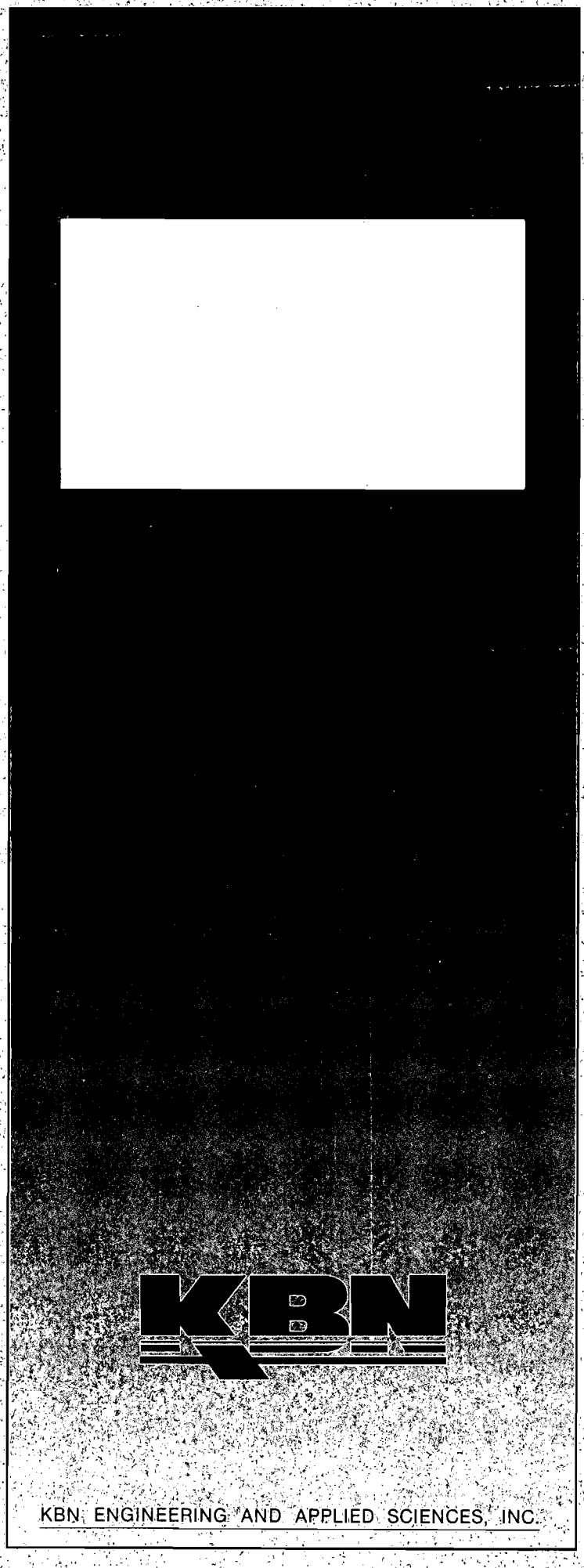
KBN
KBN ENGINEERING AND APPLIED SCIENCES, INC.

PRELIMINARY AIR QUALITY IMPACT ASSESSMENT OF 450 MW OF SIMPLE CYCLE COMBUSTION TURBINES FPC INTERCESSION CITY FACILITY

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

KBN Engineering and Applied Sciences, Inc. (KBN) has been contracted by Florida Power Corporation (FPC) to provide environmental services for evaluating the suitability of locating up to 450 megawatts (MW) of simple cycle combustion turbines (CTs) at the Intercession City facility. Simple cycle CTs have a nominal generating capacity of 75 to 95 MW; therefore, depending on the manufacturer selected, five to six CTs will be needed to generate 450 MW. The preliminary analyses were undertaken to determine compliance with prevention of significant deterioration (PSD) increments and preconstruction de minimis monitoring levels for the proposed plant only.

A full PSD review will be performed at a later date to determine whether significant air quality deterioration will result from the proposed facility and other PSD increment consuming sources and to determine compliance with ambient air quality standards (AAQS). The PSD review will also include control technology review, source impact analysis, air quality analysis (monitoring), and additional impact analyses.

The applicable PSD increments, de minimis monitoring levels, and significance levels are presented in Table 1-1. The PSD increments are specified as certain increases above an air quality baseline concentration that would constitute significant deterioration. If a proposed source's impacts are less than the de minimis monitoring levels, then the preconstruction monitoring requirement does not have to be met. Otherwise, monitoring data collected at or near the project site are required based on the use of existing air quality data or the collection of on-site data. If a proposed source's impacts are less than the significance levels, then the source's impacts are assumed to be insignificant and further impact assessments are not required to demonstrate compliance with ambient standards.

