT) factors do not support the requirement for SCR if properly considered. The permit application as submitted clearly supports the fact that this is not an air quality environmental issue.
2. HBG&S covered the legal points involving the challenge of the top-down methodology.
3. HBG&S distributed a tabulation comparing the BACT analysis costs with and without retrofit. It was reemphasized that FPUA contends that retrofit costs are legitimate.
4. HBG&S discussed the ammonia issue. An aerial photograph of the City was presented showing the relative location of the power plant to the densely populated downtown area. There was discussion regarding a fatal accident involving ammonia that occurred several years ago in the immediate vicinity of the plant.
5. DER indicated that they would like to have some clarification as to the physical layout of the affected equipment, particularly as it relates to the retrofit requirements for SCR.

Ft. Pierce Utilities Authority
PSD Permit Application for Unit 9

B&V Project 16589.070
August 12, 1991

6. DER indicated that they will be contacting Larry Elmore of the EPA who is the agency expert on SCR.
7. HBG&S pointed out the EPA has set a dollar limit of \$5,000 per ton as the limit above which SCR economics are considered to be prohibitive.
8. DER stated that they are willing to consider other arguments regarding the SCR issue. The matter is not closed at this point. It was indicated that the new Secretary (Secretary Browner) has a much more environmentally oriented perspective than her predecessor.
9. DER indicated that they will consider the additional information that has been provided, and will get back to FPUA by the end of the first week in September.
10. DER also suggested that if something can be done with Units 6, 7 or 8, to reduce their NO_x emissions, it may be possible to consider that as an alternative to SCR.
11. DER indicated that if the hearing can not be held in December as planned, it will have to be postponed until after January, since Pat Comer's schedule is currently blocked through the month of January.
12. It was pointed out that the renewal of the permits for Units 6, 7 and 8 is being held in abeyance pending resolution of the Unit 9 PSD issue.

There was no further discussion and the meeting was adjourned at approximately 3:30 p.m.

smb

cc: All Participants (Except DER)
Don Knighton
Steve Day
Stan Rasmussen

7th Pierce NATG
8/12/91

Hearing Dec 9th 2010 7th Pierce
Issue
DPR

NO_x emission limit that requires
SCR 9 ppm vs 42 ppm by applicant.

Hope to find intermediate level NO_x level.

Do not believe that ^{AW} ~~AW~~ air quality issue
exists. NO deterioration of air quality.

Significant factors in applying SCR involve
cost and other environmental factors.

EPA will go through rule making for
top down policy.

Incremental additional cost is calculated
to be \$780 including retrofit and \$100/ton
including the retrofit cost.

SCR requires the use of ammonia which
has some safety implications. An
explainer took place in 9/83 talking one
and ignoring two others. The community is
concerned by use of ammonia.

low NO_x combustor not feasible according
to GE

25 ppm is the standard on Vero Beach

Explain what can be done to reach
a compromise to get NO_x down

- #6, 7, 8 limitations
- #9 low NO_x burners
-

FT PIERCE
MTG 8/12/91

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PRESTON LEWIS	DER - AIR	(904) 488-1344
PETER CUNNINGHAM	HBS	(904) 222-7500
GARY PERKO	HBS	(904) 222-7500
HARRY LAMB	FPUA	407 464 5792
JOHN COCHRAN	Black & Veatch	913-339-2190
Tom Richards	FPUA	(407) 464-5600
HARRY SCHINDEHETTE	FPUA	407-464-5600
Jack Miller	Black & Veatch	(913) 339-7199
PAT COMER	DER - OGC	(904) 488-9730
GARY SMALDRIDGE	" "	" " "
G. STEVE DOW	" "	" " "

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CECELIA C. SMITH

OF COUNSEL
W. ROBERT FOKES

August 9, 1991

Ms. Patricia E. Comer, Esquire
Assistant General Counsel
Florida Department of Environmental
Regulation

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

RECEIVED

AUG 14 1991

Division of Air
Resources Management

Re: Fort Pierce Utilities Authority
H.D. King Generating Plant - Unit 9
FDER Permit Nos. AC 56-185836, PSD-FL-154
DOAH Case No. 91-3786

Dear Pat:

In preparation for our meeting on Monday, August 12, 1991, we respectfully submit the following comments on behalf of Fort Pierce Utilities Authority ("FPUA"). As discussed below, FPUA stands by its position that a nitrogen oxides ("NOx") emission rate of 42 ppmvd constitutes best available control technology ("BACT") for Unit 9 under the case-by-case analysis required by the Department's current rules.

Background

As you know, the pending permit challenge involves unusual and, to our knowledge, unprecedented circumstances in that the Department has preliminarily determined BACT for an already constructed unit. Unit 9, a natural gas-fired 31.6MW combined cycle unit, began commercial operation in 1989 under a construction permit issued on March 28, 1988 that imposed a NOx emissions rate of 84 ppmvd. When FPUA applied for the original construction permit in October, 1987, an aggressive construction schedule dictated by operating demands necessitated an expedited permitting process. As a result, FPUA obtained creditable offsets for carbon monoxide ("CO") and NOx emissions by proposing operating limits for existing Units 6, 7, and 8. FDER approved the offsets and issued a construction permit without PSD review.

Ms. Patricia E. Comer, Esq.
August 9, 1991
Page 2

In addition to requiring compliance with new source performance standards for NOx emissions from Unit 9, the original Unit 9 permit imposed limits on the hours of operation of Units 6, 7 and 8 to ensure continued maintenance of the creditable offsets. On August 28, 1990, FPUA submitted an application for the PSD permit at issue for the purpose of removing these restrictions on Units 6, 7, and 8. In the PSD permit application, FPUA proposed a NOx emissions rate of 42 ppmvd (at 15% oxygen) as BACT for Unit 9. This emissions rate would require FPUA to achieve a 50% reduction of current permit levels by increasing the steam injection rate of the unit.

In the air quality impact analysis accompanying the PSD permit application, FPUA rejected SCR as BACT for NOx after considering the energy, environmental, and economic factors specified in Rule 17-2.100(28), F.A.C. Since that time, FPUA has performed a revised economic analysis, based on EPA methodology, which establishes the annual incremental cost of SCR to be \$5,840 per ton of NOx removed. In addition, as discussed more fully below, the transportation and on-site storage of ammonia required for an SCR system makes use of SCR at the H.D. King plant particularly inappropriate due to the plant's location in downtown Fort Pierce. Based on these and other significant adverse impacts associated with SCR, including a one percent loss in energy output, FPUA stands by its original conclusion that SCR is inappropriate and unreasonable for Unit 9.

In recent weeks, FPUA has contacted General Electric Corporation ("GE"), the manufacturer of Unit 9, to inquire about low NOx burners for the Frame 5 unit. GE advised FPUA that although low NOx burners are being developed for the larger Frame 6 and 7 machines, due to limited demand GE has no near term plans to develop low NOx burner technology for the smaller Frame 5 turbine. Thus, the 42 ppmvd emissions rate proposed by FPUA, is the lowest guaranteed for a Frame 5 machine. In light of the unavailability of low NOx burners and the inappropriateness of SCR, FPUA maintains that the proposed 42 ppmvd emission rate constitutes BACT for Unit 9.

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DER's Preliminary Determination

As you know, the Department based its preliminary determination on guidance from the U.S. Environmental Protection Agency ("EPA") requiring use of the "top down" approach to BACT determination. However, in order to resolve litigation over this "top down" policy, EPA has since entered a settlement agreement that requires the Agency to propose a new rule describing the criteria to be considered in determining BACT.^{2/} This settlement agreement specifically states:

Until EPA takes final action on the proposed rule, the current PSD regulations, 40 C.F.R. Pts. 51-51, will remain in effect. . . . Any EPA BACT policy statement or interpretation is intended only to guide the implementation of BACT under approved state new source review programs and is not intended to create binding legal rights or obligations and does not have the force and effect of law. 55 Fed. Reg. 23,547, 23,548 (June 11, 1990).

See, Exhibit "A" (emphasis added). Although SCR is unwarranted for Unit 9 even under the "top down" approach, this settlement agreement supports our contention that the Department's reliance on this non-rule policy requires compliance with §120.54 rulemaking procedures before it can be applied in Florida. Moreover, it reinforces the Department's authority, as administrator of Florida's EPA-approved PSD program, to reject the "top down" approach altogether.

^{2/} The settlement agreement involves two separate cases in which various industry groups have challenged EPA's "top down" policy at the federal level, claiming it is inconsistent with the Clean Air Act because it illegally equates BACT with the Lowest Achievable Emission Rate ("LAER") requirement of nonattainment new source review. In addition, the industry petitioners argue that the policy represents such a significant change in methodology that requires notice and comment rulemaking under the Federal Administrative Procedures Act.

Ms. Patricia E. Comer, Esq.
August 9, 1991
Page 4

Regardless of the methodology used, DER's preliminary BACT analysis is seriously flawed. In evaluating the economic impacts of SCR, DER rejected the the cost figures submitted by FPUA. Instead DER based its economic analysis on preliminary cost estimates for SCR on a 40MW combined cycle unit proposed by the City of Vero Beach. Since that time, DER has issued a final permit for the Vero Beach project based on revised cost figures. In the Revised BACT Determination accompanying that permit, DER specifically concluded that the incremental cost of \$5,907 per ton of NOx removed "exceeds costs that have been previously justified as BACT." See, DER Permit No. PSD-FL-154, Revised BACT Determination, p.5 (June 19, 1991). As noted above, based on EPA methodology, the incremental cost of SCR on FPUA's Unit 9 (\$5,840) is comparable to the revised figures for the Vero Beach unit.

In addition to basing its preliminary determination on SCR costs for a completely different project, DER arbitrarily refused to consider the substantial cost of HSRG modifications required for installation of SCR on Unit 9. Guidelines on determining BACT issued by EPA in 1978 and 1990 do not preclude the consideration of retrofit costs in determining BACT for an already constructed source. In fact, we are unaware of any guidance applicable to this unique set of facts. Nevertheless, because they will ultimately be absorbed by FPUA's customers, we believe these retrofit costs should be considered in the BACT analysis for Unit 9.

By failing to consider these retrofit costs in its preliminary determination, the Department has evaluated Unit 9 as if it were never constructed. In effect, the Department has turned the clock back to 1988 for purposes of determining the costs of SCR. However, in evaluating these costs the Department has used cost-effectiveness guidelines that have changed significantly since the time Unit 9 was originally permitted. As late as May 30, 1989, the Department applied guidelines that generally presumed control technologies with incremental costs of more than \$1,000 per ton of NOx removed to be economically prohibitive. See, Final BACT Determination for Tropicana Products, Inc. (May 30, 1989). For the sake of consistency and fairness, we believe the Department should apply these guidelines if it chooses to ignore retrofit costs in the

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Page 5

BACT analysis for Unit 9. In any event, we would emphasize that even if these costs are artificially ignored, the incremental cost of SCR for Unit 9 (\$5,100/ton) is unreasonable.

In addition to its economic impacts, SCR would also have significant site-specific environmental impacts. As noted above, use of SCR at the H.D. King plant would require on-site handling and storage of ammonia in a densely populated area in downtown Fort Pierce. Because ammonia is a potentially hazardous material, any accidental spill during transport or handling at the H.D. King plant could require evacuation of surrounding areas. Due to a previous ammonia storage accident at a former ice plant only blocks from the H.D. King Plant (see attached article), it is likely that a final permit requiring the use of ammonia at this site would meet local opposition.

In any event, the potential hazards related to ammonia are not justified by any air quality benefits associated with SCR. At the proposed 42 ppmvd emission rate, emissions from Unit 9 would result in a maximum NO_x impact of less than ten percent of applicable National Ambient Air Quality Standards ("NAAQS"). When added to the NO_x background and other interacting sources, this impact results in an ambient concentration of only about one third of the NAAQS. In addition, the H.D. King site is not near any ozone or NO_x non-attainment areas. These facts demonstrate that SCR would result in no discernible air quality benefit, particularly if one considers the emissions of unreacted ammonia (approximately 23 tons/year) associated with SCR.

Conclusion

Under the case-by-case BACT analysis required by the Department's current rules, there are no environmental benefits justifying the substantial economic, environmental, and energy impacts associated with installation and use of SCR at the H.D. King plant. Although this conclusion is valid even under the Department's current "top down" BACT policy, we believe the recent federal settlement agreement underscores the need for the Department to complete rulemaking in accordance with §120.54, F.S., before utilizing the "top down" approach in permitting decisions. Consequently, we respectfully request the Department to

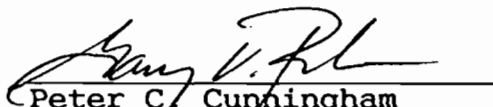
Ms. Patricia E. Comer, Esq.
August 9, 1991
Page 6

reconsider its preliminary BACT determination for Unit 9,
based on the foregoing discussion.

We look forward to meeting with you and DER's air staff
on Monday to discuss potential methods of resolving the
pending permit challenge. In the meantime, if you have and
questions or comments, please do not hesitate to call.

Sincerely,

HOPPING BOYD GREEN & SAMS

By: 
Peter C. Cunningham
Gary V. Perko

Attorneys for Fort Pierce
Utilities Authority

Attachments

cc: Clair Fancy
Barry Andrews ✓
Preston Lewis

GVP/LtrFPUA

SETTLEMENT AGREEMENT

WHEREAS, on July 10, 1989, the American Paper Institute and the National Forest Products Association (collectively API) filed a petition for review of a May 12, 1989 letter by the Administrator of the United States Environmental Protection Agency (EPA) denying API's administrative petition regarding the "top-down" process for determining best available control technology (BACT) under the prevention of significant deterioration (PSD) provisions of the Clean Air Act (CAA), 42 U.S.C. § 7475. API v. Reilly, No. 89-1428 (D.C. Cir.).

WHEREAS, on July 11, 1989, Alabama Power Company, et al. (APC), filed a similar petition for review. APC v. Reilly, No. 89-1429 (D.C. Cir.). The two petitions for review were consolidated on December 14, 1989.

WHEREAS, on July 18, 1989, API filed a complaint concerning the "top-down" process for making BACT determinations. API v. Reilly, No. 89-2030 (D.D.C.).

WHEREAS, on February 1, 1990, the Utility Air Regulatory Group (UARG) submitted an administrative petition concerning EPA's policy and practice on BACT determinations.

WHEREAS, on July 13, 1990, API filed a petition for review of an EPA draft guidance document on BACT determinations. API v. Reilly, No. 90-1364 (D.C. Cir.).

WHEREAS, the parties wish to resolve and settle all five of the judicial and administrative matters listed above without further litigation.

NOW, THEREFORE, without admission of any issues of fact or law, or waiver of any claim or defense, either factual or legal, the parties agree as follows:

SPECIFIC PROVISIONS

1. EPA agrees to publish in the Federal Register, within one hundred eighty (180) days after all of the parties sign this settlement agreement, a proposed rule proposing to revise or clarify the regulations defining BACT (currently codified at 40 C.F.R. §§ 51.166(j), 52.21(j)), and proposing to revise or clarify how BACT determinations should be made.

2. EPA agrees to take final action on the proposed rule as expeditiously as practicable. Nothing in this settlement agreement shall be construed to waive or supersede any procedural or substantive requirements imposed by law.

3. (a) Until EPA takes final action on the proposed rule, the current PSD regulations, 40 C.F.R. Pts. 51-52, will remain in effect. BACT determinations made pursuant to these regulations will continue to be subject to judicial review on a case-by-case basis. Any EPA BACT policy statement or interpretation is intended only to guide the implementation of BACT under approved state new source review programs and is not intended to create binding legal rights or obligations and does not have the force and effect of law. 55 Fed. Reg. 23,547, 23,548 (June 11, 1990).

(b) In addition, if there are any significant questions regarding the application of the current regulations in specific cases, EPA will, upon written request, attempt to resolve any

disputes within the constraints of available resources and in the context of the specific facts of the case.

4. (a) (i) Upon the publication in the Federal Register of a proposed rule pursuant to Paragraph 1, API shall file a notice or stipulation of voluntary dismissal without prejudice pursuant to Fed. R. Civ. P. 41(a)(1) in API v. Reilly, No. 89-2030 (D.D.C.);
- (ii) Upon the publication in the Federal Register of a proposed rule pursuant to Paragraph 1, API and APC shall file motions to stay the litigation in API v. Reilly, No. 90-1364 (D.C. Cir.), and API v. Reilly, No. 89-1428 and consolidated case (D.C. Cir.), pending completion of all the activities called for in this agreement;
- (iii) Upon completion of all the activities called for in this agreement, API and APC shall file motions for voluntary dismissal pursuant to Fed. R. App. P. 42(b) in API v. Reilly, No. 90-1364 (D.C. Cir.), and API v. Reilly, No. 89-1428 and consolidated case (D.C. Cir.); and
- (iv) Upon completion of all the activities called for in this agreement, UARG shall withdraw the February 1, 1990 administrative petition. In the interim, UARG shall take no action whatsoever to pursue the administrative petition, and EPA shall

be under no obligation to take action on the administrative petition.

(b) Each party shall bear its own costs, including attorneys' fees, in the underlying judicial or administrative matters.

5. The actions EPA agrees to undertake in this settlement agreement are not judicially enforceable. If EPA does not take final action on the proposed rule within one year after publication in the Federal Register, API's, APC's and UARG's sole remedy is to reopen or reactivate the underlying judicial or administrative matters.

6. The parties agree and acknowledge that final approval of this settlement agreement is subject to the requirements of section 113(g) of the CAA, as added by section 701 of the CAA Amendments of 1990. Pursuant to that provision, EPA shall publish notice of this settlement agreement in the Federal Register, the public shall have at least thirty (30) days to make comments, and the Administrator or Attorney General shall consider any comments in deciding whether to consent to this agreement.

GENERAL PROVISIONS

7. The parties may agree in writing to modify any provision of this settlement agreement.

8. It is the intent of the parties to this settlement agreement that the individual paragraphs of this agreement are severable, and should any paragraph of this agreement be declared

by a court of competent jurisdiction to be invalid, the remaining paragraphs of the agreement shall remain in full force and effect.

9. This is the entire settlement agreement between the parties with respect to the issues raised in the five judicial and administrative matters identified in Paragraph 4 above. All prior conversations, meetings, discussions, drafts and writings of any kind are specifically superceded by this settlement agreement and may not be used by the parties to vary or contest the terms of this agreement, or as evidence of the parties' intent in entering into this agreement.

10. This settlement agreement is being entered into so as to avoid further litigation. Nothing in this settlement agreement shall be construed to constitute an admission of any issue of fact, law or liability by any of the parties. Specifically, API, APC, and UARG do not waive any claims against EPA, and EPA does not waive any defenses to any claims by API, APC, and UARG.

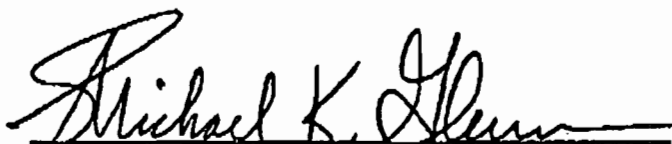
11. Each party shall bear its own costs, including attorneys' fees, in monitoring, overseeing or implementing this settlement agreement, and in participating in the administrative proceedings contemplated by this agreement.

12. The individuals signing this settlement agreement on behalf of the parties hereby certify that they are authorized to bind the respective parties to the terms of this agreement.

//

DATE:

July 9, 1991



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1123 20th Street, N.W.
Washington D.C. 20036
(202) 778-3050

Attorney for API

DATE:

July 9, 1991

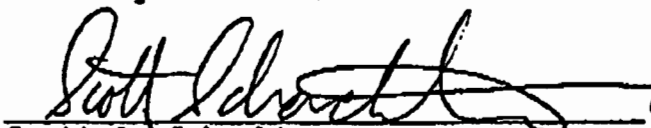


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7/10/91



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Attorneys for EPA

The News Tribune

For. 9/16/83

Our 80th Year

Fort Pierce/Port St. Lucie, Florida

Complete Closing Stocks

Ice plant explosion injures 17

By Peter Williams
and Ann McCallum
News Tribune Writers

The manager of a downtown Fort Pierce ice plant, a supervisor, and two workmen were critically burned Thursday when a tank be-

ing filled with ammonia exploded at the plant.

The explosion spewed a white cloud of the searing gas into downtown streets and windows and caused 13 downtown Fort Pierce residents and shoppers to seek medical treatment.

Authorities moved quickly to evacuate homes and shops near the Royal Palm Ice Company on Avenue B and North Second Street.

Two of the employees were transferred by air from Lawnwood Medical Center to burn centers in

Orlando and Miami, and two others were admitted to Lawnwood's intensive care unit.

Five persons were admitted for respiratory distress and at least eight others were released after treatment for exposure to the gas, the hospital spokesman said.

Midday heat might have triggered the explosion, but the timing also saved those plant employees who had gone to lunch from serious injury, said Fire Chief Russell Rogers.

The explosion occurred at 12:12

p.m. in a tank on the south side of the ice company building, 218 Avenue B. There was no fire, but the ammonia gas could be detected up to a mile and a half away.

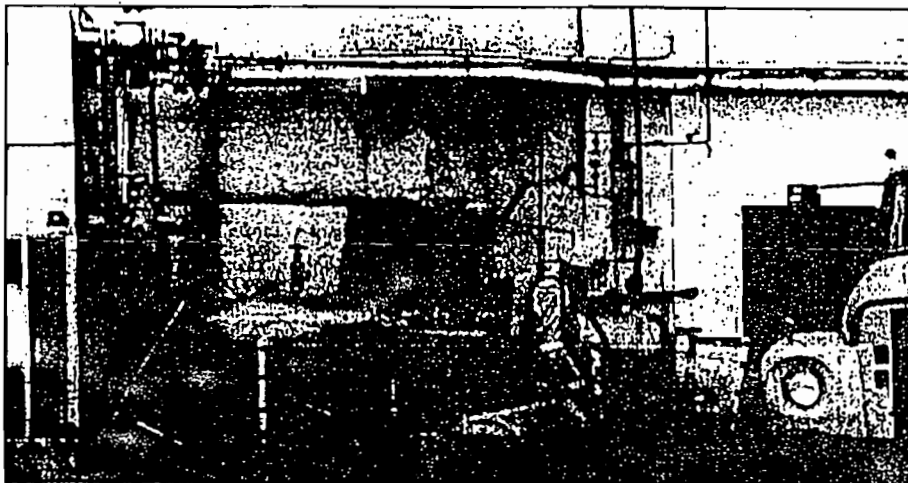
Bystanders at the scene said four men were filling a small tank with ammonia from a larger tank, when the small tank exploded.

"We don't know yet whether they overfilled it or there was a weak spot in the little tank," said Rogers Thursday night. The little tank's usual pressure ranges from 250 to 1,000 pounds of pressure per

square inch, Rogers said.

The ammonia is cool when it is used as a refrigerant, he said, but heats up as the ice is made. The

Turn to *Explosion*, page A2



Part of the shell of tank that exploded is visible in front of larger storage tank

Names of the injured

In the wake of the ice plant explosion Thursday, the following persons were treated for skin burns:

- Joe Caudill, 53, 723 FFA Rd., Fort Pierce, ICU, flown to Orlando burn unit.
- Edward Dominguez, 51, Glades Cut-Off Road, White City, ICU, flown to Jackson Memorial Hospital.
- Danny Gibson, 32, Leesburg, Fla., ICU.
- Carl McCormick, 33, West Palm Beach, ICU.

The following were treated for respiratory distress:

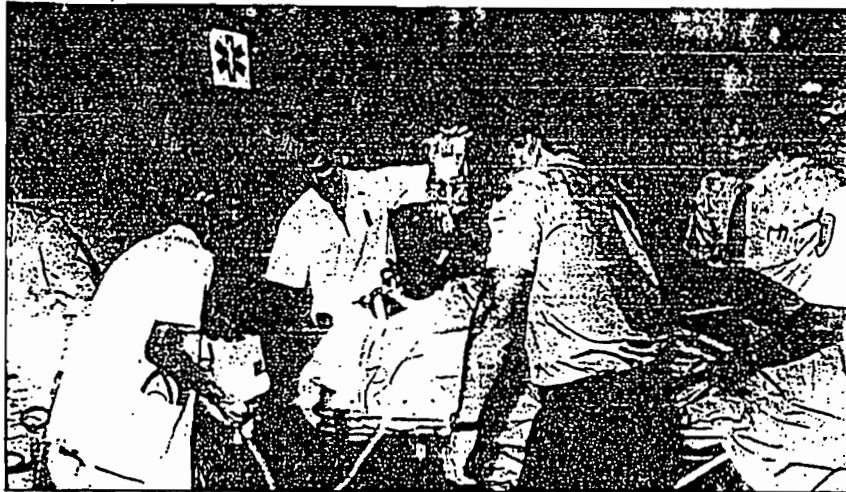
- Nancy Lantz, Vero Beach, admitted, fair.
- Jeanne Vickers, Fort Pierce, admitted, fair.
- Helen Goldman, North Lauderdale, admitted, fair.
- Stuart Goldman, North Lauderdale, admitted, fair.
- Leonard Stark, Fort Pierce, admitted, fair.

Lawnwood also treated and released eight persons complaining of respiratory distress.



Firemen check building

9/16/83



News Tribune photo by Jean Dale Brown

Critically injured explosion victim Joe Caudill (photo above) is taken to plane for flight to an Orlando burn center Thursday evening. Earlier (photo at right), Fort Pierce resident Barbara Stokes appears to be affected by ammonia fumes



AP Wirephoto

Explosion

From page A1

heat of the sun may have increased the temperature of the gas — and the pressure, he said.

Rogers said he could not confirm the report until fire inspectors Walter Wile and Murray "Lucky" Noyes had made a complete examination, but he denied that any chlorine was in use. Rogers said the inspectors plan to submit their report this morning.

As six persons were loaded in ambulances, police blocked off downtown intersections against spectators. Firemen using air tanks and masks conducted a house-to-house search for residents, shoppers and businessmen who might have been burned by the escaping ammonia.

At the city hall annex, about 200 yards away, employees said the explosion was a "low-pitched boom."

Keith Hendrick, owner of the Music Bin south of the explosion site and across Avenue A, said he was in a back room when he heard "a thunderous roar."

"I came out and saw this gigantic white cloud, and this one guy running away covering his face."

A half-block from the plant on Avenue A, Greg Trennepohl, ran out of the Downtown Discount Clothing store, stopped some men whose clothes were burning, told

them to strip and washed them down with a hose.

"I saw chemical fire coming off their clothes. I told them to get their clothes off. They did and I sprayed them with the hose."

Trennepohl said he wasn't a hero: "I just did what anybody else would have done. I knew these people. They cash their paychecks at the store."

Joe Caudill, 53, of 723 FFA Rd., Fort Pierce, a maintenance man at the plant for the last four years, was flown to Orlando for treatment of burns covering 32 percent of his body. Edward Dominguez, 51, of Glades Cut-off Rd., White City, an ice plant supervisor, with second-degree burns over 90 percent of his body, was flown to Jackson Memorial Hospital.

The manager, Carl McCormick, 33, and workman Danny Gibson, 32, were placed in Lawnwood's Intensive Care Unit in critical condition.

Five other persons were admitted to the hospital. They were: Nancy Lantz; Jeanne Vickers; Helen Goldman; Stuart Goldman; and Leonard Stark.

The hospital sent out a call for blood donors.

Police Chief James A. "Bo" Powell said he had reports that the

cloud of ammonia spread all the way to U.S. 1 and Virginia Avenue, a distance of about a mile and a half.

Firemen had trouble shutting off valves that were leaking the gas for more than an hour after the explosion. Finally, two firefighters wearing special hazard suits were able to plug the leaks, Rogers said.

Other than the destruction of the ammonia tank, the only damage at the plant appeared to be a ruptured pipe on the compressor that poured a steady stream of water into Avenue A.

Two fire engines, three ambulances and 20 firefighters were called out for the emergency, Rogers said. Powell called in the next shift an hour early so officers who had been exposed to the ammonia could clean up.

The ice company has been around since 1919; longer than most structures in the downtown area.

The firm largely is responsible for the placement of the Fort Pierce Utilities Authority generating station across North Second Street, oldtimers say.

The story goes that the ice company owned a generator and sold enough power to the city to run

five street lights. When the generator broke in the early 1920s and the ice company opted not to fix it, the city raised \$15,000 to buy and repair the heavy equipment.

8/12/91

PT Pierce #9

Table 2. SCR System
Retrofit Cost Comparison

	With Retrofit \$1,000	Without Retrofit \$1,000
Capital Costs:		
SCR System	930	930
HRSG Modifications	590	0
System Erection	520	210
Differential Balance of Plant	<u>70</u>	<u>70</u>
1991 Capital Cost	2,110	1,210
Contingency (15%)	320	180
Escalation (6%)	<u>180</u>	<u>110</u>
Direct Capital Cost	2,610	1,500
Indirects (16%)	420	240
Interest During Construction (8%)	<u>60</u>	<u>30</u>
1993 Total Capital Cost	3,090	1,770
Levelized Annual Costs:		
Operating Personnel	70	70
Maintenance	510	510
Ammonia	50	50
Energy	40	40
Lost Generation	<u>170</u>	<u>170</u>
1993 Annual Operating Cost	840	840
Fixed Charges on Capital (13.6%)	<u>340</u>	<u>190</u>
1993 Total Annual Cost	1,180	1,030
 Nitrogen Oxides Emission Rate, ppmvd	 9	 9
Annual NO _x Emission Reduction, tpy	202	202
NO _x Emission Reduction Cost, \$/ton	5,840	5,100

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W. ROBERT FOXES

August 9, 1991

Ms. Patricia E. Comer, Esquire
Assistant General Counsel
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Fort Pierce Utilities Authority
H.D. King Generating Plant - Unit 9
FDER Permit Nos. AC 56-185836, PSD-FL-154
DOAH Case No. 91-3786

Dear Pat:

In preparation for our meeting on Monday, August 12, 1991, we respectfully submit the following comments on behalf of Fort Pierce Utilities Authority ("FPUA"). As discussed below, FPUA stands by its position that a nitrogen oxides ("NOx") emission rate of 42 ppmvd constitutes best available control technology ("BACT") for Unit 9 under the case-by-case analysis required by the Department's current rules.

Background

As you know, the pending permit challenge involves unusual and, to our knowledge, unprecedented circumstances in that the Department has preliminarily determined BACT for an already constructed unit. Unit 9, a natural gas-fired 31.6MW combined cycle unit, began commercial operation in 1989 under a construction permit issued on March 28, 1988 that imposed a NOx emissions rate of 84 ppmvd. When FPUA applied for the original construction permit in October, 1987, an aggressive construction schedule dictated by operating demands necessitated an expedited permitting process. As a result, FPUA obtained creditable offsets for carbon monoxide ("CO") and NOx emissions by proposing operating limits for existing Units 6, 7, and 8. FDER approved the offsets and issued a construction permit without PSD review.

would SCR
have been
legal on
3/28/88
when permit
was issued

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Page 2

In addition to requiring compliance with new source performance standards for NOx emissions from Unit 9, the original Unit 9 permit imposed limits on the hours of operation of Units 6, 7 and 8 to ensure continued maintenance of the creditable offsets. On August 28, 1990, FPUA submitted an application for the PSD permit at issue for the purpose of removing these restrictions on Units 6, 7, and 8. In the PSD permit application, FPUA proposed a NOx emissions rate of 42 ppmvd (at 15% oxygen) as BACT for Unit 9. This emissions rate would require FPUA to achieve a 50% reduction of current permit levels by increasing the steam injection rate of the unit. ✓

In the air quality impact analysis accompanying the PSD permit application, FPUA rejected SCR as BACT for NOx after considering the energy, environmental, and economic factors specified in Rule 17-2.100(28), F.A.C. Since that time, FPUA has performed a revised economic analysis, based on EPA methodology, which establishes the annual incremental cost of SCR to be \$5,840 per ton of NOx removed. In addition, as discussed more fully below, the transportation and on-site storage of ammonia required for an SCR system makes use of SCR at the H.D. King plant particularly inappropriate due to the plant's location in downtown Fort Pierce. Based on these and other significant adverse impacts associated with SCR, including a one percent loss in energy output, FPUA stands by its original conclusion that SCR is inappropriate and unreasonable for Unit 9.

In recent weeks, FPUA has contacted General Electric Corporation ("GE"), the manufacturer of Unit 9, to inquire about low NOx burners for the Frame 5 unit. GE advised FPUA that although low NOx burners are being developed for the larger Frame 6 and 7 machines, due to limited demand GE has no near term plans to develop low NOx burner technology for the smaller Frame 5 turbine. Thus, the 42 ppmvd emissions rate proposed by FPUA, is the lowest guaranteed for a Frame 5 machine. In light of the unavailability of low NOx burners and the inappropriateness of SCR, FPUA maintains that the proposed 42 ppmvd emission rate constitutes BACT for Unit 9. *one committed to installing them*

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DER's Preliminary Determination

As you know, the Department based its preliminary determination on guidance from the U.S. Environmental Protection Agency ("EPA") requiring use of the "top down" approach to BACT determination. However, in order to resolve litigation over this "top down" policy, EPA has since entered a settlement agreement that requires the Agency to propose a new rule describing the criteria to be considered in determining BACT.^{2/} This settlement agreement specifically states:

Until EPA takes final action on the proposed rule, the current PSD regulations, 40 C.F.R. Pts. 51-51, will remain in effect. . . . Any EPA BACT policy statement or interpretation is intended only to guide the implementation of BACT under approved state new source review programs and is not intended to create binding legal rights or obligations and does not have the force and effect of law. 55 Fed. Reg. 23,547, 23,548 (June 11, 1990).

See, Exhibit "A" (emphasis added). Although SCR is unwarranted for Unit 9 even under the "top down" approach, this settlement agreement supports our contention that the Department's reliance on this non-rule policy requires compliance with §120.54 rulemaking procedures before it can be applied in Florida. Moreover, it reinforces the Department's authority, as administrator of Florida's EPA-approved PSD program, to reject the "top down" approach altogether.

^{2/} The settlement agreement involves two separate cases in which various industry groups have challenged EPA's "top down" policy at the federal level, claiming it is inconsistent with the Clean Air Act because it illegally equates BACT with the Lowest Achievable Emission Rate ("LAER") requirement of nonattainment new source review. In addition, the industry petitioners argue that the policy represents such a significant change in methodology that requires notice and comment rulemaking under the Federal Administrative Procedures Act.

Ms. Patricia E. Comer, Esq.
August 9, 1991
Page 4

Regardless of the methodology used, DER's preliminary BACT analysis is seriously flawed. In evaluating the economic impacts of SCR, DER rejected the the cost figures submitted by FPUA. Instead DER based its economic analysis on preliminary cost estimates for SCR on a 40MW combined cycle unit proposed by the City of Vero Beach. Since that time, DER has issued a final permit for the Vero Beach project based on revised cost figures. In the Revised BACT Determination accompanying that permit, DER specifically concluded that the incremental cost of \$5,907 per ton of NOx removed "exceeds costs that have been previously justified as BACT." See, DER Permit No. PSD-FL-154, Revised BACT Determination, p.5 (June 19, 1991). As noted above, based on EPA methodology, the incremental cost of SCR on FPUA's Unit 9 (\$5,840) is comparable to the revised figures for the Vero Beach unit. ✓

In addition to basing its preliminary determination on SCR costs for a completely different project, DER arbitrarily refused to consider the substantial cost of HSRG modifications required for installation of SCR on Unit 9. Guidelines on determining BACT issued by EPA in 1978 and 1990 do not preclude the consideration of retrofit costs in determining BACT for an already constructed source. In fact, we are unaware of any guidance applicable to this unique set of facts. Nevertheless, because they will ultimately be absorbed by FPUA's customers, we believe these retrofit costs should be considered in the BACT analysis for Unit 9.

By failing to consider these retrofit costs in its preliminary determination, the Department has evaluated Unit 9 as if it were never constructed. In effect, the Department has turned the clock back to 1988 for purposes of determining the costs of SCR. However, in evaluating these costs the Department has used cost-effectiveness guidelines that have changed significantly since the time Unit 9 was originally permitted. As late as May 30, 1989, the Department applied guidelines that generally presumed control technologies with incremental costs of more than \$1,000 per ton of NOx removed to be economically prohibitive. See, Final BACT Determination for Tropicana Products, Inc. (May 30, 1989). For the sake of consistency and fairness, we believe the Department should apply these guidelines if it chooses to ignore retrofit costs in the

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BACT analysis for Unit 9. In any event, we would emphasize that even if these costs are artificially ignored, the incremental cost of SCR for Unit 9 (\$5,100/ton) is unreasonable.

In addition to its economic impacts, SCR would also have significant site-specific environmental impacts. As noted above, use of SCR at the H.D. King plant would require on-site handling and storage of ammonia in a densely populated area in downtown Fort Pierce. Because ammonia is a potentially hazardous material, any accidental spill during transport or handling at the H.D. King plant could require evacuation of surrounding areas. Due to a previous ammonia storage accident at a former ice plant only blocks from the H.D. King Plant (see attached article), it is likely that a final permit requiring the use of ammonia at this site would meet local opposition.

In any event, the potential hazards related to ammonia are not justified by any air quality benefits associated with SCR. At the proposed 42 ppmvd emission rate, emissions from Unit 9 would result in a maximum NO_x impact of less than ten percent of applicable National Ambient Air Quality Standards ("NAAQS"). When added to the NO_x background and other interacting sources, this impact results in an ambient concentration of only about one third of the NAAQS. In addition, the H.D. King site is not near any ozone or NO_x non-attainment areas. These facts demonstrate that SCR would result in no discernible air quality benefit, particularly if one considers the emissions of unreacted ammonia (approximately 23 tons/year) associated with SCR.

Conclusion

Under the case-by-case BACT analysis required by the Department's current rules, there are no environmental benefits justifying the substantial economic, environmental, and energy impacts associated with installation and use of SCR at the H.D. King plant. Although this conclusion is valid even under the Department's current "top down" BACT policy, we believe the recent federal settlement agreement underscores the need for the Department to complete rulemaking in accordance with §120.54, F.S., before utilizing the "top down" approach in permitting decisions. Consequently, we respectfully request the Department to

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reconsider its preliminary BACT determination for Unit 9,
based on the foregoing discussion.

We look forward to meeting with you and DER's air staff
on Monday to discuss potential methods of resolving the
pending permit challenge. In the meantime, if you have and
questions or comments, please do not hesitate to call.

Sincerely,

HOPPING BOYD GREEN & SAMS

By: 
Peter C. Cunningham
Gary V. Perko

Attorneys for Fort Pierce
Utilities Authority

Attachments

cc: Clair Fancy ✓
Barry Andrews
Preston Lewis

GVP/LtrFPUA

SETTLEMENT AGREEMENT

WHEREAS, on July 10, 1989, the American Paper Institute and the National Forest Products Association (collectively API) filed a petition for review of a May 12, 1989 letter by the Administrator of the United States Environmental Protection Agency (EPA) denying API's administrative petition regarding the "top-down" process for determining best available control technology (BACT) under the prevention of significant deterioration (PSD) provisions of the Clean Air Act (CAA), 42 U.S.C. § 7475. API v. Reilly, No. 89-1428 (D.C. Cir.).

WHEREAS, on July 11, 1989, Alabama Power Company, et al. (APC), filed a similar petition for review. APC v. Reilly, No. 89-1429 (D.C. Cir.). The two petitions for review were consolidated on December 14, 1989.

WHEREAS, on July 18, 1989, API filed a complaint concerning the "top-down" process for making BACT determinations. API v. Reilly, No. 89-2030 (D.D.C.).

WHEREAS, on February 1, 1990, the Utility Air Regulatory Group (UARG) submitted an administrative petition concerning EPA's policy and practice on BACT determinations.

WHEREAS, on July 13, 1990, API filed a petition for review of an EPA draft guidance document on BACT determinations. API v. Reilly, No. 90-1364 (D.C. Cir.).

WHEREAS, the parties wish to resolve and settle all five of the judicial and administrative matters listed above without further litigation.

NOW, THEREFORE, without admission of any issues of fact or law, or waiver of any claim or defense, either factual or legal, the parties agree as follows:

SPECIFIC PROVISIONS

1. EPA agrees to publish in the Federal Register, within one hundred eighty (180) days after all of the parties sign this settlement agreement, a proposed rule proposing to revise or clarify the regulations defining BACT (currently codified at 40 C.F.R. §§ 51.166(j), 52.21(j)), and proposing to revise or clarify how BACT determinations should be made.

2. EPA agrees to take final action on the proposed rule as expeditiously as practicable. Nothing in this settlement agreement shall be construed to waive or supersede any procedural or substantive requirements imposed by law.

3. (a) Until EPA takes final action on the proposed rule, the current PSD regulations, 40 C.F.R. Pts. 51-52, will remain in effect. BACT determinations made pursuant to these regulations will continue to be subject to judicial review on a case-by-case basis. Any EPA BACT policy statement or interpretation is intended only to guide the implementation of BACT under approved state new source review programs and is not intended to create binding legal rights or obligations and does not have the force and effect of law. 55 Fed. Reg. 23,547, 23,548 (June 11, 1990).

(b) In addition, if there are any significant questions regarding the application of the current regulations in specific cases, EPA will, upon written request, attempt to resolve any

disputes within the constraints of available resources and in the context of the specific facts of the case.

4. (a) (i) Upon the publication in the Federal Register of a proposed rule pursuant to Paragraph 1, API shall file a notice or stipulation of voluntary dismissal without prejudice pursuant to Fed. R. Civ. P. 41(a)(1) in API v. Reilly, No. 89-2030 (D.D.C.);
- (ii) Upon the publication in the Federal Register of a proposed rule pursuant to Paragraph 1, API and APC shall file motions to stay the litigation in API v. Reilly, No. 90-1364 (D.C. Cir.), and API v. Reilly, No. 89-1428 and consolidated case (D.C. Cir.), pending completion of all the activities called for in this agreement;
- (iii) Upon completion of all the activities called for in this agreement, API and APC shall file motions for voluntary dismissal pursuant to Fed. R. App. P. 42(b) in API v. Reilly, No. 90-1364 (D.C. Cir.), and API v. Reilly, No. 89-1428 and consolidated case (D.C. Cir.); and
- (iv) Upon completion of all the activities called for in this agreement, UARG shall withdraw the February 1, 1990 administrative petition. In the interim, UARG shall take no action whatsoever to pursue the administrative petition, and EPA shall

be under no obligation to take action on the administrative petition.

(b) Each party shall bear its own costs, including attorneys' fees, in the underlying judicial or administrative matters.

5. The actions EPA agrees to undertake in this settlement agreement are not judicially enforceable. If EPA does not take final action on the proposed rule within one year after publication in the Federal Register, API's, APC's and UARG's sole remedy is to reopen or reactivate the underlying judicial or administrative matters.

6. The parties agree and acknowledge that final approval of this settlement agreement is subject to the requirements of section 113(g) of the CAA, as added by section 701 of the CAA Amendments of 1990. Pursuant to that provision, EPA shall publish notice of this settlement agreement in the Federal Register, the public shall have at least thirty (30) days to make comments, and the Administrator or Attorney General shall consider any comments in deciding whether to consent to this agreement.

GENERAL PROVISIONS

7. The parties may agree in writing to modify any provision of this settlement agreement.

8. It is the intent of the parties to this settlement agreement that the individual paragraphs of this agreement are severable, and should any paragraph of this agreement be declared

by a court of competent jurisdiction to be invalid, the remaining paragraphs of the agreement shall remain in full force and effect.

9. This is the entire settlement agreement between the parties with respect to the issues raised in the five judicial and administrative matters identified in Paragraph 4 above. All prior conversations, meetings, discussions, drafts and writings of any kind are specifically superceded by this settlement agreement and may not be used by the parties to vary or contest the terms of this agreement, or as evidence of the parties' intent in entering into this agreement.

10. This settlement agreement is being entered into so as to avoid further litigation. Nothing in this settlement agreement shall be construed to constitute an admission of any issue of fact, law or liability by any of the parties. Specifically, API, APC, and UARG do not waive any claims against EPA, and EPA does not waive any defenses to any claims by API, APC, and UARG.

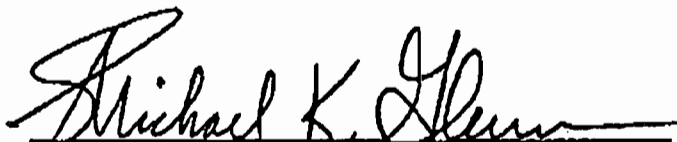
11. Each party shall bear its own costs, including attorneys' fees, in monitoring, overseeing or implementing this settlement agreement, and in participating in the administrative proceedings contemplated by this agreement.

12. The individuals signing this settlement agreement on behalf of the parties hereby certify that they are authorized to bind the respective parties to the terms of this agreement.

//

DATE:

July 9, 1991



Michael K. Glenn, Esq.
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Washington D.C. 20036
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Attorney for API

DATE:

July 9, 1991

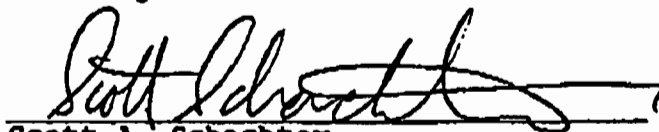


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DATE:

7/10/91



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Attorneys for EPA

The News Tribune

For 9/16/83

Our 80th Year

Fort Pierce/Port St. Lucie, Fla.

Complete Closing Stocks

Ice plant explosion injures 17

By Peter Williams
and Ann McCallum
News Tribune Writers

The manager of a downtown Fort Pierce ice plant, a supervisor, and two workmen were critically burned Thursday when a tank be-

ing filled with ammonia exploded at the plant.

The explosion spewed a white cloud of the searing gas into downtown streets and windows and caused 13 downtown Fort Pierce residents and shoppers to seek medical treatment.

Authorities moved quickly to evacuate homes and shops near the Royal Palm Ice Company on Avenue B and North Second Street.

Two of the employees were transferred by air from Lawnwood Medical Center to burn centers in

Orlando and Miami, and two others were admitted to Lawnwood's intensive care unit.

Five persons were admitted for respiratory distress and at least eight others were released after treatment for exposure to the gas, the hospital spokesman said.

Midday heat might have triggered the explosion, but the timing also saved those plant employees who had gone to lunch from serious injury, said Fire Chief Russell Rogers.

The explosion occurred at 12:12

p.m. in a tank on the south side of the ice company building, 218 Avenue B. There was no fire, but the ammonia gas could be detected up to a mile and a half away.

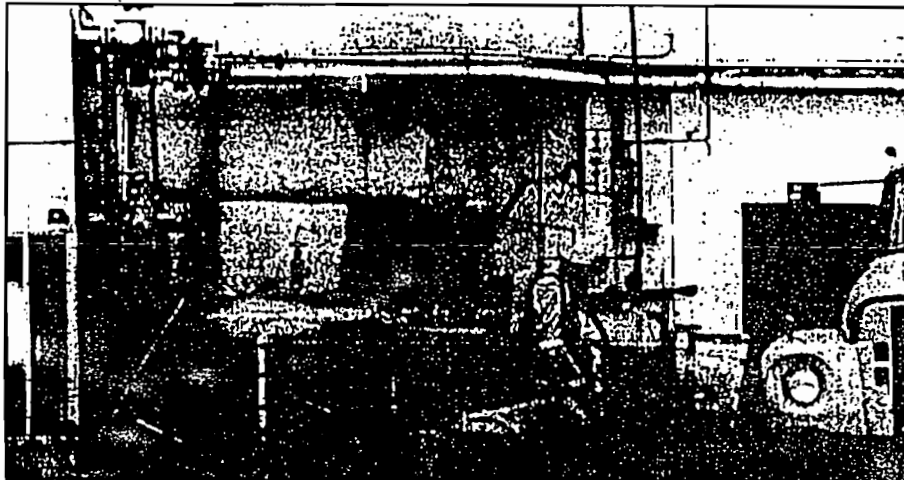
Bystanders at the scene said four men were filling a small tank with ammonia from a larger tank, when the small tank exploded.

"We don't know yet whether they overfilled it or there was a weak spot in the little tank," said Rogers Thursday night. The little tank's usual pressure ranges from 250 to 1,000 pounds of pressure per

square inch, Rogers said.

The ammonia is cool when it is used as a refrigerant, he said, but heats up as the ice is made. The

Turn to *Explosion*, page A2



Part of the shell of tank that exploded is visible in front of larger storage tank

Names of the injured

In the wake of the ice plant explosion Thursday, the following persons were treated for skin burns:

- Joe Caudill, 53, 723 FFA Rd., Fort Pierce, ICU, flown to Orlando burn unit.
 - Edward Dominguez, 51, Glades Cut-Off Road, White City, ICU, flown to Jackson Memorial Hospital.
 - Danny Gibson, 32, Leesburg, Fla., ICU.
 - Carl McCormick, 33, West Palm Beach, ICU.
- The following were treated for respiratory distress:
- Nancy Lantz, Vero Beach, admitted, fair.
 - Jeanne Vickers, Fort Pierce, admitted, fair.
 - Helen Goldman, North Lauderdale, admitted, fair.
 - Stuart Goldman, North Lauderdale, admitted, fair.
 - Leonard Stark, Fort Pierce, admitted, fair.

Lawnwood also treated and released eight persons complaining of respiratory distress.



Firemen check building

9/16/83



News Tribune photo by Joan Dale Brown

Critically injured explosion victim Joe Caudill (photo above) is taken to plane for flight to an Orlando burn center Thursday evening. Earlier (photo at right), Fort Pierce resident Barbara Stokes appears to be affected by ammonia fumes



AP Wirephoto

Explosion

From page A1

heat of the sun may have increased the temperature of the gas — and the pressure, he said.

Rogers said he could not confirm the report until fire inspectors Walter Wile and Murray "Lucky" Noyes had made a complete examination, but he denied that any chlorine was in use. Rogers said the inspectors plan to submit their report this morning.

As six persons were loaded in ambulances, police blocked off downtown intersections against spectators. Firemen using air tanks and masks conducted a house-to-house search for residents, shoppers and businessmen who might have been burned by the escaping ammonia.

At the city hall annex, about 200 yards away, employees said the explosion was a "low-pitched boom."

Keith Hendrick, owner of the Music Bin south of the explosion site and across Avenue A, said he was in a back room when he heard "a thunderous roar."

"I came out and saw this gigantic white cloud, and this one guy running away covering his face."

A half-block from the plant on Avenue A, Greg Trennepohl, ran out of the Downtown Discount Clothing store, stopped some men whose clothes were burning, told

them to strip and washed them down with a hose.

"I saw chemical fire coming off their clothes. I told them to get their clothes off. They did and I sprayed them with the hose."

Trennepohl said he wasn't a hero: "I just did what anybody else would have done. I knew these people. They cash their paychecks at the store."

Joe Caudill, 53, of 723 FFA Rd., Fort Pierce, a maintenance man at the plant for the last four years, was flown to Orlando for treatment of burns covering 32 percent of his body. Edward Dominquez, 51, of Glades Cut-off Rd., White City, an ice plant supervisor, with second-degree burns over 90 percent of his body, was flown to Jackson Memorial Hospital.

The manager, Carl McCormick, 32, and workman Danny Gibson, 32, were placed in Lawnwood's Intensive Care Unit in critical condition.

Five other persons were admitted to the hospital. They were: Nancy Lantz; Jeanne Vickers; Helen Goldman; Stuart Goldman; and Leonard Stark.

The hospital sent out a call for blood donors.

Police Chief James A. "Bo" Powell said he had reports that the

cloud of ammonia spread all the way to U.S. 1 and Virginia Avenue, a distance of about a mile and a half.

Firemen had trouble shutting off valves that were leaking the gas for more than an hour after the explosion. Finally, two firefighters wearing special hazard suits were able to plug the leaks, Rogers said.

Other than the destruction of the ammonia tank, the only damage at the plant appeared to be a ruptured pipe on the compressor that poured a steady stream of water into Avenue A.

Two fire engines, three ambulances and 20 firefighters were called out for the emergency, Rogers said. Powell called in the next shift an hour early so officers who had been exposed to the ammonia could clean up.

The ice company has been around since 1919; longer than most structures in the downtown area.

The firm largely is responsible for the placement of the Fort Pierce Utilities Authority generating station across North Second Street, oldtimers say.

The story goes that the ice company owned a generator and sold enough power to the city to run

five street lights. When the generator broke in the early 1920s and the ice company opted not to fix it, the city raised \$15,000 to buy and repair the heavy equipment.

8/12/91

7+ Prevue #9

Table 2. SCR System
Retrofit Cost Comparison

	With Retrofit of HRSG \$1,000	Without Retrofit \$1,000
Capital Costs:		
SCR System	930	930
HRSG Modifications	590	0
System Erection	520	210
Differential Balance of Plant	70	70
1991 Capital Cost	2,110	1,210
Contingency (15%)	320	180
Escalation (6%)	180	110
Direct Capital Cost	2,610	1,500
Indirects (16%)	420	240
Interest During Construction (8%)	60	30
1993 Total Capital Cost	3,090	1,770
Levelized Annual Costs:		
Operating Personnel	70	70
Maintenance	510	510
Ammonia	50	50
Energy	40	40
Lost Generation	170	170
1993 Annual Operating Cost	840	840
Fixed Charges on Capital (13.6%)	340	190
1993 Total Annual Cost	1,180	1,030
Nitrogen Oxides Emission Rate, ppmvd	9	9
Annual NO _x Emission Reduction, tpy	202	202
NO _x Emission Reduction Cost, \$/ton	5,840	5,100

S. Smathers
Clair

HOPPING BOYD GREEN & SAMS

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CECELIA C. SMITH

OF COUNSEL
W. ROBERT FOKES

June 7, 1991

RECEIVED

JUN 10 1991

Division of Air
Resources Management

Office of the Secretary

BY HAND-DELIVERY

Ms. Carol Browner, Secretary
Office of General Counsel
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Fort Pierce Utilities Authority
H. D. King Electric Generating Plant
Permit No. AO 56-190275

Dear Secretary Browner:

On or about May 29, 1991, Fort Pierce Utilities Authority ("FPUA") received notice of the Department's intent to issue permit No. AO 56-190275 for diesels 1 and 2, and Units 6, 7, and 8 at the H.D. King Electric Generating Plant in Fort Pierce, St. Lucie County, Florida. The Notice of Permit Issuance was issued by the Department's Southeast District. Pursuant to Florida Administrative Code Rule 17-103.155, FPUA has until June 12, 1991 to file a petition for administrative proceedings regarding the Department's proposed action on this permit.

We are writing on behalf of FPUA to request an extension of ninety (90) days, to and including September 10, 1991, in which to file a petition for administrative proceedings regarding the permit. This request is made pursuant to Florida Administrative Code Rule 17-103.070, which provides that a timely request for extension of time shall toll the running of the period in which to file an appropriate petition. As good cause for granting the requested extension, FPUA states the following:

1. The proposed permit contains nine (9) specific conditions, including restrictions on the operation of Units 6, 7, and 8. These operating restrictions were required by the original construction permit for Unit 9 at the H. D. King plant (AC 56-141460).

Ms. Carol Browner, Secretary
June 7, 1991
Page 2

2. In order to remove conditions in the Unit 9 permit (AC 56-141460) which require these operating restrictions on Units 6 through 8, FPUA submitted an application for a PSD permit for Unit 9 on or about August 31, 1990. On April 15, 1991, the Department noticed its intent to issue a PSD permit (AC 56-185836) for Unit 9.

3. The proposed PSD permit for Unit 9 currently is the subject of administrative proceedings initiated by FPUA on June 4, 1990.

4. This request is being filed to allow time for resolution of the administrative proceedings related to the PSD permit for Unit 9, which may obviate the need for administrative proceedings on the proposed operating permit for deisels 1 and 2 and units 6, 7, and 8.

5. In addition, certain conditions in the proposed permit for deisels 1 and 2 and Units 6, 7, and 8 appear to need clarification and/or correction.

6. Undersigned counsel has recently been retained to represent FPUA in this matter, and additional time is needed to allow review of the pertinent documents.

7. Representatives of FPUA intend to initiate discussions with Department staff regarding the proposed permit in the near future.

8. This request is filed as a protective measure to avoid waiver of FPUA's right to challenge the Department's proposed action as set forth in the Notice of Permit Issuance. Grant of the request will allow the parties an opportunity to discuss the matters in dispute with the potential for achieving a mutually acceptable resolution without the initiation of formal administrative proceedings.

I hereby certify that I have spoken with Ms. Patricia E. Comer, Assistant General Counsel for the Department and that she agrees with the grant of an extension of time to file for administrative proceedings, but has not agreed on a specific duration of such an extension.

Accordingly, I respectfully request that you issue an order formally extending the time for filing of a petition

Ms. Carol Browner, Secretary
June 7, 1991
Page 3

for administrative proceedings regarding the Department's
proposed air permit No. AO 56-190275 to and including
September 10, 1991.

Respectfully submitted,

HOPPING BOYD GREEN & SAMS

By:


Gary V. Perko

Counsel for FORT PIERCE
UTILITIES AUTHORITY

GVP:FTPopext



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

JUN 7 1991

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

RECEIVED

JUN 12 1991

Division of Air
Resources Management

RE: Fort Pierce Utilities Authority, H.D. King Station (PSD-FL-159)

Dear Mr. Fancy:

This is to acknowledge receipt of your preliminary determination and draft permit for the proposed modification to the above referenced facility, transmitted by your letter dated April 15, 1991. As discussed between Mr. Barry Andrews of your staff and Mr. Gregg Worley of my staff, we have reviewed the package as requested and have the following comments.

Background: The H.D. King Generating Facility of the Fort Pierce Utilities Authority applied for a PSD permit for their previously constructed unit No. 9 (a combined cycle turbine). This unit had previously escaped PSD review in 1987 when the facility accepted federally enforceable limits on three of their existing units to allow Unit 9 to "net out" of PSD review. These limits were in the form of hours of operation limits on the existing units. Since that time, however, the Authority's need for power has increased. The Authority wishes to remove the hours of operation limit on the three existing units; however, this would entail Unit 9 going through PSD review. Consequently, the Authority applied for a PSD permit for Unit 9.

Regulatory Requirements: The language in the PSD regulations is clear concerning these situations. The specific reference is found at 40 CFR §52.21(r)(4) as follows:

At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on the hours of operation, then the requirements of paragraphs (j) through (s) of this section shall apply to the source or modification as though construction had not yet commenced on the source or modification.

It is clear that the PSD review for Unit 9 must be conducted as if the unit had not been constructed; therefore, items such as retrofit costs can not be considered in making a BACT determination.

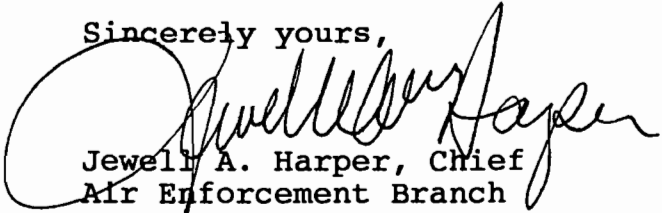
BACT Determination

Unit 9 is a combined cycle natural gas-fired turbine nominally rated at 31.6 MW. The equipment consists of a GE Frame 5 turbine along with its associated heat recovery steam generator (HRSG). The BACT determination for NO_x which was requested by the applicant was the utilization of water injection to a level of 42 ppm @ 15% O₂. The applicant did not evaluate the use of lo-NO_x combustors since their unit was already constructed. The applicant's primary reason for dismissing more stringent levels of control than what they proposed (e.g., SCR to a level of 9 ppm) was economics.

FDER, in their analysis, correctly determined that the inclusion of HRSG modification costs and higher erection costs due to retrofitting did not comply with the language or the intent of the PSD regulations. Upon further investigation of the economic analysis submitted by the applicant, and after comparison with similarly sized combined cycle projects, FDER concluded that the installation of SCR at an annual cost of approximately \$3,835 per ton of NO_x removed was economically reasonable. Furthermore, the use of SCR on gas fired turbines has been established as being technically feasible; therefore, in the Preliminary Determination for this PSD permit, FDER concluded that the utilization of SCR to achieve a NO_x emission rate of 9 ppm @ 15% O₂ would be BACT for NO_x.

We concur with your determination concerning BACT for this facility. In addition, we feel that you made the legally correct decision in not allowing retrofit costs to be considered in the BACT analysis. If you have any questions on these comments, please contact Mr. Gregg Worley of my staff at (404) 347-5014.

Sincerely yours,



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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION IV
AIR, PESTICIDES & TOXICS MANAGEMENT DIVISION
345 Courtland Street, N. E.
Atlanta, Georgia 30365
Fax Number: FTS 257-5207 or 404/347-5207

FACSIMILE TRANSMISSION SHEET

DATE: 6-7-91 NUMBER OF PAGES (Including this sheet) 3

(Preparer must number all pages)

TO: MR. CLAIR H. FANCY, CHIEF PHONE: _____

ADDRESS: F.D.R. FAX NUMBER: 8 - 904 - 488-6579

FROM: GREGG WURLEY PHONE: 347 - 5014

If the following pages are received poorly, please call GREGG
at FTS 257-5014 or 404/347-5014.

SPECIAL INSTRUCTIONS FOR RECEIVER: _____

cc: CHF
Preston Lewis }
Barry Andrews } -6-10-91 RM
Clem Holloday }

RECEIVED

JUN 10 1991

Division of Air
Resources Management



P.O. Box 69
Fort Pierce, St. Lucie County, Florida 34954-0069

RECEIVED

STATE OF FLORIDA
COUNTY OF ST. LUCIE

JUN 4 - 1991

Before the undersigned authority personally appeared David T. Rutledge or Kathleen K. LeClair, who on ^{Bureau of Air Regulation} says that he/she is publisher, business manager of The Tribune, a daily newspaper published at Fort Pierce in St. Lucie County, Florida; that the attached copy of the advertisement, being a.....Notice..of..Intent..to..Issue in the matter of.....DER-Permit..to..Ft..Pierce.....

Utilities Authority

was published in said newspaper in the issues of 6/3/91

Affiant further says that The Tribune is a newspaper published at Fort Pierce, in said St. Lucie County, Florida, and that the said newspaper has heretofore been continuously published in St. Lucie County, Florida, each day and has been entered as second class mail matter at the post office in Fort Pierce, in said St. Lucie County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement: and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed before me

This.....3rd.....day of.....June.....
A.D.....1991.....

(SEAL) Notary Public

NOTARY PUBLIC STATE OF FLORIDA
COMMISSION EXPIRES FEB. 5, 1993
BOONED THRU GENERAL REG. UNIT.

NO. 04478
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT
TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a PSD permit to Fort Pierce Utilities Authority, P.O. Box 1298, Fort Pierce, St. Lucie County, Florida 33448, to operate a 31.6 MW combined cycle gas turbine system and to change restrictions on existing units. A determination of Best Available Control Technology (BACT) was required. The maximum degree of increment consumed for nitrogen dioxide is 2.0% of the Class II proposed annual mean. For sulfur dioxide, the maximum consumption is also 2.0%. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

The Petition shall contain the following information:

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

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

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

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

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

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

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

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

The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at: Department of Environmental Regulation, Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Department of Environmental Regulation, Southeast District, 1900 S. Congress Avenue, Suite A, West Palm Beach, Florida 33406.

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

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

PUBLISH: June 3, 1991

I N T E R O F F I C E M E M O R A N D U M

Date: 03-May-1991 10:58am GMT
From: Iris Littleton
LITTLETON_I
Dept: Office General Counsel
Tel No: 904/488-9730

TO: Scott Benyon

(BENYON, SCOTT)

CC: Pat Manning

(MANNING_P)

CC: Janet G. Llewellyn

(LLEWELLYN, JANET)

Subject: New OGC Case Assignments

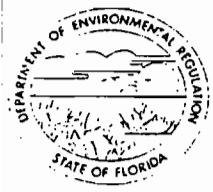
TO: Scott Benyon

FROM: Iris - OGC - Tallahassee

Received 5/02/91 request for an Extension of Time from Fort
Pierce Utilities Authority - Unit 9 concerning permit
AC56-185836.

Received 4/30/91 request for an Extension of Time from Lake Worth
Drainage District/Baynton Canal dredge and fill permit
50-145713-9.

*cc: P. Lewis
C. Holladay
B. Andrews*



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: Barry Andrews
FROM: Stephanie Brooks *[Signature]*
DATE: April 23, 1991
RE: Ft. Pierce Utilities Unit No. 9

-
1. Add the word attached to clarify (e.g., "below")

Table 1 (Attached)

2. Specific Condition #3 and Specific Condition #5

Visible Condition shall not exceed 10% but they have to stack test after the initial test only if the VE exceeds 10%?

3. Specific Condition #21

Typo

Point not Paint

SB/k7

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP		ACTION NO																																
		ACTION DUE DATE																																
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4.		Initial																																
		Date																																
REMARKS:		INFORMATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;"></td><td style="width: 95%;">Review & Return</td></tr> <tr><td></td><td>Review & File</td></tr> <tr><td></td><td>Initial & Forward</td></tr> <tr><td></td><td></td></tr> </table> DISPOSITION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;"></td><td style="width: 95%;">Review & Respond</td></tr> <tr><td></td><td>Prepare Response</td></tr> <tr><td></td><td>For My Signature</td></tr> <tr><td></td><td>For Your Signature</td></tr> <tr><td></td><td>Let's Discuss</td></tr> <tr><td></td><td>Set Up Meeting</td></tr> <tr><td></td><td>Investigate & Report</td></tr> <tr><td></td><td>Initial & Forward</td></tr> <tr><td></td><td>Distribute</td></tr> <tr><td></td><td>Concurrence</td></tr> <tr><td></td><td>For Processing</td></tr> <tr><td></td><td>Initial & Return</td></tr> </table>		Review & Return		Review & File		Initial & Forward				Review & Respond		Prepare Response		For My Signature		For Your Signature		Let's Discuss		Set Up Meeting		Investigate & Report		Initial & Forward		Distribute		Concurrence		For Processing		Initial & Return
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		<i>SC 232-2650</i>																																
		<i>407-433-2650</i>																																



H.D. KING ELECTRIC GENERATING PLANT

311 North Indian River Drive (34950)
Post Office Box 1298 (34954)
Fort Pierce, Florida
(407) 464-5792

October 23, 1990

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

FEDERAL EXPRESS

Attn: Mr. C. H. Fancy

Dear Mr. Fancy:

Re: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9

Enclosed is our response to your comment letter of September 28, 1990 and subsequent telephone clarifications regarding our permit to relicense Unit 9.

Your comment #12, Requested Construction Permits for Units 6, 7 & 8, we have reviewed our files and records, contacted former employees, and have not been able to locate a copy of any construction permits for these units. We have also contacted former employees of Reynolds, Smith & Hills which was our engineer of record in the past; however, their files have been purged and we are unable to obtain any information regarding construction permits from them.

We have contacted the Florida Dept. of Environmental Regulation, Southeast District office regarding the possibility of construction permits in their files. We will research their archives within the next few days and will forward copies to your office of any construction permits we are able to locate.

We have attempted to formulate our responses based on the methodology approved most recently by the DER in the BACT determination for TECO's Hardee County permit. We believe that this consistency of analysis is important to both the DER and to applicants trying to comply with BACT analysis requirements.

We are most interested in discussing this with the DER further, to ensure that we are correctly applying the DER's policy decisions made during the Hardee County permit process.

Sincerely,

A handwritten signature in dark ink, appearing to read "Harry Schindehette".

