FPL

ORIGINAL

P.O. Box 029100, Miami, FL 33102-9100

April 3, 2000

Ms. Blanca S. Bayo
Florida Public Service Commission
Director, Division of Records and Reporting
2540 Shumard Oak Blvd.
Tallahassee, Florida 32399-0850

VIA HAND DELIVERY

Dear Ms. Bayo:

In accordance with Chapter 186, Section 186.801 (Ten Year Power Plant Site Plans) of the Florida Statutes, enclosed for filing are twenty-five (25) copies of Florida Power & Light Company's Ten-Year Power Plant Site Plan.

If you have any questions, please do not hesitate to contact me at (305) 552-4334 or Starr Adams at (305) 552-3448.

Sincerely,

Terry Keith

Terry Keith
Regulatory Affairs

TK/spa

Enclosures

AFA
APP
CAF
CMU
CTR
EAG Staff
LEG
MAS
OPC
RRR
SEC 1
WAW
OTH

DOCUMENT NUMBER-DATE
04124 APR-4 8
FPSC-RECORDS/REPORTING

Ten Year Power Plant Site Plan

2000 - 2009

ORIGINAL

FPL

FPL

Ten Year Power Plant Site Plan

2000-2009

Submitted To:

Florida Public
Service Commission

Miami, Florida
April, 2000

Table of Contents

List of Figures and Tables

List of Schedules

(This page is intentionally left blank)

Overview of The Document

Chapter 186 of the Florida Statutes requires that each electric utility in the State of Florida with a minimum existing generating capacity of 250 megawatts (MW) must annually submit a ten - year power plant site plan. This plan includes an estimate of the utility's electric power generating needs, a projection of how those needs will be met, and a disclosure of information pertaining to the utility's preferred and potential power plan sites. This information is compiled and presented in accordance with rules 25-22.070, 25-22.071, and 25-22.072 of the Florida Administrative Code (FAC).

This ten-year power plant site plan document is based on Florida Power & Light Company's (FPL) 1999 planning analyses and the forecasted information presented in this plan addresses the 2000 – 2009 time frame.

It should be recognized by all concerned that ten - year power plant site plans are long-term planning documents and should be viewed in this context. A ten - year power plant site plan submitted by an electric utility contains tentative information, especially for the latter years of the ten - year time horizon, and is subject to change at the discretion of the utility. Much of the data submitted is preliminary in nature and is presented in a general manner. Specific and detailed data will be submitted as part of the Florida site certification process, or through other proceedings and filings, which have been established for the review of such data.

This document is organized in the following manner:

Chapter I – Description of Existing Resources
This chapter provides an overview of FPL's current generating facilities. Also included is data on other FPL resources including its transmission system.

Chapter II – Forecast of Electric Power Demand
FPL's load forecasting methodology and its forecast of seasonal peaks and annual energy usage are presented in Chapter II.

Chapter III – Projection of Incremental Resource Additions
This chapter discusses FPL's integrated resource planning (IRP) process and outlines FPL's projected resource additions, especially new power plants, as determined in FPL's 1999 IRP work.

Chapter IV – Environmental and Land Use Information

This chapter discusses various environmental information as well as preferred and potential site locations for additional electric generation facilities.

Chapter V – Other Planning Assumptions and Information

This chapter address 12 “discussion items” which pertain to additional specific information which is to be included in a ten-year power plant site plan filing.

FPL
List of Abbreviations
Used in FPL Forms

Reference	*Abbreviation*	*Definition*
Unit Type	IC	Internal Combustion
	NP	Nuclear Power
	ST	Steam Unit
	GT	Gas Turbine
	CT	Combustion Turbine
	CC	Combined Cycle
	BIT	Bituminous Coal
Fuel Type	UR	Uranium
	NG	Natural Gas
	FO6	#4,#5,#6 Oil (Heavy)
	FO2	#1, #2 or Kerosene Oil (Distillate)
	BIT	Bituminous Coal
	NO	None
Fuel Transportation	TK	Truck
	RR	Railroad
	PL	Pipeline
	WA	Water
	No	None
Air Pollution Control	LNB	Low No_x Burners
Cooling Method Type	OTS	Once Through - Saline
	CP	Cooling Pond
Unit/Site Status	P	Planned Unit
	A	Generation Unit Capability Increased (Rerated or Relicensed)

(This page is left intentionally blank)

Executive Summary

Florida Power & Light Company's (FPL) 2000 Ten - Year Power Plant Site Plan primarily addresses FPL's plans to increase its electric generation capability as part of its efforts to meet its projected incremental resource needs for the 2000 – 2009 time period.

FPL's total generation capability will significantly increase during the 2000 – 2009 time period as is shown in Table ES.1. This table also shows the resulting Summer and Winter reserve margins for FPL over the ten-year time horizon.

Table ES.1 reflects FPL's efforts to repower existing units at its Ft. Myers and Sanford sites, its approved DSM goals, planned changes to existing generation units (due to unit overhauls, etc.); and scheduled changes in the delivered amounts of purchased power. The table also reflects the planned additions of new generating units.

The number of these new generating units that will be added is driven in part by the outcome of the Florida Public Service Commission docket No. 981890-EU. This docket ended with a stipulated agreement that primarily resulted in FPL, along with Tampa Electric Company and Florida Power Corporation, switching from a minimum reserve margin planning criterion of 15% to one of 20% beginning with the Summer of 2004. As a consequence, FPL is now planning to add significantly more new generation capacity than has been shown in its recent Ten-Year Site Plans.

As shown in Table ES.1, FPL plans to add four new combustion turbines (CT's) in the 2001 – 2003 time period. Two new CT's will be installed at FPL's existing Martin plant site in 2001. Another two new CT's will be installed at FPL's existing Ft. Myers plant site in 2003 which will be in addition to the repowering project at the Ft. Myers site.

Also during the 2001 – 2003 time period, FPL will be repowering its two existing steam units at its Ft. Myers site and will be repowering two (unit Nos. 4 & 5) of its existing three steam units at its Sanford site.

In addition, five new combined cycle (CC) units will also be added during the 2006 – 2009 time period. Two CC units will be added at FPL's Martin plant site in 2006. In addition, one new CC unit will be added each year from 2007 through 2009. Sites for these last three CC units have not yet been selected.

These planned increases in electric generation capability will allow FPL to continue to maintain system reliability and integrity at a reasonable cost.

Projected Capacity Changes and Reserve Margins for FPL [1]					
		Net Capacity Changes (MW)		FPL Reserve Margin (%)	
Year		Summer [2]	Winter [3]	Summer	Winter
2000	Changes to existing plants	66	75	15%	19%
2001	Changes to existing plants	20	80	22%	20%
	Ft. Myers Repowering:Initial Phase [4]	894	543		
	Combustion Turbines (2) at Martin	298	---		
2002	Ft. Myers Repowering:Second Phase	35	(5)	21%	18%
	Combustion Turbines (2) at Martin	---	362		
	Sanford Repowering # 5: Initial Phase [5]	---	(394)		
	Sanford Repowering # 5: Second Phase	567	---		
	Sanford Repowering # 4: Initial Phase [5]	(390)	---		
	Changes to existing plants	31	40		
	Changes to existing purchases	(9)	---		
2003	Ft. Myers Repowering:Second Phase	---	531	26%	28%
	Sanford Repowering # 5: Second Phase	---	1065		
	Sanford Repowering # 4: Second Phase	957	671		
	Combustion Turbines (2) Ft. Myers [6]	298	---		
	Changes to existing purchases	---	(9)		
2004	Combustion Turbines (2) Ft. Myers	---	362	24%	28%
2005	Changes to existing purchases	(10)	(10)	22%	25%
2006	Martin Combined Cycle No.5 & 6 [7]	788	---	21%	22%
	Changes to existing purchases	(133)	(133)		
2007	Martin Combined Cycle No.5 & 6 [7]	---	858	21%	24%
	Unsited Combined Cycle #1	394	---		
2008	Unsited Combined Cycle #2	394	---	21%	24%
	Unsited Combined Cycle #1	---	429		
2009	Unsited Combined Cycle #3	394	---	21%	24%
	Unsited Combined Cycle #2	---	429		
	Changes to existing purchases	(51)	---		
	TOTALS=	**4,543**	**4,894**		

Note:

(1) Additional information about these capacity changes and resulting reserve margins is found in Chapter III of this document.

(2) Summer values are values for August of year shown.

(3) Winter values are values for January of year shown.

(4) The initial phase of the Ft. Myers repowering project consists of the introduction of combustion turbines followed by taking existing steam units out-of-service. The second phase of repowering consists of completing the integration of the combustion turbines, heat recovery steam generators and exisiting steam turbines.

(5) The initial phase of the Sanford repowering project consists solely of taking existing steam units out-of-service; combustion turbine operation is not introduced at this time. The second phase of the repowering consists of integrating the combustion turbines, heat recovery steam generators and existing steam turbines.

(6) The two CT's at Ft. Myers are scheduled to be in-service in the Spring of 2003. Therefore, the CTs are included in the 2003 Summer reserve margin calculation and are included in the 2004 - on reserve margin calculations for Summer and Winter.

(7) All combined cycle units are scheduled to be in-service in June of the year shown. Consequently, they are included in the Summer reserve margin calculation for the in-service year and in both the Summer and Winter reserve margin calculations for subsequent years.

Table ES.1

(This page is left intentionally blank)

CHAPTER I

Description of Existing Resources

(This page is left intentionally blank.)

I. Description of Existing Resources

FPL's service area contains approximately 27,650 square miles and has a population of approximately 7 million people. FPL served an average of 3,680,470 customer accounts in thirty-five counties during 1999. These customers were served from a variety of resources including: FPL-owned fossil and nuclear generating units, non-utility-owned generation, demand side management, and interchange/purchased power.

