Enron North America Corp.
P.O. Box 1188
Houston, TX 77251-1188

April 20, 2001

Mr. Al Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Dade Development Company, LLC
Permit Application for South Dade Energy Center

Dear Mr. Linero:

On behalf of, Dade Development Company, LLC, enclosed are four (4) copies of an air permit application for the South Dade Energy Center in Dade County, Florida. This application is for a non-PSD permit for a simple cycle combustion turbine power plant consisting of 2 Mitsubishi Heavy Industries (MHI) 501F dual-fuel units. Although not required for a non-PSD review, we have conducted an air quality impact assessment, which is contained in Attachment C of this document. In addition, enclosed is a CD-ROM containing the modeling archive. Separate copies of this application are being sent to the Southeast District of the Florida DEP as well as to Miami-Dade County Department of Environmental Resources Management (DERM). An application fee of $7,500 has been enclosed.

If you have any questions, please don't hesitate to call me at (713) 853-3161.

Sincerely,
Enron North America

David A. Kellermeyer

David A. Kellermeyer
Director

Enclosures

cc: Mr. Lennon Anderson, DEP Southeast District
Mr. Patrick Wong, DERM
J. Heron
C. Halladay

Dade Development Company, L.L.C.
Houston, TX

Air Permit Application for the South Dade Energy Center

ENSR Corporation
April 2001
Document Number 6792-140-410

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1.0 INTRODUCTION

Dade Development Company, L.L.C. is proposing to construct and operate a simple cycle combustion turbine peaking electric generating facility in Dade County, Florida. The South Dade Energy Center (SDEC) will be a non-utility power generating facility (merchant plant) designed to produce electric energy for sale to the wholesale power market.

The SDEC will be sited on approximately 31 acres located in Dade County, Florida (see Figure 1-1). The facility will consist of two Mitsubishi Heavy Industry (MHI) 501F simple cycle combustion turbines with a nominal generating capacity of approximately 370 megawatts (MW). The plant will fire natural gas and low sulfur distillate fuel oil. Natural gas will be the primary fuel. Distillate fuel will be used as a back-up fuel, in the event that natural gas is unavailable to the facility. The turbines will use dry low-NO_x combustors during natural gas firing, and water injection during distillate oil firing to minimize NO_x formation. Good combustion practices will be used to control emissions of CO and VOC. The turbines will be equipped with inlet air chilling for power augmentation. The SDEC is scheduled to begin producing power as early as May 1, 2002. Construction will take approximately 6 months with a planned start date of November 1, 2001 (upon receipt of all necessary local and environmental approvals).

As a peaking facility, the project will operate on an intermittent basis, primarily during periods when short-term electrical demand exceeds base load supply. Hence, the SDEC will run primarily during the peak demand hours of the summer months and to a limited extent on the coldest winter days. In order to be permitted as a minor source of air emissions, the SDEC will limit emissions of all criteria pollutants to less than 250 tons per year (TPY) by accepting an enforceable limitation on tons per year of all criteria pollutants emitted. NO_x and CO have been determined to be the limiting pollutants for major source status. As such, it is proposed that NO_x and CO emissions be limited to no more than 248 TPY, as measured by NO_x and CO continuous emission monitoring systems.

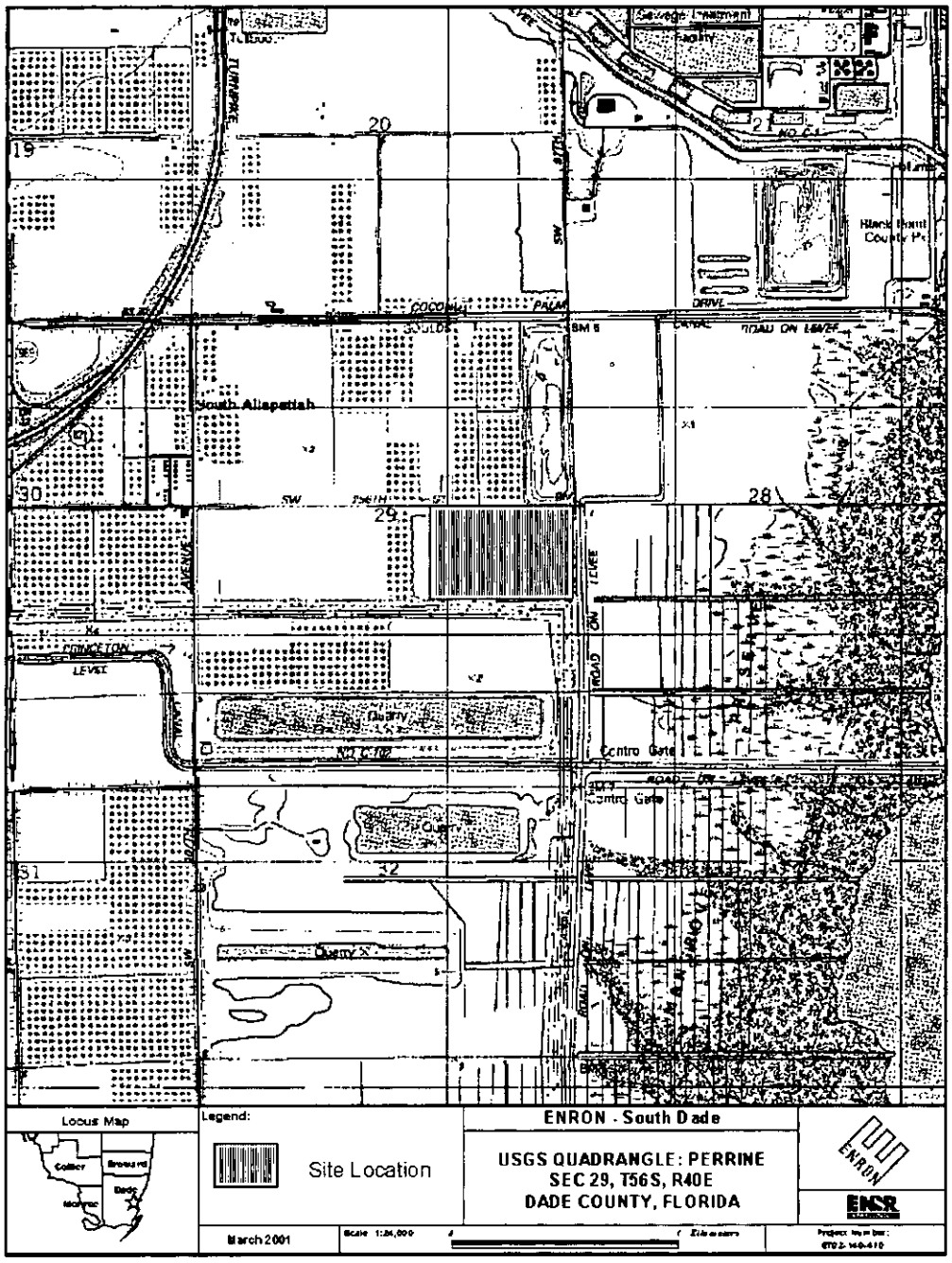
As part of its application, Dade Development Company, L.L.C. is requesting the ability to burn fuel oil. While the intention is to burn natural gas at every opportunity, near term constraints on the Florida Gas Transmission ("FGT") pipeline may impede the ability to burn natural gas during some periods of peak demand during the summer season. In general, the FGT natural gas transmission line flows near its maximum pipeline capacity of 1.5 Bcf/day during the summer season. In order to accommodate the demand for incremental generation within the state of Florida, FGT plans to expand its pipeline capacity by approximately 600,000 MMBtu/day before the summer of 2002. Additionally, FGT is in active discussions with potential shippers to perform another expansion of its pipeline in 2003. The addition of this capacity should reduce periods of pipeline constraint and will result in an increased availability of natural gas to the proposed site. The request for oil burning flexibility is necessitated by near term FGT capacity constraints and is not due to deficient gas supplies received by FGT. Moreover, operational guidelines dictate that natural gas be the primary fuel source and that oil will be

used as a backup fuel to the extent that transmission capacity constraints on FGT pipeline preclude the delivery of natural gas to the site.

Section 2 of this application provides a more detailed project description. Section 3 presents a summary of the project emissions and the basis and methods used to calculate emissions. The required Florida Department of Environmental Protection (FDEP) application forms are presented in Appendix A, with supporting calculations for emissions included in Appendix B. Although not formally required as part of the construction permitting process for minor sources, air dispersion modeling was conducted to assess the impact of the SDEC on local air quality, including the Everglades and Biscayne National Parks. The air quality impact assessment is presented in Appendix C.

As "new affected units" under Phase II of the Acid Rain Program, the SDEC is required to obtain SO_2 allowances. The application for the Phase II Acid Rain permit will be submitted shortly after this application is filed.

Figure 1-1 Site Location Map



2.0 PROJECT DESCRIPTION

The proposed SDEC will utilize two MHI 501F combustion turbines (CTs), providing a total nominal generating capacity of approximately 370 MW. Emissions from each turbine will be vented through stacks that are 80 feet tall and with an effective diameter of 27.68 feet. Figure 2-1 is a conceptual drawing depicting the layout of the proposed turbine configuration, Figure 2-2 is a process flow diagram for the proposed combustion turbines.

The turbines will be equipped to fire both natural gas and fuel oil utilizing natural gas as the primary fuel. The project will not use any other fuel source for startup, shutdown, or backup. The SDEC will have the ability to utilize power from the grid for startup. Electrical power produced by the project will be interconnected to the electric grid by a transmission line to FPL's transmission line in the vicinity of the property.

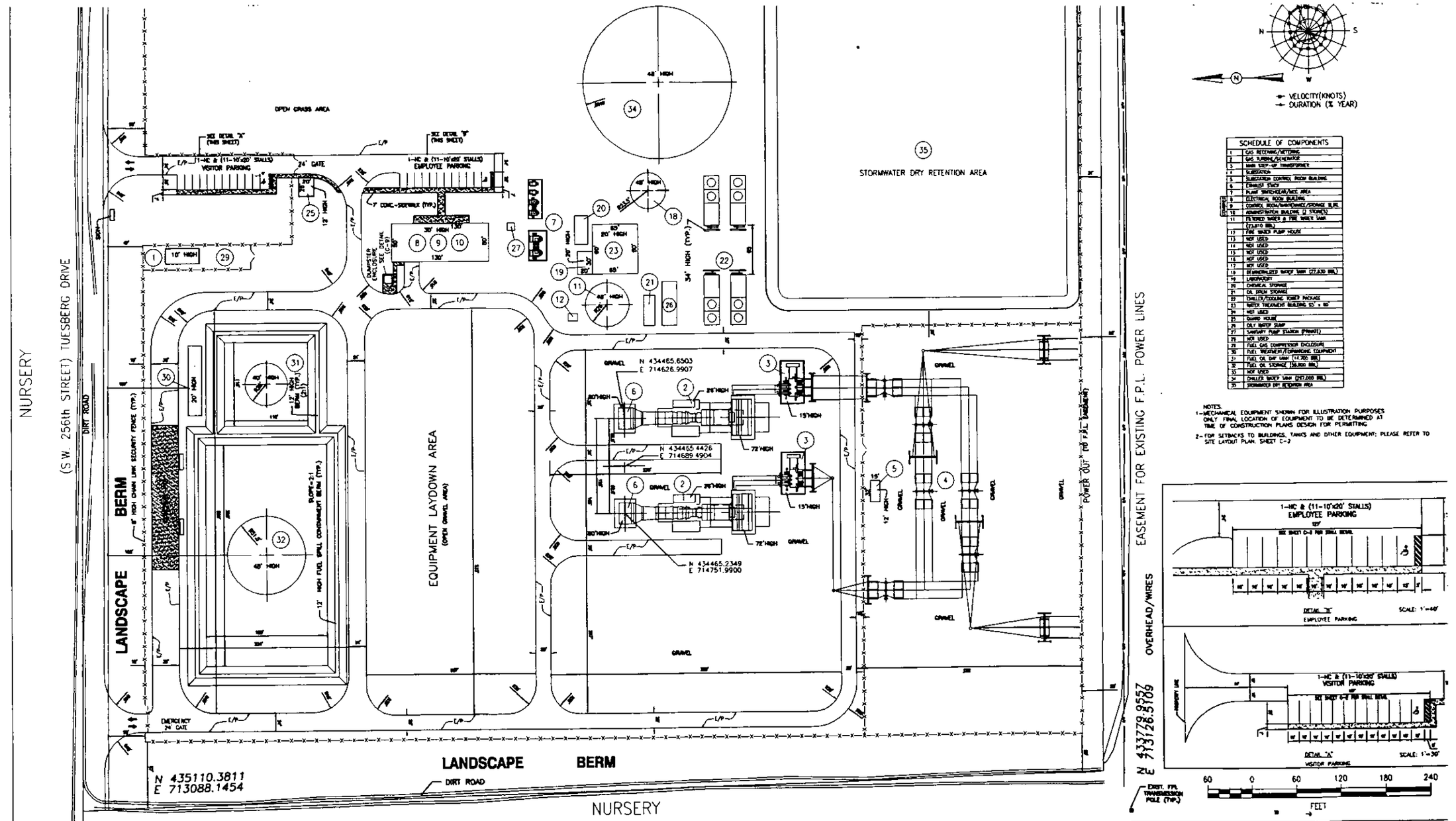
The SDEC will use simple cycle power generation for peaking electrical generation for periods when short-term electrical demand exceeds base load supply. Peaking units have the ability to be brought on-and off-line quickly in response to fluctuations in electrical demand. Typical startup to 100% load and shutdown from 100% load can be achieved in approximately 20 minutes .

The SDEC will be permitted and operated as a synthetic minor source under the Clean Air Act by accepting a permit limitation on tons per year of criteria pollutants emitted. Figure 2-3 illustrates the relative emissions rates of criteria pollutants from the proposed turbines. Based on the proposed permit limits, the most limiting pollutant is NO_x during natural gas and distillate oil operation. Dade Development Company, L.L.C. proposes to limit potential emissions from the SDEC through the use of a Continuous Emission Monitoring System (CEMS) for NO_x and CO. By limiting emissions of NO_x and CO to less than the major source threshold of 248 tons per year, it can be seen than none of the remaining criteria pollutants will exceed the 250 ton per year threshold. Although performance data has been included for operating conditions at 75% and 100% load, each CT will typically be operated at full (100%) load. Depending upon demand, all units may not be in operation.

The SDEC will also incorporate tanks used to store distillate oil for the combustion turbines a fire-water pump engine, a natural gas fuel heater, and a chiller system with four small mechanical draft cooling towers for cooling the inlet air to the turbines during high ambient temperature conditions. The on site oil storage requirements have been estimated to be a maximum of 1,852,200 gallons, with a maximum day storage tank requirement of 463,000 gallons. The working and breathing losses from the two tanks has been estimated using EPA's Tanks 4.0 program to be less than 0.85 tons per year.

For emergency purposes the SDEC will incorporate a fire water pump powered by a 250 hp diesel engine. The emissions from this engine have been estimated using AP-42 emission factors, assuming a maximum operation of 500 hours per year. Based on this operational limitation the fire water pump engine satisfies the applicable criteria of Rule 62-210.300(b)1 for exemption from permitting and thus

has not been addressed in the Section III of the FDEP application forms. In addition, a 6 MMBtu/hr fuel gas heater will be included for use as a means to prevent condensation of moisture and hydrates in natural gas used in the gas turbines. This emissions unit also meets the criteria for the generic emissions unit exemption under Rule 62.210.300(b)1 and has not been included in Section III of the application forms.



SCHEDULE OF COMPONENTS		
	1	GAS RECEIVING/METERING
	2	GAS TURBINE/GENERATOR
	3	MAIN STEP-UP TRANSFORMER
	4	SUBSTATION
	5	SUBSTATION CONTROL ROOM BUILDING
	6	EXHAUST STACK
	7	PLANT SWITCHGEAR/MCC AREA
	8	ELECTRICAL ROOM BUILDING
	9	CONTROL ROOM/WAREHOUSE/STORAGE BLDG.
	10	ADMINISTRATION BUILDING (2 STORIES)
	11	FILTERED WATER & FIRE WATER TANK (73,810 BBL)
	12	FIRE WATER PUMP HOUSE
	13	NOT USED
	14	NOT USED
	15	NOT USED
	16	NOT USED
	17	NOT USED
	18	DEMINERALIZED WATER TANK (27,630 BBL)
	19	LABORATORY
	20	CHEMICAL STORAGE
	21	OIL DRUM STORAGE
	22	CHILLER/COOLING TOWER PACKAGE
	23	WATER TREATMENT BUILDING 50' x 80'
	24	NOT USED
	25	GUARD HOUSE
	26	OILY WASTE SUMP
	27	SANITARY PUMP STATION (PRIVATE)
	28	NOT USED
	29	FUEL GAS COMPRESSOR ENCLOSURE
	30	FUEL HEATER/FORWARDING EQUIPMENT
	31	FUEL OIL DAY TANK (14,700 BBL)
	32	FUEL OIL STORAGE (56,000 BBL)
	33	NOT USED
	34	CHILLER WATER TANK (267,000 BBL)
	35	STORMWATER DRY RETENTION AREA

NOTES:
1- MECHANICAL EQUIPMENT SHOWN FOR ILLUSTRATION PURPOSES ONLY. FINAL LOCATION OF EQUIPMENT TO BE DETERMINED AT TIME OF CONSTRUCTION PLANS DESIGN FOR PERMITTING.
2- FOR SETBACKS TO BUILDINGS, TANKS AND OTHER EQUIPMENT; PLEASE REFER TO SITE LAYOUT PLAN, SHEET C-2

NO	REFERENCE DRAWING TITLE	NO	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
		E	GENERAL REVISION	LJL	02-20-01	RJL	
		D	GENERAL REVISION	LJL	01-29-01	RJL	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE	APPROVED BY	APPROVED DATE
PREL'Y						
BID						
CONSTR.						
CADDS	PLOT DATE					
	FILE NAME					

P.I./STA. ACCT. NO.		
CONSTRUCTION YR		
	BY	DATE
DESIGN	R.CABRERA	11-30-00
DRAWN	L.MADUREIRA	11-30-00
ASBUILT		
FILE NO.		
SCALE	1"=80'	

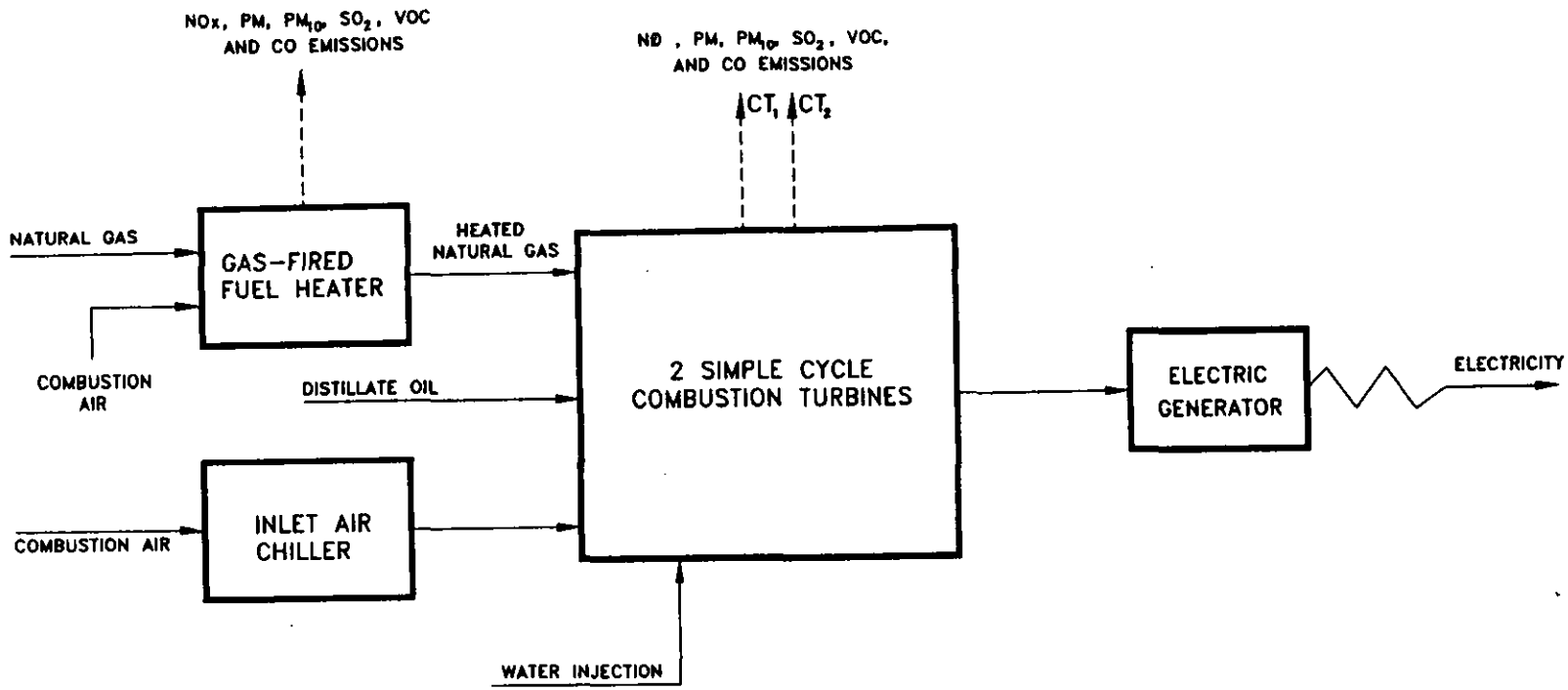
RICHARD A. LEAR, P.E.
DATE
LIC. No. 25189, STATE OF FLORIDA

PB Power, Inc.
A Parsons Brinckerhoff Company
3575 Piedmont Road, Suite 300, Atlanta, GA 30305
(404) 841-4700 (404) 841-4725 Fax

South Dade Energy Center

Figure 2-1
Equipment Arrangement Plan

APL/WORK ORDER	
ASBUILT DWG. NO.	
CONSTRUCTION DWG. NO.	
SHEET C-3	REV. NO. E



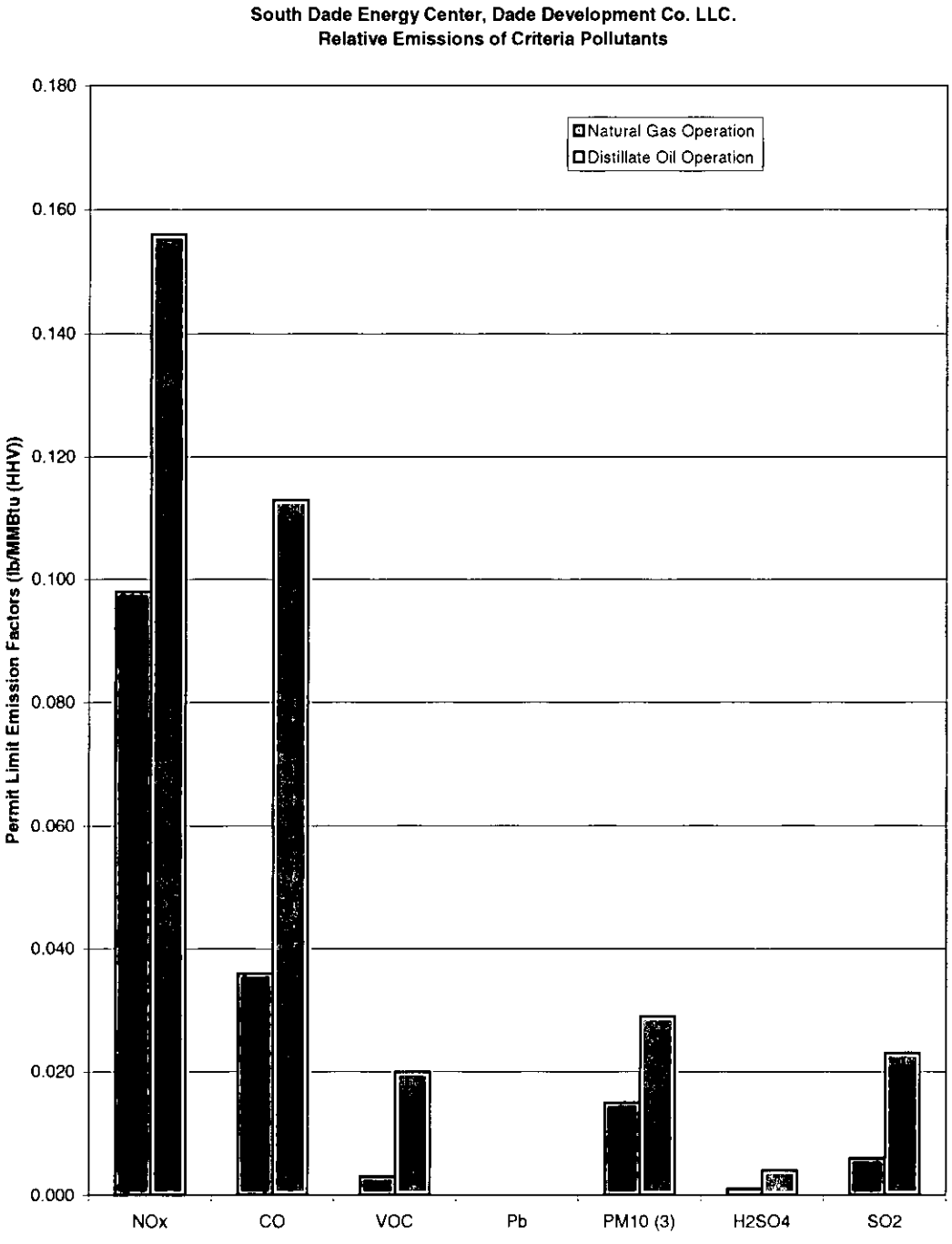
ENSR INTERNATIONAL

FIGURE 2-2
PROCESS FLOW DIAGRAM
SIMPLE CYCLE COMBUSTION TURBINE

DRAWN:	JK	DATE:	4/01	PROJECT NUMBER:	REV.
APPVD:	DD	REVISED:	X	06792-140	0

679211A.DWG

Figure 2-3 CTG Relative Criteria Pollutant Emission Rates



3.0 EMISSIONS SUMMARY

This section discusses the basis and methods used to estimate potential emissions for the SDEC.