Harry Schindehette, P.E.
Director of Utilities

HL/HS:m

Enclosure
cc: Jack Miller
Harry Lamb

M. Harley
B. Andrews
A. Holladay

J. Goldman
J. Harper, EPA

RECEIVED
OCT 24 1990
DER-BAQM

6553362-25

6553362653

RECIPIENT'S COPY

Date		10/23/90		RECIPIENT'S COPY	
From (Your Name) Please Print		Your Phone Number (Very Important)		To (Recipient's Name) Please Print	
Harry Schindehette		(407) 464-5600		C. H. Fancy	
Company		Department/Floor No.		Company	
Ft. Pierce Utilities Authority				Florida Dept. of Environmental Regulation	
Street Address				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)	
311 No. Indian River Drive				Twin Towers Office Bldg.	
City		State		City	
Ft. Pierce		FL		Tallahassee	
		*ZIP Required 34950			
				State	
				FL	
				*ZIP Required 32399-2400	
YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)				IF HOLD FOR PICK-UP, Print FEDEX Address Here	
				Street Address	
				City	
				State	
				*ZIP Required	
PAYMENT 1 ☒ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card					
5 ☐ Cash					
SERVICES (Check only one box)				FEDERAL EXPRESS USE	
Priority Overnight Service (Delivery by next business morning)				Base Charges	
Standard Overnight Service (Delivery by next business afternoon)				Declared Value Charge	
11 ☐ YOUR PACKAGING				Other 1	
16 ☐ FEDEX LETTER				Other 2	
12 ☒ FEDEX PAK				Total Charges	
13 ☐ FEDEX BOX				REVISION DATE 11/89	
14 ☐ FEDEX TUBE				PART #18500 SRCEP 1 P	
Economy Service (formerly Standard Air) (Delivery by second business day)				FORMAT #014	
Heavyweight Service (for Extra Large or any package over 150 lbs.)				014	
70 ☐ HEAVYWEIGHT **				© 1989 F.E.C.	
80 ☐ DEFERRED HEAVYWEIGHT **				PRINTED IN USA	
30 ☐ ECONOMY SERVICE					
*Declared Value Limit \$100. **Call for delivery schedule.					
1 Delivery commitment may be later in some areas.					
DELIVERY AND SPECIAL HANDLING				EMP. NO. DATE	
1 ☐ HOLD FOR PICK-UP (Fill in Box #)				☐ Cash Received	
2 ☒ DELIVER WEEKDAY				☐ Return Shipment	
3 ☐ DELIVER SATURDAY (Extra charge)				☐ Chg. To Del. ☐ Chg. To Hold	
4 ☐ DANGEROUS GOODS (Extra charge) (CSS not available for Dangerous Goods Shipments)				Street Address	
5 ☐ CONSTANT SURVEILLANCE SVCS (CSS) (Extra charge) (Release Signature Not Applicable)				City	
6 ☐ DRY ICE _____ Lbs.				State	
7 ☐ OTHER SPECIAL SERVICE _____				Zip	
8 ☐ SATURDAY PICK-UP (Extra charge)				Received By:	
9 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)				X	
PACKAGES WEIGHT IN POUNDS ONLY YOUR DECLARED VALUE OVER \$500				Date/Time Received	
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P 256 396 205

RECEIPT FOR CERTIFIED MAIL

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

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

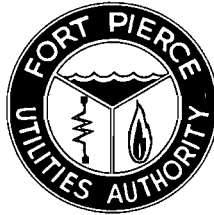
Sent to Mr. Harry Schindehette, P.E.	
Street and No. P. O. Box 3191	
P.O., State and ZIP Code Ft. Pierce, FL 34948	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 9-28-90 Permit: AC 56-185836	

● SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested. 1. ☐ Show to whom delivered, date, and addressee's address. (Extra charge) 2. ☐ Restricted Delivery (Extra charge)		4. Article Number P 256396 205 Type of Service: ☐ Registered ☒ Certified ☐ Express Mail ☐ Insured ☐ COD ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and <u>DATE DELIVERED</u>.	
3. Article Addressed to: Mr. Harry Schindehette, P.E. Director of Utilities City of Ft. Pierce P. O. Box 3191 Ft. Pierce, FL 34948		8. Addressee's Address (ONLY if requested and fee paid)	
5. Signature — Address X		6. Signature Agent X <i>[Signature]</i>	
7. Date of Delivery 9/1/90			

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

File Copy

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

August 3, 1990

Florida Department of Environmental Regulation
2600 Blainstone Road
Tallahassee, Florida 32399

Attention: Mr. Barry Andrews

Dear Mr. Andrews:

REFERENCE AIR PERMITS: Unit #6 - AO-56-113534
 Unit #7 - AO-56-112679
 Unit #8 - AO-56-112678
 Unit #9 - AO-56-175955

Thank you for meeting with us on July 24, 1990 to discuss the permit revisions. Fort Pierce Utilities Authority is requesting for our H. D. King Electric Generating Station. As we discussed, the current limitations (restricting the annual operation of Units 6, 7, and 8) of the Unit 9 operating permit may impede our ability to meet our anticipated electric generation requirements. Accordingly, we have authorized our consultant, Black & Veatch, to prepare a Prevention of Significant Deterioration (PSD) permit application for Unit 9 to relieve the limitations.

Currently, Units 6, 7, and 8 are restricted to 12, 1344 and 6384 annual operating hours, respectively. These requirements are a result of Unit 9 construction permit application assumptions for creditable emissions. Subsequently, these restrictions were included as specific conditions in the Unit 9 operating permit.

Due to transmission line restrictions beyond our control and limited availability of purchased power, there is a chance that Unit 8 will exceed 6384 hours of operation this year. Based on the current projected requirements for Unit 8, it is likely that the 6384 hour requirement would be exceeded in mid to late November, 1990. Considering the time required to process a PSD application, we are uncertain that a new Unit 9 permit would be available in time to avoid difficulties with Unit 8 operations this year. Therefore, we proposed a Unit 9 permit amendment that would allow flexibility in our station's operation without violating the essence of existing permit requirements.

The proposed amendment would restrict operation of Units 6, 7, and 8 to a total heat input restriction. The heat inputs (fuel burn rates) for Units 6, 7, and 8 are 218.8 MBtu/h, 470 MBtu/h, and 611 MBtu/h, respectively. Multiplying those heat inputs by

RECEIVED
AUG 31 1990
DER-BAQM

FEDERAL EXPRESS		AIRBILL		PACKAGE TRACKING NUMBER	
9171		4003880462		4003880462	
Date		8/30/90		RECIPIENT'S COPY	
From (Your Name) Please Print		Your Phone Number (Very Important)		To (Recipient's Name) Please Print	
Harry Schindehette		(407) 464-5600		Barry Andrews	
Company		Department/Floor No.		Company	
FT PIERCE UTILITIES AUTHORITY				Fla. Dept. Environmental REGulation	
Street Address				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)	
206 S 6TH ST				2600 Blairstone Road	
City		State		City	
FT PIERCE FL		ZIP Required 34950		Tallahassee, Florida FL	
State		ZIP Required		State	
FL		34950		FL 32399-2400	
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE)				IF HOLD FOR PICK-UP, Print FEDEX Address Here	
3				Street Address	
PAYMENT ☒ Bill Sender ☐ Bill Recipient's FedEx Acct No. ☐ Bill 3rd Party FedEx Acct No. ☐ Bill Credit Card				City	
☐ Cash				State	
				ZIP Required	
SERVICES		DELIVERY AND SPECIAL HANDLING		Emp. No. Date	
1 ☒ PRIORITY 1 Overnight Delivery		1 ☐ HOLD FOR PICK-UP (Fill in Box H)		☐ Cash Received	
2 ☐ COURIER-PAK OVERNIGHT ENVELOPE		2 ☒ DELIVER WEEKDAY		☐ Return Shipment	
3 ☐ OVERNIGHT BOX		3 ☐ DELIVER SATURDAY (Extra charge)		☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold	
4 ☐ OVERNIGHT TUBE		4 ☐ DANGEROUS GOODS (Extra charge)		Street Address	
5 ☐ STANDARD AIR Delivery not later than second business day		5 ☐ CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable)		City	
		6 ☐ DRY ICE Lbs.		State	
		7 ☐ OTHER SPECIAL SERVICE		Zip	
		8 ☐ SATURDAY PICK-UP (Extra charge)		Received By	
		9 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)		X	
				Date/Time Received FedEx Employee Number	
				Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.	
				Release Signature	
				PART #111800 REVISION DATE 10/88 PRINTED IN U.S.A. FXEM 009 PROD. 5/88 © 1988 F.E.C.	

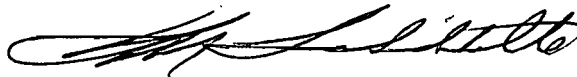
Page 2
August 3, 1990

the allowable annual hours of operation results in a total allowable heat input for the three units of 4,534,930 MBtu per year. This permit amendment would not affect the creditable emissions analysis that we the basis of the Unit 9 construction permit application.

This permit amendment would allow Fort Pierce Utilities Authority additional flexibility this year to provide electric power to our customers without comprising the restrictions delineated in the Unit 9 operating permit.

We would like to implement this permit amendment as soon as possible to avoid this potentially difficult situation. If you would like to discuss this proposed amendment in more detail, please feel free to call Mr. Steve Day of Black & Veatch at (913) 339-2880.

Sincerely,



Harry Schindehette, P.E.
Director of Utilities

HS:kh

cc:

Barry Andrews

T. Goldman / S. Brooks

} 8-31-90 ERM

8-31-90
Was sent in → rec'd
unsigned. Signed
copy was received
on August 31, 1990.
RN

FROM THE DESK OF

Harry Schindehette

8-30-90

Barry,

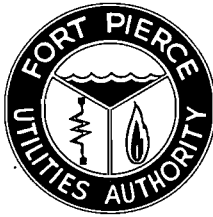
I APOLOGIZE FOR
FAILING TO SIGN
THE FIRST LETTER.

PLEASE DESTROY YOUR
"UNSIGNED" COPY AND
REPLACE WITH THIS
ONE.

THANKS,

Harry Schindehette

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

REC-1

August 13, 1990

AUG 20 1990

DER-BAQM

Florida Department of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32399

Attention: Mr. Barry Andrews

Dear Mr. Andrews::

Subject: Conference Notes for Meeting of July 24, 1990
Regarding PSD Application Process for Unit 9
Conference Memorandum 027

Reference: Air Permit, Unit 9 - A0-56-175955

I have enclosed conference notes documenting the highlights of the discussions that were conducted during our meeting in your offices on July 24, 1990. The meeting was held to discuss Fort Pierce Utilities Authority's (FPUA) intent to submit a PSD application for the H. D. King Electric Generating Station Unit 9.

As discussed, we are proceeding with preparation of the PSD Application and expect to submit it to your office within the next week or two.

If you have any comments or changes to the enclosed conference memorandum, please let me know.

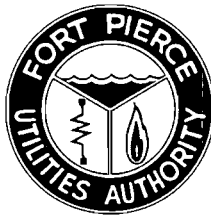
Sincerely,

A handwritten signature in cursive script, appearing to read "Harry Schindehette".

Harry Schindehette, P.E.
Director of Utilities

Its
Enclosure

cc: Jack Miller
Steve Day
Don Knighton
Harry Lamb

WATER
ELECTRICGAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

August 3, 1990

Florida Department of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32399

Attention: Mr. Barry Andrews

Dear Mr. Andrews:

REFERENCE AIR PERMITS: Unit #6 - AO-56-113534
 Unit #7 - AO-56-112679
 Unit #8 - AO-56-112678
 Unit #9 - AO-56-175955

Thank you for meeting with us on July 24, 1990 to discuss the permit revisions. Fort Pierce Utilities Authority is requesting for our H. D. King Electric Generating Station. As we discussed, the current limitations (restricting the annual operation of Units 6, 7, and 8) of the Unit 9 operating permit may impede our ability to meet our anticipated electric generation requirements. Accordingly, we have authorized our consultant, Black & Veatch, to prepare a Prevention of Significant Deterioration (PSD) permit application for Unit 9 to relieve the limitations.

Currently, Units 6, 7, and 8 are restricted to 12, 1344 and 6384 annual operating hours, respectively. These requirements are a result of Unit 9 construction permit application assumptions for creditable emissions. Subsequently, these restrictions were included as specific conditions in the Unit 9 operating permit.

Due to transmission line restrictions beyond our control and limited availability of purchased power, there is a chance that Unit 8 will exceed 6384 hours of operation this year. Based on the current projected requirements for Unit 8, it is likely that the 6384 hour requirement would be exceeded in mid to late November, 1990. Considering the time required to process a PSD application, we are uncertain that a new Unit 9 permit would be available in time to avoid difficulties with Unit 8 operations this year. Therefore, we proposed a Unit 9 permit amendment that would allow flexibility in our station's operation without violating the essence of existing permit requirements.

The proposed amendment would restrict operation of Units 6, 7, and 8 to a total heat input restriction. The heat inputs (fuel burn rates) for Units 6, 7, and 8 are 218.8 MBtu/h, 470 MBtu/h, and 611 MBtu/h, respectively. Multiplying those heat inputs by

BEST AVAILABLE COPY

FEDERAL EXPRESS		AIRBILL		PACKAGE TRACKING NUMBER	
171		4003880112		4003880112	
Date		8/30/90		RECIPIENT'S COPY	
From (Your Name) Please Print		Your Phone Number (Very Important)		To (Recipient's Name) Please Print	
Harry Schindehette		(407) 464-5600		Barry Andrews	
Company		Department/Floor No.		Company	
FLORIDA UTILITIES AUTHORITY				Fla. Dept. Environmental Regulation	
Street Address				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)	
2600 Blairstone Road				2600 Blairstone Road	
City		State		City	
Tallahassee		FL		Tallahassee, Florida	
ZIP Required		32399-2400		ZIP Required	
32399-2400				32399-2400	
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)				IF HOLD FOR PICK-UP, Print FEDEX Address Here	
PAYMENT ☒ Bill Sender ☐ Bill Recipient's FedEx Acct. No. ☐ Bill 3rd Party FedEx Acct. No. ☐ Bill Credit Card ☐ Cash				Street Address City State ZIP Required	
4 SERVICES		DELIVERY AND SPECIAL HANDLING		Emp. No. Date	
1 ☒ PRIORITY 1 Overnight Delivery 2 ☐ COURIER-PAK OVERNIGHT ENVELOPE* 3 ☐ OVERNIGHT BOX 4 ☐ OVERNIGHT TUBE 5 ☐ STANDARD AIR Delivery not later than second business day 6 ☐ OVERNIGHT LETTER* 7 ☐ 8 ☐ 9 ☐ 10 ☐		1 ☐ HOLD FOR PICK-UP (Fill in Box 1) 2 ☐ DELIVER WEEKDAY 3 ☐ DELIVER SATURDAY (Extra charge) 4 ☐ DANGEROUS GOODS (Extra charge) 5 ☐ CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable) 6 ☐ DRY ICE Lbs 7 ☐ OTHER SPECIAL SERVICE 8 ☐ 9 ☐ SATURDAY PICK-UP (Extra charge) 10 ☐ 11 ☐ 12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)		Federal Express Use Base Charges Declared Value Charge Other 1 Other 2 Total Charges Received By: X Date/Time Received FedEx Employee Number Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom. Release Signature:	
*Declared Value Limit \$100.		PACKAGES WEIGHT IN POUNDS ONLY YOUR DECLARED VALUE OVER SIZE Total Total Total Received At 1 ☐ Regular Stop 2 ☐ On-Call Stop 3 ☐ Drop Box 4 ☐ B.S.C. 5 ☐ Station FEDEX Corp. Employee No. Date/Time for FEDEX Use		PART #111800 REVISION DATE 10/89 PRINTED IN U.S.A. FXEM 009 © 1988 F.E.C.	

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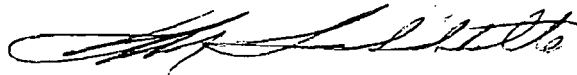
Page 2
August 3, 1990

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Sincerely,



Harry Schindehette, P.E.
Director of Utilities

HS:kh

Received
In the name of the
Director of Utilities

8-31-90
Was sent in → rec'd
unsigned. Signed
copy was received
on August 31, 1990.
RAN

FROM THE DESK OF

Harry Schindehette

8-30-90

BARRY,

I APOLOGIZE FOR
FAILING TO SIGN
THE FIRST LETTER.

PLEASE DESTROY YOUR
"UNSIGNED" COPY AND
REPLACE WITH THIS
ONE.

THANKS,

Harry Schindehette

BEST AVAILABLE COPY

NEED: A COMPLETED PERMITS APPLICATION FORM

APPLICATION MUST BE SIGNED & SEALED BY ENGINEER REGISTERED IN FLORIDA

Black & Veatch

CONFERENCE MEMORANDUM 027

Fort Pierce Utilities Authority
Unit 9 PSD Application
Kickoff Meeting with DER

B&V Project 16589.070
B&V File 32.0003
32.0203
July 25, 1990

The purpose of the meeting was to present Fort Pierce Utilities Authority's approach to the PSD Application, discuss the reasons for their having to seek this change to the permit, and ascertain whether the overall goal of removing restrictions from Units 6, 7, and 8, can be accomplished by the proposed methodology.

Attending: Department of Environmental Regulation (DER)

Barry Andrews ✓
Teresa Heron
Cleve Holiday

Fort Pierce Utilities Authority (FPUA) Black & Veatch (B&V)

Harry Schindehette
Harry Lamb

Jack Miller
John Cochran
Steve Day

The meeting was held at the Department of Environmental Regulation's (DER) office in Tallahassee, Florida on July 24, 1990. It commenced at approximately 1:30 p.m. The highlights of the ensuing discussion are as follows.

1. The initial discussion established the following facts.
 - a. Unit 9 is a Major Facility.
 - b. The application for Permit to Construct was submitted in October 1987.
 - c. The Permit to Construct was issued on March 28, 1988.
 - d. The initial operation of the unit occurred in February 1989.
 - e. The permanent Operating Permit was issued on May 8, 1990.
2. After additional discussion and investigation by DER, it was determined that the DER Engineer that had worked on the original permit application, is Teresa Heron. She then joined the meeting at that point.

CONFERENCE MEMORANDUM 027

Fort Pierce Utilities Authority 2
Unit 9 PSD Application
Kickoff Meeting with DER

B&V Project 16589.070
July 25, 1990

3. Black & Veatch and FPUA reviewed the circumstances surrounding the original permit application. There was discussion regarding the subsequent changes that have occurred in the power market. When Unit 9 was originally built, it was anticipated that purchased power would continue to be a significant part of their power supply strategy, thus, allowing them to operate the less efficient older units much less. Starting approximately a year ago, however, available power for purchases became more scarce, and the ability to transmit those power purchases into FPUA's system has diminished considerably. In fact, quite frequently they are unable to access external power at all as a result of transmission restrictions. Therefore, FPUA is having to rely much more heavily on the older units than was originally anticipated. The restrictions on operating hours for those units, that are incorporated into the Unit 9 operating permit, now present a constraint that will most likely result in a serious impediment to FPUA's ability to meet their customers' needs.
4. The provisions in the Unit 9 permit that restrict the operation of Units 6, 7, and 8 are as follows.
 - a. Unit 8 - 6,384 hours
 - b. Unit 7 - 1,344 hours
 - c. Unit 6 - 12 hours

All units burn natural gas as the primary fuel and are steam turbine generating units. Residual fuel oil is used as an emergency backup.
5. FPUA stated that, by removing the restrictions on those units, they would intend to operate them up to 8,760 hours per year.
6. DER asked if the existing Unit 9 is equipped with duct burners. It was indicated that it is not.
7. DER asked what kind of operation Unit 9 experiences. It was stated that it is essentially a base loaded unit.
8. DER asked if it is intended that a complete PSD, with topdown Best Avoidable Control Technology (BACT), analysis, be followed. FPUA and B&V said that is their intent.

Black & Veatch

CONFERENCE MEMORANDUM 027

Fort Pierce Utilities Authority 3
Unit 9 PSD Application
Kickoff Meeting with DER

B&V Project 16589.070
July 25, 1990

9. There was some discussion regarding the pollutants that are of concern. Black & Veatch said that the CO emissions are much less than the permitted levels based on actual testing. It is expected that NOx will be the only significant pollutant to be addressed in the PSD.
10. DER asked when FPUA intends to submit their permit application. It was indicated that the application will be submitted during the first half of August 1990. FPUA said that they hope to have the relief on Units 6, 7, and 8 prior to running out of the 6,344 hours for which Unit 8 is currently permitted. That point will be reached sometime in late November 1990. DER said that the schedule is probably attainable, however, it is not known how EPA will view the entire matter or to what extent their involvement will impact the schedule.
11. DER provided a brief background on how BACT has been handled historically. It has generally been evaluated on the basis of the cost for an incremental decrease in emissions (dollars per ton). Until recently, if the cost exceed \$1,000 per ton, it was considered noneconomic. The EPA is currently pushing to have that threshold raised. Selective Catalytic Reduction (SCR) is being much more closely examined, particularly for base loaded plants.
12. DER could not predict how SCR would be ruled upon in FPUA's case. They will just have to review the cost per ton that is calculated by FPUA, and make a determination at that point. FPUA asked what the new guideline would be with regard to cost per ton. DER stated that they generally refer to other projects of similar size, where SCR has been incorporated. They are seeing figures of \$2,500 to \$4,000 per ton at facilities where SCR has been installed.
13. Black & Veatch stated that the current operating permit allows for NOx emissions of 84 ppm. The PSD Application will be submitted on the basis of emissions of 42 ppm. That will be done regardless of whether SCR is included or not. Therefore, as a minimum, repermitting of Unit 9 will result in NOx emissions of 50 percent of current levels.
14. DER stated that in briefly reviewing the existing permit documentation, it appears that Units 6, 7, and 8 have hourly operating limits aside from those contained in the Unit 9 permit. Black & Veatch did not agree with that, noting that the hourly figures contained in the respective units' permits are derived from the description of normal plant operations that is contained in the permit, and are not actually cited in the general or specific provisions of the permit. After some discussion, it was agreed by DER that there are no hourly operating restrictions on Units 6, 7, and 8 except for those contained in the Unit 9 permit provisions.

Black & Veatch

CONFERENCE MEMORANDUM 027

Fort Pierce Utilities Authority 4
Unit 9 PSD Application
Kickoff Meeting with DER

B&V Project 16589.070
July 25, 1990

15. DER asked about the size of each of the affected units. The following approximate information was given.
 - a. Unit 6 - 16.5 MW
 - b. Unit 7 - 33 MW
 - c. Unit 8 - 56 MW
16. Black & Veatch asked DER if the permitting process that is being proposed will result in a removal of the limits on Units 6, 7, and 8. DER indicated that their initial reaction is that it will.
17. DER asked if NOx would be the only pollutant that would be looked at. Black & Veatch indicated that it is. It was also stated that distillate oil is an emergency fuel only.
18. Black & Veatch indicated that the two BACT cases that would be analyzed are:
 - a. Steam injection to attain NOx emission of 42 ppm using the existing capabilities of the generation equipment. (A reduction of 50 percent from existing permit requirements).
 - b. SCR.

DER was asked whether or not those are the only two cases that need to be addressed. DER said that those two cases will suffice. DER noted, however, that this is the first situation that they can recall where a PSD Application has been done retroactively in order to effect a change in existing permit provisions. Therefore, it is not completely clear as to which procedures and policies apply.
19. DER asked if FPUA has considered merely asking for an increase in the hours of operation for Units 6, 7, and 8, and then looking at BACT for them. Black & Veatch indicated that it is their understanding that a change in the hours of operation is specifically exempted from a BACT, ie., it is not considered a major modification.
20. It was acknowledged that the potential total emissions from the plant will increase if the restrictions on Units 6, 7, and 8 are removed from the Unit 9 permit. However, it will have been done within the context of a complete PSD analysis and resulting permit provisions.

Black & Veatch

CONFERENCE MEMORANDUM 027

Fort Pierce Utilities Authority
Unit 9 PSD Application
Kickoff Meeting with DER

5

B&V Project 16589.070
July 25, 1990

- As per cc meeting held?*
21. DER asked if EPA has been contacted in conjunction with the proposed permitting activity. It was indicated that EPA has not yet been contacted. DER suggested that FPUA may want to meet with EPA directly, particularly since this is a unique permitting situation. DER indicated that they would contact EPA to discuss the concept with them. DER will let FPUA know if a meeting with EPA is warranted.
 22. Black & Veatch summarized the overall purpose of the proposed permitting activity. It is being proposed that the hourly operating constraints on Units 6, 7, and 8 be removed from the permit for Unit 9; and that a topdown BACT be prepared for Unit 9.
 23. DER was asked who, at EPA, Region IV, should be contacted in regard to this. DER suggested Mark Armentrout.
 24. The dispersion modeling was discussed. DER indicated that B&V should examine areas of significance associated with nearby major sources, to determine if their impact areas affect the area of significance that has been predicted for Unit 9.
 25. FPUA said that they had had a conversation with Scott Benyon of the DER's West Palm Beach office, in regard to the possibility of using some of Unit 7 unused operating hours to displace some of Unit 8's hours of operation. This would be one way of avoiding exceeding the existing hourly constraint on Unit 8. Scott Benyon felt that such an approach was certainly feasible, in as much as they are basically concerned about the total emissions from the plant, and not just one specific unit. He did indicate, however, that the final disposition would have to be rendered by the Tallahassee office of DER.
- Barry Andrews suggested that such an approach could be accomplished by submitting an amendment to the Unit 9 permit, that converts the hourly constraints to a total Btu basis. That way, hours can be shifted from one unit to the next, as long as the total (aggregate of Units 6, 7, and 8) Btu's are not exceeded. FPUA indicated that B&V would prepare an amendment to that effect immediately. That requested amendment will be submitted prior to the PSD Application.

There were no further comments or discussion and the meeting was adjourned at 2:45 p.m.

lts



BLACK & VEATCH

8400 Ward Parkway, P.O. Box No. 8405, Kansas City, Missouri 64114, (913) 339-2000

Fort Pierce Utilities Authority
PSD Application for Unit 9
NOx Background Data

B&V Project 16589
B&V File 32.0000
July 19, 1990

FEDERAL EXPRESS

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

Attention: Mr. Barry Andrews

Gentlemen:

Enclosed is a proposed agenda for our meeting Tuesday afternoon, July 24, at 1:30 p.m. This meeting is scheduled to discuss repermitting of Unit 9 at the FPUA H. D. King Generating Station.

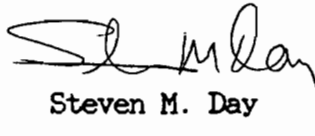
We currently expect Fort Pierce to be represented at the meeting by Mr. Harry Schindehette, Director of Utilities for FPUA and Mr. Harry Lamb.

Black & Veatch will be represented by Jack Miller, John Cockran and me.

We appreciate your efforts to work this meeting into your schedule.

Very truly yours,

BLACK & VEATCH



Steven M. Day

lar
Enclosure

cc: Harry Schindehette - FPUA
Cleveland Holladay - FDER Tallahassee
Stephanie Brooks - FDER Southeast District

PROPOSED MEETING AGENDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FORT PIERCE UTILITIES AUTHORITY
TALLAHASSEE, FLORIDA
JULY 24, 1990

- I. INTRODUCTIONS
- II. BACKGROUND OF LICENSING FOR THE H. D. KING
ELECTRIC GENERATING PLANT UNIT 9
- III. DISCUSSION OF UNEXPECTED OPERATIONAL DEMANDS AT THE H. D. KING
ELECTRIC GENERATING PLANT UNITS 6-8
- IV. DISCUSSION OF PROPOSED REPERMITTING OF UNIT 9 TO REMOVE
OPERATIONAL RESTRICTIONS ON UNITS 6-8
 - A. MODELING (PSD & NAAQS)
 - B. BACT ANALYSIS
 - C. OTHER
- V. PROPOSED SCHEDULE FOR REPERMITTING OF UNIT 9
- VI. DER COMMENTS

DER Meeting Attendance

2/22/90

AES For Pierce

AES Nocatee

<u>Attending</u>	<u>Representing</u>	<u>Phone</u>
Tom Rogers	DER/BAMA	(904) 488-1344
Jim Pennington	DER/BAR	(904) 488-1344
Cleve Holladay	DER/BAR	(904) 488-1344
Julie Burden	AES	703 358 0514
Buck Owen	DER	488-1344
DAN Nelson	Black + Veatch	913-339-2149
Terry Cde	Oertel & Hoffman	904 871 0099
Sarah Slusser	AES	703 358 0523
Pradeep Raval	DER/BAR	904 488 1344
Max Linn	DER/BAMA	(904) 488-1344
Steve Day	Black + Veatch	913-339-2880

3/1/90 MARTIN HARDEE DUE
2/22/90

AES - ~~SARASOTA~~ ^{NOCATEE} & Ft. Pierce
SARAH TO EXPLAIN PROJECTS
DAN ON AIR
planting trees in Guatemala

Ft. Pierce, St. Lucie - ²⁵⁰₇₀ 300 MEGAWATTS
COAL FIRED, EASTERN Ky.
50 ACRES - INDUSTRIALLY ZONED
ANTICIPATE SELLING STEAM TO TROPICANA
ALSO INDIAN RIVER FOODS
WATER FROM CITY OF Ft. Pierce - ^{RECLAIMED} GRAY WATER
4M GALLONS / DAY
PIPELINE
COOLING TOWERS

MAY DO DEEP WELL INJECTION → T.A.C. ^{JIM McNEIL} ^{OR} DON WHITE
HAVE MET W/ CITY & COUNTY - POSITIVE RESPONSE
NOT IN CITY, BUT MUST PASS THRU.
LAND FILL NEARBY
ASH FOR SALE ; or back to EASTERN Ky. BY RAIL

NOCATEE - 270 TO 300 MW
replica of Ft. Pierce - site in flood plain
150 ACRES

same coal mines
"De Soto county in dire needs of development"
WATER & FLORIDIAN AQUIFER

monitoring → 1 station at each site → SO₂; NO_x; PM₁₀ NO CONCERN? OZONE?
problem → 5 sites planned in area
sharing monitoring data

WIND SPEED & DIRECTION

WILL DO EVERYTHING THEY CAN TO CONTROL DUST
monitoring for PM_{10}

WHY DOES THE DATA MEET THE CRITERIA

MODELING MUST ACCOUNT FOR EVERYTHING, NOT JUST STACK EMISSIONS
FUGITIVES, ETC.

VOC > 100 TONS PER YEAR



inventory → will provide a list of sources
in the impact area

District offices have best info
methods for eliminating sources

North Carolina 200
50 KM

INDEPENDENT MODELING NEEDED

THE EVERGLADES & BIG CYPRESS SHOULD BE LOOKED AT
ALSO SANIBEL due to environmental sensitivity

two weeks to approve modeling plans

✓ SO_2

NO_x

PM_{10}

✓ OZONE

**AES Fort Pierce & AES Nocatee
Cogeneration Facilities**

February 1990



AES Fort Pierce and Nocatee Cogeneration Facilities Presentation Outline

- **AES Company Background** Page 1
 - **AES Fort Pierce Overview** Page 12
 - **Project Description** Page 15
 - **AES Nocatee Overview** Page 21
 - **Project Description** Page 24
-

**The AES Corporation
Company Background**



The AES Corporation

Background:	Privately held corporation founded in 1981 by Roger Sant and Dennis Bakke to be a long-term supplier of low-cost electricity and steam.
Business:	Develops, owns, and operates cogeneration facilities.
Strategy:	Long-term relationships with customers and host community. Combustion of solid fuel for long-term stability.
Customers:	Electric utilities and industrial companies.
Markets:	Domestic and international.

AES OFFICERS AND DIRECTORS

BOARD OF DIRECTORS

DENNIS W. BAKKE	President/COO of AES, Former Deputy Assistant Administrator at the Federal Energy Administration.
FRANK JUNGERS	Retired Chairman of the Board and Chief Executive Officer of Arabian American Oil Company (ARAMCO).
HENRY R. LINDEN	Frank Gunsalus Professor of Engineering at Illinois Institute of Technology and Former President of the Gas Research Institute.
C. ARTHUR ROLANDER	Former Senior Vice President of Gulf Oil Corporation, and former President of General Atomic Company and General Atomic International.
ROGER W. SANT	Chairman/CEO of AES, Former Assistant Administrator for Energy Conservation and Environment at the Federal Energy Administration.
RUSSELL E. TRAIN	President and Chief Executive Officer of World Wildlife Fund, U.S. and former Administrator, Environmental Protection Agency.
THOMAS I. UNTERBERG	Chairman, C. E. Unterberg Inc., former Managing Director of the Investment Banking Division of Shearson Lehman Brothers, Inc.
ROBERT H. WATERMAN, JR.	Founder of Waterman & Company, former Director of McKinsey & co-author of the bestseller <u>In Search of Excellence</u> , and author of <u>The Renewal Factor</u> published in September 1987.

OFFICERS

ROGER W. SANT	Chairman and Chief Executive Officer
DENNIS W. BAKKE	President and Chief Operating Officer
ROBERT F. HEMPHILL, JR.	Executive Vice President
KENNETH R. WOODCOCK	Senior Vice President for Business Development
MARK S. FITZPATRICK	Vice President for Design and Construction
ROGER F. NAILL	Vice President for Planning
BARRY J. SHARP	Vice President and Chief Financial Officer
THOMAS A. TRIBONE	Vice President for Project Development



Approach to Development and Operations

Development Philosophy:

- Structure project to benefit all parties -- consumers, ratepayers, and local community
 - Work to foster open channels of communication with concerned people
 - Local citizens
 - All levels of government
 - Environmental and other civic groups
 - Establish and maintain a cooperative relationship with regulatory agencies
-



Approach to Development and Operations

Environmental Highlights:

- AES Thames project - will finance its own CO₂ offset through a CARE Guatemala reforestation
 - AES Placerita facility - integrated into a ranch community in California, low noise levels and very low emissions - also oak tree moving effort during construction.
 - AES Beaver Valley - an aging coal power plant which was purchased and retrofitted with a scrubber to reduce air emissions.
 - AES Deepwater - awarded Power Magazine's Environmental Award for its production of electricity, steam and gypsum from a waste product.
 - Success recognized by many outside parties
 - 1989 recipient of the Council on Economic Priorities' America's Corporate Conscience Awards for Environmental Responsibility
 - 1989 Articles in National Geographic, Time Magazine, the New York Times and other papers discuss our concern for the environment.
-



Approach to Development and Operations

Operations:

- AES will operate all of its power facilities.
 - The single most important goal in AES is to achieve operating excellence.
 - We strive for this goal from the start of project development through the design and construction phase and during the entire plant operating life.
 - Our ability to achieve operating excellence is highly dependent on our operating technicians and the organization that supports them. We focus on:
 - Hiring and training.
 - Delegation and decentralization.
 - Bonus compensation for achieving performance goals.
 - Upward and horizontal communication. There are only two levels between the newest operating technician and the President of AES.
 - No headquarters staff which creates rules and procedures and retards motivation rather than promoting it.
 - Results have been favorable:
 - AES Deepwater operated at 91% availability for 1988 and at 86% availability in 1989.
 - AES Beaver Valley operated at over 91% availability in 1989, a remarkable rate for a 50 year old plant.
-



Corporate Values

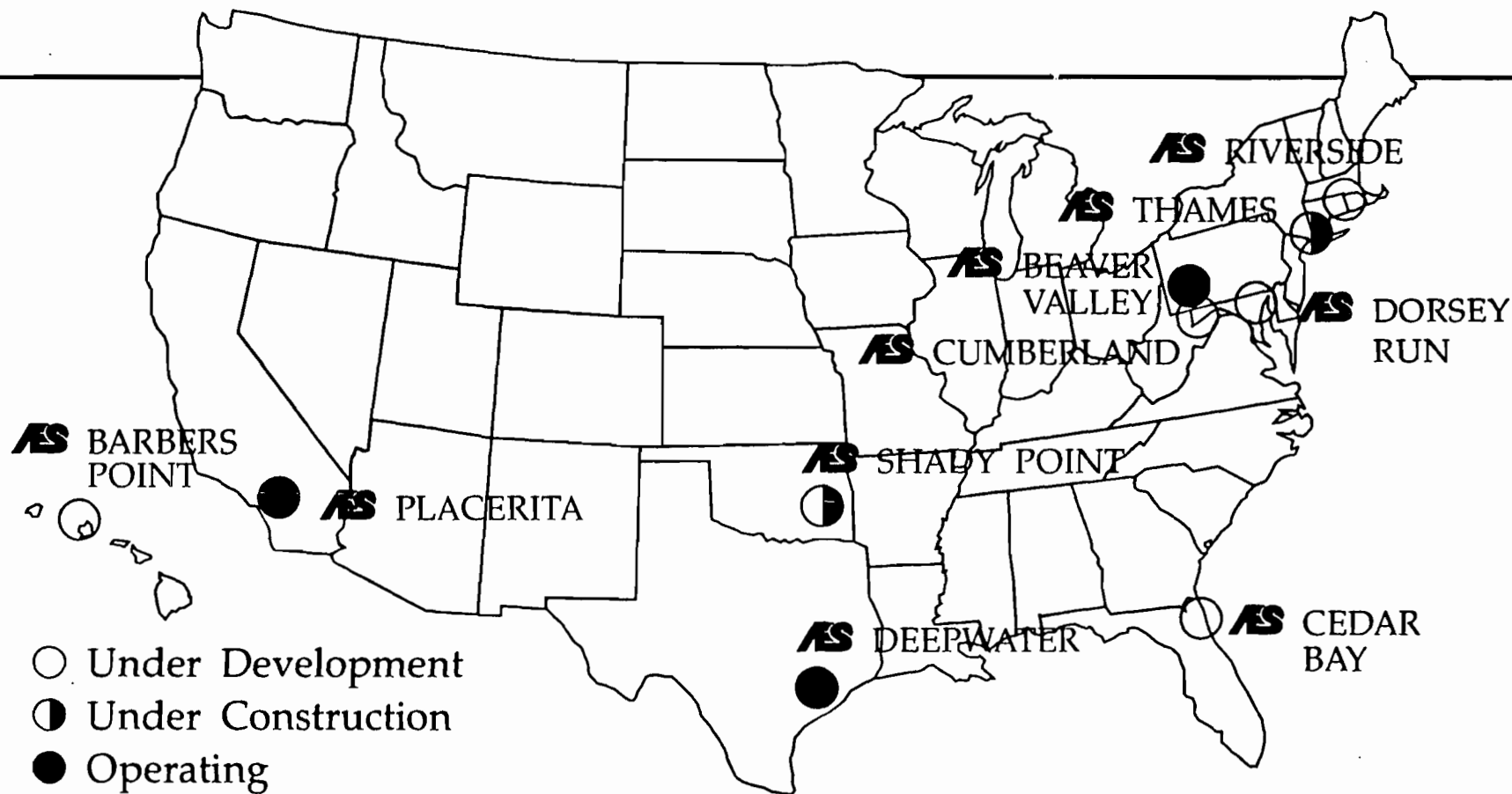
- Integrity
 - Fairness
 - Fun
 - Social Responsibility
-



Experience

- Three plants in operation with combined capacity of about 360 megawatts
 - Two plants under construction with a combined capacity of 500 megawatts
 - Signed power purchase agreements with utilities for more than 730 additional megawatts
 - Completed financings totaling \$1.2 billion for construction of 5 cogeneration facilities
-

AES Plant Locations



AES EXPERIENCE

<u>AES FACILITY/ LOCATION</u>	<u>CUSTOMERS</u>	<u>COST Million</u>	<u>FUEL</u>	<u>STEAM (#/HR)</u>	<u>POWER (MW)</u>	<u>CONST. START</u>	<u>ON LINE</u>
Deepwater Houston, Texas	Texas Utilities Lyondell Petrochemical	\$280	Petcoke	30,000	139	December 1983	June 1986
Beaver Valley Monaca, Pennsylvania	West Penn Power Arco Chemical	116	Coal	145,000	118	September 1985	July 1987
Placerita Newhall, California	Southern California Edison, Tenneco	120	Gas	250,000	99	July 1986	August 1988
Thames Montville, Connecticut	Northeast Utilities Stone Container	250	Coal	65,000	180	December 1986	November 1989
Shady Point Poteau, Oklahoma	Oklahoma G&E AES CO ₂ Plant	475	Coal	100,000	320	June 1987	January 1991
Riverside New England	New England Electric Boston Edison Eastern Utilities Associates	290	Coal	30,000	180	1991	1994
Barbers Point Oahu, Hawaii	Hawaiian Electric Chevron	250	Coal	30,000	180	1990	1992
Cumberland Cumberland, Maryland	Potomac Edison	280	Coal	30,000	180	1992	1995
Middle Branch Maryland	Potomac Electric	270	Coal	30,000	248	1991	1993
Cedar Bay Jacksonville, Florida	Florida Power & Light Stone Container	350	Coal	600,000	225	1990	1993
Fort Pierce Fort Pierce, FL	FPL (Tropicana)	400	Coal	45,000	270	1992	1995
Nocatee DeSoto County, FL	FPL AES CO ₂ Plant	<u>400</u>	Coal	<u>45,000</u>	<u>270</u>	1992	1995
TOTAL		<u>\$3451</u> Million		<u>1,310,000 lb/hr</u>	<u>1869 MW</u>		



Operating Experience

- By early 1995, AES expects to have 37 years of experience operating cogeneration facilities of 100 MW or greater, as follows:

<u>YEARS</u>	<u>AES PLANT</u>	<u>CAPACITY (MW)</u>	<u>FUEL</u>	<u>LOCATION</u>
8	Deepwater	140	Pet Coke	Texas
9	Beaver Valley	120	Coal	Pennsylvania
6	Placerita	100	Gas	California
5	Thames	180	Coal	Connecticut
4	Shady Point	320	Coal	Oklahoma
2	Barbers Point	180	Coal	Hawaii
1	Riverside	180	Coal	New England
2	Cedar Bay	225	Coal	Florida

37 Total cumulative years of operating experience by early 1995.

- AES plant managers, engineers and operating people will be available to consult with or partially staff the new Florida project.
-

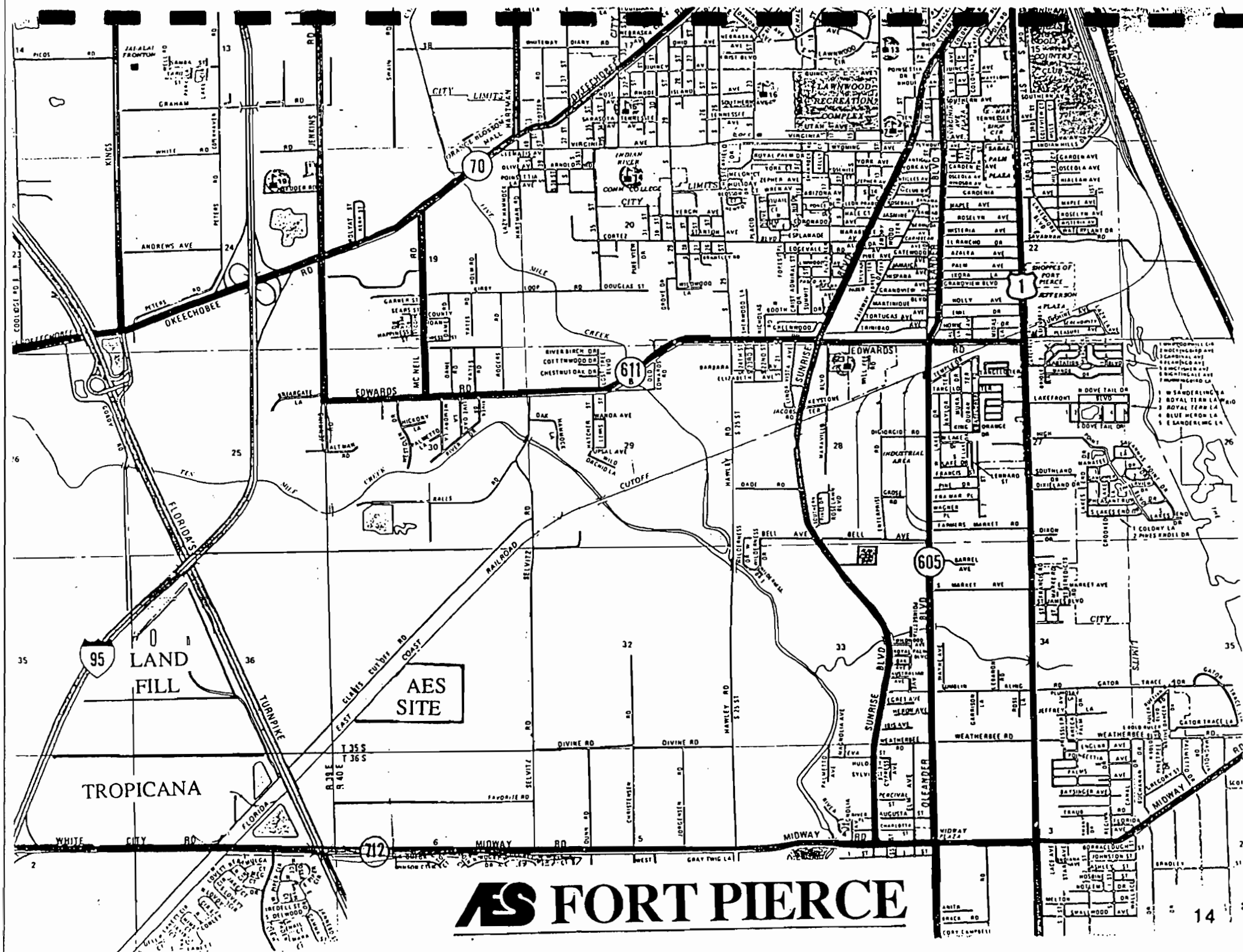
**Fort Pierce Cogeneration Facility
Project Overview**



Fort Pierce Cogeneration Facility

Project Overview

- 270 megawatt net coal-fired cogeneration facility.
 - \$400 million project (approximate cost) to commence operation in 1995.
 - Wholly owned subsidiary of The AES Corporation.
 - Utilizes an environmentally advanced, clean-coal technology.
 - Creates approximately 70 full-time plant jobs, 10 transportation jobs, 200 mining jobs and an average of 500-600 construction jobs. Additional jobs created by steam customer.
-



AES FORT PIERCE

**Fort Pierce Cogeneration Facility
Project Description**

Fort Pierce Cogeneration Facility

Site:

- Zoned industrial.
- Removed from residential areas, near a landfill.
- Served by Florida East Coast Railroad.
- Located in county vs city.
- 50 acres under option.
- Easement obtained that provides access to FPL transmission lines. Midway substation is nearby.

Community:

- Community, including politicians, are clearly interested in responsible economic development.
 - Many local parties have been briefed including:
 - City Commissioners
 - County Commissioners
 - County Planner
 - Ft. Pierce Mayor
 - Utility Authority Directors
 - Business Leaders
 - Environmental Groups
 - Ft. Pierce Tribune
-

Fort Pierce Cogeneration Facility (continued)

- High and seasonal unemployment rate makes job creation an important County goal.
- County is interested in tax revenues generated by facility.
- Ft. Pierce Utility Authority (FPUA) is proceeding with plans to provide us with "grey" water, approximately 4 million gallons per day; from their sewage treatment plant.
 - Utility Authority being urged to reduce its discharge rate by SFWMD
 - Recent manatee kills has increased pressure on the FPUA to stop discharging to the Indian River Aquatic Preserve
 - Our use of water helps FPUA avoid potentially costly alternatives
- Recent cold snap has sensitized county residents to the need for more power.
- Expansion of Ft. Pierce Utility Authority services to site will eventually permit annexation of larger area by City of Ft. Pierce.

Fort Pierce Cogeneration Facility (continued)

Design:

- Facility will use either Circulating Fluidized Bed Boilers or Pulverized Coal Boilers with low NOX burners and dry scrubbers.
 - Single reheat boilers
 - 2400 psig cycle likely
 - Steam output approximately 2 million pounds/hour
- One 3600 rpm turbine generator will be used.
- Active coal pile will be in an enclosed building.
- Mechanical draft cooling towers.
- Facility will be dispatchable.

Environmental:

- KBN completed a permit plan and fatal flaw analysis of the site. Site is well suited for a power facility.
 - No prior industrial activity so no contamination is present.
 - Air quality in the region is good.
 - Lower Floridian aquifer is well suited for wastewater injection.
 - Field investigation uncovered no evidence of threatened or endangered species.
 - Potential to use existing meteorological data for PSD application modeling is good.
 - Area of landlocked wetlands on site must be considered in design.
 - Airport approximately 10 miles from site necessitates an FAA review.
-



Fort Pierce Cogeneration Facility (continued)

Fuel Supply:

- Coal will be supplied from Appalachian mines under a long-term contract and delivered by the Florida East Coast Railroad via CSX or Norfolk Southern.
 - Annual consumption of 850 thousand tons of coal expected.
 - Eastern Kentucky, Southwestern Virginia or Southern West Virginia, are the most likely sources.
 - Coastal Coal Corp. and Island Creek have provided pricing.
 - Twenty year contracts will be sought.
 - Delivery will be by unit trains. Offloading will be in an enclosed building.
 - AES fuel procurement program is based on extensive experience.
 - Three operating sold fuel facilities burning 1.6 million tons per year.
 - Additional contracts signed for 3.8 millions tons per year.
 - Current suppliers include
 - CSX/Anker Energy
 - United Pittsburgh Coal Sales (Aloe)
 - Island Creek
 - British Petroleum (Supplying Indonesian coal to Barbers Point project)
 - Costain
-



Fort Pierce Cogeneration Facility (continued)

Ash Disposal:

- AES will market the reaction products and fly ash produced during operation.
- AES is exploring the option of local disposal. Alternatively, a long-term contract to transport the waste back to the mines for disposal will be pursued.
 - SCA process makes the local option a realistic alternative.
 - Discussions for a local disposal site in Florida, remote from developed areas, are ongoing.
 - AES has signed 4 agreements for other facilities where the waste is transported to mines for disposal.

Steam Output:

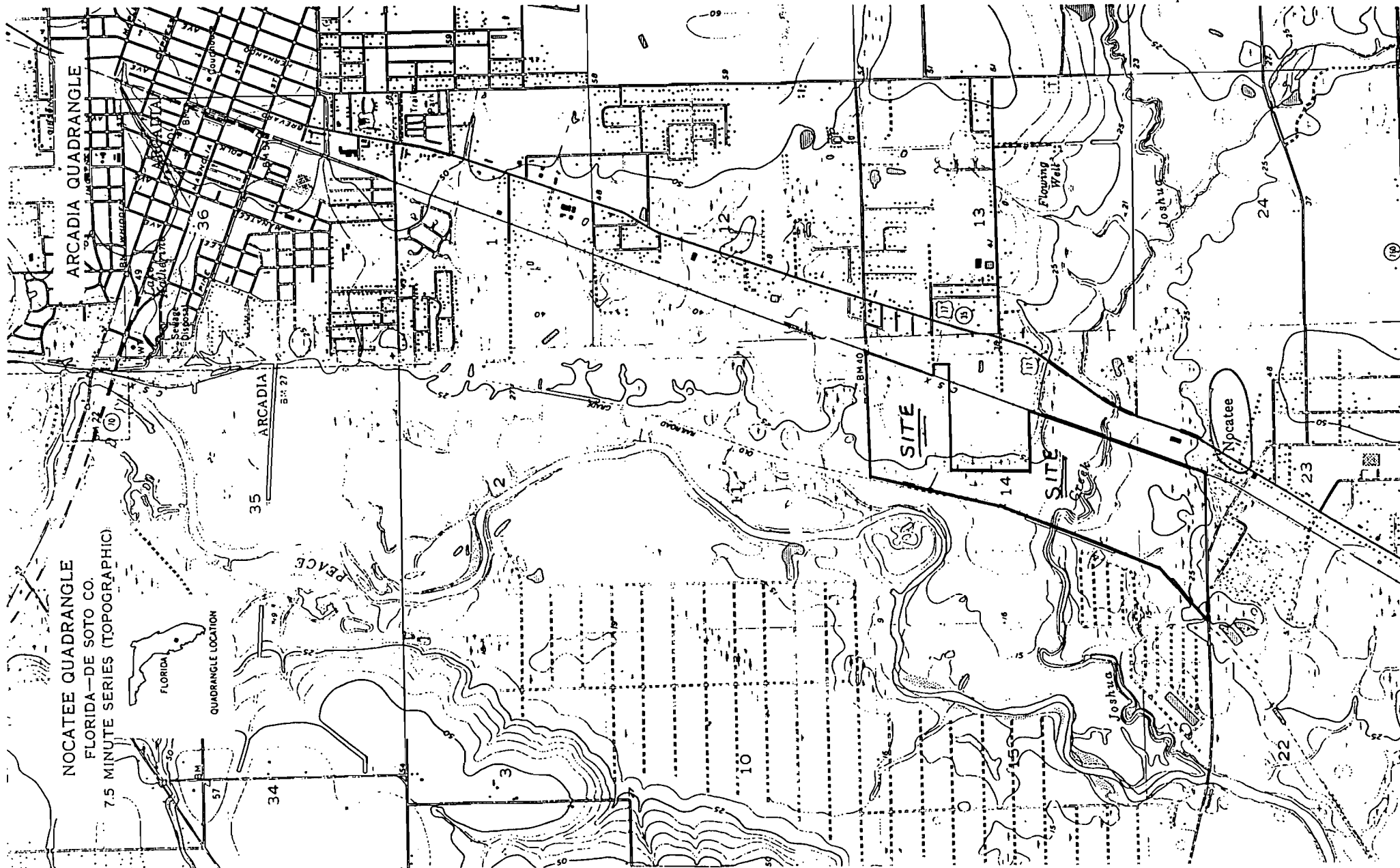
- Minimum of 45,000 lbs/hr available for Tropicana processing plant or an AES owned CO2 plant or another clean industry which we would attract with economically priced steam.
-

**Nocatee Cogeneration Facility
Project Overview**

Nocatee Cogeneration Facility

Project Overview

- 270 megawatt net coal-fired cogeneration facility. All the output will be sold to FPL.
 - \$400 million project (approximate cost) to commence operation in 1995.
 - Wholly owned subsidiary of the AES Corporation.
 - Utilizes an environmentally advanced, clean-coal technology.
 - Creates approximately 70 full-time plant jobs, 10 transportation jobs, 200 mining jobs and an average of 500-600 construction jobs. Additional jobs created by steam customer.
-



**Nocatee Cogeneration Facility
Project Description**

Nocatee Cogeneration Facility

Site:

- Adjacent to an industrial area.
- Remote from residential areas.
- Served by Seminol Gulf Railroad.
- Located in county vs city.
- Option terms for 280 acres substantially accepted.
- Easement available from railroad to access nearby FPL Nocatee substation. FPL transmission lines cross site.

Community:

- DeSoto County needs and wants economic development.
 - Community leaders are supportive. Briefings have included:
 - County Commissioners
 - City Commissioners
 - Former County Administrator
 - Business Leaders
 - Tampa Tribune
 - Environmental (NIMBY) groups take a reasonable approach to development.
-

Nocatee Cogeneration Facility (continued)

- Job creation is an important county goal.
- The county needs to expand its tax base.
- Our facility could advance the start of construction for the Route 17 expansion.
- Use of 1-2 million gallons per day of effluent from the City of Arcadia would reduce its impact on the Peace River.

Design:

- Major components of the plant will be identical to the AES Fort Pierce facility.
- Differences in auxiliary systems include:
 - Coal storage outside
 - Water primarily obtained from the Floridian aquifer.

Environmental:

- KBN completed a permit plan and fatal flaw analysis of two properties proposed for our Nocatee facilities:
 - The old stump plant site was deemed unacceptable due to regulatory delay involved with cleaning-up contaminants from that defunct operation.

Nocatee Cogeneration Facility (continued)

- The second parcel, currently owned by Orange-co, has approximately 150 acres that is outside the floodplain.
- Other highlights include:
 - No prior industrial activity so no contamination is present.
 - Air quality in the region is good.
 - Floridian aquifer can supply all or water requirements if necessary. Even so, AES has proposed recharging the aquifer from the Peace River during the rainy season and possibly using grey water from Arcadia.
 - Studies are on-going but they suggest that the geology at a 3500 foot depth is suitable for wastewater injection.
 - Potential to use existing meteorological data for PSD application modeling is good.
 - No apparant threatened or endangered species have been detected although more field work is needed to be definitive.

Fuel Supply:

- The procurement of fuel for AES Nocatee will be performed in conjunction with AES Fort Pierce.
 - Seminol Gulf Railroad connecting with CSX services the site.
-

Nocatee Cogeneration Facility (continued)

Ash Disposal:

- Our strategy here is similar to our strategy for Ft. Pierce.
 - Our site has adequate space for on-site disposal.
 - Additional nearby sites provide another alternative.

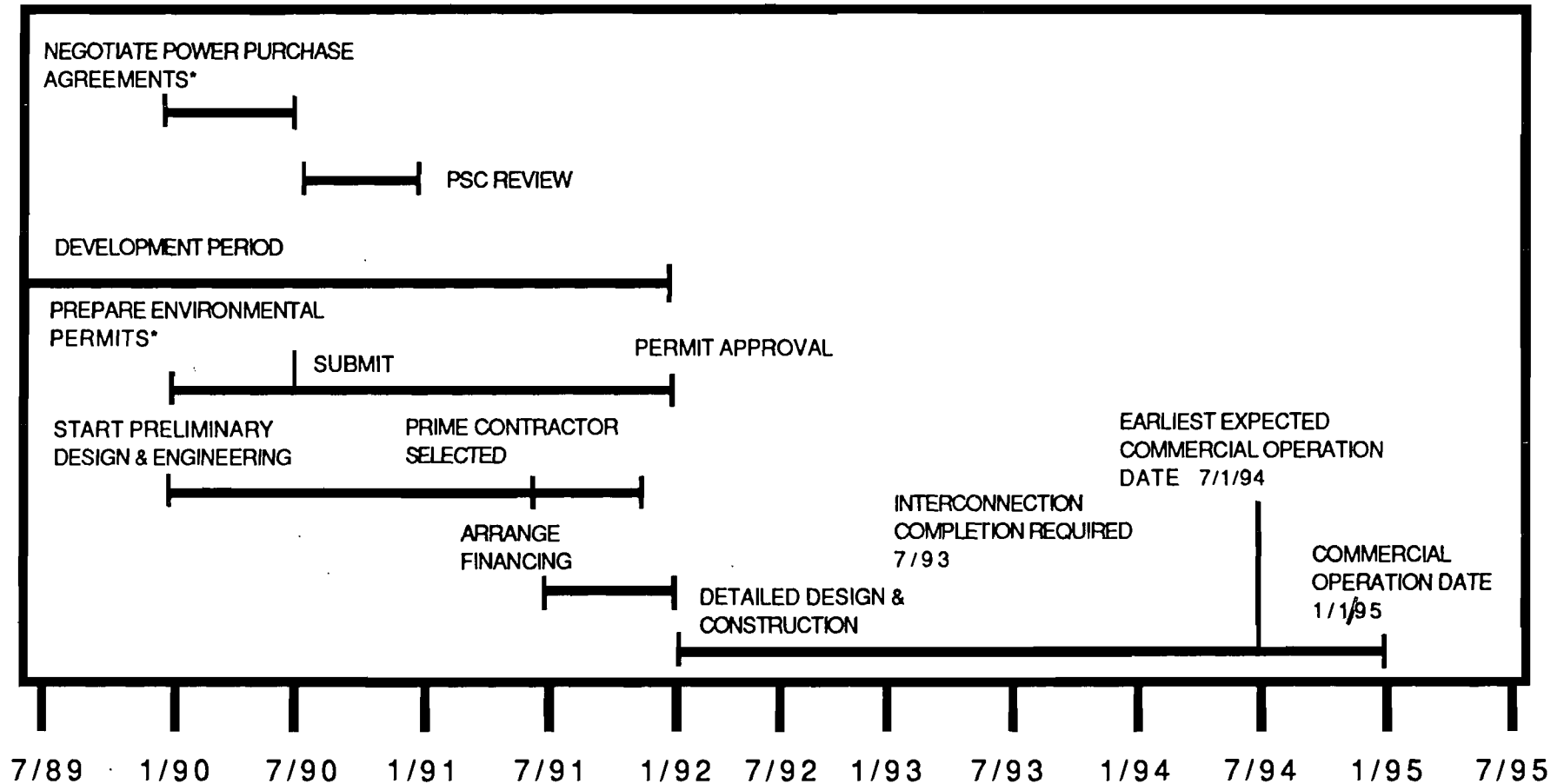
Steam Output:

- AES is committed to attract a steam customer on a best efforts basis that provides economic benefits to the county. AES will provide economically priced steam and financial assistance.
 - If we are unsuccessful in attracting a steam customer, AES will build its own CO2 production plant to use 45,000 lbs/hr.
-

AES FORT PIERCE & AES NOCATEE

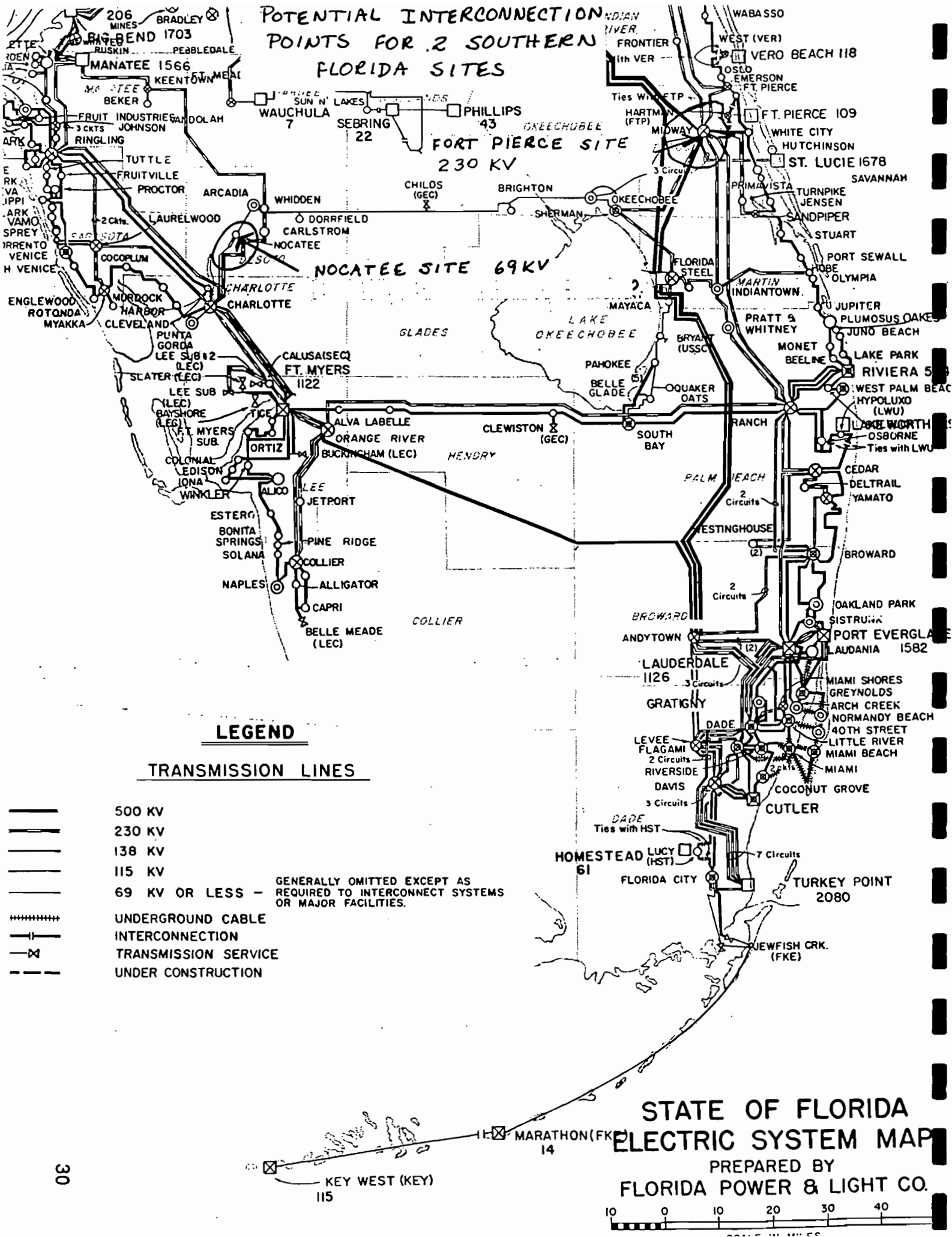
270 MW
COAL FIRED
PLANT

Planned Schedule



* TIMING IS LINKED TO PROGRESS WITH FPL ON POWER PURCHASE AGREEMENTS.

POTENTIAL INTERCONNECTION POINTS FOR 2 SOUTHERN FLORIDA SITES



Project Team (Both Ft. Pierce & Nocatee):

(additions and changes are made during development as required)

- AES In-house Team

Kerry Varkonda
Sarah Slusser
Julie Blunden
Bob Muir

Gary Jungers
Michael Ullman
Ken Woodcock
Tom Tribone

Steve Meyer
Jeff Swain
Bill Arnold (Operations liaison)

- Supporting Players

Environmental Consultants

Black & Veatch Engineers
KBN Engineering and Applied Sciences

Conceptual Engineering

Bibb & Associates

Hydrology & water sciences

Layne Atlantic

General counsel

Chadbourn & Parke

Environmental counsel

Oertel, Hoffman, Fernandez & Cole

Regulatory counsel

Moore, Williams, Bryant, Peebles & Gautier

Local counsel, Ft. Pierce

Gonano & Harrell

Local counsel, Nocatee

Fletcher Brown

Economic Development Contact, Ft. Pierce

Al Rivett

Economic Development Contact, Nocatee

Bill Hackney

Economic Development Contact, Florida

Gene Cavanaugh

Printer



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

April 15, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Fort Pierce
P. O. Box 1298
Fort Pierce, Florida 33448

Dear Mr. Schindehette:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to construct and operate a 31.6 MW combined cycle gas turbine system.

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

Sincerely,

Barry D. Fancy

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

CHF/PL/plm

Attachments

c: Stephanie Brooks, SED
Jewell Harper, EPA
Steven M. Day, P.E.

He Lamb - Ft. Pierce Services

T. Miller - Ft. Pierce Services

P 407 852 663

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

PS Form 3800, June 1985

U.S.G.P.O. 1989-234-555

Sent to Mr. Harry Schindehette, P.E.	
Street and No. Ft. Pierce Utilities P. O. Box 3191	
P.O. State and ZIP Code Ft. Pierce, FL 34948	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 4-15-91 Permit: AC 56-185836 PSD-FL-154	

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

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

3. Article Addressed to:
Mr. Harry Schindehette, P.E.
Director of Utilities
City of Fort Pierce
P. O. Box 3191
Ft. Pierce, FL 34948

4. Article Number
P 407 852 663

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

Always obtain signature of addressee or agent and **DATE DELIVERED**.

5. Signature — Addressee
X

6. Signature — Agent
X *[Signature]*

7. Date of Delivery
APR 17 1991

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

PS Form 3811, Apr. 1989

U.S.G.P.O. 1989-238-815

DOMESTIC RETURN RECEIPT

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Fort Pierce Utilities Authority
H.D. King Electric Generating Plant
P. O. Box 1298
Fort Pierce, Florida 33448

DER File No. AC 56-185836
PSD-FL-154

INTENT TO ISSUE

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

The applicant, Fort Pierce Utilities Authority, applied on October 23, 1990, to the Department of Environmental Regulation for a PSD permit to operate a 31.6 MW combined cycle gas turbine generator and to change restrictions on existing units at their H.D. King Electric Generating Plant.

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

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

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

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

The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by Petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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

to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for Barry D. Antler
C. H. Fancy, P.E.

Chief
Bureau of Air Regulation

Copies furnished to:

Stephanie Brooks, SED
Jewell Harper, EPA
Steven M. Day, P.E.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on April 15, 1991.

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

Tracy C. Carter 4-15-91
clerk Date

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

The Department of Environmental Regulation hereby gives notice of its intent to issue a PSD permit to Fort Pierce Utilities Authority, P. O. Box 1298, Fort Pierce, St. Lucie County, Florida 33448, to operate a 31.6 MW combined cycle gas turbine system and to change restrictions on existing units. A determination of Best Available Control Technology (BACT) was required. The maximum degree of increment consumed for nitrogen dioxide is 2.0% of the Class II proposed annual mean. For sulfur dioxide, the maximum consumption is also 2.0%. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

The Petition shall contain the following information:

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

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

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

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

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

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

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

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

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

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

Department of Environmental Regulation
Southeast District
1900 S. Congress Avenue, Suite A
West Palm Beach, Florida 33406

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

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Technical Evaluation
and
Preliminary Determination

Fort Pierce Utilities Authority
H.D. King Electric Generating Plant
Fort Pierce, St. Lucie County, Florida

31.6 MW Combined Cycle Gas Turbine System

Permit Number: AC 56-185836
PSD-FL-154

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

April 15, 1991

SYNOPSIS OF APPLICATION

I. NAME AND ADDRESS OF APPLICANT

Fort Pierce Utilities Authority
H.D. King electric Generating Plant
P. O. Box 1298
Fort Pierce, Florida 33448

II. REVIEWING AND PROCESS SCHEDULE

Date of Receipt of Application: August 31, 1990.

1st Completeness Review: Department letter dated September 28, 1990.

Response to 1st Incompleteness Letter: Company letter received on October 23, 1990.

2nd Completeness Review: Department letter dated November 21, 1990.

Response to 2nd Incompleteness Letter: Company letter dated December 6, 1990.

3rd Completeness Review: Department letter dated January 4, 1991.

Application Completeness Date: January 16, 1991.

III. FACILITY INFORMATION

III.1 Facility Location

This facility is located at 311 North Indian River Drive in Fort Pierce, St. Lucie County, Florida. The UTM coordinates are 566.692 km East and 3036.292 km North.

III.2 Facility Identification Code (SIC)

Major Group No. 49 - Electric, Gas and Sanitary Services.

Industry Group No. 493 - Combination Electric, Gas and Other Utility Services.

Industry Group No. 4931 - Electric and Other Services Combined.

III.3 Facility Category

The City of Fort Pierce Utilities Authority-H.D. King Electric Generating Plant is classified as a major emitting facility. The proposed project will burn natural gas only and emit

approximately 258.0 tons per year (TPY) of nitrogen oxides (NO_x), 0.9 TPY of sulfur dioxide (SO₂), 11.0 TPY of particulate matter (PM), 10.5 TPY of volatile organic compounds (VOC), 0.0007 TPY of beryllium, 0.06 TPY of lead, 0.1 TPY of mercury, and 0.027 TPY of sulfuric acid mist.

IV. PROJECT DESCRIPTION

The Fort Pierce Utilities Authority proposes to operate a 31.6 MW combined cycle gas turbine at the H.D. King Power Plant in Fort Pierce, Florida. The combined cycle system (Units 9 and 5) consists of a 23.4 MW natural gas fired combustion turbine-generator, steam generator, and an 8.2 MW condensing turbine. A chronology of major events are as follows:

- a) The application for permit to construct was submitted in October of 1987.
- b) The permit to construct was issued on March 28, 1988.
- c) The initial operation of the unit occurred in February of 1989.
- d) The permanent operating permit was issued on May 8, 1990, including restricted hours on Units 6, 7, and 8.
- e) The application for a PSD permit to operate without restricted hours on Units 6, 7, and 8 was submitted on August 31, 1990.
- f) The application was considered complete on January 16, 1991.

V. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code (F.A.C.).

The plant is located in an area designated attainment for all criteria pollutants in accordance with F.A.C. Rule 17-2.420.

The proposed project will be reviewed under F.A.C. Rule 17-2.500, Prevention of Significant Deterioration (PSD), because it will be a major modification to a major facility. This review consists of a determination of Best Available Control Technology (BACT) and unless otherwise exempted, an analysis of the air quality impact of the increased emissions. For PSD reviews in which the source has been already constructed, the rules require that BACT be evaluated as if the source has not been constructed. No air quality impact analysis is required for ozone, even though there will be a significant increase in VOC emissions, because this increase is less than 100 TPY. The review also includes an analysis of the project's impacts on soils, vegetation and visibility; along with air quality impacts resulting from associated commercial, residential and industrial growth.

This source shall comply with the New Source Performance Standards for Gas Turbines, Subpart GG, Appendix A, which is contained in 40 CFR 60, and is adopted by reference in F.A.C. Rule 17-2.660. The proposed source shall also comply with applicable provisions of F.A.C. Rule 17-2.700, Stack Test Procedures, and F.A.C. Rule 17-2.630, Best Available Control Technology.

VI. SOURCE IMPACT ANALYSIS

VI.1 Emission Limitations

The operation of the combined cycle plant will produce emissions of NO_x, SO₂, CO, HC, sulfuric acid mist, PM, Be, Pb and Hg. The impact of these pollutant emissions are below the Florida ambient air quality standards (AAQS) and/or the acceptable ambient concentration levels (AAC). Table 1 lists each contaminant and its maximum expected emission rate, along with the proposed increase of emissions.

VI.2 Air Toxics Evaluation

The operation of this source will produce emissions of chemical compounds that may be toxic in high concentrations. The emission rates of these chemicals shall not create ambient concentrations greater than the acceptable ambient concentrations (AAC) as shown below. Determination of the AAC for these organic compounds shall be determined by Department approved dispersion modeling or ambient monitoring.

$$AAC = \frac{OEL}{\text{Safety Factor}}$$

Where,

AAC = acceptable ambient concentration

Safety Factor = 50 for category B substances and 8 hrs/day
100 for category A substances and 8 hrs/day
210 for category B substances and 24 hrs/day
420 for category A substances and 24 hrs/day

OEL = Occupational exposure level such as ACGIH, ASHA and NIOSH published standards for toxic materials.

MSDS = Material Safety Data Sheets

VI.3 Air Quality Analysis

a. Introduction

The operation of the proposed 31.6 MW combined cycle gas turbine system will result in emissions increases which are projected to be greater than the PSD significant emission rates for the following pollutant: NO_x. Therefore, the project is subject to the PSD review requirements contained in F.A.C. Rule 17-2.500 for this pollutant. Part of these requirements is an air quality impact analysis for NO_x, which includes:

- An analysis of existing air quality;
- A PSD increment analysis;
- An Ambient Air Quality Standards analysis (AAQS);

- An analysis of impacts on soils, vegetation, visibility and growth-related air quality impacts; and
- A Good Engineering Practice (GEP) stack height determination

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses are based on air quality dispersion modeling completed in accordance with EPA guidelines.

Based on these required analyses, the Department has reasonable assurance that the combined cycle gas turbine system, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. A brief description of the modeling methods used and results of the required analyses follow. A more complete description is contained in the permit application on file.

b. Analysis of the Existing Air Quality

Preconstruction ambient air quality monitoring may be required for pollutants subject to PSD review. However, an exemption to the monitoring requirement can be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration. The predicted maximum concentration increase for NO_x is 9.6 ug/m³, which is less than the PSD de minimus concentration for NO_x of 14 ug/m³, annual average.

No preconstruction monitoring is required for NO_x. However, a background concentration was developed by the Department for use in the ambient air quality analysis. This value of 24 ug/m³, annual average, was based on 1989 data from a site in West Palm Beach. Data from the West Palm Beach monitor are considered conservatively high since West Palm Beach is significantly more urbanized than Fort Pierce.

c. Modeling Method

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used by the applicant to predict the impact of the proposed project on the surrounding ambient air. All recommended EPA default options were used. Direction-specific downwash parameters were used because the stacks were less than the good engineering practice (GEP) stack height. Five years of sequential hourly surface and mixing depth data from the West Palm Beach, Florida National Weather Service (NWS) station collected during 1982 through 1986 were used in the model. Since five years of data were used, the highest-second-high short-term predicted concentrations are compared with the appropriate ambient air quality standards or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards.

d. Modeling Results

The applicant first evaluated the potential increase in ambient ground-level concentrations associated with the project to determine if these predicted ambient concentration increases would be greater than the specified PSD significant impact level for NOx. This evaluation was based on the "worst case" load conditions with the turbine operating at 100% load and with the HRSG operational. Dispersion modeling was performed with receptors placed along the 36 standard radial directions (10 degrees apart) surrounding the proposed source at the following downwind distances: 100 meter intervals from 100 to 1,000 meters, 250 meter intervals from 1,250 to 3,000 meters, and 1,000 meter intervals from 4,000 to 10,000 meters. The results of this modeling showed that the increases in ambient ground-level concentrations for all NO₂ were greater than the PSD significant impact level for NOx, thus requiring the applicant to perform a full impact analysis for NOx. The significant impact area was determined to be 300m and all sources within 50 km of the significant impact area were evaluated by the applicant.

The results of the AAQS analysis and the PSD Class II increment analysis for NOx are shown below. No PSD Class I increment analysis was done since the project is located more than 100 km from the nearest Class I area.

NOx AAQS Analysis (all values in ug/m³)

Maximum Predicted Concentration	83.2
Combined Fort Pierce Utilities Source Impact	59.2*
Background Concentration	24
NOx AAQS, Annual Average	100

* Maximum combined Fort Pierce Utilities impact from:
Unit 9 (HRSG firing natural gas), Units 6-8 (firing
No. 6 fuel oil), Diesel Units 1 and 2 (firing No. 2
fuel oil).

NOx PSD Class II Increment Analysis (all values in ug/m³)

Maximum Predicted Concentration	9.6
Increment, Annual Average	25

e. Additional Impacts Analysis

The maximum predicted concentrations from NOx emissions are less than the AAQS and the PSD Class II increments. As such no harmful effects on soils and vegetation is expected. In addition, the proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

VII. CONCLUSION

Based on the information provided by H.D. King Electric Generating Plant, the Department has reasonable assurance that the proposed installation of the 31.6 MW combined cycle gas turbine system, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

Barry D. Anderson
36024
4-15-91

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standard	Gas Turbine and HRSG ^(a)	Basis
	Gas Firing	<u>Tons Per Year</u> Gas	
NO _x	9 ppm at 15% oxygen on a dry basis	55.2	BACT
SO ₂	Natural gas as fuel	0.9	Est. by Appl.
PM/PM ₁₀	" "	11	Est. by Appl.
VOC	-	11	Est. by Appl.
CO	-	37	Est. by Appl.
Sulfuric Acid Mist	Natural gas as fuel	0.027	Est. by Appl.

(a) Emission rates based on 20°F and 15% O₂.



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:

Fort Pierce Utilities Authority
H.D. King Electric Generating
Plant
P. O. Box 1298
Fort Pierce, FL 33448

Permit Number: AC 56-185836

PSD-FL-154

Expiration Date: March 30, 1992

County: St. Lucie

Latitude/Longitude: 27°27'01"N

80°19'29"W

Project: 31.6 MW Combined Cycle
Gas Turbine (Unit 9)

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

For an existing 31.6 MW combined cycle gas turbine (Unit 9) to be located at the H.D. King Electric Generating Plant in Fort Pierce, Florida. The UTM coordinates are 566.692 km East and 3036.292 km North.

This permit addresses the need to remove operational restrictions on existing Units 6, 7, and 8, which thereby subjects Unit 9 to a Prevention of Significant Deterioration (PSD) review. As this is the case, the Specific Conditions contained in this permit supercede those contained in construction permit AC 56-141460 for Unit 9. In addition, all operational restrictions for Units 6, 7, and 8 that were imposed in AC 56-141460 are removed as a result of this permitting action.

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

Attachments are listed below:

1. H.D. King Pre-application document dated August 27, 1990.
2. Department's letter dated September 28, 1990.
3. H.D. King Electric Generating Plant's application dated October 23, 1990.
4. Department's letter dated November 21, 1990.
5. H.D. King Electric Generating Plant's letter dated December 5, 1990.
6. Department's letter dated December 26, 1990.
7. H. D. King Electric Generating Plant's letter dated January 16, 1991.

PERMITTEE:
Fort Pierce Utilities Authority

Permit Number: AC 56-185836
Expiration Date: March 30, 1992

GENERAL CONDITIONS:

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

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

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

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

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

PERMITTEE:

Fort Pierce Utilities Authority

Permit Number: AC 56-185836

Expiration Date: March 30, 1992

GENERAL CONDITIONS:

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

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

- a. Have access to and copy any records that must be kept under the conditions of the permit;
- b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

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

PERMITTEE:
Fort Pierce Utilities Authority

Permit Number: AC 56-185836
Expiration Date: March 30, 1992

GENERAL CONDITIONS:

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

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

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

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

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

13. This permit also constitutes:

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

14. The permittee shall comply with the following:

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

PERMITTEE:

Fort Pierce Utilities Authority

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GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

Emission Limits

1. The maximum allowable emissions from this facility shall not exceed the emission rates listed in Table 1.

2. Unless the Department has determined that other concentrations are required to protect public health and safety, the predicted acceptable ambient air concentrations (AAC) of the following pollutants shall not be exceeded:

PERMITTEE:

Fort Pierce Utilities Authority

Permit Number: AC 56-185836

Expiration Date: March 30, 1992

SPECIFIC CONDITIONS:

Pollutant	Acceptable Ambient Concentrations ug/m ³		
	8-hrs	24-hrs	Annual
Beryllium	0.02	0.005	0.0004
Lead	1.5	0.36	0.09
Mercury: allyl compounds	0.1	0.024	- RAC = 2
· all forms of vapor			
· except allyl	0.5	0.12	-
· allyl & organic compounds	1	0.24	-

3. Visible emissions shall not exceed 10% opacity.

Operating Rates

4. This source is allowed to operate continuously (8760 hours per year).

5. This source is allowed to use natural gas only.

6. The permitted materials and utilization rates for the combined cycle gas turbine shall not exceed the maximum heat input of 353 MMBtu/hr (gas).

7. Any change in the method of operation, equipment or operating hours shall be submitted to the DER's Bureau of Air Regulation and Southeast District offices.

8. Any other operating parameters established during compliance testing and/or inspection that will ensure the proper operation of this facility shall be included in the operating permit.

Compliance Determination

9. Compliance with the NO_x, SO₂, CO, PM, and VOC standards shall be determined by the following reference methods as described in 40 CFR 60, Appendix A (July 1, 1988) and adopted by reference in F.A.C. Rule 17-2.700.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3. Gas Analysis

PERMITTEE:
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Permit Number: AC 56-185836
Expiration Date: March 30, 1992

SPECIFIC CONDITIONS:

- Method 5. Determination of Particulate Matter Emissions from Stationary Sources
- Method 9. Determination of the Opacity of the Emissions from Stationary Sources
- Method 10. Determination of the Carbon Monoxide Emission from Stationary Sources
- Method 20. Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines

10. Method 5 must be used to determine the initial compliance status of this unit. Thereafter, the opacity emissions test may be used unless 10% opacity is exceeded.

11. Compliance with the SO₂ emission limit can also be determined by calculations based on fuel analysis using ASTM D2880-71 for the sulfur content of liquid fuels and ASTM D1072-80, D3031-81, D4084-82 or D3246-81 for sulfur content of gaseous fuels.

12. Compliance with the total volatile organic compound emission limits will be assumed, provided the CO allowable emission rate is achieved; specific VOC compliance testing is not required.

13. During performance tests, to determine compliance with the proposed NO_x standard, measured NO_x emission at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction factor:

$$NO_x = (NO_x \text{ obs}) \left(\frac{P_{\text{ref}}}{P_{\text{obs}}} \right)^{0.5} e^{19} (H_{\text{obs}} - 0.00633) \left(\frac{288^\circ K}{T_{\text{AMB}}} \right)^{1.53}$$

where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

NO_x obs = Measured NO_x emission at 15 percent oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.

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Fort Pierce Utilities Authority

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Expiration Date: March 30, 1992

SPECIFIC CONDITIONS:

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{AMB} = Temperature of ambient air at test.

14. Test results will be the average of 3 valid runs. The Southeast District office will be notified at least 30 days in advance of the compliance test. The source shall operate between 90% and 100% of permitted capacity during the compliance test. Compliance test results shall be submitted to the Southeast District office no later than 45 days after completion.

15. A continuous monitoring system shall be installed to monitor and record the fuel consumption. Continuous monitoring shall also be installed, operated, and maintained in accordance with 40 CFR 60, Appendix F, for the combined cycle unit to monitor nitrogen oxides emissions.

- a. Each continuous emission monitoring system (CEMS) shall meet performance specifications of 40 CFR 60, Appendix B.
- b. CEMS data shall be recorded and reported in accordance with Chapter 17-2, F.A.C., and 40 CFR 60. The record shall include periods of startup, shutdown and malfunction.
- c. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset conditions or preventable equipment breakdown shall not be considered malfunctions.
- d. The procedures under 40 CFR 60.13 shall be followed for installation, evaluation and operation of all CEMS.
- e. For purposes of reports required under this permit, excess emissions are defined as any calculated average emission concentration, as determined pursuant to Condition No. 22 herein, which exceeds the applicable emission limits in Condition No. 1.

PERMITTEE:
Fort Pierce Utilities Authority

Permit Number: AC 56-185836
Expiration Date: March 30, 1992

SPECIFIC CONDITIONS:

16. Sulfur, nitrogen content and lower heating value of the fuel being fired in the gas turbine shall be recorded daily. The records of fuel oil usage will be kept by the company for a two-year period; available for regulatory agency's inspection.

17. Compliance with the acceptable ambient concentrations for Be, Lead, and Hg emissions shall be demonstrated based on calculations certified by a Professional Engineer registered in Florida, using actual operating conditions. Determination of the ambient concentrations for chemical compounds shall be determined by Department approved dispersion modeling. This compliance determination shall be made available upon request.

Rule Requirements

18. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes and Chapters 17-2 and 17-4, Florida Administrative Code.

19. This source shall comply with all requirements of 40 CFR 60, Subpart GG and F.A.C. Rule 17-2.660(2)(a), Standards of Performance for Stationary Gas Turbines.

20. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-2.210(1)).

21. This source shall comply with F.A.C. Rule 17-2.700, Stationary Paint Source Emission Test Procedures.

22. Pursuant to F.A.C. Rule 17-2.210(2), Air Operating Permits, 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, nitrogen content and lower heating value of the fuel being fired, fuel usage, hours of operation, air emissions limits, etc. Annual reports shall be sent to the Department's Southeast District office.

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

PERMITTEE:
Fort Pierce Utilities Authority

Permit Number: AC 56-185836
Expiration Date: March 30, 1992

SPECIFIC CONDITIONS:

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

Issued this _____ day
of _____, 1990

**STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION**

Carol M. Browner
Secretary

Best Available Control Technology (BACT) Determination
Ft. Pierce Utilities Authority
H.D. King Electric Generating Plant
St. Lucie County

The applicant proposes to operate a 31.6 MW combined cycle gas turbine system (Unit 9) at their facility on North Indian River Drive, Ft. Pierce, St. Lucie County, Florida.

The maximum heat input will be 353 MMBtu/hr using natural gas as a fuel. Fuel oil will not be fired in the unit. The applicant has indicated the maximum annual tonnage of regulated air pollutants emitted from the facility based on sea level conditions at 59°F and 100 percent capacity to be as follows:

Pollutant	Potential Emissions (tons/yr)	PSD Significant Emission Rate (tons/yr)
NOx	258.0	40
SO ₂	0.9	40
PM	11.0	25
PM ₁₀	11.0	15
CO	37.2	100
VOC	10.5	40

Florida Administrative Code Rule 17-2.500(2)(f)(3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

Date of Receipt of a BACT Application

January 16, 1991

BACT Determination Requested by the Applicant

<u>Pollutant</u>	<u>Determination</u>

NOx	42 ppmvd @ 15% O ₂

BACT Determination Procedure

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

BACT

Ft. Pierce Utilities Authority

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- (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 applicant has stated that BACT for nitrogen oxides will be met by using steam injection necessary to limit emissions to 42 ppmvd at 15% oxygen.

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

Selective catalytic reduction is a post-combustion method for control of NOx emissions. The SCR process combines vaporized ammonia with NOx 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. The SCR process can achieve up to 90% reduction of NOx with a new catalyst. As the catalyst ages, the maximum NOx reduction will decrease to approximately 86 percent.

BACT

Ft. Pierce Utilities Authority

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Given the applicant's proposed BACT level for nitrogen oxides control stated above, an evaluation can be made of the cost and associated benefit of using SCR as follows:

The applicant has indicated that the annualized cost (amortized capital plus operating) for a SCR system would be approximately \$1,250,000 based on a total system cost of \$3.1 million and a 13.6 percent fixed charge rate. Operating costs are projected to be \$910,000 per year.

Based on recent economic evaluations for reviewing SCR as a BACT alternative, the applicant's capital and operating cost estimates appear high. Since this source has been constructed and originally avoided PSD review in 1987 by taking certain restrictions on existing units, the Department does not support including HRSG modification costs and higher erection costs as part of the BACT evaluation.

For comparison purposes, the Department is currently reviewing an application for a 40 MW natural gas fired combustion turbine. The cost to operate SCR in this case is estimated to be \$520,000 annually. Considering that the turbine proposed for Ft. Pierce Unit 9 is smaller (31.6 MW compared to 40 MW) it is estimated that the annual operating cost for SCR should be approximately \$410,800 instead of the \$0.9 million proposed.

In terms of equipment cost, the estimates provided for the 40 MW turbine application are also less than what has been stated for Ft. Pierce's application. The total capital cost of equipping the 40 MW turbine with SCR is estimated to be 1.85 million dollars. This is well below that estimated for equipping Unit 9 (\$3.09 million).

Because the Ft. Pierce Unit 9 should be evaluated as if it were never constructed, a conservative cost analyses can be developed by using the data presented in the application for the 40 MW unit. Using this approach it is expected that the actual cost which would be incurred for Unit 9 will be lower since Unit 9 is smaller (rated at 31.6 MW).

Assuming that SCR would reduce NOx emissions by an additional 80%, the SCR would control approximately 206 tons of NOx annually. When this reduction is taken into consideration with the total levelized annual cost of \$790,000 which was provided for the 40 MW unit (\$270,000 for annualized capital plus \$520,000 for operation), the cost per ton of controlling NOx is \$3,835. This cost

BACT

Ft. Pierce Utilities Authority

Page 4

(\$3,835/ton) is representative of costs that have been previously justified as BACT and explains why the use of using SCR on combined cycle facilities is becoming common as BACT instead of just a LAER requirement for facilities being permitted today.

Since SCR has been determined to be BACT for several combined cycle facilities, 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 recent letter from EPA Region IV to the Department regarding the permitting of a combined cycle facility (Tropicana Products, Inc.), the following statement is 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."

A review of the combined cycle facilities in which SCR has been established as a BACT requirement indicates that the majority of these facilities are also intended to operate at high capacity factors. As this is the case, the proposed project is similar to other facilities in which SCR has been established as BACT, thereby supporting SCR as BACT for the proposed facility.

Environmental Impact Analysis

The predominant environmental impacts associated with this proposal are related to the use of SCR for NO_x control. The use of SCR results in emissions of ammonia, which may increase with increasing levels of NO_x control. In addition, some catalysts may contain substances which are listed as hazardous waste, thereby creating an additional environmental burden. Although the use of SCR does have some environmental impacts, the disadvantages do not outweigh the benefit which would be provided by reducing nitrogen oxide emissions by 80 percent. The overwhelming benefit of NO_x control by using SCR is substantiated by the fact that nearly one half of all BACT determinations have established SCR as the control measure for nitrogen oxides over the last five years.

In addition to the criteria pollutants, the impacts of toxic pollutants associated with the combustion of natural gas have been evaluated. These toxics (formaldehyde and polycyclic organic matter) common to the combustion of natural gas, are expected to be emitted in minimal amounts and will not have an impact on air quality.

Although the emissions of these toxic pollutants could be controlled by particulate control devices such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination would be affected by the emissions of these pollutants.

Potentially Sensitive Concerns

With regard to controlling NOx emissions with SCR, the applicant has identified the following technical limitations:

- o Reduced power output, ammonia slip and disposal of hazardous waste generated (spent catalyst)

BACT Determination by DER

Based on the information presented by the applicant and the studies conducted, the Department believes that the use of SCR for NOx control is justifiable as BACT. A review of the permitting activities for combined cycle 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, capacity factors ranging from low to high). Although the concerns expressed by the applicant were valid at one time the most recent experiences indicate that these problems have been resolved through advances in catalysts and experiences gained through operation.

The review conducted by the Department indicates that the maximum expected incremental cost of controlling NOx when following PSD regulations for sources already constructed (\$3,835/ton) is reasonable based on recent BACT determinations. It should be noted that this cost estimate to control NOx is likely higher than what would be incurred since it is based on a 40 MW combined cycle unit and not the 31.6 MW unit that is being evaluated. As this is the case, SCR shall be required with the emission limit for the Ft. Pierce Unit 9 project being established as follows:

<u>Pollutant</u>	<u>Emission Limit</u>
NOx	9 ppmvd @ 15% O ₂

BACT
Ft. Pierce Utilities Authority
Page 6

Details of the Analysis May be Obtained by Contacting:

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

Recommended by:

Approved by:

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

Carol M. Browner, Secretary
Dept. of Environmental Regulation

Date 1991

Date 1991

FT PIERCE

NOTES

?

CALCULATIONS

TO

SUPPORT THE

REVISION OF

SCR

COST

OP Lewis
3/5/91

BACT FT Pierce #9

from Vero Beach BACT 40 MW ^{air fired} cycle CT

① SCR COST
1240 Direct Capital cost

1850 Total Capital cost

790 Total annual cost

FT Pierce

$$31.6 \text{ MW} = 31600 \text{ KW} \times 8760 =$$

276,816,000 KWH PER YEAR

BASED ON RECENT PUBLICATION

@ \$0.04/KWH SCR Installation and operating cost ~~\$10,726~~

@ \$0.09/KWH SCR " " ~~\$249,134~~

② SCR COST
Based on Air Waste Mgmt. Aug 89

High \$0.04 = 4 MILS

Low \$0.09 = 9 MILS

\$1,107,264

Low

\$2,491,344

High

CAPITAL RECOVERY CALCULATION

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1} \quad i = \text{interest rate}$$

$$n = \text{years}$$

FOR FT. PIERCE CAPITAL RECOVERY

10% interest and 20yr (ASSUMED)

Capital Recovery factor = CRF

$$CRF = \frac{.673}{6.73 - 1} = .117$$

$$CAC = \text{Capitalized annual cost} = C_A (CRF)$$

$C_A = \text{CAPITAL AMOUNT}$

$$CAC = \frac{\$2.0}{10^6} (10^6) (.117) = \$234,000$$

$$\text{~~175,500~~}$$

Best Available Copy

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND LEVELIZED ANNUAL COSTS (REVISED)

	DER	Revised	SCR SYSTEM		
				\$1,000	
Capital Costs:					
SCR System	930		930	- same	
HRSR Modifications	0		590	- same	
System Erection	520		520	- same	
Differential Balance of Plant	70		70	- same	
1991 Capital Cost	1520		2,110	- same	1,210
Contingency (15 percent) (USE 10%)	152		320	- same	1,410
Escalation (6 percent) ^{15 MONTHS} (1.7% @ 6%)	91		180	- 150	1,560
Direct Capital Cost	1763		2,610	- 2,550	1,410
Indirects (16 percent) (USE 12%)	212		420	- 410	2,000
Interest During Construction (8 percent)	60		60	- 240	1,760
1993 Total Capital Cost	2035		3,090	- 3,230	
Levelized Annual Costs*:					
Operating Personnel	60	70	- 60	10	60
Maintenance	420	510	- 420	90	420
Ammonia	70	70	- 70		70
Energy	40	50	- 40	10	40
Lost Generation	40	210	- 40	170	110
1993 Annual Operating Cost	630	910	- 630	280	630
Fixed Charges on Capital (13.6 percent) (n=10% m=30YRS)	234	340	- 350	- 10	240
1993 Total Annual Cost	864	1,250	- 980	270	870
Nitrogen Oxides Emission Rate, ppmv					
Annual NO _x Emission Reduction, tpy	203		202		
NO _x Emission Reduction Cost, \$/ton	4256		6,190	- 4,500	1690

*Annual costs are based on a 100 percent capacity factor.

Lead to think much less cost

FT Pierce

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND LEVELIZED ANNUAL COSTS

*Cashed
BA to check
2/19/91
BPL*

Capital Costs:

SCR System

HRSO Modifications

System Erection

Differential Balance of Plant

1991 Capital Cost

Contingency (15 percent)

Direct Capital Cost

Escalation (6 percent) $(.06) 1748$

Indirects (16 percent) $(.16)(1748 + 105)$

Interest During Construction (8 percent) $(.08)(1748 + 105 + 246)$ 240

1993 Total Capital Cost

520

70

2,110

320

2,430

150

410

240

3,230

*cannot
include cost of
modification at this
Point Per Day
answer.*

1,520

228

1748

105

296

172

2321

Levelized Annual Costs*:

Operating Personnel

Maintenance

Ammonia

Energy

Lost Generation

1993 Annual Operating Cost

Fixed Charges on Capital (13.6 percent) $(1853)(.136)$

1993 Total Annual Cost

60

420

70

40

40

630

350

980

$1748 + 105$

630

252

882

Nitrogen Oxides Emission Rate, ppm_{dv}

Annual NO_x Emission Reduction, tpy

NO_x Emission Reduction Cost, \$/ton

9

218

4,500

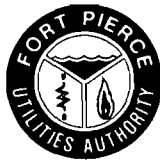
9

218

4041

$\frac{\$882000}{218 \text{ T/y}}$

*Annual costs are based on a 100 percent capacity factor.



H.D. KING ELECTRIC GENERATING PLANT

311 North Indian River Drive (34950)
Post Office Box 1298 (34954)
Fort Pierce, Florida
(407) 464-5792

J. Smallwood
Chair

RECEIVED

MAR 7 1991

Office of the Secretary

March 1, 1991

State of Florida
Department of Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

ATTENTION: Carol M. Browner

Dear Ms. Browner:

RE: OGC No. 91-0330
Order Granting Temporary Use of Unapproved Fuels
During Highly Adverse Weather Conditions

As required by the Order to Burn Unapproved Fuels, we are reporting that no fuel oil was burned during the period of February 15 through February 18.

Sincerely,


Harry Lamb, Supt.
Power Resources

HL/s

cc: Jack Miller, Black & Veatch

RECEIVED

MAR 08 1991

DER-BAQM



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

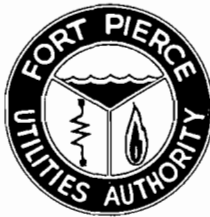
TO: Gary Smallridge
FROM: Clair Fancy *CTR*
DATE: February 15, 1991
SUBJ: Emergency Order for Burning Oil in Units 6, 7, and 8
Ft. Pierce Utilities Authority
REFERENCE AIR PERMITS: Unit 6 AO-56-113534
Unit 7 AO 56-112679
Unit 8 AO 56-112678
Unit 9 AO 56-175955

We have reviewed information submitted with Ft. Pierce's request for an emergency order to relax the Units 6, 7, and 8 SO₂ and particulate limitations found in the existing Unit 9 permit. Included in this information are the results of modeling we requested. The modeling results show that the combined impacts from Units 6, 7, and 8 when firing No. 6 fuel oil, do not exceed the applicable Florida and National Ambient Air Quality Standards and increments for SO₂ and PM. The modeling results were based on Units 6 and 8 burning 0.80 lb SO₂/MBtu No. 6 fuel oil and Unit 7 burning 2.75 lb SO₂/MBtu fuel oil. Based on the information Ft. Pierce has given us, we recommend that you draft an emergency order to be used in the event of a natural gas curtailment which will allow the emergency burning of No. 6 fuel oil in Units 6, 7, and 8 for a period not to exceed three days.

CHF/CH/t

cc: Barry Andrews
Preston Lewis
Cleve Holladay

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

January 15, 1991

RECEIVED
JAN 16 1991
DER-BAQM

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. C. H. Fancy

RE: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9

Dear Mr. Fancy:

This letter is in response to your comment letter dated January 4, 1991.

As stated in our December 5, 1990 letter, we are requesting that Unit 9 be permitted to burn natural gas only. The 1990 NO_x compliance test for Unit 9 was conducted on December 27, 1990 and will be provided under separate cover as soon as the results are received from the testing contractor.

We emphasize that this permit application is for Unit 9 only. It was previously demonstrated that, for Unit 9, only NO_x has the potential to be emitted at levels above the PSD significant emission rates. Therefore, a review of SO₂ and particulate matter impacts from Units 6, 7, and 8 is not applicable to the Unit 9 permit application.

Units 6, 7, and 8 are currently permitted to burn natural gas and fuel oil. Applications to renew these permits request a continuation of this authority. A separate emergency order has been requested which would relax the Units 6, 7, and 8 SO₂ and particulate limitations found in the existing Unit 9 permit. The SO₂ and particulate matter modeling requested in support of this emergency order has been completed for Units 6, 7, and 8. The results of this modeling were provided in our January 4, 1991 response to DER's December 26, 1990 letter. It demonstrated combined maximum impacts well below the AAQS.

Construction on Unit 8 began prior to January 6, 1975 and operational testing began in March of 1976. Based on FAC 17-2.500(4)(b)3.b., Unit 8 is a baseline source, not an increment consumer. Consequently, Unit 8 impacts have not (nor need not) be separately modeled.

Best Available Copy

FEDERAL EXPRESS 297M 9364264593		QUESTIONS? CALL 800-238-5355 TOLL FREE		AIRBILL PACKAGE TRACKING NUMBER 9364264593	
From (Your Name) - Please Print Harry Schindehette Company T. PIERCE UTILITIES AUTHORITY Street Address 06 S 6TH ST City T. PIERCE State FL ZIP Required 34950		To (Recipient's Name) Please Print C. H. Fancy Company Fla. Dept. Environmental Reg. Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes) 2600 Blair Stone Rd/ Twin Towers Ofc. B City Tallahassee, Fla. State FL ZIP Required 32399-240		RECIPIENT'S COPY	
YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)		IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required			
PAYMENT 1 ☒ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card. 5 ☐ Cash/Check		Emp. No. Date ☐ Cash Received ☐ Return Shipment ☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold Street Address City State Zip Received By: ☒ X Date/Time Received FedEx Employee Number			
SERVICES (Check only one box) Priority Overnight Service (Delivery by next business morning) Standard Overnight Service (Delivery by next business afternoon) 11 ☐ YOUR PACKAGING 51 ☐ 16 ☐ FEDEX LETTER * 56 ☐ FEDEX LETTER * 12 ☐ FEDEX PAK * 52 ☐ FEDEX PAK * 13 ☐ FEDEX BOX 53 ☐ FEDEX BOX 14 ☐ FEDEX TUBE 54 ☐ FEDEX TUBE Economy Two-Day Service (formerly Standard Air) (Delivery by second business day) Heavyweight Service (for Extra Large or any package over 150 lbs.) 30 ☐ ECONOMY TWO-DAY SVC. 70 ☐ HEAVYWEIGHT ** 80 ☐ DEFERRED HEAVYWEIGHT ** * Delivery commitment may be later in some areas. ** Call for delivery schedule.		DELIVERY AND SPECIAL HANDLING (Check services required) 1 ☐ HOLD FOR PICK-UP (If in Box H) 2 ☒ DELIVER WEEKDAY 3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations) 4 ☐ DANGEROUS GOODS (Extra charge) 5 ☐ 6 ☐ DRY ICE Lbs. 7 ☐ OTHER SPECIAL SERVICE 8 ☐ 9 ☐ SATURDAY PICK-UP (Extra charge) 10 ☐ 11 ☐ RESUBMIT 12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)		PACKAGES WEIGHT to Recipient YOUR DECLARED VALUE Total Total Total DIM SHIPMENT (Chargeable Weight) Received At 1 ☐ Regular Stop 3 ☐ Drop Box 4 ☐ B.S.C. 5 ☐ Station 2 ☐ On-Call Stop FedEx Emp. No.	
				Federal Express Use: Base Charges Declared Value Charge Other 1 Other 2 Total Charges REVISION DATE 8/90 PART #119501 FXEM 10/93 FORMAT #041 041 © 1990 F.E.C. PRINTED IN U.S.A.	

Florida Department of Environmental Regulation
Mr. C. H. Fancy

B&V Project 16589
January 15, 1991

Once again, we are anxious for your letter of completeness on our Unit 9 permit application.

Sincerely,



Harry Schindehette, P.E.
Director of Utilities

ckw

cc: Mr. Jack Miller
Mr. Harry Lamb
Mr. Steve Day
P. Lewis
B. Andrews
C. Holladay
J. Harper, EPA
J. Goldman, SE Dist.



BLACK & VEATCH

8400 Ward Parkway, P.O. Box No. 8405, Kansas City, Missouri 64114, (913) 339-2000

Fort Pierce Utilities Authority
Continuing Engineering Services

B&V Project 16589.070
B&V Files 15.0200/32.0203
Letter BV-FP-110
January 8, 1991

Fort Pierce Utilities Authority
206 South Sixth Street
Fort Pierce, FL 34948

Subject: Conference Memorandum 036

Attention: Mr. Harry Schindehette
Director of Utilities

Gentlemen:

In reviewing our records, it was determined that the conference memorandum documenting our meeting in the Department of Environmental Regulation's (DER) offices on Monday, November 19, 1990, in Tallahassee, Florida, was never distributed. We are enclosing it for your files.

If you have any comments, please contact Steve Day at (913) 339-2880, John Cochran at (913) 339-2190 or me at (913) 339-7199.

Very truly yours,

BLACK & VEATCH

J. B. Miller, Jr.

Its
Enclosure

cc: Mr. Harry Lamb, w/enclosure
Mr. Barry Andrews, w/enclosure
Mr. Mike Harley, w/enclosure
Mr. Cleve Holladay, w/enclosure
Ms. J. Morrison, w/enclosure

BLACK & VEATCH

CONFERENCE MEMORANDUM 036

Fort Pierce Utilities Authority
Continuing Engineering Services
PSD Application for H.D. King Unit 9

B&V Project 16589.070
B&V Files 15.0200/32.0203
December 27, 1990

Meeting held on Monday, November 19, 1990, at 2:00 p.m., in Department of Environmental Regulation (DER) offices in Tallahassee, Florida.

Recorded by: Jack Miller

Attending: Fort Pierce

Harry Schindehette
Harry Lamb

Black & Veatch

Jack B. Miller
Steve Day
John Cochran

DER

Barry Andrews
Mike Harley
Cleve Holladay

The purpose of the meeting was to review the responses that FPUA has submitted in response to DER's comments of September 28, 1990 regarding the PSD application for H.D. King Unit 9.

The highlights of the conversation are as follows.

1. Black & Veatch recapped the current situation regarding the burning of oil under emergency conditions in Units 6, 7, and 8. It was noted that FPUA is willing to accept the condition that no oil will be burned in Units 6, 7, and 8 unless it is needed as a last resort to meet its customers load i.e. under a true emergency condition. It was pointed out that temporary relief had been sought through the West Palm Beach office as an interim measure until the constraints set forth in the Unit 9 permit are done away with through the current PSD application process. The West Palm Beach office has refused to allow the burning of oil in Unit 6, 7, and 8 in any circumstances.
2. DER suggested that it should be possible to get a consent order enacted that would allow temporary relief until the Unit 9 permit has been revised. DER suggested that FPUA estimate the emissions that will exist from Units 6, 7, and 8 while burning oil and that the information be included in the consent order. DER suggested that FPUA approach Stephanie Brooks of DER's West Palm Beach office for the purpose of obtaining a consent order to allow the burning of oil in Units 6, 7, and 8 under emergency conditions.

Fort Pierce Utilities Authority
Continuing Engineering Services
PSD Application for H.D. King Unit 9

B&V Project 16589.070
December 27, 1990

3. FPUA stated that they did not recall receiving a letter from DER in response to a letter requesting that the Unit 9 permit be modified to express the hourly constraints on Units 6, 7, and 8 in terms of total Btu's of fuel input. DER indicated that they would check their files to see if it had been mailed out and would send a copy to FPUA. (Note: Permit modification dated November 9, 1990 was received by B&V on December 3, 1990.)
4. FPUA asked if the PSD application for Unit 9 is now considered complete. DER indicated that it is not complete as there are still some items of information that had been requested but not yet received.
5. DER indicated that they want air modeling to be performed to considering SO₂ and NO_x emissions when burning oil to demonstrate that there are no violations of the Ambient Air Quality Standards (AAQS). They recognize that oil would only be burned under emergency conditions; however, they still want the modeling to be done. They also recognize that the incremental emissions are likely to be less than significant.
6. DER requested that sample calculations be provided as to how the emission factors from AP42 were applied.
7. DER requested that FPUA provide them with documentation from the turbine manufacturer (General Electric) as to the emissions declarations for the frame 5 combustion turbine.
8. Regarding stack parameters, DER requested that FPUA provide them with the tested results for stack parameters at the tested conditions.
9. DER requested that cost computations for Selective Catalytic Reduction (SCR) Systems be based on 80 percent NO_x reduction from the 42 PPM level. That would result in a level of 8.4 PPM versus the 9.0 PPM used in the initial calculations.
10. DER also indicated that they believe that the increment of reduction (NO_x reduction using SCR) should be 84 PPM to 8.4 PPM instead of 42 PPM to 8.4 PPM. They indicate that their position is supported by the fact that the existing permit currently allows 84 PPM. Black & Veatch pointed out that this strategy would be inconsistent for a "Top-Down" BACT analysis. The unit is currently capable of 42 PPM using steam injection without any

Fort Pierce Utilities Authority
Continuing Engineering Services
PSD Application for H.D. King Unit 9

B&V Project 16589.070
December 27, 1990

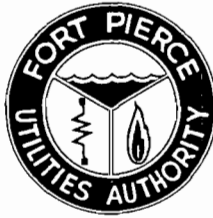
additional modifications. Therefore the incremental reduction of NO_x attributable to SCR should have a starting point of 42 PPM.

11. There was some discussion regarding escalation rates, the need for an additional one-half person for SCR, the impact of burning oil on catalyst life etc.
12. DER asked for an explanation as to why oil burning is detrimental to catalyst performance. Black & Veatch indicated that it is primarily due to the trace metals and other contaminants that occur in flue gas from oil combustion.
13. The DER indicated that their letter formally addressing the most recent responses of FPUA will be issued in a day or two.
14. Mike Harley of DER indicated that he expected to be out of the office from December 7 through January 2. FPUA indicated that they are most anxious to get the completeness issue resolved before his departure.
15. The DER indicated that they planned to follow-up the comments with a formal request for additional information. (Note: This letter was issued by the DER on November 21, 1990 and answered by FPUA on December 5, 1990.)
16. There were no further comments and the meeting was adjourned at approximately 3:30 p.m.

cae

cc: Mr. Harry Schindehette
Mr. Harry Lamb
Mr. Barry Andrews
Mr. Mike Haley
Mr. Cleve Holladay
Mr. Don Knighton
Mr. Jack Miller
Mr. John Cochran

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

January 4, 1991

RECEIVED

JAN 8 1991

Florida Department of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32399

DER-BAQM

Attention: Mr. C. H. Fancy, P.E.

SUBJECT: Emergency Order for Burning Oil
in Units 6, 7 and 8

REFERENCE AIR PERMITS: Unit 6 - AO-56-113534
Unit 7 - AO-56-112679
Unit 8 - AO-56-112678
Unit 9 - AO-56-175955

We have received your letter of December 26, 1990 responding to our letter of December 10, 1990 regarding the subject.

The responses to your questions and requests for additional information are as follows.

Question 1. What grade fuel will be burned in the Units? What is the maximum sulfur content of the fuel? What is the maximum ash content?

Response: No. 6 fuel oil will be fired in Units 6, 7, and 8 during emergency conditions.

Currently, two separate supplies of No. 6 fuel oil are being stored onsite with maximum sulfur contents corresponding to 2.75 and 0.80 lb SO₂/MBtu. These compliance fuels satisfy the Florida Administrative Code (FAC) SO₂ emission rates for Units 7 and 8, respectively.

The FAC does not specify an SO₂ limit for boilers the size of Unit 6. Instead the FAC states that the limit must be established by a Best Available Control Technology (BACT) determination. The BACT analysis for Unit 6 was recently submitted to the FDER and concluded that the lower sulfur No. 6 fuel oil represented BACT. Consequently, Units 6 and 8 will burn the 0.80 lb SO₂/MBtu No. 6 fuel oil and Unit 7 will burn the 2.75 lb SO₂/MBtu fuel oil.

FEDERAL EXPRESS		AIRBILL		PACKAGE TRACKING NUMBER 4003880560	
Date 1-7-91		RECIPIENT'S COPY			
From (Your Name) Please Print 1 Harry Schindehette		Your Phone Number (Very Important) (407) 464-5600		To (Recipient's Name) Please Print 2 Mr. C. H. Fancy, P.E.	
Company PIERCE UTILITIES AUTHORITY		Department/Floor No.		Recipient's Phone Number (Very Important) (904) 488-81	
Street Address 66 S 6TH ST		City T PIERCE		Company Fla. Dept. Environmental Regulation	
State FL		ZIP Required 32399		Department/Floor No.	
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. * Zip Codes.) 2600 Blairstone Rd.		City Tallahassee, Fla.		State FL	
ZIP Required 32399					
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)				IF HOLD FOR PICK-UP, Print FEDEX Address Here	
PAYMENT ☐ Bill Sender ☐ Bill Recipient's FedEx Acct. No. ☐ Bill 3rd Party FedEx Acct. No. ☐ Bill Credit Card				Street Address	
☐ Cash				City	
				State	
				ZIP Required	
SERVICES		RECEIVED		Federal Express Use	
1 ☐ PRIORITY 1 Overnight Delivery		1 ☐ HOLD FOR PICK-UP (Fill in Box 1)		Emp. No. Date	
2 ☐ COURIER-PAK OVERNIGHT ENVELOPE		2 ☐ DELIVER WEEKDAY (Extra charge)		☐ Cash Received	
3 ☐ OVERNIGHT BOX		3 ☐ DANGEROUS GOODS (Extra charge)		☐ Return Shipment	
4 ☐ OVERNIGHT TUBE		4 ☐ CONSTANT SURVEILLANCE SERVICE (Extra charge)		☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold	
5 ☐ STANDARD AIR Delivery not later than second business day		5 ☐ SATURDAY PICK-UP (Extra charge)		Street Address	
		6 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)		City State Zip	
				Received By: X	
				Date/Time Received FedEx Employee Number	
				Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.	
				Release Signature:	
				PART #111R00 REVISION DATE 10/88 PRINTED IN USA FXEM 009 PROD 5/89 © 1988 F.E.C.	

The ash content of the fuel oil is not monitored by FPUA. Therefore, in responding to the question, it is necessary to approximate the expected particulate emission rates for the three units. The emission particulate rates for Units 6, 7, and 8 are estimated to be approximately 0.1 lb/MBtu.

Question 2. To ensure compliance with ambient air quality standards, please submit modeling of sulfur dioxide and particulate emissions for all sources at the facility, assuming the units are firing the type fuel which will be used during a natural gas curtailment.

Response: Refer to attached modeling results (Attachment A).

Question 3. Is it possible for Fort Pierce Utilities Authority to purchase power from another utility during a natural gas curtailment?

Response: In the event of a natural gas curtailment to the Fort Pierce Utilities Authority generators, replacement power from another utility would be sought. If that effort is unsuccessful, fuel oil would be burned as a last resort to meet the needs of our customers.

Weather related peak demands for power and natural gas generally coincide, and so the availability of surplus power during a weather related gas curtailment, is less likely than at other times.

Question 4. Why do you expect the supply of natural gas to be curtailed this winter? Would you burn fuel oil less than 400 hours during the year?

Response: Historically, there is a correlation between the occurrence of low temperature extremes and the unavailability of natural gas for generating electricity, particularly in a steam boiler. There is no way to predict with certainty whether cold weather of that severity will occur in South Florida this winter; however, we do expect that if extremely cold weather is experienced, we will also be subjected to an accompanying curtailment of natural gas.

Based on past experience, we would expect to burn oil less than 400 hours per year.

Florida Department of Environmental
Regulation
Mr. C. H. Fancy, P.E.

Page 3
January 4, 1991

If you need additional information or have any other comments, please call me at (407) 464-5600, Steve Day at (913) 339-2080 or Jack Miller at (913) 339-7199.

Very truly yours,



Harry Schindehette, P.E.
Director of Utilities

Its

cc: S. Day
B. Andrews
C. Phillips
C. Halladay
J. Goldman

FORT PIERCE UTILITIES AUTHORITY
ATTACHMENT A
RESPONSE TO FDER QUESTION 2

1.0 INTRODUCTION

As requested by the Florida Department of Environmental Regulation (FDER) in a December 26, 1990 letter (Question 2), this attachment summarizes the air dispersion modeling for the Fort Pierce Utilities Authority H. D. King Units 6, 7, and 8. In accordance with FDER's request, the modeling analysis examined sulfur dioxide (SO₂) and particulate matter (PM) impacts. Units 6, 7, and 8 were modeled with No. 6 fuel oil, as operated during a natural gas curtailment.

This document outlines the source parameters, modeling options, and analysis results. The results show that the combined impacts from Units 6, 7, and 8, when firing No. 6 fuel oil, do not exceed the applicable Florida Ambient Air Quality Standards (FAAQS) for SO₂ and PM.

2.0 SOURCE PARAMETERS

The modeling analysis considered the potential air quality impacts associated with Units 6, 7, and 8 when firing No. 6 fuel oil. Table 2-1 shows the operating parameters and emission rates for the three sources. Unit 9 was not considered in the analysis since Unit 9 will only be permitted to operate when firing natural gas. The stack exhaust flows and temperatures were obtained from engineering estimates related to the boiler characteristics and fuel properties. Emission rate assumptions were previously outlined in the response to Question 1 of FDER's December 26, 1990 letter.

TABLE 2-1. SOURCE CHARACTERISTICS

Emission Source:	Unit 6	Unit 7	Unit 8
X-Coordinate* (m):	-18.6	6.7	-68.0
Y-Coordinate* (m):	36.3	33.8	18.3
Exhaust Flow (acfm):	64,440	138,300	190,290
Stack Exit Diameter (ft):	5.0	7.1	8.0
Stack Exit Velocity (fpm):	3,282	3,493	3,786
Stack Height (ft):	148	148	150
Stack Exit Temperature (F):	300	300	295
Building Height (ft):	68	68	68
Maximum Projected Width (ft):	148.6	148.6	148.6
Fuel Type:	No. 6	No. 6	No. 6
Max. Heat Input (MBtu/h):	219	470	611
SO ₂ Emission Rate (lb/MBtu):	0.8	2.75	0.8
(lb/h):	175.2	1,292.5	488.8
PM Emission Rate (lb/MBtu):	0.1	0.1	0.1
(lb/h):	21.9	47.0	61.1

*Coordinates relative to Unit 9 stack.

3.0 MODELING ASSUMPTIONS

The following list outlines the assumptions used to perform the dispersion modeling analysis.

- o The EPA approved ISCST model was used for all modeling.
- o Five years (1982 - 1986) of surface and upper air meteorological data from West Palm Beach were used with the ISCST model.
- o Receptors were placed along the 36 standard directions surrounding the Unit 9 stack at the following downwind distances: 100-meter intervals from 100 to 1,000 meters, 250-meter intervals from 1,250 to 3000 meters, and 1,000-meter intervals from 4,000 to 10,000 meters. Discrete receptors were placed at the boundary that restricts public access along the 36 radial directions.
- o The rural modeling option was considered representative of the site.
- o All EPA default modeling options were selected.
- o The modeled highest concentration was selected for annual averaging periods and the highest, second-highest concentration was selected for 3- and 24-hour averaging periods.
- o A GEP analysis showed that the Huber-Snyder building downwash algorithm was appropriate for all wind directions.

4.0 DISPERSION MODELING RESULTS

Table 4-1 shows the maximum modeled SO₂ and TSP impacts for each modeled year. These concentrations are the combined maximum from Units 6,

TABLE 4-1. MODELED SO2 AND TSP IMPACTS FROM UNITS 6, 7, AND 8

<u>Year</u>	<u>SO2</u>	<u>Location</u>		<u>Day</u>	<u>TSP</u>	<u>Location</u>		<u>Day</u>
	<u>Conc.</u> ug/m3	<u>Dist.</u> km	<u>Dir.</u> deg		<u>Conc.</u> ug/m3	<u>Dist.</u> km	<u>Dir.</u> deg	
ANNUAL (Highest)								
1982	14.7 [*]	1.5	310	-	1.0 [*]	1.5	310	-
1983	11.9	1.5	310	-	0.8	1.5	310	-
1984	13.1	2.0	260	-	0.9	2.0	260	-
1985	12.6	1.75	270	-	0.9	1.75	270	-
1986	14.3	1.75	270	-	1.0	1.75	270	-
24-HOUR (Second Highest)								
1982	131.5	0.2	250	291	7.3	1.25	310	208
1983	163.2	0.2	270	58	10.6 [*]	0.3	270	58
1984	175.9 [*]	0.2	270	23	9.2	0.2	270	23
1985	138.0	0.2	260	66	7.8	0.2	260	66
1986	104.1	2.5	270	17	6.9	2.5	270	17
3-HOUR (Second Highest)								
1982	432.6	0.2	250	88	-	-	-	-
1983	619.6 [*]	0.3	270	20	-	-	-	-
1984	397.9	0.2	80	59	-	-	-	-
1985	490.6	0.2	260	323	-	-	-	-
1986	421.0	0.2	270	8	-	-	-	-

*Maximum impact.

7, and 8 when burning No. 6 fuel oil. Table 4-2 shows the overall maximum SO₂ and PM impact for each averaging period, as well as the representative FAAQS. Note that the impacts from Units 6, 7, and 8 are well below the FAAQS. The 24-hour SO₂ impact is the most restrictive, at 68 percent of the standard. A hard copy of the modeling output files is attached.

5.0 CONCLUSION

Ambient air quality dispersion modeling showed that the combined impacts from H. D. King Units 6, 7, and 8 were well below the ambient air quality standards when burning No. 6 fuel oil. This demonstrates that the H. D. King facility will be in compliance with FAAQS when operated during a natural gas curtailment.

TABLE 4-2. IMPACT COMPARISON TO FLORIDA AMBIENT AIR QUALITY STANDARDS

<u>Averaging Period</u>	<u>SO₂</u>		<u>Percent of Standard %</u>	<u>PM</u>		<u>Percent of Standard %</u>
	<u>Conc. ug/m³</u>	<u>FAAQS ug/m³</u>		<u>Conc. ug/m³</u>	<u>FAAQS ug/m³</u>	
Annual	14.7	60	25	1.0	50	2
24-Hour	175.9	260	68	10.6	150	7
3-Hour	619.6	1300	48	-	-	-



Florida Department of Environmental Regulation

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

Bob Martinez, Governor.

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

January 4, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Fort Pierce
Post Office Box 3191
Fort Pierce, Florida 34948

Re: AC 56-185836 - Fort Pierce Utilities Authority
H. D. King Unit 9

Dear Mr. Schindehette:

We have reviewed your December 5, 1990 response to our letter of November 21, 1990 concerning the above referenced permit application. We have the following comments:

1. If you are willing to accept permit conditions allowing only the burning of natural gas in Units 6, 7, 8 and 9, we can deem your application complete as of December 5, 1990 and continue processing your permit application for Unit 9. However, we would like to have the 1990 NO_x compliance test.
2. If you want to have the authorization to burn fuel oil under emergency conditions in any unit (including Units 6, 7 and 8), then you must submit modeling of sulfur dioxide and particulate emissions for all short-term averaging times which includes all of the units you intend to burn fuel oil in. Please refer to C. H. Fancy's December 26, 1990 letter responding to your request for an emergency order for burning fuel oil in Units 6, 7 and 8. In addition, if you want to burn fuel oil in Units 8 or 9, you must also model for increment consumption.

Please advise us which option you want to choose. Please write to me at the address above or call Barry Andrews at 904-488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief

Bureau of Air Regulation

CHF/CH/plm

c: S. Day, P.E.
J. Miller
H. Lamb
I. Goldman

J. Kasper, EPA

Recycled



Paper

P 407 852 946
RECEIPT FOR CERTIFIED MAIL
 NO INSURANCE COVERAGE PROVIDED
 NOT FOR INTERNATIONAL MAIL
 (See Reverse)

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

Sent to Mr. Harry Schindehette	
Street and No. City of Ft. Pierce P. O. Box 3191	
P.O., State and ZIP Code Ft. Pierce, FL 34948	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 1-4-91 Permit: AC 56-185836 PSD-FL-154	

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

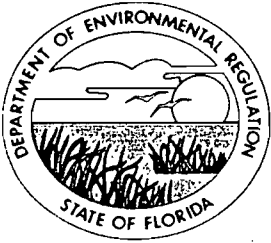
1. ☐ Show to whom delivered, date, and addressee's address. 2. ☐ Restricted Delivery (Extra charge)

3. Article Addressed to: Mr. Harry Schindehette, P.E. Director of Utilities City of Fort Pierce P. O. Box 3191 Ft. Pierce, FL 34948	4. Article Number P 407 852 946
Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.	
5. Signature - Addressee X	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent X	
7. Date of Delivery 1-7-91	

DOMESTIC RETURN RECEIPT

U.S.G.P.O. 1985-234-815

PS Form 3811, Apr. 1989



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

December 26, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Harry Schindehette, P.E.
Director of Utilities
Fort Pierce Utilities Authority
P.O. Box 3191
Fort Pierce, FL 34948

Re: Emergency Order for Burning Fuel Oil in Units 6, 7 and 8
Permit Nos. A056-113534, 112679, 112678, and 175955

Dear Mr. Schindehette:

The Department has received your petition requesting permission to burn fuel oil in Units 6, 7, and 8 under emergency conditions. The following additional information is needed in order to process this request:

1. What grade fuel will be burned in the units? What is the maximum sulfur content of the fuel? What is the maximum ash content?
2. To ensure compliance with ambient air quality standards, please submit modeling of sulfur dioxide and particulate emissions for all sources at the facility, assuming the units are firing the type fuel which will be used during a natural gas curtailment.
3. Is it possible for Fort Pierce Utilities Authority to purchase power from another utility during a natural gas curtailment?
4. Why do you expect the supply of natural gas to be curtailed this winter? Would you burn fuel oil less than 400 hours during the year?

Please supply this information as soon as possible.

Sincerely,

C. H. Fancy, P.E.
Chief

Bureau of Air Regulation

c: I. Goldman, SED
C. Forthman, OGC
S. Day, Black & Veatch

P 407 852 943

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

Sent to	Harry Schindehette	
Street and No.	Ft. Pierce U. A.	
P.O., State and ZIP Code	P.O. Box 3191	
Postage	Ft. Pierce, FL	
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt showing to whom and Date Delivered		
Return Receipt showing to whom, Date, and Address of Delivery		
TOTAL Postage and Fees	\$	
Postmark or Date	12-27-90	
AC56-113534 112679, 678 175955		

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check boxes for additional service(s) requested.

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

3. Article Addressed to:	4. Article Number
Mr. Harry Schindehette, P.E. Director of Utilities Ft. Pierce Utilities Authority P.O. Box 3191 Ft. Pierce, FL 34948	P 407 852 943
5. Signature - Addressee	Type of Service:
X	☐ Registered ☐ Insured
	☒ Certified ☐ COD
	☐ Express Mail ☐ Return Receipt for Merchandise
6. Signature - Agent	Always obtain signature of addressee or agent and DATE DELIVERED.
X	8. Addressee's Address (ONLY if requested and fee paid)

2nd January

7x Pierce questions

1. Why is there so little information on 6, 7 & 8 if the application is to remove HRS/YR restrictions on these units?
 - Do they have HRS/G?
 - What would the emissions of be burning Gas 8760 HR/YR (PSD 8/90 ^{NOT CLEAR TO MR.})
 - What kind of controls ~~are~~ do they have
 - I need a flow diagram
2. What is the maximum emissions from this source? What are the limits? How will the emissions be reduced to equal ~~are~~ ^{OR} fall under the limit
3. If increased steam injection will reduce NO_x to 42 ppm DV on #9 what has to be done to this #9 unit and the #6, #7 and #8 units to meet NO_x standards if all units are ~~based~~ base loaded on Natural Gas?

4) Where are the 1990 test results?

we have 1989

5) What about the Diesel Generator?
~~See~~ DEH Comment 3 response: 12/5/90

Has operation?

77 Pierce

History

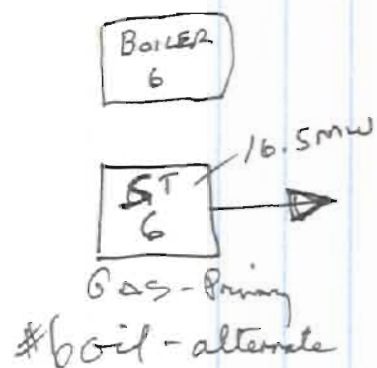
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Question

Is The Application Complete

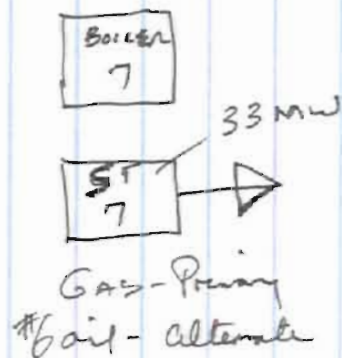
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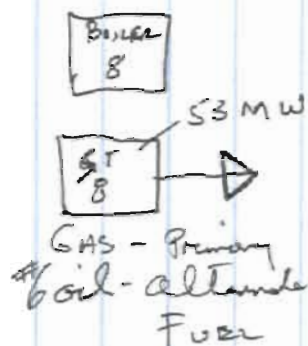


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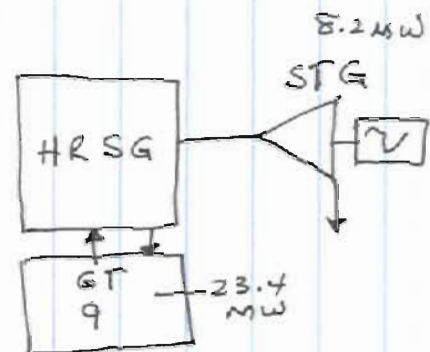
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6384

108 HRS
ON #6 OIL

8760

NO_x REDUCED BY

65% BY STEAM INJECTION

LBS/HR = 101,276

OPERATING = 8760 HRS/YR POSSIBLE

84 PPM NO_x (9.0 PPM QV W/SCR)0.015% SO₂ @ 15% O₂ DRY BASIS $\leq 15\%$ CAPACITY VISIBLE EMISSIONS

32.85 LBS/HR / 110 T/H CO

42 PPM NO_x NOT POSSIBLE W/ additional
STEAM INJECTION6720 HRS was original
Restriction

Best Available Copy

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Environmental Protection Agency

§ 52.21

Region I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont), John F. Kennedy Federal Building, Boston, Mass. 02203.

Region II (New York, New Jersey, Puerto Rico, Virgin Islands) Federal Office Building, 26 Federal Plaza (Foley Square), New York, NY 10007.

Region III (Delaware, District of Columbia, Pennsylvania, Maryland, Virginia, West Virginia) Curtis Building, Sixth and Walnut Streets, Philadelphia, PA 19106.

Region IV (Alabama, Florida, Georgia, Mississippi, Kentucky, North Carolina, South Carolina, Tennessee) Suite 300, 1421 Peachtree Street, Atlanta, GA 30309.

Region V (Illinois, Indiana, Minnesota, Ohio, Wisconsin) Federal Building, 230 South Dearborn, Chicago, Illinois 60606.

Region VI (Arkansas, Louisiana, New Mexico, Oklahoma, Texas) 1600 Paterson Street, Dallas, TX 75201.

Region VII (Iowa, Kansas, Missouri, Nebraska) 1735 Baltimore Street, Kansas City, MO 64108.

Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming) 916 Lincoln Towers, 1860 Lincoln Street, Denver, CO 80203.

Region IX (Arizona, California, Hawaii, Nevada, Guam, American Samoa) 100 California Street, San Francisco, CA 94111.

Region X (Washington, Oregon, Idaho, Alaska) 1200 Sixth Avenue, Seattle, WA 98101.

[37 FR 19808, Sept. 22, 1972, as amended at 39 FR 37987, Oct. 25, 1974]

§ 52.17 Severability of provisions.

The provisions promulgated in this part and the various applications thereof are distinct and severable. If any provision of this part or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or application of such provision to other persons or circumstances which can be given effect without the invalid provision or application.

[37 FR 19808, Sept. 22, 1972]

§ 52.18 Abbreviations.

Abbreviations used in this part shall be those set forth in Part 60 of this chapter.

[38 FR 12698, May 14, 1973]

§ 52.19 Revision of plans by Administrator.

After notice and opportunity for hearing in each affected State, the Administrator may revise any provision of an applicable plan, including but not limited to provisions specifying compliance schedules, emission limitations, and dates for attainment of national standards; if:

(a) The provision was promulgated by the Administrator, and

(b) The plan, as revised, will be consistent with the act and with the requirements applicable to implementation plans under Part 51 of this chapter.

[38 FR 12698, May 14, 1973]

§ 52.20 Attainment dates for national standards.

Each subpart contains a section which specifies the latest dates by which national standards are to be attained in each region in the State. An attainment date which only refers to a month and a year (such as July 1975) shall be construed to mean the last day of the month in question. However, the specification of attainment dates for national standards does not relieve any State from the provisions of Subpart N of this chapter which require all sources and categories of sources to comply with applicable requirements of the plan—

(a) As expeditiously as practicable where the requirement is part of a control strategy designed to attain a primary standard, and

(b) Within a reasonable time where the requirement is part of a control strategy designed to attain a secondary standard.

[37 FR 19808, Sept. 22, 1972, as amended at 39 FR 34535, Sept. 26, 1974; 51 FR 40676, Nov. 7, 1986]

§ 52.21 Prevention of significant deterioration of air quality.

(a) *Plan disapproval.* The provisions of this section are applicable to any State implementation plan which has been disapproved with respect to prevention of significant deterioration of air quality in any portion of any State where the existing air quality is better

mendation if he finds that the variance is in the national interest. If the variance is approved, the Administrator shall issue a permit pursuant to the requirements of paragraph (q)(7) of this section: *Provided*, That the applicable requirements of this section are otherwise met.

(8) *Emission limitations for Presidential or gubernatorial variance.* In the case of a permit issued pursuant to paragraph (q) (5) or (6) of this section the source or modification shall comply with such emission limitations as may be necessary to assure that emissions of sulfur dioxide from the source or modification would not (during any day on which the otherwise applicable maximum allowable increases are exceeded) cause or contribute to concentrations which would exceed the following maximum allowable increases over the baseline concentration and to assure that such emissions would not cause or contribute to concentrations which exceed the otherwise applicable maximum allowable increases for periods of exposure of 24 hours or less for more than 18 days, not necessarily consecutive, during any annual period:

MAXIMUM ALLOWABLE INCREASE

(Micrograms per cubic meter)

Period of exposure	Terrain areas	
	Low	High
24-hr maximum.....	36	62
3-hr maximum.....	130	221

(q) *Public participation.* The Administrator shall follow the applicable procedures of 40 CFR Part 124 in processing applications under this section. The Administrator shall follow the procedures at 40 CFR 52.21(r) as in effect on June 19, 1979, to the extent that the procedures of 40 CFR Part 124 do not apply.

(r) *Source obligation.* (1) Any owner or operator who constructs or operates a source or modification not in accordance with the application submitted pursuant to this section or with the terms of any approval to construct, or any owner or operator of a source or modification subject to this section who commences construction after the

effective date of these regulations without applying for and receiving approval hereunder, shall be subject to appropriate enforcement action.

(2) Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Administrator may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project; each phase must commence construction within 18 months of the projected and approved commencement date.

(3) Approval to construct shall not relieve any owner or operator of the responsibility to comply fully with applicable provisions of the State implementation plan and any other requirements under local, State, or Federal law.

(4) At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements or paragraphs (j) through (s) of this section shall apply to the source or modification as though construction had not yet commenced on the source or modification.

(s) *Environmental impact statements.* Whenever any proposed source or modification is subject to action by a Federal Agency which might necessitate preparation of an environmental impact statement pursuant to the National Environmental Policy Act (42 U.S.C. 4321), review by the Administrator conducted pursuant to this section shall be coordinated with the broad environmental reviews under that Act and under section 309 of the Clean Air Act to the maximum extent feasible and reasonable.

(t) *Disputed permits or redesignations.* If any State affected by the re-

designation of an area by a Governing Body, or any Indian Governing Body of a tribe affected by redesignation of an area by the Administrator, disagrees with such redesignation, if a permit is proposed to be issued for any major stationary source or modification proposed for construction in any State which the Governor of an affected State or Indian Governing Body of an affected tribe determines will cause or contribute to a cumulative change in air quality in excess of that allowed in the State or Reservation, the Governor or Indian Governing Body may request the Administrator to enter into negotiations with the parties involved to resolve such dispute. If requested by the State or Indian Governing Body involved, the Administrator shall make a recommendation to resolve the dispute and protect the air quality values of the lands involved. If the parties involved do not reach an agreement, the Administrator shall determine the dispute and his determination shall be the results of agreements reached through other means; shall be a part of the applicable State implementation plan and shall be enforced as part of such plan. In resolving disputes relating to area redesignation, the Administrator shall consider the extent to which the lands involved are of sufficient size to allow effective quality management or have other related values of such an area.

(u) *Delegation of authority.* The Administrator shall have the authority to delegate his responsibility for conducting source review pursuant to this section, in accordance with paragraphs (v) (2) and (3) of this section.

(2) Where the Administrator delegates the responsibility for conducting source review under this section to an agency other than a Regional Office of the Environmental Protection Agency, the following provisions shall apply:

(i) Where the delegate agency is an air pollution control agency, it shall consult with the appropriate State and local air pollution agency prior to making any determination under this section. Where the delegate agency is

emissions of the facility occurs is the date on which the owner or operator of the facility completes, or is committed to complete through a federally enforceable permit condition, a physical change in or change in the method of operation of the facility resulting in the decrease.

4. Creditable Emissions Changes.

a. An increase or decrease in the actual emissions or in the quantifiable fugitive emissions of a facility is creditable if:

(i) The Department has not relied on it in issuing a permit under the provisions of Rule 17-2.500, FAC, or EPA has not relied on it in issuing a permit under the provisions of 40 CFR 52.21, which permit is in effect when the increase in emissions of the modification occurs; and

(ii) The Department has not relied on it in demonstrating attainment, defining reasonable further progress, or issuing a permit under the provisions of Rule 17-2.17 (repealed), 17-2.510, or 17-2.650, FAC, which permit is in effect when the increase in emissions of the modification occurs.

b. An increase or decrease in the actual emissions or in the quantifiable fugitive emissions of sulfur dioxide or TSP which occurs before the applicable baseline date is creditable only to the extent that it must be considered in calculating the amount of any maximum allowable increase in ambient concentration remaining available.

c. A decrease in the actual emissions or in the quantifiable fugitive emissions of a facility is creditable only if:

(i) The old level of actual emissions, the old level of federally enforceable allowable emissions, or the old level of allowable emissions under Rule 17-2.650, whichever is lowest, exceeds the new level of actual emissions;

(ii) It is federally enforceable on and after the date that the owner or operator obtains from the Department a permit to construct the new or modified facility; and

(iii) It has approximately the same qualitative significance for public health and welfare as that attributed to the increase in the emissions of the modification.

(f) Pollutants Subject to New Source Review.

1. Except as provided under 17-2.500(2)(f)3., below, for a proposed new facility or modification subject to the NSR requirements of this section pursuant to 17-2.500(2)(d)2. or 3., the NSR requirements of this section shall apply to all pollutants regulated under the Act for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility or modification would be equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants — Significant Emission Rates; or for which the sum of the potential emissions and the quantifiable fugitive emissions of the facility or modification would be greater than zero when the facility is located within 10 kilometers of a Class I area and the potential and quantifiable fugitive emissions would have an impact on the Class I area equal to or greater than 1.0 microgram per cubic

meter (24-hour average).

2. Except as provided under 17-2.500(2)(f)3., below, for a proposed modification subject to the NSR requirements of this section pursuant to 17-2.500(2)(d)4., the NSR requirements of this section shall apply to all pollutants regulated under the Act for which the modification would result in: a significant net emissions increase (as set forth in 17-2.500(2)(e)2.); or a net emissions increase (as set forth in 17-2.500(2)(e)1.) when the facility to be modified is located within 10 kilometers of a Class I area and the net emissions increase would have an impact on the Class I area equal to or greater than 1.0 microgram per cubic meter (24-hour average).