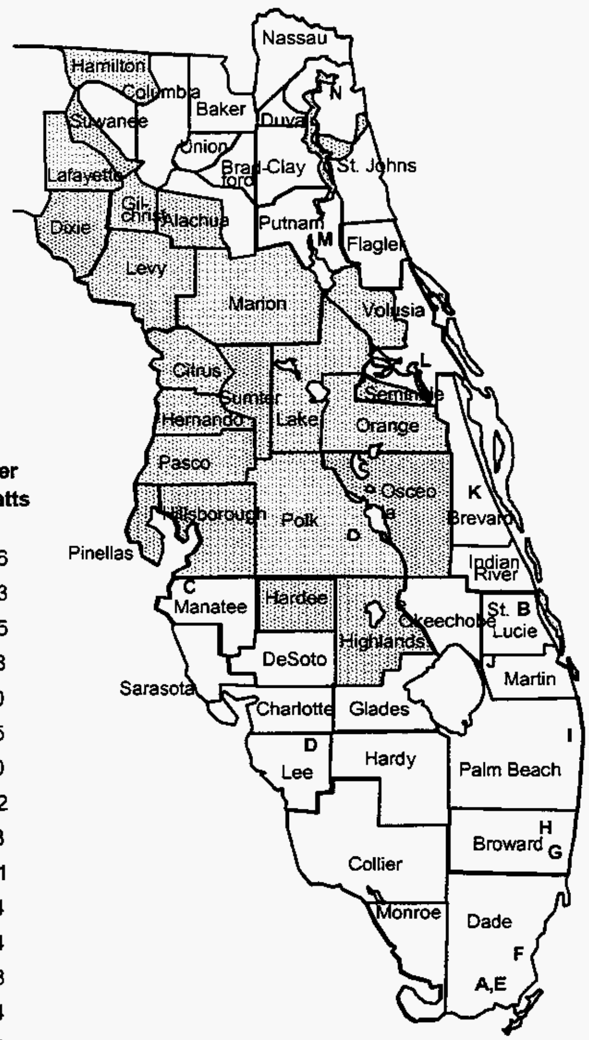
I.A. FPL-Owned Resources

The existing FPL generating resources are located at fourteen generating sites distributed geographically around its service territory and also include partial ownership of one unit located in Georgia and two units located in Jacksonville. The current generating facilities consist of four nuclear steam units, three coal units, six combined cycle units, twenty-one fossil steam units, forty-eight gas turbines, and five diesel units. The location of these units is shown on Figure I.A.1.

The bulk transmission system is composed of 1,107 circuit miles of 500 KV lines (including 75 miles of 500 KV lines [two 37-1/2 mile lines] between Duval Substation and the Florida-Georgia state line, which are jointly owned with Jacksonville Electric Authority) and 2,530 circuit miles of 230 KV lines. The underlying network is composed of 1,602 circuit miles of 138 KV lines, 716 circuit miles of 115 KV lines, and 180 circuit miles of 69 KV transmission lines. Integration of the generation, transmission, and distribution system is achieved through FPL's 487 substations.

The existing FPL system, including generating plants, major transmission stations, and transmission lines, is shown on Figure I.A.2. In addition, Figure I.A.3. shows FPL's interconnection ties with other utilities.

Capacity Resources
(as of December 31, 1999)



Non-FPL Territory

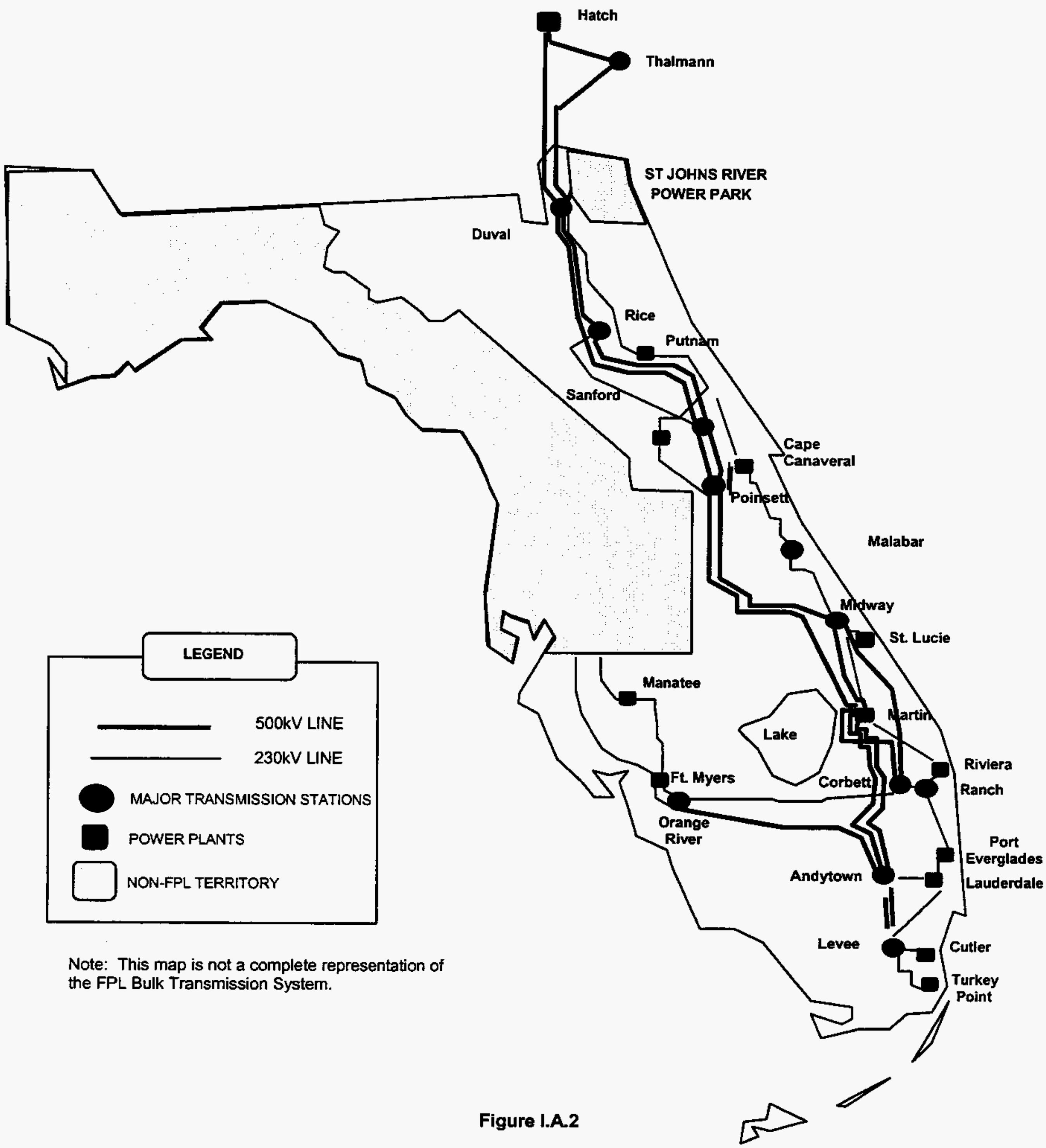
	Unit Name	No. of Units	Fuel Type	Summer Megawatts
A.	Turkey Point	2	Nuclear	1,386
B.	St. Lucie *	2	Nuclear	1,553
C.	Manatee	2	Oil	1,625
D.	Ft. Myers	2	Oil	543
E.	Turkey Point	2	Oil/Gas	810
F.	Cutler	2	Gas	215
G.	Lauderdale	2	Oil/Gas	860
H.	Port Everglades	4	Oil/Gas	1,242
I.	Riviera	2	Oil/Gas	573
J.	Martin	4	Gas/Oil	2,581
K.	Cape Canaveral	2	Oil/Gas	804
L.	Sanford	3	Oil/Gas	934
M.	Putnam	2	Oil/Gas	498
N.	St. Johns River *	2	Coal	254
Scherer **		1	Coal	658
Peaking Units				1,908
FPL Generation				**16,444**

** Represents FPL's ownership share: St. Lucie nuclear: 100% unit 1, 85% unit 2; St. Johns River: 20% of two units.*

*** The Scherer unit is located in Georgia and is not shown on this map.*

Figure I.A.1

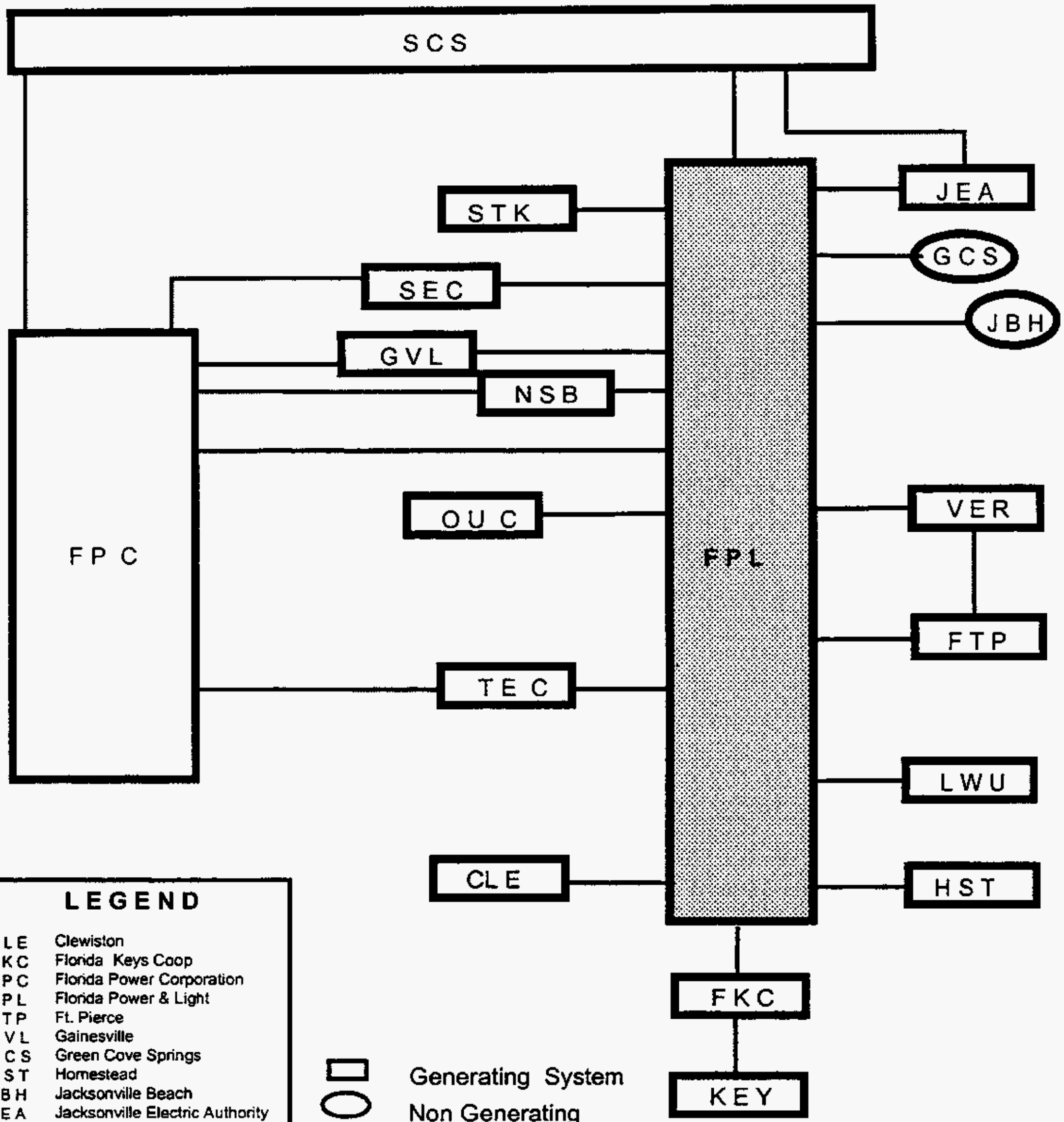
FPL Substation and Transmission System Configuration