The data used during the development of this application rely on process information developed by MHI for Dade Development Company, L.L.C. The summary presented in Table 3-1 has been prepared for the two MHI 501F combustion turbines. Detailed emission calculations for these turbines are presented at 100% and 75% load cases in Appendix B along with operating specifications at the following ambient conditions:

- 32, 59, 74, 95°F dry bulb at 65% relative humidity, and
- 59, 74, 95°F dry bulb at 65% relative humidity chilled to 45°F and 65% relative humidity.

3.1 Criteria Pollutant Emissions

The primary emission sources at the SDEC will be the two CTs. Each CT, when used, will typically operate at 100% load, but may, at times, be operated down to 75% load. The turbines will fire natural gas, supplied directly to the site by pipeline and fuel oil, provided by onsite storage. Hourly emissions from these units were calculated from manufacturers operating parameters and guaranteed in-stack concentrations for CO, NO_x, and VOC. As PM_{10} emissions are based on manufacturers guaranteed hourly emission rates, a worst case lb/MMBtu emission factor has been calculated from the lb/hr guarantee emission rate for purposes of calculating annual PM_{10} emissions. SO_2 emissions were calculated using the manufacturers' supplied fuel consumption data and an expected maximum fuel gas sulfur content of 2.0 grains per 100 standard cubic feet for natural gas and 0.05 wt % for distillate oil. Particulate emissions are estimated to be 40 lb/hour while firing fuel oil and 20 lb/hour while firing natural gas.

Maximum hourly emission rates for each pollutant were established after reviewing the calculations for the four ambient temperatures at two turbine load conditions (75%, and 100%) that represent the range of expected operating conditions. The annual facility emissions of NO_x and CO will be limited through the use of CEMS, to a maximum of 248 tons per year. Although annual operation is restricted through the use of NO_x and CO CEMS rather than a fuel cap, an estimate of the maximum annual fuel consumption is used to calculate the maximum annual emissions of VOC, SO_2, Pb, and PM_{10}.

Table 3-1 Combustion Turbine Maximum Hourly Emission Rate Summary

Compound	Load	Ambient Temperature (deg F)							
	(%)	32	59[1]	74[1]	95[1]	32	59[1]	74[1]	95[1]
		Emissions for one MHI 501F Turbine (lb/hr)							
		Natural Gas				Distillate Oil			
NOx	100	173	173	173	173	281	272	272	272
	75	148	132	128	122	226	212	205	196
CO	100	47	42	42	42	204	197	197	197
	75	54	49	47	45	164	154	149	142
VOC	100	3.0	3.0	3.0	3.0	35	34	34	34
	75	4.0	2.0	2.0	2.0	28	27	26	25
SO2	100	11.3	11.3	11.3	11.3	78	76	76	76
	75	9.0	8.7	8.4	8.0	63	59	57	55
H2SO4	100	1.8	1.8	1.8	1.8	12.0	11.7	11.7	11.7
	75	1.4	1.4	1.3	1.3	9.7	9.1	8.8	8.5
Pb	100	ND	ND	ND	ND	0.02	0.02	0.02	0.02
	75	ND	ND	ND	ND	0.02	0.02	0.02	0.02
PM10	100	20	20	20	20	40	40	40	40
	75	20	20	20	20	40	40	40	40

Notes

[1]At baseload, turbine air inlet temperature is cooled to 45°F.

Based on the guaranteed emission concentrations, during both natural gas and distillate oil operation NO_x is the limiting pollutant. Annual emissions of VOC, SO_2, Pb, and PM_{10} have been estimated using NO_x as the limiting pollutant for both natural gas and distillate oil operation. The data used in this analysis is presented in Appendix B. Table 3-2 presents a summary of annual emissions for the two combustion turbines, the distillate oil storage tank, the fire-water pump engine, natural gas fuel heater, and cooling towers. Tables 3-4 and 3-5 provide a summary of proposed permit limits for the combustion turbines.

Table 3-2 Annual Criteria Pollutant Emissions

Source Name	NO_x [1]	CO [1]	VOC [2]	SO_2 [2]	H_2SO_4 [2]	Pb [2]	PM [2]	PM_{10} [2]
Annual Emission Rates (tons/year)								
501F Combustion Turbines.	245.5	247.2	34.7	75.8	6.9	0.02	50.2	50.2
Distillate Oil Storage Tanks	N/A	N/A	0.8	N/A	N/A	N/A	N/A	N/A
Cooling Towers	N/A	N/A	N/A	N/A	N/A	N/A	0.73	0.73
Fire-Water Pump Engine	2.00	0.40	0.20	0.10	-	-	0.20	0.20
Natural Gas Fuel Heater	0.46	0.41	0.27	0.01	-	-	0.05	0.05
Total	**248.0**	**248.0**	**36.0**	**75.9**	**6.9**	**0.02**	**52.0**	**52.0**

Notes:
(1) Limited by CEMS on NO_x and CO.
(2) Estimated from CEMS limitation on NO_x and CO. Annual emissions of VOC, SO_2, H_2SO_4, Pb, and PM/PM_{10} increased by a 10% margin.

3.2 Hazardous Air Pollutant Emissions

Emissions of hazardous air pollutants (HAPs) were calculated to confirm that the SDEC will not be a new major HAP source subject to preconstruction permitting under 40 CFR 63 Subpart B. HAP emissions (with the exception of formaldehyde) were derived from the April 2000 version of AP-42 Section 3.1 which provides emission factors for stationary combustion turbines. An emission factor for formaldehyde was developed from a subset of the database used by EPA to develop the AP-42 emission factors (see Appendix B for details).

Annual HAP emissions are presented in Table 3-3. Total facility-wide emissions for all HAPs combined is 3.0 TPY with the largest single HAP being less than 1.3 TPY. Both of these values are well below the 25/10 tpy major source thresholds for HAPs.

Table 3-3 HAP Emission Summary, Dade Development Company Electric Generating Facility

Pollutant	CTG Natural Gas		CTG Distillate Oil		SDEC	
	Emission Rate, Per Turbine		Emission Rate, Per Turbine		Emission Rate All CTGs	
	Max Hourly (lb/hr)	Annual (tpy)	Max Hourly (lb/hr)	Annual (tpy)	Max Hourly (lb/hr)	Annual (tpy)
1,3-Butadiene	8.20E-04	5.92E-04	2.66E-02	1.32E-02	5.33E-02	2.63E-02
Acetaldehyde	7.63E-02	5.51E-02	0.00E+00	0.00E+00	1.53E-01	1.10E-01
Acrolein	1.22E-02	8.82E-03	0.00E+00	0.00E+00	2.44E-02	1.76E-02
Benzene	2.29E-02	1.65E-02	9.16E-02	4.53E-02	1.83E-01	9.06E-02
Ethylbenzene	6.10E-02	4.41E-02	0.00E+00	0.00E+00	1.22E-01	8.82E-02
Formaldehyde	2.62E-01	1.89E-01	4.66E-01	2.31E-01	9.33E-01	4.61E-01
Naphthalene	2.48E-03	1.79E-03	5.83E-02	2.88E-02	1.17E-01	5.76E-02
PAHs	4.20E-03	3.03E-03	6.66E-02	3.29E-02	1.33E-01	6.59E-02
Propylene Oxide	5.53E-02	4.00E-02	0.00E+00	0.00E+00	1.11E-01	7.99E-02
Toluene	2.48E-01	1.79E-01	0.00E+00	0.00E+00	4.96E-01	3.58E-01
Xylene	1.22E-01	1.22E-01	0.00E+00	0.00E+00	2.44E-01	2.44E-01
Arsenic	0.00E+00	0.00E+00	1.83E-02	9.06E-03	3.66E-02	1.81E-02
Beryllium	0.00E+00	0.00E+00	5.16E-04	2.55E-04	1.03E-03	5.10E-04
Cadmium	0.00E+00	0.00E+00	7.99E-03	3.95E-03	1.60E-02	7.90E-03
Chromium	0.00E+00	0.00E+00	1.83E-02	9.06E-03	3.66E-02	1.81E-02
Lead	0.00E+00	0.00E+00	2.33E-02	1.15E-02	4.66E-02	2.31E-02
Manganese	0.00E+00	0.00E+00	1.32E+00	6.50E-01	2.63E+00	1.30E+00
Mercury	0.00E+00	0.00E+00	2.00E-03	9.88E-04	4.00E-03	1.98E-03
Nickel	0.00E+00	0.00E+00	7.66E-03	3.79E-03	1.53E-02	7.57E-03
Selenium	0.00E+00	0.00E+00	4.16E-02	2.06E-02	8.33E-02	4.12E-02
					Facility Total HAPs	**3.0**
					Maximum Individual HAP	**1.3**

Proposed emission limits for the combustion turbines during natural gas and distillate oil operation are presented in Tables 3-4 and 3-5, respectively. Annual limits for VOCs, SO2, PM10, and Pb are not proposed to be included in the permit. This is because compliance with a 248 ton/year limit for NOx and CO will insure that these other pollutants are emitted in quantities considerably lower than the 250 ton/year major source threshold.

Table 3-4 Summary of Proposed Permit Limits Natural Gas Operation

	ppmvd @ 15% O_2	Lb/hr[1] Each Turbine	CTG Annual Tons/Yr	Control Technology	Test Method
NO_x	25	173	245.5	Dry Low NO_x Combustors	Stack Test Ref. Method 19 & 20
CO	16	54	247.2	Good Combustion Practices	Stack Test Ref. Method 10 & 19
VOC	2.0	4.0		Good Combustion Practices	Stack Test Ref. Method 25a less Methane via bag sample & Method 18
SO_2	N/A	11.3		Low Sulfur Fuel (less than 2.0 grain S/100 SCF gas)	Fuel Monitoring
PM_{10}	N/A	20		Low Sulfur Fuel (less than 2.0 grain S/100 SCF gas)	Stack Test Ref. Method 5 & 202

[1]lb/hr for each turbine is based on worst case emission rates over all operating loads and temperatures.

Table 3-5 Summary of Proposed Permit Limits Distillate Oil Operation

	Ppmvd @ 15% O_2	Lb/hr[1] Each Turbine	CTG Annual Tons/Yr	Control Technology	Test Method
NO_x	42	281	245.5	Water Injection	Stack Test Ref. Method 19 & 20
CO	50	204	247.2	Good Combustion Practices	Stack Test Ref. Method 10 & 19
VOC	15	35		Good Combustion Practices	Stack Test Ref. Method 25a less Methane via bag sample & Method 18
SO_2	N/A	78		Low Sulfur Fuel	Fuel Monitoring
Pb	N/A	.02		Low Ash Fuel	N/A
PM_{10}	N/A	40		Low Sulfur Fuel	Stack Test Ref. Method 5 & 202

[1]lb/hr for each turbine is based on worst case emission rates over all operating loads and temperatures.

4.0 REFERENCES AND BIBLIOGRAPHY

Pequot Publishing, 1997. Gas Turbine World 1997 Handbook.

Rasnic, John B., August 1987. Letter to Air Compliance Branch Chiefs, Regions I-IX, RC: NSPS Custom Fuel Monitoring.

U.S. EPA. September 1977. Standards Support and Environmental Impact Statement - Volume I: Proposed Standards of Performance for Stationary gas Turbines. EPA 450/2-77-017a.

U.S. EPA. October 1990. New Source Review Workshop manual. Draft.

U.S. EPA. October 1996. AP-42.

APPENDIX A

APPLICATION FOR AIR PERMIT – TITLE V SOURCE
DEP FORM NO. 62-210.900(1)

Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Dade Development Company, L.L.C.**	
2. Site Name: **South Dade Energy Center**	
3. Facility Identification Number:	[✔] Unknown
4. Facility Location: Street Address or Other Locator: **SW Corner of 256th Street and SW 97th Avenue** City: **Unincorporated** County: **Dade** Zip Code:**33032**	
5. Relocatable Facility? [ ] Yes [✔] No	6. Existing Permitted Facility? [ ] Yes [✔] No

Application Contact

1. Name and Title of Application Contact: **Dave Kellermeyer, Director**
2. Application Contact Mailing Address: Organization/Firm: **Dade Development Company, L.L.C.** Street Address: **1400 Smith Street** City: **Houston** State: **TX** Zip Code: **77002-7631**
3. Application Contact Telephone Numbers: Telephone: **(713) 853-3161** Fax: **(713) 646-3037**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	4-23-01
2. Permit Number:	025 1099-001-AC
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number:_____

[ ] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number:_____

Operation permit number to be revised:_____

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected:_____

[ ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised:_____

Reason for revision:_____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[✔] Air construction permit to construct or modify one or more emissions units.

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Ben Jacoby – Attorney-In-Fact

2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Dade Development Company, L.L.C.**
   Street Address: **1400 Smith Street**
   City: **Houston** State: **TX** Zip Code: **77002-7631**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: **(713) 853-6173** Fax: **(713) 646-3037**

4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative(check here [ ], if so) or the responsible official (check here [✔], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

DAC

Signature

4-18-01

Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Blair Burgess**
   Registration Number: **45460**

2. Professional Engineer Mailing Address:
   Organization/Firm: **ENSR**
   Street Address: **2809 West Mall Drive**
   City: **Florence** State: **AL** Zip Code: **35630**

3. Professional Engineer Telephone Numbers:
   Telephone: **(256) 767-1210** Fax: **(256) 767-1211**

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [✔], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

4/18/01

Signature

4/18/01

Date

EMBOSSED METALLIC

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
CT001 – CT002	MHI 501F Single Cycle Combustion Turbines (Two identical combustion turbines)	AC1B	$5,000 Similar emissions unit fee per Rule 62-4.050(4)(a)(4)
T001 – T002	Distillate Fuel Oil Storage Tanks	AC1F	$250
FWP	Firewater Pump Diesel Engine	AC1F	$250
NGH	Natural Gas Fuel Heater	ACIF	$250

Application Processing Fee

Check one: [✔] Attached - Amount: $5,750 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations

Dade Development Company, L.L.C. proposes to construct and operate a peaking electrical power generating facility at a greenfield site in Dade County, Florida. The facility will consist of up to two MHI 501F combustion turbines operating in simple cycle mode; each turbine has a nominal generating capacity of 184 MW. The combustion turbines will be fired primarily with natural gas with low sulfur distillate oil as a backup fuel. NO_x emissions will be controlled with dry low NOx combustors when firing natural gas and water injection when firing distillate oil. Permit conditions will limit total facility annual emissions to less than 248 tons per year of any regulated air pollutant in order to be permitted as a synthetic minor source with respect to Rule 62-212.400, Prevention of Significant Deterioration. Ancillary equipment includes one 1.9 million gallon distillate oil storage tank, one 463,000 gallon distillate oil storage tank, one natural gas fuel heater and one emergency diesel fired IC engine driving a firewater pump.

2. Projected or Actual Date of Commencement of Construction:

November 1, 2001

3. Projected Date of Completion of Construction:

May 1, 2002

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **565.1** North (km): **2823.4**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): Longitude (DD/MM/SS):			
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: **Dave Kellermeyer, Director**
2. Facility Contact Mailing Address: Organization/Firm: **Dade Development Company, L.L.C.** Street Address: **1400 Smith Street** City: **Houston** State: **TX** Zip Code: **77002-7631**
3. Facility Contact Telephone Numbers: Telephone: **(713) 853-3161** Fax: **(713) 646-3037**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [✔] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [✔] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [ ] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [✔] One or More Emissions Units Subject to NSPS?	
7. [ ] One or More Emission Units Subject to NESHAP?	
8. [✔] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters):	

List of Applicable Regulations (Facility-wide)

Chapter 62-4	Permits
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-214	Requirements for Sources Subject to the Federal Acid Rain Program

Rule 62-296.	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods
Rule 62-297.520	EPA Continuous Monitor Performance Specifications
40 CFR 60	Applicable sections of Subpart A, General Requirements, NSPS Subparts GG and Kb
40 CFR 72	Acid Rain Permits
40 CFR 75	Monitoring
40 CFR 77	Acid Rain Program – Excess Emissions

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap lb/hour	3. Requested Emissions Cap tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
NOX	**A, SM (PSD/248 tpy)**		**248**	**ESCPSD**	**Units CT001-CT002, FWP + NGH included under NO_x cap.**
CO	**A, SM (PSD/248 tpy)**		**248**	**ESCPSD**	**Units CT001-CT002, FWP + NGH included under CO cap.**
SO2	**B**				**CT SO_2 emissions and fuel sulfur content regulated under 40 CFR 60, Subpart GG**
VOC	**B**				**Units T001-T002 subject to record keeping requirements of 40 CFR 60, Subpart Kb**

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [✔] Attached, Document ID:_**Fig. 1-1** [ ] Not Applicable [ ] Waiver Requested
2. Facility Plot Plan: [✔] Attached, Document ID: **Fig. 2-1** [ ] Not Applicable [ ] Waiver Requested
3. Process Flow Diagram(s): [ ] Attached, Document ID: **Fig. 2-2** [ ] Not Applicable [ ] Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID:_____ [✔] Not Applicable [ ] Waiver Requested
5. Fugitive Emissions Identification: [ ] Attached, Document ID:_____ [✔] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application: [✔] Attached, Document ID: **ENSR Document No. 6792-123-410**[ ] Not Applicable
7. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities:
   [✔] Attached, Document ID: **Section 2** [ ] Not Applicable

9. List of Equipment/Activities Regulated under Title VI:
   [ ] Attached, Document ID:_____
   [ ] Equipment/Activities On site but Not Required to be Individually Listed
   [✔] Not Applicable

10. Alternative Methods of Operation:
    [ ] Attached, Document ID:_____ [✔] Not Applicable

11. Alternative Modes of Operation (Emissions Trading):
    [ ] Attached, Document ID:_____ [✔] Not Applicable

12. Identification of Additional Applicable Requirements:
    [ ] Attached, Document ID:_____ [✔] Not Applicable

13. Risk Management Plan Verification:
    [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:_____) or previously submitted to DEP (Date and DEP Office:_____)
    [ ] Plan to be submitted to CEPPO (Date required:_____)
    [✔] Not Applicable

14. Compliance Report and Plan:
    [ ] Attached, Document ID:_____ [✔] Not Applicable

15. Compliance Certification (Hard-copy Required):
    [ ] Attached, Document ID:_____ [✔] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[✔] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[✔] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
CT001 through CT002 are identical MHI 501F simple cycle combustion turbines (CT) each having a nominal rating 184 megawatts (MW). Each CT will be fired primarily with natural gas with low sulfur distillate oil as a back up fuel.

4. Emissions Unit Identification Number: [✔] No ID
ID: **CT001 – CT002** [ ] ID
Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C	**May 2002**	**49**	[✔]

9. Emissions Unit Comment: (Limit to 500 Characters)
Each combustion turbine (CT001 to CT002) should be considered separate emissions units. The grouping of all turbines into one Emissions Unit Information Section has been done for administrative convenience since the information required in Subsections A through J is identical for each combustion turbine.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

NOx is limited through use of dry low NOx combustors for natural gas firing and water injection for distillate oil firing.

2. Control Device or Method Code(s): **028**

Emissions Unit Details

1. Package Unit:
   Manufacturer: **Mitsubishi Heavy Industries** Model Number: **501F**
2. Generator Nameplate Rating: **184MW (nominal)**
3. Incinerator Information: **N/A**
   Dwell Temperature: °F
   Dwell Time: seconds
   Incinerator Afterburner Temperature: °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	**1907** mmBtu/hr **HHV (base load on natural gas @ 59°F**
2. Maximum Incineration Rate:	**N/A** lb/hr **N/A** tons/day
3. Maximum Process or Throughput Rate:	**N/A**
4. Maximum Production Rate:	**N/A**
5. Requested Maximum Operating Schedule:	
	24 hours/day **7** days/week
	52 weeks/year **8760**[1] hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):	
1 – Annual operations will be limited through the use of a Continuous Emissions Monitoring System for NO_x and CO.	