3. For a proposed new facility or modification subject to the NSR requirements of this section which would construct in an area designated as nonattainment for a particular pollutant under Section 17-2.410, the NSR requirements of this section shall not apply to the affected pollutant.

(g) Relaxations of Restrictions on Pollutant Emitting Capacity.

If a previously permitted facility or modification becomes a facility or modification which would be subject to the NSR requirements of this section if it were a proposed new facility or modification solely by virtue of a relaxation in any federally enforceable limitation on the capacity of the facility or modification to emit a pollutant (such as a restriction on hours of operation), which limitation was established after August 7, 1980, then at the time of such relaxation the NSR requirements of this section shall apply to the facility or modification as though construction had not yet commenced on it.

(3) Limited Exemptions and Special Provisions.

The provisions of this subsection establish exemptions and exclusions from certain of the General Provisions of 17-2.500(4) and Preconstruction Review Requirements of 17-2.500(5).

(a) Relocatable Facilities.

A relocatable facility which has a valid Department operating permit and which has previously been reviewed and issued a construction permit pursuant to 40 CFR 52.21 or to the NSR requirements of this section shall obtain permission to relocate and operate such facility at a new location through an amendment to the facility's operating permit, provided the following conditions are met:

1. The duration of emissions of the facility at the new location would not exceed two years;

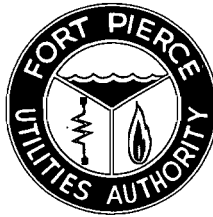
2. The federally enforceable allowable emissions would not be increased at the new location and the emissions of the facility would not have a significant impact on any Class I area or area where an applicable maximum allowable increase is known to be violated;

3. The owner or operator has provided the Department with reasonable assurance that the emissions of the facility at the new location would not cause or contribute to a violation of ambient air quality standards; and

4. The owner or operator of the facility would

Facility shall
if this section
physical change
a new major
pollutant to

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

December 10, 1990

RECEIVED

DEC 13 1990

DER-BAQM

Florida Department of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32399

Attention: Mr. Steve Smallwood

SUBJECT: Emergency Order for Burning Fuel oil
in Units 6, 7 and 8

REFERENCE AIR PERMITS: Unit 6 - AO-56-113534
Unit 7 - AO-56-112679
Unit 8 - AO-56-112678
Unit 9 - AO-56-175955

Pursuant to discussions with Mr. Dan Thompson of the DER, we have prepared and are submitting herewith a petition requesting permission to burn fuel oil in Units 6, 7 and 8 under emergency conditions.

Provisions of the Unit 9 permit, in effect preclude burning of oil in Units 6, 7 and 8 under any circumstances. We are in the process of revising our permit for Unit 9 precisely so that all constraints to the operation of Units 6, 7 and 8, contained in the Unit 9 permit, will be removed. FPUA is vulnerable to a natural gas curtailment that would preclude generating power with natural gas, the primary fuel. If purchase power is unavailable during a natural gas supply interruption, without the ability to burn oil as an emergency backup, FPUA will be forced to curtail its electric customers.

The attached petition for Emergency Order sets forth the facts regarding this situation, and requests issuance of an Emergency Order for use of fuel oil under emergency conditions.

We have been trying to resolve this situation since late August 1990. Now as the winter season is immediately upon us, the probability of needing emergency provisions to burn oil in order to avoid curtailing our customers, is high. Your expeditious attention to this matter is appreciated.

Fort Pierce Utilities Authority
Mr. Harry Schindehette

December 10, 1990

If you have any questions, please call me at (407) 464-5600 or Steve Day
at (913) 339-2880.

Sincerely,

A handwritten signature in dark ink, appearing to read "H. Schindehette", written in a cursive style.

Harry Schindehette, P.E.
Director of Utilities

lts
Enclosure

cc: S. Day
D. Thompson
C. Fancy
B. Andrews

IN RE: FORT PIERCE UTILITIES AUTHORITY)
)
 Issuance of An Emergency Order)
 To Permit Burning of Oil In)
 H. D. King Units 6, 7 and 8 Under)
 Emergency Conditions)
)

(a) Name of Petitioner: Fort Pierce Utilities Authority

(b) Address of Petitioner: 206 South Sixth Street
P.O. Box 3191
Fort Pierce, Florida 34948

(c) Statutory provision under which Emergency Order is sought:

(d) The precise factual circumstances giving rise to the petition:

The permit for Unit 9, Permit/Certification Number A0-56-175955, contains provisions that impose operational constraints on Units 6, 7 and 8. Those constraints apply to hours of operation of the units as well as emissions, (both the hourly rate and maximum annual total). In effect, the emissions constraints now preclude the burning of fuel oil in units 6, 7 and 8 under any

circumstances, whereas, prior to the unit 9 provisions, those units were permitted to burn fuel oil under the circumstances of an emergency or a temporary natural gas curtailment. The permit No.s for Units 6, 7 and 8 are AO-56-32954, AO-56-32948 and AO-56-41413, respectively.

Ongoing trends in the State's electric power supply and delivery system, as well as the natural gas delivery system, have substantially changed the operational requirements for Units 6, 7 and 8. As a result, FPUA is currently in the process of revising the Permit for Unit 9 so as to remove any constraints applicable to Units 6, 7 and 8. It now appears that the revised permit will not be issued prior to experiencing the peak demands imposed by the 1990-91 winter conditions.

The requested Emergency Order will permit use of fuel oil to meet electrical demand under emergency circumstances, until such time as the new permit is issued for Unit 9, and the current constraints are removed from Units 6, 7 and 8. Without the relief provided by the requested Emergency Order, electric power may have to be curtailed to FPUA customers, in order not to violate the existing permits.

(e) Points upon which this petition is based.

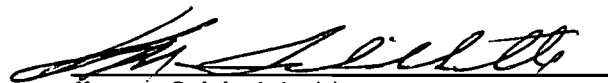
If the FPUA must curtail electric power supply to its customers, in order to comply with its current permits, it will pose an immediate threat to public health, safety and welfare. Such action would leave the affected customers without lights and many without heat or means for preparing food. Hospitals and

other vital services could be without power temporarily, depending on whether or not their emergency backup systems function properly. Industrial, commercial, office and retail facilities would be adversely affected and would suffer economic hardship. Traffic signals would be out of service adversely affecting traffic safety. The loss of street and security lighting also would adversely affect public safety.

Subsection 120.59(3), F.S., provides for issuance of an immediate final order if matters of public health, safety or welfare are involved.

It is hereby requested that an Emergency Order be issued to FPUA authorizing the burning of fuel oil in units 6, 7 and 8, under circumstances that would result in the FPUA's inability to supply electrical power to its customers, all or in part, were the burning of fuel oil in those units, not allowed.

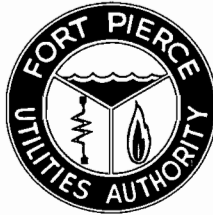
Dated this 10TH day of December 1990.



Harry Schindehette
Utility Director
Fort Pierce Utilities Authority

Consulting Engineer
Black & Veatch
c/o Steve Day
11401 Lamar
Overland Park, Kansas 66211
(913) 339-2880

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

December 5, 1990

RECEIVED

DEC 6 - 1990

DER-BAQM

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. C. H. Fancy

Dear Mr. Fancy:

RE: AC 56-185836 - Fort Pierce Utilities Authority - H. D.
King, Unit 9

Enclosed is our response to your second comment letter dated November 21, 1990.

Please note that the enclosed modeling is for nitrogen oxide only and does not include sulfur dioxide or particulate modeling. While we would prefer to retain our authorization to burn No. 2 Fuel Oil in Unit 9 under emergency conditions, we are hereby withdrawing any prior request to do so if the DER believes that SO₂ and TSP modeling is necessary for this reauthorization. We must insist that the relicensing of Unit 9 proceed without the delay that this additional modeling would entail. We would also point out that the DER can request SO₂ and TSP modeling for the repermitting of Units 6, 7, and 8 if the DER believes this to be necessary to ensure compliance with ambient air quality standards. This repermitting will begin this month. Should FPUA, request authorization in the future to burn No. 2 Fuel Oil in Unit 9, then we will provide the appropriate demonstrations of compliance with that request. In the meantime, DER is to proceed with our application without consideration of the No. 2 Fuel Oil option for Unit 9. It is worth repeating and emphasizing the fact that we are willing to forego burning of fuel oil in Unit 9 in order to eliminate the need for SO₂ and TSP modeling, and thereby expedite action on the subject application.

We are most anxious for your letter of completeness on our Unit 9 permit application. With cold weather about to be upon us, it becomes critical that the Unit 9 permit be reissued immediately or some other appropriate action be suggested by the DER. We will not intentionally violate our permit conditions without your prior authorization to do so in an emergency. Consequently, our customers face potential cold weather blackouts until this issue is resolved.

It is our understanding that the person assigned to oversee DER's review of the subject application is Mr. Mike Harley. Mr. Harley has indicated that he will be out of the office from December 7 through the end of the year. In view of that, we are requesting that review of this submittal, and hopefully, issuance of a letter of completeness, be accomplished prior to his upcoming period of absence. It is essential that the permitting process continue during December, and we are prepared to meet with you further to ensure that this occurs.

Sincerely,

Harry Schindehette by *gmf*
Harry Schindehette, P.E.
Director of Utilities

Enclosure

cc: Mr. Jack Miller
Mr. Harry Lamb
Mr. Steve Day

P. Lewis
B. Andrews
C. Holladay
S. Brooks, SE Dist.
G. Harper, EPA

DER Comment 1

- o Please fully explain how the stack parameters listed in Attachment 3 relate to the actual stack parameters for FPUA Unit 9 and provide numerical comparisons.

Response

- o The stack parameters listed in Attachment 3 (submitted with the letter dated October 23, 1990 responding to the DER's comment letter dated September 28, 1990) are based on the worst case ambient conditions (20 F) expected for the unit. Combustion turbine outputs (megawatts, fuel burn rates, and emissions) increase for operation at lower ambient temperatures. Therefore, worst case project impacts occur at this lower temperature rather than at ISO (59 F) or more typical operating conditions. The attached table provides a numerical comparison of operating parameters for three different ambient conditions, 20 F, 59 F, and 90 F when operating in the combined cycle mode (HRSG stack).

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS

Ambient Temperature, F	20	59	90
Turbine Generator Output, kW	31,200	27,000	23,600
Stack Exit Flow, lb/h	1,090,000	999,000	928,000
Stack exit temperature, F	494	487	481
Stack exit volume, acfm	447,000	409,000	380,000
, dscfm	226,000	207,000	190,000
Stack velocity, fpm	4,530	4,150	3,850
Stack moisture, % by volume	8.10	8.67	10.26
Stack oxygen, % by volume	14.53	14.51	14.29
NO _x Emissions, ppmvd @ 15% O ₂	42	42	42
, lb/h	59	53	49
CO Emissions, ppmvd @ 15% O ₂	10	10	10
, lb/h	8.5	7.7	7.0
NMHC Emissions, ppmvd @ 15% O ₂	5	5	5
, lb/h	2.4	2.2	2.0

DER Comment 2

- o Please explain how the emission rates for nitrogen oxides, carbon monoxide, non-methane hydrocarbons (NMHC), and particulate were determined for FPUA Unit 9 by General Electric. Provide supporting information.

Response

- o Unit 9 consists of one General Electric Frame 5 combustion turbine. Previously provided Unit 9 emission estimates were based on the following emission rates provided by General Electric for a Frame 5 combustion turbine (see attached GE performance table for MS5001PA frame size).

Nitrogen oxides = 42 ppmvd at 15 percent oxygen.

Carbon monoxide = 10 ppmvd at 15 percent oxygen.

Unburned hydrocarbons = 7 ppmvd at 15 percent oxygen.

Particulate = 2.5 lb/h

These emission rates are consistent with those expected for all Frame 5 turbine generators installed throughout the United States. General Electric did not specifically guarantee these emission levels for Unit 9. However, the Unit 9 Frame 5 turbine generator does not have any unique differences from other Frame 5 turbine generators sold with the above emission guarantees.

Non-methane hydrocarbons will occur as a portion of total unburned hydrocarbons. Based on previous performance information NMHC were conservatively estimated to be 5 ppmvd at 15 percent oxygen.

HEAVY DUTY PRODUCT LINE PERFORMANCE AND EMISSIONS

TURBINE MODEL/ COMBUSTOR	EMISSIONS LEVEL	DILUENT	OUTPUT KW		HEAT RATE BTU/KWH		INJ RATE LB/H		NO _x PPMVD @ 15% O ₂		CO PPMVD		UHC PPMVD		VOC'S PPMVD		PART. LB/H		INSP. INT. HRS. PH/TS > 100	
			G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D
MS5001PA																				
AO LINER	DRY		26300	25800	11820	11930	-	-	135	202	10	10	7	7	1.4	3.5	2.5	5	12000	12000
	NSPS	WATER	26670	26710	11910	12160	4020	10000	87	86	10	10	7	7	1.4	3.5	2.5	5	12000	6000
		STEAM	26820	26990	11690	11630	5940	13610	87	86	10	10	7	7	1.4	3.5	2.5	5	12000	6000
	42/65	WATER	27320	27080	12070	12260	11050	14180	42	65	10	10	7	7	1.4	3.5	2.5	5	6000	6000
		STEAM	27690	27380	11480	11540	15970	18180	42	65	10	10	7	7	1.4	3.5	2.5	5	6000	6000
	42/42	WATER	27320	27780	12070	12430	11050	21970	42	42	10	10	7	7	1.4	3.5	2.5	5	6000	4000
		STEAM	27690	28000	11480	11390	15970	25460	42	42	10	10	7	7	1.4	3.5	2.5	5	6000	4000
MS6001B																				
AO LINER	DRY		38340	37520	10860	10970	-	-	148	267	10	10	7	7	1.4	3.5	2.5	17	12000	12000
	NSPS	WATER	38830	38690	10940	11180	4700	11510	95	94	10	10	7	7	1.4	3.5	2.5	10	8000	6000
		STEAM	39010	39390	10770	10710	6780	18980	95	94	10	10	7	7	1.4	3.5	2.5	17	8000	6000
	42/65	WATER	40010	39290	11140	11280	16020	17410	42	65	10	10	7	7	1.4	3.5	2.5	10	6000	4000
		STEAM	40630	40230	10560	10600	23150	27620	42	65	10	10	7	7	1.4	3.5	2.5	17	8000	6000
	42/42	WATER	40010	40360	11140	11460	16020	28070	42	42	10	10	7	7	1.4	3.5	2.5	10	6000	1500
		STEAM	40630	41480	10560	10440	23150	40600	42	42	10	10	7	7	1.4	3.5	2.5	17	8000	3000
MDI*	25/42	WATER	-	40360	-	11460	-	28070	-	42	-	10	-	7	-	3.5	-	10	-	1500
		STEAM	42740	41480	10300	10440	44970	40600	25	42	40	10	7	7	1.4	3.5	2.5	17	3000	3000
DLN	25/165	DRY	38180	37360	10890	11000	-	-	25	165	15	20	7	7	1.4	2.5	2.5	17	8000	8000
	25/65	WATER	38180	38370	10890	11180	-	10010	25	65	15	20	7	7	1.4	3.5	2.5	17	8000	8000
	25/65	STEAM	38180	38990	10890	10770	-	16680	25	65	15	20	7	7	1.4	3.5	2.5	17	8000	8000

NOTE: NSPS NO_x IS 75 PPMVD AT 15% O₂ WITH THE HEAT RATE CORRECTION.
ALL PERFORMANCE IS RUN WITH PM INLET AND EXHAUST LOSSES, ISO CONDITIONS.

* MDI - MASSIVE DILUENT INJECTION

DER Comment 3

- o Explain and show how the actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 were calculated in units of the applicable emission limiting standard, lb/hr, and tons/year for each source at the H. D. King facility.

Response

- o Actual emissions and estimates of actual emissions (see attached table) were provided to the DER for each source at the H. D. King facility in a letter dated October 23, 1990 responding to the DER's comment letter dated September 28, 1990. As discussed in the response, in the absence of actual performance tests, emission rates were calculated based on appropriate emission factors from AP-42. Attached please find sample calculations illustrating how these emissions were calculated.

H. D. KING UNITS 6 - 9 ACTUAL EMISSION RATES

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Allowable Annual Operation, hr	12	1344	6384	8736
Hourly Emissions, lb/h				
Nitrogen Oxides	117	251	111*	57*
Carbon Monoxide	8.5	18	24	0.68*
Particulate	0.64	1.4	1.8	0.93
Non-Methane Hydrocarbons	0.30	0.64	0.83	0.44
Sulfur Dioxide	0.13	0.27	0.36	0.20
Annual Emissions, tons/year				
Nitrogen Oxides	0.70	169	353*	250*
Carbon Monoxide	0.051	12.3	76	3.0*
Particulate	0.0038	0.92	5.7	4.1
Non-Methane Hydrocarbons	0.0018	0.43	2.7	1.9
Sulfur Dioxide	0.00077	0.18	1.1	0.81

*Emission rates based on the attached emission test results.



Owner FPUA Computed By JR Cochran
Plant King Unit 6-9 Date 12/4 19 90
Project No. 16589 File No. _____
Title Actual Emission Estimates Checked By PKW
Date 12/5 19 90
Page 1 of 3

Unit 8 NO_x Emissions from 9/11/89 compliance test = 0.181 ^{lb}/_{MBtu}

Unit 8 fuel burn rate = 611 ^{MBtu}/_{hr}

Unit 8 Actual NO_x Emission = (0.181 ^{lb}/_{MBtu})(611 ^{MBtu}/_{hr}) = 111 ^{lb}/_{hr}

Based on Unit 9 permit restrictions Unit 8 is allowed to operate 6384 ^{hr}/_{yr}

Unit 8 Actual Annual NO_x Emission = (111 ^{lb}/_{hr})(6384 ^{hr}/_{yr})(^{ton}/_{2000 lb})
= 353 ^{tons}/_{yr}

Unit 9 NO_x Emissions from 9/13/89 compliance test = $\frac{59+43}{2} = 51 \text{ ppmvd}$
@ 15% O₂

CO Emissions = 1 ppmvd @ 15% O₂

Ambient Temperature = 90 F Flue Gas Flow = 926,000 ^{lb}/_{hr}

	<u>Volume</u> <u>%</u>	<u>Moles</u>	<u>Moles @ 15% O₂</u> <u>dry</u>
Oxygen	14.92	4850	3663
Nitrogen	73.63	24097	19630
Carbon Dioxide	2.54	831	831
Argon	0.90	295	294
Moisture	<u>8.11</u>	<u>2654</u>	
	100.00	32,727	24,418

NO_x Emission Rate = (51 ^{moles NO₂}/_{10⁶ moles flue gas})(24,418 ^{moles}/_{hr})(46.0055 ^{lb NO_x}/_{mol NO₂})
= 57.3 ^{lb}/_{hr}

Unit 9 permit restrictions limit annual hours of operation to 8736 ^{hr}/_{yr}.

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PGN-172A



Owner FPJA Computed By Jel
Plant Kinn Unit 6-9 Date 12/4 19 90
Project No. 16889 File No. _____
Title Actual Emission Estimates Checked By Jel
Date 12/5 19 90
Page 2 of 3

$$\text{Unit 9 Actual Annual NO}_x \text{ Emission} = (57.3 \frac{\text{lb}}{\text{h}}) (8736 \frac{\text{hr}}{\text{yr}}) (\frac{+0\text{N}}{2000 \text{ lb}})$$

$$= \underline{250 \frac{\text{tons}}{\text{yr}}}$$

$$\text{Unit 9 CO Emission} = (\frac{1 \text{ mol CO}}{10^6 \text{ mol fuel gas}}) (24419 \frac{\text{mol fuel gas}}{\text{hr}}) (28.01055 \frac{\text{lb CO}}{\text{mol CO}})$$

$$= \underline{0.684 \frac{\text{lb}}{\text{h}}}$$

$$\text{Unit 9 Actual Annual CO Emission} = (0.684 \frac{\text{lb}}{\text{h}}) (8736 \frac{\text{hr}}{\text{yr}}) (\frac{\text{ton}}{2000 \text{ lb}})$$

$$= \underline{2.98 \frac{\text{tons}}{\text{yr}}}$$

Remaining actual emission estimates will be calculated based on emission factors from AP-42.

AP-42 Emission Factors for Natural Gas Combustion

Particulates	=	1 to 5 $\frac{\text{lb}}{10^6 \text{ ft}^3}$ (use 3 $\frac{\text{lb}}{10^6 \text{ ft}^3}$)
SO ₂	=	0.6 $\frac{\text{lb}}{10^6 \text{ ft}^3}$
NO _x	=	550 $\frac{\text{lb}}{10^6 \text{ ft}^3}$
CO	=	40 $\frac{\text{lb}}{10^6 \text{ ft}^3}$
NMHC	=	1.4 $\frac{\text{lb}}{10^6 \text{ ft}^3}$

Fuel Burn Rates:

Unit 6	=	213,000 $\frac{\text{ft}^3}{\text{h}}$
Unit 7	=	450,300 $\frac{\text{ft}^3}{\text{h}}$
Unit 8	=	596,000 $\frac{\text{ft}^3}{\text{h}}$
Unit 9	=	310,600 $\frac{\text{ft}^3}{\text{h}}$

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Owner EPDA Computed By SR
 Plant Kina Unit 6-9 Date 12/4 19 90
 Project No. 10599 File No. _____ Checked By SR
 Title Actual Emission Estimates Date 12/5 19 90
 Page 3 of 3

Actual Emission Estimates (lb/h)

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Particulate	0.639	1.37	1.79	0.932
SO ₂	0.128	0.274	0.358	0.186
NO _x	117	251		
CO	8.52	18.3	23.8	
NMHC	0.298	0.639	0.834	0.435

Actual Emission Estimates (tons/year)

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Particulate	0.0038	0.92	5.7	4.1
SO ₂	0.00077	0.18	1.1	0.81
NO _x	0.70	169		
CO	0.051	12.3	76	
NMHC	0.0018	0.43	2.7	1.9
Annual Operating, hr/yr	12	1344	6394	8736

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PGN-172A

DER Comment 4

- o Describe the situations that make it necessary to burn oil in each of the units located at the H. D. King facility. List the actual number of hours per year (during each of the last two years) that oil was burned in each air pollution source at the H. D. King facility including each diesel.

Response

- o Natural gas is the primary fuel for the H. D. King Electric Generating Plant. The facility has retained the flexibility in Units 6, 7, 8, and 9 to burn fuel oil in the event of natural gas curtailments (emergency situations). Units 6, 7, and 8 steam generators are capable of burning either natural gas or fuel oil No. 6 (residual oil). The Unit 9 combustion turbine is capable of burning either natural gas or fuel oil No. 2 (distillate oil). At the current time, due to emission restrictions contained in Unit 9's operating permit, Units 6, 7, and 8 cannot burn fuel oil. No oil will be burned in these units until the Unit 9 permit is reissued.

FPUA is hereby withdrawing it's application to burn fuel oil in Unit 9 during emergencies. Natural gas will be the primary fuel for Unit 9.

In addition to Units 6 through 9, the H. D. King Electric Generating Plant periodically operates two diesel electric generators. These generators burn fuel oil No. 2 (distillate oil). These diesel generators are operated strictly during peak demand periods.

The attached table lists the actual hours of operation that these sources have burned oil during the last two years (1989 and 1990).

H. D. KING ELECTRIC GENERATING PLANT FUEL OIL FIRED OPERATION

	<u>Fuel Oil Fired</u>	<u>1989</u>	<u>1990</u>
		<u>hours</u>	<u>hours</u>
Unit 6	Residual	0	0
Unit 7	Residual	0	0
Unit 8	Residual	108*	0
Unit 9	Distillate	0	0
Diesel No. 1	Distillate	61	51
Diesel No. 2	Distillate	74	85

*Fuel oil burned during a natural gas curtailment.

DER Comment 5

- o Provide the maximum emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lb/hr, and tons/year for each source at the H. D. King facility when oil is burned.

Response

- o The attached table provides estimates of maximum hourly emission rates for Units 6, 7, and 8 when burning residual fuel oil, and diesel generators 1 and 2 when burning distillate fuel oil.

Since it would be impossible to meet the emission limits listed in the Unit 9 permit for Units 6, 7, and 8 (when Units 6, 7, and 8 are burning oil) no oil will be burned in these units until the Unit 9 permit is reissued. Accordingly, no annual emissions can be estimated at this time. Except for Unit 8 NO_x and SO₂, emission estimates provided in the attached table are based on AP-42 emission factors. Nitrogen oxide emissions for Unit 8 are based on an emission limit of 0.20 lb/MBtu. Sulfur dioxide emission estimates for Unit 8 are based on a maximum fuel sulfur content of 0.75 percent. Attached please find the detailed calculations illustrating determination of these values.

As previously discussed, FPUA is withdrawing it's application to burn fuel oil in the Unit 9 combustion turbine during natural gas curtailments (emergencies). Natural gas will be the primary fuel for Unit 9. Accordingly, no emission estimates are provided in this response for Unit 9 when burning fuel oil.

H. D. KING ELECTRIC GENERATING PLANT FUEL OIL FIRED EMISSION RATES

	<u>Unit 6</u> <u>lb/h</u>	<u>Unit 7</u> <u>lb/h</u>	<u>Unit 8</u> <u>lb/h</u>	<u>Diesel</u> <u>Generators*</u> <u>lb/h</u>
Nitrogen Oxides	98	210	122	4.2
Carbon Monoxide	7.3	16	20	1.1
Particulate	34	72	43	0.42
Non-Methane Hydrocarbons	1.1	2.4	3.1	0.042
Sulfur Dioxide	458	984	504	12

*Diesel generators 1 and 2 are identically sized. Values listed are for one diesel generator only.



Owner FPUA Computed By [Signature]
 Plant Kine Unit 6-9 Date 12/3 19 90
 Project No. 16589 File No. _____ Checked By [Signature]
 Title Maximum Emission Rates When Burning Date 12/3 19 90
Residual OIL Page 1 of 2

AP-42 Emission Factors for Residual Oil Fired Boilers

Particulate = $[10(S) + 3] \frac{1}{10^3} \text{ gal}$ (S is weight % S in fuel)
 SO_2 = $157(S) \frac{1}{10^3} \text{ gal}$
 NO_x = $67 \frac{1}{10^3} \text{ gal}$
 CO = $5 \frac{1}{10^3} \text{ gal}$
 NMHC = $0.76 \frac{1}{10^3} \text{ gal}$

Fuel Burn Rates

$$\begin{aligned}
 \text{Unit 6} &= (219 \frac{\text{MBtu}}{\text{h}}) (10^6 \frac{\text{Btu}}{\text{MBtu}}) (\frac{1}{150,000 \text{ Btu}}) = 1460 \frac{\text{gal}}{\text{h}} \\
 \text{Unit 7} &= 470 \frac{\text{MBtu}}{\text{h}} (10^6) (\frac{1}{150,000}) = 3133 \frac{\text{gal}}{\text{h}} \\
 \text{Unit 8} &= 611 \frac{\text{MBtu}}{\text{h}} (10^6) (\frac{1}{150,000}) = 4073 \frac{\text{gal}}{\text{h}}
 \end{aligned}$$

Unit 6 & 7 fuel oil sulfur = 2.0%

Unit 8 fuel oil sulfur = 0.75%

Hourly Emission Rates

	<u>Unit 6</u> <u>1/h</u>	<u>Unit 7</u> <u>1/h</u>	<u>Unit 8</u> <u>1/h</u>
Particulate	33.6	72.1	42.8
SO ₂	453	984	
NO _x	97.3	210	
CO	7.3	15.7	20.4
NMHC	1.11	2.38	3.10

DO NOT WRITE IN THIS SPACE



Owner FPOA
Plant Kina Unit 6-8
Project No. 16589 File No. _____
Title Maximum Emission Rates When Burning Residual Oil
Computed By [Signature]
Date 12/3 1990
Checked By [Signature]
Date 12/16 1990
Page 2 of 2

Unit 8 NO_x Emission Limit = 0.20 ^{lb}/MBtu

$$\text{Maximum Unit 8 NO}_x \text{ Emission} = (0.20 \frac{\text{lb}}{\text{MBtu}}) (611 \frac{\text{MBtu}}{\text{h}}) = \underline{\underline{122 \frac{\text{lb}}{\text{h}}}}$$

Unit 8 Fuel Oil Sulfur Content Limited to 0.75%

$$\begin{aligned} \text{Maximum Unit 8 SO}_2 \text{ Emission} &= \left(\frac{0.75 \frac{\text{lb}}{\text{bbl}}}{100} \right) \left(\frac{16 \frac{\text{fuel}}{\text{bbl}}}{1800 \text{ MBtu}} \right) (611 \frac{\text{MBtu}}{\text{h}}) \left(\frac{10^6 \text{ Btu}}{\text{MBtu}} \right) \\ &\times \left(\frac{64 \frac{\text{lb SO}_2}{32 \text{ lb S}}}{165} \right) = \underline{\underline{504 \frac{\text{lb}}{\text{h}}}} \end{aligned}$$

AP-42 Emission Factors for Diesel Fuel Electric Generators

Process Industrial Boiler - Distillate Oil

Particulate = 2 ^{lb}/_{10³ gal}
SO₂ = 142 (S) ^{lb}/_{10³ gal}
NO_x = 20 ^{lb}/_{10³ gal}
CO = 5 ^{lb}/_{10³ gal}
NMHC = 0.2 ^{lb}/_{10³ gal}

Distillate Oil Sulfur Content = 0.4%

Fuel Burn Rate = 210 gal/h

Particulate = (2 ^{lb}/_{10³ gal}) (210 gal/h) = 0.42 ^{lb}/h
SO₂ = (142) (0.4 ^{lb}/_{10³ gal}) (210 gal/h) = 11.9 ^{lb}/h
NO_x = (20 ^{lb}/_{10³ gal}) (210 gal/h) = 4.2 ^{lb}/h
CO = (5 ^{lb}/_{10³ gal}) (210 gal/h) = 1.05 ^{lb}/h
NMHC = (0.2 ^{lb}/_{10³ gal}) (210 gal/h) = 0.042 ^{lb}/h

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DER Comment 6

- o Provide the stack parameters for each source at the H. D. King facility when oil is burned. The parameters are to include stack height, stack exit diameter, stack exit volume (acfm and dscfm), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume).

Response

- o The attached table lists stack parameters for Units 6, 7, and 8 when burning residual fuel oil, and diesel generators 1 and 2 when burning distillate oil. As discussed previously, FPUA will not burn fuel oil in Unit 9, therefore, no stack parameters are provided for Unit 9.

H. D. KING ELECTRIC GENERATING PLANT FUEL OIL FIRED STACK PARAMETERS

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Diesel Generators</u> *
Stack height, ft	148	148	150	23
Exit diameter, ft	5	7.1	8	3
Volumetric flow, acfm	64,400	138,000	190,000	16,600
, dscfm	39,900	85,500	119,000	5,400
Gas temperature, F	300	300	295	950
Exit velocity, fpm	3,280	3,490	3,780	2,350
Stack moisture, percent	10.97	10.98	10.82	12.74
Stack oxygen, percent	2.68	2.69	3.50	1.72

*Diesel generators 1 and 2 are identically sized. Values listed are for one diesel generator only.

DER Comment 7

- o Please model the ambient concentrations and increment consumption for the criteria pollutants sulfur dioxide, particulate, and nitrogen oxides from all sources (including the bypass stack) and for all averaging times when oil is burned. Incidentally, based on the available information, it appears that FPUA Unit 8 is an increment consuming source. Also, please update the soils and vegetation analysis to account for the effects of oil burning.

Response

- o As stated previously, Unit 9 will now only be permitted to operate while firing natural gas. The Unit 9 Prevention of Significant Deterioration (PSD) Application - August 1990 showed that, when firing natural gas, Unit 9 has predicted significant impacts for NO_x only. Consequently, NO_x is the only criteria pollutant for which impacts are considered.

The only FPUA source which consumes Class II PSD NO_x increment is Unit 9. (Note that Unit 8 began operating in 1976 and, thus, does not consume NO_x increment.) The August 1990 PSD application showed that Unit 9 (alone) consumes only 38 percent of the available Class II increment. This result is not affected by the burning of oil in the other FPUA sources.

Revised NAAQS modeling (accounting for oil use in other FPUA sources) was performed following the modeling methodology described in Section 5.0 of the August 1990 PSD application. It was shown in this application that the FPUA sources were the only sources that had the potential to interact with the Unit 9 NO_x significant impact area. Thus, FPUA Units 6 - 8 (firing No. 6 Fuel Oil) and Diesel Units 1 and 2 (firing No. 2 fuel oil) were considered along with Unit 9 (firing natural gas in the HRSG mode). Unit 9 source parameters and emission rates are given in

the response to DER Comment 1. Source parameters and emission rates for the other FPUA sources are given in the responses to DER Comments 5 and 6. All sources were conservatively assumed to operate 8,760 hours per year for the modeling analysis.

The attached table shows the results of the NAAQS modeling. The maximum combined source impact was 59.2 ug/m³, which occurred 100 meters west of the Unit 9 stack. This value was added to the 24 ug/m³ background value (West Palm Beach monitor - 1989) to get a total concentration of 83.2 ug/m³. This concentration is well below the annual NO_x standard of 100 ug/m³. Therefore, the FPUA facility annual NO_x impacts, including Unit 9, do not exceed the NAAQS. Copies of the NAAQS modeling runs are attached.

Note that NAAQS impacts with Unit 9 operating in the bypass mode would be even lower since the stack gas exit temperature and acfm flow values are higher for the bypass case. Higher temperatures and flows increase the thermal and momentum buoyancy and thus, increase the plume height. It is commonly accepted that, in the absence of elevated terrain, higher plume heights lead to lower ground-level pollutant impacts.

Since Unit 9 will only fire natural gas, the soils and vegetation analysis originally presented in the August 1990 PSD application is still applicable.

NAAQS MODELING SUMMARY FOR FPUA SOURCES

	NAAQS Modeling <u>Summary</u>
Maximum Impact Location	
Distance:	100 meters
Direction:	280 degrees
Meteorological Year:	1982
Combined Source Maximum Impact*:	59.2 ug/m3
Background Concentration**:	24 ug/m3
Total NAAQS Concentration: (Combined Maximum Impact plus Background)	83.2 ug/m3
NAAQS Primary NO _x Standard:	100 ug/m3

*Maximum Combined Impact From: Unit 9 (HRSG firing natural gas)
Units 6 - 8 (firing No. 6 fuel oil)
Diesel Units 1 and 2 (firing No. 2 fuel oil)

**Background concentration measured in 1989 at West Palm Beach monitor.

DER Comment 8

- o Please explain what the situation in the Middle East has to do with the escalation rates. Explain the basis for the capital cost escalation rate of 6%, the operating cost escalation rate of 7%, the indirect cost factor of 16%, and the present worth discount rate of 8%. Provide data to support the selection of these rates as representative of the real world.

Response

- o Iraq's invasion of Kuwait substantially disrupted the world's oil supply. Accordingly, markets reacted increasing the price of crude oil from between \$15 and \$20 per barrel to as high as \$40 per barrel. Further price increases are likely should the Middle East situation result in a direct armed conflict.

Secondary effects of this large price increase (and potential future increases) will be felt throughout the economy, affecting alternate energy source and consumer product prices, and ultimately payroll costs. The most pronounced effect will be on natural gas prices. Natural gas competes directly with fuel oil for use in a number of applications. Natural gas price deregulation and fuel oil price increases will allow natural gas suppliers to increase prices substantially without risking competitive damage. Fort Pierce Utilities Authority has already experienced a substantial increase in the price of natural gas. Since Iraq's invasion, FPUA natural gas prices have increased 42 percent. Accordingly, the capital and operating cost escalation rates used in the revised BACT analysis reflect current and future economic uncertainty. Operating costs are escalated at a higher rate (7 percent) than capital costs (6 percent) since there is more uncertainty inherent in projecting operating costs over the remaining Unit 9 life of 25 years. These escalation rates are representative of rates used in a number of recent project financial viability evaluations.

Indirect costs listed in the calculation of total capital cost reflect owner and architect/engineer costs to design, procure, construct, and start-up the SCR system. The indirect cost factor of 16 percent is applied to the escalated direct capital cost of equipment. The rate of 16 percent is based on historical information regarding projects of this nature.

The present worth concept is a method of taking into account the time value of money. Therefore, the present worth discount rate of 8 percent used in the BACT analysis is based on the cost to FPUA for financing projects through the issuance of municipal bonds. This present worth discount rate was used in conjunction with the operating cost escalation rate (7 percent) and the remaining plant life assumption (25 years) to determine a levelization factor of 1.94. Levelized costs were determined by multiplying first year costs by the levelization factor. Levelized costs reflect the effects of escalation and present worth of future annual expenditures.

DER Comment 9

- o Explain why the installation of SCR on the combined cycle unit will require additional personnel equivalent to one operator for one-half shift per day. Please explain the term loaded payroll cost as it is used in conjunction with the additional personnel cost.

Response

- o The plant has been staffed to man existing operations in an efficient manner. Addition of an SCR system on Unit 9 will add complexity to operation of the existing facility. Mechanical and control equipment associated with operation of the SCR system will require periodic inspections to ensure operability, reliability, and safety. Periodic shipments of ammonia will be received by truck. Plant personnel will be required to monitor and assist in the receipt of these ammonia supplies. In addition, SCR system operation will require periodic surveillance of performance to ensure reliable compliance. All of these services associated with retrofit of an SCR system will require plant staffing. However, due to the relative simplicity of SCR system operation only four operating personnel hours per day were included in the evaluation.

Operating personnel costs were based on a loaded payroll cost of \$45,000 per year (1990 dollars). Loaded payroll costs include basic wages, social security, insurance, and other benefit costs.

DER Comment 10

- o Explain the difference between a catalyst that is suitable only for units that burn gas and a catalyst for units that burn both gas and oil. Please explain the difference both in technical and economic terms.

Response

- o FPUA is withdrawing it's application to burn fuel oil in Unit 9 during emergencies (see response to DER comments 4 and 5). Natural gas will be the primary fuel for Unit 9. As stated previously, the costs presented in the BACT analysis are based on a catalyst designed to treat flue gas from the combustion of natural gas only. If the facility were requesting dual fuel capabilities (natural gas or fuel oil) the catalyst would be larger, and therefore, more expensive. Larger catalysts are required for oil fired applications due to the fouling characteristics of the fuel oil's flue gas (predominately due to the sulfur content of the fuel) in the presence of ammonia. More reactive catalysts (used in natural gas applications) would tend to convert SO_2 in the flue gas to SO_3 . Subsequently, this SO_3 could react with ammonia to form ammonia sulfate and bisulfate salts. Ammonia salts would tend to blind catalyst surface areas and foul downstream equipment. Accordingly, to effectively treat flue gas from fuel oil combustion, the catalyst would consist of a less reactive catalyst material and have a lower space velocity (a parameter inversely related to the residence time of the flue gas in the catalyst bed).

DER Comment 11

- o Please explain why the emission reductions for using SCR to control NO_x are not consistent in Table 4-1 for the original application and the additional information response (218 vs. 202 tons per year).

Response

- o The original application's calculation of the annual emission difference between a 42 and a 9 ppmvd NO_x emission limit of 218 tons per year was in error. The correct difference is 202 tons per year. The example calculation provided in Attachment 4 (submitted with the letter dated October 23, 1990 responding to the DER's comment letter dated September 28, 1990) correctly illustrates the calculation of emission rate based on an outlet NO_x concentration of 42 ppmvd. The following response to DER comment 12 will provide an example calculation of the difference used in the BACT analysis.

DER Comment 12

- o Please show the calculations to document the NO_x emission reduction achieved by SCR shown in Table 4-1.

Response

- o As documented in the BACT analysis, a new SCR system catalyst can achieve up to 90 percent reduction of NO_x emissions. However, as the catalyst ages the maximum NO_x emission reduction efficiency will decrease to between 80 and 85 percent. To ensure reliable compliance with emission limits it is recommended that an SCR system is capable of maintaining an emission limit of 9 ppmvd (at 15 percent oxygen) continuously. The attached calculation (included as a supplement to the example calculation provided in Attachment 4 of the previous response) documents the calculation of emissions and emission differences based on a maximum NO_x emission of 9 ppmvd.



Owner FPUA
Plant H.D. King Unit 9
Project No. 10589 File No. _____
Title Unit 9 NO_x Emission When Using
an SCR System
Computed By J. Cochran
Date 12/5 19 90
Checked By PKW
Date 12/5 19 90
Page 1 of 1

Reference Sample Calculation provided to DER in Attachment 4
in responses to previous DER comments (submitted dated 10/23/90).

Unit 9

Flue Gas Mols @ 15% Oxygen = 30488 $\frac{\text{mols}}{\text{h}}$ (See previous Attachment 4)

SCR NO_x Emission Rate = 9 ppmvd @ 15% O₂

$$\text{NO}_x \text{ Emission Rate} = \left(9 \frac{\text{mols NO}_x}{10^6 \text{ mols flue gas}} \right) (30,488 \frac{\text{mols}}{\text{h}}) (46.0055 \frac{\text{lb NO}_x}{\text{mol NO}_x})$$

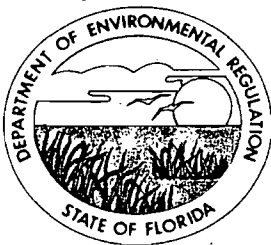
$$\text{NO}_x \text{ Emission Rate} = 12.6 \frac{\text{lb}}{\text{h}}$$

$$\text{NO}_x \text{ Emission Rate @ 42 ppmvd (15\% O}_2) = 58.9 \frac{\text{lb}}{\text{h}} \text{ (see previous Attachment 4)}$$

$$\text{Annual Plant Operation} = 8760 \frac{\text{hr}}{\text{yr}}$$

$$\begin{aligned} \text{Annual NO}_x \text{ Reduction From Use of SCR} &= (58.9 - 12.6 \frac{\text{lb}}{\text{h}}) (8760 \frac{\text{hr}}{\text{yr}}) (\frac{1 \text{ ton}}{2000 \text{ lb}}) \\ &= \underline{\underline{202 \text{ tpy}}} \end{aligned}$$

DO NOT WRITE IN THIS SPACE



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

November 21, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Ft. Pierce
P. O. Box 3191
Ft. Pierce, FL 34948

RE: AC 56-185836 - Ft. Pierce Utilities Authority - H. D. King
Unit 9

Dear Mr. Schindehette:

We have reviewed your response to our letter of September 28 concerning the above referenced permit application and find it to be incomplete. You will need to show all calculations, state and justify all assumptions, identify the sources of any emission factors, and provide copies of references where the emission factors or other information were obtained from sources other than AP-42. In responding to those questions that request information concerning air pollutant emissions, please provide the emissions for each fuel that the affected sources are authorized to burn. Processing of your application will resume upon receipt of the following information:

- Please fully explain how the stack parameters listed in Attachment 3 relate to the actual stack parameters for FPUA Unit 9 and provide numerical comparisons.
- Please explain how the emission rates for nitrogen oxides, carbon monoxide, non-methane hydrocarbons, and particulate were determined for FPUA Unit 9 by General Electric. Provide supporting documentation.
- Explain and show how the actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 were calculated in units of the applicable emission limiting standard, lbs./hr., and tons/year for each source at the H. D. King facility

Mr. H. Schindehette

November 21, 1990

Page Two

- Describe the situations that make it necessary to burn oil in each of the units located at the H. D. King facility. List the actual number hours per year (during each of the last two years) that oil was burned in each air pollution source at the H. D. King facility including each diesel.
- Provide the maximum emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lbs./hr., and tons/year for each source at the H. D. King facility when oil is burned.
- Provide the stack parameters for each source at the H. D. King facility when oil is burned. The parameters are to include stack height, stack exit diameter, stack exit volume (ACFM and DSCFM), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume).
- Please model the ambient concentrations and increment consumption for the criteria pollutants sulfur dioxide, particulate, and nitrogen oxides from all sources (including the bypass stack) and for all averaging times when oil is burned. Incidentally, based on the available information, it appears that FPUA Unit 8 is an increment consuming source. Also, please update the soils and vegetation analysis to account for the effects of oil burning.
- Please explain what the situation in the Middle East has to do with the escalation rates. Explain the basis for the capital cost escalation rate of 6%, the operating cost escalation rate of 7%, the indirect cost factor of 16%, and the present worth discount rate of 8%. Provide data to support the selection of these rates as representative of the real world.
- Explain why the installation of SCR on the combined cycle unit will require additional personnel equivalent to one operator for one-half shift per day. Please explain the term loaded payroll cost as it is used in conjunction with the additional personnel cost.
- Explain the difference between a catalyst that is suitable only for units that burn gas and a catalyst for units that burn both gas and oil. Please explain the difference both in technical and economic terms.
- Please explain why the emission reductions for using SCR to control NOx are not consistent in Table 4-1 for the original application and the additional information response (218 vs. 202 tons per year).

Mr. H. Schindehette
November 21, 1990
Page Three

- Please show the calculations to document the NOx emission reduction achieved by SCR shown in Table 4-1.

If you have any questions or wish to meet with us, please write to me at the address above or call Barry Andrews at (904) 488-1344.

Sincerely,



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

cc: S. Day, P.E.
J. Miller
H. Lamb
I. Goldman

P 256 395 040

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

Sent to <i>Harry Schindelhette</i>	
Street and No. <i>City of Ft Pierce</i>	
P.O., State and ZIP Code <i>Ft. Pierce, FL</i>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date <i>11-21-90</i> <i>AC 56-185826</i>	

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

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

3. Article Addressed to:
Mr. Harry Schindelhette, P.E.
Director of Utilities
City of Ft. Pierce
P.O. Box 3191
Ft. Pierce, FL 34948

4. Article Number
P 256 395 040

Type of Service:
☐ Registered
☒ Certified
☐ Express Mail
☐ Insured
☐ COD
☐ Return Receipt for Merchandise
 Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X *J. Naughton*

7. Date of Delivery

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

PS For

RECEIPT



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

November 21, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Ft. Pierce
P. O. Box 3191
Ft. Pierce, FL 34948

RE: AC 56-185836 - Ft. Pierce Utilities Authority - H. D. King
Unit 9

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- Explain and show how the actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 were calculated in units of the applicable emission limiting standard, lbs./hr., and tons/year for each source at the H. D. King facility



- 4
OK
- Describe the situations that make it necessary to burn oil in each of the units located at the H. D. King facility. List the actual number hours per year (during each of the last two years) that oil was burned in each air pollution source at the H. D. King facility including each diesel.
- 5
- Provide the maximum emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lbs./hr., and tons/year for each source at the H. D. King facility when oil is burned.
- 6
OK
- Provide the stack parameters for each source at the H. D. King facility when oil is burned. The parameters are to include stack height, stack exit diameter, stack exit volume (ACFM and DSCFM), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume).
- 7
OK
- Please model the ambient concentrations and increment consumption for the criteria pollutants sulfur dioxide, particulate, and nitrogen oxides from all sources (including the bypass stack) and for all averaging times when oil is burned. Incidentally, based on the available information, it appears that FPUA Unit 8 is an increment consuming source. Also, please update the soils and vegetation analysis to account for the effects of oil burning.
- 8
OK
- Please explain what the situation in the Middle East has to do with the escalation rates. Explain the basis for the capital cost escalation rate of 6%, the operating cost escalation rate of 7%, the indirect cost factor of 16%, and the present worth discount rate of 8%. Provide data to support the selection of these rates as representative of the real world.
- 9
OK
- Explain why the installation of SCR on the combined cycle unit will require additional personnel equivalent to one operator for one-half shift per day. Please explain the term loaded payroll cost as it is used in conjunction with the additional personnel cost.
- 10
OK
- Explain the difference between a catalyst that is suitable only for units that burn gas and a catalyst for units that burn both gas and oil. Please explain the difference both in technical and economic terms.
- 11
OK
- Please explain why the emission reductions for using SCR to control NOx are not consistent in Table 4-1 for the original application and the additional information response (218 vs. 202 tons per year).

Mr. H. Schindehette
November 21, 1990
Page Three

12. OK •

Please show the calculations to document the NOx emission reduction achieved by SCR shown in Table 4-1.

If you have any questions or wish to meet with us, please write to me at the address above or call Barry Andrews at (904) 488-1344.

Sincerely,

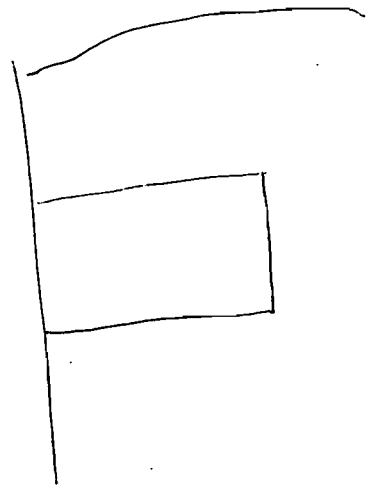


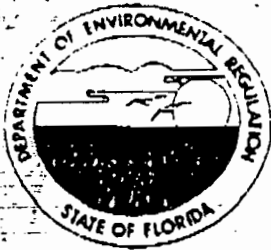
C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

cc: S. Day, P.E.
J. Miller
H. Lamb
I. Goldman

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2





Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary
Scott Benyon, Deputy Assistant Secretary

November 7, 1990

Mr. Harry Schindehette, P.E.
Director of Utilities
Ft. Pierce Utilities Authority
P.O. Box 3191
Ft. Pierce, FL 34948

Dear Mr. Schindehette:

RE: Renewal Requirements for Units 6, 7, and 8

The Department is in receipt of your October 23, 1990 letter. Tom Pittle and I have reviewed your request for fuel oil use in Units 6, 7, and 8 under emergency conditions. Under the Specific Conditions for Unit 9, the use of fuel oil is allowed for Units 6, 7, and 8 if compliance is demonstrated or reasonable assurances provided. Your letter states that Units 6, 7, and 8 cannot comply with the restrictions for particulates and sulfur dioxides, therefore, the use of oil even in emergencies cannot be permitted. Fuel oil may be burned under the following conditions:

- a) The Department's permission is received and the burn is for testing purposes;
- b) Reasonable assurances are provided to the Department that the Units will comply with the permit restrictions, or;
- c) Unit 9's permit is modified to allow the use of fuel oil.

Permits for Units 6, 7, and 8 will be renewed without allowing the use of fuel oil under the present circumstances.

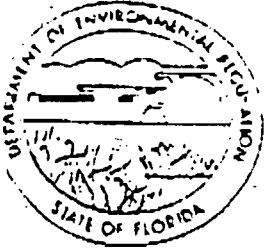
Should you have any questions, call me at (407) 433-2650.

Sincerely,

Stephanie S. Brooks, P.E.
Stephanie S. Brooks, P.E.
Professional Engineer II
Senior Air Permitting Engineer

cc: Dan Nelson

Best Available Copy



Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9665

Bob Martinez, Governor

Dale Tischmann, Secretary

John Shearer, Assistant Secretary

Scott Benson, Deputy Assistant Secretary

FAX TRANSMITTAL LETTER

DATE: 12-14-90MODULE 7051TO:
NAME: Cathy Phillips, DAGENCY: BARFAX TELEPHONE NUMBER: 904-922-6979NUMBER OF PAGES (INCLUDING THIS PAGE) 2FROM: S. BrooksAGENCY: DER

TRANSMITTAL ON A HITACHI FAX #35, NUMBER 407/433-2666

IF ANY OF THESE PAGES ARE NOT CLEARLY RECEIVED, PLEASE CALL
407/433-2650SENDER'S NAME: S. Brooks

COMMENTS:

Best Available Copy



H.D. KING ELECTRIC GENERATING PLANT

311 North Indian River Drive (34950)
Post Office Box 1298 (34954)
Fort Pierce, Florida
(407) 464-5792

RECEIVED
OCT 30 1990
DER-BAQM

October 26, 1990

FEDERAL EXPRESS

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attn: Mr. C. H. Fancy

Dear Mr. Fancy:

Re: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9
Your Request for Construction
Permits for our Units 6, 7 & 8

As I stated in my letter of October 23rd, we reviewed the archives of the Florida Dept. of Environmental Regulation, Southeast District's office and located a Construction Permit for our Unit #8. No Construction Permits were found for Units 6 and 7, and we suspect that no Construction Permits were ever issued for these units since the permit requirement did not appear to be required until 1971 and these units were constructed in 1958 and 1964 respectively.

Sincerely,

A handwritten signature in dark ink, appearing to read "Harry Schindehette".

Harry Schindehette, P.E.
Director of Utilities

HL/HS:m

Enclosure

cc: Jack Miller
Harry Lamb

Handwritten notes:
M. Rayburn
J. Gallaway
J. Smith
J. Thompson
J. Williams



AIRBILL
PACKAGE
TRACKING NUMBER

6553362664

6553362664

RECIPIENT'S COPY

Date		10-29-90		RECIPIENT'S COPY	
From (Your Name) Please Print		Your Phone Number (Very Important)		To (Recipient's Name) Please Print	
Larry Schindehette		(407) 464-5600		C. H. Fancy	
Company		Department/Floor No.		Company	
t. Pierce Utilities Authority				Florida Department of Environmental Reg.	
Street Address				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes)	
11 No. Indian River Drive				Twin Towers Office Building	
City		State		City	
t. Pierce		FL		Tallahassee	
ZIP Required		34950		State	
				FL	
ZIP Required		32399-2400			
YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)				IF HOLO FOR PICK-UP, Print FEDEX Address Here	
				Street Address	
				City	
				State	
				ZIP Required	
PAYMENT ☐ Bill Sender ☐ Bill Recipient's FedEx Acct. No. ☐ Bill 3rd Party FedEx Acct. No. ☐ Bill Credit Card					
5 ☐ Cash					
SERVICES (Check only one box)		DELIVERY AND SPECIAL HANDLING		Emp. No.	
Priority Overnight Service (Delivery by next business morning)		1 ☐ HOLD FOR PICK-UP (Fill in Box H)		Date	
Standard Overnight Service (Delivery by next business afternoon)		2 ☐ DELIVER WEEKDAY		☐ Cash Received	
11 ☐ YOUR PACKAGING 51 ☐		3 ☐ DELIVER SATURDAY (Extra charge) ☐		☐ Return Shipment	
16 ☐ FEDEX LETTER 56 ☐		4 ☐ DANGEROUS GOODS (Extra charge) (CSS not available for Dangerous Goods Shipments)		☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold	
12 ☐ FEDEX PAK 52 ☐		5 ☐ CONSTANT SURVEILLANCE SVC. (CSS) (Extra charge) (Release Signature Not Applicable)		Street Address	
13 ☐ FEDEX BOX 53 ☐		6 ☐ DRY ICE Lbs		City	
14 ☐ FEDEX TUBE 54 ☐		7 ☐ OTHER SPECIAL SERVICE		State	
Economy Service (formerly Standard Air) (Delivery by second business day)		8 ☐		Zip	
Heavyweight Service (for Extra Large or any package over 150 lbs.)		9 ☐ SATURDAY PICK-UP (Extra charge)		Received By:	
30 ☐ ECONOMY SERVICE		10 ☐		X	
11 ☐ DEFERRED HEAVYWEIGHT **		11 ☐ DISCOUNT		Date/Time Received	
*Declared Value Limit \$100. **Call for delivery schedule.		12 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)		FedEx Employee Number	
				Release Signature:	
				Date/Time	
				10/29/90	



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BY

SOUTHEAST REGION
DEPT. OF POLLUTION CONTROL

PERMIT NO. AC56-2452

State of Florida
Department of Air and Water Pollution Control

DATE

8-24-73

Application For Permit to Construct Air Pollution

Sources

signed 5/22/73

Applicant
(Owner or authorized agent)

C. W. Temby, Director of Utilities
(Name and Title)

Name of Establishment

Fort Pierce Utilities Authority
(Corporation, Company, Political SD, Firm, etc.)

Mailing Address

Post Office Box 3191, Fort Pierce, Florida 33450

Location of Pollution Source

311 N. Indian River Dr., Fort Pierce, Florida
(Number and Street) (City)

St. Lucie
(County)

Nature of Industrial Operation

Henry D. King Municipal Electric Station

Permit Applied For:

Project Engineer:

New Source (Proposed 56,116 kW ☒
Steam Generating Unit and
Steam Driven Turbine

Existing Source after modification ☐

Existing Source ☐

Relocation, expansion or reconstruction ☐

Urban U. Parrish, Jr.

Name
Reynolds, Smith and Hills
Architects-Engineers-Planners, Incorporated

Firm
P. O. Box 4850, Jacksonville, Florida 32201

Mailing Address

Urban U. Parrish, Jr.
Signature

4665

Florida Registration Number

For Department's Use Only

Permit No.

Date:

STATE OF FLORIDA

DEPARTMENT OF POLLUTION CONTROL

CONSTRUCTION PERMIT PROVISOS

AIR POLLUTION SOURCES

Permit No. AC 56-2152

Date: 8-24-73

- [X] 1. Construction of this installation shall be completed by 11-30-74
- [X] 2. This construction permit expires on 3-31-75 following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Pollution Control Board.
- [X] 3. All applicable rules of the Department including design discharge limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.
- [X] 4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. A report of such inspection shall be submitted by the engineer to the Department of Pollution Control for consideration toward the issuance of an operation permit.
- [X] 5. This boiler stack shall be tested for particulate within 60 days after it is placed in operation. These test results are required prior to our issuance of an operation permit and shall be submitted in duplicate to the DPC Southeast Florida Regional Office, 200 SE 6th Street, Suite 500, Ft. Lauderdale, FL 33301
- [X] 6. The operation of this installation shall be observed for visible emissions in accordance with Method 9 - Visible Determination of the Opacity of Emissions from Stationary Sources (Federal Register, December 23, 1971). The observation results are required prior to our issuance of an operation permit, and shall be submitted in duplicate to the DPC Southeast Florida Regional Office, 200 SE 6th Street, Suite 500, Ft. Lauderdale, FL 33301
- [] 7. Stack sampling for total particulate or other contaminant emissions shall be conducted if found by the DPC Southeast Florida Regional Office to be necessary as a basis for the issuance of an operation permit.
- [X] 8. Satisfactory ladders, platforms, and other safety devices shall be provided/available as well as necessary ports to facilitate the carrying out of an adequate sampling program.

(TURN OVER)

[X] 9. The following items are required prior to our issuance of an operation permit in addition to the engineer of record's report of inspection:

- (a) An emission report for total particulates and sulfur oxides based upon actual operations.
- (b) A tabular summary of actual records of frequencies and durations of soot blowing as well as boiler blowdown characteristics and disposal practices.

These items are required prior to our issuance of an operation permit and shall be submitted in duplicate to the DPC _____
Florida Regional Office, _____

[] 10. There shall be no discharges of liquid effluents or contaminated runoff from the plant site.

[X] 11. All fugitive dust generated at this site shall be adequately controlled.



STATE OF FLORIDA
DEPARTMENT OF POLLUTION CONTROL

2562 EXECUTIVE CENTER CIRCLE, EAST
MONTGOMERY BUILDING, TALLAHASSEE, FLORIDA 32301

VINCENT D. PATTON
EXECUTIVE DIRECTOR

Please reply to
State of Florida, Southeast Region
Department of Pollution Control
200 Southeast 6th Street, Suite 500
Fort Lauderdale, Florida 33301
Telephone (305) 524-8593

DAVID H. LEVIN
CHAIRMAN

Sept. 6, 1973

St. Lucie County - AP
Ft. Pierce Util. Auth.

Mr. C. W. Temby, Dir. of Util.
Fort Pierce Utilities Auth.
P. O. Box 3191
Fort Pierce, FL 33450

Dear Mr. Temby:

UNIT #8

Pursuant to your recent application, please find enclosed a permit (No. AC 56-2152) dated 8-24-73 to construct/~~operate~~ the subject pollution source.

This permit will expire on 3-31-75 , and will be subject to the conditions, requirements and restrictions checked or indicated otherwise in the attached sheet Construction/~~Operation~~ "Permit Conditions."

This permit is issued under the authority of Florida Statutes 403.061 (16). The time limits imposed herein are a condition to this permit and are enforceable under Florida Statute 403.161. You are hereby placed on Notice that the Department will review this permit before the scheduled date of expiry and will seek court action for violation of the conditions and requirements of this permit.

You have ten days from the date of receipt hereof within which to seek a review of the conditions and requirements contained in this permit.

Your continued cooperation in this matter is appreciated and in future communication please refer to your permit number.

Yours very truly,

Warren G. Strahm,
Regional Engineer

cc: Project Engineer: Urban U. Parrish, Jr., Reynolds, Smith & Hills
Local Program Arch.-Engrs.-Planners, Inc., P.O.B. 4850, Jacksonville 32201
Al Cox - Ft. Pierce Subregion Office
Tallahassee Central Files

Misc.
Obsolete

STATE OF FLORIDA
DEPARTMENT OF AIR AND WATER
POLLUTION CONTROL

CONSTRUCTION PERMIT

FOR FT. PIERCE UTILITIES AUTHORITY

P. O. Box 3191

Ft. Pierce, FL 33450

PERMIT NO. AC 56-2152

DATE 8-24-73

PURSUANT TO THE PROVISION OF SECTION 403.061 (16) OF CHAPTER 403, FLORIDA STATUTES AND CHAPTER 17-4 FLORIDA ADMINISTRATIVE CODE, THIS PERMIT IS ISSUED TO:
Mr. C. W. Temby, Director of Utilities

FOR THE CONSTRUCTION OF THE FOLLOWING:
Electric powerplant boiler #8 producing 15,452.7 (10) BTU/day
burning natural gas or .75% sulfur #6 fuel oil.

LOCATED AT 311 N. Indian River Dr., Ft. Pierce, St. Lucie County

UTM: 7566875 E: 3036312 N

IN ACCORDANCE WITH THE APPLICATION DATED 5-22-73*
AND IN CONFORMITY WITH THE STATEMENTS AND SUPPORTING DATA ENTERED THEREIN,
ALL OF WHICH ARE FILED WITH THE DEPARTMENT AND ARE CONSIDERED A PART OF THIS
PERMIT.

THIS PERMIT SHALL BE EFFECTIVE FROM THE DATE OF ITS ISSUANCE UNTIL 3-31-75
AND SHALL BE SUBJECT TO ALL APPLICABLE LAWS OF THE STATE AND THE RULES AND REGULATIONS OF THE DEPARTMENT.

DAVID H. SCOTT, CHIEF
BUREAU OF PERMITTING

WARREN G. STRAHM
Regional Engineer

VINCENT D. PATTON
EXECUTIVE DIRECTOR

*And DPC Board approval at public hearing 7-25-73 in Tampa, FL
FORM 1-J

STATE OF FLORIDA

DEPARTMENT OF POLLUTION CONTROL

CONSTRUCTION PERMIT PROVISOS

AIR POLLUTION SOURCES

Permit No. AC 56-2152A

Date: June 24, 1975

- (X) 1. Construction of this installation shall be completed by March 31, 1976. Application for Permit to Operate to be submitted by May 31, 1976.
- (X) 2. This construction permit expires on June 30, 1976 following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Pollution Control Board.
- (X) 3. All applicable rules of the Department including design discharge limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.
- (X) 4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. A report of such inspection shall be submitted by the engineer to the Department of Pollution Control for consideration toward the issuance of an operation permit.
- (X) 5. This boiler shall be tested* for particulate and SO₂ within 60 days after it is placed in operation. These test results are required prior to our issuance of an operation permit and shall be submitted in duplicate to the DPC Southeast Florida Regional Office 200 Southeast 6 Street, Suite 504, Fort Lauderdale, Florida 33301.
*FUEL ANALYSIS MAY BE SUBMITTED FOR REQUIRED SULFUR DIOXIDE EMISSION TEST.
- (X) 6. The operation of this installation shall be observed for visible emissions in accordance with Method 9 - Visible Determination of the Opacity of Emissions from Stationary Sources (36FR24895; Federal Register, December 23, 1971). The observation results are required prior to our issuance of an operation permit, and shall be submitted in duplicate to the DPC Southeast Florida Regional Office, 200 S.E. 6 St., Suite 504, Ft. Lauderdale, Florida 33301.
- (X) 7. Satisfactory ladders, platforms, and other safety devices shall be provided/available as well as necessary ports to facilitate the carrying out of an adequate sampling program.
- () 8. There shall be no discharges of liquid effluents or contaminated runoff from the plant site.
- (X) 9. All fugitive dust generated at this site shall be adequately controlled.

STATE OF FLORIDA
DEPARTMENT OF POLLUTION CONTROL

CONSTRUCTION PERMIT

For FORT PIERCE UTILITIES AUTHORITY
Post Office Box 3191
Fort Pierce, Florida 33450

Permit no. AC 56-2152A Date June 24, 1975 *

Pursuant to the provisions of section 403.06(16) of Chapter 403 Florida Statutes and Chapter 17-4 Florida Administrative Code. This permit is issued to:
WALTER M. BALDWIN, DIRECTOR OF UTILITIES

For the construction of the following:

Boiler number 8, capacity of 644 MBTU/hr. (1346.8 MWH/day) to
operate continuously, burning natural gas or .75% sulfur #6 fuel
oil, expecting 33 #/hr. particulate and 480 #/hr. SO₂ to discharge
through stack 150' above ground level.

Located at: 311 North Indian River Drive, Ft. Pierce, St. Lucie
County. UTM: 17 566.8 Km E; 3036.3 Km N

In accordance with the application dated May 22, 1973 **

and in conformity with the statements and supporting data entered therein, all of which are filed with the department and are considered a part of this permit.

This permit shall be effective from the date of issue until June 30, 1976
or until revoked or surrendered and shall be subject to all laws of the state and the rules and regulations of the department.

Robert A. Baker
ROBERT A. BAKER, P. E.
REGIONAL ENGINEER

Peter P. Baljet
PETER P. BALJET
EXECUTIVE DIRECTOR



DJK

* This permit supersedes permit #AC 56-2152 issued May 24, 1973 and extends expiration date from March 31, 1975 to June 30, 1976.

** and DPC Board approval at Public Hearing July 25, 1973 in Tampa, Florida



REVISED PSD

H.D. KING ELECTRIC GENERATING PLANT

311 North Indian River Drive (34950)
Post Office Box 1298 (34954)
Fort Pierce, Florida
(407) 464-5792

October 23, 1990

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

FEDERAL EXPRESS

Attn: Mr. C. H. Fancy

Dear Mr. Fancy:

Re: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9

Enclosed is our response to your comment letter of September 28, 1990 and subsequent telephone clarifications regarding our permit to relicense Unit 9.

Your comment #12, Requested Construction Permits for Units 6, 7 & 8, we have reviewed our files and records, contacted former employees, and have not been able to locate a copy of any construction permits for these units. We have also contacted former employees of Reynolds, Smith & Hills which was our engineer of record in the past; however, their files have been purged and we are unable to obtain any information regarding construction permits from them.

We have contacted the Florida Dept. of Environmental Regulation, Southeast District office regarding the possibility of construction permits in their files. We will research their archives within the next few days and will forward copies to your office of any construction permits we are able to locate.

6TH
FL
BACT
We have attempted to formulate our responses based on the methodology approved most recently by the DER in the BACT determination for TECO's Hardee County permit. We believe that this consistency of analysis is important to both the DER and to applicants trying to comply with BACT analysis requirements.

We are most interested in discussing this with the DER further, to ensure that we are correctly applying the DER's policy decisions made during the Hardee County permit process.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Harry Schindehette'.

Harry Schindehette, P.E.
Director of Utilities

HL/HS:m

Enclosure
cc: Jack Miller
Harry Lamb

RECEIVED
OCT 24 1990
DER-BAQM

DER Comment 1

- o Please provide a completed State of Florida permit application form [DER Form 17-1.202(1)] that is signed by the owner or the owner's authorized agent. The permit application form is also to be signed and sealed with a metallic impression-type seal by a professional engineer registered in Florida.

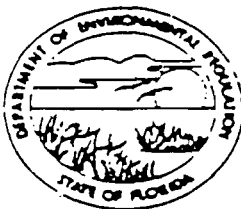
Response

- o Attached please find a completed permit application form.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

RTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207BOB GRAHAM
GOVERNORVICTORIA J. TSCHINKEL
SECRETARYG. DOUG BUTTON
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Combustion Turbine ☒ New¹ ☐ Existing¹APPLICATION TYPE: ☒ Construction ☐ Operation ☐ ModificationCOMPANY NAME: Fort Pierce Utilities Authority COUNTY: St. LucieIdentify the specific emission point source(s) addressed in this application (i.e. Lime
Gas Turbine/
Kila No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Waste Heat BoilerSOURCE LOCATION: ~~XXXXXX~~ Street 311 North Indian River Drive City Fort PierceUTM: East 566.692 North 3036.292Latitude 27° 27' 01" N Longitude 80° 19' 29" WAPPLICANT NAME AND TITLE: Harry Schindehette, DirectorAPPLICANT ADDRESS: FPUA, P.O. Box 3191, Fort Pierce, Florida 33448

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Fort Pierce Utilities
Authorities

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

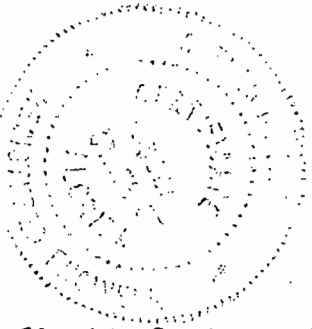
Signed: [Signature]Harry Schindehette, Director
Name and Title (Please type)Date: 0-23-90 Telephone No. (305) 464-5600

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

¹ See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed

Steven M. Day
Steven M. Day

Name (Please Type)

Black & Veatch

Company Name (Please Type)

P. O. Box 8405, Kansas City, MO 64114

Mailing Address (Please Type)

Florida Registration No. 43028 Date: 10/19/90 Telephone No. (913)339-2880

SECTION II: GENERAL PROJECT INFORMATION

- A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See Section 2.0 of the AAQIA (Attachment 1) & the revised BACT Analysis (Attachment

2). The project will result in full compliance with all applicable regulations.