Table 1-1. Allowable PSD Increments, De Minimis Monitoring Levels, and Significance Levels

Pollutant	Averaging Time	PSD Class II Increments ($\mu g/m^3$)	De Minimis Monitoring Levels ($\mu g/m^3$)	Significant Impact Levels ($\mu g/m^3$)
Particulate Matter (TSP)	Annual geometric mean	19	19	1
	24-Hour maximum[a]	37	37	5
Particulate Matter (PM10)	Annual arithmetic mean	17[c]	NA	1
	24-Hour maximum[b]	30[c]	10	5
Sulfur Dioxide	Annual arithmetic mean	20	NA	1
	24-Hour maximum[a]	91	13	5
	3-Hour maximum[a]	512		25
Carbon Monoxide	8-Hour maximum[a]	NA	575	500
	1-Hour maximum[a]	NA	NA	2,000
Nitrogen Dioxide	Annual arithmetic mean	25[d]	14	1
Lead	Calendar quarter	NA	0.1	NA

Note: NA = not applicable, i.e., no standard exists.
PM10 = particulate matter with aerodynamic diameter less than or equal to 10 micrometers (μm).
TSP = total suspended particulate matter.
μg/m3 = micrograms per cubic meter.

[a]Maximum concentration not to be exceeded more than once per year.
[b]Achieved when the expected number of exceedances per year is less than 1.
[c]Proposed PSD increments.
[d]The State of Florida has not yet adopted the PSD increments for NO_2 concentrations.

Source: 40 CFR 52.21.

This report addresses only the proposed project's impact analysis requirement for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM), and lead concentrations within the PSD regulations. These pollutants are critical in evaluating compliance with PSD and AAQS.

The remainder of this report is presented in three sections. The air quality analysis approach is presented in Section 2.0. A description of the proposed project's sources is presented in Section 2.1. This section includes descriptions of the design stack, operating, and emission data for the proposed CTs. The general modeling approach is presented in Section 2.2. The meteorological data and receptor grids are described in Sections 2.3 and 2.4, respectively. The results of the air quality analyses are summarized in Section 3.0. A summary of existing ambient and emission data within 50 km of the site is given in Section 4.0.

Based on the information and model results presented in this report, existing air quality monitoring data are appropriate for use in satisfying the PSD preconstruction monitoring requirements for this project.

2.0 AIR QUALITY ANALYSIS APPROACH

2.1 DESCRIPTION OF PROJECT SOURCES

The design stack, operating, and emission data for the proposed CTs firing fuel oil are provided in Tables 2-1 and 2-2. These data have been developed from manufacturers' data for four types of simple cycle CTs for a range of operating conditions (i.e., 40°F and 95°F) and supplied by FPC. The operating and emission data for oil firing were used to assess impacts because emissions with this fuel were higher than those for natural gas. Because a manufacturer has not been selected, modeling was performed for two of the possible CTs which could potentially produce the highest impacts. Case 2 was selected because it had the lowest flow rate among the CTs under consideration. Case 4 was selected because it had the highest potential emissions among the four cases. For these cases, modeling was performed using the higher emissions at 40°F conditions coupled with the lower gas flow rates at 95°F conditions. These two cases will result in either the lowest plume rise or maximum emissions and, therefore, produce conservative estimates of maximum concentrations. The stack and operating parameters for the two cases modeled are given in Table 2-3.

Building data were also available to assess the potential for building downwash effects to occur. The building data used in the analyses are based on a building height, length, and width of 50, 100, and 52 ft, respectively. The modeling analyses used a building height and maximum projected width of 50 and 113 ft, respectively.

2.2 GENERAL MODELING METHODOLOGY

The modeling approach followed EPA and FDER modeling guidelines (EPA, 1987) for determining compliance with AAQS and PSD increments. In general, when model predictions are used to determine compliance with AAQS and PSD increments, current policies stipulate that the highest annual average and highest, second-highest short-term (i.e., 24 hours or less) concentrations be compared to the applicable standard when 5 years of meteorological data

Table 2-1. Design Information and Stack Parameters for the Simple-Cycle Combustion Turbines at the FPC Intercession City Facility