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

40 CFR 60, Subpart A (General Provisions for New Source Performance Standards)	
40 CFR 60.332(a)(1) – NO_x standards for Stationary Gas Turbines	
40 CFR 60.333 – SO_2 standards for Stationary Gas Turbines	
40 CFR 60.334 – Monitoring Provisions for Stationary Gas Turbines	
40 CFR Part 72 – Acid Rain Program Requirements Regulations	
40 CFR Part 73 – Acid Rain Program SO_2 Allowances System	
40 CFR Part 75 – Acid Rain Program Continuous Emissions Monitoring	
Rule 62-296(4)(b)1 – Visible emissions	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **CT1 and CT2**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **Exhaust stacks for combustion turbines; one stack per turbine unit.**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **N/A**		
5. Discharge Type Code: **V**	6. Stack Height: **80** feet	7. Exit Diameter: **27.68** feet **(Effective diameter)**
8. Exit Temperature: **1124°F (NG)** **1006°F (Oil)**	9. Actual Volumetric Flow Rate: **532,310 acfm (NG)** **2,395,169 acfm (Oil)**	10. Water Vapor: **8.45 % (NG)** **6.51 % (Oil)**
11. Maximum Dry Standard Flow Rate: **844,444 dscfm (NG)** **861,779 dscfm (Oil)**	12. Nonstack Emission Point Height: **N/A** feet	
13. Emission Point UTM Coordinates: Zone: **17** East (km): **565.065** North (km): **2823.350**		
14. Emission Point Comment (limit to 200 characters): **Exhaust temperatures and flow rates (Items 8,9,10,11) are at 100% load and 59° F operating conditions. Stack temperatures and flow rates will vary with load and ambient temperature.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment __1___ of __2___

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural gas**		
1. Source Classification Code (SCC): **2-01-002-01**	3. SCC Units: **Million Cubic Feet Burned**	
6. Maximum Hourly Rate: **1.821**	7. Maximum Annual Rate: **5264**	6. Estimated Annual Activity Factor: **N/A**
7. Maximum % Sulfur: **2 grains/100 SCF**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **1047**
10. Segment Comment (limit to 200 characters): **Annual operation will be restricted through the use of NOx and CO CEMS. Maximum Annual Rate is an estimate only.**		

Segment Description and Rate: Segment __2___ of __2___

2. Segment Description (Process/Fuel Type) (limit to 500 characters): **No. 2 Distillate Fuel Oil**		
3. Source Classification Code (SCC): **2-01-001-0**	3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate: **12.38**	5. Maximum Annual Rate: **23,692**	6. Estimated Annual Activity Factor: **N/A**
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash: **Trace**	9. Million Btu per SCC Unit: **144.5**
10. Segment Comment (limit to 200 characters): **Annual operation will be restricted through the use of NOx and CO CEMS. Maximum Annual Rate is an estimate only.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	**028**		**EL**
CO			**EL**
PM			**NS**
PM10			**NS**
SO2			**NS**
VOC			**NS**
PB			**NS**

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NOX**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **281** lb/hour **(per turbine)** **245.5** tons/year **(total two turbines)**	4. Synthetically Limited? [✔]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.164 lb/MMBtu (HHV)** Reference: **See Appendix B for emissions calculations**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Hourly emission rate is based on worst case emission rate for both natural gas and distillate oil. Annual NOx emissions will be restricted through the use of CEMS.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ___**1**___ of __**2**____

1. Basis for Allowable Emissions Code: **ESCPSD**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **245.5 tons/yr (CT1 –CT2)**	4. Equivalent Allowable Emissions: **N/A** lb/hour **N/A** tons/year
5. Method of Compliance (limit to 60 characters): **Direct emissions monitoring of stack emissions using Part 75-certified CEMs**	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

Pollutant Detail Information Page 2 of 5

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **204** lb/hour **(per turbine)** **247.2** tons/year **(total two turbines)**	4. Synthetically Limited? [✔]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.119 lb/MMBtu (HHV)** Reference: **See Appendix B for emission calculations**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Hourly emission rate is based on worst case emissions for both natural gas and distillate oil. Annual CO emissions will be restricted through the use of CEMS.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ___2___ of __2____

1. Basis for Allowable Emissions Code: **ESCPSD**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **247.2 tons/yr (CT1 – CT2)**	4. Equivalent Allowable Emissions: **N/A** lb/hour **N/A** tons/year
5. Method of Compliance (limit to 60 characters): **Direct emissions monitoring of stack emissions using certified continuous emissions monitors on each turbine stack**	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **40** lb/hour **(per turbine)** **51.04** tons/year **(total two turbines)**	4. Synthetically Limited? [✔]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.031 lb/MMBtu (HHV)** Reference: **See Appendix B for emissions calculations**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Hourly emission rate is based on worst case emission rate for both natural gas and distillate oil.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions _____ of _____ **N/A**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

Pollutant Detail Information Page 4 of 5

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **78** lb/hour **(per turbine)** **75.79** tons/year **(total two turbines)**	4. Synthetically Limited? [✔]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.046 lb/MMBtu (HHV)** Reference: **See Appendix B for emissions calculations**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Hourly emission rate is based on worst case emission rate for both natural gas and distillate oil.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions _____ of _____ **N/A**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Pollutant Detail Information Page 5 of 5

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **35** lb/hour **(per turbine) 34.54** tons/year **(total six turbines)**	4. Synthetically Limited? [✔]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.021 lb/MMBtu (HHV)** Reference: **See Appendix B for emissions calculations**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Hourly emission rate is based on worst case emission rate for both natural gas and distillate oil.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions _____ of _____ **N/A**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ___1___ of ___1___

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [✔] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Reference Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **The general visible emission standard requirements of Rule 62-296.320(4)(b)1, F.A.C. applies to each turbine stack.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor __1___ of __1___

1. Parameter Code: **EM**	2. Pollutant(s): **NOX and CO**
3. CMS Requirement:	[✔] Rule (**NOX**) [✔] Other (**CO**)
4. Monitor Information: **TBD** Manufacturer: **TBD** Model Number: **TBD**	Serial Number: **TBD**
5. Installation Date: **Prior to start up**	6. Performance Specification Test Date: **90 days after unit commences commercial operation in accordance with 40 CFR 75.4(b)(2)**
7. Continuous Monitor Comment (limit to 200 characters): **Annual emissions of NO_x and CO from the facility will be limited to a maximum of 248 tons per year. Compliance with these annual limits will be demonstrated using continuous emissions monitoring systems for NO_x and CO.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [✔] Attached, Document ID:**Fig. 2-2** [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [✔] Attached, Document ID:**App. B** [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:_____ [✔] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_____ [✔] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:_____ [ ] Previously submitted, Date:_____ [✔] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:_____ [✔] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:_____ [✔] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [✔] Attached, Document ID: **ENSR Doc. No. 6792-123-410**
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_____ [✔] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:_____ [✔] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:_____ [✔] Not Applicable

13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID:_____ [✔] Not Applicable

14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:_____ [✔] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID: _____

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:_____

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:_____

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:_____

[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:_____

[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:_____

[ ] Not Applicable

III. TANK EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[✔] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[ ] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[✔] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
Distillate fuel oil storage tanks

4. Emissions Unit Identification Number:
ID: **T001, T002**
[✔] No ID
[ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C	**May 2002**	**49**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

T001 – main storage tank
T002 – day storage tank.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

   None

2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit:
   Manufacturer: Model Number:
2. Generator Nameplate Rating: MW
3. Incinerator Information:
   Dwell Temperature: °F
   Dwell Time: seconds
   Incinerator Afterburner Temperature: °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate: **N/A** mmBtu/hr	
2. Maximum Incineration Rate: **N/A** lb/hr	**N/A** tons/day
3. Maximum Process or Throughput Rate: **22,660,000 gal/year**	
4. Maximum Production Rate: **N/A**	
5. Requested Maximum Operating Schedule:	
24 hours/day	**7** days/week
52 weeks/year	**8760** hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):	

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

40 CFR 60, Subpart A (General Provisions for New Source Performance Standards)	
40 CFR 60.116b(a) and (b) – Record Keeping requirements under Subpart Kb	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **T001 + T002**	2. Emission Point Type Code: **4**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **N/A**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **N/A**		
5. Discharge Type Code: **V**	6. Stack Height: **N/A** feet	7. Exit Diameter: **N/A** feet
8. Exit Temperature: **N/A**	9. Actual Volumetric Flow Rate: **N/A**	10. Water Vapor: **N/A**
11. Maximum Dry Standard Flow Rate: **N/A** dscfm	12. Nonstack Emission Point Height: **N/A** feet	
13. Emission Point UTM Coordinates: Zone: **17** East (km): **565.048 (Main Tank); 565.116 (Day Tank)** North (km): **2823.498 (Main Tank); 2823.498 (Day Tank)**		
14. Emission Point Comment (limit to 200 characters):		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment **1** of **1**

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate fuel oil storage tanks**		
2. Source Classification Code (SCC): **40301021**	3. SCC Units: **Thousand Gallons Throughput**	
4. Maximum Hourly Rate: **N/A**	5. Maximum Annual Rate: **22,600**	6. Estimated Annual Activity Factor: **N/A**
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **N/A**
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment ___ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential VOC emissions from distillate fuel oil storage tanks are less than 5 tons per year (less than the threshold amount for reporting in this subsection). See Appendix B for emission calculations.**	

Allowable Emissions Allowable Emissions **1** of **1** **N/A**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: N/A

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: N/A

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule (**NOX**) [ ] Other (**CO**)
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements N/A

1. Process Flow Diagram [ ] Attached, Document ID: [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [ ] Attached, Document ID: [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:_____ [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_____ [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:_____ [ ] Previously submitted, Date:_____ [ ] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:_____ [ ] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:_____ [ ] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID:
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_____ [ ] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:_____ [ ] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:_____ [ ] Not Applicable

13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID:_____ [ ] Not Applicable

14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:_____ [ ] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:_____

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:_____

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:_____

[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:_____

[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:_____

[ ] Not Applicable

APPENDIX B

EMISSION CALCULATIONS

ENSR
Dade Development Co. LLC
South Dade Energy Center
MHI 501F Simple Cycle Natural Gas Emissions
EMISSIONS COMPUTATION PER CTG
GAS Fired CTG

Date 3/21/2001
Author J. Lubetsky
Checked By M. Griffin
Revision 1

CASE NUMBER and OPERATION CONDITIONS		1	2	3	4	5	6	7	8
(1) AMBIENT TEMPERATURE, °F		32	59	74	95	32	59	74	95
(1) RELATIVE HUMIDITY, %		65%	65%	65%	65%	65%	65%	65%	65%
CTG LOAD		100%	100%	100%	100%	75%	75%	75%	75%
CHILLER STATUS		OFF	ON	ON	ON	OFF	OFF	OFF	OFF
(1) CTG EFFECTIVE INLET TEMPERATURE, F		32	45	45	45	32	59	74	95
(1) CTG EFFECTIVE INLET RELATIVE HUMIDITY, %		65%	100%	100%	100%	65%	65%	65%	65%
(1) CTG NET POWER OUTPUT, kW		185,130	183,900	183,900	183,900	139,620	131,640	124,940	115,860
(1) CTG FUEL CONSUMPTION, MMBtu/hr LHV		1,717	1,718	1,718	1,718	1,366	1,314	1,269	1,211
(1) CTG FUEL CONSUMPTION, lb/hr		82,212	82,260	82,260	82,260	65,408	62,916	60,761	57,984
CTG FUEL CONSUMPTION, MMBtu/hr HHV		1,906	1,907	1,907	1,907	1,516	1,459	1,409	1,344
(1) CTG EXHAUST GAS FLOW RATE, 1000 lb/hr		3,743	3,730	3,730	3,730	2,983	2,945	2,893	2,818
(1) STACK TEMPERATURE, °F		1,112	1,124	1,124	1,124	1,148	1,148	1,148	1,148
CTG STACK EXHAUST ANALYSIS (%VOL)									
(1) ARGON + NITROGEN	28.154	75.74%	75.28%	75.28%	75.28%	75.75%	75.30%	74.76%	73.49%
(1) OXYGEN	31.998	12.53%	12.40%	12.40%	12.40%	12.55%	12.84%	12.65%	12.50%
(1) CARBON DIOXIDE	44.009	3.87%	3.86%	3.86%	3.86%	3.86%	3.76%	3.66%	3.58%
(1) WATER	18.015	7.85%	8.45%	8.45%	8.45%	7.84%	8.31%	8.88%	10.42%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
CTG EXHAUST MOLECULAR WEIGHT		28.45	28.39	28.39	28.39	28.45	28.39	28.32	28.15
CTG EXHAUST GAS FLOW RATE, lb mol/hr		131,548	131,390	131,390	131,390	104,835	103,723	102,142	100,122
CTG EXHAUST GAS FLOW RATE, DRY, lb mol/hr		121,218	120,290	120,290	120,290	98,621	95,106	93,067	89,686
EXH. PARAMETERS @ STACK									
(5) STACK DIAMETER, ft		27.66	27.66	27.66	27.66	27.66	27.66	27.66	27.66
MOLECULAR WEIGHT		28.45	28.39	28.39	28.39	28.45	28.39	28.32	28.15
STACK EXHAUST GAS FLOW RATE, lb/hr		3,743,000	3,730,000	3,730,000	3,730,000	2,983,000	2,945,000	2,893,000	2,818,000
SPECIFIC VOLUME, ft³/lb		40.3	40.7	40.7	40.7	41.3	41.3	41.4	41.7
VOLUMETRIC FLOW, acfm		2,516,114	2,532,310	2,532,310	2,532,310	2,051,142	2,029,371	1,998,442	1,958,913
DRY STANDARD FLOW RATE, dscfm		844,444	843,390	843,390	843,390	672,982	665,807	655,822	642,555
EXIT VELOCITY, ft/sec		69.7	70.1	70.1	70.1	56.8	56.2	55.4	54.3
ACTUAL O2% DRY		13.6%	13.5%	13.5%	13.5%	13.6%	13.8%	13.9%	14.0%
MOLES EXHAUST GAS per HOUR WET		131,548	131,390	131,390	131,390	104,835	103,723	102,142	100,122
MOLES EXHAUST GAS per HOUR DRY		121,218	120,290	120,290	120,290	98,621	95,106	93,067	89,686
NOx EMISSION CALCULATION									
(1) LIMIT, ppmVd @ 15% O2		25.0	25.0	25.0	25.0	27.0	25.0	25.0	25.0
LIMIT, ppmVd		30.9	31.2	31.2	31.2	33.3	30.2	29.7	29.4
CORRESPONDING MASS RATE, lb/hr as NO2		173	173	173	173	148	132	128	122
CORRESPONDING EMISSIONS FACTOR, lb/MMBtu HHV		0.091	0.091	0.091	0.091	0.098	0.091	0.091	0.091
CO EMISSION CALCULATION									
(6) LIMIT, ppmVd @ 15% O2		11	10	10	10	16	15	15	15
CTG Exhaust, ppmVd		13.6	12.5	12.5	12.5	19.8	18.1	17.8	17.7
CTG MASS RATE, lb/hr		47	42	42	42	54	49	47	45
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.025	0.022	0.022	0.022	0.036	0.034	0.033	0.033
PARTICULATE EMISSION CALCULATION									
(2) CTG EXHAUST, lb/hr		20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
CORRESPONDING EMISSIONS FACTOR, lb/MMBtu HHV		0.010	0.010	0.010	0.010	0.013	0.014	0.014	0.015
VOC EMISSION CALCULATION									
(3) LIMIT, ppmVd @ 15% O2		1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0
CTG Exhaust, ppmVw		1.2	1.2	1.2	1.2	2.5	1.2	1.2	1.2
CTG MASS RATE, lb/hr		3.0	3.0	3.0	3.0	4.0	2.0	2.0	2.0
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.0016	0.0016	0.0016	0.0016	0.0026	0.0014	0.0014	0.0015
Pb EMISSION CALCULATION									
PB EMISSION FACTOR, lb/MMBtu		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
STACK EMISSIONS, lb/hr		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SO2 EMISSION CALCULATION									
(4) CTG EMISSIONS, lb/hr		11.3	11.3	11.3	11.3	9.0	8.7	8.4	8.0
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
STACK EMISSIONS, ppmVd @ ACTUAL O2		1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4
STACK EMISSIONS, ppmVd @ 15% O2		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
H2SO4 EMISSION CALCULATION									
(4) CTG EMISSIONS, lb/hr		1.8	1.8	1.8	1.8	1.4	1.4	1.3	1.3
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	0.0009	0.0010

SITE CONDITIONS

FUEL TYPE	Natural Gas
FUEL LHV, Btu/lb	20685
FUEL LHV, Btu/SCF	868.3
FUEL HHV, Btu/SCF	964.5
FUEL SULFUR CONTENT [grains per 100 SCF]	2

CONTROL EQUIPMENT LIMITS

NOx PERMIT LIMIT, ppmVd @ 15% O2	25

SO2 TO H2SO4 CONVERSION

(7) % CONVERSION, SO2 TO H2SO4	10%

Notes

1 Based on MHI501F data provided in e-mail from Dave Kellermeyer (e-mail dated March 15, 2001)
2 PM10 Emission rate based on data provided in e-mail from Dave Kellermyer March 15, 2001
3 VOC Emission limit based on data provided in e-mail from Dave Kellermyer March 15, 2001
4 SO2 emissions calculated based on fuel sulfur content of 2 grains per 100 standard cubic foot
5 Stack diameter based on conversation with Chris Booth, May 23, 2000
6 CO Emission limit based on data provided in e-mail from Dave Kellermyer March 15, 2001
7 Assume 10% of SO2 is converted to H2SO4

Dade Development Co. LLC
South Dade Energy Center
MHI 501F - Calculation of Exhaust Composition

CTG STACK EXHAUST ANALYSIS (%VOL)		Mol Wt	Case 1 % weight	Case 2 % weight	Case 3 % weight	Case 4 % weight	Case 5 % weight	Case 6 % weight	Case 7 % weight	Case 8 % weight
	ARGON	39.95	1.32%	1.31%	1.31%	1.31%	1.32%	1.31%	1.31%	1.29%
	NITROGEN	28.013	73.63%	73.35%	73.35%	73.35%	73.64%	73.36%	73.03%	72.23%
	OXYGEN	31.998	14.09%	13.97%	13.97%	13.97%	14.11%	14.24%	14.29%	14.21%
	CARBON DIOXIDE	44.009	5.99%	6.01%	6.01%	6.01%	5.97%	5.82%	5.72%	5.80%
	WATER	18.015	4.97%	5.36%	5.36%	5.36%	4.96%	5.27%	5.65%	6.67%
			Mol	Mol	Mol	Mol	Mol	Mol	Mol	Mol
	ARGON		0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00032
	NITROGEN		0.02628	0.02618	0.02618	0.02618	0.02629	0.02619	0.02607	0.02578
	OXYGEN		0.00440	0.00437	0.00437	0.00437	0.00441	0.00445	0.00447	0.00444
	CARBON DIOXIDE		0.00136	0.00137	0.00137	0.00137	0.00136	0.00132	0.00130	0.00127
	WATER		0.00276	0.00298	0.00298	0.00298	0.00275	0.00293	0.00314	0.00370
			(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)
	ARGON		0.94%	0.93%	0.93%	0.93%	0.94%	0.93%	0.93%	0.91%
	NITROGEN		74.80%	74.35%	74.35%	74.35%	74.81%	74.37%	73.85%	72.58%
	NITROGEN +ARGON		75.74%	75.28%	75.28%	75.28%	75.75%	75.30%	74.78%	73.49%
	OXYGEN		12.53%	12.40%	12.40%	12.40%	12.55%	12.64%	12.65%	12.50%
	CARBON DIOXIDE		3.87%	3.88%	3.88%	3.88%	3.86%	3.76%	3.68%	3.58%
	WATER		7.85%	8.45%	8.45%	8.45%	7.84%	8.31%	8.88%	10.42%

ENSR
South Dade Development Co. LLC
South Dade Energy Center
MHI 501F Simple Cycle Oil Emissions
EMISSIONS COMPUTATION PER CTG
Oil Fired CTG

Date 3/21/2001
Author J. Lubetsky
Checked By M. Griffin
Revision 1

CASE NUMBER and OPERATION CONDITIONS		1	2	3	4	5	6	7	8
(1) AMBIENT TEMPERATURE, °F		32	59	74	95	32	59	74	95
(1) RELATIVE HUMIDITY, %		65%	65%	65%	65%	65%	65%	65%	65%
CTG LOAD		100%	100%	100%	100%	75%	75%	75%	75%
CHILLER STATUS		OFF	ON	ON	ON	OFF	OFF	OFF	OFF
(1) CTG EFFECTIVE INLET TEMPERATURE, F		32	80	80	95	32	80	74	95
(1) CTG EFFECTIVE INLET RELATIVE HUMIDITY, %		65%	100%	100%	100%	65%	65%	65%	65%
(1) CTG NET POWER OUTPUT, kW		166,020	159,140	159,140	159,140	124,200	112,490	110,250	97,790
(1) CTG FUEL CONSUMPTION, MMBtu/hr LHV		1,623	1,571	1,571	1,571	1,303	1,224	1,184	1,130
(1) CTG FUEL CONSUMPTION, lb/hr		77,711	75,221	75,221	75,221	62,389	58,607	56,691	54,106
CTG FUEL CONSUMPTION, MMBtu/hr HHV		1,720	1,665	1,665	1,665	1,381	1,297	1,255	1,198
(1) CTG EXHAUST GAS FLOW RATE, 1000 lb/hr		3,868	3,761	3,761	3,761	3,044	2,896	2,815	2,692
(1) STACK TEMPERATURE, °F		1,008	1,014	1,014	1,014	1,084	1,088	1,099	1,121
CTG STACK EXHAUST ANALYSIS (%VOL)									
(1) ARGON + NITROGEN	28.154	78.00%	75.55%	75.55%	75.55%	75.94%	75.43%	74.90%	73.57%
(1) OXYGEN	31.998	13.27%	13.20%	13.20%	13.20%	13.12%	13.10%	13.00%	12.89%
(1) CARBON DIOXIDE	44.009	4.77%	4.74%	4.74%	4.74%	4.67%	4.80%	4.76%	4.72%
(1) WATER	18.015	5.95%	6.51%	6.51%	6.51%	6.09%	6.67%	7.34%	9.01%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
CTG EXHAUST MOLECULAR WEIGHT		28.82	28.75	28.75	28.75	28.82	28.74	28.66	28.48
CTG EXHAUST GAS FLOW RATE, lb mol/hr		134,223	130,807	130,807	130,807	105,635	100,757	98,203	94,531
CTG EXHAUST GAS FLOW RATE, DRY, lb mol/hr		126,234	122,287	122,287	122,287	99,229	94,036	90,999	86,012
EXH. PARAMETERS @ STACK									
(5) STACK DIAMETER, ft		27.68	27.68	27.68	27.68	27.68	27.68	27.68	27.68
MOLECULAR WEIGHT		28.82	28.75	28.75	28.75	28.82	28.74	28.66	28.48
STACK EXHAUST GAS FLOW RATE, lb/hr		3,868,000	3,761,000	3,761,000	3,761,000	3,044,000	2,896,000	2,815,000	2,692,000
SPECIFIC VOLUME, ft³/lb		37.1	37.4	37.4	37.4	38.5	39.3	39.7	40.5
VOLUMETRIC FLOW, acfm		2,394,169	2,345,962	2,345,962	2,345,962	1,958,790	1,895,314	1,862,822	1,818,476
DRY STANDARD FLOW RATE, dscfm		861,779	839,797	839,797	839,797	678,225	648,868	630,435	606,781
EXIT VELOCITY, ft/sec		66.3	65.0	65.0	65.0	54.3	52.5	51.6	50.4
ACTUAL O2% DRY		14.1%	14.1%	14.1%	14.1%	14.0%	14.0%	14.0%	14.0%
MOLES EXHAUST GAS per HOUR WET		134,223	130,807	130,807	130,807	105,635	100,757	98,203	94,531
MOLES EXHAUST GAS per HOUR DRY		126,234	122,287	122,287	122,287	99,229	94,036	90,999	86,012
NOx EMISSION CALCULATION									
(1) LIMIT, ppmVd @ 15% O2		42	42	42	42	42	42	42	42
LIMIT, ppmVd		48.3	48.2	48.2	48.2	49.3	48.9	48.9	49.5
CORRESPONDING MASS RATE, lb/hr as NO2		281	272	272	272	226	212	205	196
CORRESPONDING EMISSIONS FACTOR, lb/MMBtu HHV		0.163	0.163	0.163	0.163	0.164	0.163	0.163	0.164
CO EMISSION CALCULATION									
(6) LIMIT, ppmVd @ 15% O2		50	50	50	50	50	50	50	50
CTG Exhaust, ppmVd		57.6	57.4	57.4	57.4	58.7	58.2	58.2	58.9
CTG MASS RATE, lb/hr		204	197	197	197	164	154	149	142
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.119	0.118	0.118	0.118	0.119	0.119	0.119	0.119
PARTICULATE EMISSION CALCULATION									
(2) CTG EXHAUST, lb/hr		40	40	40	40	40	40	40	40
CORRESPONDING EMISSIONS FACTOR, lb/MMBtu HHV		0.023	0.024	0.024	0.024	0.029	0.031	0.032	0.033
VOC EMISSION CALCULATION									
(3) LIMIT, ppmVd @ 15% O2		15	15	15	15	15	15	15	15
CTG Exhaust, ppmVw		17.3	17.2	17.2	17.2	17.6	17.5	17.5	17.7
CTG MASS RATE, lb/hr		35	34	34	34	28	27	26	25
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.020	0.020	0.020	0.020	0.020	0.021	0.021	0.021
Pb EMISSION CALCULATION									
PB EMISSION FACTOR, lb/MMBtu		0.000014	0.000014	0.000014	0.000014	0.000014	0.000014	0.000014	0.000014
STACK EMISSIONS, lb/hr		0.023	0.022	0.022	0.022	0.018	0.017	0.017	0.016
SO2 EMISSION CALCULATION									
(4) CTG EMISSIONS, lb/hr		78	76	76	76	63	59	57	55
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.045	0.046	0.046	0.046	0.046	0.045	0.045	0.046
STACK EMISSIONS, ppmVd @ ACTUAL O2		9.6	9.7	9.7	9.7	9.9	9.6	9.6	10.0
STACK EMISSIONS, ppmVd @ 15% O2		8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.5
H2SO4 EMISSION CALCULATION									
(4) CTG EMISSIONS, lb/hr		12.0	11.7	11.7	11.7	9.7	9.1	8.8	8.5
CTG EMISSIONS FACTOR, lb/MMBtu HHV		0.0070	0.0070	0.0070	0.0070	0.0070	0.0070	0.0070	0.0071