- B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction April 1988 Completion of Construction January 1990

- C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

See Attachment 2. Note that steam injection for

reduction of NO_x emissions is an integral part of the gas turbine.

- D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Permit to Construct: AC 56-141460 Issued March 28, 1990

Permit to Operate: AO 56-175955 Issued May 1, 1990

Expires March 30, 1995

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack): *

Stack Height: _____ ft. Stack Diameter: _____ ft.
 Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F
 Water Vapor Content: _____ % Velocity: _____ fpm

*See Attachment 3 for HRSG and Bypass Stack Characteristics.

SECTION IV: INCINERATOR INFORMATION

NA

Type of Waste	Type I (Plastics)	Type II (Rubbish)	Type III (Refuse)	Type IV (Garbage)	Type V (Pathological)	Type VI (Liq. & Gas By-prod.)	Type VII (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lb/hr)							

Description of Waste _____

Total Weight Incinerated (lb/hr) _____ Design Capacity (lb/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume (ft) ³	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM Velocity: _____ FPS

If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control devices: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) _____

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
	See Attachment 2. NO _x emissions control by steam injection is an integral part of the gas turbine			

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas		0.380	353
		(@20 F Ambient Conditions)	
No. 2 Fuel Oil (Emergency Backup)		2672	350
		(@20 F Ambient Conditions)	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: Natural Gas

Percent Sulfur: 2000 gr/MMCF Percent Ash: Nil
 Density: 0.0446 lb/SCF ~~XXXXXX~~ Typical Percent Nitrogen: 0.71%
 Heat Capacity: 20.860 BTU/lb 930 Btu/SCF ~~XXXXXX~~

Other Fuel Contaminants (which may cause air pollution): See Section 3.3 of the AAQIA
(Attachment 1) and Attachment 2.

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average NA Maximum NA

G. Indicate liquid or solid wastes generated and method of disposal.

NA

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% wt		
Water	(NA - No	Emissions	from Water)	

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): NA

2. Product Weight (lbs/hr): NA

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission ¹		Allowed Emission Rate per Rule 17-2	Allowable Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	2.5	11.0	NA				
SO _x	0.2	0.9	150 ppm _{dv}				
NO _x	58.9	258.0	*				
VOC	2.4	10.5	NA				
CO	8.5	37.2	NA				

¹See Section V, Item 2.

²Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, C. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

*New Source Performance Standards for combustion turbines (40 CFR 60 Subpart GG) limits NO_x to 75 ppm_{dv} at 15% O₂, corrected for fuel nitrogen content and turbine heat rate, or 84 ppm_{dv} at 15% O₂, whichever is more stringent.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52
if power plant, hrs/yr 8760; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions.
(Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
a. If yes, has "offset" been applied? _____
b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? Yes
If yes, see Section VI.

3. Does the State "Prevention of Significant Deterioration" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

6. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

a. If yes, for what pollutants? N/A

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.630 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

Best Available Copy

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. For a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. For an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See AAQIA (Attachment 1) and calculations included in Attachment 4.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
See Attachment 4
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.) See Attachment 2
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency). See Attachment 2
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
See Attachment 5.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
See Figure 2-1 in the AAQIA (Attachment 1)
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
See Figure 2-2 in the AAQIA (Attachment 1)

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
 Fee has already been submitted.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

- A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 61 applicable to the source?

☒ Yes ☐ No

Contaminant	Rate or Concentration
SO ₂	150 ppmvd at 15% O ₂
NO _x	*

*75 ppmvd at 15% O₂ corrected for nitrogen content and heat rate, or 84 ppmvd at 15% O₂.

- B. Has EPA declared the best available control technology for this class of sources (yes, attach copy)

☐ Yes ☒ No Case-by-case determination

Contaminant	Rate or Concentration

- C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
See Attachment 2.	
NO _x	42 ppmvd at 15% O ₂ (Natural Gas)

- D. Describe the existing control and treatment technology (if any).

See Attachment 2

1. Control Device/System:

2. Operating Principles:

3. Efficiency:

4. Capital Costs:

Explain method of determining

Best Available Copy

5. Useful Life:

7. Energy:

9. Emissions:

6. Operating Costs:

8. Maintenance Cost:

Contaminant

Rate or Concentration

10. Stack Parameters

a. Height:

ft.

b. Diameter:

ft.

c. Flow Rate:

ACFM

d. Temperature:

°F

e. Velocity:

FPS

E. Describe the control and treatment technology available (As many types as applicable use additional pages if necessary).

1. See Attachment 2

a. Control Devices:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Costs:

g. Energy:²

h. Maintenance Costs:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Devices:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Costs:

g. Energy:²

h. Maintenance Costs:

i. Availability of construction materials and process chemicals:

¹ Explain method of determining efficiency.

Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See Attachment 2

1. Control Device:

2. Efficiency:¹

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:²

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

Explain method of determining efficiency.

Energy to be reported in units of electrical power - KWH design rate.

Form 17-1.202(1)

Effective November 30, 1982

Page 10 of 12

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

(8) Process Rate:¹

b. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

(8) Process Rate:¹

10. Reason for selection and description of system:

¹Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

See Section 6.5 of the AAQIA (Attachment 1)

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ () SO₂ _____ Wind spd/dir _____

Period of Monitoring _____ / _____ / _____ to _____ / _____ / _____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No
- b. Was instrumentation calibrated in accordance with Department procedures?
☐ Yes ☐ No ☐ Unknown

8. Meteorological Data Used for Air Quality Modeling See Section 5.5 of the AAQIA (Attachment 1)

1. _____ Year(s) of data from _____ to _____
month day year month day year

2. Surface data obtained from (location) _____

3. Upper air (mixing height) data obtained from (location) _____

4. Stability wind rose (STAR) data obtained from (location) _____

Computer Models Used See Section 5.3 of the AAQIA

1. _____ Modified? If yes, attach description.
2. _____ Modified? If yes, attach description.
3. _____ Modified? If yes, attach description.
4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

Applicants Maximum Allowable Emission Data See Section 5.2 of the AAQIA (Attachment 1)

Pollutant	Emission Rate
TSP	_____ grams/sec
SO ₂	_____ grams/sec

Emission Data Used in Modeling *

Attach list of emission sources. Emission data required is source name, description of point source (on NEQS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

Attach all other information supportive to the PSD review. *

Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. *

Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

* E-H: See AAQIA (Attachment 1) for detail.

ATTACHMENT 1

AMBIENT AIR QUALITY IMPACT ANALYSIS (AAQIA)
AUGUST 1990

FORT PIERCE UTILITIES AUTHORITY
H. D. KING UNIT 9
PREVENTION OF SIGNIFICANT DETERIORATION
(PSD)
APPLICATION

B&V PROJECT 16589.070
AUGUST 1990

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APPENDIX A	DIRECTION-SPECIFIC BUILDING ANALYSIS

1.0 INTRODUCTION

On May 1, 1990, the Fort Pierce Utilities Authority (FPUA) was issued a permit (AO 56-175955) by the Florida Department of Environmental Regulation (FDER) for the operation of a 31.6 MW combined cycle gas turbine at the H. D. King power plant in Fort Pierce, Florida. This combined cycle system (Unit 9 and 5) consists of a 23.4 MW natural gas fired combustion turbine generator, steam generator, and an 8.2 MW condensing steam turbine. Unit 9 commenced operation in early 1989; the final operating permit was issued in early 1990.

In the Unit 9 construction permit, the operating hours for the existing H. D. King Units 6, 7, and 8 were restricted such that the net increase of all regulated pollutants were below Prevention of Significant Deterioration (PSD) significant emission increases. Therefore, Unit 9 was previously not subject to PSD regulations. Due to increased electricity demands, it is now necessary to remove the operational limitation for Units 6, 7, and 8 that were imposed in the original Unit 9 permit. If the Unit 9 permit operational restrictions on Unit 6, 7, and 8 are removed, then Unit 9 requires repermitting subject to PSD regulations.

This report describes the PSD applicability and modeling methodology for air quality permitting of the Unit 9 combined cycle system. The permit methodology assumes that Units 6, 7, and 8 can operate at the levels described in their respective permits (AO-56-113534, AO-56-112679, and AO-56-112678). The purpose of this analysis is to demonstrate that the combustion turbine will not cause or contribute to an exceedance of any national or state ambient air quality standards and will not consume more than the applicable amount of Prevention of Significant Deterioration (PSD) air quality increment. A Workplan which described the proposed methodology to be followed in this analysis was discussed with the appropriate FDER staff on July 24, 1990.

2.0 PROJECT DESCRIPTION

The FPUA Project is located in St. Lucie County, Florida, on land currently owned by the FPUA. The land is zoned M-1 and is adjacent to the Indian River. A project site location map is shown in Figure 2-1. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are: 566.8 kilometers (East) and 3,036.3 kilometers (North). The project site arrangement is shown in Figure 2-2.

The combined cycle system includes a 23.4 MW combustion turbine (CT), a steam generator, and an 8.2 MW condensing steam turbine. The CT will burn natural gas as the primary fuel. No. 2 fuel oil (distillate) will only be used as emergency backup fuel. Emergency fuel is defined in Subpart GG, Standard of Performance for Stationary Gas Turbines, 40 CFR 60.331.

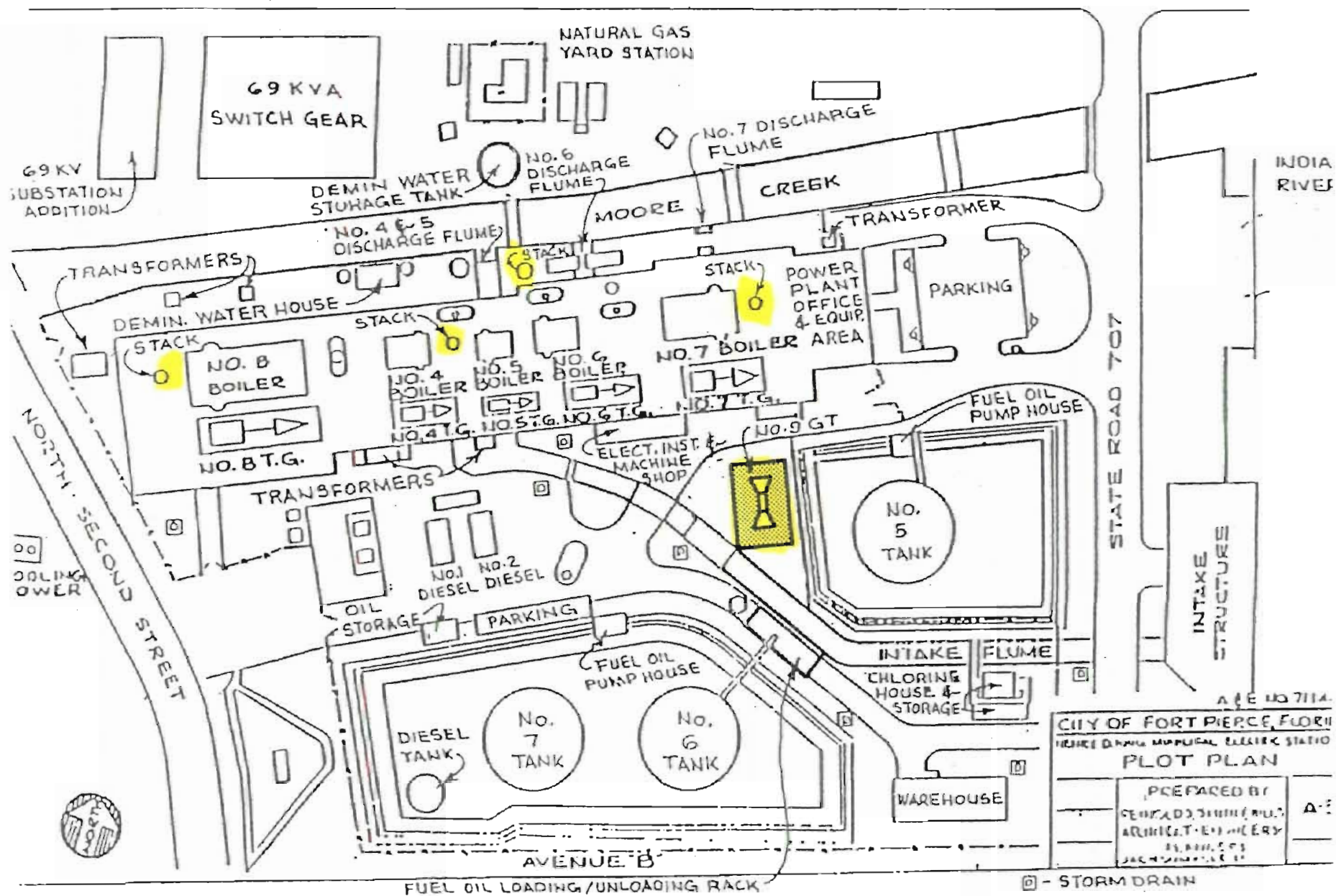
Base Map Source: USGS,
Fort Pierce, FL Quadrangle, 1980

PROJECT SITE LOCATION

Figure 2-1

FIGURE 2-2. SITE ARRANGEMENT

2-3



3.0 APPLICABILITY ANALYSIS

For PSD regulations to be applicable, a source must be considered a new major stationary source or a major modification to an existing facility. In addition, the source must be located in an area which is designated as "attainment" or "unclassifiable" for at least one pollutant emitted by the source and regulated under the Clean Air Act. If a source is determined to be subject to PSD regulations, then each regulated pollutant that is emitted in excess of designated "significant emission rates" is subject to additional PSD review. Additional review includes a Best Available Control Technology (BACT) analysis, an Ambient Air Quality Impact Analysis (AAQIA), and additional impacts analysis, as appropriate.

3.1 CURRENT AIR QUALITY STATUS

The project site is located in St. Lucie County. This area is currently designated as attainment or unclassifiable with regard to carbon monoxide (CO), particulate matter (PM₁₀), nitrogen oxides (NO_x), ozone (VOCs) and sulfur dioxide (SO₂).

An area is designated as "attainment" for a pollutant if ambient air quality standards for that pollutant are being met and "nonattainment" if they are not. An area is designated as "unclassifiable" for a pollutant if the attainment status cannot be determined. Unclassifiable areas will be considered in attainment for this PSD analysis.

The nearest nonattainment area is Palm Beach County, which is designated nonattainment for ozone. This area, located over 50 km from the H. D. King site, is not anticipated to be significantly impacted by the proposed project.

3.2 SOURCE APPLICABILITY

A major stationary source is defined as any one of 28 source categories listed in 40 CFR 52.21 which emits, or has the potential to emit, 100 tons per year or more of any regulated pollutant. In addition, any stationary source not listed in 40 CFR 52.21 which emits 250 tons per

year (tpy) or more of any regulated pollutant is also considered a major stationary source. The existing Unit 6, 7, and 8 boilers can be categorized in one of the 28 listed source categories. These boilers emit at least 100 tpy of a criteria pollutant and are thus considered to be a major existing source.

A major modification is defined as any physical or operational change in a major stationary source that would result in a significant net emissions increase of any regulated pollutant. The previous permit for Unit 9 restricted the operational hours of Units 6, 7, and 8 such that the net emission increases were below PSD significant levels. The emission calculations were based on net emission increases from Unit 9 minus the net emission decreases resulting from the operational limitations of Units 6, 7, and 8.

Due to increased energy demands, it is necessary to remove operational restrictions on Units 6, 7, and 8. Therefore, the emission credit can no longer be taken for the contemporaneous decreases in emissions for these units. Thus, the net increases from Unit 9 alone must be compared to the PSD significant emission rates.

The significant emission rates and Unit 9 emissions are given in Table 3-1. The annual emissions are based on Unit 9 operating at maximum load for 8,760 hours per year. The NO_x emissions are based on 42 parts per million on a dry volume basis (ppmvd), referenced to 15 percent oxygen. As shown in the table, Unit 9 emissions of NO_x exceed the PSD significant emission rate. Therefore, the project is considered to be a major modification to an existing major source and is subject to PSD regulations.

3.3 POLLUTANT APPLICABILITY

Once a source is determined to be subject to PSD regulations, each regulated pollutant must be assessed for PSD program applicability. The significant emission rate criteria used to determine source applicability are also used to establish pollutant applicability. Table 3-1 shows that only NO_x has the potential to be emitted at levels above the PSD significant emission rates. Thus, NO_x is subject to further PSD review, including a BACT assessment and an AAQIA.

TABLE 3-1. SIGNIFICANT AND UNIT 9 ANNUAL EMISSION RATES

<u>Pollutant</u>	<u>Significant Emission Rates</u> tpy	<u>Unit 9 Estimated Annual Emissions^a</u> tpy	<u>Applicable Pollutant</u> Yes/No
Carbon Monoxide (CO)	100	41.6	No
Nitrogen Oxide (NO _x)	40	288.4	Yes
Sulfur Dioxide (SO ₂)	40	0.9	No
Particulate (TSP)	25	11.0	No
Particulate (PM ₁₀)	15	11.0 ^b	No
Ozone (VOC)	40	17.5	No
Lead	0.6	<<0.6	No
Asbestos	0.007	<<0.007	No
Beryllium	0.0004	<<0.0004	No
Mercury	0.1	<<0.1	No
Fluorides	3	<<3	No
Sulfuric Acid Mist	7	0.027	No
Vinyl Chloride	1.0	<<1.0	No
Total Reduced			
Sulfur (TRS)	10	<< 10	No
Reduced Sulfur	10	<< 10	No
Hydrogen Sulfide	10	<< 10	No

^aEmissions are based on 8,760 hours per year of natural gas firing at full load.

^bAssumes all particulate less than 10 microns.

4.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

(See Attachment 2 for Revised BACT Analysis)

5.0 MODELING METHODOLOGY

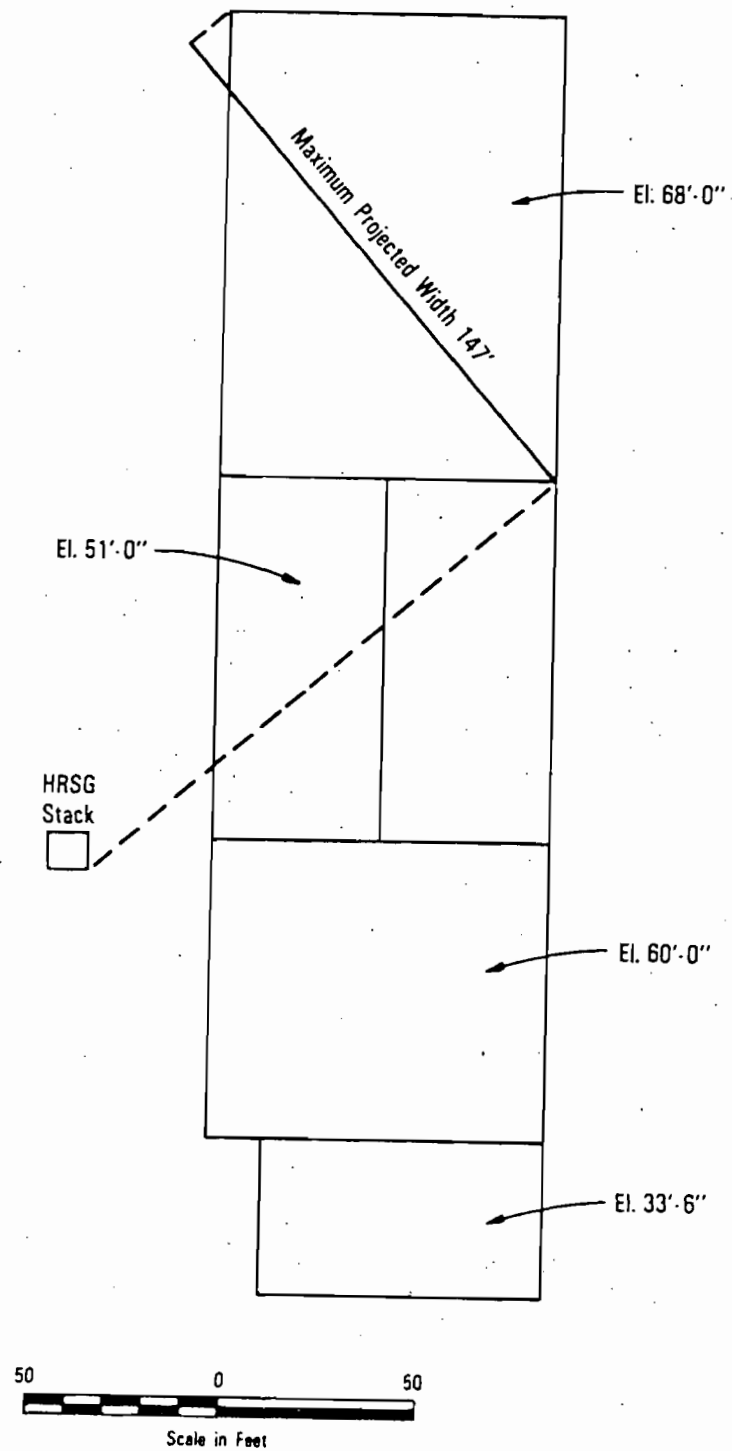
This section describes the modeling methodology for determining the ambient air quality impacts for Unit 9. The methodology is based on FDER and EPA guidelines and used EPA approved dispersion models. The dispersion models have been revised to include the most recent changes associated with EPA dispersion modeling guidelines. The modeling methodology includes a discussion of the CEP stack height, source data, appropriate dispersion models, receptor locations, meteorological data, and the definition of modeling assumptions used in the preliminary modeling analysis.

The air quality modeling output files supporting the PSD Permit Application will be submitted to the FDER on diskette and as hardcopy.

5.1 CEP STACK HEIGHT DETERMINATION

A Good Engineering Practice (GEP) stack height is defined as the height at which emissions are not significantly influenced by building downwash. The GEP stack height is calculated as the height of a nearby building plus 1.5 times the lesser of the building height or maximum projected width. A nearby building is defined as one which is located within five times the lesser of its height or maximum projected width from the stack. The resultant GEP stack height is the highest calculated stack height based on all influencing building dimensions.

Emissions from the Unit 9 stack will be influenced by the structures associated with the existing H. D. King facility. The building dimensions and GEP determination are shown in Figure 5-1. The GEP stack height of 170 feet is based on the steam turbine building height of 68 feet, and a maximum projected width that exceeds the height. The bypass and HRSG stacks for Unit 9 are constructed at 60 feet. Because the stack height is less than the calculated GEP height, the effect of building downwash on pollutant dispersion will be incorporated in the modeling analysis. In fact, since the stack height is less than the dominant building height, direction-specific building heights and widths must be used in the refined modeling analysis. Appendix A shows the output of Trinity Consultant's "BRZWAKE" program, which was used to determine direction-specific building dimensions.



GEP STACK HEIGHT
DETERMINATION

Figure 5-1

5.2 PROPOSED SOURCE DATA

Unit 9 will fire natural gas as the primary fuel with distillate used as emergency backup fuel. Modeling was based on natural gas firing assuming 8,760 hours of operation per year at maximum design capacity. Unlike steam generating plants, gas turbines typically operate at maximum (100 percent) load and generally do not operate at reduced load conditions.

The bypass stack will operate only when the HRSG is being serviced. The flue gas exiting the bypass stack is hotter than the HRSG flue gas. Increased thermal buoyancy associated with the bypass stack will enhance plume rise and subsequent dispersion. Thus, impacts from the bypass stack are expected to be less than those from HRSG operation. Therefore, only impacts from HRSG operation were modeled in this analysis.

Modeling parameters for Unit 9 operating in combined cycle and firing natural gas are given in Table 5-1.

5.3 MODEL SELECTION AND DESCRIPTION

For most air quality modeling assessments, it is desirable to use both screening-level and refined dispersion modeling techniques. In this analysis, screening-level modeling was used to determine impacts in the building cavity region. Refined dispersion modeling was used to identify the maximum ambient pollutant impacts, the location of those impacts, and the area which will be significantly impacted by the source.

5.3.1 Screening Modeling

The EPA approved "Screen" model was used to determine the impacts in the building cavity region. This model assumes worst case meteorological conditions to predict maximum 1-hour pollutant impacts. If the cavity region is on FPUA property, then the cavity impacts need not be considered. However, if the cavity region extends beyond the property boundary, then the impacts must be considered in the AAQIA.

5.3.2 Refined Modeling

In order to assess the Unit 9 impacts, the modeling analyses incorporated simple terrain, rural land use, calculation of short-term and annual impacts, and building downwash effects. EPA guideline documents

TABLE 5-1. SOURCE DATA FOR THE UNIT 9 COMBUSTION TURBINE FIRING
NATURAL GAS

<u>Model Parameters</u>	<u>Unit 9</u>
Stack Height, feet	60
Stack Exit Diameter, feet	11.2
Stack Flow Volume, acfm	418,540
Stack Exit Velocity, fpm	4,271
Stack Exit Temperature, F	491
Ambient Temperature, F	20
<u>Emissions*</u>	
SO ₂ emissions, lb/h	0.2**
NO _x emissions, lb/h	65.9***
CO emissions, lb/h	9.5
TSP/PM ₁₀ emissions, lb/h	2.5
VOC emissions, lb/h	4
Model Coordinates, km	
(East - x)	0
(North - y)	0
Source Coordinates, km	
(East - x)	566.8
(North - y)	3036.3

*Emissions based on manufacturer's performance estimates with natural gas firing.

**The SO₂ emission rate is based on a sulfur content of 2,000 grains of sulfur per million cubic feet of natural gas (AP-42), a heat content of 929.6 Btu/ft³, and a heat input of 340 MBtu/h.

***The NO_x emission rate is based on 42 ppmvd referenced to 15 percent oxygen.

recommend that the Industrial Source Complex Short-Term (ISCST) dispersion model be used for these modeling situations. EPA has issued guidelines to assist in determining what model options should be used. The following assumptions were made for the modeling analyses:

- o The site was considered rural based on actual land use within 3 km.
- o Standard EPA default modeling options were applied.
- o Terrain elevations were not used.
- o Schulman-Scire building downwash with direction-specific building heights and widths were considered.
- o The highest modeled concentrations were used to represent the annual impacts.

Preliminary modeling (see Section 6.0) for determining the Unit 9 significant impact areas and maximum impacts was based on a nominal emissions rate (1 g/s) and a ratio of actual pollutant emissions. That is, individual pollutant impacts were determined by multiplying the nominal impacts by the actual pollutant emission rates (g/s).

5.4 RECEPTOR LOCATIONS

Initial modeling for the Unit 9 stack was performed with receptors placed along the 36 standard radial directions surrounding the Unit 9 stack at the following downwind distances: 100 meter intervals from 100 to 1,000 meters, 250 meter intervals from 1,250 to 3,000 meters, and 1,000 meter intervals from 4,000 to 10,000 meters. Furthermore, discrete receptors were placed at the boundaries that restrict public access along the 36 radial directions.

5.5 METEOROLOGICAL DATA

Five consecutive years of meteorological data from a nearby National Weather Service station can be considered to be representative of the dispersion patterns at the site. Specifically, West Palm Beach surface and upper air data for the period 1982 through 1986 were obtained from the FDER and were used for the analysis.

6.0 AIR QUALITY IMPACT ANALYSES

6.1 CAVITY ANALYSIS

The "Screen" model cavity analysis showed that the cavity region extends 33 meters downwind from the source. Since this distance is well within the facility property boundary, cavity impacts were not considered in the ambient impact analysis.

6.2 PRELIMINARY MODELING

Unit 9 was modeled with ISCST and the five years of meteorological data. The modeling was based on the stack parameters and modeling assumptions given in Section 5.0. The results of the modeling were used to determine if a pollutant's impact exceeds PSD significant impact levels, determine whether preconstruction monitoring is required, and establish pollutant significant impact areas.

The results of the preliminary modeling are given in Table 6-1. As demonstrated in Section 3-2, it was only necessary to model NO_x . As shown, the annual NO_x impact (9.6 ug/m^3) is predicted to exceed the PSD significant impact level (1 ug/m^3) but not the monitoring threshold (14 ug/m^3). The maximum impact for each year occurred along the plant boundary. Since the annual NO_x impact exceeds the significance level, interacting source modeling must be performed.

For each applicable pollutant, the extent of the significant impact area must be defined. The radii of significant impact is determined by extending the receptor array outward until the predicted pollutant concentration at a receptor distance is less than the appropriate significance level. The highest modeled annual concentrations were used to determine the significant impact area.

The significant impact area for NO_x was found to extend only 300 meters from the HRSG stack. This radius is small because of the extreme downwash associated with the nearby H. D. King structures.

TABLE 6-1. RESULTS OF THE PRELIMINARY MODELING ANALYSIS

	Unit 9
	NO _x
	Annual
	<u>Impact</u>
Significant Impact Criteria	1 ug/m3
Monitoring Criteria	14 ug/m3
Maximum Impact*	9.6 ug/m3
Location	
Distance	0.88 km
Direction	260 deg
Year	1984

* Maximum nominal impacts for 1 g/s are 1.15697 ug/m³ (annual).

6.3 POTENTIAL INTERACTING SOURCES

Since the annual NO_x impact is greater than the PSD significant impact criteria, potential interacting sources must be assessed. The FDER provided copies of the Air Pollution Information System Master Detail Report ("the inventory") for St. Lucie, Indian River, and Martin counties. All sources in these counties that satisfied one of the following conditions were considered potential interacting sources.

- o All sources within the Unit 9 NO_x significant impact area (300 meters).
- o All sources within 50 kilometers of Unit 9 which have annual NO_x emissions greater than 100 tons per year and show a significant impact in the Unit 9 significant impact area.
- o All sources within 10 kilometers of Unit 9 which have annual NO_x emissions greater than 1 ton per year and show a significant impact in the Unit 9 significant impact area.

From the inventory, it is apparent that the only NO_x sources within the 300 meter significant impact area are associated with the FPUA H.D. King power plant. Consequently, the H.D. King Unit 6, 7, and 8 boilers were used in the National Ambient Air Quality Standards (NAAQS) interacting source modeling. However, since the inventory does not indicate that these sources are subject to PSD regulations, they were not used in the PSD increment modeling. The source parameters for these boilers were extracted from the inventory and are listed in Table 6-2.

All 100 ton per year sources within 50 kilometers and 1 ton per year sources within 10 kilometers were extracted from the inventory and are listed below by facility.

- o City of Vero Beach Steam Power Plant
- o Tropicana Products
- o Fort Pierce Lawnwood Regional Medical Center
- o Minton Sun Citrus Processing Plant
- o Fort Pierce Contracting Corporation Asphalt Plant

These facilities were modeled using ISCST and the source parameters listed in the inventory to determine if the significant impact level was exceeded at the FPUA facility. Where possible, the maximum allowable

TABLE 6-2. NAAQS INTERACTING SOURCES

<u>Parameter^a</u>	<u>FPUA Unit 6</u>	<u>FPUA Unit 7</u>	<u>FPUA Unit 8</u>
East Coordinate ^b (m):	-18.6	6.7	-68.0
North Coordinate ^b (m):	36.3	33.8	18.3
Volumetric Flow (acfm)	42,735	83,333	125,847
Stack Exit Diameter (ft)	5	7.1	8.0
Stack Exit Velocity (fps)	36.3	35.1	41.7
Stack Height (ft)	148	128	150
Exit Temperature (F)	325	253	275
NO _x Emission Rate ^c (lb/h)	1.3	104.4	173.2

^aSource parameters extracted from FDER source inventory.

^bStack coordinates relative to FPUA Unit 9 stack.

^cHourly emission rates as stated in FPUA Unit 9 permit.

pounds per hour NO_x emission rate was used in the modeling. However, since the allowable emission rate was not listed in the inventory, the actual NO_x emission rate was used for the Tropicana and Fort Pierce Contracting Corporation sources. The modeling showed that the highest annual NO_x impact from these facilities was 0.08 ug/m³. Since this impact is well below the PSD significance level of 1.0 ug/m³, these sources were not included in the NAAQS or PSD increment modeling.

6.4 PSD INCREMENT ANALYSIS

PSD regulations were promulgated as a result of the 1977 Clean Air Act Amendments to ensure that air quality in defined areas does not significantly deteriorate or exceed NAAQS while providing a margin for future growth. Currently SO₂, NO_x, and TSP are regulated by the PSD program. The EPA is currently proposing PSD regulations for PM₁₀.

The proposed site is located in a PSD Class II area. Since Unit 9 has significant ambient impacts for NO_x, compliance with the NO_x Class II PSD increment (25 ug/m³) must be demonstrated. As stated in Section 6.3, only the FPUA sources have the potential to significantly interact with Unit 9 impacts. These sources are not considered PSD increment consuming sources. Thus, only the Unit 9 impact was compared to the PSD Class II NO_x increment. As shown in Table 6-1, the Unit 9 annual NO_x impact is 9.6 ug/m³, which is 38.4 percent of the available PSD Class II increment. Consequently, the addition of Unit 9 does not cause an exceedance of PSD Class II increments.

The nearest mandatory PSD Class I area is the Everglades National Park, located approximately 150 kilometers south-southwest of the site. A Class I analysis was not necessary because this area is more than 100 km from the site.

6.5 NAAQS ANALYSIS

To predict the total impact on ambient air quality, a refined air quality assessment must be performed for applicable pollutants. This analysis must show compliance with the applicable NAAQS.

The NAAQS concentration was determined by adding the Unit 9 and additional source impacts to a representative background level. To show compliance with NAAQS, the combined NO_x annual impacts must be less than 100 ug/m^3 . Identification of interacting NO_x sources for use in demonstrating NAAQS compliance was performed as described in Section 6.3. A representative NO_x background concentration of 24 ug/m^3 was obtained from the FDER. This value represents the annual arithmetic mean measured at the West Palm Beach monitor in 1989. Data from the West Palm Beach monitor are considered conservatively high since West Palm Beach is significantly more urbanized than Fort Pierce.

NAAQS modeling was performed following the modeling methodology described in Section 5.0. FPUA Units 6, 7, and 8 were included as the only significant interacting sources. Table 6-3 shows the results of the NAAQS modeling. The maximum combined source impact was 11.3 ug/m^3 , which occurred along the property boundary. This value was added to the 24 ug/m^3 background value to get a total concentration of 35.3 ug/m^3 . This value is only 35.3 percent of the annual NO_x standard. Consequently, the Unit 9 annual NO_x impacts do not exceed the NAAQS.

TABLE 6-3. NAAQS MODELING RESULTS

	<u>NAAQS Modeling Summary</u>
Maximum Impact Location	
Distance	0.88 km
Direction	260 deg
Meteorological Year	1984
Combined Source Maximum Impact	11.3 ug/m3
Background Concentration	24 ug/m3
Total Concentration (Combined Maximum Impact plus Background)	35.3 ug/m3
NAAQS Primary NO _x Standard	100 ug/m3
Percent of Standard	35.3 percent

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 VISIBILITY

The nearest PSD Class I area is the Everglades National Park. The Everglades National Park is located approximately 150 kilometers south-southwest of the project site. Since this area is not within 100 kilometers of the plant site, no visibility assessment is considered necessary.

7.2 SOILS AND VEGETATION

Ambient air quality standards have been established to protect public health and welfare from any adverse effect of air pollutants. It is not expected that the estimated effects of the proposed project will significantly add to the background pollutant concentrations. Therefore, no adverse effects on soils and terrestrial vegetation is expected.

7.3 GROWTH

The operation of the Unit 9 combustion turbine at the H. D. King Power Plant is not expected to induce any secondary growth in the surrounding area.

APPENDIX A

DIRECTION-SPECIFIC BUILDING ANALYSIS

RBR2WAKE

IBM-PC VERSION (2.0)

(C) COPYRIGHT 1989, TRINITY CONSULTANTS, INC.

SERIAL NUMBER 6440 SOLD TO BLACK & VEATCH CONSULTING ENG

RUN NAME: FPHD

RUN BEGAN ON 08-09-90 AT 16:53:32

NUMBER OF SOURCES = 4

THE FOLLOWING OPTIONS HAVE BEEN CHOSEN:

CALCULATIONS ARE MADE FOR THE ISCST MODEL.

ALL STACKS MUST BE WITHIN 5L TO BE CONSIDERED FOR DIRECTION SPECIFIC DOWNWASH.

DOWNWASH IS CALCULATED IN 36 RADIAL DIRECTIONS.

BUILDINGS ARE COMBINED REPEATEDLY.

ALGORITHMS:

0 = NO DOWNWASH
1 = HUBER-SNYDER DOWNWASH
2 = SCHULMAN-SCIRE DOWNWASH

INPUT BUILDINGS

DESCRIPTION	BLDG #	BLDG HT(M)	# OF CORNERS	X(M)	Y(M)
F.O. TANK 5	1	13.23	10		
				39.12	1.51
				42.72	-3.44
				42.72	-9.56
				39.12	-14.51
				33.30	-16.40
				27.48	-14.51
				23.88	-9.56
				23.88	-3.44
				27.48	1.51
				33.30	3.40
F.O. TANK 6	2	12.93	10		
				9.72	-47.69
				13.32	-52.64
				13.32	-58.76
				9.72	-63.71
				3.90	-65.60
				-1.92	-63.71
				-5.52	-58.76
				-5.52	-52.64
				-1.92	-47.69
				3.90	-45.80
F.O. TANK 7	3	13.92	10		
				-18.91	-46.94
				-15.02	-52.29
				-15.02	-58.91
				-18.91	-64.26
				-25.20	-66.30
				-31.49	-64.26
				-35.38	-58.91
				-35.38	-52.29
				-31.49	-46.94
				-25.20	-44.90
GEN BUILD 68 FT	4	20.73	4		
				-33.53	4.88
				-38.71	30.48
				-74.68	22.86
				-69.49	-2.74
GEN BUILD 60 FT	5	19.29	4		
				17.37	15.54
				12.19	41.15
				-10.67	36.58
				-5.79	10.67
GEN BUILD 51 FT	6	15.54	4		
				-5.79	10.67
				-10.67	36.58
				-38.71	30.48
				-33.53	4.88
GEN BUILD 33.5 FT	7	10.21	4		
				28.65	22.86
				24.38	43.89
				12.19	41.15
				16.76	19.81

COMBINED BUILDINGS

STRUCTURE 1 HAS A HEIGHT 20.73 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 4: GEN BUILD 68 FT

STRUCTURE 2 HAS A HEIGHT 18.29 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 5: GEN BUILD 60 FT

STRUCTURE 3 HAS A HEIGHT 15.54 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 4: GEN BUILD 68 FT

BUILDING # 5: GEN BUILD 60 FT

BUILDING # 6: GEN BUILD 51 FT

STRUCTURE 4 HAS A HEIGHT 13.92 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 3: F.O. TANK 7

STRUCTURE 5 HAS A HEIGHT 13.23 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 1: F.O. TANK 5

BUILDING # 4: GEN BUILD 68 FT

BUILDING # 5: GEN BUILD 60 FT

BUILDING # 6: GEN BUILD 51 FT

STRUCTURE 6 HAS A HEIGHT 12.93 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 2: F.O. TANK 6

BUILDING # 3: F.O. TANK 7

STRUCTURE 7 HAS A HEIGHT 10.21 METERS AND CONTAINS THE FOLLOWING BUILDINGS:

BUILDING # 1: F.O. TANK 5

BUILDING # 4: GEN BUILD 68 FT

BUILDING # 5: GEN BUILD 60 FT

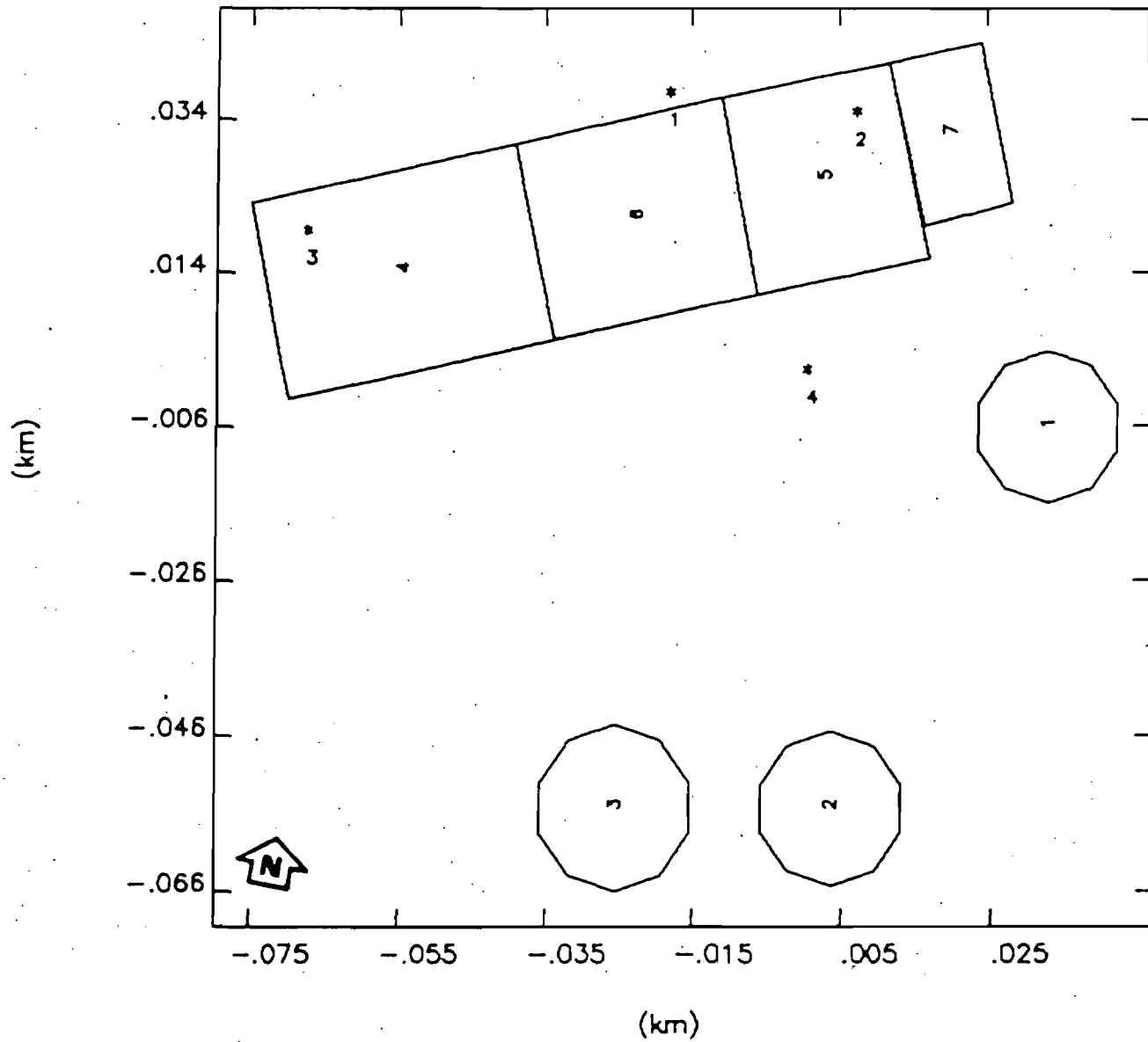
BUILDING # 6: GEN BUILD 51 FT

BUILDING # 7: GEN BUILD 33.5 FT

INPUT STACKS

STACK ID #	STACK #	STACK HT(M)	X(M)	Y(M)
1	1	45.11	-18.60	36.30
2	2	39.01	6.70	33.80
3	3	45.72	-68.00	18.30
4	4	18.29	.00	.00

FORT PIERCE PLANT SITE



STACK ID # 1, STACK # 1

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	1	20.73	43.65	51.81	1
20	1	20.73	44.82	51.81	1
30	1	20.73	44.63	51.81	1
40	1	20.73	43.08	51.81	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	1	20.73	38.06	51.81	1
110	2	18.29	34.79	45.72	1
120	2	18.29	35.39	45.72	1
130	2	18.29	34.91	45.72	1
140	2	18.29	33.37	45.72	1
150	2	18.29	30.81	45.72	1
160	2	18.29	27.32	45.72	1
170	2	18.29	23.96	45.72	1
180	2	18.29	28.04	45.72	1
190	1	20.73	43.65	51.81	1
200	1	20.73	44.82	51.81	1
210	1	20.73	44.63	51.81	1
220	1	20.73	43.08	51.81	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	1	20.73	30.97	51.81	1
260	1	20.73	27.37	51.81	1
270	1	20.73	33.22	51.81	1
280	1	20.73	38.06	51.81	1
290	2	18.29	34.79	45.72	1
300	2	18.29	35.39	45.72	1
310	2	18.29	34.91	45.72	1
320	2	18.29	33.37	45.72	1
330	2	18.29	30.81	45.72	1
340	2	18.29	27.32	45.72	1
350	2	18.29	23.96	45.72	1
360	2	18.29	28.04	45.72	1

STACK ID # 2, STACK # 2

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	2	18.29	31.27	45.72	1
20	2	18.29	33.55	45.72	1
30	2	18.29	34.80	45.72	1
40	2	18.29	35.00	45.72	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	2	18.29	33.14	45.72	1
110	2	18.29	34.79	45.72	1
120	2	18.29	35.39	45.72	1
130	2	18.29	34.91	45.72	1
140	2	18.29	33.37	45.72	1
150	2	18.29	30.81	45.72	1
160	2	18.29	27.32	45.72	1
170	2	18.29	23.96	45.72	1
180	2	18.29	28.04	45.72	1
190	2	18.29	31.27	45.72	1
200	2	18.29	33.55	45.72	1
210	2	18.29	34.80	45.72	1
220	2	18.29	35.00	45.72	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	2	18.29	29.36	45.72	1
260	2	18.29	26.89	45.72	1
270	1	20.73	33.22	51.81	1
280	2	18.29	33.14	45.72	1
290	2	18.29	34.79	45.72	1
300	2	18.29	35.39	45.72	1
310	2	18.29	34.91	45.72	1
320	2	18.29	33.37	45.72	1
330	2	18.29	30.81	45.72	1
340	2	18.29	27.32	45.72	1
350	2	18.29	23.96	45.72	1
360	2	18.29	28.04	45.72	1

STACK ID # 3, STACK # 3

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	1	20.73	43.65	51.81	1
20	1	20.73	44.82	51.81	1
30	1	20.73	44.63	51.81	1
40	1	20.73	43.08	51.81	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	1	20.73	38.06	51.81	1
110	1	20.73	41.74	51.81	1
120	1	20.73	44.16	51.81	1
130	1	20.73	45.23	51.81	1
140	1	20.73	44.93	51.81	1
150	1	20.73	43.27	51.81	1
160	1	20.73	40.29	51.81	1
170	1	20.73	37.40	51.81	1
180	1	20.73	41.15	51.81	1
190	1	20.73	43.65	51.81	1
200	1	20.73	44.82	51.81	1
210	1	20.73	44.63	51.81	1
220	1	20.73	43.08	51.81	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	1	20.73	30.97	51.81	1
260	1	20.73	27.37	51.81	1
270	1	20.73	33.22	51.81	1
280	1	20.73	38.06	51.81	1
290	1	20.73	41.74	51.81	1
300	1	20.73	44.16	51.81	1
310	1	20.73	45.23	51.81	1
320	1	20.73	44.93	51.81	1
330	1	20.73	43.27	51.81	1
340	1	20.73	40.29	51.81	1
350	1	20.73	37.40	51.81	1
360	1	20.73	41.15	51.81	1

STACK ID # 4, STACK # 4

THE DOMINANT STRUCTURE WITHIN SL IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	2	18.29	31.27	45.72	2
20	2	18.29	33.55	45.72	2
30	2	18.29	34.80	45.72	2
40	2	18.29	35.00	45.72	2
50	2	18.29	34.14	45.72	2
60	2	18.29	32.24	45.72	2
70	2	18.29	29.36	45.72	2
80	1	20.73	27.37	51.81	2
90	1	20.73	33.22	51.81	2
100	1	20.73	38.06	51.81	2
110	1	20.73	41.74	51.81	2
120	1	20.73	44.16	51.81	2
130	1	20.73	45.23	51.81	2
140	1	20.73	44.93	51.81	2
150	2	18.29	30.81	45.72	2
160	2	18.29	27.32	45.72	2
170	2	18.29	23.96	45.72	2
180	2	18.29	28.04	45.72	2
190	2	18.29	31.27	45.72	2
200	2	18.29	33.55	45.72	2
210	2	18.29	34.80	45.72	2
220	2	18.29	35.00	45.72	2
230	2	18.29	34.14	45.72	2
240	2	18.29	32.24	45.72	2
250	2	18.29	29.36	45.72	2
260	1	20.73	27.37	51.81	2
270	1	20.73	33.22	51.81	2
280	1	20.73	38.06	51.81	2
290	1	20.73	41.74	51.81	2
300	1	20.73	44.16	51.81	2
310	1	20.73	45.23	51.81	2
320	1	20.73	44.93	51.81	2
330	2	18.29	30.81	45.72	2
340	2	18.29	27.32	45.72	2
350	2	18.29	23.96	45.72	2
360	2	18.29	28.04	45.72	2

STACK # 1

STACK ID: 1, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 18.29 18.29
 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 43.65 44.82 44.63 43.08 40.22 36.15 30.97 27.37 33.22 38.06 34.79 35.39
 34.91 33.37 30.81 27.32 23.96 28.04 43.65 44.82 44.63 43.08 40.22 36.15
 30.97 27.37 33.22 38.06 34.79 35.39 34.91 33.37 30.81 27.32 23.96 28.04

STACK # 2

STACK ID: 2, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73 18.29 18.29 18.29
 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73
 18.29 18.29 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 31.27 33.55 34.80 35.00 40.22 36.15 30.97 27.37 33.22 33.14 34.79 35.39
 34.91 33.37 30.81 27.32 23.96 28.04 31.27 33.55 34.80 35.00 40.22 36.15
 29.36 26.89 33.22 33.14 34.79 35.39 34.91 33.37 30.81 27.32 23.96 28.04

STACK # 3

STACK ID: 3, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
 43.65 44.82 44.63 43.08 40.22 36.15 30.97 27.37 33.22 38.06 41.74 44.16
 45.23 44.93 43.27 40.29 37.40 41.15 43.65 44.82 44.63 43.08 40.22 36.15
 30.97 27.37 33.22 38.06 41.74 44.16 45.23 44.93 43.27 40.29 37.40 41.15

STACK # 4

STACK ID: 4, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 18.29 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 18.29 20.73 20.73 20.73 20.73 20.73 20.73 20.73 18.29 18.29 18.29 18.29
 31.27 33.55 34.80 35.00 34.14 32.24 29.36 27.37 33.22 38.06 41.74 44.16
 45.23 44.93 30.81 27.32 23.96 28.04 31.27 33.55 34.80 35.00 34.14 32.24
 29.36 27.37 33.22 38.06 41.74 44.16 45.23 44.93 30.81 27.32 23.96 28.04

ATTACHMENT 2

REVISED BACT ANALYSIS

4.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

4.1 INTRODUCTION

The existing Fort Pierce Utilities Authority H. D. King Electric Generating Plant Unit 9 consists of one 23.4 MW General Electric Frame 5 combustion turbine. The combustion turbine is followed by a heat recovery steam generator (HRSG) manufactured by the Henry Vogt Machine Company. Steam from the HRSG is directed to the 8.2 MW Unit 5 steam turbine for repowering.

The primary fuel for the Unit 9 combustion turbine is natural gas. However, distillate fuel oil may be burned as an emergency back-up fuel. Since distillate fuel oil will only be burned during emergencies this Best Available Control Technology analysis will only consider the combustion of natural gas. Section 3.0 concluded that when natural gas is burned for the maximum project operation (8,760 hours per year), the project's nitrogen oxide emissions are subject to the provisions of the PSD program.

The existing operating permit for Unit 9 limits NO_x emissions to New Source Performance Standards for combustion turbines (40 CFR 60 Subpart GG) of 75 parts per million dry volume (ppmdv) at 15 percent oxygen, corrected for fuel nitrogen content and turbine heat rate, or 84 ppmv at 15 percent oxygen, whichever is more stringent. Nitrogen oxide emissions from the existing combustion turbine are controlled by steam injection.

Under the federal Clean Air Act, BACT represents the maximum degree of pollutant reduction determined on a case-by-case basis considering technical, economic, energy, and environmental considerations. However, BACT cannot be less stringent than the emission limits established by any applicable New Source Performance Standards (NSPS).

This BACT analysis follows the general requirements of EPA's draft "top down" BACT guidance document. This approach requires that the BACT analysis start by assuming the use of the Lowest Achievable Emission Rate (LAER) control alternative. Other, less efficient emission control technologies are similarly evaluated when LAER is determined to be unreasonable considering the above factors.

4.2 NITROGEN OXIDES EMISSIONS CONTROL

During combustion, two types of NO_x are formed; fuel NO_x and thermal NO_x . Fuel NO_x emissions are formed through the oxidation of a portion of the nitrogen contained in the fuel. Thermal NO_x emissions are generated through the oxidation of a portion of the nitrogen contained in the combustion air. Nitrogen oxides formation can be limited by lowering combustion temperatures, and staging combustion (a reducing atmosphere followed by an oxidizing atmosphere).

4.2.1 Alternative NO_x Emission Reduction Systems

A review of the Environmental Protection Agency's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations (1985 edition and subsequent supplements) indicates that the lowest NO_x emission limit established to date for a combustion turbine is 4.5 ppmdv (at 15 percent oxygen) for a combustion turbine with a heat recovery steam generator located in California. That permit value was based on the use of water injection into the combustion turbine and a selective catalytic reduction (SCR) system contained within the heat recovery steam generator (combined cycle operation). Therefore, the LAER NO_x emission control alternative for use with combustion turbines is established as water or steam injection followed by an SCR system.

Injection of steam into the Unit 9 turbine combustion chamber is capable of limiting NO_x emissions to 42 ppmdv (at 15 percent oxygen) when burning natural gas. Addition of an SCR system downstream of the Unit 9 combustion turbine has the potential to limit NO_x emissions to 9 ppmdv (at 15 percent oxygen).

In addition to combustion controls and addition of an SCR system, NO_x emissions from other types of combustion sources have also been controlled through installation of selective non-catalytic reduction (SNCR) systems such as Thermal DeNO_x . However, a SNCR system requires gas temperatures of at least 1,500 F for NO_x reduction. The temperature at the outlet of a combustion turbine is too low (950 F to 1,100 F) for such systems. Since raising the flue gas exit temperature to 1,500 F would require supplemental heating of the flue gas, thereby increasing total emissions from increased

fuel usage, this alternative is judged technically unacceptable for application on a combustion turbine.

4.2.1.1 Selective Catalytic Reduction. 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. The SCR process can achieve up to 90 percent reduction of NO_x with a new catalyst. However, an aged catalyst will provide a maximum of between 80 and 85 percent percent NO_x reduction.

The optimum flue gas temperature range for SCR operation is approximately 650 to 750 F. Flue gas from the combustion turbines will typically be 950 F to 1100 F. Therefore, an SCR would be installed in an intermediate point of the existing heat recovery steam generator boiler where a temperature of approximately 700 F occurs. The existing Unit 9 HRSG does not include adequate space to incorporate an SCR system. For an SCR system to be installed downstream of the Unit 9 combustion turbine it will be necessary to split and expand the existing HRSG.

4.2.1.2 Steam Injection. Use of steam injection in the combustion zones of a combustion turbine can limit the amount of NO_x formed. Existing operation of the Unit 9 combustion turbines uses steam injection. Thermal NO_x formation is avoided due to lower combustion temperatures resulting from the steam injection. The degree of reduction in NO_x formation is somewhat proportional to the amount of steam injected into the turbine.

Since the combustion turbine NSPS was last revised in 1982, combustion turbines have improved their tolerance to the water or steam necessary to control NO_x emissions below the current NSPS level. However, there is still a point at which the amount of water or steam injected into the turbine seriously degrades the turbine's reliability and operational life. With the existing turbine design for Unit 9 this generally occurs below a NO_x emission level of about 42 ppm_{dv} (at 15 percent oxygen) when firing natural gas and 65 ppm_{dv} when firing distillate oil. These NO_x emission levels can be achieved with little additional cost and without significant impact on reliability or power output over those costs required to comply with the current NSPS.

4.2.2 Capital and Operating Costs of Alternatives

Table 4-1* presents the capital and levelized annual cost of installing an SCR system within the existing HRSG. Annual operating costs and NO_x emissions are based on natural gas firing for a maximum of 8,760 hours per year in the turbines.

The differential capital costs for the SCR system include the costs of the ammonia storage/injection system, the catalytic reactors, HRSG modifications and balance of plant equipment. In addition to the 1991 equipment costs of the two alternatives, the total capital costs include a contingency charge, escalation, indirect costs, and interest during construction.

Levelized annual costs include operating personnel, maintenance costs (primarily catalyst replacement), ammonia additive, energy, lost generating capacity and fixed charges on capital investment. The differential energy cost and lost generating capacity for the SCR alternative is the result of the reduced net output of the turbine and the energy requirements of associated equipment. Levelized annual costs are based on the following parameters.

- o Remaining plant life of 25 years.
- o Operator cost of \$45,000 per man-year.
- o Catalyst life of three years.
- o Ammonia cost of \$250 per ton.
- o Energy cost of 70 mills/kwh.
- o Demand cost of \$800 per kw.
- o Escalation rate of ~~6~~* percent.
- o Present worth discount rate of 8.0 percent.
- o Levelization factor of ~~1.75~~*

The 1993 total capital cost for addition of an SCR system to Unit 9 is ~~\$3.2 million~~*. The levelized annual cost for addition of SCR is ~~\$0.98~~* million per year. This levelized annual cost results in a removal cost of approximately ~~\$4,500~~* per ton of NO_x reduction (~~218~~* tons per year).

*REVISED. SEE RESPONSE TO DER COMMENT 10.

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND LEVELIZED ANNUAL COSTS

	SCR SYSTEM \$1,000
Capital Costs:	
SCR System	930
HRSG Modifications	590
System Erection	520
Differential Balance of Plant	70
1991 Capital Cost	2,110
Contingency (15 percent)	320
Direct Capital Cost	2,430
Escalation (6 percent)	150
Indirects (16 percent)	410
Interest During Construction (8 percent)	240
1993 Total Capital Cost	3,230
Levelized Annual Costs*:	
Operating Personnel	60
Maintenance	420
Ammonia	70
Energy	40
Lost Generation	40
1993 Annual Operating Cost	630
Fixed Charges on Capital (13.6 percent)	350
1993 Total Annual Cost	980
Nitrogen Oxides Emission Rate, ppm _{dv}	9
Annual NO _x Emission Reduction, tpy	218
NO _x Emission Reduction Cost, \$/ton	4,500

*Annual costs are based on a 100 percent capacity factor.

4.2.3 Other Considerations

Compared to the existing combustion turbine with steam injection, the energy requirements of the SCR system would reduce the output of the combustion turbines by approximately one percent.

The use of an SCR system could result in a negative environmental impact due to the release of quantities of unreacted ammonia to the atmosphere. Ammonia and a number of amine compounds are recognized hazardous air pollutants. This represents a potential adverse human health effect, since prolonged exposure to these compounds can increase chances of contracting a number of debilitating diseases. Although ammonia emissions are not regulated nationally, a number of sources are limited to ammonia emissions as low as 10 ppm. Unreacted ammonia emissions from an SCR system could average 7 to 10 ppm, and could create objectionable odor and health hazards.

Ammonia is also a hazardous material. Accordingly, this material must be handled and stored with extreme care. Additionally, some catalytic elements are toxic, and because they have to be replaced periodically, hazardous waste disposal procedures may be necessary.

4.2.4 Conclusions

Installation of an SCR system on Unit 9 designed to meet a NO_x emission limitation of 9 ppm_{dv} would cost Fort Pierce Utilities Authority approximately \$3.3 million.* Addition of an SCR system increases total levelized annual costs for the project by \$1.01 million* resulting in a removal cost of \$4,640* per ton of NO_x removed while burning natural gas (8760 hrs/yr). The use of SCR would reduce the effective output of the turbine generator by approximately one percent.* In addition, the use of an SCR system could result in adverse environmental effects due to unreacted ammonia being released to the atmosphere causing a potential human health hazard. Project emissions of 42 ppm_{dv} do not result in any violation of ambient air quality standards. Therefore, based on economic, energy, and environmental considerations, NO_x BACT proposed for this combustion turbine facility is the use of steam injection to achieve NO_x emissions of 42 ppm_{dv}

* REVISED. SEE RESPONSE TO DER COMMENT 10.

(at 15 percent oxygen) when burning natural gas. Additionally, it is recommended that during emergency situations where distillate oil must be used NO_x emissions be limited to 65 ppm_{dv} (at 15 percent oxygen) through the use of steam injection.



Owner FPUA
Plant HD KING Unit 9
Project No. 16589 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS
Computed By [Signature]
Date 10/20 19 90
Checked By [Signature]
Date 10/21 19 90
Page 2 of 4

CALCULATIONS

$$\begin{aligned} \text{FLUE GAS MOLECULAR WEIGHT} &= (0.1453)(31.9988) + (0.7376)(28.0134) \\ &+ (0.0270)(44.0103) + (0.0091)(39.948) + (0.0810)(18.01534) \\ &= 28.32 \text{ lb/mol} \checkmark \end{aligned}$$

$$PV = nRT$$

$$V = \frac{nRT}{P}$$

$$n = \frac{(1,086,350 \text{ lb/h})}{(28.32 \text{ lb/mol})} = 38,356 \text{ mol/s}$$

$$R = 1545 \frac{\text{ft} \cdot \text{lb}}{\text{mol} \cdot ^\circ \text{R}}$$

$$T = 460 + 488 = 948 ^\circ \text{R}$$

$$P = (29.92 \text{ in Hg}) (0.4912 \frac{\text{lb/in}^2}{\text{in Hg}}) (\frac{144 \text{ in}^2}{\text{ft}^2}) = 2116 \frac{\text{lb}}{\text{ft}^2}$$

$$V = \frac{(38,356 \text{ mol/s}) (1545 \frac{\text{ft} \cdot \text{lb}}{\text{mol} \cdot ^\circ \text{R}}) (948 ^\circ \text{R})}{(2116 \frac{\text{lb}}{\text{ft}^2}) (60 \text{ min/h})} = 442,000 \text{ acf/min} \checkmark$$

DO NOT WRITE IN THIS SPACE

ATTACHMENT 3

STACK CHARACTERISTICS (HRSG AND BYPASS)

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS*

	HRSG <u>Stack</u>	Bypass <u>Stack</u>
Stack Height, ft	60	60
Effective Stack Diameter, ft	11.2 ^{**}	11.2 ^{**}
Stack Exit Volume, acfm , dscfm	440,420 225,350	621,140 225,350
Stack Velocity, fpm	4,470	6,305
Stack Exit Temperature, F	488	877
Stack Moisture, % by volume	8.10	8.10
Stack Oxygen, % by volume	14.53	14.53

*Stack parameters are given for a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

NOTE

All HRSG stack modeling performed in support of the Unit 9 air permit used preliminary stack flow parameters (See Table 5-1 of the AAQIA). These modeling parameters included lower stack flows and higher pounds per hour emission rates than the final values presented in this application. The lower gas flows used in the modeling decrease the momentum plume rise and thus, give higher ground-level impacts than the revised flows presented here. Likewise, the higher pound per hour emission rates used in the modeling analyses give higher ground level impacts than the emission rates presented in this application. Consequently, the modeled Unit 9 impacts are now expected to be slightly smaller than those presented in support of the Unit 9 Ambient Air Quality Impact Analysis.

ATTACHMENT 4

EMISSION ESTIMATES: SOURCES AND CALCULATIONS



Owner FORT PIERCE UTILITIES AUTHORITY
Plant J. D. KING Unit 9
Project No. 16539 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS

Computed By JOHN COCHRAN
Date 10/20 1990
Checked By Steve M. Day
Date 10/21 1990
Page 1 of 4

ASSUMPTIONS

- GENERAL ELECTRIC FRAME 5 COMBUSTION TURBINE ✓
 - NATURAL GAS FIRED (930 BTU/SCF)
 - 100% LOAD ✓
 - AMBIENT CONDITIONS:
 - TEMPERATURE = 20 F ✓
 - PRESSURE = 29.92 in Hg
 - RELATIVE HUMIDITY = 60% ✓
 - COMBINED CYCLE OPERATION ✓
 - FLUE GAS TEMPERATURE = 488 F *
 - OUTLET FLUE GAS PRESSURE = 0 in W.G.
 - FLUE GAS FLOW RATE = 1,036,350 lb/h *
 - FLUE GAS ANALYSIS (VOLUMETRIC): *
- | | | |
|----------------|---|---------|
| OXYGEN | = | 14.53% |
| NITROGEN | = | 73.76% |
| CARBON DIOXIDE | = | 2.70% |
| ARGON | = | 0.91% |
| MOISTURE | = | 9.10% |
| | | 100.00% |

- MOLECULAR WEIGHTS:
- | | | |
|------------------|---|-----------------|
| OXYGEN | = | 31.9988 lb/mol |
| CARBON | = | 12.01115 lb/mol |
| HYDROGEN | = | 2.01594 lb/mol |
| SULFUR | = | 32.064 lb/mol |
| NITROGEN | = | 28.0134 lb/mol |
| ARGON | = | 39.948 lb/mol |
| CO ₂ | = | 44.0095 lb/mol |
| H ₂ O | = | 18.01534 lb/mol |
| NO ₂ | = | 46.0055 lb/mol |

* VALUES FROM TABLE 1 (ATTACHED). OPERATION VALUES BASED ON MANUFACTURED PERFORMANCE CURVES.

DO NOT WRITE IN THIS SPACE

P-GN-172A



Owner FPUA
Plant H.D. KING Unit 9
Project No. 16599 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS

Computed By [Signature]
Date 10/20 19 90
Checked By SM [Signature]
Date 10/21 19 90
Page 3 of 4

NO_x EMISSION RATE = 42 ppmv @ 15% OXYGEN

	VOLUME %	MOLES*	DRY VOLUME %
OXYGEN	14.53	5573	15.81
NITROGEN	73.76	28291	80.26
CARBON DIOXIDE	2.70	1036	2.94
ARGON	0.91	349	0.99
MOISTURE	8.10	3107	
		38356	100.00 ✓

$$* \text{MOLES} = (\text{VOLUME, \%} / 100) \times 38356 \text{ mol/h}$$

$$\text{DRY MOLES} = 38356 - 3107 = 35249 \text{ mol/h}$$

— AIR CONSISTS OF 21% OXYGEN & 79% NITROGEN (BY VOLUME)

— TO CORRECT TO 15% OXYGEN IT IS NECESSARY TO HYPOTHETICALLY SUBTRACT AIR FROM THE FUE GAS

X = moles of AIR ADDED

$$0.15 = \frac{5573 + 0.21X}{35249 + X}$$

$$0.15(35249 + X) = 5573 + 0.21X$$

$$5287.35 + 0.15X = 5573 + 0.21X$$

$$X(0.15 - 0.21) = 5573 - 5287.35$$

$$X = -4760.8 \text{ mol Air/h}$$

DO NOT WRITE IN THIS SPACE

PGN-172A



Owner EPUR
Plant H.D. KING Unit 9
Project No. 10589 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS

Computed By [Signature]
Date 12/20 19 90
Checked By SMO
Date 12/21 19 90
Page 4 of 4

	ACTUAL MOLES mol/h	15% O ₂ CORRECTED MOLES mol/h	CORRECTED Dry Volume %
OXYGEN	5573 - 4760.8 (0.21) =	4573 -	15.0
NITROGEN	28291 - 4760.8 (0.79) =	24530 -	80.5
CARBON DIOXIDE	1036	1036 -	3.4
ARGON	349	349 -	1.1
TOTAL	35,249	30,488	100.0

$$NO_x \text{ EMISSION RATE} = 42 \text{ ppm dv} = 42 \frac{\text{moles } NO_x}{10^6 \text{ moles FUE GAS}}$$

$$NO_x \text{ EMISSION RATE} = \left(42 \frac{\text{moles } NO_x}{10^6 \text{ moles FUE GAS}} \right) (30488 \frac{\text{moles}}{h}) \left(\frac{16.0055 \text{ lb } NO_x}{\text{mole } NO_x} \right)$$

$$NO_x \text{ EMISSION RATE} = \underline{58.9 \frac{\text{lb}}{h}}$$

$$CO \text{ EMISSION RATE} = 10 \text{ ppm dv @ 15\% O}_2$$

$$CO \text{ EMISSION RATE} = \left(\frac{10}{10^6} \right) (30488) (12.01115 + 31.9999/2) = \underline{3.5 \frac{\text{lb}}{h}}$$

$$VOC = \text{NON-METHANE HYDROCARBONS} = 5 \text{ ppm dv @ 15\% O}_2$$

$$\text{NON-METHANE HYDROCARBONS} = \left(\frac{5}{10^6} \right) (30488) (12.01115 + 12)(2.01594) = \underline{2.4 \frac{\text{lb}}{h}}$$

Why is the CO emission rate expected to increase from 3.0 $\frac{\text{lb}}{h}$ to 8.5 $\frac{\text{lb}}{h}$?