Data	Case 1		Case 2		Case 3		Case 4	
	No.2 Oil at 40°F	No.2 Oil at 95°F	No.2 Oil at 40°F	No.2 Oil at 95°F	No.2 Oil at 40°F	No.2 Oil at 95°F	No.2 Oil at 40°F	No.2 Oil at 95°F
General:								
Power (kW)	92,488.0	77,986.0	92,067.0	75,761.0	115,940.0	95,191.0	118,018.0	96,085.0
Heat Rate (Btu/kWh)	12,491.0	12,850.0	11,629.0	12,015.0	11,494.0	12,233.0	11,408.0	11,969.0
Heat Input (MMBtu/hr)	1,155.3	1,002.1	1,070.6	910.3	1,332.6	1,164.5	1,346.3	1,150.0
Fuel Oil (lb/hr)	58,439.0	50,714.0	54,183.0	46,065.0	67,439.0	58,931.0	68,132.0	58,200.0
Fuel:								
Heat Content--Oil(HHV)	19,768.8	19,760.2	19,759.8	19,760.5	19,760.3	19,759.9	19,760.9	19,760.2
Percent Sulfur	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CT Exhaust:								
Volume Flow (acfm)	1,699,826	1,510,154	1,525,434	1,385,909	1,857,998	1,737,025	1,881,709	1,716,410
Volume Flow (scfm)	638,342	556,040	564,421	499,836	672,855	614,711	695,758	620,729
Mass Flow (lb/hr)	2,812,602	2,424,000	2,515,022	2,207,000	2,980,386	2,697,000	3,095,915	2,735,000
Temperature (°F)	946	974	967	1,004	998	1,032	968	1,000
Moisture (% vol)	10.22	12.99	7.52	9.69	9.26	11.55	7.97	10.35
Moisture (% mass)	6.5	8.35	4.73	6.15	5.86	7.38	5.02	6.58
Oxygen (% vol)	13.10	12.54	13.39	13.17	12.76	12.55	13.17	12.94
Oxygen (% mass)	14.81	14.33	14.97	14.86	14.35	14.25	14.75	14.63
Molecular Weight	28.3	28	28.62	28.36	28.45	28.18	28.58	28.3
Water Injected (lb/hr)	107,615	96,357	54,183	38,234	86,523	77,671	68,132	58,200
Stack:								
Volume Flow (acfm)	1,699,826	1,510,154	1,525,434	1,385,909	1,857,998	1,737,025	1,881,709	1,716,410
Temperature (°F)	946	974	967	1,004	998	1,032	968	1,000
Diameter (ft)	15.0	15.0	20.9	20.9	18.5	18.5	25.1	25.1
Velocity (ft/sec)	160.3	142.4	74.3	67.5	115.2	107.7	63.5	57.9
Velocity (ft/min)	9619	8546	4460	4052	6912	6462	3809	3475

Note: For Case 2, effective diameter given based on rectangular vent with length and width of 19 and 18 ft, respectively.
For Case 4, effective diameter given based on rectangular vent with length and width of 38 and 13 ft, respectively.

acfm = actual cubic feet per minute.
Btu/kWh = British thermal units per kilowatt hour.
°F = degrees fahrenheit.
ft = feet.
ft/min = feet per minute.
ft/sec = feet per second.
HHV = high heating value.
kW = kilowatt hour.
lb/hr = pounds per hour.
% mass = percent mass.
MMBtu = million British thermal units.
% vol = percent volume.

Table 2-2. Maximum Criteria Pollutant Emissions for One Simple-Cycle CT at the Intercession City Facility

Pollutant	Case 1		Case 2		Case 3		Case 4	
	No.2 Oil at 40°F	No.2 Oil at 95°F	No.2 Oil at 40°F	No.2 Oil at 95°F	No.2 Oil at 40°F	No.2 Oil at 95°F	No.2 Oil at 40°F	No.2 Oil at 95°F
Particulate:								
Basis								
lb/hr	45.5	41.0	42.1	37.0	50.0	45.1	49.1	43.1
TPY	199.4	179.4	184.4	162.2	219.1	197.4	214.9	188.8
Sulfur Dioxide:								
Basis	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur
lb/hr	584.39	507.14	541.83	460.65	674.39	589.31	681.32	582.00
TPY	2,559.6	2,221.3	2,373.2	2,017.6	2,953.8	2,581.2	2,984.2	2,549.2
Nitrogen Oxides:								
Basis	42 ppm[a]	42 ppm[a]	42 ppm[a]	42 ppm[a]	42 ppm[a]	42 ppm[a]	42 ppm[a]	42 ppm[a]
lb/hr	184.4	160.1	170.9	145.4	212.9	186.0	215.0	183.5
TPY	807.7	701.1	748.6	636.8	932.5	814.9	941.6	803.9
ppm	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Carbon Monoxide:								
Basis	30 ppm[b]	30 ppm[b]	30 ppm[b]	30 ppm[b]	30 ppm[b]	30 ppm[b]	30 ppm[b]	30 ppm[b]
lb/hr	75.0	63.3	68.3	59.0	79.8	71.1	83.7	72.8
TPY	328.3	277.1	299.0	258.6	349.7	311.4	366.8	318.8
ppm	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
VOCs:								
Basis	6 ppm[b]	6 ppm[b]	6 ppm[b]	6 ppm[b]	6 ppm[b]	6 ppm[b]	6 ppm[b]	6 ppm[b]
lb/hr	6.42	5.42	5.85	5.06	6.84	6.09	7.18	6.24
TPY	28.1	23.8	25.6	22.2	30.0	26.7	31.4	27.3
ppm	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead:								
Basis	EPA(1988)	EPA(1988)	EPA(1988)	EPA(1988)	EPA(1988)	EPA(1988)	EPA(1988)	EPA(1988)
lb/hr	1.03×10^{-2}	8.92×10^{-3}	9.53×10^{-3}	8.10×10^{-3}	1.19×10^{-2}	1.04×10^{-2}	1.20×10^{-2}	1.02×10^{-2}
TPY	4.50×10^{-2}	3.91×10^{-2}	4.17×10^{-2}	3.55×10^{-2}	5.19×10^{-2}	4.54×10^{-2}	5.25×10^{-2}	4.48×10^{-2}

[a]Corrected to 15 percent O_2 dry conditions.
[b]Corrected to dry conditions.