SITE CONDITIONS

FUEL TYPE	Distillate Oil
FUEL LHV, Btu/lb	18180
FUEL SULFUR CONTENT [wt % S]	0.05

CONTROL EQUIPMENT LIMITS

NOx PERMIT LIMIT, ppmVd @ 15% O2	42

SO2 TO H2SO4 CONVERSION

(7) % CONVERSION, SO2 TO H2SO4	10%

Notes

1 Based on MHI501F data provided in e-mail from Dave Kellermyer (e-mail dated March 15, 2001)
2 PM10 Emission rate based on data provided in e-mail from Dave Kellermyer March 15, 2001.
3 VOC Emission limit based on data provided in e-mail from Dave Kellermyer March 15, 2001
4 SO2 emissions calculated based on fuel sulfur content.
5 Stack diameter based on conversation with Chris Booth, May 20, 2000
6 CO Emission limit based on data provided in e-mail from Dave Kellermyer March 15, 2001
7 Assume 10% of SO2 is converted to H2SO4.

Dade Development Co. LLC
South Dade Energy Center
MHI 501F - Calculation of Exhaust Composition

CTG STACK EXHAUST ANALYSIS		Mol Wt	Case 1 % weight	Case 2 % weight	Case 3 % weight	Case 4 % weight	Case 5 % weight	Case 6 % weight	Case 7 % weight	Case 8 % weight
	ARGON	39.95	1.31%	1.30%	1.30%	1.30%	1.31%	1.30%	1.29%	1.28%
	NITROGEN	28.013	72.95%	72.68%	72.68%	72.68%	72.89%	72.59%	72.28%	71.46%
	OXYGEN	31.998	14.73%	14.69%	14.69%	14.69%	14.57%	14.58%	14.51%	14.26%
	CARBON DIOXIDE	44.009	7.29%	7.25%	7.25%	7.26%	7.44%	7.35%	7.31%	7.30%
*	WATER	18.015	3.72%	4.08%	4.08%	4.08%	3.79%	4.18%	4.61%	5.70%

	Mol	Mol	Mol	Mol	Mol	Mol	Mol	Mol
ARGON	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00032	0.00032
NITROGEN	0.02604	0.02594	0.02594	0.02594	0.02602	0.02591	0.02580	0.02551
OXYGEN	0.00460	0.00459	0.00459	0.00459	0.00455	0.00456	0.00453	0.00446
CARBON DIOXIDE	0.00166	0.00165	0.00165	0.00165	0.00169	0.00167	0.00166	0.00166
WATER	0.00206	0.00226	0.00226	0.00226	0.00210	0.00232	0.00256	0.00316

	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)	(%Vol)
ARGON	0.95%	0.94%	0.94%	0.94%	0.95%	0.94%	0.93%	0.91%
NITROGEN	75.06%	74.61%	74.61%	74.61%	74.99%	74.49%	73.97%	72.66%
NITROGEN +ARGON	76.00%	75.55%	75.55%	75.55%	75.94%	75.43%	74.90%	73.57%
OXYGEN	13.27%	13.20%	13.20%	13.20%	13.12%	13.10%	13.00%	12.69%
CARBON DIOXIDE	4.77%	4.74%	4.74%	4.74%	4.87%	4.80%	4.76%	4.72%
WATER	5.95%	6.51%	6.51%	6.51%	6.06%	6.67%	7.34%	9.01%

CALCULATIONS AND COMPUTATIONS

Project: South Dade Energy Center, Dade Development Co. LLC.
Project Number: 6792-140-410 Computed by: J. Lubetsky Date: 3/21/2001
Subject: Fire-Water Pump Emission Calculations Checked by: M. Griffin Date: 4/9/2001

Emission Source: Fire-Water Pump Engine

Source Type: Diesel Fueled Reciprocating Engine
250 Horsepower

Operating Hours per Year: 500

Compound	Emission Factor (a)		Emission Rate Hourly (b)	Emission Rate Annual (c)
	(Lbs/hp hr)	(lb/MMBtu)	(Lbs/Hr)	(Tons/Year)
Nitrogen Oxides	0.031		7.8	2.0
Carbon Monoxide	0.00668		1.7	0.4
Volatile Organic Carbon	0.00247		0.6	0.2
Sulfur Oxides	0.00205		0.5	0.1
Particulate	0.0022		0.6	0.2
Benzene	6.53E-06	9.33E-04	1.63E-03	4.08E-04
Toluene	2.86E-06	4.09E-04	7.16E-04	1.79E-04
Xylenes	2.00E-06	2.85E-04	4.99E-04	1.25E-04
Propylene	1.81E-05	2.58E-03	4.52E-03	1.13E-03
1,3-Butadiene	2.74E-07	3.91E-05	6.84E-05	1.71E-05
Formaldehyde	8.26E-06	1.18E-03	2.07E-03	5.16E-04
Acetaldehyde	5.37E-06	7.67E-04	1.34E-03	3.36E-04
Acrolein	6.48E-07	9.25E-05	1.62E-04	4.05E-05
PAH	1.18E-06	1.68E-04	2.94E-04	7.35E-05

Total HAPS 5.6 lb/year

Notes:
(a) Emission Factors from AP-42, Section 3.3, Table 3.3-1
(b) Hourly Emission Rate (Lbs/Hr) = (Emission Factor, Lbs/BHP) * (Horsepower, BHP)
(c) Annual Emission Rate (Tons/Yr) = (Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 Lbs/Ton)

CALCULATIONS AND COMPUTATIONS

Project: South Dade Energy Center, Dade Development Co. LLC.
Project Number: 6792-123-610 — Computed by: J. Lubetsky — Date: 3/27/2001
Subject: Natural Gas Heater - Emission Calculations — Checked by: M. Griffin — Date: 4/9/2001

Emission Source:	Natural Gas Heater
Heat Input (MMBtu/hr):	6
Number of Units:	1
Sulfur Content of Fuel (grains/scf):	0.02
Fuel Heating Value, HHV (Btu/scf):	1047
LHV (Btu/scf):	946
Operating Hours per Year:	1500
Fuel Feed Rate (scf/HR):	5731

Compound	Emission Factor (a)	Emission Rate - per Unit	
		Hourly (b)	Annual (c)
	(Lbs/MMBtu)	(Lbs/Hr)	(Tons/Year)
Criteria Pollutants			
Nitrogen Oxides	0.102	0.612	0.459
Carbon Monoxide	0.09	0.54	0.405
Volatile Organic Carbon	0.06	0.36	0.27
Sulfur Oxides (d)	0.003	0.016	0.012
Particulate	0.01	0.06	0.045

Notes:

(a) Emission Factors based on the information supplied by ENRON on 8/11/99.
(b) Hourly Emission Rate (Lbs/Hr) = (Heat Input * Emission Factor)
(c) Annual Emission Rate (Tons/Yr) = (Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 Lbs/Ton)
(d) Sulfur Oxides Emission Rate (Lbs/Hr) based on the sulfur content of the fuel.

CALCULATIONS AND COMPUTATIONS

Project: South Dade Energy Center, Dade Development Co. LLC.
Project Number: 6792-123-610 Computed by: K. Field Date: 10/2/2000
Subject: Cooling Tower Emissions Checked by: M. Griffin Date: 4/9/2001

Water Circulation Rate (a), per cell	(GPM)	4,000
Number of Cells		4
Total Water Circulation Rate (a), all cells	(GPM)	16,000
Annual Operation	(hrs/year)	8,760
Total Liquid Drift (b)	(%)	0.001
Expected TDS/TSS of Circulated Water (c)	(ppmw)	2085
Emission Rate - Total Cooling Tower		
Total Suspended Particulate (d)	(Lbs/Hr)	0.167
	(Tons/Yr)	0.732

Notes: (a) Design Water Circulation Rate, Gallons/Minute (GPM)
(b) Design Total Liquid Drift, Percent (%)
(c) Process Design Data
(d) Based on USEPA AP-42 Section 13.4 Wet Cooling Towers, Table 13.4-1. Modified to Cooling Tower Design
Lbs/Hr = (Water Circulation Rate,GPM)*60*(Drift,%) / 100 * (8.3453 Lbs/Gal) * (TDS, Lbs PM/1,000,000 Lbs Water)
Tons/Yr = (Lbs/Hr) * (8,760 Hrs/Yr) / (2,000 Lbs/Ton)

South Dade Energy Center, Dade Development Co. LLC.

Pollutant	CTG Natural Gas Short Term Emission Limits			CTG Distillate Oil Short Term Emission Limit			Fuel Use Calculation				Annual Emissions			
							Compliance Method [7]	Maximum CTG Emissions for Minor Source [1]	Natural Gas No Oil Annual Fuel Use [5]	Distillate Oil Annual Fuel Use [5]	Option 1 Natural Gas Fired CTGs [6]	Option 2 Distillate Oil Fired CTGs [6]	Worst Case CTG Emissions [4]	Ancillary Equipment Emissions
	ppmvd @ 15% O2	*lb/MMBtu (HHV)*	*Max lb/hr [1]*	*ppmvd @ 15% O2*	*lb/MMBtu (HHV)*	*Max lb/hr [1]*		*tons/year*	*MMBtu/yr (HHV)*	*MMBtu/yr (HHV)*	*(tpy)*	*(tpy)*	*(tpy)*	*(tpy)*
NOx	27	0.098	173	42	0.164	281	CEMS	245.5	5,010,204	2,993,902	245.5	245.5	245.5	2.5
CO	16	0.036	54	50	0.119	204.0	CEMS	247.2	13,733,333	4,154,622	247.2	247.2	247.2	0.8
VOC	2	0.003	4	15	0.021	35	Fuel Tracking	218.7	145,800,000	20,828,571	7.5	31.4	34.54	1.3
Pb	N/A	0	0	N/A	0.000014	0.02	Fuel Tracking	220	N/A	31,428,571,429	0	0.02	0.02	0.0
PM10 [2]	N/A	0.015	20	N/A	0.031	40	Fuel Tracking	219	29,200,000	14,129,032	37.6	46.4	51.04	1.0
H2SO4	N/A	0.001	1.8	N/A	0.007	12	Fuel Tracking	220	440,000,000	62,857,143	2.5	10.5	11.55	0.0
SO2	N/A	0.006	11.3	N/A	0.046	78	Fuel Tracking	219.9	73,300,000	9,560,870	15	68.9	75.79	0.1
							Estimated Fuel Cap [3]		5,010,204	2,993,902			Margin	10%
							Total CTG Hours/Year		2,627	1,798				
							Hours/CTG/Year		1,314	899				

Notes

(1) CTG Emissions = Total Facility Emissions - (Fire Water Pump Engine Emissions + Natural Gas Heater + Tank Emissions)

(2) PM10 emissions limited based on lb/hr emission rate, lb/MMBtu value calculated only for demonstration of compliance with Minor Source Status

(3) NOx and CO limited based on CEMS. To provide the most conservative estimate of of non-CEMS monitored pollutant emissions the maximum annual fuel consumption limited by the NOx fuel cap is used.

(4) Worst Case of Natural Gas and Distillate Oil Case VOC, PM10, and SO2 emissions include a margin of 10%.

(5) [Annual Fuel Use (MMBtu/yr (HHV)] = [Maximum CTG Emissions (tons/year)] x [2,000 lb/ton] / [Emission Factor (lb/MMBtu (HHV))]

(6) [CTG Annual Emissions (tons/year)] = [Estimated Fuel Cap (MMBtu/yr (HHV))] * [Emission Factor (lb/MMBtu (HHV))] / [2,000 lb/ton]

(7) For pollutants monitored by CEMS, maximum annual allowable emissions are assumed to be 248 tpy For pollutants monitored through fuel tracking, maximum annual allowable emissions are assumed to be 220 tpy.

South Dade Energy Center, Dade Development Co. LLC.
NSPS NO_X Emission Standard Calculation

Turbine MHI 501F		
Fuel Natural Gas		
Maximum Electrical Capacity	183.9	MW
Maximum Energy Input	1,718	MMBtu/hr (LHV)
	1,813,520,800	kJ/hr
Heat Rate	9,342	Btu/kWh
	9.9	kJ/Wh
NSPS Subpart GG NOx Limit	0.0110%	Volume % NOx @ 15% O2
	110	ppmvd @ 15% O2

Turbine MHI 501F		
Fuel Distillate Oil		
Maximum Electrical Capacity	159.1	MW
Maximum Energy Input	1,571	MMBtu/hr (LHV)
	1,658,347,600	kJ/hr
Heat Rate	9,872	Btu/kWh
	10.4	kJ/Wh
NSPS Subpart GG NOx Limit	0.0104%	Volume % NOx @ 15% O2
	104	ppmvd @ 15% O2

Calculations and Computations

HAP Emissions from Combined Cycle CTG Facility

Project: South Dade Energy Center, Dade Development Co. LLC.
Project Number: 6792-140-410
Subject: Natural Gas/Distillate Oil Fired Turbine Non-Criteria Regulated Pollutant Emissions Calculations

Computed by: J. Lubetsky Date: 3/27/2001
Checked by: M. Griffin Date: 4/9/2001

Pollutant	Type[a]	Emission Factor AP-42 Section 3.1 04/00 - Combustion Turbine Natural Gas (lb/10^{6}scf)	Emission Factor AP-42 Section 3.1 04/00 - Combustion Turbine Natural Gas (lb/MMBtu)[d]	Rating	Emission Factor AP-42 Section 3.1 04/00 - Combustion Turbine No. 2 Fuel Oil (lb/10^3 gallons)	Emission Factor AP-42 Section 3.1 04/00 - Combustion Turbine No. 2 Fuel Oil (lb/MMBtu)[d]	Rating	CTG Natural Gas Combustion: Maximum Heat Input, per turbine (MMBtu/Hr)[b]	CTG Natural Gas Combustion: Average Heat Input, per turbine (MMBtu/Hr)[c]	Distillate Oil: Maximum Heat Input, per turbine (MMBtu/Hr)[b]	Distillate Oil: Average Heat Input, per turbine (MMBtu/Hr)[c]	CTG Natural Gas: Emission Rate, Per Turbine: Hourly[e] (lb/hr)	CTG Natural Gas: Emission Rate, Per Turbine: Annual[f] (tpy)	CTG Distillate Oil: Emission Rate, Per Turbine: Hourly[e] (lb/hr)	CTG Distillate Oil: Emission Rate, Per Turbine: Annual[f] (tpy)	Facility: Emission Rate All CTGs: Hourly[e] (lb/hr)	Facility: Emission Rate All CTGs: Annual[f] (tpy)	Facility Major Source (Y/N)
1,3-Butadiene	HAP		4.30E-07	D		1.60E-05	D	1,907	1,907	1,665	1,665	8.20E-04	5.92E-04	2.66E-02	1.32E-02	5.33E-02	2.63E-02	No
Acetaldehyde	HAP		4.00E-05	C				1,907	1,907	1,665	1,665	7.63E-02	5.51E-02	0.00E+00	0.00E+00	1.53E-01	1.10E-01	No
Acrolein	HAP		6.40E-06	C				1,907	1,907	1,665	1,665	1.22E-02	8.82E-03	0.00E+00	0.00E+00	2.44E-02	1.76E-02	No
Benzene	HAP		1.20E-05			5.50E-05	C	1,907	1,907	1,665	1,665	2.29E-02	1.65E-02	9.16E-02	4.53E-02	1.83E-01	9.06E-02	No
Ethylbenzene	HAP		3.20E-05	C				1,907	1,907	1,665	1,665	6.10E-02	4.41E-02	0.00E+00	0.00E+00	1.22E-01	8.82E-02	No
Formaldehyde[h]	HAP	1.32E-01	1.37E-04			2.80E-04	B	1,907	1,907	1,665	1,665	2.62E-01	1.89E-01	4.66E-01	2.31E-01	9.33E-01	4.61E-01	No
Naphthalene	HAP		1.30E-06	C		3.50E-05	C	1,907	1,907	1,665	1,665	2.48E-03	1.79E-03	5.83E-02	2.88E-02	1.17E-01	5.76E-02	No
PAHs	HAP		2.20E-06	C		4.00E-05	C	1,907	1,907	1,665	1,665	4.20E-03	3.03E-03	6.66E-02	3.29E-02	1.33E-01	6.59E-02	No
Propylene Oxide	HAP		2.90E-05	D				1,907	1,907	1,665	1,665	5.53E-02	4.00E-02	0.00E+00	0.00E+00	1.11E-01	7.99E-02	No
Toluene	HAP		1.30E-04					1,907	1,907	1,665	1,665	2.48E-01	1.79E-01	0.00E+00	0.00E+00	4.96E-01	3.58E-01	No
Xylene	HAP		6.40E-05	C				1,907	1,907	1,665	1,665	1.22E-01	8.82E-02	0.00E+00	0.00E+00	2.44E-01	1.76E-01	No
Arsenic	HAP			E		1.10E-05	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	1.83E-02	9.06E-03	3.66E-02	1.81E-02	No
Beryllium	HAP					3.10E-07	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	5.16E-04	2.55E-04	1.03E-03	5.10E-04	No
Cadmium	HAP			E		4.80E-06	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	7.99E-03	3.95E-03	1.60E-02	7.90E-03	No
Chromium	HAP					1.10E-05	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	1.83E-02	9.06E-03	3.66E-02	1.81E-02	No
Lead	HAP			E		1.40E-05	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	2.33E-02	1.15E-02	4.66E-02	2.31E-02	No
Manganese	HAP			E		7.90E-04	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	1.32E+00	6.50E-01	2.63E+00	1.30E+00	No
Mercury	HAP			E		1.20E-06	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	2.00E-03	9.88E-04	4.00E-03	1.98E-03	No
Nickel	HAP					4.60E-06	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	7.66E-03	3.79E-03	1.53E-02	7.57E-03	No
Selenium	HAP					2.50E-05	D	1,907	1,907	1,665	1,665	0.00E+00	0.00E+00	4.16E-02	2.06E-02	8.33E-02	4.12E-02	No

	Annual Fuel Use (MMBtu/yr)
CTG Natural Gas Maximum[g]	5,511,224
CTG Distillate Oil Maximum[g]	3,293,293
Number of CTGs per Facility	2

Facility Total HAPs 3.0 No

Maximum Individual HAP 1.3 No

Natural Gas Heating Value 964.5 Btu/SCF (HHV)

Notes:
(a) Type = NC for Non-Criteria Pollutants, HAP/POM for compounds included as polycyclic organic matter or HAP for Hazardous Air Pollutant.
(b) Maximum heat input rate for turbine is based on HHV data at an ambient temperature of 59 °F and base load operating conditions.
(c) Average heat input rate is based on data at an average ambient temperature of 59 °F and base load operating conditions.
(d) Emission Factor (lb/MMBtu) = (Emission Factor, lb/10^6 scf) / (Heat Value Btu/scf)
(e) Hourly Emission Rate (lb/hr) = [Heat Input (MMBtu/Hr) * Emission Factor (lb/MMBtu)]
(f) Annual Emission Rate (tons/year) = [Annual Heat Input (MMBtu/Yr) * Emission Factor (lb/MMBtu) / (2,000 lb/ton)]
(h) Modified from AP-42 Section 3.1 emissions database for aero derivative turbines.
(i) Annual Fuel Use increased by 10% margin

AP-42 Emission Factor for Formaldehyde Emissions from Natural Gas Fired Combustion Turbine