Note: This map is not a complete representation of the FPL Bulk Transmission System.

Figure I.A.2

FPL Interconnection Diagram



LEGEND	
C L E	Clewiston
F K C	Florida Keys Coop
F P C	Florida Power Corporation
F P L	Florida Power & Light
F T P	Ft. Pierce
G V L	Gainesville
G C S	Green Cove Springs
H S T	Homestead
J B H	Jacksonville Beach
J E A	Jacksonville Electric Authority
K E Y	Key West
L W U	Lake Worth
N S B	New Smyrna Beach
O U C	Orlando Utilities Commission
S E C	Seminole Electric Cooperative
S C S	Southern Companies
S T K	Starke
T E C	Tampa Electric Company
V E R	Vero Beach

Figure I.A.3

I.B Non-Utility Generation

Non-utility generation is an important part of FPL's resource mix. FPL currently has contracts with ten cogeneration/small power production facilities to purchase firm capacity and energy (two of these contacts are currently in litigation). A listing of these facilities appears in Table I.B.1. In addition, FPL purchases as-available (non-firm) energy from several cogeneration facilities and small power production facilities, as shown in Table I.B.2.

A cogeneration facility is one which simultaneously produces electrical and thermal energy, with the thermal energy (e.g., steam) being used for industrial, commercial, or cooling and heating purposes. A small power production facility is one which does not exceed 80 MW (unless it is exempted from this size limitation by the Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990 and uses as its primary energy source (at least 50%) solar, wind, waste, geothermal, or other renewable resources.

Florida Power & Light Company Firm Capacity and Energy Contracts with Cogeneration/Small Power Production Facilities					
Project	***County***	***Fuel***	***MW Capacity***	***In-Service Date***	***End Date***
Bio-Energy	Broward	Landfill Gas	10.0	5/1/98	1/1/05
Broward South	Broward	Solid Waste	50.6	4/1/91	08/1/09
			1.4	1/1/93	12/31/26
			1.5	1/1/95	12/31/26
			0.6	1/1/97	12/31/26
Broward North	Broward	Solid Waste	45.0	4/1/92	12/31/10
			7.0	1/1/93	12/31/26
			1.5	1/1/95	12/31/26
			2.5	1/1/97	12/31/26
Royster Mulberry	Polk	Waste Heat	8.0	4/1/92	03/31/02
			1.0	12/1/95	03/31/02
Cedar Bay Generating Co.	Duval	Coal (CFB)	250.0	1/25/94	12/31/24
Indiantown Cogen., LP	Martin	Coal (PC)	330.0	12/22/95	12/01/25
Palm Beach SWA	Palm Beach	Solid Waste	43.5	4/1/92	3/31/10
Florida Crushed Stone	Hernando	Coal (PC)	110.0	4/1/92	10/31/05
			11.0	01/01/94	10/31/05
			12.0	01/01/95	10/31/05
Osceola (1)	Palm Beach	Bagasse/Wood	55.9	(3)	(3)
Okeelanta (2)	Palm Beach	Bagasse/Wood	70	(3)	(3)

Notes:

(1) Off-Line since 9/14/97.

(2) Currently selling to FPL on an as-available basis.

(3) FPL has filed suit against the Okeelanta and Osceola Partnerships in Palm Beach County Circuit Court. The lawsuit seeks a declaratory judgment that the Partnerships failed to accomplish commercial operations by January 1, 1997, as required by the power purchase contracts with the Partnerships, and, as a result, FPL is relieved of all further obligations, including capacity payments, under the contracts. In addition, the amount of capacity which the Osceola Partnership has attempted to declare remains subject to dispute.

Table I.B.1

As-Available Energy Purchases From Non-Utility Generators in 1999				
Project	***County***	***Fuel***	***In-Service Date***	***Energy (MWH) Delivered to FPL in 1999***
US Sugar-Bryant	Palm Beach	Bagasse	2/80	6,377
Tropicana	Manatee	Natural Gas	2/90	7,209
Lee County Resource Recovery	Lee	Solid Waste	7/94	217,998
Okeelanta	Palm Beach	Bagasse/Wood	11/95	278,653
Tomaka Farms	Volusia	Landfill Gas	7/98	25,075
Georgia Pacific	Putnam	Paper By-Product	2/94	9,456

Table I.B.2

I.C. Demand Side Management (DSM)

FPL's DSM activities continue what has been FPL's practice since 1978 of encouraging cost-effective conservation and load management. FPL's DSM efforts through 1999 have resulted in a cumulative summer peak reduction of approximately 2,800 megawatts at the generator and an estimated cumulative annual energy saving of 5,040 gigawatt-hours at the generator.

In early 1999, FPL filed with the Florida Public Service Commission FPL's proposed new DSM Goals for the 2000 – 2009 time frame. These DSM goals were subsequently approved by the Commission. FPL's 1999 resource plan, and the schedule for new generation additions presented in this document, are based on these approved DSM levels.

I.D. Purchased Power

Purchased power remains an important part of FPL's resource mix. FPL has a contract to purchase up to 931 MW, with a minimum of 380 MW, of coal-fired generation from the Southern Company. In addition, FPL has contracts with the Jacksonville Electric Authority (JEA) for the purchase of 388 MW of coal-fired generation from the St. John's Power Park Unit Nos. 1 and 2. Table I.D.1 presents the Summer and Winter MW resulting from these purchased power contracts through the year 2009.

	FPL's Purchased Power MW [(1)]					
	UPS		***SJRPP***		***Total***	
	Winter	***Summer***	***Winter***	***Summer***	***Winter***	***Summer***
1999 [(2)]	921	921	388	388	1309	1309
2000	931	931	388	388	1319	1319
2001	931	931	388	388	1319	1319
2002	931	931	388	388	1319	1319
2003	931	931	388	388	1319	1319
2004	931	931	388	388	1319	1319
2005	931	931	388	388	1319	1319
2006	931	931	388	388	1319	1319
2007	931	931	388	388	1319	1319
2008	931	931	388	388	1319	1319
2009	931	931	388	388	1319	1319

Note:

(1) Total reflects total resource entitlements resulting from agreements between FPL, Southern Companies, and JEA.

(2) Values for 1999 are actual

Table I.D.1

Schedule 1
Exisitng Generating Facilties
As of December 31, 1999

(1) Plant Name	(2) Unit No.	(3) Location	(4) Unit Type	(5) Fuel Pri.	(6) Fuel Alt.	(7) Fuel Transport. Pri.	(8) Fuel Transport. Alt.	(9) Alt. Fuel Days Use	(10) Commercial In-Service Month/Year	(11) Expected Retirement Month/Year	(12) Gen.Max. Nameplate KW	(13) Net Capability 1/ Summer MW	(14) Net Capability 1/ Winter MW
Turkey Point		Dade County											
		27/57S/40E									2,338,100	2,208	2,260
	1		ST	FO6	NG	WA	PL	Unknown	Apr-67	Unknown	402,050	410	411
	2		ST	FO6	NG	WA	PL	Unknown	Apr-68	Unknown	402,050	400	403
	3		NP	UR	No	TK	No	Unknown	Nov-72	Unknown	760,000	693	717
	4		NP	UR	No	TK	No	Unknown	Jun-73	Unknown	760,000	693	717
	1-5		IC	FO2	No	TK	No	Unknown	Dec-67	Unknown	14,000	12	12
Cutler		Dade County											
		27/55S/40E									236,500	215	217
	5		ST	NG	No	PL	No	Unknown	Nov-54	Unknown	74,500	71	72
	6		ST	NG	No	PL	No	Unknown	Jul-55	Unknown	162,000	144	145
Lauderdale		Broward County											
		30/50S/42E									1,863,972	1,700	1,968
	4		CC	NG	FO2	PL	PL	Unknown	Oct-57	Unknown	521,250	430	475
	5		CC	NG	FO2	PL	PL	Unknown	Apr-58	Unknown	521,250	430	475
	1-12		GT	NG	FO2	PL	PL	Unknown	Aug-70	Unknown	410,736	420	509
	13-24		GT	NG	FO2	PL	PL	Unknown	Aug-72	Unknown	410,736	420	509
Port Everglades		City of Hollywood											
		23/50S/42E									1,665,086	1,662	1,757
	1		ST	FO6	NG	WA	PL	Unknown	Jun-60	Unknown	225,250	221	222
	2		ST	FO6	NG	WA	PL	Unknown	Apr-61	Unknown	225,000	221	222
	3		ST	FO6	NG	WA	PL	Unknown	Jul-64	Unknown	402,050	390	392
	4		ST	FO6	NG	WA	PL	Unknown	Apr-65	Unknown	402,050	410	412
	1-12		GT	NG	FO2	PL	PL	Unknown	Aug-71	Unknown	410,736	420	509

1/ These ratings are peak capability.