Note: EPA = U.S. Environmental Protection Agency.
lb/hr = pounds per hour.
ppm = parts per million.
TPY = tons per year.

Table 2-3. Stack, Operating, and Emission Data for the Simple-Cycle CTs Used in the Air Dispersion Modeling

Parameter	Values	
	Case 2	Case 4
Stack Data		
Height, ft	75	75
Diameter, ft	20.87[a]	25.07[b]
Operating Data		
Output (MW) for 1 Unit--		
at 40°F	92.067	118.018
at 95°F	75.761	96.085
Number of Units		
Needed for 450 MW--		
Number at 95°F	6	5
Output (MW)	454.56	480.43
Data for 95°F Conditions--		
Temperature, °F	1,004	1,000
Flow rate, acfm	1,385,909	1,716,410
Velocity, ft/sec	67.5	57.9
Emission Data (40°F Conditions)		
SO_2, total for proposed source, lb/hr	3,251	3,407

[a]Effective diameter based on area of rectangular vent with length and width of 19 and 18 ft, respectively.
[b]Effective diameter based on area of rectangular vent with length and width of 38 and 13 ft, respectively.

Note: acfm = actual cubic feet per minute.
°F = degrees Fahrenheit.
ft = feet.
ft/sec = feet per second.
lb/hr = pounds per hour.
MW = megawatts.

are used. The highest, second-highest concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with the air quality standards, which permit a short-term average concentration to be exceeded once per year at each receptor.

The Industrial Source Complex (ISC) dispersion model (EPA, 1988a) was used as the recommended model to evaluate the pollutant emissions from the proposed plant and existing FPC facilities. EPA regulatory options were used to address maximum impacts. Based on a review of the land use around the site, the rural mode was selected for all analyses based on the limited degree of residential, industrial, and commercial development within 3 km of each site.

2.3 METEOROLOGICAL DATA

Meteorological data used in the ISCST model to determine air quality impacts consisted of a concurrent 5-year period from 1982 through 1986 of hourly surface weather observations and twice-daily upper-air soundings from the National Weather Service (NWS) stations located nearest the site. For this project, surface and upper-air data collected at the NWS stations at Orlando International Airport and Ruskin, respectively, were used. These stations also have the most readily available and complete databases which are considered representative of the plant site. To provide a meteorological database suitable for modeling, these surface and upper-air data were preprocessed by using RAMMET, an EPA UNAMAP meteorological processing program (EPA, 1988b).

2.4 RECEPTOR LOCATIONS

Receptors were located along 36 radials spaced at 10-degree increments outward from the facility, with the proposed CTs at the center of a grid. The receptor locations were selected to include the area of maximum impacts as a result of the proposed sources. Impacts are required to be determined at receptors that are considered representative of ambient air. Ambient air is defined as those areas where the general public has access. In general, EPA and FDER consider areas outside of fenced property as ambient air. In this analysis, receptors were located along each radial at distances ranging from the fenced plant property, which is a minimum of approximately 210 meters (m) in certain directions, and distances of 400, 700, 1,000, 1,500, 2,000, 2,500, and 3,000 m. Receptors on plant property were not considered in the analysis.

3.0 AIR QUALITY MODELING RESULTS

3.1 PROPOSED COMBUSTION TURBINES ONLY

A summary of the maximum SO_2 concentrations due to the proposed simple cycle CTs for the two modeled cases is presented in Table 3-1. The results are summarized from the maximum concentrations predicted using 5 years of meteorological data from the NWS station in Orlando for Cases 2 and 4. A summary of the maximum SO_2, NO_2, CO, PM, and lead concentrations due to the proposed CTs is presented in Table 3-2. These results are based on scaling the maximum SO_2 concentrations given in Table 3-1 by the ratio of pollutant emissions to the modeled SO_2 emissions. Based on these results, the maximum concentrations predicted for the proposed turbines are less than the significance levels for NO_2, CO, and PM and de minimis levels for NO_2, CO, PM, and lead. As such, additional impact analyses are not required to be addressed for these pollutants (i.e., modeling of impacts due to other sources to determine compliance with ambient standards).