IN THIS SPACE

DO NOT WRITE

P-C-N-172A

FORT PIERCE, FLORIDA, COMBINED CYCLE PROJECT
B&V PROJECT 16589.070
ESTIMATED COMBINED CYCLE STACK PERFORMANCE VALUES

10/18/90

Fuel	Gas	Gas w/ SCR	Oil	Gas	Gas w/ SCR	Oil
Ambient Temperature, F	20	20	20	59	59	59
Exhaust Flow, lb/h	1,086,350	1,086,350	1,091,790	999,000	999,000	1,004,000
CT Exhaust Temperature, F	877	879	877	905	907	905
Stack Temperature, F	494	493	494	487	486	487
Stack Exit Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7

Exhaust Gas Constituents (mass basis)

Percent CO2	4.20	4.20	5.50	4.12	4.12	5.39
Percent H2O	5.15	5.15	3.96	5.53	5.53	4.37
Percent O2	16.41	16.41	16.56	16.43	16.43	16.58
Percent N2	72.95	72.95	72.68	72.63	72.63	72.37
Percent Ar	1.29	1.29	1.28	1.28	1.28	1.28
Total	100.00	100.00	99.98	99.99	99.99	99.99

Exhaust Gas Constituent Flows, lb/h

CO2	45,627	45,627	60,060	41,163	41,163	54,121
H2O	55,947	55,947	43,244	55,250	55,250	43,879
O2	178,270	178,270	180,837	164,152	164,152	166,480
N2	792,492	792,492	793,672	725,646	725,646	726,667
Ar	14,014	14,014	13,978	12,788	12,788	12,852
Total, lb/h	1,086,350	1,086,350	1,091,790	999,000	999,000	1,004,000

Exhaust Gas Constituent Flows, mole/h

							MW (lb/mole)
CO2	1,036.7	1,036.7	1,364.7	935.3	935.3	1,229.7	44.010
H2O	3,105.4	3,105.4	2,400.3	3,066.7	3,066.7	2,435.6	18.016
O2	5,570.9	5,570.9	5,651.2	5,129.8	5,129.8	5,202.5	32.000
N2	28,287.1	28,287.1	28,329.2	25,901.1	25,901.1	25,937.6	28.016
Ar	350.9	350.9	350.0	320.2	320.2	321.8	39.940
Total, mole/h	38,351.0	38,351.0	38,095.4	35,353.1	35,353.1	35,127.2	

Exhaust Gas Constituents (volume basis)

Percent CO2	2.702	2.702	3.582	2.652	2.652	3.502
Percent H2O	8.102	8.102	6.302	8.672	8.672	6.932
Percent O2	14.532	14.532	14.832	14.512	14.512	14.812
Percent N2	73.762	73.762	74.362	73.262	73.262	73.842
Percent Ar	0.912	0.912	0.922	0.912	0.912	0.922
Total	100.002	100.002	99.992	100.002	100.002	100.002

Wet (Total) Exhaust Gas Analysis

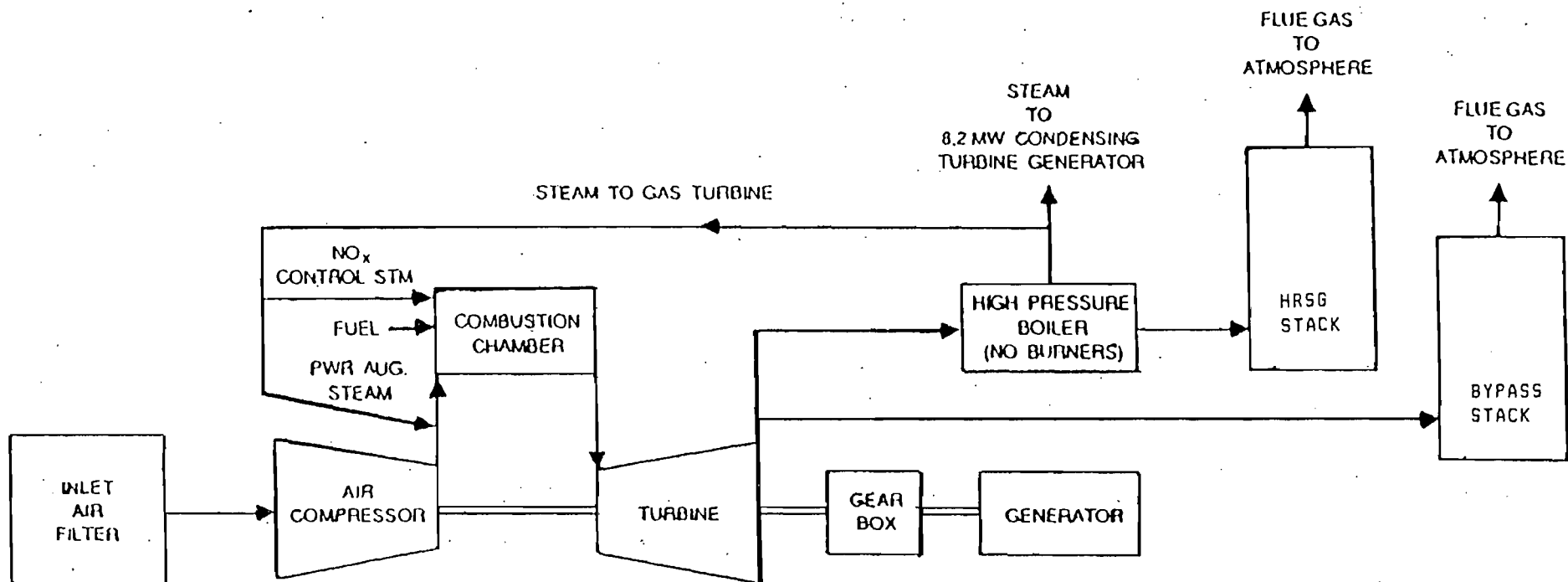
Exhaust Gas Molecular Weight, lb/mole	28.33	28.33	28.66	28.26	28.26	28.58
Gas Constant for Exhaust Gas, ft-lbf/lbm-R	54.536	54.536	53.908	54.671	54.671	54.059
Exhaust Gas Specific Volume, ft ³ /lb	24.58	24.55	24.30	24.46	24.43	24.18
Exhaust Gas Flow, acfm	445,041	444,498	442,175	407,259	406,760	404,612

Dry Exhaust Gas Analysis

Exhaust Gas Molecular Weight, lb/mole	29.23	29.23	29.38	29.23	29.23	29.37
Gas Constant for Exhaust Gas, ft-lbf/lbm-R	52.857	52.857	52.587	52.857	52.857	52.605
Exhaust Gas Specific Volume, ft ³ /lb	23.82	23.80	23.70	23.65	23.62	23.53
Exhaust Gas Flow, acfm	431,281	430,919	431,257	393,773	393,273	393,735

ATTACHMENT 5

COMBUSTION TURBINE FLOW DIAGRAM



Simplified process flow diagram.

DER Comment 2

- o Provide the present actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lb/hr, and tons/year for each affected source [Unit 6, Unit 7, Unit 8, and Unit 9]. The present actual emissions are to be determined on the basis of the most recent source emission test wherever possible. Where emission tests are used, copies of the cover page and summary sheet are to be included.

Response

- o Unit 9 is the only affected source, however, present actual emissions are being provided for all four units. The attached table provides the actual emission rates for applicable pollutants listed in Table 500-2 of F.A.C. Rule 17-2.500. The units will only burn natural gas during 1990. Therefore, the emissions listed in the attached table are based on the combustion of natural gas only. Emission tests are not required for a number of the pollutants. In the absence of actual performance tests, emission rates are calculated based on appropriate emission factors from AP-42. When applicable, test summary sheets are attached to support emission rates listed in the tables. Annual emissions are based on the allowable hours of operation for the four sources listed in the operating permit for Unit 9.

What were the actual number of hours of operation for each source at the facility?

H. D. KING UNITS 6 - 9 ACTUAL EMISSION RATES

	Unit 6	Unit 7	Unit 8	Unit 9
Allowable Annual Operation, hr	12	1344	6384	8736
Hourly Emissions, lb/h				
Nitrogen Oxides	117	251	111*	57*
Carbon Monoxide	8.5	18	24	0.68*
Particulate	0.64	1.4	1.8	0.93
Non-Methane Hydrocarbons	0.30	0.64	0.83	0.44
Sulfur Dioxide	0.13	0.27	0.36	0.20
Annual Emissions, tons/year				
Nitrogen Oxides	0.70	169	353*	250*
Carbon Monoxide	0.051	12.3	76	3.0*
Particulate	0.0038	0.92	5.7	4.1
Non-Methane Hydrocarbons	0.0018	0.43	2.7	1.9
Sulfur Dioxide	0.00077	0.18	1.1	0.87

*Emission rates based on the attached emission test results.

Explain and show how actual emissions for each source were obtained from the emission test results.

Provide the present actual emissions from each diesel unit at this site so addition to other air pollution sources.

What are the actual hours per year of operation for each diesel unit? Give for allowable. Explain the how the diesel are used. Provide complete description about the diesel.

SOURCE COMPLIANCE TEST REPORT
for
OXIDES OF NITROGEN AND VISIBLE EMISSIONS
UNIT 8

AND

VISIBLE EMISSIONS
EAST DIESEL UNIT

H.D. KING GENERATING STATION
FT. PIERCE MUNICIPAL UTILITIES

FDER PERMIT NUMBERS
UNIT 8 AO 56-112678
EAST DUCT UNIT AO 56-113533

SEPTEMBER 11, 1989

Prepared for:

FT. PIERCE MUNICIPAL UTILITIES
311 NORTH INDIAN RIVER DRIVE
FT. PIERCE, FLORIDA 33454

Prepared by:

AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606
(904) 335-1889

Table 1 NO_x Emission Summary
 Ft. Pierce Utilities
 H.D. King Generating Station
 Unit 8
 September 11, 1989

Run Number	Time	Oxygen (%)	NO _x Emissions		Allowable (lb/MMBTU)
			(ppm Dry)	Actual (lb/MMBTU)	
1	0820-0920	5.80	129	0.186	0.2
2	0935-1035	5.46	126	0.177	0.2
3	1105-1205	5.57	126	0.179	0.2
Average	----	5.61	127	0.181	0.2

STATIONARY GAS TURBINE EMISSION TEST

FORT PIERCE UTILITIES AUTHORITY
HENRY D. KING POWER PLANT

FORT PIERCE, FLORIDA

EEI 6103

SEPTEMBER 1989

Prepared by:

CEM/Engineering Division
Entropy Environmentalists, Inc.
Research Triangle Park, North Carolina

Prepared for:

General Electric Company
GE Turbines Division
Schenectady, New York

REPORT CERTIFICATION

The sampling and analysis performed for this report were carried out under my direction and supervision, and I hereby certify that the test report is authentic and accurate.

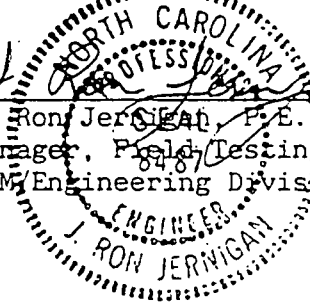
Date 10/24/89

Signature Kenneth R. Loder
Kenneth R. Loder
Senior Projects Manager
CEM/Engineering Division

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 10/24/89

Signature J. Ron Jerigan
J. Ron Jerigan, P.E.
Manager, Field Testing Services
CEM/Engineering Division



1. INTRODUCTION

General Electric Company's Turbine Division retained Entropy Environmentalists, Inc. to perform emissions testing on a combined cycle gas turbine installed at Ft. Pierce Utilities Authority's Henry D. King Power Plant in Ft. Pierce, Florida. EPA test methods were employed to accurately quantify the atmospheric emissions of oxygen (O_2), carbon dioxide (CO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and visible emissions from the turbine at four operating load conditions.

Ken Loder, Le Tan, and Mark Winter from Entropy conducted the testing on September 13, 1989. The test program was coordinated by Betty Lou Bailey, P.E. and Chuck Prosser from General Electric, and Dave Schade from the Henry D. King Power Plant. Thomas Davis, P.E. from the environmental engineering firm of Hunter/ESE observed the testing on behalf of the plant. Tom Tittle and Joseph Kahn represented the State of Florida, Department of Environmental Regulations, during the test period.

This report presents the test data, test methods and equipment used, and data reduction and quality assurance procedures utilized during the emissions test program.

furnished by General Electric, were cleaned and purged with nitrogen prior to use. The high nitrogen content indicates inadequate sample purge of the container before sample collection. The high nitrogen sample was rejected. The analysis of the remaining sample showed the SO_2 was well within the 150 ppm (0.015%) by-volume limit.

TABLE 1.

EMISSION DATA SUMMARY
GAS TURBINE EMISSION TESTING
HENRY D. KING POWER PLANT, UNIT 9
SEPTEMBER 13, 1989

	Load Level			
	100%	100%	75%	30%
Operating Load (MW):	23.0	23.9	17.8	7.6
NO_x @ 15% O_2 , Dry ISO Conditions (ppm_{vd}):	59	43	58	44
NO_x Emission Limit (ppm_{vd}):	84	84	84	84
SO_2 Concentration, dry (ppm_{vd}):	< 1	< 1	< 1	< 1
Average CO Concentration, dry (ppm_{vd}):	1	1	4	112
Visible Emissions (% opacity):	0	0*	---	---
Visible Emissions Limit (% opacity):	15	15	15	15
Steam Injection (lb/sec):	0.83	0.90	0.0	0.0
Steam Augmentation (lb/sec):	0.0	2.23	0.0	0.0
Fuel Flow (lb/sec)	3.72	3.80	3.09	2.02

*Daylight conditions permitted only 24 minutes of visible emissions data to be recorded.

DER Comment 3

- o Provide the maximum proposed emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lb/h and tons/year to be emitted by each affected source [Unit 6, Unit 7, Unit 8, and Unit 9]

Response

- o The attached table provides the maximum proposed emission rates for applicable pollutants listed in Table 500-2 of F.A.C. Rule 17-2.500. The following summarizes the basis of these emission rates

Unit 8 emissions are limited by F.A.C. requirements to the following rates.

- Nitrogen oxides = 0.20 lb/MBtu (natural gas)
= 0.30 lb/MBtu (fuel oil)
- Particulate = 0.10 lb/MBtu
- Opacity = 20 percent

The Unit 8 emissions listed in the attached table are based on combustion of natural gas only.

The proposed maximum emission rates for Unit 9 are as follows.

- Nitrogen oxides = 42 ppmdv (parts per million dry volumetric) at 15 percent oxygen
- Carbon monoxide = 10 ppmdv at 15 percent oxygen
- Non-methane hydrocarbons = 5 ppmdv at 15 percent oxygen
- Particulate = 2.5 lb/h

These emission rates are typical for a General Electric Frame 5 combustion turbine and were provided by the equipment manufacturer. Hourly emission rates listed in the table for Unit 9 are calculated assuming a worst case ambient temperature of 20 F (resulting in the maximum expected emissions). In addition, sulfur dioxide emissions for Unit 9 are based on a gas sulfur content of 2000 gr/10⁶ scf, and a gas heating value of 930 Btu/scf.

The remaining Unit 6, Unit 7, Unit 8, and Unit 9 emission rates are calculated based on appropriate emission factors from AP-42.

H. D. KING UNITS 6 - 9 PROPOSED MAXIMUM EMISSION RATES

	Unit 6	Unit 7	Unit 8	Unit 9
Allowable Annual Operation, hr	8760	8760	8760	8760
Hourly Emissions, lb/h				
Nitrogen Oxides	117	251	122	59 ✓
Carbon Monoxide	8.5	18	24	8.5 ✓
Particulate	0.64	1.4	1.8	(2.5)
Non-Methane Hydrocarbons	0.30	0.64	0.83	2.4 ✓
Sulfur Dioxide	0.13	0.27	0.36	0.20 ✓
Annual Emissions, tons/year				
Nitrogen Oxides	512	1099	535	258
Carbon Monoxide	37	80	104	37
Particulate	2.8	6.0	7.8	11
Non-Methane Hydrocarbons	1.3	2.8	3.7	11
Sulfur Dioxide	0.56	1.2	1.6	0.88

Unit 9

$$SO_2 = \left(\frac{2000 \text{ g}}{1 \text{ EG Fe}^3} \right) \left(\frac{1 \text{ lb}}{7000 \text{ gr}} \right) (353 \text{ EG Btu}) \left(\frac{\text{Fe}^3}{930 \text{ Btu}} \right) (2) = 0.22 \text{ lb/hr}$$

$$NO_x = (11559459 \text{ dscfh}) \left(\frac{4.2 \text{ parts}}{1 \text{ EG}} \right) \left(\frac{46 \text{ lb}}{\text{mole}} \right) (1 \text{ atm}) \left(\frac{1}{0.7302} \right) \left(\frac{1}{519^\circ \text{R}} \right) = 58.93 \text{ lb/hr}$$

(AP-42) $PM = \left(\frac{141 \text{ lb}}{1 \text{ EG Fe}^3} \right) (353 \text{ EG Btu}) \left(\frac{\text{Fe}^3}{930 \text{ Btu}} \right) = 5.31 \text{ lb/hr}$

(AP-42) $CO = \left(\frac{115 \text{ lb}}{1 \text{ EG Fe}^3} \right) (353 \text{ EG Btu}) \left(\frac{\text{Fe}^3}{930 \text{ Btu}} \right) = 43.65 \text{ lb/hr}$

(ME-93) $CH_4 = (11559459 \text{ dscfh}) \left(\frac{4 \text{ parts}}{1 \text{ EG}} \right) \left(\frac{28 \text{ lb}}{\text{mole}} \right) (1 \text{ atm}) \left(\frac{1}{0.7302} \right) \left(\frac{1}{519^\circ \text{R}} \right) = 3.42 \text{ lb/hr}$

$$VOC = (11559459 \text{ dscfh}) \left(\frac{5 \text{ parts}}{1 \text{ EG}} \right) \left(\frac{16 \text{ lb}}{\text{mole}} \right) (1 \text{ atm}) \left(\frac{1}{0.7302} \right) \left(\frac{1}{519^\circ \text{R}} \right) = 2.44 \text{ lb/hr}$$

(AP-42) $VOC = \left(\frac{42 \text{ lb}}{1 \text{ EG Fe}^3} \right) (353 \text{ EG Btu}) \left(\frac{\text{Fe}^3}{930 \text{ Btu}} \right) = 15.94 \text{ lb/hr}$

CHECK OIL 65 ppm

DER Comment 4

- o Explain why the previous application for a construction permit projected carbon monoxide emissions of 110 tons/year from Unit 9 while the present permit application indicates projected CO emissions of 41 tons/year from Unit 9. The previous application also included total contemporaneous emission reductions of about 99.3 tons/year from Units 6, 7, and 8. It appears that you may be required to determine downwind concentrations of CO using EPA approved models and perform a best available control technology (BACT) analysis for CO.

Response

- o AP-42 emission factors provided the basis for the 110 tons/year CO emission rate listed in the previous application. However, actual performance of the General Electric Frame 5 combustion turbines has indicated CO emissions far below the AP-42 emission factors. Based on consultations with General Electric the maximum expected CO emission rate from the combustion turbines is 10 ppm_{dv} (corrected to 15 percent oxygen). Based on CO emissions of 10 ppm_{dv} the maximum emission rate for the project is expected to be 8.5 lb/h. This results in an annual emission of 37 tons/year. This annual CO emission is below the 100 ton/year PSD significance level. Therefore, no ambient air quality analyses will be required.

DER Comment 5

- o ISO standard day conditions for gas turbines are defined as 288 K (59 F), 101.3 KPa (29.92 in. Hg.), and 60% relative humidity. The concentration standard for gas turbines is expressed at dry ISO conditions. Some of your gas turbine emission calculations involving standard conditions did not appear to be based on dry ISO conditions. Please make necessary corrections. For other air pollutant emission sources state and federal regulations define standard temperature and pressure to be 68 F and 29.92 in. Hg.

Response

- o Emission rates listed in the application and these responses for the Unit 9 combustion turbine are based on the following constant emission rates.
 - Nitrogen oxides = 42 ppmdv (parts per million volumetric dry) at 15 percent oxygen
 - Carbon monoxide = 10 ppmdv at 15 percent oxygen
 - Non-methane hydrocarbons = 5 ppmdv at 15 percent oxygen
 - Particulate = 2.5 lb/h

Combustion turbine outputs (megawatts, fuel burn rates, and emissions) increase for operation at lower ambient temperatures. Therefore, the maximum emission rates for a combustion turbine do not occur at 59 F ISO standard day conditions but occur during lower ambient temperatures. The lowest anticipated temperature for the Fort Pierce project is 20 F. To keep the analysis of impacts conservative, the maximum emission rates listed in the application and these responses are based on an ambient temperature of 20 F.

Flue gas values appear to be corrected to dry ISO conditions

DER Comment 6

- o Provide the present actual and proposed stack parameters for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9].
The parameters are to include stack height, stack exit diameter, stack exit volume (ACFM and DSCFM), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume). Also, provide the present actual and the proposed annual hours of operation for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9].

Response

- o The proposed stack parameters for the Unit 9 combustion turbine are given in the attached table for both HRSG and bypass operation when firing natural gas. These stack parameters are based on estimated performance of a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. As noted in an October 4, 1990 telephone conference with the DER, the comments with respect to Units 6, 7, and 8 are no longer applicable.

How
about
bypass
0/1/2

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS*

	<u>HRSG Stack</u>	<u>Bypass Stack</u>
Stack Height, ft	60	60
Effective Stack Diameter, ft	11.2**	11.2**
Stack Exit Volume, acfm	440,420	621,140
, dscfm	225,350	225,350
Stack Velocity, fpm	4,470	6,305
Stack Exit Temperature, F	488	877
Stack Moisture, % by volume	8.10	8.10
Stack Oxygen, % by volume	14.53	14.53
20 F Emission Rate @ 15% O ₂ :		
PM, lb/h	2.5	2.5
, tpy***	11.0	11.0
SO ₂ , lb/h	0.2	0.2
, tpy***	0.9	0.9
NO _x , ppmdv	42	42
, lb/h	58.9	58.9
, tpy***	258.0	258.0
VOC, ppmdv	5	5
, lb/h	2.4	2.4
, tpy***	10.5	10.5
CO, ppmdv	10	10
, lb/h	8.5	8.5
, tpy***	37.2	37.2

*Stack parameters are given for a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

**Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

***Annual emissions are based on 8,760 hours of operation per year.

NOTE: The bypass stack is only used during startup and for emergency peaking generation in simple cycle.

DER Comment 7

- o Considering the geography and climatology of Ft. Pierce, we question the use of an ambient temperature of 20 F [Table 5-1] in the modeling parameters. Please explain. Additional modeling may be required.

Response

- o Combustion turbine outputs (megawatts, fuel burn rates, and emissions) increase for operation at lower ambient temperatures (see response to DER Comment 5). The lowest anticipated temperature for the Fort Pierce project is 20 F. To keep the analysis of impacts conservative, the maximum emission rates used in the modeling analyses are based on an ambient temperature of 20 F. However, the dispersion analyses are based on five years (1982-1986) of hourly meteorological data from West Palm Beach, Florida as indicated in the application's ambient air quality impact analysis. Therefore, the modeling analysis is quite conservative since actual emissions will almost always be lower than the modeled emissions.

DER Comment 8

- o Provide the maximum quantities of NO_x, ammonia, and each amine compound (ppmv @ dry conditions, lbs./hr., and tons/year) that would be emitted if Unit 9 were equipped with steam injection and selective catalytic reduction. Please identify each of the amine compounds that would be expected. Please provide the stack parameters for Unit 9 based on the installation of steam injection and selective catalytic reduction.

Response

- o The maximum quantities of NO_x and ammonia that would be emitted if SCR were added to Unit 9 are given in the attached table. No detailed information is available concerning emissions of amine compounds when SCR is utilized. HRSG stack parameters considering steam injection and SCR are also given in the attached table. These stack parameters assume an ambient temperature of 20 F.

	FRSG Stack SCR
Stack Height, ft	60
Effective Stack Diameter, ft	11.2**
Stack Exit Volume, acfm	439,490
, dscfm	225,350
Stack Velocity, fpm	4,461
Stack Exit Temperature, F	486
Stack Moisture, % by volume	8.10
Stack Oxygen, % by volume	14.53
20 F Emission Rate @ 15% O ₂ :	
PM, lb/h	2.5
, tpy***	11.0
SO ₂ , lb/h	0.2
, tpy***	0.9
NO _x , ppmdv	9
, lb/h	12.6
, tpy***	55.2
VOC, ppmdv	5
, lb/h	2.4
, tpy***	10.5
CO, ppmdv	10
, lb/h	8.5
, tpy***	37.2
Ammonia, ppmdv	10
, lb/h	5.2
, tpy***	22.8

** Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

$$(11559 + 59 \text{ dscch}) \left(\frac{10 \text{ pacets}}{1 \text{ EG}} \right) (17 \frac{\text{lbs}}{\text{cubic}}) (1 \text{ atm}) \left(\frac{1}{0.7302} \right) \left(\frac{1}{5.902} \right) = 5.19 \frac{\text{lb}}{\text{ft}^3}$$

DER Comment 9

- o Provide the 1-hour, 8-hour, 24-hour, and annual concentrations of NO_x , ammonia, and each of the identified amine compounds that would result if Unit 9 were equipped with steam injection and catalytic reduction.

Response

- o As requested, the 1-, 8-, 24-hour, and annual concentrations of NO_x and ammonia are given in the attached table. Ground-level concentrations could not be evaluated for amine compounds since detailed emission information is not available. A diskette and paper copy of the modeling output has been included.

It should be noted that the combustion turbine as proposed (steam injection only to achieve a NO_x emission limit of 42 ppm_{dv} at 15 percent oxygen) showed maximum NO_x impacts to be less than ten percent of the NAAQS in the AAQIA modeling. These turbine impacts added to the NO_x background and other interacting sources were only about one third of the NAAQS. In addition, the H.D. King site is not near any ozone non-attainment areas. These facts demonstrate that there would be minimal air quality benefit from the addition of SCR for this turbine and, additionally, would create a small adverse impact from ammonia emissions.

MODELED NO_x AND AMMONIA IMPACTS WITH SCR¹

Averaging Period ³	Maximum Ground Level Impacts ²		Impact Location	
	Ammonia with SCR (10 ppm _{dv})	NO _x with SCR (9 ppm _{dv})		
	ug/m ³	ug/m ³	Dist. km	Dir. deg
Annual	0.8	From 11.3 to 1.8	0.879	260
24-Hour	19.6 vs 43	47.4	0.879	260
8-Hour	36.9 vs 180	89.5	0.654	90
1-Hour	71.6 vs 270 est	173.6	0.654	90

¹GE PG5371 combined cycle combustion turbine with steam injection and Selective Catalytic Reduction (SCR).

²All modeled maximum impacts occurred in 1984.

³Annual pollutant impacts are based on maximum modeled concentrations. The short-term impacts are based on highest, second-highest modeled concentrations.

NOTE: Modeling was performed as described in Section 5.0 of the AAQIA. Specifically, stack parameters as presented in Table 5-1 of the AAQIA were used in this analysis. SCR emission rates at 20 F ambient conditions were used to determine impacts. These rates are:

NO _x @ 15% O ₂ , ppm _{dv}	9
, lb/h	12.6
, tpy	55.2
Ammonia @ 15% O ₂ , ppm _{dv}	10
, lb/h	5.2
, tpy	22.8

1 ppm NH₃ = 698 µg/m³

ASHRAE 62-1981

Ammonia-0 annual 500 µg/m³

Ceiling 7000 µg/m³

At 25 ppm O₂ = 17,450 µg/m³

50 ppm TWA = 34,900 µg/m³

DER Comment 10

- o Explain how the costs on page 4-5 were derived, what is included in each of the listed categories (contingency, escalation, indirects, maintenance, energy, lost generation, etc.), the terms "energy" and "lost generation", and how the various percentages were arrived at. Since BACT is being evaluated using "today's" cost guidelines the economic analysis for selective catalytic reduction should be based on the present cost instead of the 1993 projections.

Response

- o Based on a more current cost analysis a revised Table 4-1 from the BACT analysis is attached. Revisions were made for a number of reasons. Economic criteria used to develop the costs listed on Table 4-1 were in some cases revised to reflect current economic conditions. In light of recent developments in the Mideast it appears that the escalation rates used in original analysis may be low. Therefore, the revised Table 4-1 is based on an operating cost escalation rate of 7 percent in lieu of the original 6 percent. Other revisions and a response to the comment are fully described by the following.

What does the middle east have to do with escalation rates provided and concrete support

Capital costs for the SCR system and HRSG modifications were based on budgetary quotations from equipment manufacturers and in-house cost estimates. The 15 percent margin for contingency accounts for uncertainties inherent in estimating capital costs of this magnitude for a retrofit project. In addition, the contingency margin will cover costs neglected in determining the capital cost estimates.

use 10%

It would take approximately 18-months to procure, design, construct and start-up an SCR system on Unit 9. Therefore, costs presented in the revised Table 4-1 are reflective of July 1992

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND
LEVELIZED ANNUAL COSTS (REVISED)

	SCR SYSTEM		
	\$1,000		
Capital Costs:			
SCR System	930 - same		
HRSR Modifications	590 - same		
System Erection	520 - same		
Differential Balance of Plant	70 - same		
1991 Capital Cost	2,110 - same		1,210
Contingency (15 percent)	320 - same		180
Escalation (6 percent)	180 - 150		100
Direct Capital Cost	2,610 - 2,580	30	1,470
Indirects (16 percent)	420 - 410	10	240
Interest During Construction (8 percent)	60 - 240	-80	40
1993 Total Capital Cost	3,090 - 3,230	-140	1,770
Levelized Annual Costs*:			
Operating Personnel	70 - 60	10	60
Maintenance	510 - 420	90	420
Ammonia	70 - 70		70
Energy	50 - 40	10	40
Lost Generation	210 - 40	170	110
1993 Annual Operating Cost	910 - 630	280	630
Fixed Charges on Capital (13.6 percent)	340 - 350	-10	240
1993 Total Annual Cost	1,250 - 980	270	870
Nitrogen Oxides Emission Rate, ppm _{dv}	9		
Annual NO _x Emission Reduction, tpy	20 ³		
NO _x Emission Reduction Cost, \$/ton	6,190 - 4,500	1,690	

*Annual costs are based on a 100 percent capacity factor.

I tend
to think
much less
cost

dollars. Previous costs listed in Table 4-1 of the application were based on a 24-month schedule.

Payment for the equipment would be expected to occur around month 15 of the project. Therefore, capital costs were escalated at an annual rate of six percent for 15 months. This results in a direct capital cost of \$2,610,000. The previous Table 4-1 was based on only one year of escalation at a rate of six percent.

Thought 74c was the case?

An indirect cost factor of 16 percent ^{was the basis?} was applied to the escalated direct capital cost. Indirects cover owner and architect/engineer costs to design, procure, construct, and start-up the SCR system.

Interest during construction is applied to the escalated direct capital cost plus indirects for the construction period of three months at a rate of 8 percent. The previous Table 4-1 was based on one year of interest during construction. The July 1992 capital cost of retrofitting a SCR system to Unit 9 is \$3,090,000.

The annual operating costs for use of a SCR system include operating personnel, maintenance costs (primarily catalyst replacement), ammonia additive, energy, and lost generating capacity. Current estimates of these costs were escalated to the first year of operation based on an escalation rate of 7 percent. These first year costs were also levelized to account for the effect of escalation and present worth of future annual expenditures. Assuming a constant escalation rate of 7 percent and a constant present worth discount rate of 8 percent and the 25-year life of the facility the levelization factor is 1.94. Accordingly, first year operating costs were multiplied by this levelization factor to determine the levelized annual operating costs listed in Table 4-1.

Additional detail regarding the basis of the annual operating costs follows.

Operating personnel costs are based on one operator for one-half shift per day (4 hours). Additionally, operator costs are based on a loaded payroll cost of \$45,000 per year (1990 dollars).

Maintenance costs consist of a minor amount of routine SCR system maintenance and the predominant expense of catalyst replacements. It is expected that catalyst replacements will occur once every three years. Catalyst replacement costs only reflect replacement of the catalyst bed.

Ammonia costs are based on a 1990 cost of ammonia of \$250 per ton. Ammonia usage rates were based on information obtained from potential SCR manufacturers.

Energy costs reflect the electrical consumption requirements of the SCR system. It is estimated that the SCR system will consume 36 kW of electricity to run pumps and vaporizers. Energy penalties are assessed based on a 1990 cost of 70 mills per kWh. This energy cost reflects fuel, O&M, and replacement plant costs.

Due to the pressure drop associated with the use of a SCR system the Unit 9 combustion turbine will be derated by approximately 0.6 percent (approximately 162 kW). This lost generation capacity must be replaced. Therefore, a penalty based on a 1990 energy cost of 70 mills per kWh is assessed against the SCR system. Previous values for lost generation listed in the original Table 4-1 only reflected the capital cost of replacement power for this lost generation. Current estimates provided in the revised Table 4-1 also include the operation and maintenance costs associated with makeup of this lost generation.

?
 - Why
 - 136
 5 Hour
 in
 Table
 4.1

Table
4.1

~~SECRET~~

~~ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE~~

~~DATE 08-09-00 BY SP-6 JAB/STP~~

~~REASON FOR DECLASSIFICATION~~

~~EXEMPTION CODE~~

~~AUTHORITY~~

EARLIER BACT DOES NOT HAVE ANYTHING TO DO WITH THE PRESENT
BACT REQUIREMENT, THERE IS NO GUARENTEE THAT SCR AS BACT
WOULD NOT HAVE BEEN 20
REQUIRED

DER Comment 11

- o On page 4-6, you state that the addition of a selective catalytic reduction system to meet 9 ppmv @ 15% O₂ will add \$1.1 million dollars to the levelized annual cost for Unit 9? What is the present levelized annual cost for each of the other generating units at H. D. King generating station? Would the selective catalytic reduction system in your analysis achieve an NO_x concentration of 25 ppmv @ 15% O₂ when oil is burned? Fully explain your answer.

Response

- o The present annual cost of operating Unit 9 is \$728,830. The initial capital cost of Unit 9 was \$13.4 million in 1989 dollars. To compare with the July 1992 costs listed in the revised Table 4-1 it is necessary to adjust these annual operating and capital costs by the following factors.

- Capital escalation = 6 percent per year
- Operating cost escalation = 7 percent per year
- Levelized fixed charge rate = 10.87 percent
- Operating cost levelization factor = 1.94

Escalation and levelization of the Unit 9 operating and capital cost results in a levelized annual cost of \$3.46 million in July 1992 dollars. Based on a levelized annual cost of \$1.25 million to own and operate a SCR system the levelized annual cost for Unit 9 would increase to \$4.71 million, a 36 percent increase.

Based on the October 4, 1990 telephone conference between the DER and B&V it is not necessary to present the levelized annual costs for Units 6, 7, and 8.

Unit 9's combustion turbine is capable of limiting NO_x emissions to 65 ppmv at 15 percent oxygen when burning fuel oil. However, fuel oil will only be burned during emergency operation. Use of a SCR system when burning fuel oil could lead to a number of

catalyst poisoning and downstream equipment fouling problems. Costs listed in the revised Table 4-1 reflect a catalyst designed for use with natural gas only. Therefore, the basis of the BACT's SCR scenario is that if an emergency situation arose that required the use of fuel oil the SCR system would not be operated. In emergency situations when fuel oil must be burned a NO_x emission rate of 65 ppmdv at 15 percent oxygen should be achievable.

Explain to the community an emergency situation and maximum number of emergencies per year that have occurred during the last 2 yrs. What was the annual duration of these emergencies?

DER Comment 12

- o Please provide a copy of each construction permit that has been issued for the construction of Unit 6, Unit 7, and Unit 8. Provide the initial date of construction and completion for each of these air pollution sources.

Response

- o If any construction permits for these units have been found in our files we have enclosed a copy of them with these responses.

DER Comment 13

- o Describe the bypass stack in terms of the circumstances and frequency of use, location within the facility, geometry [height and diameter], flue gas parameters [volume (ACFM and DSCFM), exit velocity (fpm), exit temperature (°F), moisture (% by volume), and oxygen (% by volume)], and the maximum hourly and annual emissions of each pollutant listed (in) Table 500-2 of F.A.C. Chapter 17-2.

Response

- o The Unit 9 combustion turbine bypass stack is only used during startup and emergency peaking generation in simple cycle operation. Although these uses are expected to be very infrequent and/or of short duration, the stack is being permitted such that it could be operational for 8,760 hours per year. The location of the bypass stack relative to the HRSG stack is shown in the attached figure.

The stack parameters for both HRSG and bypass operation are given in the attached table. Note that the emission rates are the same for both simple (bypass) and combined cycle operation (HRSG). However, simple cycle operation involves much higher gas exit temperatures (and thus higher ACFM exit flows). These higher temperatures and flow volumes lead to greater thermal and momentum plume rise. This increase in plume height will lead to lower ground-level impacts. Consequently, air dispersion modeling was not performed for the simple cycle case.

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS*

	<u>HRSG Stack</u>	<u>Bypass Stack</u>
Stack Height, ft	60	60
Effective Stack Diameter, ft	11.2**	11.2**
Stack Exit Volume, acfm	440,420	621,140
, dscfm	225,350	225,350
Stack Velocity, fpm	4,470	6,305
Stack Exit Temperature, F	488	877
Stack Moisture, % by volume	8.10	8.10
Stack Oxygen, % by volume	14.53	14.53
20 F Emission Rate @ 15% O ₂ :		
PM, lb/h	2.5	2.5
, tpy***	11.0	11.0
SO ₂ , lb/h	0.2	0.2
, tpy***	0.9	0.9
NO _x , ppmdv	42	42
, lb/h	58.9	58.9
, tpy***	258.0	258.0
VOC, ppmdv	5	5
, lb/h	2.4	2.4
, tpy***	10.5	10.5
CO, ppmdv	10	10
, lb/h	8.5	8.5
, tpy***	37.2	37.2

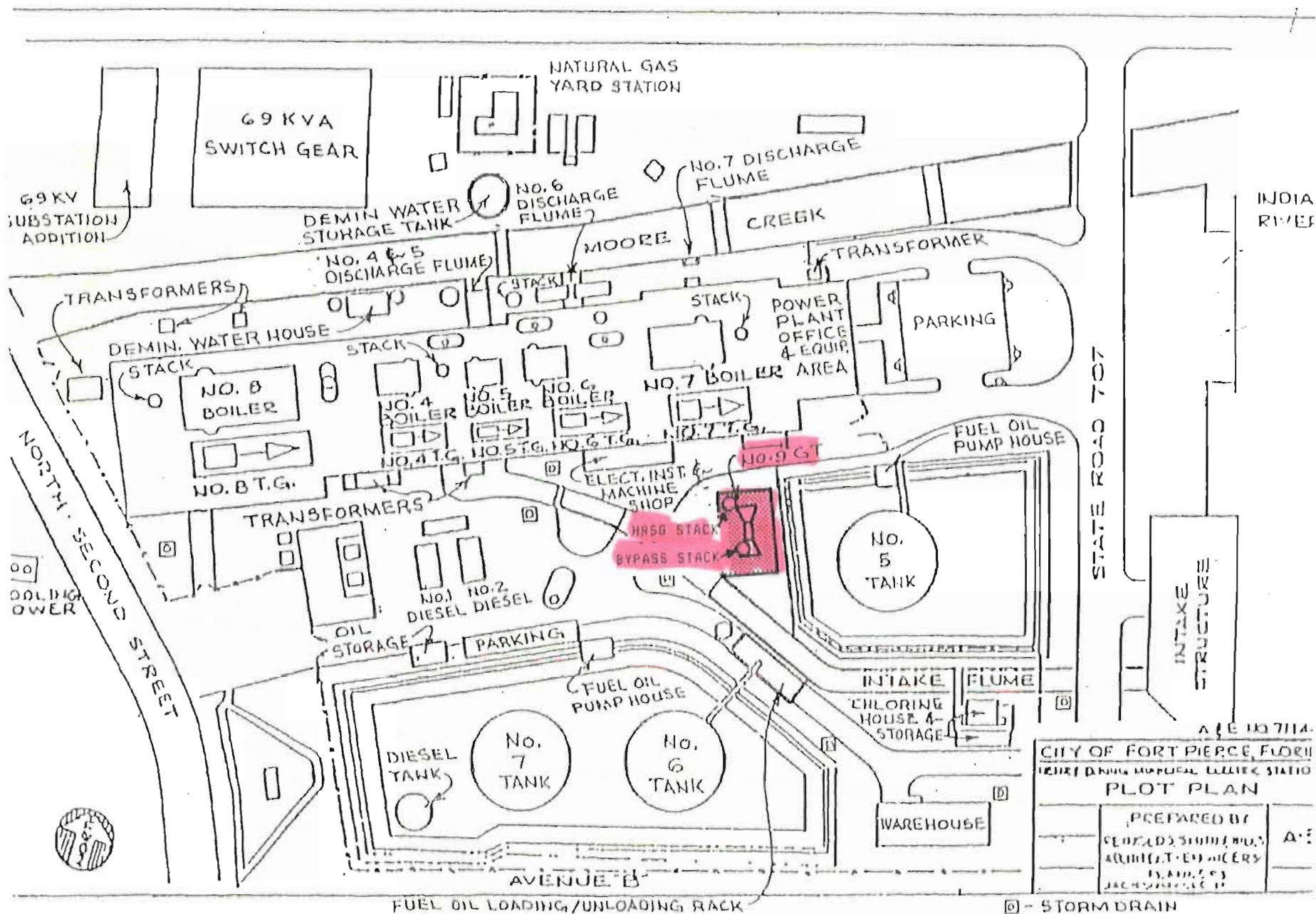
*Stack parameters are given for a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

**Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

***Annual emissions are based on 8,760 hours of operation per year.

NOTE: The bypass stack is only used during startup and for emergency peaking generation in simple cycle.

FIGURE 2-2. SITE ARRANGEMENT



DER Comment 14

- o Please note that we have not received a BACT application for Unit 6 as was requested by the Southeast District.

Response

- o A BACT analysis for Unit 6 will not be a part of this application for Unit 9. We will be happy to provide you a copy of it when we file it with our renewal application for Unit 6 in December.

WATER
ELECTRIC



GAS
SEWER

206 S. SIXTH STREET * P. O. BOX 3191 * FORT PIERCE, FLORIDA 34948 * PHONE (407) 464-5600

December 5, 1990

RECEIVED

DEC 6 - 1990

DER-BAQM

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. C. H. Fancy

Dear Mr. Fancy:

RE: AC 56-185836 - Fort Pierce Utilities Authority - H. D.
King, Unit 9

Enclosed is our response to your second comment letter dated November 21, 1990.

Please note that the enclosed modeling is for nitrogen oxide only and does not include sulfur dioxide or particulate modeling. While we would prefer to retain our authorization to burn No. 2 Fuel Oil in Unit 9 under emergency conditions, we are hereby withdrawing any prior request to do so if the DER believes that SO₂ and TSP modeling is necessary for this reauthorization. We must insist that the relicensing of Unit 9 proceed without the delay that this additional modeling would entail. We would also point out that the DER can request SO₂ and TSP modeling for the repermitting of Units 6, 7, and 8 if the DER believes this to be necessary to ensure compliance with ambient air quality standards. This repermitting will begin this month. Should FPUA, request authorization in the future to burn No. 2 Fuel Oil in Unit 9, then we will provide the appropriate demonstrations of compliance with that request. In the meantime, DER is to proceed with our application without consideration of the No. 2 Fuel Oil option for Unit 9. It is worth repeating and emphasizing the fact that we are willing to forego burning of fuel oil in Unit 9 in order to eliminate the need for SO₂ and TSP modeling, and thereby expedite action on the subject application.

We are most anxious for your letter of completeness on our Unit 9 permit application. With cold weather about to be upon us, it becomes critical that the Unit 9 permit be reissued immediately or some other appropriate action be suggested by the DER. We will not intentionally violate our permit conditions without your prior authorization to do so in an emergency. Consequently, our customers face potential cold weather blackouts until this issue is resolved.

Best Available Copy

It is our understanding that the person assigned to oversee DER's review of the subject application is Mr. Mike Harley. Mr. Harley has indicated that he will be out of the office from December 7 through the end of the year. In view of that, we are requesting that review of this submittal, and hopefully, issuance of a letter of completeness, be accomplished prior to his upcoming period of absence. It is essential that the permitting process continue during December, and we are prepared to meet with you further to ensure that this occurs.

Sincerely,

Harry Schindehette by *grief*
Harry Schindehette, P.E.
Director of Utilities

Enclosure

cc: Mr. Jack Miller
Mr. Harry Lamb
Mr. Steve Day

C. Piliado
S. Brooks, SE Dist.
J. Harper, EPA

DER Comment 1

- o Please fully explain how the stack parameters listed in Attachment 3 relate to the actual stack parameters for FPUA Unit 9 and provide numerical comparisons.

Response

- o The stack parameters listed in Attachment 3 (submitted with the letter dated October 23, 1990 responding to the DER's comment letter dated September 28, 1990) are based on the worst case ambient conditions (20 F) expected for the unit. Combustion turbine outputs (megawatts, fuel burn rates, and emissions) increase for operation at lower ambient temperatures. Therefore, worst case project impacts occur at this lower temperature rather than at ISO (59 F) or more typical operating conditions. The attached table provides a numerical comparison of operating parameters for three different ambient conditions, 20 F, 59 F, and 90 F when operating in the combined cycle mode (HRSG stack).

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS

Ambient Temperature, F	20	59	90
Turbine Generator Output, kW	31,200	27,000	23,600
Stack Exit Flow, lb/h	1,090,000	999,000	928,000
Stack exit temperature, F	494	487	481
Stack exit volume, acfm	447,000	409,000	380,000
, dscfm	226,000	207,000	190,000
Stack velocity, fpm	4,530	4,150	3,850
Stack moisture, % by volume	8.10	8.67	10.26
Stack oxygen, % by volume	14.53	14.51	14.29
NO _x Emissions, ppmvd @ 15% O ₂	42	42	42
, lb/h	59	53	49
CO Emissions, ppmvd @ 15% O ₂	10	10	10
, lb/h	8.5	7.7	7.0
NMHC Emissions, ppmvd @ 15% O ₂	5	5	5
, lb/h	2.4	2.2	2.0

DER Comment 2

- o Please explain how the emission rates for nitrogen oxides, carbon monoxide, non-methane hydrocarbons (NMHC), and particulate were determined for FPUA Unit 9 by General Electric. Provide supporting information.

Response

- o Unit 9 consists of one General Electric Frame 5 combustion turbine. Previously provided Unit 9 emission estimates were based on the following emission rates provided by General Electric for a Frame 5 combustion turbine (see attached GE performance table for MS5001PA frame size).

Nitrogen oxides = 42 ppmvd at 15 percent oxygen.

Carbon monoxide = 10 ppmvd at 15 percent oxygen.

Unburned hydrocarbons = 7 ppmvd at 15 percent oxygen.

Particulate = 2.5 lb/h

These emission rates are consistent with those expected for all Frame 5 turbine generators installed throughout the United States. General Electric did not specifically guarantee these emission levels for Unit 9. However, the Unit 9 Frame 5 turbine generator does not have any unique differences from other Frame 5 turbine generators sold with the above emission guarantees. Non-methane hydrocarbons will occur as a portion of total unburned hydrocarbons. Based on previous performance information NMHC were conservatively estimated to be 5 ppmvd at 15 percent oxygen.

HEAVY DUTY PRODUCT LINE PERFORMANCE AND EMISSIONS

TURBINE MODEL/ COMBUSTOR	EMISSIONS LEVEL	DILWENT	OUTPUT KW		HEAT RATE BTU/KWH		INJ RATE LB/H		NOx PPMVD @ 15% O2		CO PPMVD		UHC PPMVD		VOC'S PPMVD		PART. LB/H		INSP. INT. HRS. FH/TS > 100	
			G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D
MS5001PA																				
AO LJNER	DRY		26300	25800	11820	11930	-	-	135	202	10	10	7	7	1.4	3.5	2.5	5	12000	12000
	NSPS	WATER	26670	26710	11910	12160	4020	10000	87	86	10	10	7	7	1.4	3.5	2.5	5	12000	6000
		STEAM	26820	26990	11690	11630	5940	13610	87	86	10	10	7	7	1.4	3.5	2.5	5	12000	6000
	42/65	WATER	27320	27080	12070	12260	11050	14180	42	65	10	10	7	7	1.4	3.5	2.5	5	6000	6000
		STEAM	27690	27380	11480	11540	15970	18180	42	65	10	10	7	7	1.4	3.5	2.5	5	6000	6000
	42/42	WATER	27320	27780	12070	12430	11050	21970	42	42	10	10	7	7	1.4	3.5	2.5	5	6000	4000
		STEAM	27690	28000	11480	11390	15970	25460	42	42	10	10	7	7	1.4	3.5	2.5	5	6000	4000
MS6001B																				
AO LJNER	DRY		38340	37520	10860	10970	-	-	148	267	10	10	7	7	1.4	3.5	2.5	17	12000	12000
	NSPS	WATER	38830	38690	10940	11180	4700	11510	95	94	10	10	7	7	1.4	3.5	2.5	10	8000	6000
		STEAM	39010	39390	10770	10710	6780	18980	95	94	10	10	7	7	1.4	3.5	2.5	17	8000	6000
	42/65	WATER	40010	39290	11140	11280	16020	17410	42	65	10	10	7	7	1.4	3.5	2.5	10	6000	4000
		STEAM	40630	40230	10560	10600	23150	27620	42	65	10	10	7	7	1.4	3.5	2.5	17	8000	6000
	42/42	WATER	40010	40360	11140	11460	16020	28070	42	42	10	10	7	7	1.4	3.5	2.5	10	6000	1500
MOI*		STEAM	40630	41430	10560	10440	23150	40600	42	42	10	10	7	7	1.4	3.5	2.5	17	8000	3000
	25/42	WATER	-	40360	-	11460	-	28070	-	42	-	10	-	7	-	3.5	-	10	-	1500
		STEAM	42740	41480	10300	10440	44970	40600	25	42	40	10	7	7	1.4	3.5	2.5	17	3000	3000
DLN	25/165	DRY	38180	37360	10890	11000	-	-	25	165	15	20	7	7	1.4	2.5	2.5	17	8000	8000
	25/65	WATER	38180	38370	10890	11180	-	10010	25	65	15	20	7	7	1.4	3.5	2.5	17	8000	8000
	25/65	STEAM	38180	38990	10890	10770	-	16680	25	65	15	20	7	7	1.4	3.5	2.5	17	8000	8000

NOTE: NSPS NOx IS 75 PPMVD AT 15% O2 WITH THE HEAT RATE CORRECTION.
ALL PERFORMANCE IS RUN WITH FUEL INLET AND EXHAUST LOSSES, ISO CONDITIONS.

* MIX - MASSIVE DILUENT INJECTION

DER Comment 3

- o Explain and show how the actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 were calculated in units of the applicable emission limiting standard, lb/hr, and tons/year for each source at the H. D. King facility.

Response

- o Actual emissions and estimates of actual emissions (see attached table) were provided to the DER for each source at the H. D. King facility in a letter dated October 23, 1990 responding to the DER's comment letter dated September 28, 1990. As discussed in the response, in the absence of actual performance tests, emission rates were calculated based on appropriate emission factors from AP-42. Attached please find sample calculations illustrating how these emissions were calculated.

H. D. KING UNITS 6 - 9 ACTUAL EMISSION RATES

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Allowable Annual Operation, hr	12	1344	6384	8736
Hourly Emissions, lb/h				
Nitrogen Oxides	117	251	111*	57*
Carbon Monoxide	8.5	18	24	0.68*
Particulate	0.64	1.4	1.8	0.93
Non-Methane Hydrocarbons	0.30	0.64	0.83	0.44
Sulfur Dioxide	0.13	0.27	0.36	0.20
Annual Emissions, tons/year				
Nitrogen Oxides	0.70	169	353*	250*
Carbon Monoxide	0.051	12.3	76	3.0*
Particulate	0.0038	0.92	5.7	4.1
Non-Methane Hydrocarbons	0.0018	0.43	2.7	1.9
Sulfur Dioxide	0.00077	0.18	1.1	0.81

*Emission rates based on the attached emission test results.

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Owner FPUA Computed By J. Cochran
 Plant King Unit 6-9 Date 12/4 19 90
 Project No. 16589 File No. _____
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 Page 1 of 3

Unit 8 NO_x Emissions per 9/11/89 compliance test = $0.181 \frac{\text{lb}}{\text{MBtu}}$

Unit 8 fuel input rate = $611 \frac{\text{MBtu}}{\text{hr}}$

Unit 8 Actual NO_x Emission = $(0.181 \frac{\text{lb}}{\text{MBtu}})(611 \frac{\text{MBtu}}{\text{hr}}) = 111 \frac{\text{lb}}{\text{hr}}$

Based on Unit 9 permit restrictions Unit 8 is allowed to operate $6334 \frac{\text{lb}}{\text{hr}}$

Unit 8 Actual Annual NO_x Emission = $(111 \frac{\text{lb}}{\text{hr}})(6334 \frac{\text{hr}}{\text{yr}})(\frac{1}{1000} \frac{\text{ton}}{\text{lb}})$
 $= 352 \frac{\text{ton}}{\text{yr}}$

Unit 9 NO_x Emissions per 9/13/89 compliance test = $\frac{5243}{2} = 51 \frac{\text{ppm}}{\text{d}}$
 @ $15\% \text{ O}_2$

CO Emissions = $1 \text{ ppmvd @ } 15\% \text{ O}_2$

Inlet Temperature = 90°F Flue Gas Flow = $926,000 \frac{\text{lb}}{\text{hr}}$

	<u>Volume %</u>	<u>Mols</u>	<u>Mols @ $15\% \text{ O}_2$</u>
<u>Imaginary</u>	14.92	4850	3663
<u>Nitrogen</u>	73.63	24097	19630
<u>Carbon Dioxide</u>	2.54	931	831
<u>Oxygen</u>	0.90	295	294
<u>Moisture</u>	8.11	2654	
	100.00	32,727	24,418

NO_x Emission Rate = $(51 \frac{\text{mols NO}_2}{10^6 \text{ mols flue gas}})(24,418 \frac{\text{mols}}{\text{hr}})(46,0055 \frac{\text{lb NO}_2}{\text{mol NO}_2})$
 $= 57.3 \frac{\text{lb}}{\text{hr}}$

Unit 9 permit restrictions limit annual hours of operation to $3736 \frac{\text{hr}}{\text{yr}}$

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 Date _____ 1920
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$$\text{Unit 9 Actual Annual } \text{NO}_x \text{ Emission} = (57.3 \frac{\text{lb}}{\text{h}}) (8736 \frac{\text{hr}}{\text{yr}}) (\frac{2000}{2000})$$

$$= 280 \frac{\text{tons}}{\text{yr}}$$

$$\text{Unit 9 CO Emissions} = \left(\frac{1 \text{ mol CO}}{12 \text{ mol fuel gas}} \right) (24419 \frac{\text{mol fuel gas}}{\text{hr}}) (20.01055 \frac{\text{lb CO}}{\text{mol CO}})$$

$$= 0.684 \frac{\text{lb}}{\text{h}}$$

$$\text{Unit 9 Actual Annual CO Emission} = 0.684 \frac{\text{lb}}{\text{h}} (8736 \frac{\text{hr}}{\text{yr}}) (\frac{2000}{2000})$$

$$= 2.93 \frac{\text{tons}}{\text{yr}}$$

Engineering overall emission estimates will be calculated based on emission factors from AP-42

AP-42 Emission Factors for Natural Gas Combustion

Particulate	=	1 to 5 $\frac{\text{lb}}{10^6 \text{ Btu}}$ (use 3 $\frac{\text{lb}}{10^6 \text{ Btu}}$)
CO ₂	=	0.6 $\frac{\text{lb}}{10^6 \text{ Btu}}$
NO _x	=	550 $\frac{\text{lb}}{10^6 \text{ Btu}}$
CO	=	10 $\frac{\text{lb}}{10^6 \text{ Btu}}$
NH ₃	=	1.4 $\frac{\text{lb}}{10^6 \text{ Btu}}$

Fuel Burn Rates:

Unit 6	=	213,000 $\frac{\text{Btu}}{\text{h}}$
Unit 7	=	480,300 $\frac{\text{Btu}}{\text{h}}$
Unit 8	=	596,000 $\frac{\text{Btu}}{\text{h}}$
Unit 9	=	310,600 $\frac{\text{Btu}}{\text{h}}$

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Project No. 10599 File No. _____ Checked By SK
Title Actual Emission Estimates Date 12/4 19 90
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Actual Emission Estimates ($\frac{lb}{hr}$)

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Particulate	0.639	1.37	1.79	0.932
SO ₂	0.123	0.274	0.358	0.186
NO _x	117	251		
CO	8.52	18.3	23.8	
NMHC	0.293	0.639	0.934	0.435

Actual Emission Estimates (tons/year)

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Particulate	0.0033	0.92	5.7	4.1
SO ₂	0.00077	0.13	1.1	0.81
NO _x	0.70	169		
CO	0.051	12.3	76	
NMHC	0.0018	0.43	2.7	1.9
Annual Operating, $\frac{hr}{yr}$	12	1344	6394	9736

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DER Comment 4

- o Describe the situations that make it necessary to burn oil in each of the units located at the H. D. King facility. List the actual number of hours per year (during each of the last two years) that oil was burned in each air pollution source at the H. D. King facility including each diesel.

Response

- o Natural gas is the primary fuel for the H. D. King Electric Generating Plant. The facility has retained the flexibility in Units 6, 7, 8, and 9 to burn fuel oil in the event of natural gas curtailments (emergency situations). Units 6, 7, and 8 steam generators are capable of burning either natural gas or fuel oil No. 6 (residual oil). The Unit 9 combustion turbine is capable of burning either natural gas or fuel oil No. 2 (distillate oil). At the current time, due to emission restrictions contained in Unit 9's operating permit, Units 6, 7, and 8 cannot burn fuel oil. No oil will be burned in these units until the Unit 9 permit is reissued.

FPUA is hereby withdrawing it's application to burn fuel oil in Unit 9 during emergencies. Natural gas will be the primary fuel for Unit 9.

In addition to Units 6 through 9, the H. D. King Electric Generating Plant periodically operates two diesel electric generators. These generators burn fuel oil No. 2 (distillate oil). These diesel generators are operated strictly during peak demand periods.

The attached table lists the actual hours of operation that these sources have burned oil during the last two years (1989 and 1990).

H. D. KING ELECTRIC GENERATING PLANT FUEL OIL FIRED OPERATION

	<u>Fuel Oil Fired</u>	<u>1989</u>	<u>1990</u>
		<u>hours</u>	<u>hours</u>
Unit 6	Residual	0	0
Unit 7	Residual	0	0
Unit 8	Residual	108*	0
Unit 9	Distillate	0	0
Diesel No. 1	Distillate	61	51
Diesel No. 2	Distillate	74	85

*Fuel oil burned during a natural gas curtailment.

DER Comment 5

- o Provide the maximum emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lb/hr, and tons/year for each source at the H. D. King facility when oil is burned.

Response

- o The attached table provides estimates of maximum hourly emission rates for Units 6, 7, and 8 when burning residual fuel oil, and diesel generators 1 and 2 when burning distillate fuel oil.

Since it would be impossible to meet the emission limits listed in the Unit 9 permit for Units 6, 7, and 8 (when Units 6, 7, and 8 are burning oil) no oil will be burned in these units until the Unit 9 permit is reissued. Accordingly, no annual emissions can be estimated at this time. Except for Unit 8 NO_x and SO₂, emission estimates provided in the attached table are based on AP-42 emission factors. Nitrogen oxide emissions for Unit 8 are based on an emission limit of 0.20 lb/MBtu. Sulfur dioxide emission estimates for Unit 8 are based on a maximum fuel sulfur content of 0.75 percent. Attached please find the detailed calculations illustrating determination of these values.

As previously discussed, FPUA is withdrawing it's application to burn fuel oil in the Unit 9 combustion turbine during natural gas curtailments (emergencies). Natural gas will be the primary fuel for Unit 9. Accordingly, no emission estimates are provided in this response for Unit 9 when burning fuel oil.

H. D. KING ELECTRIC GENERATING PLANT FUEL OIL FIRED EMISSION RATES

	<u>Unit 6</u> <u>lb/h</u>	<u>Unit 7</u> <u>lb/h</u>	<u>Unit 8</u> <u>lb/h</u>	<u>Diesel</u> <u>Generators</u> <u>lb/h</u> **
Nitrogen Oxides	98	210	122	4.2
Carbon Monoxide	7.3	16	20	1.1
Particulate	34	72	43	0.42
Non-Methane Hydrocarbons	1.1	2.4	3.1	0.042
Sulfur Dioxide	458	984	504	12

*Diesel generators 1 and 2 are identically sized. Values listed are for one diesel generator only.



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 Page 1 of 2

AP-42 Emission Factors for Residual Oil Fuel Boilers

Particulates	=	$10(S) + 3 \left(\frac{16}{10^3} \text{ gal} \right)$	<u>67</u>	<u>5.6</u> lbs weight % S in fuel
SO ₂	=	$157(S) \left(\frac{16}{10^3} \text{ gal} \right)$	<u>140</u>	
NO _x	=	$67 \left(\frac{16}{10^3} \text{ gal} \right)$	<u>69.8</u>	
CO	=	$5 \left(\frac{16}{10^3} \text{ gal} \right)$	<u>15.4</u>	
NMHC	=	$0.76 \left(\frac{16}{10^3} \text{ gal} \right)$	<u>5.57</u>	

Fuel Burn Rates

$$\begin{aligned} \text{Unit 6} &= (219 \text{ MBtu/h}) (10^6 \text{ BTU/MBtu}) \left(\frac{1}{150,000 \text{ Btu}} \right) = 1460 \text{ gal/h} \\ \text{Unit 7} &= 470 \text{ MBtu/h} (10^6) \left(\frac{1}{150,000} \right) = 3133 \text{ gal/h} \\ \text{Unit 9} &= 611 \text{ MBtu/h} (10^6) \left(\frac{1}{150,000} \right) = 4073 \text{ gal/h} \end{aligned}$$

Unit 6 oil sulfur = 2.0%

Unit 9 fuel oil sulfur = 0.75%

Hourly Emission Rates

	<u>Unit 6</u> <u>lb/h</u>	<u>Unit 7</u> <u>lb/h</u>	<u>Unit 9</u> <u>lb/h</u>
Particulates	33.6	72.1	42.8
SO ₂	453	984	
NO _x	97.9	210	
CO	7.3	15.7	20.4
NMHC	1.1	2.38	3.10

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Project No. 16589 File No. _____
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Date 12/3 1990
Checked By [Signature]
Date _____ 19____
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Unit 3 NO_x Emission Limit = 0.20 ^{lb}/MBtu

$$\text{Maximum Unit 3 NO}_x \text{ Emission} = (0.20 \frac{\text{lb}}{\text{MBtu}}) (611 \frac{\text{MBtu}}{\text{h}}) = \underline{\underline{122 \frac{\text{lb}}{\text{h}}}}$$

Unit 3 Fuel Oil Sulfur Content limited to 0.75%

$$\begin{aligned} \text{Maximum Unit 3 SO}_2 \text{ Emission} &= \left(\frac{0.75 \frac{\text{lb}}{100 \text{ gal}}}{100} \right) \left(\frac{16 \text{ fuel}}{1800 \text{ MBtu}} \right) \left(611 \frac{\text{MBtu}}{\text{h}} \right) \left(\frac{10^3 \text{ gal}}{\text{MBtu}} \right) \\ &\times \left(\frac{64 \text{ lb SO}_2}{32 \text{ lb S}} \right) = \underline{\underline{504 \frac{\text{lb}}{\text{h}}}} \end{aligned}$$

AP-42 Emission Factors for Diesel Fuel Electric Generators

Heavy Industrial Boiler - Distillate Oil

Particulate = 2 ^{lb}/10³ gal
SO₂ = 142 (5) ^{lb}/10³ gal
NO_x = 20 ^{lb}/10³ gal
CO = 5 ^{lb}/10³ gal
NMHC = 0.2 ^{lb}/10³ gal

Distillate Oil Sulfur Content = 0.4%

Fuel Burn Rate = 210 gal/h

Particulate = (2 ^{lb}/10³ gal) (210 gal/h) = 0.42 ^{lb}/h
SO₂ = (142) (0.4 ^{lb}/10³ gal) (210 gal/h) = 11.9 ^{lb}/h
NO_x = (20 ^{lb}/10³ gal) (210 gal/h) = 4.2 ^{lb}/h
CO = (5 ^{lb}/10³ gal) (210 gal/h) = 1.05 ^{lb}/h
NMHC = (0.2 ^{lb}/10³ gal) (210 gal/h) = 0.042 ^{lb}/h

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DER Comment 6

- o Provide the stack parameters for each source at the H. D. King facility when oil is burned. The parameters are to include stack height, stack exit diameter, stack exit volume (acfm and dscfm), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume).

Response

- o The attached table lists stack parameters for Units 6, 7, and 8 when burning residual fuel oil, and diesel generators 1 and 2 when burning distillate oil. As discussed previously, FPUA will not burn fuel oil in Unit 9, therefore, no stack parameters are provided for Unit 9.

H. D. KING ELECTRIC GENERATING PLANT FUEL OIL FIRED STACK PARAMETERS

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Diesel Generators</u> *
Stack height, ft	148	148	150	23
Exit diameter, ft	5	7.1	8	3
Volumetric flow, acfm	64,400	138,000	190,000	16,600
, dscfm	39,900	85,500	119,000	5,400
Gas temperature, F	300	300	295	950
Exit velocity, fpm	3,280	3,490	3,780	2,350
Stack moisture, percent	10.97	10.98	10.82	12.74
Stack oxygen, percent	2.68	2.69	3.50	1.72

*Diesel generators 1 and 2 are identically sized. Values listed are for one diesel generator only.

DER Comment 7

- o Please model the ambient concentrations and increment consumption for the criteria pollutants sulfur dioxide, particulate, and nitrogen oxides from all sources (including the bypass stack) and for all averaging times when oil is burned. Incidentally, based on the available information, it appears that FPUA Unit 8 is an increment consuming source. Also, please update the soils and vegetation analysis to account for the effects of oil burning.

Response

- o As stated previously, Unit 9 will now only be permitted to operate while firing natural gas. The Unit 9 Prevention of Significant Deterioration (PSD) Application - August 1990 showed that, when firing natural gas, Unit 9 has predicted significant impacts for NO_x only. Consequently, NO_x is the only criteria pollutant for which impacts are considered.

The only FPUA source which consumes Class II PSD NO_x increment is Unit 9. (Note that Unit 8 began operating in 1976 and, thus, does not consume NO_x increment.) The August 1990 PSD application showed that Unit 9 (alone) consumes only 38 percent of the available Class II increment. This result is not affected by the burning of oil in the other FPUA sources.

Revised NAAQS modeling (accounting for oil use in other FPUA sources) was performed following the modeling methodology described in Section 5.0 of the August 1990 PSD application. It was shown in this application that the FPUA sources were the only sources that had the potential to interact with the Unit 9 NO_x significant impact area. Thus, FPUA Units 6 - 8 (firing No. 6 Fuel Oil) and Diesel Units 1 and 2 (firing No. 2 fuel oil) were considered along with Unit 9 (firing natural gas in the HRSG mode). Unit 9 source parameters and emission rates are given in

the response to DER Comment 1. Source parameters and emission rates for the other FPUA sources are given in the responses to DER Comments 5 and 6. All sources were conservatively assumed to operate 8,760 hours per year for the modeling analysis.

The attached table shows the results of the NAAQS modeling. The maximum combined source impact was 59.2 ug/m3, which occurred 100 meters west of the Unit 9 stack. This value was added to the 24 ug/m3 background value (West Palm Beach monitor - 1989) to get a total concentration of 83.2 ug/m3. This concentration is well below the annual NO_x standard of 100 ug/m3. Therefore, the FPUA facility annual NO_x impacts, including Unit 9, do not exceed the NAAQS. Copies of the NAAQS modeling runs are attached.

Note that NAAQS impacts with Unit 9 operating in the bypass mode would be even lower since the stack gas exit temperature and acfm flow values are higher for the bypass case. Higher temperatures and flows increase the thermal and momentum buoyancy and thus, increase the plume height. It is commonly accepted that, in the absence of elevated terrain, higher plume heights lead to lower ground-level pollutant impacts.

Since Unit 9 will only fire natural gas, the soils and vegetation analysis originally presented in the August 1990 PSD application is still applicable.