Schedule 1
Exisitng Generating Facilties
As of December 31, 1999

(1) Plant Name	(2) Unit No.	(3) Location	(4) Unit Type	(5) Fuel Pri.	(6) Fuel Alt.	(7) Fuel Transport Pri.	(8) Fuel Transport Alt.	(9) Alt. Fuel Days Use	(10) Commercial In-Service Month/Year	(11) Expected Retirement Month/Year	(12) Gen.Max. Nameplate KW	(13) Net Capability 1/ Summer MW	(14) Net Capability 1/ Winter MW
Riviera		City of Riviera Beach											
		33/42S/43E									620,840	573	575
	3		ST	FO6	NG	WA	PL	Unknown	Jun-62	Unknown	310,420	283	283
	4		ST	FO6	NG	WA	PL	Unknown	Mar-63	Unknown	310,420	290	292
Martin		Martin County											
		29/29S/38E									2,950,000	2,581	2,654
	1		ST	NG	FO6	PL	PL	Unknown	Dec-80	Unknown	863,000	821	833
	2		ST	NG	FO6	PL	PL	Unknown	Jun-81	Unknown	863,000	810	821
	3		CC	NG	FO2	PL	PL	Unknown	Feb-94	Unknown	612,000	475	500
	4		CC	NG	FO2	PL	PL	Unknown	Apr-94	Unknown	612,000	475	500
St. Lucie		St. Lucie County											
		16/36S/41E									1,553,000	1,553	1,579
	1		NP	UR	No	TK	No	Unknown	May-76	Unknown	839,000	839	853
	2	2/	NP	UR	No	TK	No	Unknown	Jun-83	Unknown	714,000	714	726
Cape Canaveral		Brevard County											
		19/24S/36F									804,100	804	810
	1		ST	FO6	NG	WA	PL	Unknown	Apr-65	Unknown	402,050	403	406
	2		ST	FO6	NG	WA	PL	Unknown	May-69	Unknown	402,050	401	404
Sanford		Volusia County											
		16/19S/30E									1,022,450	934	942
	3		ST	FO6	NG	WA	PL	Unknown	May-59	Unknown	150,250	152	154
	4		ST	FO6	NG	WA	PL	Unknown	Jul-72	Unknown	436,100	391	394
	5		ST	FO6	No	WA	No	Unknown	Jul-73	Unknown	436,100	391	394

1/ These ratings are peak capability.

2/ Total capability is 839/853 MW. Capabilities shown represent the company's share of the unit and exclude the Orlando Utilities Commission (OUC) and Florida Municipal Power Agency (FMPA) combined portion of 14.89551%.

Schedule 1
Exisitng Generating Facilties
As of December 31, 1999

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Plant Name	Unit No.	Location	Unit Type	Fuel Pri.	Fuel Alt.	Fuel Transport Pri.	Fuel Transport Alt.	Alt. Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen.Max. Nameplate KW	Net Capability 1/ Summer MW	Net Capability 1/ Winter MW
Putnam		Putnam County 16/10S/27E									580,000	498	594
	1		CC	NG	FO2	PL	WA	Unknown	Apr-78	Unknown	290,000	249	297
	2		CC	NG	FO2	PL	WA	Unknown	Aug-77	Unknown	290,000	249	297
Ft. Myers		Lee County 35/43S/25E									1,302,250	1,179	1,313
	1		ST	FO6	No	WA	No	Unknown	Nov-58	Unknown	156,250	141	142
	2		ST	FO6	No	WA	No	Unknown	Jul-69	Unknown	402,000	402	402
	1-12		GT	FO2	No	WA	No	Unknown	May-74	Unknown	744,000	636	769
Manatee		Manatee County 18/33S/20E									1,726,600	1,625	1,639
	1		ST	FO6	No	WA	No	Unknown	Oct-76	Unknown	863,300	815	822
	2		ST	FO6	No	WA	No	Unknown	Dec-77	Unknown	863,300	810	817
St. Johns River Power Park 2/		Duval County 12/15/28E (RPC4)									250,000	254	260
	1		BIT	BIT	No	RR	No	Unknown	Mar-87	Unknown	125,000	127	130
	2		BIT	BIT	No	RR	No	Unknown	May-88	Unknown	125,000	127	130
Scherer3/		Monroe, GA									891,000	658	666
	4		BIT	BIT	No	RR	No	Unknown	Jul-89	Unknown	891,000	658	666
								Total System as of December 31, 1999 =				**16,444**	**17,234**

1/ These ratings are peak capability.

2/ The net capability ratings represent Florida Power & Light Company's share of St. Johns River Park Unit No 1 and No. 2, excluding Jacksonville Electric Authority (JEA) share of 80%.; SJRPP receives coal by water (WA) in addition to rail.

3/ These ratings represent Florida Power & Light Company's share of Scherer Unit No. 4, adjusted for transmission losses.

(This page is left intentionally blank.)

CHAPTER II

Forecast of Electric Power Demand

(This page is left intentionally blank)

II. Forecast of Electric Power Demand

Long-term (20-year) forecasts of sales, net energy for load (NEL), and peak loads are developed on an annual basis for resource planning work at FPL. These forecasts are a key input to the models used to develop the Integrated Resource Plan. The following pages describe how forecasts are developed for each component of the long-term forecast: sales, NEL, and peak loads.

II.A. Long-Term Sales Forecasts

Long-term forecasts of electricity sales are developed for each revenue class for the forecasting period of 1999 – 2018. The results of these sales forecasts are presented in Schedules 2.1 – 2.3 which appear at the end of this chapter. Both end-use models and econometric techniques are both employed to produce the forecasts. The methodology used to develop sales forecasts for each jurisdictional revenue class is outlined below.

1. Residential Sales

The residential sales forecast is developed using the Residential End-Use Energy Planning Model (REEPS). REEPS is an integrated end-use/econometric forecasting model developed by the Electric Power Research Institute (EPRI).

The Model

REEPS forecasts electricity sales in the residential sector by simulating acquisitions and energy usage of 11 major residential appliances (space heater, central air-conditioner, room air-conditioner, water heater, range, first refrigerator, second refrigerator, freezer, clothes washer, clothes dryer and dishwasher), plus residual electricity use.

Using a sample of households representative of the full residential customer population, probabilistic choice models are used to determine the stock of appliances in each dwelling based on household characteristics, prices, and other factors. Efficiency and usage equations determine energy consumption of each appliance. Electricity consumption is aggregated across all households to produce total residential sales.

For the base year, appliance saturations and electricity sales are calibrated to actuals. REEPS then simulates the additions of new appliance stock in new homes, and changes in appliance stock in existing homes, to produce a 20-year forecast. For each forecast year, forecasts of household characteristics, energy prices, weather, and conservation policies serve as model inputs to influence trends in appliance stock, efficiency, and utilization. These forecasts are used as explanatory variables in the choice and efficiency equations to determine the saturations and efficiencies of new housing appliance stock along with replacement and new acquisitions of appliances in existing housing. Likewise, usage equations determine energy consumption for the appliance stock in place, based on demographic and price forecasts. For each forecast period, appliance electricity consumption is aggregated across all households to produce a forecast of electricity sales.

In addition to forecasting residential electric sales, REEPS household level results are aggregated to produce other forecasts. These include:

- Total residential energy usage from all fuel sources,
- Appliance efficiencies (relative to the base year), and
- Average electricity/fuel use per appliance.

All forecasting results can be broken down by home vintage (new and existing), fuel type (electricity, natural gas, and oil/propane) and house-type (single family, small and large multi-family, and mobile home).

Model Input

For the 1999 resource planning work, REEPS version PC 2.3 was utilized using data pertaining to FPL's service territory. The following key inputs were used in FPL's implementation of REEPS:

- FPL household appliances and demographics (1995 & 1998 Home Energy Surveys),
- Residential customer forecast,
- Price forecasts of residential electricity, gas, and oil,
- Forecasts of household income and household size,
- Weather data for Miami, West Palm Beach, Daytona, and Ft. Myers, and
- Appliance average electricity use for the base year

Data from FPL's 1995 & 1998 Home Energy Surveys of Residential Customers (HES) were used to characterize FPL's existing residential customers. Results from the survey provided base-year appliance saturation for each of the 11 REEPS appliances, housing information on square footage and housing type, and demographic information on household size, household income, and geographic distribution.

The 20-year residential customer forecast, discussed earlier, was separated into four housing types using ratios for single-family detached, small and large multi-family attached, and mobile homes taken from the 1995 HES. Forecasts of residential electric prices are determined using current residential electric rates with growth rates taken from FPL's official forecast of real average price of electricity. Applying the growth rates in FPL's official fuel forecast to current natural gas and oil prices creates forecasts of future residential natural gas and propane prices.

The existing household income distribution is determined from the 1995 HES. Growth in household income is determined from the residential customer forecast and WEFA, Inc.'s economic forecast of Florida real personal income. Base-year household size is determined from the 1995 HES and is forecasted using the trend from the forecast of population per residential customer acount.

Estimates of appliance electricity consumption are taken from a conditional demand analysis of the 1990 HES data set.

The Forecast

After REEPS is calibrated to actual 1998 residential sales, the model produces a forecast of residential electricity sales for 1999-2018.

2. Commercial Sales

The commercial end-use model, COMMEND, developed by EPRI, is used to forecast long-term commercial sales.

The Model

COMMEND forecasts commercial energy requirements by building type, end-use equipment type, and fuel type. COMMEND calculates energy requirements by determining the product of the following four factors:

- Commercial floor space by building type,
- End-use saturations and fuel shares by end-use type and building type,
- Energy use index (EUI) values, which give energy use per square foot for space in each building type that is served by an end-use equipment and fuel type, and
- Utilization of equipment relative to the base year levels.

This product represents the projected energy requirements for a particular end-use equipment type and a particular building type. The total of all of the end-use equipment type values for a building type are then summed to produce a projection of total energy requirements for the building type. Adding sales across all building types produces the overall commercial sales.