For SO_2 concentrations, the proposed turbines' impacts are greater than the significance levels and additional ambient impact analyses would be required. These impact analyses are to determine if the proposed sources' impacts are greater than the de minimis monitoring level, PSD Class II increments, and AAQS. As shown in Table 3-2, the maximum impacts from the proposed turbines are less than the PSD Class II increments and consume approximately 42, 63, and 7.5 percent of the 3-, 24-hour, and annual increments, respectively, for Case 2 and 52, 59, and 7.0 percent of the respective increments for Case 4. For both cases, the proposed sources' impacts are greater than the de minimis monitoring levels which could require that preconstruction monitoring be performed. Under PSD regulations, codified in 40 CFR 52.21(i)(8) and Chapter 17-2.510, F.A.C., up to 1 year of continuous air monitoring could be required. However, ambient air quality data from existing monitoring stations may be acceptable to the FDER in order to satisfy this PSD review requirement. A discussion on the use of existing monitoring data is given in Section 4.0.

Table 3-1. Summary of Maximum SO_2 Impacts Due to the Proposed Simple-Cycle CTs for Two Cases

Averaging Period/ Year	Maximum SO_2 Concentration ($\mu g/m^3$) Case 2[a]	Case 4[b]
3-Hour		
1982	179	171
1983	214	265
1984	178	219
1985	156	162
1986	99	82
24-Hour		
1982	45.2	37.1
1983	57.2	50.8
1984	33.0	40.2
1985	55.4	53.3
1986	12.3	10.3
Annual		
1982	0.93	0.93
1983	1.5	1.4
1984	0.94	0.78
1985	1.2	1.1
1986	0.53	0.25

[a]Based on 6 units with total emissions of 3,251 lb/hr.
[b]Based on 5 units with total emissions of 3,407 lb/hr.

Note: lb/hr = pounds per hour.
$\mu g/m^3$ = micrograms per cubic meter.

Table 3-2. Summary of Maximum Impacts Due to the Proposed FPC Combustion Turbine Units

Pollutant/ Averaging Time	Maximum Predicted Concentration ($\mu g/m^3$) Case 2	Case 4	Air Quality Requirements ($\mu g/m^3$) Significance Level[a]	De minimis Monitoring[b]	PSD Class II Increment
Sulfur Dioxide (SO_2)					
3-Hour	214	265	25	--	512
24-Hour	57.2	53.3	5	13	91
Annual[c]	1.5	1.4	1	--	20
Nitrogen Dioxide (NO_2)					
Annual[c]	0.47	0.44	1	14	25
Carbon Monoxide (CO)					
8-Hour[e]	27.0	32.6	2,000	575	NA
Particulate Matter (PM)					
24-Hour	4.4	3.8	5	10	37(30)[d]
Annual[c]	0.12	0.10	1	--	19(17)[d]
Lead					
Calendar Quarter[f]	0.001	0.0009	NA	0.1	NA

Note: NA = Not applicable.

[a]If impacts for a proposed source are less than the significance levels, further modeling to demonstrate compliance with AAQS and PSD increments is not necessary.
[b]If impacts to a proposed source are less than the de minimis monitoring level, the source is exempted from preconstruction monitoring.
[c]Based on maximum short-term emissions occurring for every hour in the year.
[d]The current PSD increments are established for total suspended particulates (TSP). The proposed increments, in parentheses, are for PM10.
[e]Based on 3-hour concentration from Table 3-1.
[f]Based on 24-hour concentration from Table 3-1.

4.0 EXISTING MONITORING DATA

4.1 METEOROLOGICAL OBSERVATIONS

Surface meteorological data from the NWS station in Orlando were used to address ambient impacts from the proposed sources. This station is located approximately 30 km to the northeast of the project site. The meteorological data collected at this site are considered to be representative of the project site's meteorological conditions. The annual and seasonal wind frequency distributions from the NWS station in Orlando from 1982 through 1986 are shown in Figures 4-1 and 4-2, respectively.

4.2 AMBIENT MONITORING DATA

There are currently three monitoring stations that collect SO_2 concentrations and are within 50 km of the project site. The monitoring stations and their locations relative to the project site are identified in Table 4-1. A summary of the SO_2 concentrations measured at these stations is given in Table 4-2. For all these monitoring stations, the ambient concentrations are well below the AAQS. It should be noted that two stations in Orange County may not meet all quality assurance standards and, therefore, may not be acceptable for meeting PSD preconstruction monitoring requirements. The nearest monitoring station to the project site with more than 80 percent data capture over the past four years is located in Winter Park and is approximately 40.8 km from the site. From 1986 through 1989, the site has collected more than 85 percent of available data and meets quality assurance standards. Because of its location relative to the project site, the monitoring data collected at this site are proposed for use to satisfy the PSD preconstruction monitoring requirements.