NAAQS MODELING SUMMARY FOR FPUA SOURCES

	NAAQS Modeling <u>Summary</u>
Maximum Impact Location	
Distance:	100 meters
Direction:	280 degrees
Meteorological Year:	1982
Combined Source Maximum Impact*:	59.2 ug/m3
Background Concentration**:	24 ug/m3
Total NAAQS Concentration: (Combined Maximum Impact plus Background)	83.2 ug/m3
NAAQS Primary NO _x Standard:	100 ug/m3

*Maximum Combined Impact From: Unit 9 (HRSG firing natural gas)
Units 6 - 8 (firing No. 6 fuel oil)
Diesel Units 1 and 2 (firing No. 2 fuel
oil)

**Background concentration measured in 1989 at West Palm Beach monitor.

DER Comment 8

- o Please explain what the situation in the Middle East has to do with the escalation rates. Explain the basis for the capital cost escalation rate of 6%, the operating cost escalation rate of 7%, the indirect cost factor of 16%, and the present worth discount rate of 8%. Provide data to support the selection of these rates as representative of the real world.

Response

- o Iraq's invasion of Kuwait substantially disrupted the world's oil supply. Accordingly, markets reacted increasing the price of crude oil from between \$15 and \$20 per barrel to as high as \$40 per barrel. Further price increases are likely should the Middle East situation result in a direct armed conflict.

Secondary effects of this large price increase (and potential future increases) will be felt throughout the economy, affecting alternate energy source and consumer product prices, and ultimately payroll costs. The most pronounced effect will be on natural gas prices. Natural gas competes directly with fuel oil for use in a number of applications. Natural gas price deregulation and fuel oil price increases will allow natural gas suppliers to increase prices substantially without risking competitive damage. Fort Pierce Utilities Authority has already experienced a substantial increase in the price of natural gas. Since Iraq's invasion, FPUA natural gas prices have increased 42 percent. Accordingly, the capital and operating cost escalation rates used in the revised BACT analysis reflect current and future economic uncertainty. Operating costs are escalated at a higher rate (7 percent) than capital costs (6 percent) since there is more uncertainty inherent in projecting operating costs over the remaining Unit 9 life of 25 years. These escalation rates are representative of rates used in a number of recent project financial viability evaluations.

Indirect costs listed in the calculation of total capital cost reflect owner and architect/engineer costs to design, procure, construct, and start-up the SCR system. The indirect cost factor of 16 percent is applied to the escalated direct capital cost of equipment. The rate of 16 percent is based on historical information regarding projects of this nature.

The present worth concept is a method of taking into account the time value of money. Therefore, the present worth discount rate of 8 percent used in the BACT analysis is based on the cost to FPUA for financing projects through the issuance of municipal bonds. This present worth discount rate was used in conjunction with the operating cost escalation rate (7 percent) and the remaining plant life assumption (25 years) to determine a levelization factor of 1.94. Levelized costs were determined by multiplying first year costs by the levelization factor. Levelized costs reflect the effects of escalation and present worth of future annual expenditures.

DER Comment 9

- o Explain why the installation of SCR on the combined cycle unit will require additional personnel equivalent to one operator for one-half shift per day. Please explain the term loaded payroll cost as it is used in conjunction with the additional personnel cost.

Response

- o The plant has been staffed to man existing operations in an efficient manner. Addition of an SCR system on Unit 9 will add complexity to operation of the existing facility. Mechanical and control equipment associated with operation of the SCR system will require periodic inspections to ensure operability, reliability, and safety. Periodic shipments of ammonia will be received by truck. Plant personnel will be required to monitor and assist in the receipt of these ammonia supplies. In addition, SCR system operation will require periodic surveillance of performance to ensure reliable compliance. All of these services associated with retrofit of an SCR system will require plant staffing. However, due to the relative simplicity of SCR system operation only four operating personnel hours per day were included in the evaluation.

Operating personnel costs were based on a loaded payroll cost of \$45,000 per year (1990 dollars). Loaded payroll costs include basic wages, social security, insurance, and other benefit costs.

DER Comment 10

- o Explain the difference between a catalyst that is suitable only for units that burn gas and a catalyst for units that burn both gas and oil. Please explain the difference both in technical and economic terms.

Response

- o FPUA is withdrawing it's application to burn fuel oil in Unit 9 during emergencies (see response to DER comments 4 and 5). Natural gas will be the primary fuel for Unit 9. As stated previously, the costs presented in the BACT analysis are based on a catalyst designed to treat flue gas from the combustion of natural gas only. If the facility were requesting dual fuel capabilities (natural gas or fuel oil) the catalyst would be larger, and therefore, more expensive. Larger catalysts are required for oil fired applications due to the fouling characteristics of the fuel oil's flue gas (predominately due to the sulfur content of the fuel) in the presence of ammonia. More reactive catalysts (used in natural gas applications) would tend to convert SO_2 in the flue gas to SO_3 . Subsequently, this SO_3 could react with ammonia to form ammonia sulfate and bisulfate salts. Ammonia salts would tend to blind catalyst surface areas and foul downstream equipment. Accordingly, to effectively treat flue gas from fuel oil combustion, the catalyst would consist of a less reactive catalyst material and have a lower space velocity (a parameter inversely related to the residence time of the flue gas in the catalyst bed).

DER Comment 11

- o Please explain why the emission reductions for using SCR to control NO_x are not consistent in Table 4-1 for the original application and the additional information response (218 vs. 202 tons per year).

Response

- o The original application's calculation of the annual emission difference between a 42 and a 9 ppmvd NO_x emission limit of 218 tons per year was in error. The correct difference is 202 tons per year. The example calculation provided in Attachment 4 (submitted with the letter dated October 23, 1990 responding to the DER's comment letter dated September 28, 1990) correctly illustrates the calculation of emission rate based on an outlet NO_x concentration of 42 ppmvd. The following response to DER comment 12 will provide an example calculation of the difference used in the BACT analysis.

DER Comment 12

- o Please show the calculations to document the NO_x emission reduction achieved by SCR shown in Table 4-1.

Response

- o As documented in the BACT analysis, a new SCR system catalyst can achieve up to 90 percent reduction of NO_x emissions. However, as the catalyst ages the maximum NO_x emission reduction efficiency will decrease to between 80 and 85 percent. To ensure reliable compliance with emission limits it is recommended that an SCR system is capable of maintaining an emission limit of 9 ppmvd (at 15 percent oxygen) continuously. The attached calculation (included as a supplement to the example calculation provided in Attachment 4 of the previous response) documents the calculation of emissions and emission differences based on a maximum NO_x emission of 9 ppmvd.

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Owner FRPA Computed By J. Cochran
Plant H.D. King Unit 9 Date 12/5 19 90
Project No. 10589 V File No. _____ Checked By AKW
Title Unit 9 NO_x Emission When Using Date 10/15 19 90
an SCR System Page 1 of 1

Revised Sample Calculation provided to DER in Attachment #
in response to previous DER comments (submitted dated 10/23/90).

Unit 9

Flue Gas Mols @ 15% Oxygen = $30,485 \frac{\text{mols}}{\text{h}}$ (See previous Attachment 4)

SCR NO_x Emission Rate = 9 ppmvd @ 15% O₂

$$\text{NO}_x \text{ Emission Rate} = \left(9 \frac{\text{mols NO}_x}{10^6 \text{ mols flue gas}} \right) (30,485 \frac{\text{mols}}{\text{h}}) (46.0055 \frac{\text{lb NO}_x}{\text{mol NO}_x})$$

$$\text{NO}_x \text{ Emission Rate} = 12.6 \frac{\text{lb}}{\text{h}}$$

$$\text{NO}_x \text{ Emission Rate @ 42 ppmvd (15\% O}_2) = 58.9 \frac{\text{lb}}{\text{h}} \text{ (see previous Attachment 4)}$$

$$\text{Annual Plant Operation} = 8760 \frac{\text{hr}}{\text{yr}}$$

$$\begin{aligned} \text{Annual NO}_x \text{ Reduction From Inst. SCR} &= (58.9 - 12.6 \frac{\text{lb}}{\text{h}}) (8760 \frac{\text{hr}}{\text{yr}}) (\frac{1 \text{ ton}}{2000 \text{ lb}}) \\ &= \underline{\underline{202 \text{ tpy}}} \end{aligned}$$

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H.D. KING ELECTRIC GENERATING PLANT

311 North Indian River Drive (34950)
Post Office Box 1298 (34954)
Fort Pierce, Florida
(407) 464-5792

October 23, 1990

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

FEDERAL EXPRESS

Attn: Mr. C. H. Fancy

Dear Mr. Fancy:

Re: AC 56-185836 - Fort Pierce Utilities
Authority - H. D. King, Unit 9

Enclosed is our response to your comment letter of September 28, 1990 and subsequent telephone clarifications regarding our permit to relicense Unit 9.

Your comment #12, Requested Construction Permits for Units 6, 7 & 8, we have reviewed our files and records, contacted former employees, and have not been able to locate a copy of any construction permits for these units. We have also contacted former employees of Reynolds, Smith & Hills which was our engineer of record in the past; however, their files have been purged and we are unable to obtain any information regarding construction permits from them.

We have contacted the Florida Dept. of Environmental Regulation, Southeast District office regarding the possibility of construction permits in their files. We will research their archives within the next few days and will forward copies to your office of any construction permits we are able to locate.

We have attempted to formulate our responses based on the methodology approved most recently by the DER in the BACT determination for TECO's Hardee County permit. We believe that this consistency of analysis is important to both the DER and to applicants trying to comply with BACT analysis requirements.

We are most interested in discussing this with the DER further, to ensure that we are correctly applying the DER's policy decisions made during the Hardee County permit process.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Harry Schindehette', is written over a horizontal line.

Harry Schindehette, P.E.
Director of Utilities

HL/HS:m

Enclosure
cc: Jack Miller
Harry Lamb

Handwritten notes:
No. 10-10-90
F. B. H. W.
J. G. H. W.

Handwritten notes:
J. G. H. W.
J. G. H. W.

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From (Your Name) Please Print Harry Schindehette		Your Phone Number (Very Important) (407) 464-5600	
Company Fort Pierce Utilities Authority		Company Florida Dept. of Environmental Regulation	
Street Address 211 No. Indian River Drive		Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes) Twin Towers Office Bldg.	
City Ft. Pierce		City Tallahassee	
State FL		State FL	
ZIP Required 34950		ZIP Required 32399-2400	
YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)			
PAYMENT 1 ☒ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party, FedEx Acct. No. 4 ☐ Bill Credit Card		IF HOLD FOR PICK-UP, Print FEDEX Address Here	
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		YOUR DECLARED VALUE 1 2 3 4 5 6 7 8 9 10 11 12	
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		Federal Express Use Base Charges Declared Value Charge Other 1 Other 2 Total Charges REVISION DATE 11/89 PART # 19500 SRCEF 1/90 FORMAT #014 014 © 1989 F.E.C. PRINTED IN U.S.A.	

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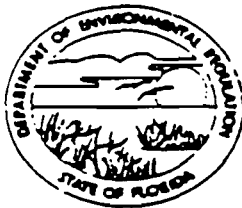
- o Please provide a completed State of Florida permit application form [DER Form 17-1.202(1)] that is signed by the owner or the owner's authorized agent. The permit application form is also to be signed and sealed with a metallic impression-type seal by a professional engineer registered in Florida.

Response

- o Attached please find a completed permit application form.

DEPARTMENT OF ENVIRONMENTAL REGULATION

RTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207BOB GRAHAM
GOVERNORVICTORIA J. TSCHINKEL
SECRETARYG. DOUG DUTTON
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Combustion Turbine [☒] New¹ [☐] Existing¹APPLICATION TYPE: [☒] Construction [☐] Operation [☐] ModificationCOMPANY NAME: Fort Pierce Utilities Authority COUNTY: St. LucieIdentify the specific emission point source(s) addressed in this application (i.e. Lime
Gas Turbine/
Kila No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Waste Heat BoilerSOURCE LOCATION: ~~XXXXX~~ 311 North Indian River Drive City Fort PierceUTM: East 566.692 North 3036.292Latitude 27° 27' 01" N Longitude 80° 19' 29" WAPPLICANT NAME AND TITLE: Harry Schindehette, DirectorAPPLICANT ADDRESS: FPUA, P.O. Box 3191, Fort Pierce, Florida 33448

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Fort Pierce Utilities
Authorities

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

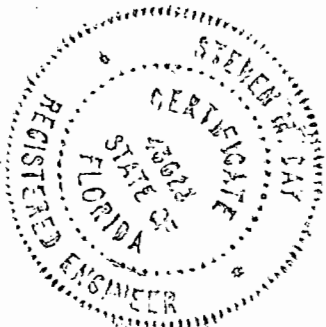
Signed: Harry Schindehette, Director
Name and Title (Please Type)Date: 10-23-90 Telephone No. (305)464-5600

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

¹ See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed Steven M. Day

Steven M. Day

Name (Please Type)

Black & Veatch

Company Name (Please Type)

P. O. Box 8405, Kansas City, MO 64114

Mailing Address (Please Type)

Florida Registration No. 43028

Date: 10/19/90

Telephone No. (913)339-2880

SECTION II: GENERAL PROJECT INFORMATION

- A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See Section 2.0 of the AAQIA (Attachment 1) & the revised BACT Analysis (Attachment

2). The project will result in full compliance with all applicable regulations.

- B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction April 1988 Completion of Construction January 1990

- C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

See Attachment 2. Note that steam injection for

reduction of NO_x emissions is an integral part of the gas turbine.

- D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Permit to Construct: AC 56-141460 Issued March 28, 1990

Permit to Operate: AQ 56-175955 Issued May 1, 1990

Expires March 30, 1995

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52
if power plant, hrs/yr 8760 ; if seasonal, describe: N/A

F. If this is a new source or major modification, answer the following questions.
(Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
 - a. If yes, has "offset" been applied?
 - b. If yes, has "Lowest Achievable Emission Rate" been applied?
 - c. If yes, list non-attainment pollutants.
2. Does best available control technology (BACT) apply to this source?
If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioration" (PSD)
requirement apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS)
apply to this source? Yes
5. Do "National Emission Standards for Hazardous Air Pollutants"
(NESHAP) apply to this source? No
- H. Do "Reasonably Available Control Technology" (RACT) requirements apply
to this source? No
 - a. If yes, for what pollutants? N/A
 - b. If yes, in addition to the information required in this form,
any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% wt		
Water	(NA - No	Emissions	from Water)	

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): NA

2. Product Weight (lbs/hr): NA

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission ¹		Allowed ² Emission Rate per Rule 17-2	Allowable ³ Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual t/yr			lbs/yr	t/yr	
Particulates	2.5	11.0	NA				
SO _x	0.2	0.9	150 ppm _{dv}				
NO _x	58.9	258.0	*				
VOC	2.4	10.5	NA				
CO	8.5	37.2	NA				

¹See Section V, Item 2.

²Reference applicable emission standards and units (e.g. Rule 17-2.600(3)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

*New Source Performance Standards for combustion turbines (40 CFR 60 Subpart GG) limits NO_x to 75 ppm_{dv} at 15% O₂, corrected for fuel nitrogen content and turbine heat rate, or 84 ppm_{dv} at 15% O₂, whichever is more stringent.

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
	See Attachment 2. NO _x emissions control by steam injection			
is an integral part of the gas turbine				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas		0.380	353
		(@20 F Ambient Conditions)	
No. 2 Fuel Oil		2672	350
(Emergency Backup)		(@20 F Ambient Conditions)	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: Natural Gas

Percent Sulfur: 2000 gr/MMCF Percent Ash: Nil

Density: 0.0446 lb/SCF ~~XXXXXX~~ Typical Percent Nitrogen: 0.71%

Heat Capacity: 20.860 BTU/lb 930 Btu/SCF ~~XXXXXX~~

Other Fuel Contaminants (which may cause air pollution): See Section 3.3 of the AAQIA

(Attachment 1) and Attachment 2.

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average NA Maximum NA

G. Indicate liquid or solid wastes generated and method of disposal.

NA

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack): *

Stack Height: _____ ft. Stack Diameter: _____ ft.

Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F

Water Vapor Content: _____ % Velocity: _____ ft

*See Attachment 3 for HRSG and Bypass Stack Characteristics.

SECTION IV: INCINERATOR INFORMATION

NA

Type of Waste	Type I (Plastics)	Type II (Rubbish)	Type III (Refuse)	Type IV (Garbage)	Type V (Pathological)	Type VI (Liq. & Gas By-prod.)	Type VII (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lb/hr)							

Description of Waste _____

Total Weight Incinerated (lb/hr) _____ Design Capacity (lb/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume (ft ³)	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ ft

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) _____

Best Available Copy

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION VI: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. For a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. For an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See AAQIA (Attachment 1) and calculations included in Attachment 4.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
See Attachment 4
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.) See Attachment 2
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency). See Attachment 2
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
See Attachment 5.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
See Figure 2-1 in the AAQIA (Attachment 1)
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing process and outlets for airborne emissions. Relate all flows to the flow diagram.
See Figure 2-2 in the AAQIA (Attachment 1)

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
 Fee has already been submitted.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

- A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

☒ Yes ☐ No

Contaminant	Rate or Concentration
SO ₂	150 ppmvd at 15% O ₂
NO _x	*

*75 ppmvd at 15% O₂ corrected for nitrogen content and heat rate, or 84 ppmvd at 15% O₂.

- B. Has EPA declared the best available control technology for this class of sources (yes, attach copy)

☐ Yes ☒ No Case-by-case determination

Contaminant	Rate or Concentration

- C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
See Attachment 2.	
NO _x	42 ppmvd at 15% O ₂ (Natural Gas)

- D. Describe the existing control and treatment technology (if any).

See Attachment 2

1. Control Device/System:

2. Operating Principles:

3. Efficiency:

4. Capital Costs:

Explain method of determining

Best Available Copy

5. Useful Life:

7. Energy:

9. Emissions:

6. Operating Costs:

8. Maintenance Cost:

Contaminant

Rate or Concentration

10. Stack Parameters

a. Height:

Ft.

b. Diameter:

Ft.

c. Flow Rate:

ACFM

d. Temperature:

°F.

e. Velocity:

FPS

C. Describe the control and treatment technology available (As many types as applicable use additional pages if necessary).

1. See Attachment 2

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Costs:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Costs:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

¹ Explain method of determining efficiency.

Energy to be reported in units of electrical power - KWH design rate.

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j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

f. Describe the control technology selected: See Attachment 2

1. Control Device:

2. Efficiency:¹

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:²

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

(8) Process Rate:¹

b. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

(8) Process Rate:¹

10. Reason for selection and description of systems:

¹Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

See Section 6.5 of the AAQIA (Attachment 1)

A. Company Monitored Data1. _____ no. sites _____ TSP _____ () SO₂ _____ Wind spd/dirPeriod of Monitoring _____ / _____ / _____ to _____ / _____ / _____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

Specify bubbler (B) or continuous (C).

Best Available Copy

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?
☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling See Section 5.5 of the AAQIA (Attachment 1)

1. _____ Year(s) of data from _____ to _____
month day year month day year

2. Surface data obtained from (location) _____

3. Upper air (mixing height) data obtained from (location) _____

4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used See Section 5.3 of the AAQIA

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

Applicant's Maximum Allowable Emission Data See Section 5.2 of the AAQIA (Attachment 1)

Pollutant	Emission Rate
TSP	_____ grams/sec
SO ₂	_____ grams/sec

E. Emission Data Used in Modeling *

Attach list of emission sources. Emission data required is source name, description of point source (on NEQS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review. *

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. *

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

* E-H: See AAQIA (Attachment 1) for detail.

ATTACHMENT 1

AMBIENT AIR QUALITY IMPACT ANALYSIS (AAQIA)
AUGUST 1990

FORT PIERCE UTILITIES AUTHORITY
H. D. KING UNIT 9
PREVENTION OF SIGNIFICANT DETERIORATION
(PSD)
APPLICATION

B&V PROJECT 16589.070
AUGUST 1990

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APPENDIX A	DIRECTION-SPECIFIC BUILDING ANALYSIS

1.0 INTRODUCTION

On May 1, 1990, the Fort Pierce Utilities Authority (FPUA) was issued a permit (AO 56-175955) by the Florida Department of Environmental Regulation (FDER) for the operation of a 31.6 MW combined cycle gas turbine at the H. D. King power plant in Fort Pierce, Florida. This combined cycle system (Unit 9 and 5) consists of a 23.4 MW natural gas fired combustion turbine generator, steam generator, and an 8.2 MW condensing steam turbine. Unit 9 commenced operation in early 1989; the final operating permit was issued in early 1990.

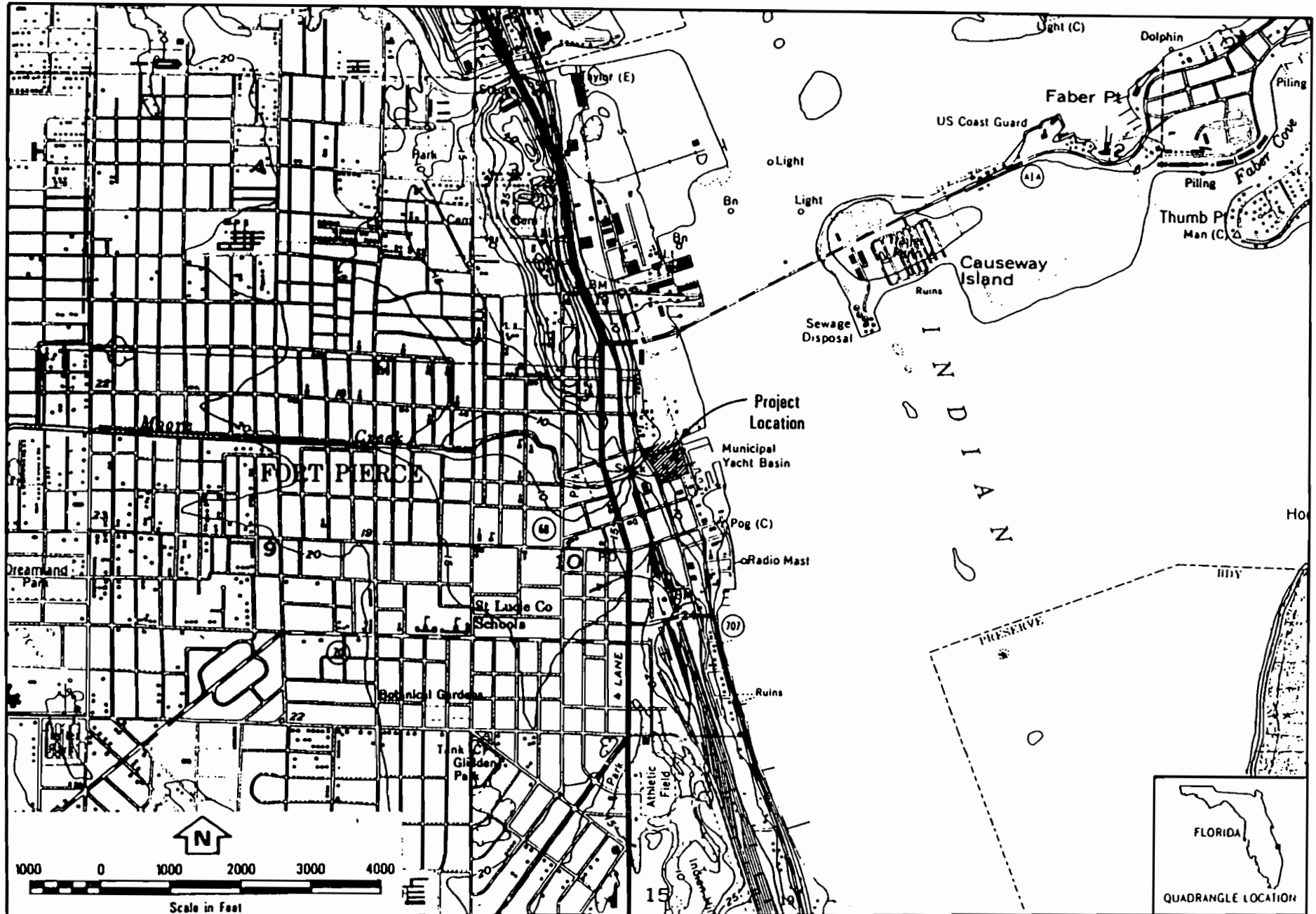
In the Unit 9 construction permit, the operating hours for the existing H. D. King Units 6, 7, and 8 were restricted such that the net increase of all regulated pollutants were below Prevention of Significant Deterioration (PSD) significant emission increases. Therefore, Unit 9 was previously not subject to PSD regulations. Due to increased electricity demands, it is now necessary to remove the operational limitation for Units 6, 7, and 8 that were imposed in the original Unit 9 permit. If the Unit 9 permit operational restrictions on Unit 6, 7, and 8 are removed, then Unit 9 requires repermitting subject to PSD regulations.

This report describes the PSD applicability and modeling methodology for air quality permitting of the Unit 9 combined cycle system. The permit methodology assumes that Units 6, 7, and 8 can operate at the levels described in their respective permits (AO-56-113534, AO-56-112679, and AO-56-112678). The purpose of this analysis is to demonstrate that the combustion turbine will not cause or contribute to an exceedance of any national or state ambient air quality standards and will not consume more than the applicable amount of Prevention of Significant Deterioration (PSD) air quality increment. A Workplan which described the proposed methodology to be followed in this analysis was discussed with the appropriate FDER staff on July 24, 1990.

2.0 PROJECT DESCRIPTION

The FPUA Project is located in St. Lucie County, Florida, on land currently owned by the FPUA. The land is zoned M-1 and is adjacent to the Indian River. A project site location map is shown in Figure 2-1. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are: 566.8 kilometers (East) and 3,036.3 kilometers (North). The project site arrangement is shown in Figure 2-2.

The combined cycle system includes a 23.4 MW combustion turbine (CT), a steam generator, and an 8.2 MW condensing steam turbine. The CT will burn natural gas as the primary fuel. No. 2 fuel oil (distillate) will only be used as emergency backup fuel. Emergency fuel is defined in Subpart GG, Standard of Performance for Stationary Gas Turbines, 40 CFR 60.331.



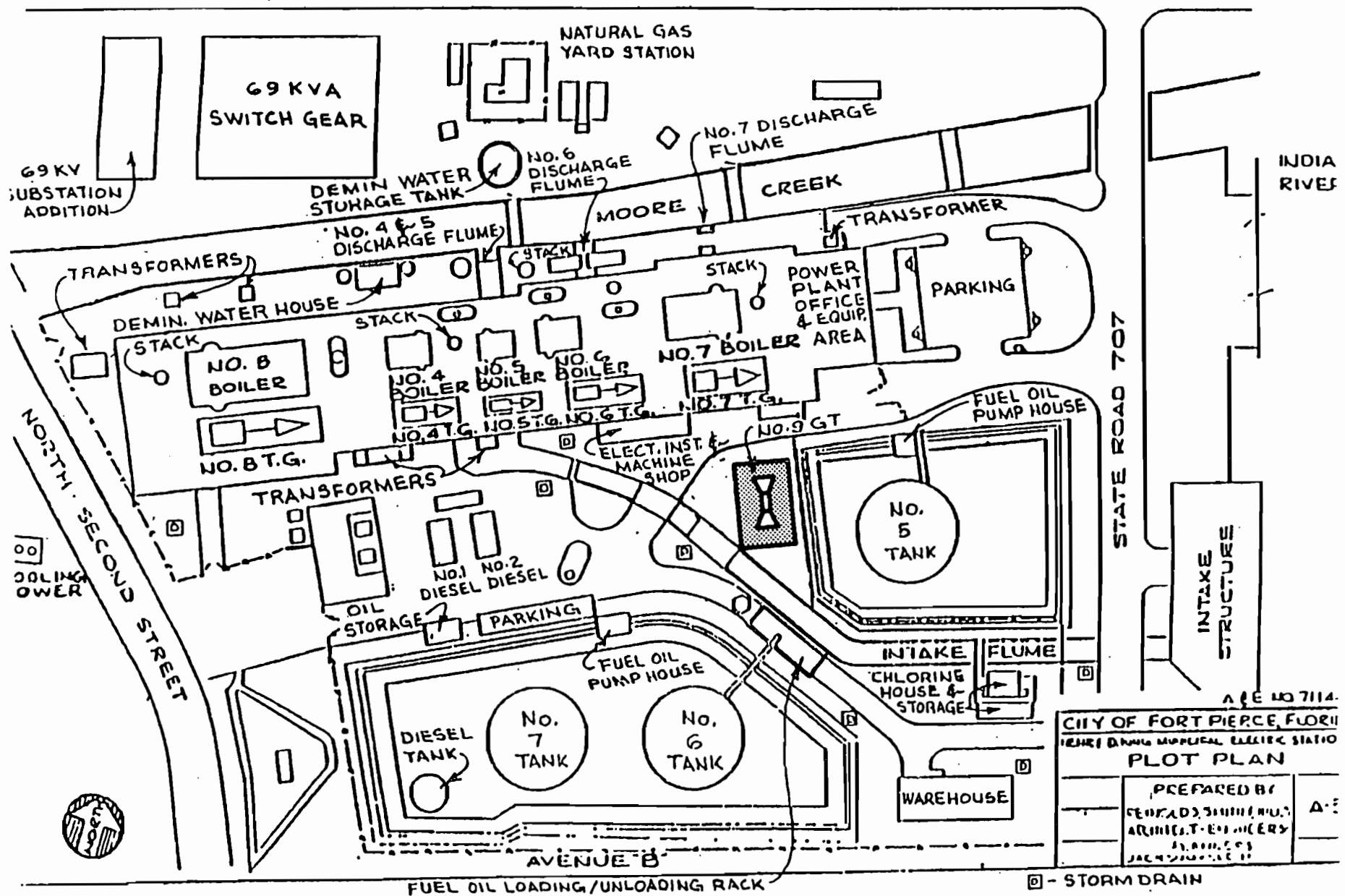
Base Map Source: USGS,
Fort Pierce, FL Quadrangle, 1983

PROJECT SITE LOCATION

Figure 2-1

FIGURE 2-2. SITE ARRANGEMENT

2-3



3.0 APPLICABILITY ANALYSIS

For PSD regulations to be applicable, a source must be considered a new major stationary source or a major modification to an existing facility. In addition, the source must be located in an area which is designated as "attainment" or "unclassifiable" for at least one pollutant emitted by the source and regulated under the Clean Air Act. If a source is determined to be subject to PSD regulations, then each regulated pollutant that is emitted in excess of designated "significant emission rates" is subject to additional PSD review. Additional review includes a Best Available Control Technology (BACT) analysis, an Ambient Air Quality Impact Analysis (AAQIA), and additional impacts analysis, as appropriate.

3.1 CURRENT AIR QUALITY STATUS

The project site is located in St. Lucie County. This area is currently designated as attainment or unclassifiable with regard to carbon monoxide (CO), particulate matter (PM₁₀), nitrogen oxides (NO_x), ozone (VOCs) and sulfur dioxide (SO₂).

An area is designated as "attainment" for a pollutant if ambient air quality standards for that pollutant are being met and "nonattainment" if they are not. An area is designated as "unclassifiable" for a pollutant if the attainment status cannot be determined. Unclassifiable areas will be considered in attainment for this PSD analysis.

The nearest nonattainment area is Palm Beach County, which is designated nonattainment for ozone. This area, located over 50 km from the H. D. King site, is not anticipated to be significantly impacted by the proposed project.

3.2 SOURCE APPLICABILITY

A major stationary source is defined as any one of 28 source categories listed in 40 CFR 52.21 which emits, or has the potential to emit, 100 tons per year or more of any regulated pollutant. In addition, any stationary source not listed in 40 CFR 52.21 which emits 250 tons per

year (tpy) or more of any regulated pollutant is also considered a major stationary source. The existing Unit 6, 7, and 8 boilers can be categorized in one of the 28 listed source categories. These boilers emit at least 100 tpy of a criteria pollutant and are thus considered to be a major existing source.

A major modification is defined as any physical or operational change in a major stationary source that would result in a significant net emissions increase of any regulated pollutant. The previous permit for Unit 9 restricted the operational hours of Units 6, 7, and 8 such that the net emission increases were below PSD significant levels. The emission calculations were based on net emission increases from Unit 9 minus the net emission decreases resulting from the operational limitations of Units 6, 7, and 8.

Due to increased energy demands, it is necessary to remove operational restrictions on Units 6, 7, and 8. Therefore, the emission credit can no longer be taken for the contemporaneous decreases in emissions for these units. Thus, the net increases from Unit 9 alone must be compared to the PSD significant emission rates.

The significant emission rates and Unit 9 emissions are given in Table 3-1. The annual emissions are based on Unit 9 operating at maximum load for 8,760 hours per year. The NO_x emissions are based on 42 parts per million on a dry volume basis (ppmvd), referenced to 15 percent oxygen. As shown in the table, Unit 9 emissions of NO_x exceed the PSD significant emission rate. Therefore, the project is considered to be a major modification to an existing major source and is subject to PSD regulations.

3.3 POLLUTANT APPLICABILITY

Once a source is determined to be subject to PSD regulations, each regulated pollutant must be assessed for PSD program applicability. The significant emission rate criteria used to determine source applicability are also used to establish pollutant applicability. Table 3-1 shows that only NO_x has the potential to be emitted at levels above the PSD significant emission rates. Thus, NO_x is subject to further PSD review, including a BACT assessment and an AAQIA.

TABLE 3-1. SIGNIFICANT AND UNIT 9 ANNUAL EMISSION RATES

<u>Pollutant</u>	<u>Significant Emission Rates</u> tpy	<u>Unit 9 Estimated Annual Emissions^a</u> tpy	<u>Applicable Pollutant</u> Yes/No
Carbon Monoxide (CO)	100	41.6	No
Nitrogen Oxide (NO _x)	40	288.4	Yes
Sulfur Dioxide (SO ₂)	40	0.9	No
Particulate (TSP)	25	11.0	No
Particulate (PM ₁₀)	15	11.0 ^b	No
Ozone (VOC)	40	17.5	No
Lead	0.6	<<0.6	No
Asbestos	0.007	<<0.007	No
Beryllium	0.0004	<<0.0004	No
Mercury	0.1	<<0.1	No
Fluorides	3	<<3	No
Sulfuric Acid Mist	7	0.027	No
Vinyl Chloride	1.0	<<1.0	No
Total Reduced			
Sulfur (TRS)	10	<< 10	No
Reduced Sulfur	10	<< 10	No
Hydrogen Sulfide	10	<< 10	No

^aEmissions are based on 8,760 hours per year of natural gas firing at full load.

^bAssumes all particulate less than 10 microns.

4.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

(See Attachment 2 for Revised BACT Analysis)

5.0 MODELING METHODOLOGY

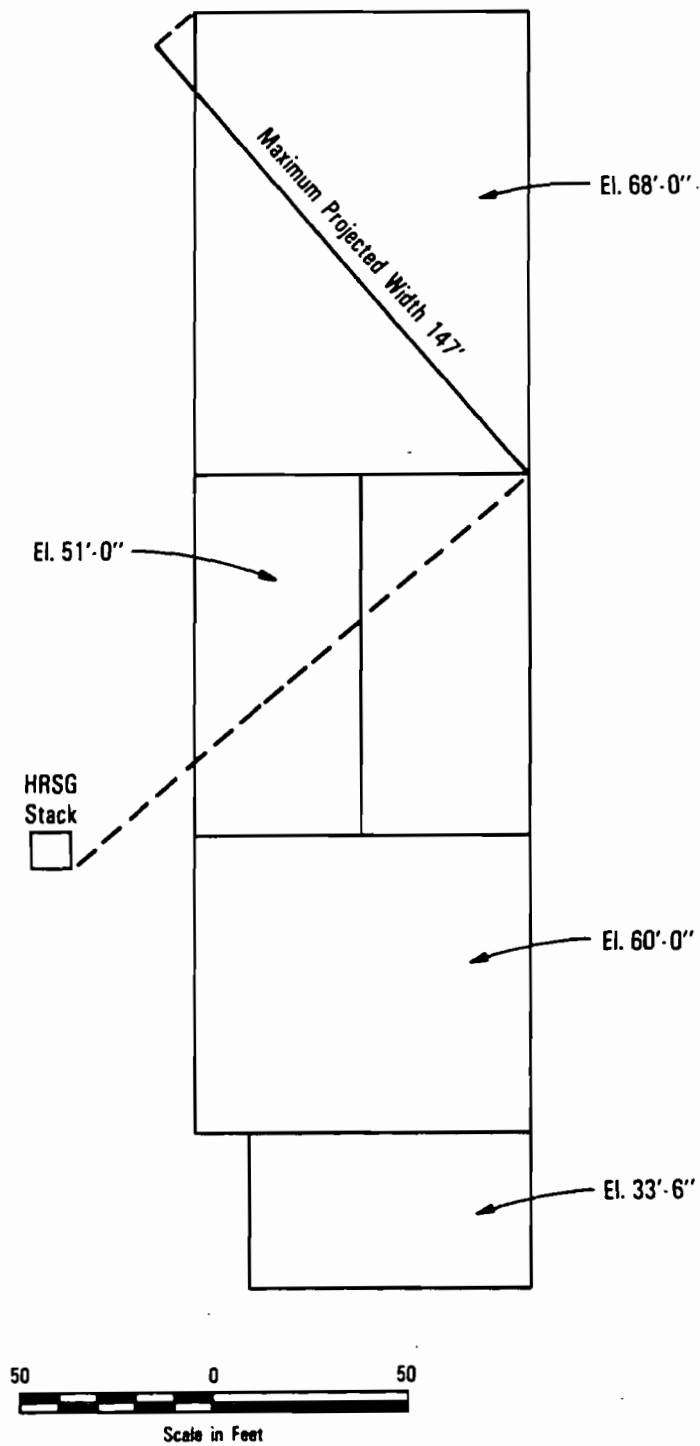
This section describes the modeling methodology for determining the ambient air quality impacts for Unit 9. The methodology is based on FDER and EPA guidelines and used EPA approved dispersion models. The dispersion models have been revised to include the most recent changes associated with EPA dispersion modeling guidelines. The modeling methodology includes a discussion of the GEP stack height, source data, appropriate dispersion models, receptor locations, meteorological data, and the definition of modeling assumptions used in the preliminary modeling analysis.

The air quality modeling output files supporting the PSD Permit Application will be submitted to the FDER on diskette and as hardcopy.

5.1 GEP STACK HEIGHT DETERMINATION

A Good Engineering Practice (GEP) stack height is defined as the height at which emissions are not significantly influenced by building downwash. The GEP stack height is calculated as the height of a nearby building plus 1.5 times the lesser of the building height or maximum projected width. A nearby building is defined as one which is located within five times the lesser of its height or maximum projected width from the stack. The resultant GEP stack height is the highest calculated stack height based on all influencing building dimensions.

Emissions from the Unit 9 stack will be influenced by the structures associated with the existing H. D. King facility. The building dimensions and GEP determination are shown in Figure 5-1. The GEP stack height of 170 feet is based on the steam turbine building height of 68 feet, and a maximum projected width that exceeds the height. The bypass and HRSG stacks for Unit 9 are constructed at 60 feet. Because the stack height is less than the calculated GEP height, the effect of building downwash on pollutant dispersion will be incorporated in the modeling analysis. In fact, since the stack height is less than the dominant building height, direction-specific building heights and widths must be used in the refined modeling analysis. Appendix A shows the output of Trinity Consultant's "BRZWAKE" program, which was used to determine direction-specific building dimensions.



GEP STACK HEIGHT DETERMINATION

Figure 5-1

5.2 PROPOSED SOURCE DATA

Unit 9 will fire natural gas as the primary fuel with distillate used as emergency backup fuel. Modeling was based on natural gas firing assuming 8,760 hours of operation per year at maximum design capacity. Unlike steam generating plants, gas turbines typically operate at maximum (100 percent) load and generally do not operate at reduced load conditions.

The bypass stack will operate only when the HRSG is being serviced. The flue gas exiting the bypass stack is hotter than the HRSG flue gas. Increased thermal buoyancy associated with the bypass stack will enhance plume rise and subsequent dispersion. Thus, impacts from the bypass stack are expected to be less than those from HRSG operation. Therefore, only impacts from HRSG operation were modeled in this analysis.

Modeling parameters for Unit 9 operating in combined cycle and firing natural gas are given in Table 5-1.

5.3 MODEL SELECTION AND DESCRIPTION

For most air quality modeling assessments, it is desirable to use both screening-level and refined dispersion modeling techniques. In this analysis, screening-level modeling was used to determine impacts in the building cavity region. Refined dispersion modeling was used to identify the maximum ambient pollutant impacts, the location of those impacts, and the area which will be significantly impacted by the source.

5.3.1 Screening Modeling

The EPA approved "Screen" model was used to determine the impacts in the building cavity region. This model assumes worst case meteorological conditions to predict maximum 1-hour pollutant impacts. If the cavity region is on FPUA property, then the cavity impacts need not be considered. However, if the cavity region extends beyond the property boundary, then the impacts must be considered in the AAQIA.

5.3.2 Refined Modeling

In order to assess the Unit 9 impacts, the modeling analyses incorporated simple terrain, rural land use, calculation of short-term and annual impacts, and building downwash effects. EPA guideline documents

TABLE 5-1. SOURCE DATA FOR THE UNIT 9 COMBUSTION TURBINE FIRING
NATURAL GAS

<u>Model Parameters</u>	<u>Unit 9</u>
Stack Height, feet	60
Stack Exit Diameter, feet	11.2
Stack Flow Volume, acfm	418,540
Stack Exit Velocity, fpm	4,271
Stack Exit Temperature, F	491
Ambient Temperature, F	20
<u>Emissions*</u>	
SO ₂ emissions, lb/h	0.2**
NO _x emissions, lb/h	65.9***
CO emissions, lb/h	9.5
TSP/PM ₁₀ emissions, lb/h	2.5
VOC emissions, lb/h	4
Model Coordinates, km	
(East - x)	0
(North - y)	0
Source Coordinates, km	
(East - x)	566.8
(North - y)	3036.3

*Emissions based on manufacturer's performance estimates with natural gas firing.

**The SO₂ emission rate is based on a sulfur content of 2,000 grains of sulfur per million cubic feet of natural gas (AP-42), a heat content of 929.6 Btu/ft³, and a heat input of 340 MBtu/h.

***The NO_x emission rate is based on 42 ppmvd referenced to 15 percent oxygen.

recommend that the Industrial Source Complex Short-Term (ISCST) dispersion model be used for these modeling situations. EPA has issued guidelines to assist in determining what model options should be used. The following assumptions were made for the modeling analyses:

- o The site was considered rural based on actual land use within 3 km.
- o Standard EPA default modeling options were applied.
- o Terrain elevations were not used.
- o Schulman-Scire building downwash with direction-specific building heights and widths were considered.
- o The highest modeled concentrations were used to represent the annual impacts.

Preliminary modeling (see Section 6.0) for determining the Unit 9 significant impact areas and maximum impacts was based on a nominal emissions rate (1 g/s) and a ratio of actual pollutant emissions. That is, individual pollutant impacts were determined by multiplying the nominal impacts by the actual pollutant emission rates (g/s).

5.4 RECEPTOR LOCATIONS

Initial modeling for the Unit 9 stack was performed with receptors placed along the 36 standard radial directions surrounding the Unit 9 stack at the following downwind distances: 100 meter intervals from 100 to 1,000 meters, 250 meter intervals from 1,250 to 3,000 meters, and 1,000 meter intervals from 4,000 to 10,000 meters. Furthermore, discrete receptors were placed at the boundaries that restrict public access along the 36 radial directions.

5.5 METEOROLOGICAL DATA

Five consecutive years of meteorological data from a nearby National Weather Service station can be considered to be representative of the dispersion patterns at the site. Specifically, West Palm Beach surface and upper air data for the period 1982 through 1986 were obtained from the FDER and were used for the analysis.

6.0 AIR QUALITY IMPACT ANALYSES

6.1 CAVITY ANALYSIS

The "Screen" model cavity analysis showed that the cavity region extends 33 meters downwind from the source. Since this distance is well within the facility property boundary, cavity impacts were not considered in the ambient impact analysis.

6.2 PRELIMINARY MODELING

Unit 9 was modeled with ISCST and the five years of meteorological data. The modeling was based on the stack parameters and modeling assumptions given in Section 5.0. The results of the modeling were used to determine if a pollutant's impact exceeds PSD significant impact levels, determine whether preconstruction monitoring is required, and establish pollutant significant impact areas.

The results of the preliminary modeling are given in Table 6-1. As demonstrated in Section 3-2, it was only necessary to model NO_x . As shown, the annual NO_x impact (9.6 ug/m³) is predicted to exceed the PSD significant impact level (1 ug/m³) but not the monitoring threshold (14 ug/m³). The maximum impact for each year occurred along the plant boundary. Since the annual NO_x impact exceeds the significance level, interacting source modeling must be performed.

For each applicable pollutant, the extent of the significant impact area must be defined. The radii of significant impact is determined by extending the receptor array outward until the predicted pollutant concentration at a receptor distance is less than the appropriate significance level. The highest modeled annual concentrations were used to determine the significant impact area.

The significant impact area for NO_x was found to extend only 300 meters from the HRSG stack. This radius is small because of the extreme downwash associated with the nearby H. D. King structures.

TABLE 6-1. RESULTS OF THE PRELIMINARY MODELING ANALYSIS

	Unit 9
	NO _x
	Annual
	<u>Impact</u>
Significant Impact Criteria	1 ug/m3
Monitoring Criteria	14 ug/m3
Maximum Impact*	9.6 ug/m3
Location	
Distance	0.88 km
Direction	260 deg
Year	1984

* Maximum nominal impacts for 1 g/s are 1.15697 ug/m³ (annual).

6.3 POTENTIAL INTERACTING SOURCES

Since the annual NO_x impact is greater than the PSD significant impact criteria, potential interacting sources must be assessed. The FDER provided copies of the Air Pollution Information System Master Detail Report ("the inventory") for St. Lucie, Indian River, and Martin counties. All sources in these counties that satisfied one of the following conditions were considered potential interacting sources.

- o All sources within the Unit 9 NO_x significant impact area (300 meters).
- o All sources within 50 kilometers of Unit 9 which have annual NO_x emissions greater than 100 tons per year and show a significant impact in the Unit 9 significant impact area.
- o All sources within 10 kilometers of Unit 9 which have annual NO_x emissions greater than 1 ton per year and show a significant impact in the Unit 9 significant impact area.

From the inventory, it is apparent that the only NO_x sources within the 300 meter significant impact area are associated with the FPUA H.D. King power plant. Consequently, the H.D. King Unit 6, 7, and 8 boilers were used in the National Ambient Air Quality Standards (NAAQS) interacting source modeling. However, since the inventory does not indicate that these sources are subject to PSD regulations, they were not used in the PSD increment modeling. The source parameters for these boilers were extracted from the inventory and are listed in Table 6-2.

All 100 ton per year sources within 50 kilometers and 1 ton per year sources within 10 kilometers were extracted from the inventory and are listed below by facility.

- o City of Vero Beach Steam Power Plant
- o Tropicana Products
- o Fort Pierce Lawnwood Regional Medical Center
- o Minton Sun Citrus Processing Plant
- o Fort Pierce Contracting Corporation Asphalt Plant

These facilities were modeled using ISCST and the source parameters listed in the inventory to determine if the significant impact level was exceeded at the FPUA facility. Where possible, the maximum allowable

TABLE 6-2. NAAQS INTERACTING SOURCES

<u>Parameter^a</u>	<u>FPUA Unit 6</u>	<u>FPUA Unit 7</u>	<u>FPUA Unit 8</u>
East Coordinate ^b (m):	-18.6	6.7	-68.0
North Coordinate ^b (m):	36.3	33.8	18.3
Volumetric Flow (acfm)	42,735	83,333	125,847
Stack Exit Diameter (ft)	5	7.1	8.0
Stack Exit Velocity (fps)	36.3	35.1	41.7
Stack Height (ft)	148	128	150
Exit Temperature (F)	325	253	275
NO _x Emission Rate ^c (lb/h)	1.3	104.4	173.2

^aSource parameters extracted from FDER source inventory.

^bStack coordinates relative to FPUA Unit 9 stack.

^cHourly emission rates as stated in FPUA Unit 9 permit.

pounds per hour NO_x emission rate was used in the modeling. However, since the allowable emission rate was not listed in the inventory, the actual NO_x emission rate was used for the Tropicana and Fort Pierce Contracting Corporation sources. The modeling showed that the highest annual NO_x impact from these facilities was 0.08 ug/m³. Since this impact is well below the PSD significance level of 1.0 ug/m³, these sources were not included in the NAAQS or PSD increment modeling.

6.4 PSD INCREMENT ANALYSIS

PSD regulations were promulgated as a result of the 1977 Clean Air Act Amendments to ensure that air quality in defined areas does not significantly deteriorate or exceed NAAQS while providing a margin for future growth. Currently SO₂, NO_x, and TSP are regulated by the PSD program. The EPA is currently proposing PSD regulations for PM₁₀.

The proposed site is located in a PSD Class II area. Since Unit 9 has significant ambient impacts for NO_x, compliance with the NO_x Class II PSD increment (25 ug/m³) must be demonstrated. As stated in Section 6.3, only the FPUA sources have the potential to significantly interact with Unit 9 impacts. These sources are not considered PSD increment consuming sources. Thus, only the Unit 9 impact was compared to the PSD Class II NO_x increment. As shown in Table 6-1, the Unit 9 annual NO_x impact is 9.6 ug/m³, which is 38.4 percent of the available PSD Class II increment. Consequently, the addition of Unit 9 does not cause an exceedance of PSD Class II increments.

The nearest mandatory PSD Class I area is the Everglades National Park, located approximately 150 kilometers south-southwest of the site. A Class I analysis was not necessary because this area is more than 100 km from the site.

6.5 NAAQS ANALYSIS

To predict the total impact on ambient air quality, a refined air quality assessment must be performed for applicable pollutants. This analysis must show compliance with the applicable NAAQS.

The NAAQS concentration was determined by adding the Unit 9 and additional source impacts to a representative background level. To show compliance with NAAQS, the combined NO_x annual impacts must be less than 100 ug/m³. Identification of interacting NO_x sources for use in demonstrating NAAQS compliance was performed as described in Section 6.3. A representative NO_x background concentration of 24 ug/m³ was obtained from the FDER. This value represents the annual arithmetic mean measured at the West Palm Beach monitor in 1989. Data from the West Palm Beach monitor are considered conservatively high since West Palm Beach is significantly more urbanized than Fort Pierce.

NAAQS modeling was performed following the modeling methodology described in Section 5.0. FPUA Units 6, 7, and 8 were included as the only significant interacting sources. Table 6-3 shows the results of the NAAQS modeling. The maximum combined source impact was 11.3 ug/m³, which occurred along the property boundary. This value was added to the 24 ug/m³ background value to get a total concentration of 35.3 ug/m³. This value is only 35.3 percent of the annual NO_x standard. Consequently, the Unit 9 annual NO_x impacts do not exceed the NAAQS.

TABLE 6-3. NAAQS MODELING RESULTS

	NAAQS Modeling <u>Summary</u>
Maximum Impact Location	
Distance	0.88 km
Direction	260 deg
Meteorological Year	1984
Combined Source Maximum Impact	11.3 ug/m3
Background Concentration	24 ug/m3
Total Concentration (Combined Maximum Impact plus Background)	35.3 ug/m3
NAAQS Primary NO _x Standard	100 ug/m3
Percent of Standard	35.3 percent

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 VISIBILITY

The nearest PSD Class I area is the Everglades National Park. The Everglades National Park is located approximately 150 kilometers south-southwest of the project site. Since this area is not within 100 kilometers of the plant site, no visibility assessment is considered necessary.

7.2 SOILS AND VEGETATION

Ambient air quality standards have been established to protect public health and welfare from any adverse effect of air pollutants. It is not expected that the estimated effects of the proposed project will significantly add to the background pollutant concentrations. Therefore, no adverse effects on soils and terrestrial vegetation is expected.

7.3 GROWTH

The operation of the Unit 9 combustion turbine at the H. D. King Power Plant is not expected to induce any secondary growth in the surrounding area.

APPENDIX A

DIRECTION-SPECIFIC BUILDING ANALYSIS

RBRZWAKE

IBM-PC VERSION (2.0)

(C) COPYRIGHT 1989, TRINITY CONSULTANTS, INC.

SERIAL NUMBER 6440 SOLD TO BLACK & VEATCH CONSULTING ENG

RUN NAME: FPHD

RUN BEGAN ON 08-09-90 AT 16:53:32

NUMBER OF SOURCES = 4

THE FOLLOWING OPTIONS HAVE BEEN CHOSEN:

CALCULATIONS ARE MADE FOR THE ISCST MODEL.

ALL STACKS MUST BE WITHIN 5L TO BE CONSIDERED FOR DIRECTION SPECIFIC DOWNWASH.

DOWNWASH IS CALCULATED IN 36 RADIAL DIRECTIONS.

BUILDINGS ARE COMBINED REPEATEDLY.

ALGORITHMS:

0 = NO DOWNWASH
1 = HUBER-SNYDER DOWNWASH
2 = SCHULMAN-SCIRE DOWNWASH

INPUT BUILDINGS

DESCRIPTION	BLDG #	BLDG HT(M)	# OF CORNERS	X(M)	Y(M)
F.O. TANK 5	1	13.23	10		
				39.12	1.51
				42.72	-3.44
				42.72	-9.56
				39.12	-14.51
				33.30	-16.40
				27.48	-14.51
				23.88	-9.56
				23.88	-3.44
				27.48	1.51
				33.30	3.40
F.O. TANK 6	2	12.93	10		
				9.72	-47.69
				13.32	-52.64
				13.32	-58.76
				9.72	-63.71
				3.90	-65.60
				-1.92	-63.71
				-5.52	-58.76
				-5.52	-52.64
				-1.92	-47.69
				3.90	-45.80
F.O. TANK 7	3	13.92	10		
				-18.91	-46.94
				-15.02	-52.29
				-15.02	-58.91
				-18.91	-64.26
				-25.20	-66.30
				-31.49	-64.26
				-35.38	-58.91
				-35.38	-52.29
				-31.49	-46.94
				-25.20	-44.90
GEN BUILD 68 FT	4	20.73	4		
				-33.53	4.88
				-38.71	30.48
				-74.68	22.86
				-69.49	-2.74
GEN BUILD 60 FT	5	18.29	4		
				17.37	15.54
				12.19	41.15
				-10.67	36.58
				-5.79	10.67
GEN BUILD 51 FT	6	15.54	4		
				-5.79	10.67
				-10.67	36.58
				-38.71	30.48
				-33.53	4.88
GEN BUILD 33.5 FT	7	10.21	4		
				28.65	22.86
				24.38	43.89
				12.19	41.15
				16.76	19.81

COMBINED BUILDINGS

STRUCTURE 1 HAS A HEIGHT 20.73 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 4: GEN BUILD 68 FT

STRUCTURE 2 HAS A HEIGHT 18.29 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 5: GEN BUILD 60 FT

STRUCTURE 3 HAS A HEIGHT 15.54 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 4: GEN BUILD 68 FT
BUILDING # 5: GEN BUILD 60 FT
BUILDING # 6: GEN BUILD 51 FT

STRUCTURE 4 HAS A HEIGHT 13.92 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 3: F.O. TANK 7

STRUCTURE 5 HAS A HEIGHT 13.23 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 1: F.O. TANK 5
BUILDING # 4: GEN BUILD 68 FT
BUILDING # 5: GEN BUILD 60 FT
BUILDING # 6: GEN BUILD 51 FT

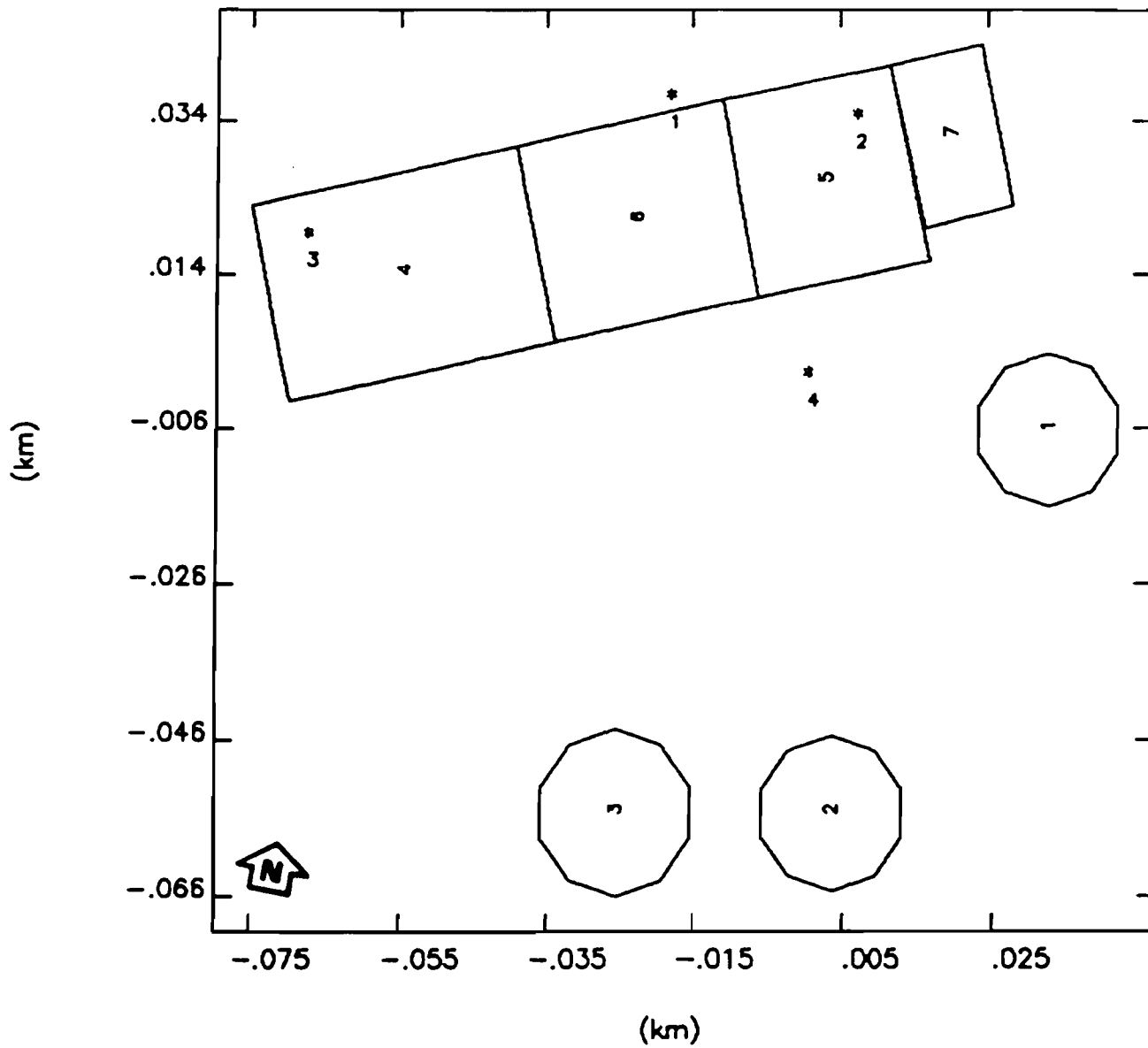
STRUCTURE 6 HAS A HEIGHT 12.93 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 2: F.O. TANK 6
BUILDING # 3: F.O. TANK 7

STRUCTURE 7 HAS A HEIGHT 10.21 METERS AND CONTAINS THE FOLLOWING BUILDINGS:
BUILDING # 1: F.O. TANK 5
BUILDING # 4: GEN BUILD 68 FT
BUILDING # 5: GEN BUILD 60 FT
BUILDING # 6: GEN BUILD 51 FT
BUILDING # 7: GEN BUILD 33.5 FT

INPUT STACKS

STACK ID #	STACK #	STACK HT (M)	X (M)	Y (M)
1	1	45.11	-18.60	36.30
2	2	39.01	6.70	33.80
3	3	45.72	-68.00	18.30
4	4	18.29	.00	.00

FORT PIERCE PLANT SITE



STACK ID # 1, STACK # 1

THE DOMINANT STRUCTURE WITHIN SL IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH
DEGREE STRUCTURE # HEIGHT WIDTH GEP ALGORITHM

10	1	20.73	43.65	51.81	1
20	1	20.73	44.82	51.81	1
30	1	20.73	44.63	51.81	1
40	1	20.73	43.08	51.81	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	1	20.73	38.06	51.81	1
110	2	18.29	34.79	45.72	1
120	2	18.29	35.39	45.72	1
130	2	18.29	34.91	45.72	1
140	2	18.29	33.37	45.72	1
150	2	18.29	30.81	45.72	1
160	2	18.29	27.32	45.72	1
170	2	18.29	23.96	45.72	1
180	2	18.29	28.04	45.72	1
190	1	20.73	43.65	51.81	1
200	1	20.73	44.82	51.81	1
210	1	20.73	44.63	51.81	1
220	1	20.73	43.08	51.81	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	1	20.73	30.97	51.81	1
260	1	20.73	27.37	51.81	1
270	1	20.73	33.22	51.81	1
280	1	20.73	38.06	51.81	1
290	2	18.29	34.79	45.72	1
300	2	18.29	35.39	45.72	1
310	2	18.29	34.91	45.72	1
320	2	18.29	33.37	45.72	1
330	2	18.29	30.81	45.72	1
340	2	18.29	27.32	45.72	1
350	2	18.29	23.96	45.72	1
360	2	18.29	28.04	45.72	1

STACK ID # 2, STACK # 2

THE DOMINANT STRUCTURE WITHIN 5L IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH
DEGREE STRUCTURE # HEIGHT WIDTH GEP ALGORITHM

10	2	18.29	31.27	45.72	1
20	2	18.29	33.55	45.72	1
30	2	18.29	34.80	45.72	1
40	2	18.29	35.00	45.72	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	2	18.29	33.14	45.72	1
110	2	18.29	34.79	45.72	1
120	2	18.29	35.39	45.72	1
130	2	18.29	34.91	45.72	1
140	2	18.29	33.37	45.72	1
150	2	18.29	30.81	45.72	1
160	2	18.29	27.32	45.72	1
170	2	18.29	23.96	45.72	1
180	2	18.29	28.04	45.72	1
190	2	18.29	31.27	45.72	1
200	2	18.29	33.55	45.72	1
210	2	18.29	34.80	45.72	1
220	2	18.29	35.00	45.72	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	2	18.29	29.36	45.72	1
260	2	18.29	26.89	45.72	1
270	1	20.73	33.22	51.81	1
280	2	18.29	33.14	45.72	1
290	2	18.29	34.79	45.72	1
300	2	18.29	35.39	45.72	1
310	2	18.29	34.91	45.72	1
320	2	18.29	33.37	45.72	1
330	2	18.29	30.81	45.72	1
340	2	18.29	27.32	45.72	1
350	2	18.29	23.96	45.72	1
360	2	18.29	28.04	45.72	1

STACK ID # 3, STACK # 3

THE DOMINANT STRUCTURE WITHIN 5L IS

STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH

DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	1	20.73	43.65	51.81	1
20	1	20.73	44.82	51.81	1
30	1	20.73	44.63	51.81	1
40	1	20.73	43.08	51.81	1
50	1	20.73	40.22	51.81	1
60	1	20.73	36.15	51.81	1
70	1	20.73	30.97	51.81	1
80	1	20.73	27.37	51.81	1
90	1	20.73	33.22	51.81	1
100	1	20.73	38.06	51.81	1
110	1	20.73	41.74	51.81	1
120	1	20.73	44.16	51.81	1
130	1	20.73	45.23	51.81	1
140	1	20.73	44.93	51.81	1
150	1	20.73	43.27	51.81	1
160	1	20.73	40.29	51.81	1
170	1	20.73	37.40	51.81	1
180	1	20.73	41.15	51.81	1
190	1	20.73	43.65	51.81	1
200	1	20.73	44.82	51.81	1
210	1	20.73	44.63	51.81	1
220	1	20.73	43.08	51.81	1
230	1	20.73	40.22	51.81	1
240	1	20.73	36.15	51.81	1
250	1	20.73	30.97	51.81	1
260	1	20.73	27.37	51.81	1
270	1	20.73	33.22	51.81	1
280	1	20.73	38.06	51.81	1
290	1	20.73	41.74	51.81	1
300	1	20.73	44.16	51.81	1
310	1	20.73	45.23	51.81	1
320	1	20.73	44.93	51.81	1
330	1	20.73	43.27	51.81	1
340	1	20.73	40.29	51.81	1
350	1	20.73	37.40	51.81	1
360	1	20.73	41.15	51.81	1

STACK ID # 4, STACK # 4

THE DOMINANT STRUCTURE WITHIN SL IS
STRUC= 1 H= 20.73 W= 45.29 GEP= 51.81

DIRECTION SPECIFIC BUILDING DOWNWASH					
DEGREE	STRUCTURE #	HEIGHT	WIDTH	GEP	ALGORITHM
10	2	18.29	31.27	45.72	2
20	2	18.29	33.55	45.72	2
30	2	18.29	34.80	45.72	2
40	2	18.29	35.00	45.72	2
50	2	18.29	34.14	45.72	2
60	2	18.29	32.24	45.72	2
70	2	18.29	29.36	45.72	2
80	1	20.73	27.37	51.81	2
90	1	20.73	33.22	51.81	2
100	1	20.73	38.06	51.81	2
110	1	20.73	41.74	51.81	2
120	1	20.73	44.16	51.81	2
130	1	20.73	45.23	51.81	2
140	1	20.73	44.93	51.81	2
150	2	18.29	30.81	45.72	2
160	2	18.29	27.32	45.72	2
170	2	18.29	23.96	45.72	2
180	2	18.29	28.04	45.72	2
190	2	18.29	31.27	45.72	2
200	2	18.29	33.55	45.72	2
210	2	18.29	34.80	45.72	2
220	2	18.29	35.00	45.72	2
230	2	18.29	34.14	45.72	2
240	2	18.29	32.24	45.72	2
250	2	18.29	29.36	45.72	2
260	1	20.73	27.37	51.81	2
270	1	20.73	33.22	51.81	2
280	1	20.73	38.06	51.81	2
290	1	20.73	41.74	51.81	2
300	1	20.73	44.16	51.81	2
310	1	20.73	45.23	51.81	2
320	1	20.73	44.93	51.81	2
330	2	18.29	30.81	45.72	2
340	2	18.29	27.32	45.72	2
350	2	18.29	23.96	45.72	2
360	2	18.29	28.04	45.72	2

STACK # 1

STACK ID: 1, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 18.29 18.29
 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 43.65 44.82 44.63 43.08 40.22 36.15 30.97 27.37 33.22 38.06 34.79 35.39
 34.91 33.37 30.81 27.32 23.96 28.04 43.65 44.82 44.63 43.08 40.22 36.15
 30.97 27.37 33.22 38.06 34.79 35.39 34.91 33.37 30.81 27.32 23.96 28.04

STACK # 2

STACK ID: 2, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73 18.29 18.29 18.29
 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73
 18.29 18.29 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 31.27 33.55 34.80 35.00 40.22 36.15 30.97 27.37 33.22 33.14 34.79 35.39
 34.91 33.37 30.81 27.32 23.96 28.04 31.27 33.55 34.80 35.00 40.22 36.15
 29.36 26.89 33.22 33.14 34.79 35.39 34.91 33.37 30.81 27.32 23.96 28.04

STACK # 3

STACK ID: 3, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73 20.73
 43.65 44.82 44.63 43.08 40.22 36.15 30.97 27.37 33.22 38.06 41.74 44.16
 45.23 44.93 43.27 40.29 37.40 41.15 43.65 44.82 44.63 43.08 40.22 36.15
 30.97 27.37 33.22 38.06 41.74 44.16 45.23 44.93 43.27 40.29 37.40 41.15

STACK # 4

STACK ID: 4, BUILDING HEIGHT: 20.73, BUILDING WIDTH: 45.29
 18.29 18.29 18.29 18.29 18.29 18.29 18.29 20.73 20.73 20.73 20.73 20.73
 20.73 20.73 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29 18.29
 18.29 20.73 20.73 20.73 20.73 20.73 20.73 20.73 18.29 18.29 18.29
 31.27 33.55 34.80 35.00 34.14 32.24 29.36 27.37 33.22 38.06 41.74 44.16
 45.23 44.93 30.81 27.32 23.96 28.04 31.27 33.55 34.80 35.00 34.14 32.24
 29.36 27.37 33.22 38.06 41.74 44.16 45.23 44.93 30.81 27.32 23.96 28.04

ATTACHMENT 2
REVISED BACT ANALYSIS

4.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

4.1 INTRODUCTION

The existing Fort Pierce Utilities Authority H. D. King Electric Generating Plant Unit 9 consists of one 23.4 MW General Electric Frame 5 combustion turbine. The combustion turbine is followed by a heat recovery steam generator (HRSG) manufactured by the Henry Vogt Machine Company. Steam from the HRSG is directed to the 8.2 MW Unit 5 steam turbine for repowering.

The primary fuel for the Unit 9 combustion turbine is natural gas. However, distillate fuel oil may be burned as an emergency back-up fuel. Since distillate fuel oil will only be burned during emergencies this Best Available Control Technology analysis will only consider the combustion of natural gas. Section 3.0 concluded that when natural gas is burned for the maximum project operation (8,760 hours per year), the project's nitrogen oxide emissions are subject to the provisions of the PSD program.

The existing operating permit for Unit 9 limits NO_x emissions to New Source Performance Standards for combustion turbines (40 CFR 60 Subpart GG) of 75 parts per million dry volume (ppmdv) at 15 percent oxygen, corrected for fuel nitrogen content and turbine heat rate, or 84 ppmv at 15 percent oxygen, whichever is more stringent. Nitrogen oxide emissions from the existing combustion turbine are controlled by steam injection.