ID Number	Facility	Turbine	Turbine Rating	Turbine Load	AP-42	AP-42 Expected Final Value	AP-42 [illegible] outliers	[illegible] LM2500 turbine	GE LM2500 turbines [illegible] outliers
					(lb/Mmcuft)	(lb/Mmcuft)	(lb/Mmcuft)	(lb/Mmcuft)	(lb/Mmcuft)
11	Gilroy Energy Co./Gilroy, CA	General Electric Fram	87 MW	NR	0.72	0.72	0.72		
12.1	Sithe Energies, 32nd St. Naval S/San I	General Electric MS6(	44 MW	100	0.11	0.11	0.11		
13.1	SD Gas & Electric Co./San Diego, CA	General Electric 5221	17 MW	95	0.48	0.48	0.48		
15.1	Modesto Irrigation District/Mclure/Mod(	General Electric Fram	50 MW	100	0.14	0.14	0.14		
16	Willamette Industries, Inc./Oxnard, CA	General Electric LM25	67.4 MW	33	0.04	0.04	0.04	0.04	0.04
18	Sycamore Cogen. Co./Bakersfield, CA	General Electric Fram	75 MW	100	0.09	0.09	0.09		
2	Calpine / Agnews Cogen./San Jose, C.	General Electric LM5C	23.33 MW	100	0.06	0.06	0.06	0.06	0.06
21	Dexzel Inc./Bakersfield, CA	General Electric LM25	29.1 MW	77	0.03	0.03	0.03	0.03	0.03
22	Procter & Gamble Manufacturing/Sacr	General Electric LM25	20.5 MW	95	0.09	0.09	0.09	0.09	0.09
23	Chevron Inc./Gaviota, CA	Allison K501	2.5 MW	NR	3.57	3.57	3.57		
25 [2]	Ell / Stewart & Stevenson/Berkeley, C/	General Electric LM25	25 MW	NR	0.48	0.48	0.48	0.48	
26	Calpine Corp./Sumas, WA	General Electric MS7(	87.83 MW	100	0.01	0.01	0.01		
27	Sargent Canyon Cogen/Bakersfield, C,	General Electric Fram	42.5 MW	50	0.06	0.06	0.06		
28	Watsonville Cogen, Partnership/Watso	General Electric LM 2	24 MW	100	0.09	0.09	0.09	0.09	0.09
3.1	Southern Cal. Edison Co./Long Beach,	Brown-Boveri-Sulzer 1	61.75 MW	107	1.33	1.33	1.33		
313.1.1	NR/NR	General Electric Fram	7.7 MW	100	0.27	0.27	0.27		
313.1.2	NR/NR	General Electric Fram	7.7 MW	25	0.43	0.43	0.43		
313.2.1	NR/NR	Solar T12000	9.4 MW	100	0.02	0.02	0.02		
313.2.2	NR/NR	Solar T12000	9.4 MW	25	9.62	9.62	9.62		
315.1	NR/NR	General Electric LM15	10.6 MW	100	4.27	4.27	4.27		
315.2	NR/NR	General Electric LM15	10.6 MW	25	25.91	25.91			
4.1.2x [1]	Southern Cal. Edison Co./Coolwater, C	Westinghouse PACE5	63 MW	100	38.96				
4.2	Southern Cal. Edison Co./Coolwater, C	Westinghouse PACE5	63 MW	100	0.35	0.35	0.35		
6.2	Imperial Irrigation D / Choachella/Impe	General Electric NS5C	46.3 MW	100	0.31	0.31	0.31		
7	Bonneville Pacific Corp./Somis, CA	Solar Mars	9 MW	100	0.74	0.74	0.74		
9	WSPA/SWEPI GT/Bakersfield, CA	Allison 501 KB5	4 MW	85	0.01	0.01	0.01		
			Mean (lb/Mmcuft)		3.39	1.97	0.97	0.13	0.06
				Std Dev	8.98	5.41	2.13	0.17	0.03

Notes:

[1] Formaldehyde data point was an outlier. Retest of the same turbine (ID Number 4.2) generated formaldehyde data more consistent with other formaldehyde data

[2] The data point for the Ell/Stewart & Stevenson facility was calculated from three "non-detects"; the Test Method employed an unusually high detection limit

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	T001
City:	Dade County
State:	Florida
Company:	South Dade Energy Center
Type of Tank:	Vertical Fixed Roof Tank
Description:	Main Tank

Tank Dimensions

Shell Height (ft):	48.00
Diameter (ft):	103.00
Liquid Height (ft):	30.00
Avg. Liquid Height (ft):	15.00
Volume (gallons):	1,852,000.00
Turnovers:	12.24
Net Throughput (gal/yr):	22,660,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft):	0.00
Radius (ft) (Dome Roof):	103.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jul	81.34	76.83	85.86	75.91	0.0127	0.0111	0.0146	130.0000			188.00	Option 5: A=12.101, B=8907

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):							84.8772					
Vapor Space Volume (cu ft):							333,831.6374					
Vapor Density (lb/cu ft):							0.0003					
Vapor Space Expansion Factor:							0.0295					
Vented Vapor Saturation Factor:							0.9736					
Tank Vapor Space Volume												
Vapor Space Volume (cu ft):							333,831.6374					
Tank Diameter (ft):							103.0000					
Vapor Space Outage (ft):							40.0648					
Tank Shell Height (ft):							48.0000					
Average Liquid Height (ft):							15.0000					
Roof Outage (ft):							7.0648					
Roof Outage (Dome Roof)												
Roof Outage (ft):							7.0648					
Dome Radius (ft):							103.0000					
Shell Radius (ft):							51.5000					
Vapor Density												
Vapor Density (lb/cu ft)							0.0003					
Vapor Molecular Weight (lb/lb-mole):							130.0000					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.0127					
Daily Avg. Liquid Surface Temp. (deg. R):							541.0146					
Daily Average Ambient Temp. (deg. F):							82.6000					
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731					
Liquid Bulk Temperature (deg. R):							535.5817					
Tank Paint Solar Absorptance (Shell):							0.1700					
Tank Paint Solar Absorptance (Roof):							0.1700					
Daily Total Solar Insulation Factor (Btu/sqft day):							1,854.1259					
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:							0.0295					
Daily Vapor Temperature Range (deg. R):							18.0416					
Daily Vapor Pressure Range (psia):							0.0035					
Breather Vent Press. Setting Range(psia):							0.0600					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.0127					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.0111					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.0146					
Daily Avg. Liquid Surface Temp. (deg R):							541.0146					
Daily Min. Liquid Surface Temp. (deg R):							536.5042					
Daily Max. Liquid Surface Temp. (deg R):							545.5250					
Daily Ambient Temp. Range (deg. R):							12.8000					
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:							0.9736					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.0127					
Vapor Space Outage (ft):							40.0648					
Working Losses (lb):							894.0045					

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)- (Continued)

Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0127
Net Throughput (gal/mo.):	22,660,000.00
	00
Annual Turnovers:	12.2354
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	1,852,000.000
	0
Maximum Liquid Height (ft):	30.0000
Tank Diameter (ft):	103.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	978.8817

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	894.00	84.88	978.88

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	T002
City:	Dade County
State:	Florida
Company:	South Dade Energy Center
Type of Tank:	Vertical Fixed Roof Tank
Description:	Day Tank

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	56.00
Liquid Height (ft):	25.10
Avg. Liquid Height (ft):	12.60
Volume (gallons):	463,050.00
Turnovers:	48.94
Net Throughput (gal/yr):	22,661,871.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft):	0.00
Radius (ft) (Dome Roof):	56.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min	Max	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jul	81.34	76.83	85.86	75.91	0.0127	0.0111	0.0146	130.0000			188.00	Option 5: A=12.101, B=8907

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):							19.6781					
Vapor Space Volume (cu ft):							76,947.0142					
Vapor Density (lb/cu ft):							0.0003					
Vapor Space Expansion Factor:							0.0295					
Vented Vapor Saturation Factor:							0.9793					
Tank Vapor Space Volume												
Vapor Space Volume (cu ft):							76,947.0142					
Tank Diameter (ft):							56.0000					
Vapor Space Outage (ft):							31.2411					
Tank Shell Height (ft):							40.0000					
Average Liquid Height (ft):							12.6000					
Roof Outage (ft):							3.8411					
Roof Outage (Dome Roof)												
Roof Outage (ft):							3.8411					
Dome Radius (ft):							56.0000					
Shell Radius (ft):							28.0000					
Vapor Density												
Vapor Density (lb/cu ft):							0.0003					
Vapor Molecular Weight (lb/lb-mole):							130.0000					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.0127					
Daily Avg. Liquid Surface Temp. (deg. R):							541.0146					
Daily Average Ambient Temp. (deg. F):							82.6000					
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731					
Liquid Bulk Temperature (deg. R):							535.5817					
Tank Paint Solar Absorptance (Shell):							0.1700					
Tank Paint Solar Absorptance (Roof):							0.1700					
Daily Total Solar Insulation Factor (Btu/sqft day):							1,854.1259					
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:							0.0295					
Daily Vapor Temperature Range (deg. R):							18.0416					
Daily Vapor Pressure Range (psia):							0.0035					
Breather Vent Press. Setting Range(psia):							0.0600					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.0127					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.0111					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.0146					
Daily Avg. Liquid Surface Temp. (deg R):							541.0146					
Daily Min. Liquid Surface Temp. (deg R):							536.5042					
Daily Max. Liquid Surface Temp. (deg R):							545.5250					
Daily Ambient Temp. Range (deg. R):							12.8000					
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:							0.9793					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.0127					
Vapor Space Outage (ft):							31.2411					
Working Losses (lb):							697.0741					

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)- (Continued)

Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0127
Net Throughput (gal/mo.):	22,661,871.00 00
Annual Turnovers:	48.9404
Turnover Factor:	0.7797
Maximum Liquid Volume (gal):	463,050.0000
Maximum Liquid Height (ft):	25.1000
Tank Diameter (ft):	56.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	716.7522

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	697.07	19.68	716.75

APPENDIX C

AIR QUALITY IMPACT ANALYSIS

1.0 INTRODUCTION

Dispersion modeling using U.S. EPA –approved models was conducted to determine the peak impact of emissions from the proposed South Dade Energy Center on ambient air concentrations of criteria pollutants for which there is a National Ambient Air Quality Standard (NAAQS). For the proposed facility, this includes NO_x, CO, SO_2, PM_{10} and lead. In addition, maximum air impacts were identified at receptors located in Biscayne National Park (BNP), approximately 2 kilometers to the east of SDEC. Analyses were also conducted to assess the potential for adverse impact to soils and vegetation (relative to the project peak impacts and impacts at BNP), and to estimate acidic deposition at BNP. The maximum air impacts predicted with the U.S. EPA's ISCST3 model were assessed relative to U.S. EPA recommended criteria for soils and vegetation. The CALPUFF model, recommended by the National Park Service for assessing deposition, was used to compute acidic deposition, in the form of sulfur and nitrogen, relative to background deposition measurements.

Section 2 presents the modeling analysis methodology and the results of the peak predicted SDEC air impacts and maximum impacts at BNP. Section 3 presents the soils and vegetation impact analysis and deposition modeling results.

2.0 AIR QUALITY MODELING ANALYSIS

2.1 Overview of Analysis Methodology

The ambient concentrations of the pollutants resulting from allowable emissions from the proposed facility were predicted using an approved U.S. EPA atmospheric dispersion model in accordance with U.S. EPA's "Guideline on Air Quality Models" (U.S. EPA, 1999). The atmospheric dispersion of emissions was simulated for a record of representative sequential hourly meteorological conditions over a historical five-year period. Ground-level concentrations at various averaging periods depending on the pollutant were predicted for a grid of ground-level model "receptors" surrounding the proposed facility. The following sections detail the specific aspects of the ambient air quality impact analysis.

2.2 Model Selection

The selection of an appropriate dispersion model must take into consideration the physical geometry of the sources, the local dispersion environment, and terrain characteristics. These factors, which formulate the basis for choosing one or more of the models recommended in the U.S. EPA modeling guidelines for both screening and refined modeling, are discussed below.

2.2.1 Physical Source Geometry

The sources of criteria pollutants from the proposed facility consist of high velocity, high temperature exhausts from stacks connected to the combustion turbines. This requires the use of a model capable of simulating the dispersion of buoyant releases from elevated point sources. The U.S. EPA modeling guidelines require the evaluation of the potential for physical structures to affect the dispersion of emissions from elevated point sources. The exhaust from stacks that are located within specified distances of buildings, and whose physical heights are below specified levels, may be subject to "aerodynamic building downwash" under certain meteorological conditions. If this is the case, a model capable of simulating this effect must be employed.

The analysis used to evaluate the potential for building downwash is referred to as a physical "Good Engineering Practice" (GEP) stack height analysis. Stacks with heights below physical GEP are considered to be subject to building downwash. In the absence of structural effects, U.S. EPA has established a "default" GEP height of 213 feet. Any portion of a stack above the maximum of the physical or default GEP height cannot be used in the dispersion modeling analysis for purposes of comparison to U.S. EPA's ambient impact criteria.

Each of the two combustion turbines at the proposed facility will have its own stack. A GEP stack height analysis was performed for the proposed project configuration in accordance with U.S. EPA's guidelines (U.S. EPA, 1985). Per the guidelines, the physical GEP height, H_{GEP}, is determined from the dimensions of all buildings which are within the region of influence using the following equation:

$$H_g = H + 1.5L$$

where:

H = height of the structure within 5L of the stack which maximizes H_g, and

L = lesser dimension (height or projected width) of the structure.

For a squat structure, i.e., height less than projected width, the formula reduces to:

$$H_g = 2.5H$$

In the absence of influencing structures, a "default" GEP stack height is credited up to 65 meters (213 feet). The locations and dimensions of the various structures at the proposed facility relative to the exhaust stacks are depicted in Figure 2-1. An analysis of the potential for building downwash is presented below.

The significant structures of the proposed facility will include the turbine enclosures, turbine air intake structures, water storage tanks, and fuel storage tanks. U.S. EPA's Building Profile Input Processor (BPIP), as implemented in Lakes-Environmental *BPIP View* software, was used to determine the GEP stack height and to develop building input data for the modeling analysis. A summary of the GEP analysis and the controlling building is provided in Table 2-1. The table lists the physical GEP stack height calculated for each influencing structure. Based on the BPIP analysis, the GEP stack height for the turbine stacks is 148.5 feet. Since the proposed height of the combustion turbine stacks is 80 feet, building downwash affects must be simulated in the dispersion modeling analysis. Also, since the stacks are less than the default GEP height of 213 feet, their full height can be considered in the modeling.

Figure 2-1 Location of Turbine Stacks Relative to Structures Included in the GEP Analysis

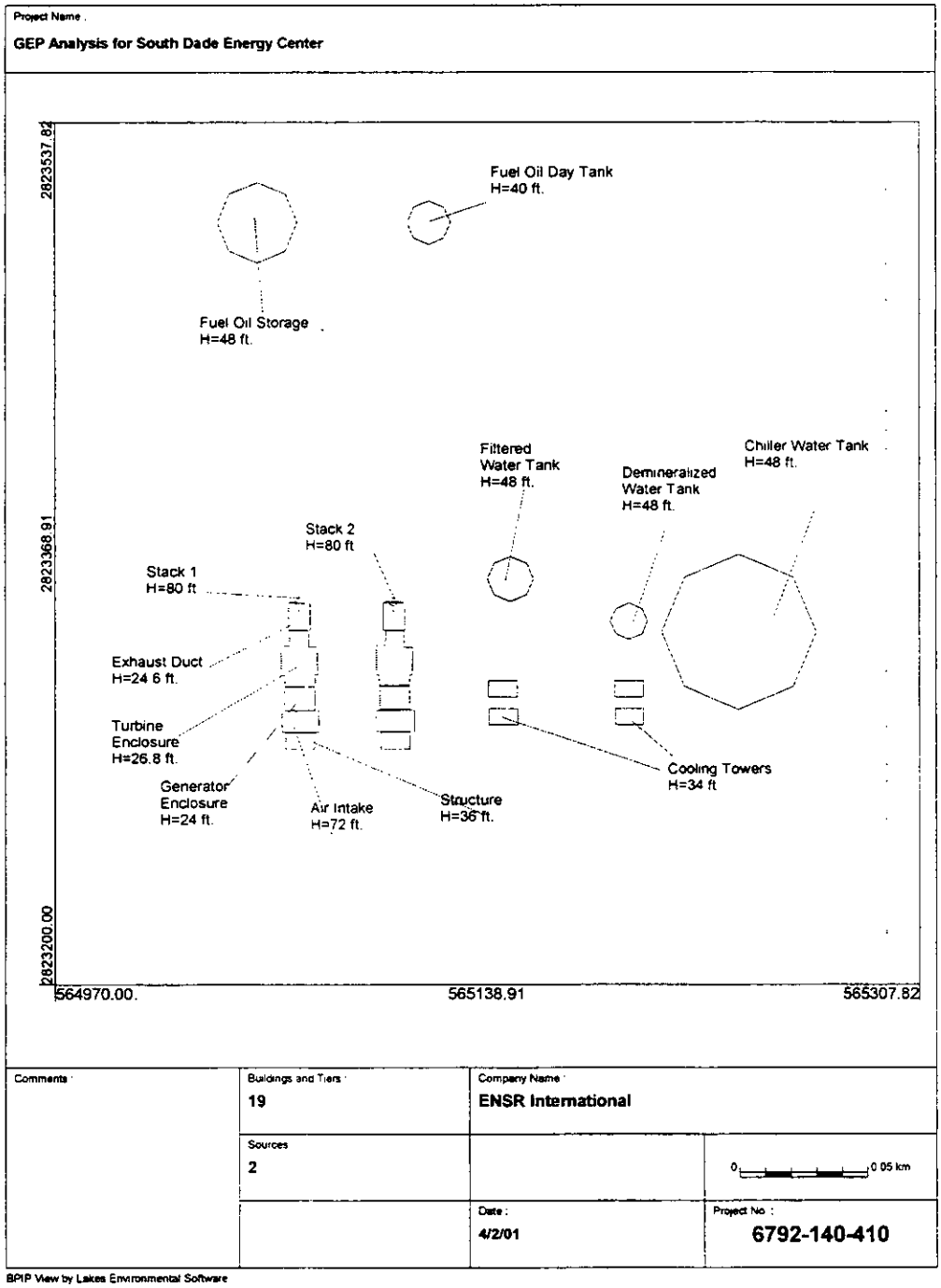


Table 2-1 Summary of GEP Analysis (Units in Feet)

Structure	Height	Length	Width	MPW[2]	GEP Formula Height	5L[3]	Distance to Turbine Stack [4]	Turbine Stack(s) Potentially Effected By Downwash Yes/No
Exhaust Duct[1]	24.6	33	26	42	61.5	123	0	No
Turbine Enclosure [1]	26.8	69	46	83	67	134	33	No
Generator Enclosure[1]	24	36	26	44	60	120	105	No
Turbine Air Intake[1]	72	46	23	51	148.5	255	138	Yes
Turbine End Structure[1]	36	36	20	41	90	180	167	Yes
Cooling Tower	34	36	20	41	85	170	157	Yes
Filtered Water Tank	48	58	58	58	120	240	125	Yes
De-mineralized Water Tank	48	47	47	47	118.5	235	276	No
Chiller Water Tank	48	200	200	200	120	240	341	No

(1) One associated with each turbine (see Figure 2-1).
(2) Maximum projected width.
(3) 5 times the lessor of the MPW or height is the maximum influence region.
(4) Closest distance relative to both turbine stacks.

2.2.2 Dispersion Environment

The selection and application of the model requires characterization of the local (within 3 km) dispersion environment as either urban or rural, based on a U.S. EPA-recommended procedure that characterizes an area by prevalent land use. This land use approach classifies an area according to 12 land use types. In this scheme, areas of industrial, commercial, and compact residential land use are designated urban. According to U.S. EPA modeling guidelines, if more than 50 percent of an area within a three-kilometer radius of the proposed facility is classified as rural, then rural dispersion coefficients are to be used in the dispersion modeling analysis.

For this analysis, the 1:24,000 scale United States Geological Survey (USGS) topographic maps were obtained for: Goulds NW, Perrine NE, Homestead SW, Arsenicker. Visual observation of the land use depicted on these maps clearly indicates that the region within 3 km is predominately rural.

2.2.3 Terrain Considerations

The U.S. EPA modeling guidelines require that the differences in terrain elevations, between the stack base and each location (receptor) at which air quality impacts are predicted, be considered in the modeling analyses. There are three types of terrain:

- simple terrain – locations where the terrain elevation is at or below the exhaust height of the stacks to be modeled;

- intermediate terrain – locations where the terrain is between the height of the stack and the modeled exhaust "plume" centerline (this varies as a function of plume rise, which in turn, varies as a function of meteorological condition);
- complex terrain – locations where the terrain is above the plume centerline.

Based on a review of USGS topographical maps, the area throughout the modeling domain is generally flat. The dispersion model must therefore be capable of simulating impacts on simple terrain only.

Based on a review of the factors discussed above, the ISCST3-Version 00101 dispersion model was selected for use in the modeling analysis.

2.3 Model Application

The ISCST3 model was used to calculate concentrations at simple terrain receptor locations. The model was applied using the ISCST3 regulatory default option, in accordance with the U.S. EPA Guidelines.

2.3.1 Meteorological Data

The ISCST3 model requires a sequential hourly record of dispersion meteorology representative of the region within which the proposed source is located. In the absence of site-specific measurements, the EPA Guidelines recommend the use of data from nearby National Weather Service (NWS) stations, provided they are representative. For this analysis a five-year sequential meteorological data set was used consisting of surface observations from the NWS at Miami International airport and concurrent mixing heights data from the NWS at West Palm Beach International airport from 1986 through 1990. These data are the closest representative data available and are recommended by the DEP. The surface data and mixing height data files were processed with the U.S. EPA's meteorological processor, PCRAMMET, for input to ISCST3.

2.3.2 Model Receptor Grid

A cartesian receptor grid was generated for use in the ISCST3 modeling to assess the peak project impacts. The grid consisted of densely spaced receptors 100 meters apart starting at and extending to 3000 meters from the plant fenceline. Beyond 3000 meters, a spacing of 500 meters was used out to five kilometers from the facility. From six to ten kilometers, a spacing of 1000 meters was used. Between ten and twenty kilometers, a spacing of 2000 meters was used. Additional receptors were placed approximately every 50 meters along the property fence-line for increased resolution of impacts. Terrain elevations were not used for the receptors given that the terrain in the study area is generally flat. The extent of this grid was sufficient to capture maximum impacts.

Figure 2-2 shows the near-field receptors (out to three kilometers) including the near-field portion of the cartesian grid and fence-line receptors. The full cartesian receptor grid out to twenty kilometers is shown in Figure 2-3.

A separate set of receptors, shown in Figure 2-4, was used to assess impacts in BNP. BNP receptors were placed at 1000-meter intervals along the park boundary and in a 5000-meter spaced grid inside the park.