4.3 EXISTING SO_2 EMISSION SOURCES

A summary of SO_2 emission sources within 50 km of the project site is given in Table 4-3. As shown, the site is located in an area that has only several sources with emissions greater than 1,000 TPY. The emissions from

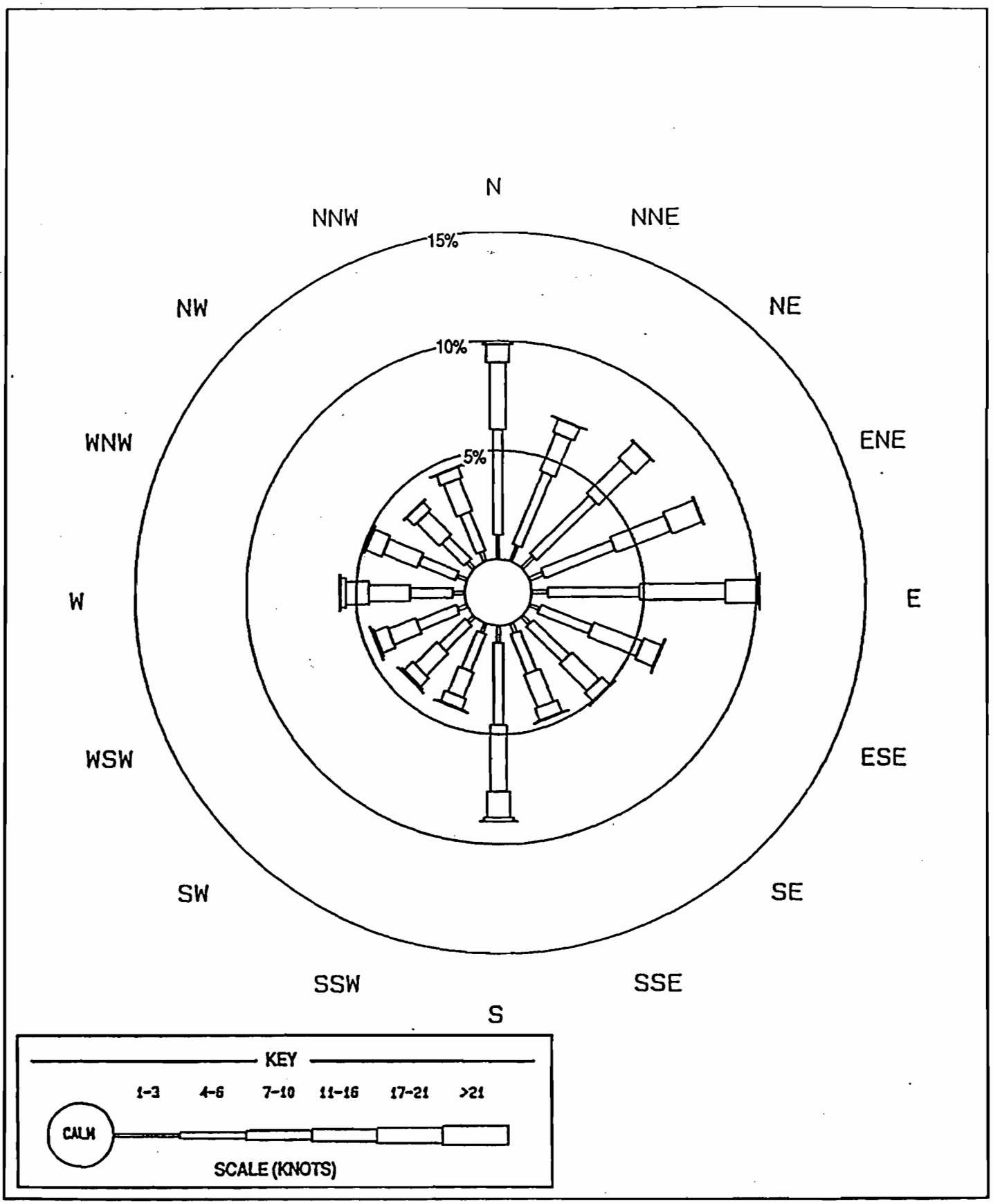

Figure 4-1 ANNUAL AVERAGE WIND FREQUENCY DISTRIBUTION (1982-1986) MEASURED AT THE NATIONAL WEATHER SERVICE STATION AT THE ORLANDO INTERNATIONAL AIRPORT