In the base year (1990), the end-use data estimates are calibrated to produce estimated sales by building type. Additional calibration is required to scale these estimates up to system sales, including non-building uses. Modeling the changes in each of the four components listed below produces commercial sales forecasts:

- Forecasts of floor stock are modeled using employee-per-square foot relationships,
- Fuel shares are forecasted using multinomial logit models, based on equipment costs and equipment operating costs,
- Changes in EUI's occur as newer, more efficient buildings are constructed. Marginal EUI's are entered into the model based on economic conditions, building vintage, and a decay function, and,
- Changes in equipment utilization, relative to the base year, are modeled using short-run fuel price elasticities for all users of end-use equipment types and weather response elasticities for heating and cooling.

Model Input

To adapt COMMEND to the FPL service territory, estimates are needed of: The total floor stock of commercial buildings served by FPL, saturations of end-use equipment type by fuel type within those buildings, and EUI values by end-use equipment type by building type. Fourteen building types and ten end-use equipment types are used in COMMEND to characterize FPL's commercial sector.

Building Types	***End-Use Equipment Type***
1 Large Office	1 Air-Conditioning
2 Small Office	2 Heating
3 Large Retail	3 Ventilation
4 Small Retail	4 Water Heating
5 Restaurant	5 Refrigeration
6 Grocery	6 Cooking
7 Hotel/Motel	7 Outside Lighting
8 Elementary/Secondary School	8 Inside Lighting
9 College/Vocational	9 Office Equipment
10 Hospital	10 Miscellaneous
11 Other Health	
12 Warehouse	
13 Refrigerated Warehouse	
14 Miscellaneous Commercial	

Base Year floor stock is estimated using information from the 1986 and 1990 Commercial/Industrial Customer (C/I) Surveys. Forecasts of future construction are developed using the COMMEND floor stock model. The forecasting equations utilize an employee-per-square foot relationship. Employment forecasts consistent with forecasts of Florida non-agricultural employment are developed for various industries to be used in the forecast equations for each building type.

End–use saturation data comes from the 1986 and 1990 C/I Surveys. EUI values are also based on the subset of the C/I Survey. Marginal share and EUI values for new construction are based on the subset of the C/I Survey results that are for recently constructed buildings.

The Forecast

Base-year sales from the model were calibrated to actual FPL commercial sales. The model then produced a forecast of commercial electricity sales for 1999-2018.

3. Industrial Sales

Industrial sales were forecasted through a linear multiple regression model using Florida manufacturing employment, and the price of electricity as the explanatory variables. Since this revenue class consists of manufacturers, employment in this sector was an important indicator of economic activity in the sector, translating into sales for the revenue class.

4. Other Public Authority Sales

The sales for this class are developed using an econometric model with Florida manufacturing employment and the other public authority sales of the previous year as explanatory variables.

5. Street & Highway Sales and Railroad & Railways Sales

The forecast of Street & Highway sales was developed using a regression model with FPL's total customers and the street and highway sales of the previous period.

The forecasts for Railroads & Railways are held constant since there are no new plans for expansion of this economic sector in FPL's service territory.

6. Resales Sales

Resale (Wholesale) customers are composed of municipalities and/or electric cooperatives. These customers differ from jurisdictional customers in that they are not the ultimate users of the electricity they buy. Instead, they resell this electricity to their own customers.

Contract Rate

Currently there are four customers in this class: the Florida Keys Electric Cooperative, City Electric, Inc. of Key West, Metro-Dade County, and FMPA. Sales to the Florida Keys are forecasted using a regression model. Forecasted sales to City Electric, Inc. of Key West are based on assumptions regarding their contact demand and expected load factor. Metro-Dade County sells 60 MW to Florida Power Corporation. Line losses are billed to Metro-Dade under a wholesale contract. The forecast is calculated based on assumptions about line losses, their capacity factor, and the number of hours in a particular month. FMPA has contracted for delivery of 75 MWs for the period of June 2002 through October 2007.

Total Sales

Sales forecasts by revenue class are summed to produce a total sales forecast. After an estimate of annual total sales is obtained, applying an expansion factor generates a forecast of annual Net Energy for Load (NEL).

II.B. Net Energy for Load

An annual econometric model is developed to produce a Net Energy for Load (NEL) forecast. The key inputs to the model are price of electricity, heating & cooling degree-days, and Florida Non-Agricultural Employment. Once an annual NEL forecast is obtained using the above-mentioned model, the results are then compared to the NEL generated using the total sales forecast for reasonability. The sales by class are then adjusted to match the NEL from the annual NEL model.

The monthly NEL forecast is also generated for the entire long-term forecasting period of 1999 – 2018. Using historical data a month-to-annual ratio is developed which is used to produce the monthly NEL forecast.

The forecasted NEL values for 1999 – 2008 are presented in Schedule 3.3 which appears at the end of this chapter

II.C System Peak Forecasts

In recent years, the absolute growth in FPL system load has been associated with a larger customer base, varying weather conditions, continued economic growth, changing patterns of customer behavior (including an increasing stock of electricity consuming appliances), and more efficient heating and cooling appliances. The Peak Forecast models were developed to capture these behavioral relationships.

The forecasting methodology of Summer and Winter system peaks is discussed below. The forecasted values for these seasonal peak loads for the years 2000 - 2009 are presented in Schedules 3.1 and 3.2, as well as in Schedules 7.1 and 7.2.

1. System Summer Peak

The Summer peak forecast is developed using an econometric model. Key variables included in the model are the total number of FPL Summer customers, the price of electricity, a ratio of Gross Domestic Product (GDP) and Florida Non-Agricultural employment, a dummy term and a weather term. The dummy variable is included to capture the structural change in the economy after the oil crisis in 1975. The weather term is the product of saturation of air conditioning equipment and temperature.

2. System Winter Peak

Like the system Summer peak model, this model is also an econometric model. The Winter peak model is a per customer model which consists of three weather-related variables : the minimum temperature on the peak day, a weather term which is a product of heating saturation and minimum Winter day temperature and heating degree hours for the prior day as well as for the morning of the Winter peak day. In addition the model also has an economic term which is a ratio of GDP and Florida non-agricultural employment, a dummy variable to capture the effects of larger homes and a dummy variable to provide additional emphasis for the more recent weather data.

3. Monthly Peak Forecasts

Monthly peaks for the 1999-2018 period are forecasted to provide information for the scheduling of maintenance for power plants and fuel budgeting. The forecasting process is basically the same as for the monthly NEL forecast:

a. Develop the historical seasonal factor for each month by using ratios of historical monthly peaks to seasonal peak (Summer = April-October, Winter = November-March).

b. Apply the monthly ratios to their respective seasonal peak forecast to derive the peak forecast by month. This process assumes that the seasonal factors remain unchanged over the forecasting period.

II.D The Hourly Load Forecast

Forecasted values for system hourly load for the period 1999-2018 are produced using a System Load Forecasting "shaper" program. This model uses sixteen years of historical FPL hourly system load data to develop load shapes for weekday, weekend, and holiday days. These daily load shapes are ranked and used with forecasted monthly peaks, NEL, and calendars in developing an hourly forecast. The model allows calibration of hourly values where the peak is maintained or where both the peak and minimum load-to-peak ratio is maintained.

Schedule 2.1
History and Forecast of Energy Consumption
And Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rural & Residential					Commercial		
Year	Population**	Members per Household	GWH	Average*** No. of Customers	Average KWH Consumption Per Customer	GWH	Average*** No. of Customers	Average KWH Consumption Per Customer
1990	6,088,140	2.17	33,488	2,801,209	11,955	26,543	337,133	78,732
1991	6,211,996	2.17	34,617	2,863,198	12,090	27,232	343,834	79,200
1992	6,314,005	2.17	34,198	2,911,807	11,745	26,991	350,269	77,058
1993	6,380,715	2.14	36,360	2,975,479	12,220	28,508	358,679	79,481
1994	6,516,879	2.15	38,716	3,037,629	12,745	29,946	366,409	81,729
1995	6,639,165	2.14	40,556	3,097,192	13,094	30,719	374,005	82,135
1996	6,754,084	2.14	41,302	3,152,625	13,101	31,211	380,860	81,949
1997	6,884,909	2.15	41,849	3,209,298	13,040	32,942	388,906	84,703
1998	7,014,152	2.15	45,482	3,266,011	13,926	34,618	396,749	87,255
1999	7,133,361	2.14	44,187	3,332,422	13,260	35,524	404,942	87,725
2000 *	7,252,571	2.14	45,618	3,390,507	13,455	36,881	415,634	88,734
2001 *	7,373,939	2.14	45,869	3,453,610	13,282	37,959	423,660	89,597
2002 *	7,492,418	2.13	46,478	3,516,847	13,216	39,042	432,151	90,343
2003 *	7,608,007	2.13	47,260	3,578,247	13,208	40,237	442,775	90,874
2004 *	7,720,707	2.12	47,800	3,637,839	13,140	41,291	451,383	91,476
2005 *	7,830,516	2.12	48,460	3,695,680	13,113	42,212	459,530	91,859
2006 *	7,935,947	2.11	49,151	3,752,369	13,099	43,124	467,288	92,285
2007 *	8,041,378	2.11	49,765	3,808,534	13,067	43,999	474,902	92,648
2008 *	8,148,414	2.11	50,448	3,864,829	13,053	44,929	482,682	93,082
2009 *	8,257,056	2.11	51,086	3,921,594	13,027	45,823	490,838	93,356

* Forecasted values for these years reflect the Most Likely economic scenario.
** Population represents only the area served by FPL.
*** Average No. of Customers is the annual average of the tw elve month values.