Figure 2-2 Near-Field Receptor Locations

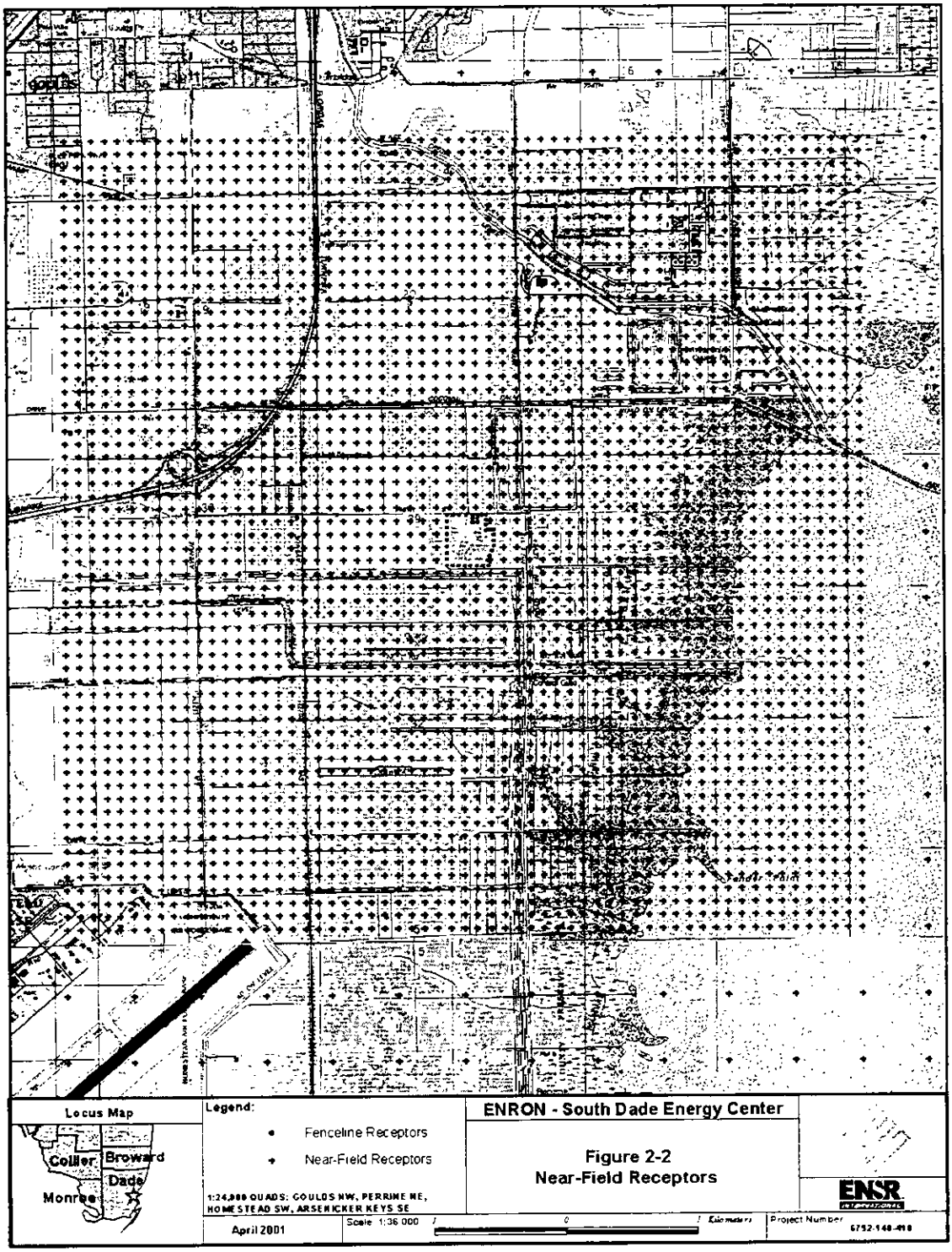


Figure 2-3 Far-Field Receptors

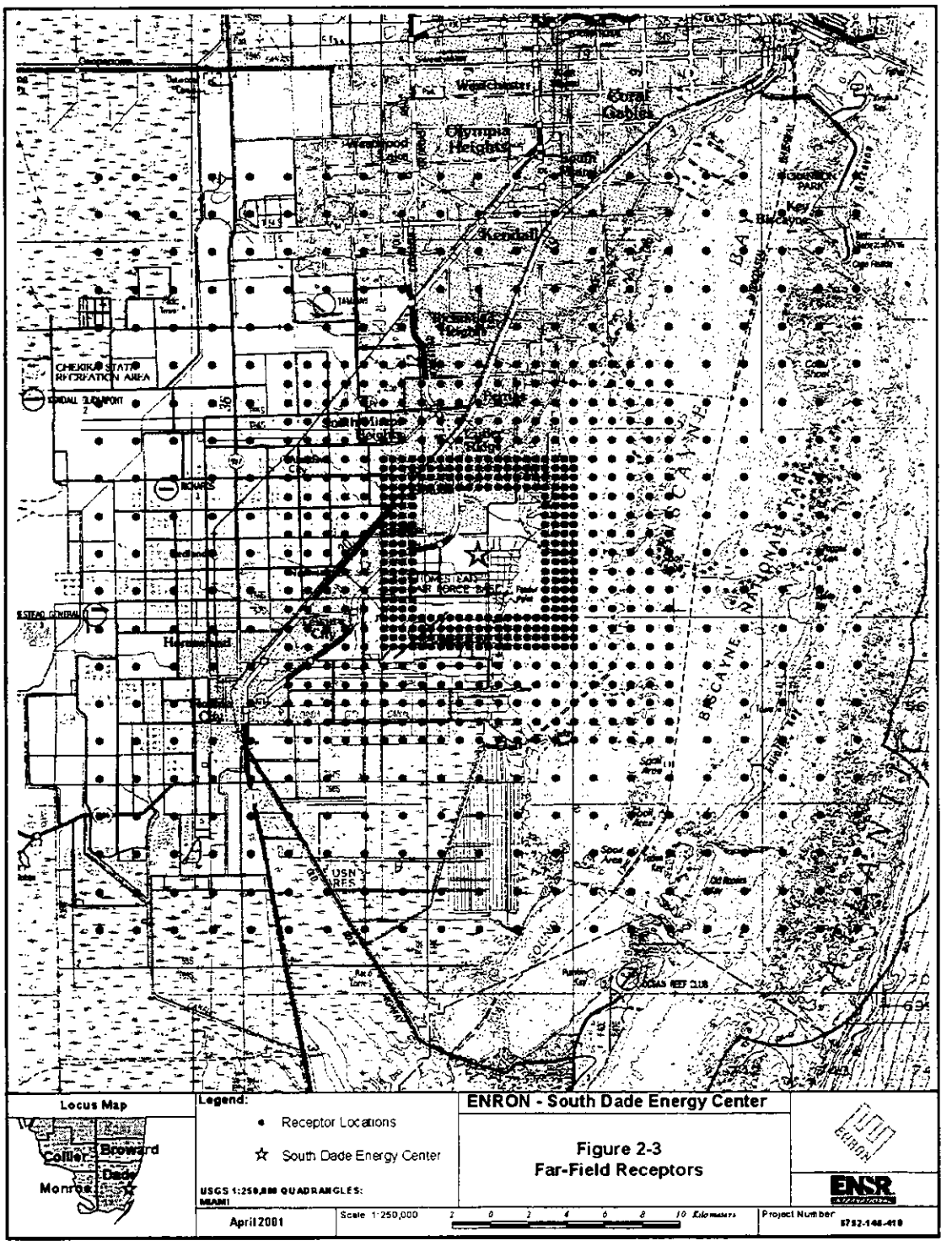
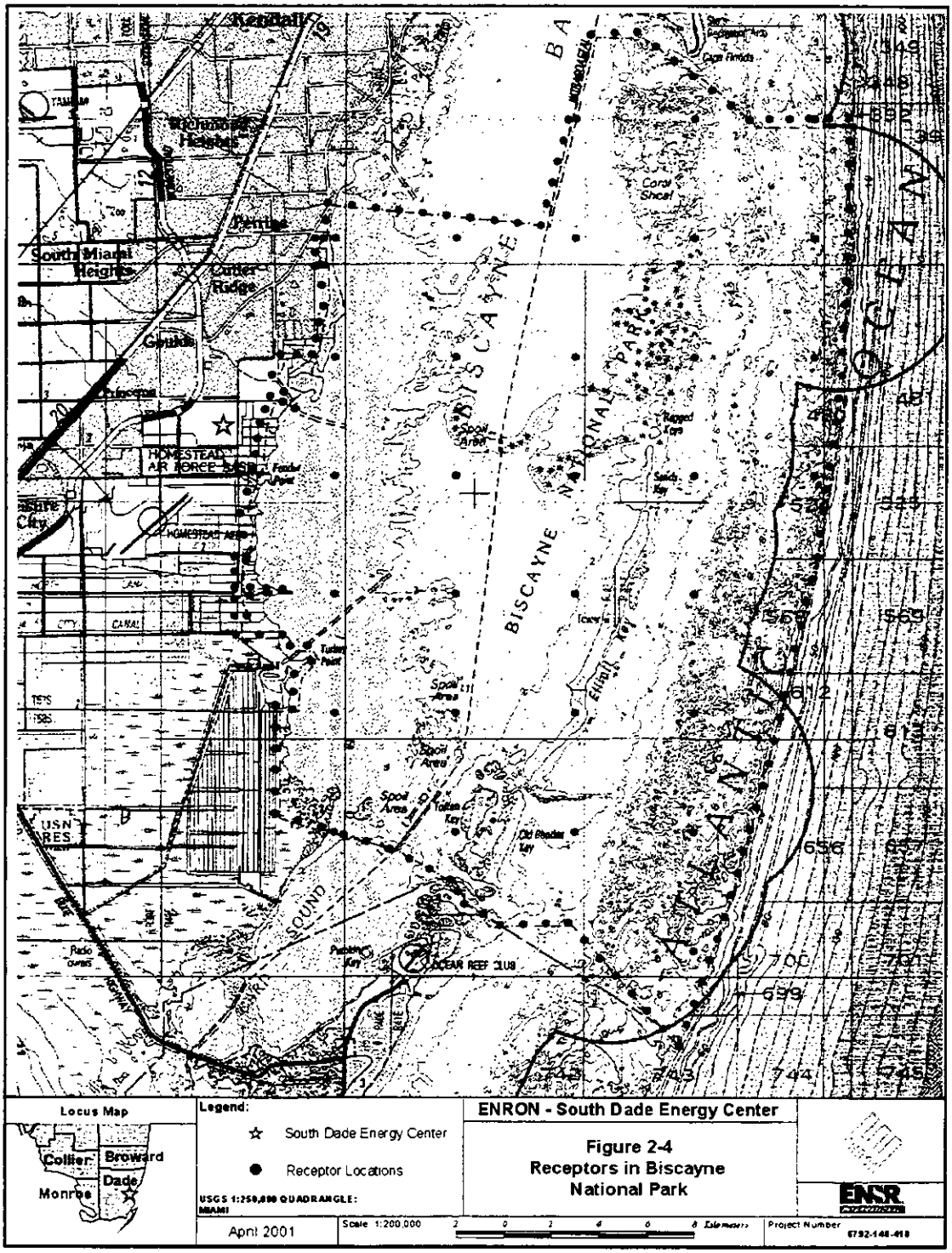


Figure 2-4 Biscayne National Park Receptors



2.3.3 Physical Source and Emissions Data

The air dispersion modeling analysis was conducted with emission rates and flue gas exhaust characteristics (flow rate and temperature) that are expected to represent the worst-case parameters among the range of possible values for the proposed MHI501F turbines Because turbine emission rates and flue gas characteristics for a given turbine load vary as a function of ambient temperature and fuel use, data were derived for four ambient temperatures for both natural gas and distillate oil at each of the two operating loads (100% and 75%). The temperatures selected were:

- 32°F, an extreme lower boundary
- 59°F, ISO conditions
- 74°F, representative annual average
- 95°F, a representative upper boundary

A summary of the exhaust data and emission rates for the modeled pollutants for each fuel at each temperature and the three operating loads is provided in Table 2-2 for the MHI 501F turbines. Detailed calculations of the emissions parameters are presented in Appendix B.

In order to conservatively calculate ground-level concentrations, a composite "worst-case" set of emissions parameters was developed for each proposed fuel for input to the modeling. For each operating load, the highest pollutant-specific emission rate, the lowest exhaust temperature and the lowest exhaust flow rate were selected. Table 2-3 summarizes the worst-case emissions parameters for the two fuels at three operating loads.

Wind-direction-specific dimensions of the structures potentially causing building downwash of the turbine stacks were derived using the U.S. EPA BPIP processor. The BPIP inputs to the ISCST3 model are provided in Appendix D.

2.4 Ambient Impact Criteria

The U.S. EPA has established specific ambient impact criteria against which to evaluate the impact of a proposed new source. These are listed in Table 2-4 for the pollutants considered in this analysis. A description of each of the criteria is described below.

Table 2-2 Combustion Turbine Performance Data for Natural Gas and Distillate Fuel Oil Operation

100 % Load – Natural Gas

Parameter		Values			
Ambient Temperature (°F)		95	74	59	32
Stack Height (Ft.)		80	80	80	80
Stack Diameter (Ft.)[1]		27.68	27.68	27.68	27.68
Exit Temperature (°F)		1124	1124	1124	1112
Exit Velocity (Ft./sec)		70.1	70.1	70.1	69.7
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_x	173	173.0	173.0	173.0
	CO	42	42.0	42.0	47.0
	SO_2	11.3	11.3	11.3	11.3
	PM_{10}	20.0	20.0	20.0	20.0

75 % Load – Natural Gas

Parameter		Values			
Ambient Temperature (°F)		95	74	59	32
Stack Height (Ft.)		80	80	80	80
Stack Diameter (Ft.)[1]		27.68	27.68	27.68	27.68
Exit Temperature (°F)		1148	1148	1148	1148
Exit Velocity (Ft./sec)		54.3	55.4	56.2	56.8
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_x	122.0	128.0	132.0	148.0
	CO	45.0	47.0	49.0	54.0
	SO_2	8.0	8.4	8.7	9.0
	PM_{10}	20.0	20.0	20.0	20.0

[1] Equivalent diameter for rectangular stack of dimensions 22' 7 11/16" x 26' 7".

Table 2-2 Combustion Turbine Performance Data for Natural Gas and Distillate Fuel Oil Operation (continued)

100 % Load – Distillate Oil

Parameter		Values			
Ambient Temperature (°F)		95	74	59	32
Stack Height (Ft.)		80	80	80	80
Stack Diameter (Ft.)[1]		27.68	27.68	27.68	27.68
Exit Temperature (°F)		1014	1014	1014	1006
Exit Velocity (Ft./sec)		65.0	65.0	65.0	66.3
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_x	272.0	272.0	272.0	281.0
	CO	197.0	197.0	197.0	204.0
	SO_2	39.0	39.0	39.0	41.0
	PM_{10}	40.0	40.0	40.0	40.0
	Lead	0.02	0.02	0.02	0.02

75 % Load – Distillate Oil

Parameter		Values			
Ambient Temperature (°F)		95	74	59	32
Stack Height (Ft.)		80	80	80	80
Stack Diameter (Ft.)[1]		27.68	27.68	27.68	27.68
Exit Temperature (°F)		1121	1099	1086	1064
Exit Velocity (Ft./sec)		50.4	51.6	52.5	54.3
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_x	196.0	205.0	212.0	226.0
	CO	142.0	149.0	154.0	164.0
	SO_2	28.0	30.0	31.0	33.0
	PM_{10}	40.0	40.0	40.0	40.0
	Lead	0.02	0.02	0.02	0.02

[1] Equivalent diameter for rectangular stack of dimensions 22' 7 11/16" x 26' 7".

Table 2-3 Worst-Case Turbine Stack Data for Dispersion Modeling

Natural Gas Operation

Parameter		Value	
Load (%)		100	75
Stack Height (Ft.)		80	80
Stack Diameter (Ft.)[1]		27.68	27.68
Exit Temperature (°F)		1112	1148
Exit Velocity (Ft./sec)		69.7	54.3
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_x	173.0	281.0
	CO	47.0	204.0
	SO_2	11.3	41.0
	PM_{10}	20.0	40.0

No. 2 Fuel Operation

Parameter		Value	
Load (%)		100	75
Stack Height (Ft.)		80	80
Stack Diameter (Ft.) [1]		27.68	27.68
Exit Temperature (°F)		1006	1064
Exit Velocity (Ft./sec)		65.0	50.4
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_x	281.0	226.0
	CO	204.0	164.0
	SO2	78.0	63.0
	PM_{10}	40.0	40.0
	Lead	0.02	0.02

[1] Equivalent diameter for rectangular stack of dimensions 22' 7 11/16" x 26' 7".

Table 2-4 Ambient Impact Criteria[1]

Pollutant	Averaging Period	NAAQS		Significant Impact Levels
		Primary	Secondary	
NO_2	Annual	100	100	1
CO	1-hour	40,000	NA	2,000
	8-hour	10,000	NA	500
PM_{10}	24-hour	150	150	5
	Annual	50	50	1
SO_2	3-hour	NA	1300	25
	24-hour	365	NA	5
	Annual	80	NA	1
Lead	Quarter	1.5	1.5	NA

[1] All values in $\mu g/m^3$. Annual averages are the maximum over all receptors. Short-term averages are the highest of the second-highest concentration over all receptors.
NA = Not Applicable

National Ambient Air Quality Standards (NAAQS)

National Ambient Air Quality Standards (NAAQS) are set by U.S. EPA, based on specific health and welfare effects criteria. Hence the term "criteria" pollutants. Ambient air refers to the air to which the general public is exposed, not the air inside buildings or in workplaces. The combined impacts of all existing sources cannot exceed the NAAQS. The primary NAAQS are established to protect the health of sensitive individuals. The secondary NAAQS are established to protect the general welfare of the public-at-large from adverse impacts on air quality related values such as visibility.

Significant Impact Levels

As can be seen from the concentrations representing these levels, the Significant Impact Levels (SILs) are small fractions of the NAAQS. The U.S. EPA guidelines require these levels to be used to determine the extent of the area surrounding a proposed source within which the source could significantly add to ambient air quality concentrations. For proposed sources whose impacts are above these levels, an analysis of the combined impacts of the proposed source with other existing sources is required. If a proposed source's impacts are below these levels it is considered to be unable to either cause or contribute to violations of the NAAQS. Therefore, a cumulative impact assessment is not required.

2.5 Background Air Quality Data

For comparison purposes, a summary of the most recent background air quality measurements available from the Florida Department of Environmental Protection (FDEP) monitoring network was compiled for the criteria pollutants. The values listed in Table 2-5 represent the highest concentrations from the most recent year of data (1999) measured at the closest monitors relative to the location of the SDEC.

2.6 Results of Ambient Air Quality Impact Analysis

The emissions from the turbine stacks (2) were modeled with ISCST3 to estimate the maximum concentrations for the criteria pollutants including NO_x, PM/PM_{10}, SO_2, CO, and lead for each year of meteorological data. Note that the modeling of annual impacts reflects limited annual operation of the combustion turbines (a maximum of 900 hours/year oil firing per turbine or a maximum of 1300 hours/year gas firing per turbine in order to limit potential emission to less than 250 tons per year).

Detailed Results for Cartesian Grid Receptors

Tables 2-6 and 2-7 provide summaries of the ISCST3 modeling results for NO_x, PM/PM_{10}, SO_2, CO, and lead for the cartesian grid and fence-line receptors for natural gas and oil firing, respectively. The maximum air concentrations over the five years modeled and corresponding receptor locations are listed for each turbine load case (100% and 75%). Note that in Table 2-6 (results for natural gas), the maximum annual concentrations are based on a maximum of 1300 hours/year of natural gas firing (i.e., the results have been scaled by a factor of 1300/8760). Similarly, in Table 2-7 (results for oil), the maximum annual concentrations are based on a maximum of 900 hours/year of oil firing (i.e., the results have been scaled by a factor of 900/8760).

Summary of SDEC Peak Air Impacts, BNP Air Impacts, and Comparison to Background

Table 2-8 lists the peak ground-level air concentrations for each pollutant and averaging period over all receptors (see Figures 2-5 and 2-6 for peak impact locations) as well as the maximum concentrations calculated at BNP (see Figure 2-7 for maximum impact locations). The maximum impacts for all pollutants and averaging periods are associated with oil firing. Note that the maximum annual impacts are associated with a worst-case operating schedule of 900 hours/year oil firing for both turbines with no natural gas firing. (This is the worst-case in terms of the dispersion modeling because oil exhaust parameters are lower than gas and therefore, higher impacts are modeled assuming an "all oil" annual operating scenario as opposed to a combination of oil and gas or gas only with the same annual emission rates.) Also listed in Table 2-8 are the measured background concentrations from the FDEP monitoring network.

The air quality impact results are illustrated in graphical form in Figures 2-8 though 2-15.

As shown in Table 2-8, all air concentrations modeled for the SDEC are very low compared to the background levels and represent an almost imperceptible increase relative to existing pollution levels. In addition, all estimated SDEC impacts are well below the SILs and the summed total of the peak SDEC impacts and background concentrations are well below the NAAQS. Based on these results it can be concluded that the proposed facility will neither cause nor contribute to a violation of the NAAQS.

Table 2-5 Summary of Florida DEP Air Monitoring Data from Miami-Dade County for 1999

Pollutant	Avg. Period	Site Name	Highest Measured Concentration ($\mu g/m^3$)
PM_{10}	24-hour	325 NW 2nd St.	41
	Annual		21
SO_2	3-hour	US 27 & SR821	24
	24-hour		8
	Annual		3
NO_2	Annual	864 NW 23rd St.	34
	1-hour		216
CO	1-hour	16000 S Dixie Highway	4580
	8-hour		3435

Table 2-6 ISCST3 Modeling Results for Natural Gas

100% Load

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)*	Receptor Location	
			UTM East (m)	UTM North (m)
NO_X	Annual	0.011	549100	2823400
PM-10	24-hour	0.121	571100	2811400
	Annual	0.001	549100	2823400
SO_2	3-hour	0.291	566900	2823300
	24-hour	0.069	571100	2811400
	Annual	0.001	549100	2823400
CO	1-hour	2.500	564975	2823305
	8-hour	0.538	575100	2807400

* Annual concentrations based on a maximum of 1300 hours/year of natural gas use.

75% Load

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)*	Receptor Location	
			UTM East (m)	UTM North (m)
NO_X	Annual	0.012	551100	2823400
PM-10	24-hour	0.506	564975	2823305
	Annual	0.002	551100	2823400
SO_2	3-hour	0.565	564975	2823305
	24-hour	0.228	564975	2823305
	Annual	0.001	551100	2823400
CO	1-hour	8.525	564975	2823305
	8-hour	2.235	564975	2823305

* Annual concentrations based on a maximum of 1300 hours/year of natural gas use.

Table 2-7 ISCST3 Modeling Results for Distillate Oil

100% Load

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)*	Receptor Location	
			UTM East (m)	UTM North (m)
NO_X	Annual	0.013	551100	2823400
PM-10	24-hour	0.281	564975	2823304.5
	Annual	0.002	551100	2823400
SO_2	3-hour	2.066	566800	2823300
	24-hour	0.549	564975	2823304.5
	Annual	0.004	551100	2823400
CO	1-hour	15.904	564975	2823304.5
	8-hour	3.909	564975	2823304.5
Lead	24-hour	1.41E-04	564975	2823304.5

* Annual concentrations based on a maximum of 900 hours/year of oil use.

75% Load

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)*	Receptor Location	
			UTM East (m)	UTM North (m)
NO_X	Annual	0.014	553100	2823400
PM-10	24-hour	1.457	564975	2823304.5
	Annual	0.002	553100	2823400
SO_2	3-hour	5.819	564975	2823304.5
	24-hour	2.295	564975	2823304.5
	Annual	0.004	553100	2823400
CO	1-hour	35.214	564975	2823304.5
	8-hour	9.577	564975	2823304.5
Lead	24-hour	7.29E-04	564975	2823304.5

* Annual concentrations based on a maximum of 900 hours/year of oil use.

Table 2-8 Summary of SDEC Dispersion Modeling Results

Pollutant	Avg Period	Peak Impact of SDEC ($\mu g/m^3$)	SDEC Impact at Biscayne National Park ($\mu g/m^3$)	EPA Sign. Impact Level ($\mu g/m^3$)	Baseline Conc.[1] ($\mu g/m^3$)	Sum of Peak SDEC Impact and Baseline ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	Annual	0.014	0.011	1	34	34	100
PM_{10}	24 hr	1.457	0.306	5	41	42	150
	Annual	0.0024	0.0020	1	21	21	50
SO_2	3-hr	5.819	1.613	25	24	27	1300
	24-hr	2.295	0.497	5	8	9	365
	Annual	0.0038	0.0031	1	3	3	80
CO	1-hr	35.214	10.778	2,000	4,580	4,615	40,000
	8-hr	9.577	2.731	500	3,435	3,445	10,000

Note: Maximum short-term (≤ 24-hour average) concentrations based on oil usage. Maximum annual concentrations based on the worst-case annual emissions scenario of 900 hours/yr of oil use for each turbine.

[1] Highest measured concentration in 1999 from FDEP monitoring stations closest to SDEC.