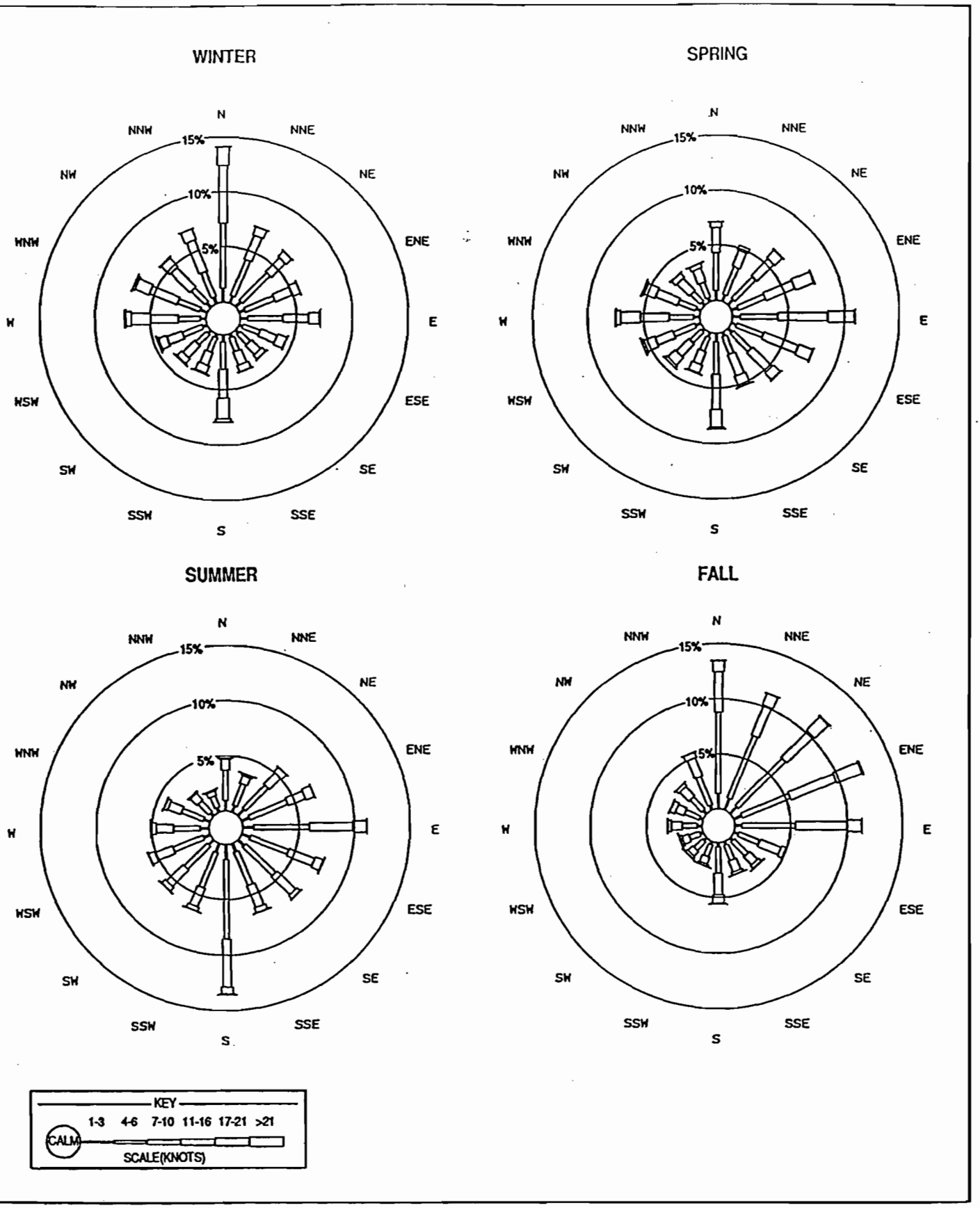

Figure 4-2 SEASONAL AVERAGE WIND FREQUENCY DISTRIBUTION (1982-1986) MEASURED AT THE NATIONAL WEATHER SERVICE STATION AT THE ORLANDO INTERNATIONAL AIRPORT

these sources are expected to be measured at the monitoring site in Winter Park.

4.4 RECOMMENDATION

Based on the available monitoring data collected near the project site and the lack of emission sources within 5 km of the site, it is recommended that the existing monitoring data can be used to satisfy the preconstruction monitoring requirements under PSD regulations. The existing air quality data show that the ambient measurements are well below the AAQS.

Table 4-1. Summary of SO_2 Monitoring Sites in the Vicinity of the FPC Intercession City Facility

Site No.	County	Address	UTM Coordinates (km) East	UTM Coordinates (km) North	Location Relative to the Intercession City Facility: Distance (km)	Location Relative to the Intercession City Facility: Direction (degrees)
4900-002-G	Orange	Lake Isle Estates, Winter Park	464.5	3,162.5	40.8	27
3240-006-J[a]	Orange	12100 Young Pine Road, Orlando	483.8	3,148.7	43.8	59
3240-002-J[a]	Orange	N.E. Corner of Section 13, Orlando	484.0	3,152.0	45.8	55
2160-001-F	Polk	Lakeland Public Works, Lakeland	407.5	3,107.5	43.0	245
2160-004-F	Polk	3333 Tenoroc Mine Road, Lakeland	412.75	3,108.5	37.8	242

[a]May not meet all quality assurance standards.
[b]FPC Intercession City facility's East and North VTM coordinates are 446.3 and 3,126 km, respectively.