Schedule 2.2
History and Forecast of Energy Consumption
And Number of Customers by Customer Class

(1)		(10)	(11)	(12)	(13)	(14)	(15)	(16)
		Industrial					Other	Total***
			Average**	Average KWH	Railroads	Street &	Sales to	Sales to
			No. of	Consumption	&	Highway	Public	Ultimate
					Railways	Lighting	Authorities	Consumers
Year		GWH	Customers	Per Customer	GWH	GWH	GWH	GWH
1990		4,065	16,657	244,044	82	331	712	65,221
1991		4,090	15,348	266,493	81	345	733	67,098
1992		4,054	14,788	274,135	77	353	721	66,393
1993		3,889	14,866	261,602	79	330	665	69,830
1994		3,845	15,588	246,658	85	353	664	73,608
1995		3,883	15,140	256,481	84	358	648	76,248
1996		3,792	14,783	256,515	83	368	577	77,334
1997		3,894	14,761	263,830	85	383	702	79,855
1998		3,951	15,126	261,233	81	373	625	85,131
1999		3,948	16,040	246,112	79	473	465	84,676
2000	*	3,947	15,194	259,803	81	373	571	87,473
2001	*	3,952	15,133	261,122	81	381	572	88,813
2002	*	3,945	15,141	260,567	81	388	572	90,506
2003	*	3,950	15,150	260,727	81	396	572	92,496
2004	*	3,957	15,114	261,803	81	403	572	94,104
2005	*	3,954	15,079	262,197	81	411	572	95,690
2006	*	3,952	15,033	262,925	81	419	571	97,298
2007	*	3,957	14,976	264,231	81	426	571	98,799
2008	*	3,957	14,960	264,543	81	433	570	100,419
2009	*	3,960	14,941	265,029	81	441	570	101,960

*These Forecasted values reflect the Most Likely economic scenario.
**Average No.of Customers is the annual average of the twelve month values.
***Values in Column 16 = Column 4 + Column 7 + Column 10 + Column 13 + Column 14 + Column 15.

Schedule 2.3
History and Forecast of Energy Consumption
And Number of Customers by Customer Class

(1)		(17)	(18)	(19)	(20)	(21)
Year		Sales for Resale GWH	Utility Use & Losses GWH	Net*** Energy For Load GWH	Average ** No. of Other Customers	Total Average**** Number of Customers
1990		882	4,926	71,029	3,819	3,158,817
1991		716	5,346	73,160	4,076	3,226,455
1992		702	6,002	73,097	4,374	3,281,238
1993		958	4,988	75,776	3,086	3,352,110
1994		1,400	5,367	80,376	2,560	3,422,187
1995		1,437	6,276	83,961	2,460	3,488,796
1996		1,353	5,984	84,671	2,480	3,550,748
1997		1,228	5,770	86,853	2,520	3,615,485
1998		1,326	6,205	92,662	2,584	3,680,470
1999		953	5,829	91,458	2,605	3,756,009
2000	*	971	6,666	95,110	2,640	3,823,974
2001	*	992	6,768	96,574	2,680	3,895,083
2002	*	1,214	6,913	98,633	2,721	3,966,860
2003	*	1,434	7,079	101,009	2,762	4,038,934
2004	*	1,455	7,202	102,761	2,801	4,107,138
2005	*	1,454	7,321	104,465	2,839	4,173,128
2006	*	1,454	7,443	106,194	2,875	4,237,565
2007	*	1,420	7,553	107,772	2,912	4,301,324
2008	*	1,053	7,648	109,120	2,948	4,365,419
2009	*	1,053	7,764	110,777	2,985	4,430,357

* Forecasted values reflect the Most Likely economic scenario.
** Average Number of Customers is the annual average of the twelve month values.
*** Values in Column 19 = Column 16 + Column 17 + Column 18
**** Values in Column 21 = Column 5 + Column 8 + Column 11 + Column 20

Schedule 3.1
History and Forecast of Summer Peak Demand: Base Case

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Res. Load Management	(7) Residential Conservation	(8) C/I Load Management	(9) C/I Conservation	(10) Net Firm Demand
1990	13,754	290	13,464	0	85	110	127	30	13,542
1991	14,123	281	13,842	0	160	129	177	38	13,786
1992	14,661	223	14,438	0	234	151	248	51	14,179
1993	15,266	397	14,869	0	311	182	320	79	14,635
1994	15,179	409	14,770	0	392	220	354	125	14,433
1995	16,172	435	15,737	0	466	259	391	193	15,315
1996	16,064	364	15,700	0	531	339	414	296	15,119
1997	16,613	380	16,233	0	615	440	432	341	15,566
1998	17,897	426	17,471	0	656	480	441	359	15,961
1999	17,615	169	17,446	0	714	524	450	381	15,546
2000	17,690	145	17,544	0	757	91	467	54	16,321
2001	17,926	146	17,781	0	782	130	480	76	16,458
2002	18,282	224	18,058	0	791	171	490	95	16,735
2003	18,658	228	18,430	0	797	213	501	115	17,032
2004	19,037	233	18,804	0	803	254	510	135	17,335
2005	19,446	233	19,213	0	809	297	521	155	17,664
2006	20,124	233	19,890	0	814	341	529	175	18,265
2007	20,565	233	20,332	0	819	386	537	195	18,628
2008	20,941	158	20,783	0	824	432	545	215	18,925
2009	21,366	158	21,208	0	828	479	550	234	19,275

Historical Values (1990 - 1999):

Cols. (2) - (4) are actual values for historical summer peaks. As such, they incorporate the effects of conservation (Cols. (7&9)), and MAY incorporate the effects of load control IF load control was operated on these peak days. Therefore, Col. (2) represents the actual Net Firm Demand.

Cols. (5) - (9) represent actual DSM capabilities starting from January 1988.

Note that the values for FPL's former Interruptible Rate are incorporated into Col. (8), which also includes CILC and GS-LC.

Col. (10) represents a HYPOTHETICAL "Net Firm Demand" if the load control values had definitely been exercised on the peak. Col. (10) is derived by the formula: (10) = (2) -(6) -(8).

Projected Values (2000 - 2009):

Cols. (2) - (4) represent FPL's forecasted peak w/o incremental conservation or cumulative load control. The effects of conservation implemented prior to 1999 are incorporated into the forecast.

Cols. (5) - (9) represent all incremental conservation and cumulative load control. These values are projected August values and are based on projections with a 1/99 starting point.

Col. (10) represents a 'Net Firm Demand" which accounts for all of the incremental conservation and assumes all of the load control is implemented on the peak. Col. (10) is derived by using the formula: (10) = (2) - (5) - (6) - (7) - (8) - (9).

Schedule 3.2
History and Forecast of Winter Peak Demand:Base Case

(1) Year	(2) Total	(3) Firm Wholesale	(4) Retail	(5) Interruptible	(6) Res. Load Management	(7) Residential Conservation	(8) C/I Load Management	(9) C/I Conservation	(10) Net Firm Demand
1990/91	11,868	328	11,540	0	102	135	144	32	11,622
1991/92	13,319	105	13,214	0	174	170	193	38	12,952
1992/93	12,964	102	12,862	0	242	195	275	48	12,447
1993/94	12,594	278	12,316	0	317	231	342	67	11,935
1994/95	16,563	635	15,928	0	393	265	360	93	15,810
1995/96	18,096	698	18,096	0	459	310	406	143	17,231
1996/97	16,490	626	15,864	0	731	368	418	154	15,341
1997/98	13,060	239	12,821	0	823	403	429	168	11,236
1998/99	16,802	149	16,653	0	1,218	404	417	169	14,594
1999/00	17,057	142	16,915	0	1,296	426	441	179	14,715
2000/01	18,585	119	18,466	0	1,371	46	455	20	16,693
2001/02	18,983	122	18,861	0	1,398	72	461	26	17,026
2002/03	19,432	200	19,232	0	1,409	99	467	33	17,424
2003/04	19,839	204	19,635	0	1,420	124	473	41	17,781
2004/05	20,251	204	20,047	0	1,430	148	478	49	18,146
2005/06	20,666	204	20,462	0	1,441	173	484	59	18,509
2006/07	21,088	204	20,884	0	1,450	196	489	68	18,885
2007/08	21,439	129	21,310	0	1,459	220	494	76	19,190
2008/09	21,860	129	21,731	0	1,468	243	499	85	19,565

Historical Values (1990 - 1999):

Cols. (2) - (4) are actual values for historical winter peaks. As such, they incorporate the effects of conservation (Cols. (7&9)), and MAY incorporate the effects of load control IF load control was operated on these peak days. Therefore, Col. (2) represents the actual Net Firm Demand.

Cols. (5) - (9) represent actual DSM capabilities starting from January 1988.

Note that the values for FPL's former Interruptible Rate are incorporated into Col. (8), which also includes CILC and GS - LC.

Col. (10) represents a HYPOTHETICAL "Net Firm Demand" if the load control values had definitely been exercised on the peak. Col. (10) is derived by the formula: (10) = (2) -(6) -(8).

Projected Values (2000-2009):

Cols. (2) - (4) represent FPL's forecasted peak w/o incremental conservation or cumulative load control. The effects of conservation implemented prior to 1999 are incorporated into the forecast.

Cols. (5) - (9) represent all incremental conservation and cumulative load control. These values in are projected January values and are based on projections with a 1/99 starting point.

Col. (10) represents a 'Net Firm Demand" which accounts for all of the incremental conservation and assumes all of the load control is implemented on the peak. Col. (10) is derived by using the formula: (10) = (2) - (5) - (6) - (7) - (8) - (9).

Schedule 3.3
History and Forecast of Annual Net Energy for Load - GWH: Base Case

(1) Year	(2) Total	(3) Residential Conservation	(4) C/I Conservation	(5) Retail	(6) Wholesale	(7) Utility Use & Losses	(8) Net Energy For Load	(9) Load Factor(%)
1990	71,510	319	162	70,628	882	4,926	71,029	59.0%
1991	73,743	397	186	73,027	716	5,346	73,160	59.1%
1992	73,778	460	221	73,076	702	6,002	73,097	56.9%
1993	76,632	553	303	75,675	957	4,988	75,776	56.7%
1994	81,493	661	456	80,093	1,400	5,367	80,376	60.4%
1995	85,415	777	677	83,978	1,437	6,276	83,961	59.3%
1996	86,708	971	1,039	85,355	1,353	5,984	84,698	60.2%
1997	89,240	1,213	1,174	88,015	1,226	5,770	86,853	59.7%
1998	95,316	1,374	1,279	93,990	1,326	6,205	92,663	66.3%
1999	94,362	1,542	1,362	93,409	953	5,829	91,459	67.2%
2000	95,110	52	39	94,137	973	6,666	95,019	66.5%
2001	96,574	139	92	95,599	975	6,768	96,342	66.8%
2002	98,633	229	122	97,422	1,211	6,913	98,282	67.0%
2003	101,009	320	152	99,630	1,379	7,079	100,536	67.4%
2004	102,761	412	184	101,380	1,381	7,202	102,165	67.3%
2005	104,465	506	217	103,085	1,380	7,321	103,741	67.0%
2006	106,194	603	251	104,814	1,380	7,443	105,340	65.8%
2007	107,772	700	283	106,459	1,313	7,553	106,789	65.4%
2008	109,120	800	314	108,140	980	7,648	108,007	65.1%
2009	110,777	901	343	109,797	980	7,764	109,533	64.9%

Historical Values (1990 - 1999):

Col. (2) represents derived "Total Net Energy For Load w/o DSM". The values are calculated using the formula: (2) = (8) + (3) + (4).