Figure 2-5 Location of SDEC Peak Short-term Impacts

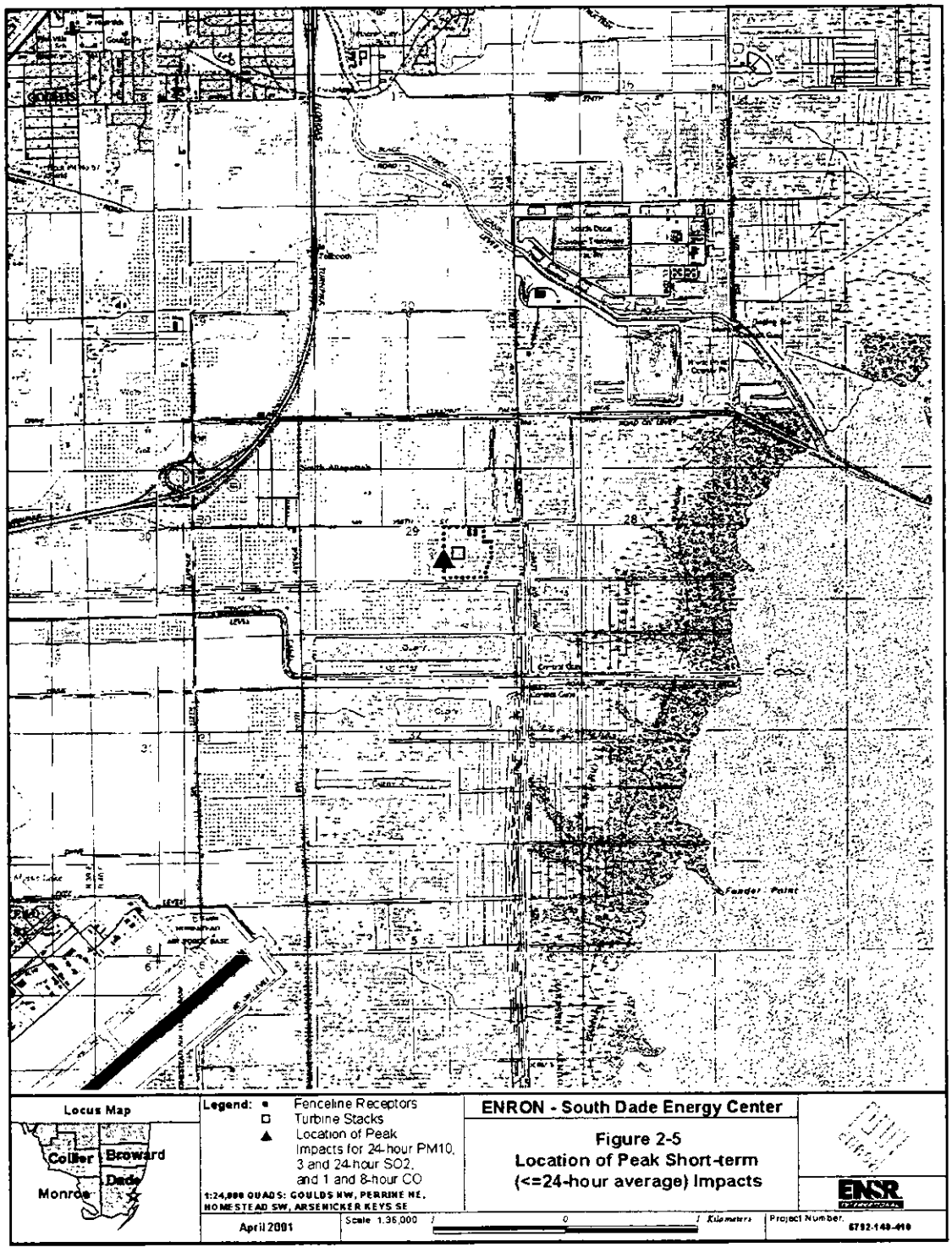


Figure 2-6 Location of SDEC Peak Annual Impacts

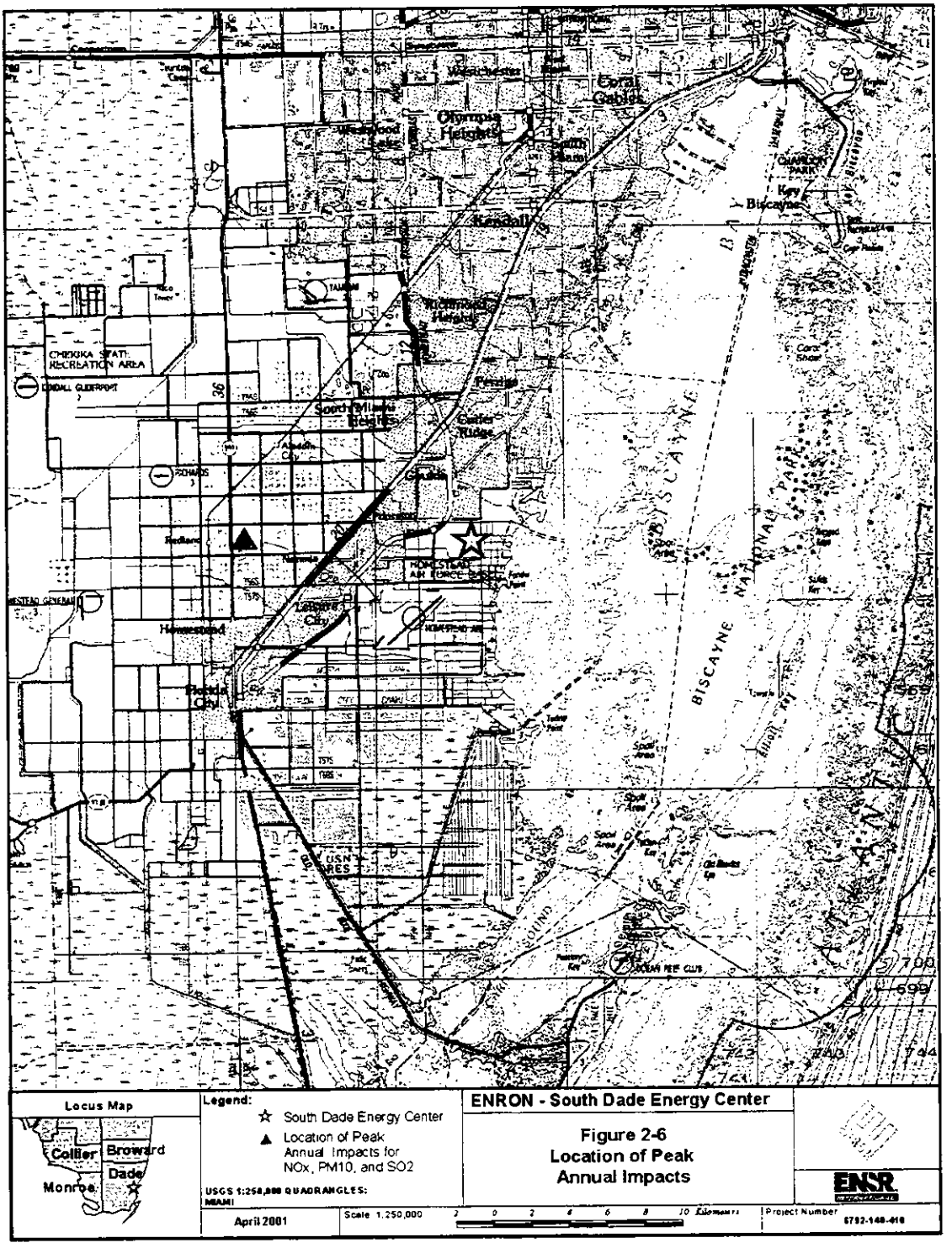


Figure 2-7 Location of SDEC Maximum Impacts at Biscayne National Park

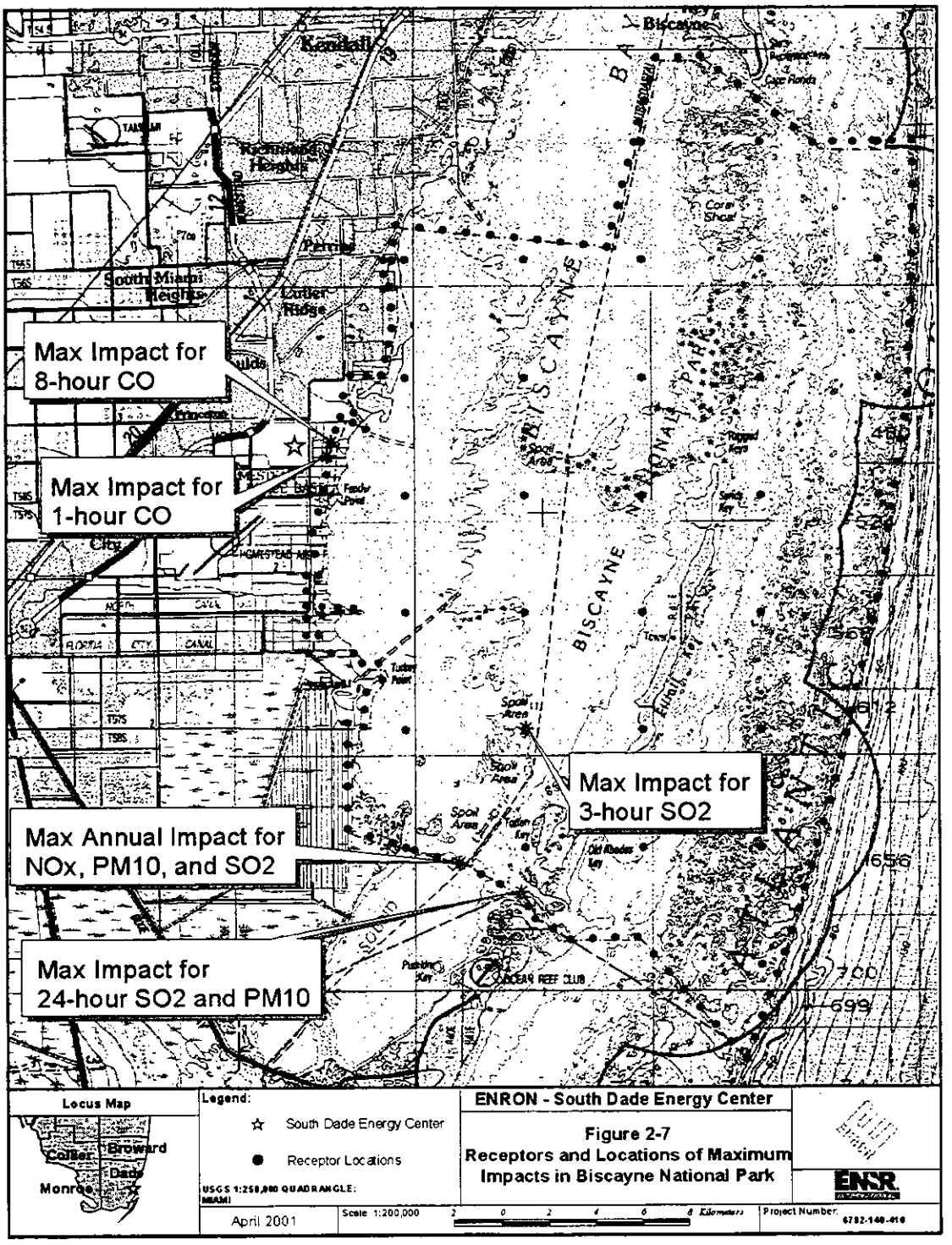


Figure 2-8 Dispersion Modeling Results for South Dade Energy Center (SDEC): 24-hour Average PM_{10} Concentrations

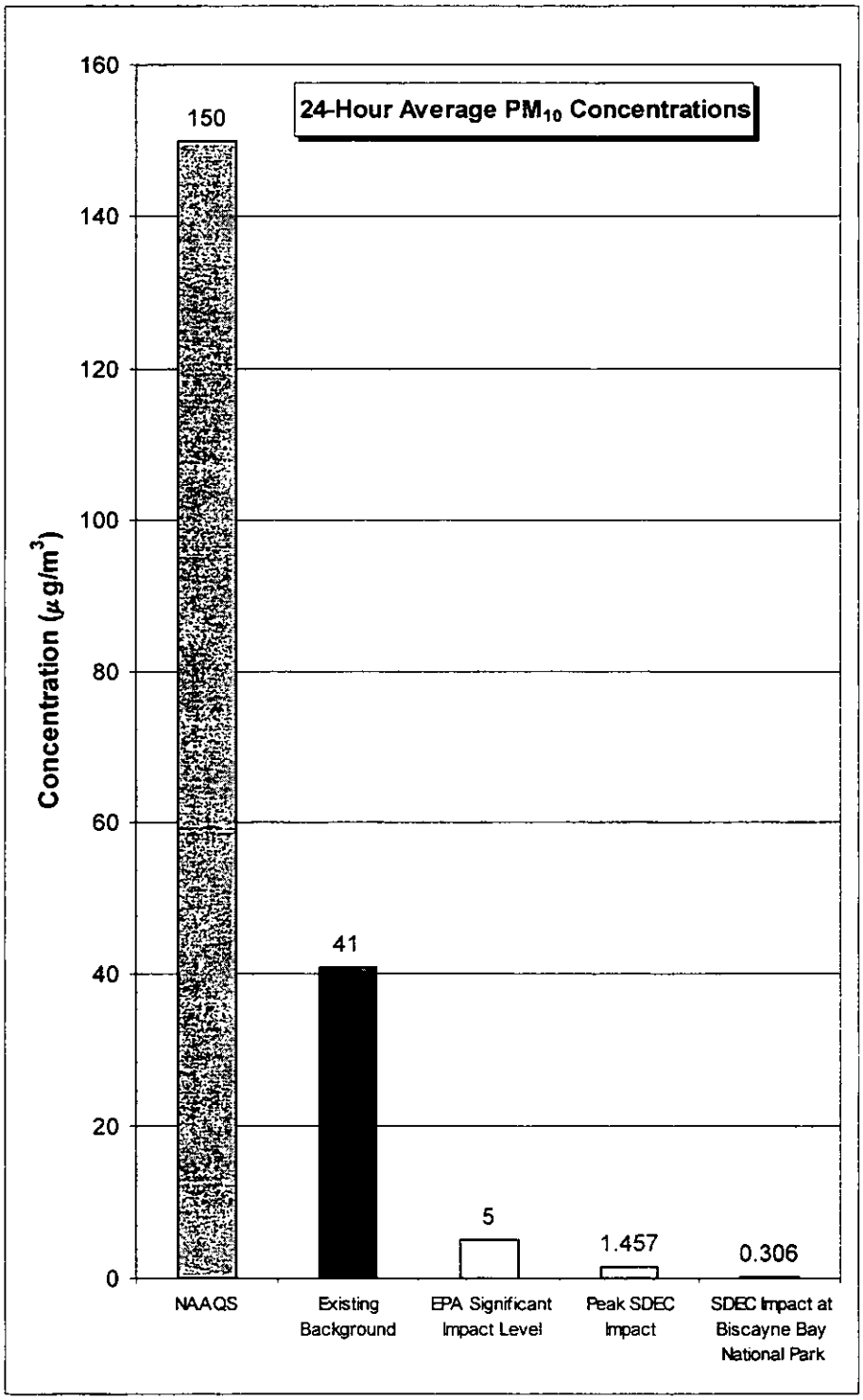


Figure 2-9 Dispersion Modeling Results for South Dade Energy Center (SDEC): Annual Average PM_{10} Concentrations

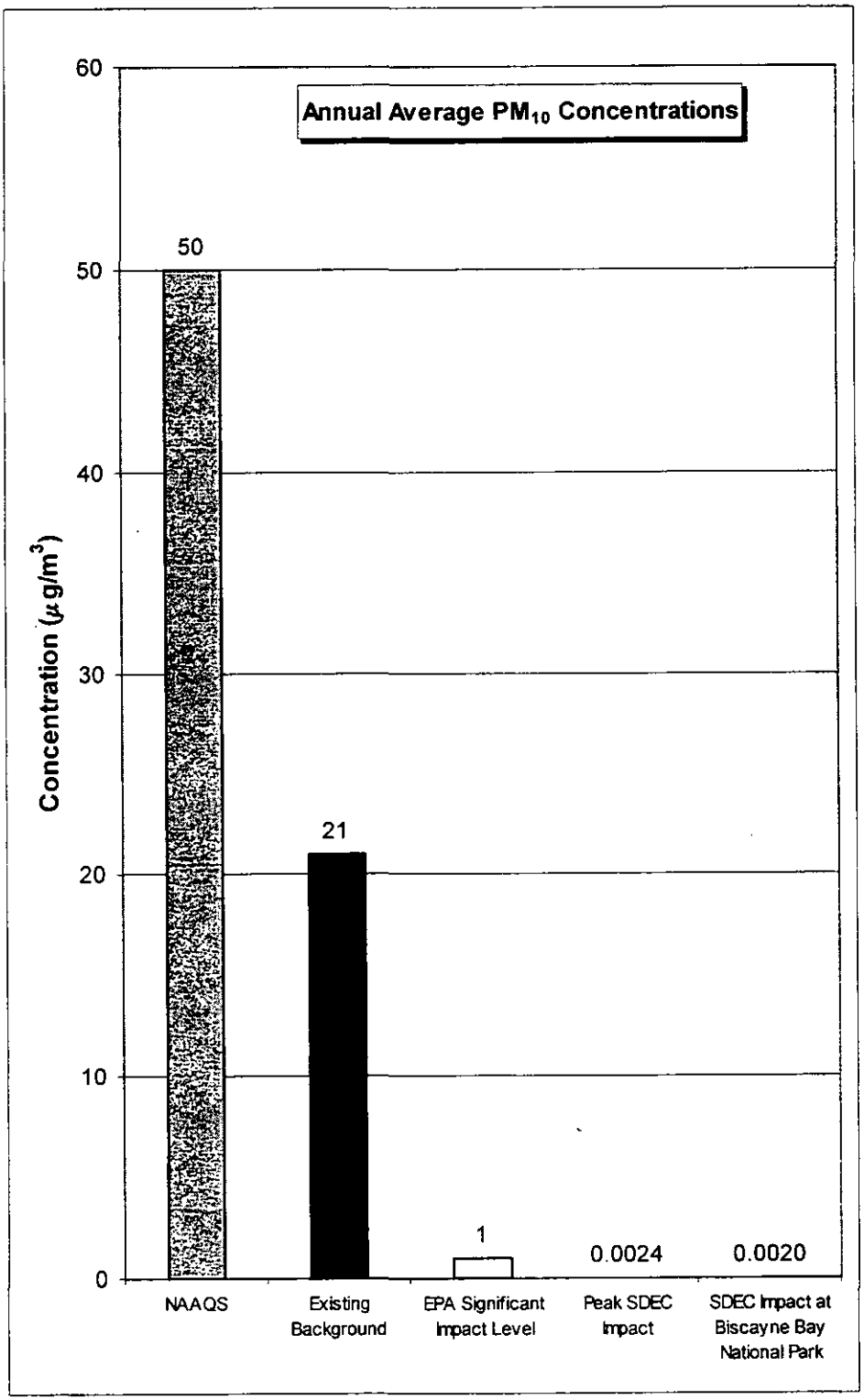


Figure 2-10 Dispersion Modeling Results for South Dade Energy Center (SDEC): 3-hour Average SO_2 Concentrations

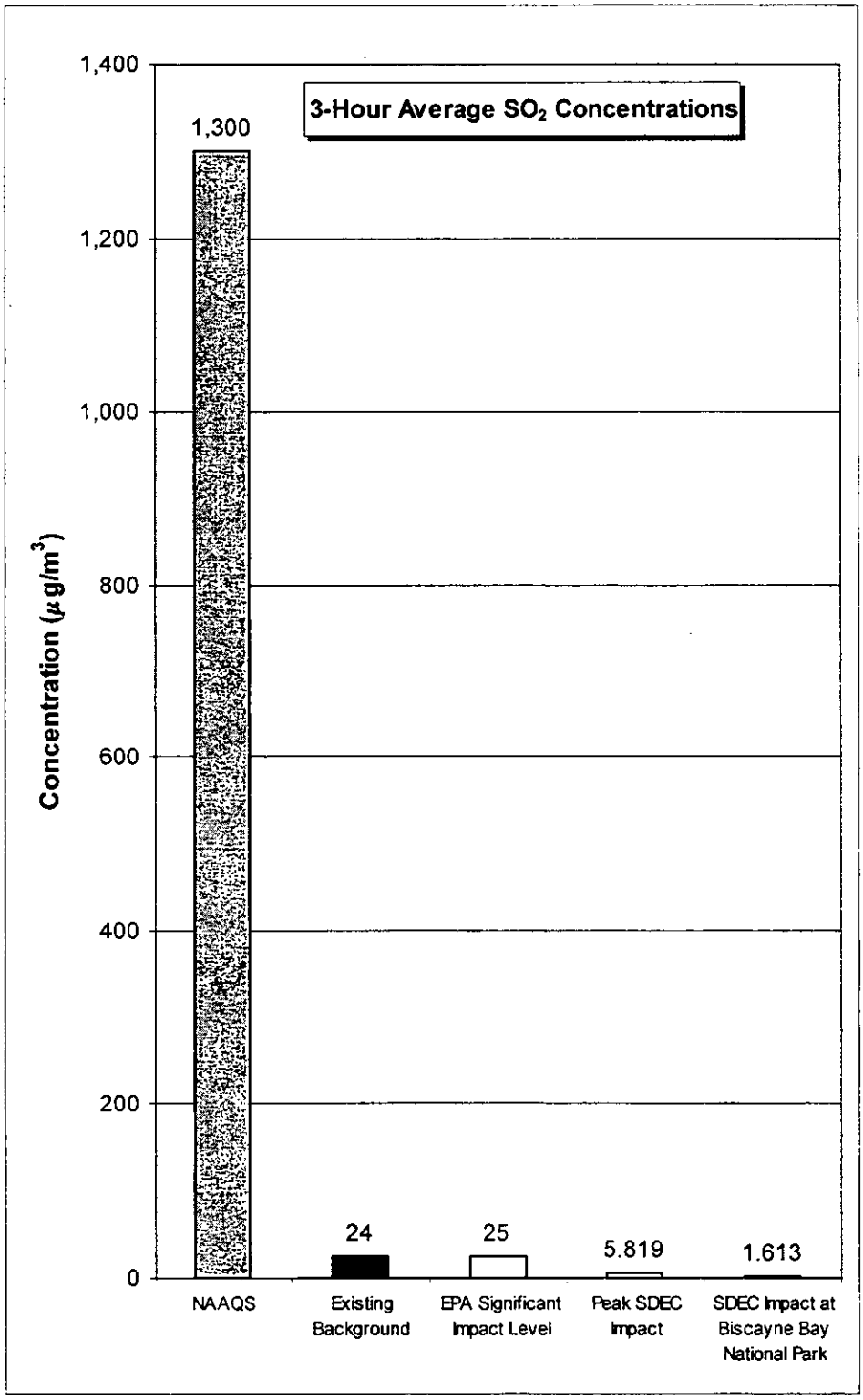


Figure 2-11 Dispersion Modeling Results for South Dade Energy Center (SDEC): 24-hour Average SO_2 Concentrations