Under the federal Clean Air Act, BACT represents the maximum degree of pollutant reduction determined on a case-by-case basis considering technical, economic, energy, and environmental considerations. However, BACT cannot be less stringent than the emission limits established by any applicable New Source Performance Standards (NSPS).

This BACT analysis follows the general requirements of EPA's draft "top down" BACT guidance document. This approach requires that the BACT analysis start by assuming the use of the Lowest Achievable Emission Rate (LAER) control alternative. Other, less efficient emission control technologies are similarly evaluated when LAER is determined to be unreasonable considering the above factors.

4.2 NITROGEN OXIDES EMISSIONS CONTROL

During combustion, two types of NO_x are formed; fuel NO_x and thermal NO_x . Fuel NO_x emissions are formed through the oxidation of a portion of the nitrogen contained in the fuel. Thermal NO_x emissions are generated through the oxidation of a portion of the nitrogen contained in the combustion air. Nitrogen oxides formation can be limited by lowering combustion temperatures, and staging combustion (a reducing atmosphere followed by an oxidizing atmosphere).

4.2.1 Alternative NO_x Emission Reduction Systems

A review of the Environmental Protection Agency's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations (1985 edition and subsequent supplements) indicates that the lowest NO_x emission limit established to date for a combustion turbine is 4.5 ppmdv (at 15 percent oxygen) for a combustion turbine with a heat recovery steam generator located in California. That permit value was based on the use of water injection into the combustion turbine and a selective catalytic reduction (SCR) system contained within the heat recovery steam generator (combined cycle operation). Therefore, the LAER NO_x emission control alternative for use with combustion turbines is established as water or steam injection followed by an SCR system.

Injection of steam into the Unit 9 turbine combustion chamber is capable of limiting NO_x emissions to 42 ppmdv (at 15 percent oxygen) when burning natural gas. Addition of an SCR system downstream of the Unit 9 combustion turbine has the potential to limit NO_x emissions to 9 ppmdv (at 15 percent oxygen).

In addition to combustion controls and addition of an SCR system, NO_x emissions from other types of combustion sources have also been controlled through installation of selective non-catalytic reduction (SNCR) systems such as Thermal De NO_x . However, a SNCR system requires gas temperatures of at least 1,500 F for NO_x reduction. The temperature at the outlet of a combustion turbine is too low (950 F to 1,100 F) for such systems. Since raising the flue gas exit temperature to 1,500 F would require supplemental heating of the flue gas, thereby increasing total emissions from increased

fuel usage, this alternative is judged technically unacceptable for application on a combustion turbine.

4.2.1.1 Selective Catalytic Reduction. 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. The SCR process can achieve up to 90 percent reduction of NO_x with a new catalyst. However, an aged catalyst will provide a maximum of between 80 and 85 percent percent NO_x reduction.

The optimum flue gas temperature range for SCR operation is approximately 650 to 750 F. Flue gas from the combustion turbines will typically be 950 F to 1100 F. Therefore, an SCR would be installed in an intermediate point of the existing heat recovery steam generator boiler where a temperature of approximately 700 F occurs. The existing Unit 9 HRSG does not include adequate space to incorporate an SCR system. For an SCR system to be installed downstream of the Unit 9 combustion turbine it will be necessary to split and expand the existing HRSG.

4.2.1.2 Steam Injection. Use of steam injection in the combustion zones of a combustion turbine can limit the amount of NO_x formed. Existing operation of the Unit 9 combustion turbines uses steam injection. Thermal NO_x formation is avoided due to lower combustion temperatures resulting from the steam injection. The degree of reduction in NO_x formation is somewhat proportional to the amount of steam injected into the turbine.

Since the combustion turbine NSPS was last revised in 1982, combustion turbines have improved their tolerance to the water or steam necessary to control NO_x emissions below the current NSPS level. However, there is still a point at which the amount of water or steam injected into the turbine seriously degrades the turbine's reliability and operational life. With the existing turbine design for Unit 9 this generally occurs below a NO_x emission level of about 42 ppm_{dv} (at 15 percent oxygen) when firing natural gas and 65 ppm_{dv} when firing distillate oil. These NO_x emission levels can be achieved with little additional cost and without significant impact on reliability or power output over those costs required to comply with the current NSPS.

4.2.2 Capital and Operating Costs of Alternatives

Table 4-1^{*} presents the capital and levelized annual cost of installing an SCR system within the existing HRSG. Annual operating costs and NO_x emissions are based on natural gas firing for a maximum of 8,760 hours per year in the turbines.

The differential capital costs for the SCR system include the costs of the ammonia storage/injection system, the catalytic reactors, HRSG modifications and balance of plant equipment. In addition to the 1991 equipment costs of the two alternatives, the total capital costs include a contingency charge, escalation, indirect costs, and interest during construction.

Levelized annual costs include operating personnel, maintenance costs (primarily catalyst replacement), ammonia additive, energy, lost generating capacity and fixed charges on capital investment. The differential energy cost and lost generating capacity for the SCR alternative is the result of the reduced net output of the turbine and the energy requirements of associated equipment. Levelized annual costs are based on the following parameters.

- o Remaining plant life of 25 years.
- o Operator cost of \$45,000 per man-year.
- o Catalyst life of three years.
- o Ammonia cost of \$250 per ton.
- o Energy cost of 70 mills/kwh.
- o Demand cost of \$800 per kw.
- o Escalation rate of ~~6~~^{*} percent.
- o Present worth discount rate of 8.0 percent.
- o Levelization factor of ~~1.75~~^{*}.

The 1993 total capital cost for addition of an SCR system to Unit 9 is ~~\$3.2 million~~^{*}. The levelized annual cost for addition of SCR is ~~\$0.98~~^{*} million per year. This levelized annual cost results in a removal cost of approximately ~~\$4,500~~^{*} per ton of NO_x reduction (~~218~~^{*} tons per year).

^{*} REVISED. SEE RESPONSE TO DER COMMENT 10.

REVISED. SEE RESPONSE TO DER COMMENT 10.

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND LEVELIZED ANNUAL COSTS

	<u>SCR SYSTEM</u> \$1,000
Capital Costs:	
SCR System	930
HRSR Modifications	590
System Erection	520
Differential Balance of Plant	<u>70</u>
1991 Capital Cost	2,110
Contingency (15 percent)	<u>320</u>
Direct Capital Cost	2,430
Escalation (6 percent)	150
Indirects (16 percent)	410
Interest During Construction (8 percent)	<u>240</u>
1993 Total Capital Cost	3,230
Levelized Annual Costs*:	
Operating Personnel	60
Maintenance	420
Ammonia	70
Energy	40
Lost Generation	<u>40</u>
1993 Annual Operating Cost	630
Fixed Charges on Capital (13.6 percent)	<u>350</u>
1993 Total Annual Cost	980
Nitrogen Oxides Emission Rate, ppm _{dv}	9
Annual NO _x Emission Reduction, tpy	218
NO _x Emission Reduction Cost, \$/ton	4,500

*Annual costs are based on a 100 percent capacity factor.

4.2.3 Other Considerations

Compared to the existing combustion turbine with steam injection, the energy requirements of the SCR system would reduce the output of the combustion turbines by approximately one percent.

The use of an SCR system could result in a negative environmental impact due to the release of quantities of unreacted ammonia to the atmosphere. Ammonia and a number of amine compounds are recognized hazardous air pollutants. This represents a potential adverse human health effect, since prolonged exposure to these compounds can increase chances of contracting a number of debilitating diseases. Although ammonia emissions are not regulated nationally, a number of sources are limited to ammonia emissions as low as 10 ppm. Unreacted ammonia emissions from an SCR system could average 7 to 10 ppm, and could create objectionable odor and health hazards.

Ammonia is also a hazardous material. Accordingly, this material must be handled and stored with extreme care. Additionally, some catalytic elements are toxic, and because they have to be replaced periodically, hazardous waste disposal procedures may be necessary.

4.2.4 Conclusions

Installation of an SCR system on Unit 9 designed to meet a NO_x emission limitation of 9 ppmdv would cost Fort Pierce Utilities Authority approximately ~~\$3.3 million~~*. Addition of an SCR system increases total levelized annual costs for the project by ~~\$1.01 million~~* resulting in a removal cost of ~~\$4,640~~* per ton of NO_x removed while burning natural gas (8760 hrs/yr). The use of SCR would reduce the effective output of the turbine generator by approximately ~~one percent~~*. In addition, the use of an SCR system could result in adverse environmental effects due to unreacted ammonia being released to the atmosphere causing a potential human health hazard. Project emissions of 42 ppmdv do not result in any violation of ambient air quality standards. Therefore, based on economic, energy, and environmental considerations, NO_x BACT proposed for this combustion turbine facility is the use of steam injection to achieve NO_x emissions of 42 ppmdv

* REVISED. SEE RESPONSE TO DER COMMENT 10.

(at 15 percent oxygen) when burning natural gas. Additionally, it is recommended that during emergency situations where distillate oil must be used NO_x emissions be limited to 65 ppm_{dv} (at 15 percent oxygen) through the use of steam injection.



Owner EPUA
Plant H.D. KING Unit 9
Project No. 16589 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS

Computed By RC
Date 10/20 19 90
Checked By SMC
Date 10/21 19 90
Page 2 of 4

CALCULATIONS

$$\begin{aligned} \text{FLUE GAS MOLECULAR WEIGHT} &= (0.1453)(31.9988) + (0.7376)(28.0134) \\ &+ (0.0270)(44.0103) + (0.0091)(39.948) + (0.0810)(18.01534) \\ &= 28.32 \text{ lb/mol} \checkmark \end{aligned}$$

$$PV = nRT$$

$$V = \frac{nRT}{P}$$

$$n = \frac{(1,086,350 \text{ lb/h})}{(28.32 \text{ lb/mol})} = 38,356 \text{ mol/s} \checkmark$$

$$R = 1545 \frac{\text{ft-lb}}{\text{mol-}^\circ\text{R}}$$

$$T = 460 + 488 = 948^\circ\text{R}$$

$$P = (29.92 \text{ in Hg}) \left(0.4912 \frac{\text{lb/in}^2}{\text{in Hg}} \right) \left(\frac{144 \text{ in}^2}{\text{ft}^2} \right) = 2116 \frac{\text{lb}}{\text{ft}^2}$$

$$V = \frac{(38,356 \text{ mol/s}) (1545 \frac{\text{ft-lb}}{\text{mol-R}}) (948 \text{ R})}{(2116 \frac{\text{lb}}{\text{ft}^2}) (60 \text{ min/h})} = \underline{\underline{442,000 \text{ acfm}}} \checkmark$$

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ATTACHMENT 3

STACK CHARACTERISTICS (HRSG AND BYPASS)

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS*

	<u>HRS</u> <u>G Stack</u>	<u>Bypass</u> <u>Stack</u>
Stack Height, ft	60	60
Effective Stack Diameter, ft	11.2**	11.2**
Stack Exit Volume, acfm , dscfm	440,420 225,350	621,140 225,350
Stack Velocity, fpm	4,470	6,305
Stack Exit Temperature, F	488	877
Stack Moisture, % by volume	8.10	8.10
Stack Oxygen, % by volume	14.53	14.53

*Stack parameters are given for a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

**Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

NOTE

All HRSG stack modeling performed in support of the Unit 9 air permit used preliminary stack flow parameters (See Table 5-1 of the AAQIA). These modeling parameters included lower stack flows and higher pounds per hour emission rates than the final values presented in this application. The lower gas flows used in the modeling decrease the momentum plume rise and thus, give higher ground-level impacts than the revised flows presented here. Likewise, the higher pound per hour emission rates used in the modeling analyses give higher ground level impacts than the emission rates presented in this application. Consequently, the modeled Unit 9 impacts are now expected to be slightly smaller than those presented in support of the Unit 9 Ambient Air Quality Impact Analysis.

ATTACHMENT 4

EMISSION ESTIMATES: SOURCES AND CALCULATIONS



Owner FORT PERCE UTILITIES AUTHORITY
Plant H. D. KING Unit 9
Project No. 16589 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS

Computed By JOHN COCHRAN
Date 10/20 19 90
Checked By Sharon M. Day
Date 10/21 19 90
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ASSUMPTIONS

- GENERAL ELECTRIC FRAMES COMBUSTION TURBINE ✓
- NATURAL GAS FIRED (930 BTU/SCF)
- 100% LOAD ✓
- AMBIENT CONDITIONS:
 - TEMPERATURE = 20 F ✓
 - PRESSURE = 29.92 in Hg
 - RELATIVE HUMIDITY = 60%
- COMBINED CYCLE OPERATION ✓
- FLUE GAS TEMPERATURE = 488 F*
- OUTLET FLUE GAS PRESSURE = 0 in wg
- FLUE GAS FLOW RATE = 1,086,350 lb/h*
- FLUE GAS ANALYSIS (VOLUMETRIC):*

OXYGEN	=	14.53%
NITROGEN	=	73.76%
CARBON DIOXIDE	=	2.70%
ARGON	=	0.91%
MOISTURE	=	8.10%
		<u>100.00%</u> ✓

- MOLECULAR WEIGHTS :

OXYGEN	=	31.9988	lb/mol
CARBON	=	12.01115	lb/mol
HYDROGEN	=	2.01594	lb/mol
SULFUR	=	32.064	lb/mol
NITROGEN	=	28.0134	lb/mol
ARGON	=	39.948	lb/mol
CO ₂	=	44.00995	lb/mol
H ₂ O	=	18.01534	lb/mol
NO ₂	=	46.0055	lb/mol

* VALUES FROM TABLE 1 (ATTACHED). OPERATION VALUES BASED ON MANUFACTURER PERFORMANCE CURVES.

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Owner FPUA Computed By [Signature]
Plant H.D. KING Unit 9 Date 10/20 19 90
Project No. 16589 File No. _____ Checked By [Signature]
Title EMISSION RATE SAMPLE CALCULATIONS Date 10/21 19 90
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NO_x EMISSION RATE = 42 ppm_{dv} @ 15% OXYGEN

	VOLUME %	MOLES*	DRY VOLUME %
OXYGEN	14.53	5573 ✓	15.81 ✓
NITROGEN	73.76	28291 ✓	80.26 ✓
CARBON DIOXIDE	2.70	1036 ✓	2.94 ✓
ARGON	0.91	349 ✓	0.99 ✓
MOISTURE	8.10	3107 ✓	
		38356	100.00 ✓

$$* \text{MOLES} = (\text{VOLUME, \%} / 100) \times 38356 \text{ mols/h}$$

$$\text{DRY MOLES} = 38356 - 3107 = 35249 \text{ mols/h} \checkmark$$

- AIR CONSISTS OF 21% OXYGEN & 79% NITROGEN (BY VOLUME)
- TO CORRECT TO 15% OXYGEN IT IS NECESSARY TO HYPOTHETICALLY SUBTRACT AIR FROM THE FUE GAS

X = moles OF AIR ADDED

$$0.15 = \frac{5573 + 0.21X}{35249 + X}$$

$$0.15(35249 + X) = 5573 + 0.21X$$

$$5287.35 + 0.15X = 5573 + 0.21X$$

$$X(0.15 - 0.21) = 5573 - 5287.35$$

$$X = -4760.8 \text{ mols AIR/h} \checkmark$$

DO NOT WRITE IN THIS SPACE



Owner FPUA
Plant H.D. KING Unit 9
Project No. 16589 File No. _____
Title EMISSION RATE SAMPLE CALCULATIONS

Computed By [Signature]
Date 10/20 19 90
Checked By SMR
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	ACTUAL MOLES mol/h	15% O ₂ CORRECTED MOLES mol/h	CORRECTED Dry Volume %
OXYGEN	5573 - 4760.8 (0.21) =	4573 ✓	15.0
NITROGEN	28291 - 4760.8 (0.79) =	24530 ✓	80.5
CARBON DIOXIDE	1036	1036 ✓	3.4
ARGON	349	349 ✓	1.1
TOTAL	35,249	30488	100.0

$$\text{NO}_x \text{ EMISSION RATE} = 42 \text{ ppm dv} = 42 \frac{\text{mols NO}_2}{10^6 \text{ mols FUE GAS}}$$

$$\text{NO}_x \text{ EMISSION RATE} = \left(42 \frac{\text{mols NO}_2}{10^6 \text{ mols FUE GAS}} \right) (30488 \frac{\text{mols}}{\text{h}}) (46.0055 \frac{\text{lb NO}_2}{\text{mol NO}_2})$$

$$\text{NO}_x \text{ EMISSION RATE} = \underline{58.9 \frac{\text{lb}}{\text{h}}} \checkmark$$

$$\text{CO EMISSION RATE} = 10 \text{ ppm dv @ 15\% O}_2$$

$$\text{CO EMISSION RATE} = \left(\frac{10}{10^6} \right) (30488) (12.01115 + 31.9988/2) = \underline{8.5 \frac{\text{lb}}{\text{h}}}$$

$$\text{VOC} = \text{NON METHANE HYDROCARBONS} = 5 \text{ ppm dv @ 15\% O}_2$$

$$\text{NON-METHANE HYDROCARBONS} = \left(\frac{5}{10^6} \right) (30488) (12.01115 + 12)(2.01594) = \underline{2.4 \frac{\text{lb}}{\text{h}}}$$

DO NOT WRITE IN THIS SPACE

FORT PIERCE, FLORIDA, COMBINED CYCLE PROJECT
B&V PROJECT 16589.070
ESTIMATED COMBINED CYCLE STACK PERFORMANCE VALUES

10/18/90

Fuel	Gas	Gas w/ SCR	Oil	Gas	Gas w/ SCR	Oil
Ambient Temperature, F	20	20	20	59	59	59
Exhaust Flow, lb/h	1,086,350	1,086,350	1,091,790	999,000	999,000	1,004,000
CT Exhaust Temperature, F	877	879	877	905	907	905
Stack Temperature, F	494	493	494	487	486	487
Stack Exit Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7

Exhaust Gas Constituents (mass basis)

Percent CO ₂	4.20	4.20	5.50	4.12	4.12	5.39
Percent H ₂ O	5.15	5.15	3.96	5.53	5.53	4.37
Percent O ₂	16.41	16.41	16.56	16.43	16.43	16.58
Percent N ₂	72.95	72.95	72.68	72.63	72.63	72.37
Percent Ar	1.29	1.29	1.28	1.28	1.28	1.28
Total	100.00	100.00	99.98	99.99	99.99	99.99

Exhaust Gas Constituent Flows, lb/h

CO ₂	45,627	45,627	60,060	41,163	41,163	54,121
H ₂ O	55,947	55,947	43,244	55,250	55,250	43,879
O ₂	178,270	178,270	180,837	164,152	164,152	166,480
N ₂	792,492	792,492	793,672	725,646	725,646	726,667
Ar	14,014	14,014	13,978	12,788	12,788	12,852
Total, lb/h	1,086,350	1,086,350	1,091,790	999,000	999,000	1,004,000

Exhaust Gas Constituent Flows, mole/h

							MW (lb/mole)
CO ₂	1,036.7	1,036.7	1,364.7	935.3	935.3	1,229.7	44.010
H ₂ O	3,105.4	3,105.4	2,400.3	3,066.7	3,066.7	2,435.6	18.016
O ₂	5,570.9	5,570.9	5,651.2	5,129.8	5,129.8	5,202.5	32.000
N ₂	28,287.1	28,287.1	28,329.2	25,901.1	25,901.1	25,937.6	28.016
Ar	350.9	350.9	350.0	320.2	320.2	321.8	39.940
Total, mole/h	38,351.0	38,351.0	38,095.4	35,353.1	35,353.1	35,127.2	

Exhaust Gas Constituents (volume basis)

Percent CO ₂	2.702	2.702	3.582	2.652	2.652	3.502
Percent H ₂ O	8.102	8.102	6.302	8.672	8.672	6.932
Percent O ₂	14.532	14.532	14.832	14.512	14.512	14.812
Percent N ₂	73.762	73.762	74.362	73.262	73.262	73.842
Percent Ar	0.912	0.912	0.922	0.912	0.912	0.922
Total	100.002	100.002	99.992	100.002	100.002	100.002

Wet (Total) Exhaust Gas Analysis

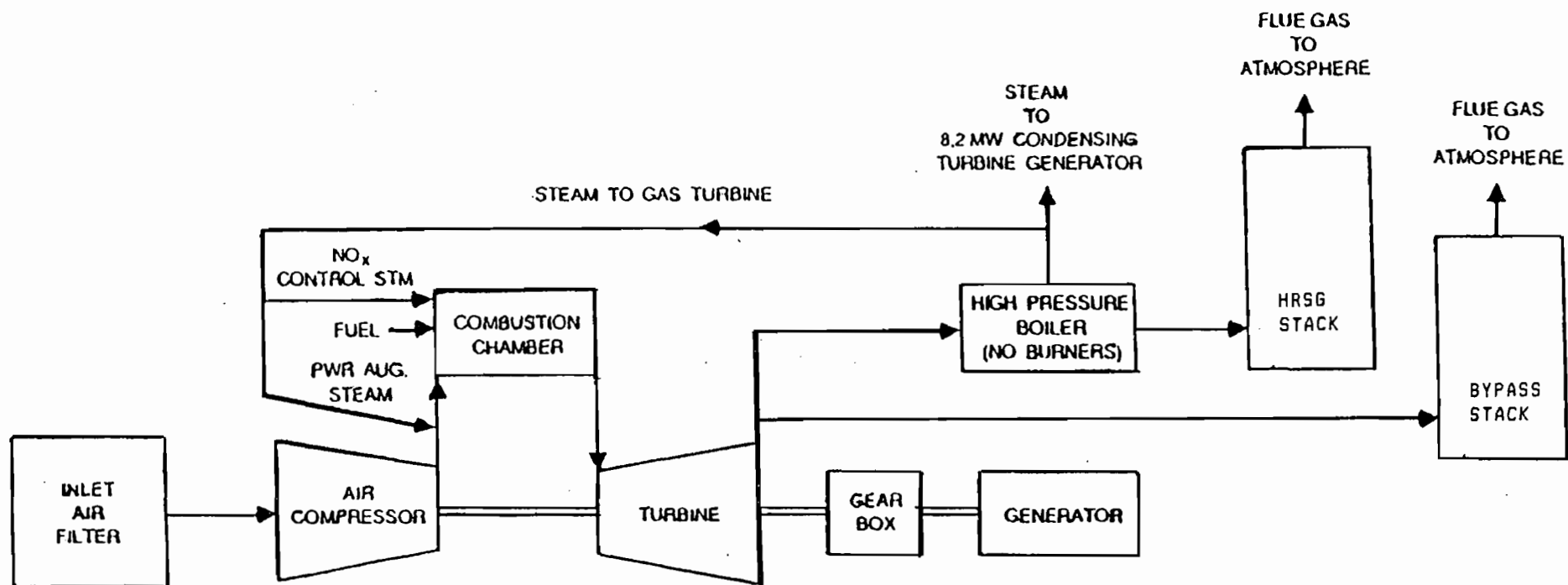
Exhaust Gas Molecular Weight, lb/mole	28.33	28.33	28.66	28.26	28.26	28.58
Gas Constant for Exhaust Gas, ft-lbf/lbm-R	54.536	54.536	53.908	54.671	54.671	54.059
Exhaust Gas Specific Volume, ft ³ /lb	24.58	24.55	24.30	24.46	24.43	24.18
Exhaust Gas Flow, acfm	445,041	444,498	442,175	407,259	406,760	404,612

Dry Exhaust Gas Analysis

Exhaust Gas Molecular Weight, lb/mole	29.23	29.23	29.38	29.23	29.23	29.37
Gas Constant for Exhaust Gas, ft-lbf/lbm-R	52.857	52.857	52.587	52.857	52.857	52.605
Exhaust Gas Specific Volume, ft ³ /lb	23.82	23.80	23.70	23.65	23.62	23.53
Exhaust Gas Flow, acfm	431,281	430,919	431,257	393,773	393,273	393,735

ATTACHMENT 5

COMBUSTION TURBINE FLOW DIAGRAM



Simplified process flow diagram.

DER Comment 2

- o Provide the present actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lb/hr, and tons/year for each affected source [Unit 6, Unit 7, Unit 8, and Unit 9]. The present actual emissions are to be determined on the basis of the most recent source emission test wherever possible. Where emission tests are used, copies of the cover page and summary sheet are to be included.

Response

- o Unit 9 is the only affected source, however, present actual emissions are being provided for all four units. The attached table provides the actual emission rates for applicable pollutants listed in Table 500-2 of F.A.C. Rule 17-2.500. The units will only burn natural gas during 1990. Therefore, the emissions listed in the attached table are based on the combustion of natural gas only. Emission tests are not required for a number of the pollutants. In the absence of actual performance tests, emission rates are calculated based on appropriate emission factors from AP-42. When applicable, test summary sheets are attached to support emission rates listed in the tables. Annual emissions are based on the allowable hours of operation for the four sources listed in the operating permit for Unit 9.

H. D. KING UNITS 6 - 9 ACTUAL EMISSION RATES

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Allowable Annual Operation, hr	12	1344	6384	8736
Hourly Emissions, lb/h				
Nitrogen Oxides	117	251	111*	57*
Carbon Monoxide	8.5	18	24	0.68*
Particulate	0.64	1.4	1.8	0.93
Non-Methane Hydrocarbons	0.30	0.64	0.83	0.44
Sulfur Dioxide	0.13	0.27	0.36	0.20
Annual Emissions, tons/year				
Nitrogen Oxides	0.70	169	353*	250*
Carbon Monoxide	0.051	12.3	76	3.0*
Particulate	0.0038	0.92	5.7	4.1
Non-Methane Hydrocarbons	0.0018	0.43	2.7	1.9
Sulfur Dioxide	0.00077	0.18	1.1	0.87

*Emission rates based on the attached emission test results.

SOURCE COMPLIANCE TEST REPORT
for
OXIDES OF NITROGEN AND VISIBLE EMISSIONS
UNIT 8

AND

VISIBLE EMISSIONS
EAST DIESEL UNIT

H.D. KING GENERATING STATION
FT. PIERCE MUNICIPAL UTILITIES

FDER PERMIT NUMBERS
UNIT 8 AO 56-112678
EAST DUCT UNIT AO 56-113533

SEPTEMBER 11, 1989

Prepared for:

FT. PIERCE MUNICIPAL UTILITIES
311 NORTH INDIAN RIVER DRIVE
FT. PIERCE, FLORIDA 33454

Prepared by:

AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606
(904) 335-1889

Table 1 NO_x Emission Summary
 Ft. Pierce Utilities
 H.D. King Generating Station
 Unit 8
 September 11, 1989

Run Number	Time	Oxygen (%)	NO _x Emissions		Allowable (lb/MMBTU)
			Actual (ppm Dry)	(lb/MMBTU)	
1	0820-0920	5.80	129	0.186	0.2
2	0935-1035	5.46	126	0.177	0.2
3	1105-1205	5.57	126	0.179	0.2
Average	----	5.61	127	0.181	0.2

STATIONARY GAS TURBINE EMISSION TEST

FORT PIERCE UTILITIES AUTHORITY
HENRY D. KING POWER PLANT

FORT PIERCE, FLORIDA

EEI 6103

SEPTEMBER 1989

Prepared by:

CEM/Engineering Division
Entropy Environmentalists, Inc.
Research Triangle Park, North Carolina

Prepared for:

General Electric Company
GE Turbines Division
Schenectady, New York

REPORT CERTIFICATION

The sampling and analysis performed for this report were carried out under my direction and supervision, and I hereby certify that the test report is authentic and accurate.

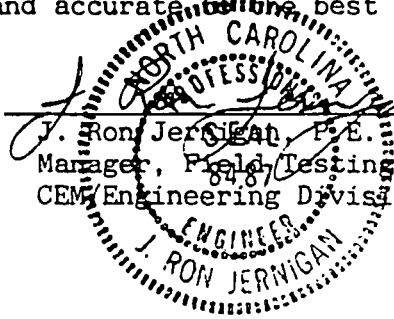
Date 10/24/89

Signature Kenneth R. Loder
Kenneth R. Loder
Senior Projects Manager
CEM/Engineering Division

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 10/24/89

Signature J. Ron Jernigan
J. Ron Jernigan, P.E.
Manager, Field Testing Services
CEM/Engineering Division



1. INTRODUCTION

General Electric Company's Turbine Division retained Entropy Environmentalists, Inc. to perform emissions testing on a combined cycle gas turbine installed at Ft. Pierce Utilities Authority's Henry D. King Power Plant in Ft. Pierce, Florida. EPA test methods were employed to accurately quantify the atmospheric emissions of oxygen (O_2), carbon dioxide (CO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and visible emissions from the turbine at four operating load conditions.

Ken Loder, Le Tan, and Mark Winter from Entropy conducted the testing on September 13, 1989. The test program was coordinated by Betty Lou Bailey, P.E. and Chuck Prosser from General Electric, and Dave Schade from the Henry D. King Power Plant. Thomas Davis, P.E. from the environmental engineering firm of Hunter/ESE observed the testing on behalf of the plant. Tom Tittle and Joseph Kahn represented the State of Florida, Department of Environmental Regulations, during the test period.

This report presents the test data, test methods and equipment used, and data reduction and quality assurance procedures utilized during the emissions test program.

furnished by General Electric, were cleaned and purged with nitrogen prior to use. The high nitrogen content indicates inadequate sample purge of the container before sample collection. The high nitrogen sample was rejected. The analysis of the remaining sample showed the SO_2 was well within the 150 ppm (0.015%) by-volume limit.

TABLE 1.

EMISSION DATA SUMMARY
GAS TURBINE EMISSION TESTING
HENRY D. KING POWER PLANT, UNIT 9
SEPTEMBER 13, 1989

— Steam Augmentation

	100%	Load Level		
		100%	75%	30%
Operating Load (MW):	23.0	23.9	17.8	7.6
NO_x @ 15% O_2 , Dry ISO Conditions (ppm_{vd}):	59	43	58	44
NO_x Emission Limit (ppm_{vd}):	84	84	84	84
SO_2 Concentration, dry (ppm_{vd}):	< 1	< 1	< 1	< 1
Average CO Concentration, dry (ppm_{vd}):	1	1	4	112
Visible Emissions (% opacity):	0	0*	---	---
Visible Emissions Limit (% opacity):	15	15	15	15
Steam Injection (lb/sec):	0.83	0.90	0.0	0.0
Steam Augmentation (lb/sec):	0.0	2.23	0.0	0.0
Fuel Flow (lb/sec)	3.72	3.80	3.09	2.02

*Daylight conditions permitted only 24 minutes of visible emissions data to be recorded.

DER Comment 3

- o Provide the maximum proposed emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lb/h and tons/year to be emitted by each affected source [Unit 6, Unit 7, Unit 8, and Unit 9]

Response

- o The attached table provides the maximum proposed emission rates for applicable pollutants listed in Table 500-2 of F.A.C. Rule 17-2.500. The following summarizes the basis of these emission rates

Unit 8 emissions are limited by F.A.C. requirements to the following rates.

- Nitrogen oxides = 0.20 lb/MBtu (natural gas)
= 0.30 lb/MBtu (fuel oil)
- Particulate = 0.10 lb/MBtu
- Opacity = 20 percent

The Unit 8 emissions listed in the attached table are based on combustion of natural gas only.

The proposed maximum emission rates for Unit 9 are as follows.

- Nitrogen oxides = 42 ppmdv (parts per million dry volumetric) at 15 percent oxygen
- Carbon monoxide = 10 ppmdv at 15 percent oxygen
- Non-methane hydrocarbons = 5 ppmdv at 15 percent oxygen
- Particulate = 2.5 lb/h

These emission rates are typical for a General Electric Frame 5 combustion turbine and were provided by the equipment manufacturer. Hourly emission rates listed in the table for Unit 9 are calculated assuming a worst case ambient temperature of 20 F (resulting in the maximum expected emissions). In addition, sulfur dioxide emissions for Unit 9 are based on a gas sulfur content of 2000 gr/10⁶ scf, and a gas heating value of 930 Btu/scf.

The remaining Unit 6, Unit 7, Unit 8, and Unit 9 emission rates are calculated based on appropriate emission factors from AP-42.

H. D. KING UNITS 6 - 9 PROPOSED MAXIMUM EMISSION RATES

	<u>Unit 6</u>	<u>Unit 7</u>	<u>Unit 8</u>	<u>Unit 9</u>
Allowable Annual Operation, hr	8760	8760	8760	8760
Hourly Emissions, lb/h				
Nitrogen Oxides	117	251	122	59
Carbon Monoxide	8.5	18	24	8.5
Particulate	0.64	1.4	1.8	2.5
Non-Methane Hydrocarbons	0.30	0.64	0.83	2.4
Sulfur Dioxide	0.13	0.27	0.36	0.20
Annual Emissions, tons/year				
Nitrogen Oxides	512	1099	535	258
Carbon Monoxide	37	80	104	37
Particulate	2.8	6.0	7.8	11
Non-Methane Hydrocarbons	1.3	2.8	3.7	11
Sulfur Dioxide	0.56	1.2	1.6	0.88

DER Comment 4

- o Explain why the previous application for a construction permit projected carbon monoxide emissions of 110 tons/year from Unit 9 while the present permit application indicates projected CO emissions of 41 tons/year from Unit 9. The previous application also included total contemporaneous emission reductions of about 99.3 tons/year from Units 6, 7, and 8. It appears that you may be required to determine downwind concentrations of CO using EPA approved models and perform a best available control technology (BACT) analysis for CO.

Response

- o AP-42 emission factors provided the basis for the 110 tons/year CO emission rate listed in the previous application. However, actual performance of the General Electric Frame 5 combustion turbines has indicated CO emissions far below the AP-42 emission factors. Based on consultations with General Electric the maximum expected CO emission rate from the combustion turbines is 10 ppm_{dv} (corrected to 15 percent oxygen). Based on CO emissions of 10 ppm_{dv} the maximum emission rate for the project is expected to be 8.5 lb/h. This results in an annual emission of 37 tons/year. This annual CO emission is below the 100 ton/year PSD significance level. Therefore, no ambient air quality analyses will be required.

DER Comment 5

- o ISO standard day conditions for gas turbines are defined as 288 K (59 F), 101.3 KPa (29.92 in. Hg.), and 60% relative humidity. The concentration standard for gas turbines is expressed at dry ISO conditions. Some of your gas turbine emission calculations involving standard conditions did not appear to be based on dry ISO conditions. Please make necessary corrections. For other air pollutant emission sources state and federal regulations define standard temperature and pressure to be 68 F and 29.92 in. Hg.

Response

- o Emission rates listed in the application and these responses for the Unit 9 combustion turbine are based on the following constant emission rates.
 - Nitrogen oxides = 42 ppm_{dv} (parts per million volumetric dry) at 15 percent oxygen
 - Carbon monoxide = 10 ppm_{dv} at 15 percent oxygen
 - Non-methane hydrocarbons = 5 ppm_{dv} at 15 percent oxygen
 - Particulate = 2.5 lb/h

Combustion turbine outputs (megawatts, fuel burn rates, and emissions) increase for operation at lower ambient temperatures. Therefore, the maximum emission rates for a combustion turbine do not occur at 59 F ISO standard day conditions but occur during lower ambient temperatures. The lowest anticipated temperature for the Fort Pierce project is 20 F. To keep the analysis of impacts conservative, the maximum emission rates listed in the application and these responses are based on an ambient temperature of 20 F.

DER Comment 6

- o Provide the present actual and proposed stack parameters for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9]. The parameters are to include stack height, stack exit diameter, stack exit volume (ACFM and DSCFM), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume). Also, provide the present actual and the proposed annual hours of operation for each of the affected sources [Unit 6, Unit7, Unit 8, and Unit 9].

Response

- o The proposed stack parameters for the Unit 9 combustion turbine are given in the attached table for both HRSG and bypass operation when firing natural gas. These stack parameters are based on estimated performance of a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. As noted in an October 4, 1990 telephone conference with the DER, the comments with respect to Units 6, 7, and 8 are no longer applicable.

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS*

	HRSG Stack	Bypass Stack
Stack Height, ft	60	60
Effective Stack Diameter, ft	11.2**	11.2**
Stack Exit Volume, acfm	440,420	621,140
, dscfm	225,350	225,350
Stack Velocity, fpm	4,470	6,305
Stack Exit Temperature, F	488	877
Stack Moisture, % by volume	8.10	8.10
Stack Oxygen, % by volume	14.53	14.53
20 F Emission Rate @ 15% O ₂ :		
PM, lb/h	2.5	2.5
, tpy***	11.0	11.0
SO ₂ , lb/h	0.2	0.2
, tpy***	0.9	0.9
NO _x , ppmdv	42	42
, lb/h	58.9	58.9
, tpy***	258.0	258.0
VOC, ppmdv	5	5
, lb/h	2.4	2.4
, tpy***	10.5	10.5
CO, ppmdv	10	10
, lb/h	8.5	8.5
, tpy***	37.2	37.2

*Stack parameters are given for a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

**Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

*** Annual emissions are based on 8,760 hours of operation per year.

NOTE: The bypass stack is only used during startup and for emergency peaking generation in simple cycle.

DER Comment 7

- o Considering the geography and climatology of Ft. Pierce, we question the use of an ambient temperature of 20 F [Table 5-1] in the modeling parameters. Please explain. Additional modeling may be required.

Response

- o Combustion turbine outputs (megawatts, fuel burn rates, and emissions) increase for operation at lower ambient temperatures (see response to DER Comment 5). The lowest anticipated temperature for the Fort Pierce project is 20 F. To keep the analysis of impacts conservative, the maximum emission rates used in the modeling analyses are based on an ambient temperature of 20 F. However, the dispersion analyses are based on five years (1982-1986) of hourly meteorological data from West Palm Beach, Florida as indicated in the application's ambient air quality impact analysis. Therefore, the modeling analysis is quite conservative since actual emissions will almost always be lower than the modeled emissions.

DER Comment 8

- o Provide the maximum quantities of NO_x, ammonia, and each amine compound (ppmv @ dry conditions, lbs./hr., and tons/year) that would be emitted if Unit 9 were equipped with steam injection and selective catalytic reduction. Please identify each of the amine compounds that would be expected. Please provide the stack parameters for Unit 9 based on the installation of steam injection and selective catalytic reduction.

Response

- o The maximum quantities of NO_x and ammonia that would be emitted if SCR were added to Unit 9 are given in the attached table. No detailed information is available concerning emissions of amine compounds when SCR is utilized. HRSG stack parameters considering steam injection and SCR are also given in the attached table. These stack parameters assume an ambient temperature of 20 F.

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS WITH SCR*

	HRSG Stack SCR
Stack Height, ft	60
Effective Stack Diameter, ft	11.2**
Stack Exit Volume, acfm	439,490
, dscfm	225,350
Stack Velocity, fpm	4,461
Stack Exit Temperature, F	486
Stack Moisture, % by volume	8.10
Stack Oxygen, % by volume	14.53
20 F Emission Rate @ 15% O ₂ :	
PM, lb/h	2.5
, tpy***	11.0
SO ₂ , lb/h	0.2
, tpy***	0.9
NO _x , ppmdv	9
, lb/h	12.6
, tpy***	55.2
VOC, ppmdv	5
, lb/h	2.4
, tpy***	10.5
CO, ppmdv	10
, lb/h	8.5
, tpy***	37.2
Ammonia, ppmdv	10
, lb/h	5.2
, tpy***	22.8

*Stack parameters are given for a GE PG5371 gas turbine with steam injection and SCR at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

**Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

***Annual emissions are based on 8,760 hours of operation per year.

DER Comment 9

- o Provide the 1-hour, 8-hour, 24-hour, and annual concentrations of NO_x, ammonia, and each of the identified amine compounds that would result if Unit 9 were equipped with steam injection and catalytic reduction.

Response

- o As requested, the 1-, 8-, 24-hour, and annual concentrations of NO_x and ammonia are given in the attached table. Ground-level concentrations could not be evaluated for amine compounds since detailed emission information is not available. A diskette and paper copy of the modeling output has been included.

It should be noted that the combustion turbine as proposed (steam injection only to achieve a NO_x emission limit of 42 ppmdv at 15 percent oxygen) showed maximum NO_x impacts to be less than ten percent of the NAAQS in the AAQIA modeling. These turbine impacts added to the NO_x background and other interacting sources were only about one third of the NAAQS. In addition, the H.D. King site is not near any ozone non-attainment areas. These facts demonstrate that there would be minimal air quality benefit from the addition of SCR for this turbine and, additionally, would create a small adverse impact from ammonia emissions.

MODELED NO_x AND AMMONIA IMPACTS WITH SCR¹

<u>Averaging Period³</u>	<u>Maximum Ground Level Impacts²</u>		<u>Impact Location</u>	
	<u>Ammonia with SCR (10 ppmdv) ug/m3</u>	<u>NO_x with SCR (9 ppmdv) ug/m3</u>	<u>Dist. km</u>	<u>Dir. deg</u>
Annual	0.8	1.8	0.879	260
24-Hour	19.6	47.4	0.879	260
8-Hour	36.9	89.5	0.654	90
1-Hour	71.6	173.6	0.654	90

¹GE PG5371 combined cycle combustion turbine with steam injection and Selective Catalytic Reduction (SCR).

²All modeled maximum impacts occurred in 1984.

³Annual pollutant impacts are based on maximum modeled concentrations. The short-term impacts are based on highest, second-highest modeled concentrations.

NOTE: Modeling was performed as described in Section 5.0 of the AAQIA. Specifically, stack parameters as presented in Table 5-1 of the AAQIA were used in this analysis. SCR emission rates at 20 F ambient conditions were used to determine impacts. These rates are:

NO _x @ 15% O ₂ , ppmdv	9
, lb/h	12.6
, tpy	55.2
Ammonia @ 15% O ₂ , ppmdv	10
, lb/h	5.2
, tpy	22.8

DER Comment 10

- o Explain how the costs on page 4-5 were derived, what is included in each of the listed categories (contingency, escalation, indirects, maintenance, energy, lost generation, etc.), the terms "energy" and "lost generation", and how the various percentages were arrived at. Since BACT is being evaluated using "today's" cost guidelines the economic analysis for selective catalytic reduction should be based on the present cost instead of the 1993 projections.

Response

- o Based on a more current cost analysis a revised Table 4-1 from the BACT analysis is attached. Revisions were made for a number of reasons. Economic criteria used to develop the costs listed on Table 4-1 were in some cases revised to reflect current economic conditions. In light of recent developments in the Mideast it appears that the escalation rates used in original analysis may be low. Therefore, the revised Table 4-1 is based on an operating cost escalation rate of 7 percent in lieu of the original 6 percent. Other revisions and a response to the comment are fully described by the following.

Capital costs for the SCR system and HRSG modifications were based on budgetary quotations from equipment manufacturers and in-house cost estimates. The 15 percent margin for contingency accounts for uncertainties inherent in estimating capital costs of this magnitude for a retrofit project. In addition, the contingency margin will cover costs neglected in determining the capital cost estimates.

It would take approximately 18-months to procure, design, construct and start-up an SCR system on Unit 9. Therefore, costs presented in the revised Table 4-1 are reflective of July 1992

TABLE 4-1. NITROGEN OXIDE EMISSIONS REDUCTION SYSTEM CAPITAL AND
LEVELIZED ANNUAL COSTS (REVISED)

	<u>SCR SYSTEM</u> \$1,000
Capital Costs:	
SCR System	930
HRSG Modifications	590
System Erection	520
Differential Balance of Plant	<u>70</u>
1991 Capital Cost	2,110
Contingency (15 percent)	320
Escalation (6 percent)	<u>180</u>
Direct Capital Cost	2,610
Indirects (16 percent)	420
Interest During Construction (8 percent)	<u>60</u>
1993 Total Capital Cost	3,090
Levelized Annual Costs*:	
Operating Personnel	70
Maintenance	510
Ammonia	70
Energy	50
Lost Generation	<u>210</u>
1993 Annual Operating Cost	910
Fixed Charges on Capital (13.6 percent)	<u>340</u>
1993 Total Annual Cost	1,250
 Nitrogen Oxides Emission Rate, ppm _{dv}	 9
Annual NO _x Emission Reduction, tpy	202
NO _x Emission Reduction Cost, \$/ton	6,190

*Annual costs are based on a 100 percent capacity factor.

dollars. Previous costs listed in Table 4-1 of the application were based on a 24-month schedule.

Payment for the equipment would be expected to occur around month 15 of the project. Therefore, capital costs were escalated at an annual rate of six percent for 15 months. This results in a direct capital cost of \$2,610,000. The previous Table 4-1 was based on only one year of escalation at a rate of six percent.

An indirect cost factor of 16 percent was applied to the escalated direct capital cost. Indirects cover owner and architect/engineer costs to design, procure, construct, and start-up the SCR system.

Interest during construction is applied to the escalated direct capital cost plus indirects for the construction period of three months at a rate of 8 percent. The previous Table 4-1 was based on one year of interest during construction. The July 1992 capital cost of retrofitting a SCR system to Unit 9 is \$3,090,000.

The annual operating costs for use of a SCR system include operating personnel, maintenance costs (primarily catalyst replacement), ammonia additive, energy, and lost generating capacity. Current estimates of these costs were escalated to the first year of operation based on an escalation rate of 7 percent. These first year costs were also levelized to account for the effect of escalation and present worth of future annual expenditures. Assuming a constant escalation rate of 7 percent and a constant present worth discount rate of 8 percent and the 25-year life of the facility the levelization factor is 1.94. Accordingly, first year operating costs were multiplied by this levelization factor to determine the levelized annual operating costs listed in Table 4-1.

Additional detail regarding the basis of the annual operating costs follows.

Operating personnel costs are based on one operator for one-half shift per day (4 hours). Additionally, operator costs are based on a loaded payroll cost of \$45,000 per year (1990 dollars).

Maintenance costs consist of a minor amount of routine SCR system maintenance and the predominant expense of catalyst replacements. It is expected that catalyst replacements will occur once every three years. Catalyst replacement costs only reflect replacement of the catalyst bed.

Ammonia costs are based on a 1990 cost of ammonia of \$250 per ton. Ammonia usage rates were based on information obtained from potential SCR manufacturers.

Energy costs reflect the electrical consumption requirements of the SCR system. It is estimated that the SCR system will consume 36 kW of electricity to run pumps and vaporizers. Energy penalties are assessed based on a 1990 cost of 70 mills per kWh. This energy cost reflects fuel, O&M, and replacement plant costs.

Due to the pressure drop associated with the use of a SCR system the Unit 9 combustion turbine will be derated by approximately 0.6 percent (approximately 162 kW). This lost generation capacity must be replaced. Therefore, a penalty based on a 1990 energy cost of 70 mills per kWh is assessed against the SCR system. Previous values for lost generation listed in the original Table 4-1 only reflected the capital cost of replacement power for this lost generation. Current estimates provided in the revised Table 4-1 also include the operation and maintenance costs associated with makeup of this lost generation.

Total annual costs for an SCR system are calculated as the sum of levelized annual operating costs and fixed charges on capital. Fixed charges are those annual ownership costs that vary directly with the capital investment. A fixed charge rate of 10.9 percent was used to calculate the costs listed in Table 4-1. The fixed charge rate was calculated based on the cost of debt, depreciation, and margins for property taxes and insurance.

The total annual cost for installation of a SCR system on Unit 9 would be \$1,250,000 in July 1992 dollars. The SCR system would be capable of meeting a NO_x emission limit of 9 ppm_v at 15 percent oxygen. This results in an incremental NO_x emission reduction cost of \$6,190 per ton. Recent permit determinations by the DER have been based on costs representative of first operational year dollars, and not current or "today's" dollars. We would expect this project to be reviewed using those same policy guidelines. Therefore, the request by DER to convert these costs to today's dollars is not consistent with precedent and therefore, does not seem appropriate.

The estimated actual costs to Fort Pierce listed in Table 4-1 of the BACT analysis include a cost of \$590,000 for HRSG modifications and an incremental cost of \$312,000 for erection over and above the cost of erection of an SCR at a new site. Fort Pierce Utilities Authority did not choose its permitting history with any intent to avoid SCR. In fact, earlier BACT guideline values would not have indicated SCR had the unit originally been subject to BACT review for NO_x. Consequently, we believe that actual expected costs are the appropriate measure of this BACT analysis.

DER Comment 11

- o On page 4-6, you state that the addition of a selective catalytic reduction system to meet 9 ppmv @ 15% O₂ will add \$1.1 million dollars to the levelized annual cost for Unit 9? What is the present levelized annual cost for each of the other generating units at H. D. King generating station? Would the selective catalytic reduction system in your analysis achieve an NO_x concentration of 25 ppmv @ 15% O₂ when oil is burned? Fully explain your answer.

Response

- o The present annual cost of operating Unit 9 is \$728,830. The initial capital cost of Unit 9 was \$13.4 million in 1989 dollars. To compare with the July 1992 costs listed in the revised Table 4-1 it is necessary to adjust these annual operating and capital costs by the following factors.
 - Capital escalation = 6 percent per year
 - Operating cost escalation = 7 percent per year
 - Levelized fixed charge rate = 10.87 percent
 - Operating cost levelization factor = 1.94

Escalation and levelization of the Unit 9 operating and capital cost results in a levelized annual cost of \$3.46 million in July 1992 dollars. Based on a levelized annual cost of \$1.25 million to own and operate a SCR system the levelized annual cost for Unit 9 would increase to \$4.71 million, a 36 percent increase. Based on the October 4, 1990 telephone conference between the DER and B&V it is not necessary to present the levelized annual costs for Units 6, 7, and 8.

Unit 9's combustion turbine is capable of limiting NO_x emissions to 65 ppmv at 15 percent oxygen when burning fuel oil. However, fuel oil will only be burned during emergency operation. Use of a SCR system when burning fuel oil could lead to a number of

catalyst poisoning and downstream equipment fouling problems. Costs listed in the revised Table 4-1 reflect a catalyst designed for use with natural gas only. Therefore, the basis of the BACT's SCR scenario is that if an emergency situation arose that required the use of fuel oil the SCR system would not be operated. In emergency situations when fuel oil must be burned a NO_x emission rate of 65 ppm_{dv} at 15 percent oxygen should be achievable.

DER Comment 12

- o Please provide a copy of each construction permit that has been issued for the construction of Unit 6, Unit 7, and Unit 8. Provide the initial date of construction and completion for each of these air pollution sources.

Response

- o If any construction permits for these units have been found in our files we have enclosed a copy of them with these responses.

DER Comment 13

- o Describe the bypass stack in terms of the circumstances and frequency of use, location within the facility, geometry [height and diameter], flue gas parameters [volume (ACFM and DSCFM), exit velocity (fpm), exit temperature (°F), moisture (% by volume), and oxygen (% by volume)], and the maximum hourly and annual emissions of each pollutant listed (in) Table 500-2 of F.A.C. Chapter 17-2.

Response

- o The Unit 9 combustion turbine bypass stack is only used during startup and emergency peaking generation in simple cycle operation. Although these uses are expected to be very infrequent and/or of short duration, the stack is being permitted such that it could be operational for 8,760 hours per year. The location of the bypass stack relative to the HRSG stack is shown in the attached figure.

The stack parameters for both HRSG and bypass operation are given in the attached table. Note that the emission rates are the same for both simple (bypass) and combined cycle operation (HRSG). However, simple cycle operation involves much higher gas exit temperatures (and thus higher ACFM exit flows). These higher temperatures and flow volumes lead to greater thermal and momentum plume rise. This increase in plume height will lead to lower ground-level impacts. Consequently, air dispersion modeling was not performed for the simple cycle case.

FPUA UNIT 9 COMBUSTION TURBINE STACK PARAMETERS - NATURAL GAS*

	<u>HRSG Stack</u>	<u>Bypass Stack</u>
Stack Height, ft	60	60
Effective Stack Diameter, ft	11.2**	11.2**
Stack Exit Volume, acfm	440,420	621,140
, dscfm	225,350	225,350
Stack Velocity, fpm	4,470	6,305
Stack Exit Temperature, F	488	877
Stack Moisture, % by volume	8.10	8.10
Stack Oxygen, % by volume	14.53	14.53
20 F Emission Rate @ 15% O ₂ :		
PM, lb/h	2.5	2.5
, tpy***	11.0	11.0
SO ₂ , lb/h	0.2	0.2
, tpy***	0.9	0.9
NO _x , ppmdv	42	42
, lb/h	58.9	58.9
, tpy***	258.0	258.0
VOC, ppmdv	5	5
, lb/h	2.4	2.4
, tpy***	10.5	10.5
CO, ppmdv	10	10
, lb/h	8.5	8.5
, tpy***	37.2	37.2

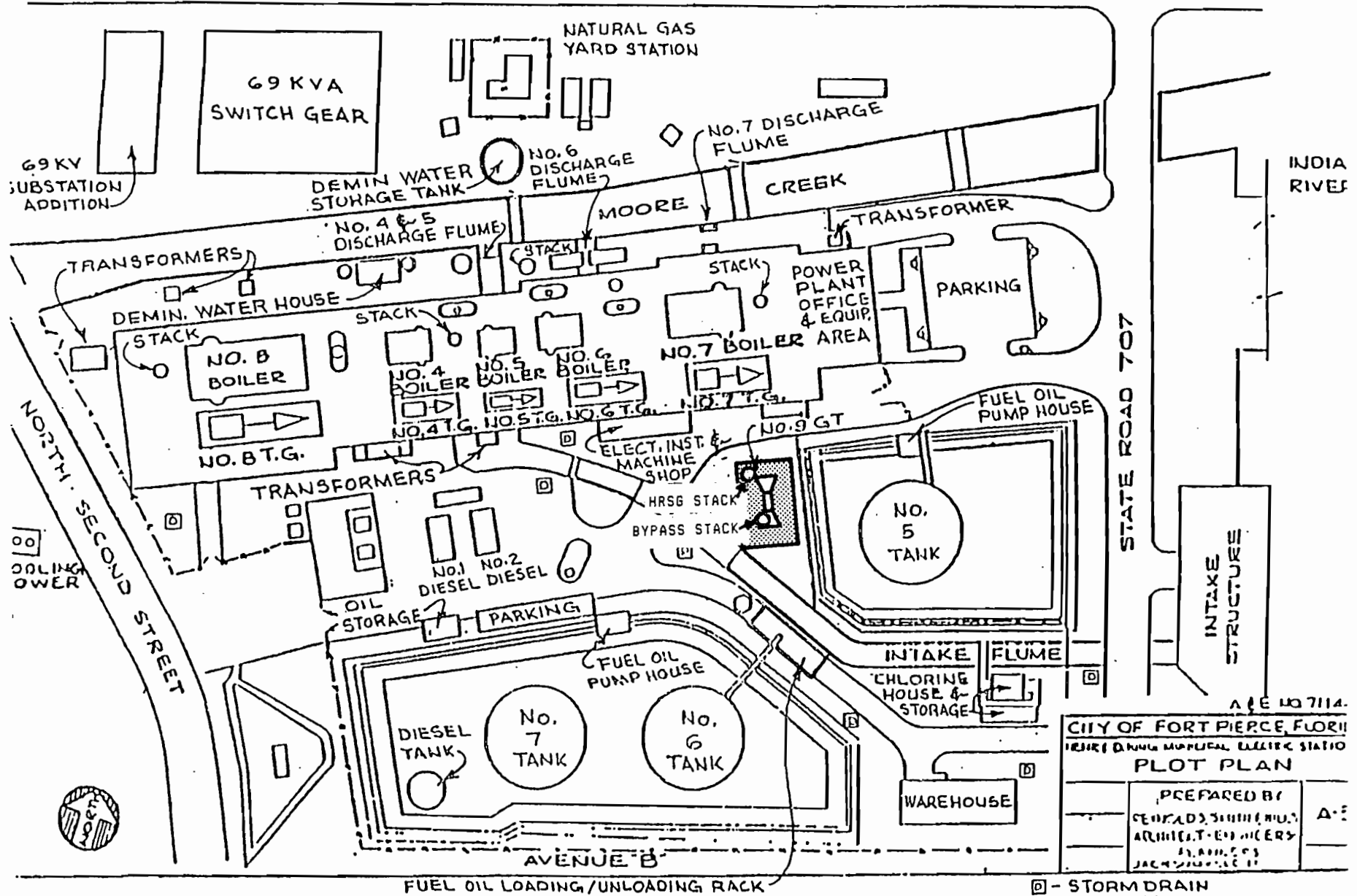
*Stack parameters are given for a GE PG5371 gas turbine with steam injection at an ambient temperature of 20 F. This ambient condition gives the highest pounds per hour emission rate.

**Actual stack is rectangular with dimensions: 9' 3" x 10' 7 1/8".

***Annual emissions are based on 8,760 hours of operation per year.

NOTE: The bypass stack is only used during startup and for emergency peaking generation in simple cycle.

FIGURE 2-2. SITE ARRANGEMENT



DER Comment 14

- o Please note that we have not received a BACT application for Unit 6 as was requested by the Southeast District.

Response

- o A BACT analysis for Unit 6 will not be a part of this application for Unit 9. We will be happy to provide you a copy of it when we file it with our renewal application for Unit 6 in December.



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Daie Twachtmann, Secretary

John Shearer, Assistant Secretary

October 2, 1990

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
U.S. EPA - Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Ms. Harper:

Re: Completeness Review

The enclosed information is being forwarded to you for completeness review.

1. Vero Beach Municipal Power Plant: 58 MW combined cycle plant; PSD-FL-152; please submit comments by October 29, 1990;
2. Farmland Industries, Inc. - Green Bay Complex: Sulfuric Acid Plant No. 5 modification; PSD-FL-143A; please submit comments as soon as possible;
3. CF Industries - "C" and "D" Double Absorption Sulfuric Acid Plants modifications; PSD-FL-155; please submit comments by October 25, 1990; and,
4. Anheuser-Busch Companies, Inc. - lid production capacity modification; PSD-FL-153; currently incomplete and their response will be forwarded upon receipt; please review for comments.
5. Ft. Pierce Utilities Authority - H.D. King Unit 9: modification; PSD-FL-154; currently incomplete and their response will be forwarded to you upon receipt; please review for comments.

If there are any questions, please call Barry Andrews at (904) 488-1344 or write to me at the above address. All comments, written or oral, should be received by the above requested dates. If it is convenient to FAX a response to us, the FAX number to use is (904)922-6979.

Sincerely,

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

CHF/BM/t



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

September 28, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Ft. Pierce
P. O. Box 3191
Ft. Pierce, FL 34948

RE: AC 56-185836 - Ft. Pierce Utilities Authority - H. D. King
Unit 9

Dear Mr. Schindehette:

We have reviewed your application for the above referenced permit and find it to be incomplete. You will need to show all calculations, state and justify all assumptions, identify the sources of any emission factors, and provide copies of references where the emission factors or other information were obtained from sources other than AP-42. In responding to those questions that request information concerning air pollutant emissions, please provide the emissions for each fuel that the affected sources are authorized to burn. Processing of your application will resume upon receipt of the following information:

NON NEGOTIABLE

- ✓ Please provide a completed State of Florida permit application form [DER Form 17-1.202(1)] that is signed by the owner or the owner's authorized agent. The permit application form is also to be signed and sealed with a metallic impression-type seal by a professional engineer registered in Florida.

UNIT 9 IS A MUST
6, 7, 8 BECAUSE
POLLUTANT HAS IMPACT
ON CROPS

Provide the present actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lbs./hr., and tons/year for each affected source [Unit 6, Unit 7, Unit 8, and Unit 9]. The present actual emissions are to be determined on the basis of the most recent source emission test wherever possible. Where emission tests are used, copies of the cover page and summary sheet are to be included.

UNIT 9 MUST
6, 7, 8, NEEDED
FOR HHS

- ✓ Provide the maximum proposed emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lbs./hr., and tons/year to be emitted by each affected source [Unit 6, Unit 7, Unit 8, and Unit 9].

EXPLANATION MUST

- ✓ Explain why the previous application for a construction permit projected carbon monoxide emissions of 110 tons/year from Unit 9 while the present permit application indicates projected CO emissions of 41 tons/year from Unit 9. The previous application also included total contemporaneous emission reductions of about 99.3 tons/year from Units 6, 7, and 8. It appears that you may be required to determine downwind concentrations of CO using EPA approved models and perform a best available control technology (BACT) analysis for CO.

MUST

- ✓ ISO standard day conditions for gas turbines are defined as 288°K (59°F), 101.3 KPa (29.92 in. Hg.), and 60% relative humidity. The concentration standard for gas turbines is expressed at dry ISO conditions. Some of your gas turbine emission calculations involving standard conditions did not appear to be based on dry ISO conditions. Please make necessary corrections. For other air pollutant emission sources state and federal regulations define standard temperature and pressure to be 68°F and 29.92 in. Hg.

MUST FOR
RETURNS
STATED IN
7:3

- ✓ Provide the present actual and proposed stack parameters for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9]. The parameters are to include stack height, stack exit diameter, stack exit volume (ACFM and DSCFM), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume). Also, provide the present actual and the proposed annual hours of operation for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9].

NEED WRITTEN
ANSWER

- ✓ Considering the geography and climatology of Ft. Pierce, we question the use of an ambient temperature of 20°F [Table 5-1] in the modeling parameters. Please explain. Additional modeling may be required.

MUST BE
ON COMMENTS
ABOUT JCR

- ✓ Provide the maximum quantities of NO_x, ammonia, and each amine compound (ppmv @ dry conditions, lbs./hr., and tons/year) that would be emitted if Unit 9 were equipped with steam injection and selective catalytic reduction. Please identify each of the amine compounds that would be expected. Please provide the stack parameters for Unit 9 based on the installation of steam injection and selective catalytic reduction.

Mr. H. Schindehette
September 28, 1990
Page Three

MUST BE
A CONSIDERATION

- ✓ Provide the 1-hour, 8-hour, 24-hour, and annual concentrations of NO_x , ammonia, and each of the identified amine compounds that would result if Unit 9 were equipped with steam injection and catalytic reduction.
- ✓ Explain how the costs on page 4-5 were derived, what is included in each of the listed categories (contingency, escalation, indirects, maintenance, energy, lost generation, etc.), the terms "energy" and "lost generation", and how the various percentages were arrived at. Since BACT is being evaluated using "today's" cost guidelines the economic analysis for selective catalytic reduction should be based on the present cost instead of the 1993 projections.
- ✓ On page 4-6, you state that the addition of a selective catalytic reduction system to meet 9 ppmv @ 15% O_2 will add \$1.1 million dollars to the levelized annual project cost. What is the present levelized annual cost for Unit 9? What is the present levelized annual cost for each of the other generating units at H. D. King generating station? Would the selective catalytic reduction system in your analysis achieve an NO_x concentration of 25ppmv @ 15% O_2 when oil is burned? Fully explain your answer.

ANY CONSTRUCTION
PERMITS HAVE
ISSUED BY DIST

Please provide a copy of each construction permit that has been issued for the construction of Unit 6, Unit 7, and Unit 8. Provide the initial date of construction and completion for each of these air pollution sources.

NEED

Describe the bypass stack in terms of the circumstances and frequency of use, location within the facility, geometry [height and diameter], flue gas parameters [volume (ACFM and DSCFM), exit velocity (fpm), exit temperature ($^{\circ}\text{F}$), moisture (% by volume), and oxygen (% by volume)], and the maximum hourly and annual emissions of each pollutant listed Table 500-2 of F.A.C. Chapter 17-2.

NEGOTIABLE

- Please note that we have not received a BACT application for Unit 6 as was requested by the Southeast District.

If you have any questions or wish to meet with us, please write to me at the address above or call Barry Andrews at (904) 488-1344.

Sincerely,


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

cc: S. Day
J. Miller

H. Lamb
I. Goldman

P 256 396 205

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

Sent to Mr. Harry Schindehette, P.E.	
Street and No. P. O. Box 3191	
P.O., State, and ZIP Code Ft. Pierce, FL 34948	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date Mailed: 9-28-90 Permit: AC 56-185836	

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested. 1. ☐ Show to whom delivered, date, and addressee's address. 2. ☐ Restricted Delivery (Extra charge)		4. Article Number P 256 396 205 Type of Service: ☐ Registered ☒ Certified ☐ Express Mail ☐ Insured ☐ COD ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.	
3. Article Addressed to: Mr. Harry Schindehette, P.E. Director of Utilities City of Ft. Pierce P. O. Box 3191 Ft. Pierce, FL 34948		5. Signature — Address X	
6. Signature Agent X <i>[Signature]</i>		8. Addressee's Address (ONLY if requested and fee paid) 16/1/90	
7. Date of Delivery 16/1/90			

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

September 27, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harry Schindehette, P.E.
Director of Utilities
City of Ft. Pierce
P. O. Box 3191
Ft. Pierce, FL 34948

Dear Mr. Schindehette:

We have reviewed your application for the above referenced permit and find it to be incomplete. You will need to show all calculations, state and justify all assumptions, identify the sources of any emission factors, and provide copies of references where the emission factors or other information were obtained from sources other than AP-42. In responding to those questions that request information concerning air pollutant emissions, please provide the emissions for each fuel that the affected sources are authorized to burn. Processing of your application will resume upon receipt of the following information:

- Please provide a completed State of Florida permit application form [DER Form 17-1.202(1)] that is signed by the owner or the owner's authorized agent. The permit application form is also to be signed and sealed with a metallic impression-type seal by a professional engineer registered in Florida.
- Provide the present actual emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of any applicable emission limiting standard, lbs./hr., and tons/year for each affected source [Unit 6, Unit 7, Unit 8, and Unit 9]. The present actual emissions are to be determined on the basis of the most recent source emission test wherever possible. Where emission tests are used, copies of the cover page and summary sheet are to be included.
- Provide the maximum proposed emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in units of the applicable emission limiting standard, lbs./hr., and tons/year to be emitted by each affected source [Unit 6, Unit 7, Unit 8, and Unit 9].
- Explain why the previous application for a construction permit projected carbon monoxide emissions of 110 tons/year from Unit 9 while the present permit application indicates projects CO emissions of 41 tons/year from Unit 9. The previous application also included total contemporaneous emission reductions of about 99.3 tons/year from Units 6, 7, and 8. It appears that you may be required to determine

downwind concentrations of CO using EPA approved models and perform a BACT analysis for CO.

- ISO standard day conditions for gas turbines are defined as 288°K (59°F), 101.3 KPa (29.91 in.Hg.), and 60% relative humidity. The concentration standard for gas turbines is expressed at dry ISO conditions. Some of your gas turbine emission calculations involving standard conditions did not appear to use these values. Please make necessary corrections. For other air pollutant emission sources state and federal regulations define standard temperature and pressure to be 68°F and 29.92 in. Hg.
- Provide the present actual and proposed stack parameters for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9]. The parameters are to include stack height, stack exit diameter, stack exit volume (ACFM and DSCFM), stack velocity, stack exit temperature, stack moisture (% by volume), and stack oxygen (% by volume). Also, provide the present actual and the proposed annual hours of operation for each of the affected sources [Unit 6, Unit 7, Unit 8, and Unit 9].
- Considering the geography and climatology of Ft. Pierce, we question the use of an ambient temperature of 20°F [Table 5-1] in the modeling parameters. Please explain. Additional modeling may be required.
- Provide the maximum quantities of NO_x, ammonia, and each amine compound (lbs./hr. and tons/year) that would be emitted if Unit 9 were equipped with steam injection and selective catalytic reduction. Please identify each of the amine compounds that would be expected. Please provide the stack parameters for Unit 9.
- Provide the 1-hour, 8-hour, 24-hour, and annual concentrations of NO_x, ammonia, and each of the identified amine compounds that would result if Unit 9 were equipped with steam injection and catalytic reduction.
- ~~A complete top-down BACT analysis that includes an analysis of the cost of meeting the LAER emission control alternative (4.5-ppmdv @ 15% O₂ using water injection and selective catalytic reduction), the cost of meeting 9-ppmdv @ 15% O₂ using steam injection and selective catalytic reduction, the cost of meeting a standard between 9 and 42-ppmdv @ 15% O₂ using water injection, and 42-ppmdv @ 15% O₂. The cost of installing and utilizing selective non-catalytic reduction should be included in the BACT analysis. The maximum proposed emissions of each pollutant listed in Table 500-2 of F.A.C. Rule 17-2.500 in lbs./hr. and tons/year should be included for each of the alternatives. Emissions should be estimated both for the use of gas and oil. Please denote the NO_x and SO₂ concentrations for those situations where oil is to be burned.~~
- Explain how the costs on page 4-5 were derived, what is included in each of the listed categories (contingency, escalation, indirects, maintenance, energy, lost generation, etc.), the terms "energy" and "lost generation", and how the various percentages were arrived at.)

On page 4-6, you state that the addition of a selective catalytic reduction system to meet 9 ppmv @ 15% O₂ will add

Since BACT is being evaluated using "today's" cost guidelines, the economic should be based on for SCR should be based on the present cost instead of 1993 projections.

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- Please provide a copy of each construction permit that has been issued for the construction of Unit 6, Unit 7, and Unit 8. Provide the initial date of construction and completion for each of these air pollution sources.
- Describe the bypass stack in terms of the circumstances and frequency of use, location within the facility, geometry [height and diameter], flue gas parameters [volume (ACFM and DSCFM), exit velocity, exit temperature, moisture (% by volume), and oxygen (% by volume)], and the maximum hourly and annual emissions of each pollutant listed Table 500-2 of F.A.C. Chapter 17-2.

- Please note that we have not received a BACT application for Unit 6 as was requested by the Southeast District.