Cols. (3) & (4) are DSM values starting in January, 1988 through 1999 which contributed to the values in Cols. (5) - (9).

Cols. (5) & (6) are a breakdown of Net Energy For Load in Col (2) into Retail and Wholesale .

Col. (9) is calculated using Col. (8) from this page and Col. (2), "Total", from Schedule 3.1.

Projected Values (2000 - 2009):

Col. (2) represents Net Energy for Load w/o DSM values.

Cols. (3) - (4) are forecasted values of the reduction on sales from incremental conservation.

Cols. (5) & (6) are a breakdown of Net Energy For Load in Col (2) , into Wholesale and Retail .

Col. (10) represents a 'Net Firm Demand" which accounts for all of the incremental conservation and assumes all of the load control is implemented the values for Col. (8) above and the values for Col. (10) on Schedule 3.1

Schedule 4

Previous Year Actual and Two-Year Forecast of Retail Peak Demand and Net Energy for Load by Month

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1999 ACTUAL		2000 * FORECAST		2001 * FORECAST	
Month	Total Peak Demand MW	NEL GWH	Total Peak Demand MW	NEL GWH	Total Peak Demand MW	NEL GWH
JAN	16,802	6,717	18,162	7,096	18,585	7,205
FEB	12,897	5,974	16,172	6,480	16,548	6,580
MAR	11,907	6,373	14,007	6,957	14,332	7,064
APR	15,469	7,618	13,761	7,159	13,946	7,269
MAY	15,902	7,668	15,093	7,677	15,295	7,795
JUN	16,001	8,297	16,665	8,934	16,888	9,071
JUL	17,469	8,992	17,299	9,243	17,530	9,385
AUG	17,580	9,443	17,690	9,714	17,926	9,863
SEP	17,615	8,921	17,177	9,421	17,407	9,566
OCT	16,274	7,928	15,942	8,053	16,156	8,177
NOV	14,218	6,951	14,708	7,304	15,050	7,417
DEC	12,666	6,577	15,031	7,072	15,381	7,181
TOTALS		91,459		95,110		96,573

* Forecasted Peaks & NEL do not include the impacts of cumulative load management and incremental conservation.

(This page is left intentionally blank.)

CHAPTER III

Projection of Incremental Resource Additions

(This page is left intentionally blank.)

III. Projection of Incremental Resource Additions

III.A FPL's Resource Planning:

FPL developed an integrated resource planning (IRP) process in the early 1990's and has since utilized the process in order to determine when new resources are needed, what the magnitude of the needed resources are, and what type of resources should be added. The timing and type of potential new power plants, the primary subjects of this document, are determined as part of the IRP process work. This section discusses how FPL applied this process in its 1999 planning work.

Four Fundamental Steps of FPL's Resource Planning:

There are 4 basic "steps" which are fundamental to FPL's resource planning. These steps can be described as follows:

Step 1: Determine the magnitude and timing of FPL's resource needs;

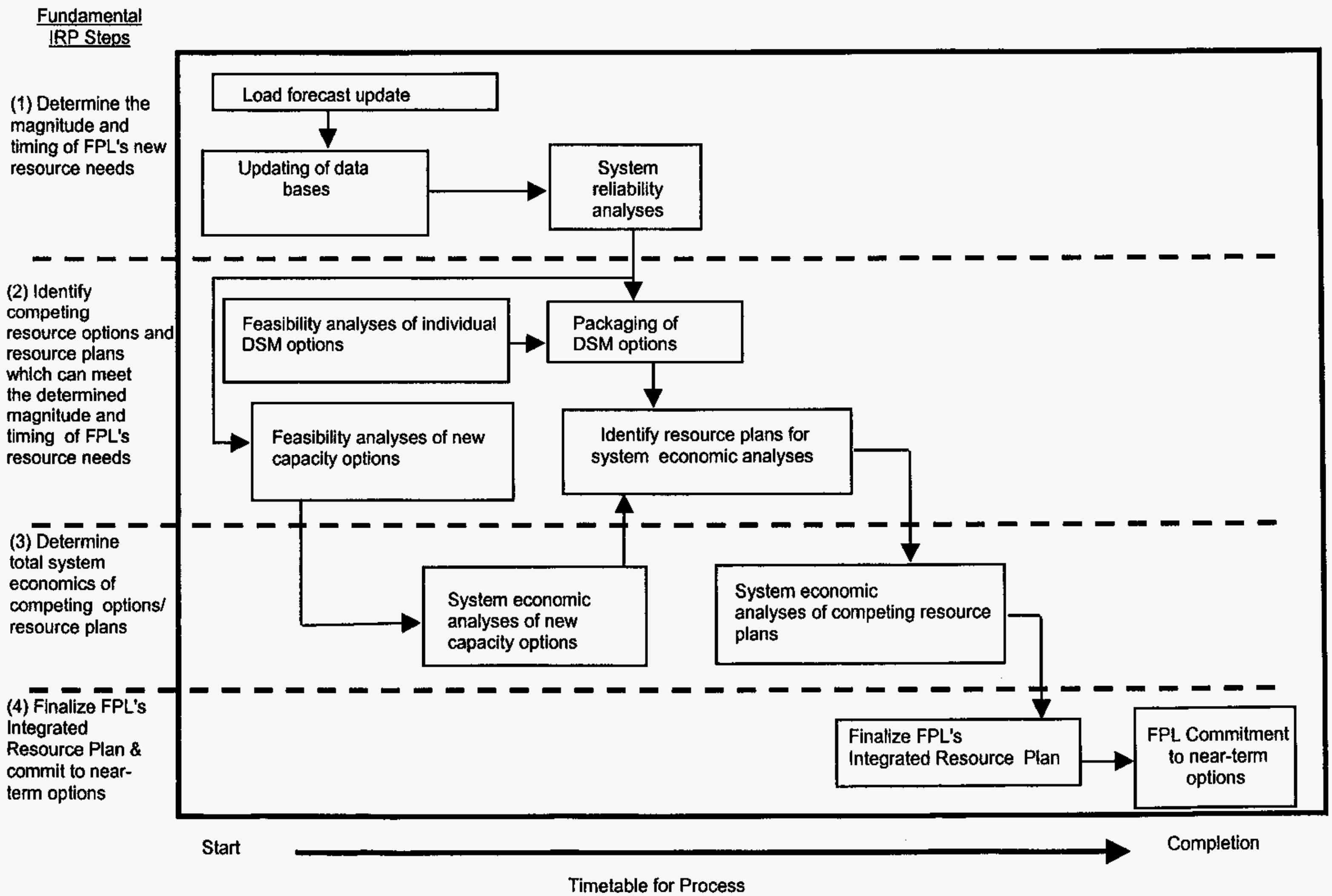
Step 2: Identify which resource options and resource plans can meet the determined magnitude and timing of FPL's resource needs (i.e. identify competing options and resource plans;

Step 3: Determine the economics for the total utility system with each of the competing options and resource plans; and,

Step 4: Select a resource plan and commit, as needed, to near-term options.

Figure III.A.1 graphically outlines the 4 steps.

Overview of FPL's IRP Process



(Normal time period: approx. 6-7 months)

Figure III.A.1

Step 1: **Determine the Magnitude and timing of FPL's Resource needs:**

The first of these four resource planning steps – determining the magnitude and timing of FPL's resource needs – is essentially a determination of how many megawatts (MW) of load reduction, new capacity, or a combination of both load reduction and new capacity options are needed. Also determined in this step is when the MW are needed to meet FPL's planning criteria. This step is often referred to as a reliability analysis for the utility system.

Step 1 starts with an updated load forecast. Several databases are also updated in this first fundamental step, not only with the new information regarding forecasted loads, but with other information as well which is used in many of the fundamental steps in resource planning. Examples of this new information include delivered fuel price projections current financial and economic assumptions, power plant capability and reliability assumptions, etc. Two assumptions made by FPL at the start of its 1999 IRP work involved near-term generation capacity additions from repowering projects and DSM.

The first of these two assumptions involved FPL's announced plans to repower several existing units. FPL committed in 1998 to repower both existing steam units at its Ft. Myers plant site and two of the three existing steam units at its Sanford plant site. These two repowering efforts will add significant capacity increases to FPL's system and will greatly increase the efficiency of the capacity now at those two sites. The repowered Ft. Myers capacity is scheduled to come in-service by the Summer, 2002. Combustion turbines (CT's), which are components of the repowering effort, will begin coming in-service at Ft. Myers in November, 2000 and through their inittial operation in a stand-alone mode will result in immediate capacity increases to the FPL system. A somewhat different schedule is planned for the two Sanford units which will be repowered. Both of these units will be repowered without the combustion turbine components coming in-service during the process. Sanford Unit No. 5 will come out-of-service in the Fall, 2001 and return fully repowered by Summer, 2002. Sanford Unit No. 4 will come out-of-service in the Spring, 2002 and return fully repowered at the end of 2002. As a result of this commitment, FPL assumed that these capacity additions resulting from the Ft. Myers and Sanford repowerings were a "given" in its 1999 resource planning work.

The second of these assumptions involved DSM. Since 1994, FPL's resource planning work has also used the DSM MW called for in FPL's approved DSM goals as a "given" in its analyses. This was again the case in FPL's 1999 planning work as its recently approved (in 1999) new DSM goals through the year 2009 were taken as a given.