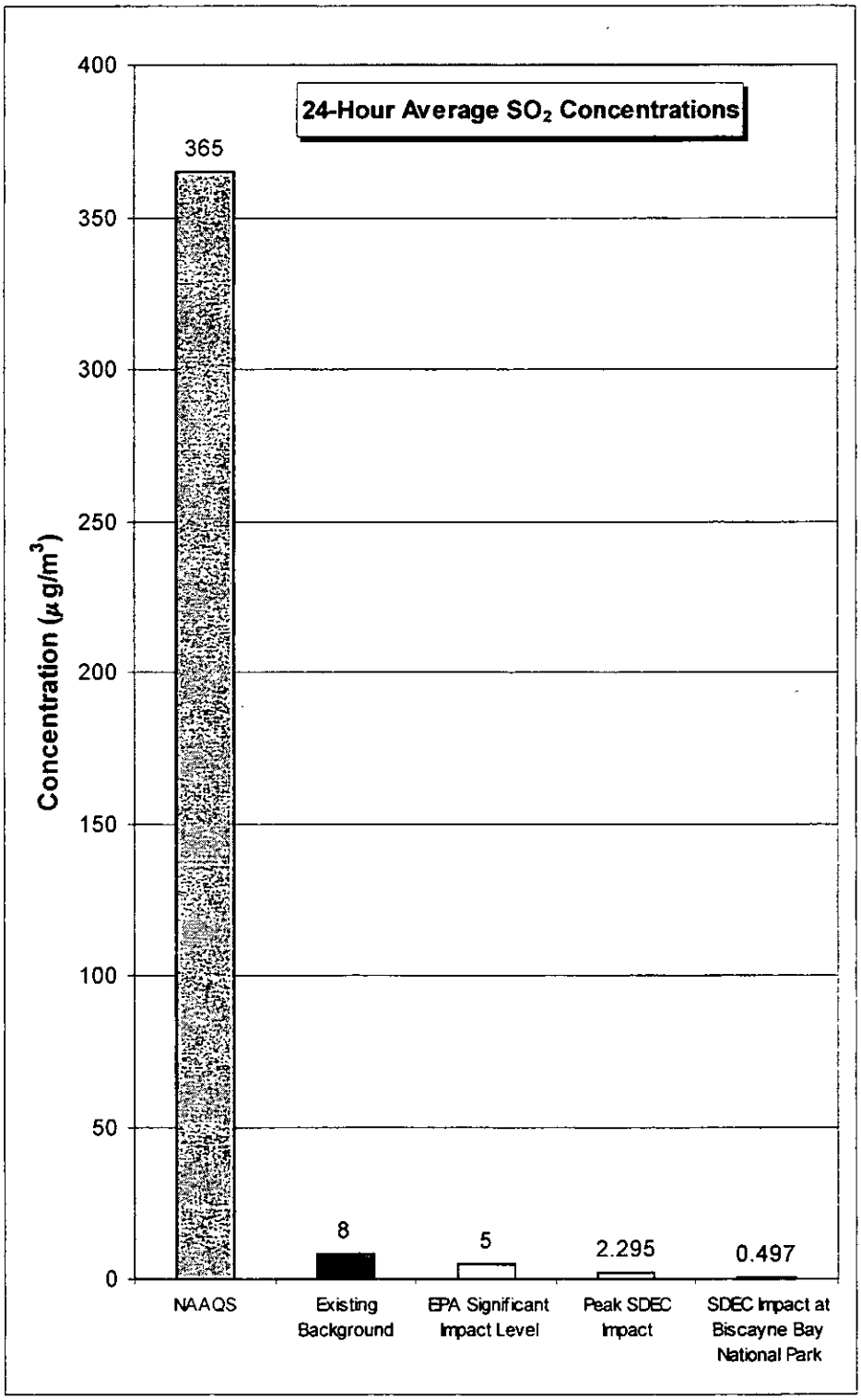


Figure 2-12 Dispersion Modeling Results for South Dade Energy Center (SDEC): Annual Average SO_2 Concentrations

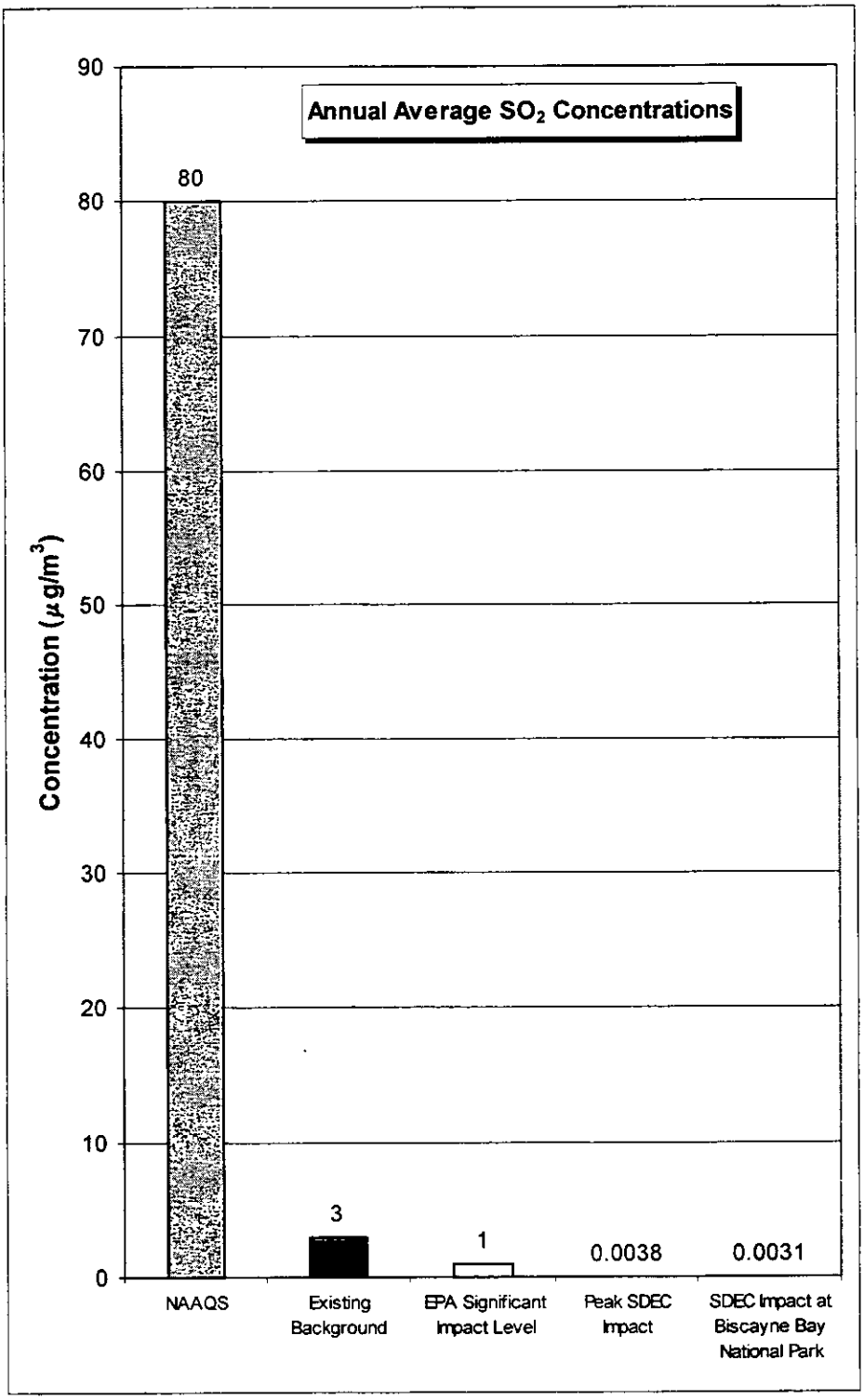


Figure 2-13 Dispersion Modeling Results for South Dade Energy Center (SDEC): Annual Average NO_x Concentrations

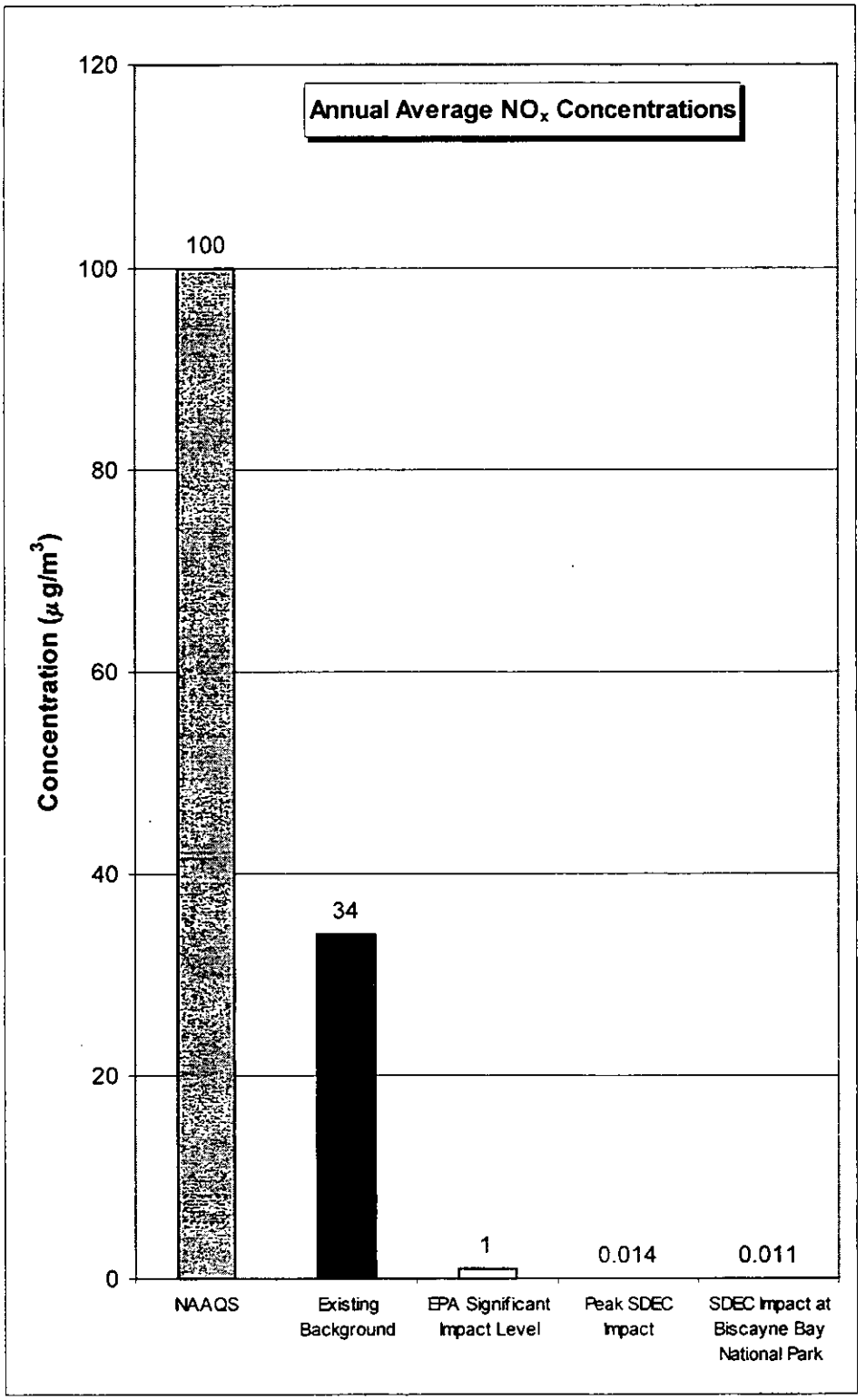


Figure 2-14 Dispersion Modeling Results for South Dade Energy Center (SDEC): 1-hour Average CO Concentrations

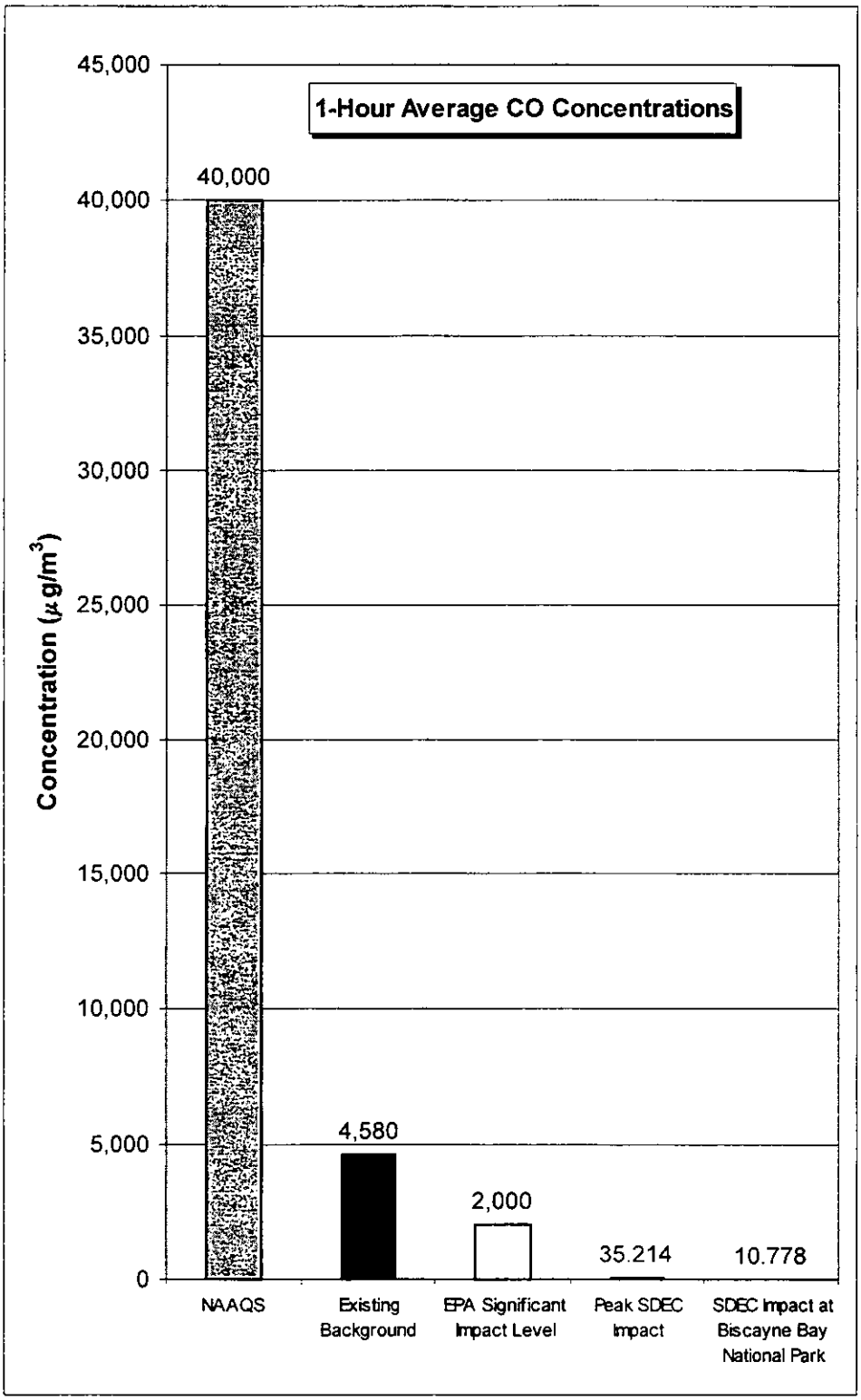
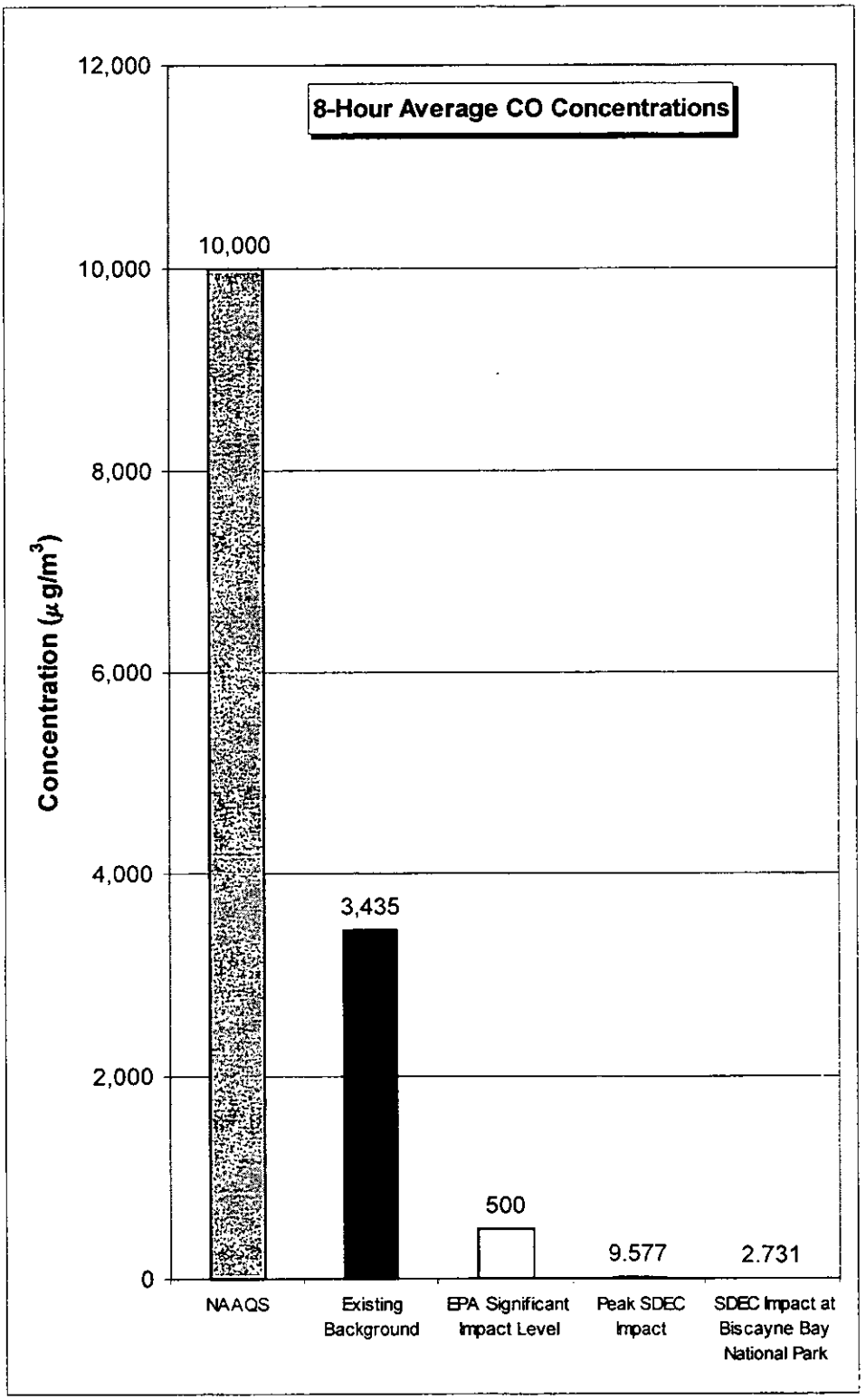


Figure 2-15 Dispersion Modeling Results for South Dade Energy Center (SDEC): 8-hour Average CO Concentrations



3.0 ADDITIONAL IMPACTS

Additional analyses were conducted to assess the potential for adverse air impact to soils and vegetation and to estimate acidic deposition at Biscayne National Park (BNP). The maximum air impacts from the ISCST3 modeling were compared to U.S. EPA recommended criteria for soils and vegetation. The CALPUFF model, recommended by the National Park Service for assessing deposition, was used to compute acidic deposition in the form of sulfur and nitrogen relative to background deposition measurements.

3.1 Soils and Vegetation

The criteria for evaluating impacts on soils and vegetation is taken from U.S. EPA's A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals (U.S. EPA 1980). Table 3-1 lists the U.S. EPA suggested criteria for the gaseous pollutants emitted directly from the proposed facility. The table lists the background concentrations (see Section 2.5), the peak SDEC impacts, the maximum SDEC impacts predicted at BNP, and the sum of the SDEC impacts plus background for comparison to the criteria concentrations. The criteria are established for sensitive vegetation and crops exposed to the effects of the gaseous pollutants through direct exposure. Adverse impacts on soil systems result more readily from the secondary effects of these pollutants' impacts on the stability of the soil system. These impacts could include increased soil temperature and moisture stress and/or increased runoff and erosion resulting from damage to vegetative cover. Thus, the Table 3-1 criteria have been applied to the proposed facility to evaluate impacts on both soils and vegetation. As shown in Table 3-1, the results clearly indicate that no adverse impacts will occur to sensitive vegetation, crops, or soil systems as a result of operation of the proposed facility.

Table 3-1 Comparison to U.S. EPA Criteria for Gaseous Pollutant Impacts on Natural Vegetation and Crops

Pollutant	Averaging Time	Peak SDEC Impact ($\mu g/m^3$)[1]	Max Impact of SDEC at BNP ($\mu g/m^3$)[1]	Background Concentration ($\mu g/m^3$)[2]	Peak SDEC Impact Plus Background ($\mu g/m^3$)	Max Impact of SDEC at BNP Plus Background ($\mu g/m^3$)	Minimum Impact Level for Affects On Sensitive Plants ($\mu g/m^3$)
SO_2	1 hour	13.53	4.14	24	37.5	28.1	917
	3 hours	5.82	1.61	24	29.8	25.6	786
	Annual	0.004	0.003	3	3.0	3.0	18
NO_x	4 hours	20.87	5.81	216	236.9	221.8	3760
	8 hours	13.20	3.76	216	229.2	219.8	3760
	1 month	8.23	1.79	216	224.2	217.8	564
	Annual	0.01	0.01	34	34.0	34.0	94
CO	1 week	5.97	1.30	3,435	3,441	3,436	1,800,000

[1] 24-hour average used to conservatively represent 1-week and 1-month average impacts and 3-hour average used to conservatively represent 4-hour average impact.

[2] Not all averaging periods are available from FDEP monitoring reports. Therefore, the following substitutions were made:

SO_2 – 3-hour value substituted for 1-hour value;

NO_x – 1-hour value substituted for 4-hour and 8-hour values; and

CO – 8-hour value substituted for 1-week value.

3.2 Acid Deposition At Biscayne National Park

Acid deposition was evaluated in the form of total sulfur and nitrogen deposition at BNP. CALPUFF modeling provided upper limit estimates of annual (wet and dry) deposition of sulfur and nitrogen compounds (kg/ha/yr) associated with emissions of SO_2 and NO_x. The CALPUFF modeling was applied with the same meteorological data used in the ISCST3 modeling analysis and was applied in accordance with recent guidance provided by the National Park Service for deposition modeling at the Everglades National Park for another project. The maximum annual sulfur deposition for the BNP receptors was 3.58E-02 kg/ha/yr and the maximum nitrogen deposition was 8.69E-03 kg/ha/yr.

There are no published deposition significance thresholds for BNP. However, the modeled results can be compared to deposition measurements at nearby Everglades National Park (ENP), which is a reasonable representation of the existing deposition of the region including BNP area. Wet deposition measurements at ENP have been taken in 1998 and 1999. Although dry deposition values are currently being taken at ENP, measurements are not yet available. Therefore, consistent with Federal Land Managers Air Quality Related Values Workgroup (FLAG) Phase I guidance, the total existing deposition was estimated by doubling the wet deposition values. Using this convention, the estimated existing annual sulfur deposition at ENP is 8 kg/ha/yr and the existing annual nitrogen deposition is 7 kg/ha/yr. Given that the modeled SDEC deposition rates of sulfur and nitrogen are only about 0.4% and 0.1%, respectively, of existing deposition rates, the deposition impact of the SDEC emissions can

be deemed insignificant. This increase in deposition does not include potential regional emission and deposition benefits that could occur if SDEC displaces emissions from existing fossil generating units.