Table 4-2. Summary of Monitoring Data in the Vicinity of the FPC Intercession City Facility

Site No.	County	Monitoring Objective	Spatial Scale	Year	Observations		Concentration ($\mu g/m^3$)				
							3-Hour Average		24-Hour Average		
					Number	% Capture	Highest	Second Highest	Highest	Second Highest	Annual Average
4900-002-G	Orange	High Conc.	Neighborhood	1986	7,816	89.2	71	61	35	26	4
				1987	7,496	85.6	68	44	26	23	5
				1988	8,600	98.2	66	58	30	26	6
				1989	8,571	97.8	55	42	19	19	8
3240-006-J[f]	Orange	–	–	1986[d]	6,796	92.5	37	37	20	17	13
				1987	6,345	72.4	58	55	21	20	13
				1988[b]	6,382	97.4	51	41	22	21	13
3240-002-J[f]	Orange	–	–	1986[c]	2,145	97.1	87	80	39	25	14
				1987	6,321	72.2	45	37	37	37	14
				1988[b]	6,408	97.8	207	135	54	31	13
2160-001-F	Polk	–	–	1986	6,520	74.4	267	178	81	71	13
				1987	8,444	96.4	200	162	86	55	10
				1988	8,646	98.4	176	154	55	53	11
				1989[e]	1,465	67.8	109	101	46	37	10
2160-004-F	Polk	–	–	1986	–	–	–	–	–	–	–
		–	–	1987	–	–	–	–	–	–	–
		–	–	1988	–	–	–	–	–	–	–
				1989[d]	5,835	79.5	147	114	33	29	5

[a]Only January data available.
[b]Only January - September data available.
[c]Only October - December data available.
[d]Only March - December data available.
[e]Only January-March data available.
[f]May not meet all quality assurance standards.

Note: -- =
$\mu g/m^3$ = micrograms per cubic meter.

Table 4-3. Inventory of SO_2 Emitting Facilities (>25 TPY) Within 50 km of FPC Intercession City

APIS Number	Facility	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Location (km)[a] To FPC Intecession City X	Relative Location (km)[a] To FPC Intecession City Y	Distance From FPC -IC (km)	Direction From FPC -IC (degree)	Maximum SO_2[b] Emissions (TPY)
0 - 10 km								
30ORL490014	FPC Intercession City	446.3	3126.0	0.0	0.0	0.0	0	4,374
10 - 20 km								
30ORG480109	Reedy Creek Energy Services	442.0	3139.0	-4.3	13.0	13.7	80	
30ORL490001	Kissimee Electric Utilities	460.1	3129.3	13.8	3.3	14.2	77	1,738
30ORL480110	Reedy Creek Energy Services	443.1	3144.3	-3.2	18.3	18.6	350	551
20 - 30 km								
30ORG480130	Macasphalt	461.8	3141.9	15.5	15.9	22.2	44	35
30ORG480127	AT&T Information Systems	459.7	3146.6	13.4	20.6	24.6	33	219
30ORL490035	Alad Construction Company	433.0	3152.9	-13.3	26.9	30.0	334	249
30 - 40 km								
30ORG350009	Sloan Construction	431.6	3152.6	-14.7	26.6	30.4	331	112
30ORG480138	AT&T Technologies, Inc.	459.3	3153.6	13.0	27.6	30.5	25	64
30ORG480048	American Asphalt Inc.	444.8	3158.2	-1.5	32.2	32.2	357	53
30ORG480097	National Linen Service	462.2	3155.6	15.9	29.6	33.6	28	355
30ORG480053	Winter Garden Citrus	443.8	3159.6	-2.5	33.6	33.7	356	145
30ORG350015	Alad Construction Co.	433.6	3158.3	-12.7	32.3	34.7	339	249
30ORL350050	Sloan Construction	432.7	3159.6	-13.6	33.6	36.2	338	96
30ORG480063	Florida Hospital	463.8	3160.7	17.5	34.7	38.9	27	36
40TPA530002	Citrus World	441.0	3087.3	-5.3	-38.7	39.1	188	597
40 - 50 km								
40TPA530001	Alcoma Packing	451.6	3085.5	5.3	-40.5	40.8	173	327
40TPA530167	Tricil Recovery Services	422.7	3091.9	-23.6	-34.1	41.5	215	240
30ORG480088	Ralston Purina Co.	451.1	3167.7	4.8	41.7	42.0	7	54
40TPA530004	Lakeland City Power	409.2	3106.2	-37.1	-19.8	42.1	242	30,176
30ORG480156	Rogers Group, Inc.	455.8	3167.1	9.5	41.1	42.2	13	164
40TPA530003	Lakeland City Power	409.0	3106.2	-37.3	-19.8	42.2	242	4,014
30ORG480014	FPC-Rio Pinar	475.2	3156.8	28.9	30.8	42.2	43	1,092
30ORG480137	OUC-Stanton Energy Center	483.5	3150.6	37.2	24.6	44.6	57	41,304
30ORL350001	B.W. Canning Company	416.2	3159.6	-30.1	33.6	45.1	318	117

[a]The UTM coordinates of FPC Intercession City are 446.3 km east and 3126.0 km north.
[b]Based on APIS data, permit information, operating reports, or previous modeling analysis.

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