A third assumption was introduced later in the 1999 planning process. As a result of a settlement in the Florida Public Service Commission's Docket No. 981890-EU, FPL, along with Tampa Electric Company and Florida Power Corporation, agreed to change its reserve margin planning criterion from a minimum of 15% to a minimum of 20% beginning with the Summer of 2004. As a consequence, FPL needs more capacity starting in mid-2004 than it otherwise would have planned for.

FPL has decided to add four new CTs in the 2001 through 2003 time frame. The first two CT's, which were announced in late – 1999, are scheduled to be in-service at FPL's existing Martin site in 2001. The second pair of combustion turbines are scheduled to be in-service in 2003 and will be placed at FPL's existing Ft. Myers site. Due to the decision to add these four new CT's, FPL's 1999 resource planning work assumed that these new CT capacity additions would also be a "given".

The first place in which these assumptions and much of the other updated information and assumptions are used is in the analyses which provide the desired result of the 1st fundamental step: the determination of the magnitude and the timing of FPL's resource needs. This determination is accomplished by system reliability analyses which are typically based on a dual planning criteria of a minimum peak period reserve margin of 15% (FPL applies this to both Summer and Winter peaks) and a maximum loss-of-load probability (LOLP) of 0.1 days/year criteria which are commonly used throughout the utility industry. FPL also used a "third" reliability criterion in its 1999 planning work: a minimum 20% Summer and Winter reserve margin criterion which is applied starting in mid-2004 for reasons previously discussed.

Historically, two types of methodologies, deterministic and probabilistic, have been employed in system reliability analyses. The calculation of excess firm capacity at the annual system peaks (reserve margin) is the most common method and this relatively simple calculation can be performed on a spreadsheet. It provides an indication of how well a generating system can meet its native load during peak periods. However, deterministic methods do not take into account probabilistic events such as: unit reliability; unit size (i.e., two 50 MW units which can be counted on to run 90% of the time are more valuable in regard to utility system reliability than is one 100 MW unit which can also be counted on to run 90% of the time); and the value of being part of an interconnected system.

Therefore, probabilistic methodologies have been used to provide additional information on the reliability of a generating system. There are a number of probabilistic methods that are being used to perform system reliability analyses. Of these, the most widely used is loss-of-load probability or LOLP. Simply stated, LOLP is an index of how well a generating system will be able to meet its demand (i.e., a measure of how often load will exceed available resources). In contrast to reserve margin, the calculation of LOLP looks at the daily peak demands for each year, while taking into consideration such probabilistic events as the unavailability of individual generators due to scheduled maintenance or forced outages.

LOLP is expressed in units of "number of times per year" that the system demand could not be served. The standard for LOLP accepted throughout the industry is a maximum of 0.1 day per year. This analysis requires a more complicated calculation methodology than does reserve margin analysis.

The end result of the first fundamental step of resource planning is a projection of how many MW are needed to maintain system reliability and of when the MW are needed. This information is used in the second fundamental step: identifying resource options and resource plans which can meet the determined magnitude and timing of FPL's resource needs.

Step 2: Identify Resource Options and Plans Which Can Meet the Determined Magnitude and Timing of FPL's Resource Needs:

The initial activities associated with this second fundamental step of resource planning generally proceed concurrently with the activities associated with Step 1. During Step 2, feasibility analyses of new capacity options are carried out to determine which new capacity options appear to be the most competitive on FPL's system. These analyses also establish capacity size (MW) values, projected construction / permitting schedules, and operating parameters and costs.

The individual new capacity options are then "packaged" into different resource plans which are designed to meet the system reliability criteria. In other words, resource plans are created by combining individual resource options so that the timing and magnitude of FPL's new resource needs are met. The creation of these competing resource plans is typically carried out using dynamic programming techniques.

Therefore, at the conclusion of the second fundamental resource planning step in 1999, a number of different combinations of new resource options (i.e., resource plans) of a magnitude and timing necessary to meet FPL's resource needs were identified. These resource plans were then compared on an economic basis.

Step 3: Determining the Total System Economics:

At the completion of the fundamental Steps 1 & 2, the most viable new resource options have been identified, and these resource options have been combined into a number of resource plans. The stage is set for comparing the system economics of these resource plans. FPL combines the resource options into resource plans using the EGEAS (Electric Generation Expansion Analysis System) computer model from the Electric Power Research Institute (EPRI) and Stone & Webster Management Consultants, Inc. The EGEAS model is also used to perform the economic analyses of the resource plans.

The economic analyses of the competing resource plans focus on total system economics. The standard basis for comparing the economics of the competing resource plans is the competing resource plans' impact on FPL's electricity rate levels with the intent of minimizing FPL's levelized system average rate (i.e. a Rate Impact Measure or RIM methodology). However, in cases such as existed for FPL's 1999 planning work in which the DSM contribution was taken as a "given" and the only competing options were new generating units, comparisons of competing resource plans' impacts on electricity rates and on system revenue requirements are equivalent. Consequently, for FPL's 1999 resource planning work, the competing options and plans were evaluated on a present value system revenue requirement basis.

At the conclusion of the analyses carried out in Step 3, a determination of FPL's preferred resource plan was made.

Step 4: Finalizing FPL's 1999 Resource Plan

The results of the previous three fundamental steps' activities were evaluated by FPL management and a decision was made as to what FPL's 1999 resource plan would be. This plan is presented in the following section.

III.B Incremental Resource Additions

FPL's projected incremental generation capacity additions/changes for 2000 through 2009 are depicted in Table III.B.1. (The planned DSM additions are shown separately in Table III.C.1.)

These capacity additions/changes will result from a variety of actions including: upgrades to existing units (which are achieved as a result of plant component replacements during major overhauls), capacity enhancements (due to overpressurization, overfiring, and/or the addition of inlet air chillers), scheduled changes in the delivered amounts of purchased power, repowering of existing units, and projected construction of new units.

As shown in Table III.B.1, the bulk of the capacity additions are made up of the following items: the repowering of both existing steam units at FPL's Ft. Myers site by Summer, 2002; a similar repowering at FPL's Sanford Unit Nos. 5 and 4 site by the Summer, 2002, and the end of 2002, respectively; the construction of four new CT's during the 2001 through 2003 time period; and the construction of two new CC's units at FPL's Martin site in 2006, followed by the construction of new CC units in 2007, 2008 and 2009 at sites yet to be determined.

Projected Capacity Changes and Reserve Margins for FPL (1)			
		Net Capacity Changes (MW)	
Year		Summer (2)	Winter (3)
2000	Changes to existing plants	66	75
2001	Changes to existing plants	20	80
	Ft. Myers Repowering:Initial Phase (4)	894	543
	Combustion Turbines (2) at Martin	298	---
2002	Ft. Myers Repowering:Second Phase	35	(5)
	Combustion Turbines (2) at Martin	---	362
	Sanford Repowering # 5: Initial Phase (5)	---	(394)
	Sanford Repowering # 5: Second Phase	567	---
	Sanford Repowering # 4: Initial Phase (5)	(390)	---
	Changes to existing plants	31	40
	Changes to existing purchases	(9)	---
2003	Ft. Myers Repowering:Second Phase	---	531
	Sanford Repowering # 5: Second Phase	---	1065
	Sanford Repowering # 4: Second Phase	957	671
	Combustion Turbines (2) Ft. Myers (6)	298	---
	Changes to existing purchases	---	(9)
2004	Combustion Turbines (2) Ft. Myers	---	362
2005	Changes to existing purchases	(10)	(10)
2006	Martin Combined Cycle No.5 & 6 (7)	788	---
	Changes to existing purchases	(133)	(133)
2007	Martin Combined Cycle No.5 & 6 (7)	---	858
	Unsited Combined Cycle #1	394	---
2008	Unsited Combined Cycle #2	394	---
	Unsited Combined Cycle #1	---	429
2009	Unsited Combined Cycle #3	394	---
	Unsited Combined Cycle #2	---	429
	Changes to existing purchases	(51)	---
	TOTALS=	**4,543**	**4,894**

Note:

(1) Additional information about these capacity changes and resulting reserve margins is found in Chapter III of this document.

(2) Summer values are values for August of year shown.

(3) Winter values are values for January of year shown.

(4) The initial phase of the Ft. Myers repowering project consists of the introduction of combustion turbines followed by taking existing steam units out-of-service. The second phase of repowering consists of completing the integration of the combustion turbines, heat recovery steam generators and exisiting steam turbines.

(5) The initial phase of the Sanford repowering project consists solely of taking existing steam units out-of-service; combustion turbine operation is not introduced at this time. The second phase of the repowering consists of integrating the combustion turbines, heat recovery steam generators and existing steam turbines.

(6) The two CT's at Ft. Myers are scheduled to be in-service in the Spring of 2003. Therefore, the CTs are included in the 2003 Summer reserve margin calculation and are included in the 2004 - on reserve margin calculations for Summer and Winter.

(7) All combined cycle units are scheduled to be in-service in June of the year shown. Consequently, they are included in the Summer reserve margin calculation for the in-service year and in both the Summer and Winter reserve margin calculations for subsequent years.

Table III.B.1

III.C Demand Side Management (DSM)

1. FPL's Current DSM Programs

FPL's currently approved DSM programs can be summarized as follows:

Residential Conservation Service

An energy audit program designed to assist residential customers in understanding how to make their homes more energy-efficient through the installation of conservation measures/practices.

Residential Building Envelope

A program designed to encourage the installation of energy-efficient ceiling insulation in residential dwellings that utilize whole-house electric air-conditioning.

Duct System Testing and Repair

A program designed to encourage demand and energy conservation through the identification of air leaks in whole-house air conditioning duct systems and by the repair of those leaks by qualified contractors.

Residential Air Conditioning

A program designed to encourage customers to purchase higher efficiency central cooling and heating equipment.

Residential Load Management (On Call)

A program designed to offer load control of major appliances/household equipment to residential customers.

BuildSmart

A program designed to encourage the design and construction of energy-efficient homes that cost-effectively reduce FPL's coincident peak load and energy consumption.

Business Energy Evaluation

A program designed to encourage energy efficiency in both new and existing commercial and industrial facilities by identifying DSM opportunities and providing recommendations to the customer.

Commercial/Industrial Heating, Ventilating, and Air Conditioning

A program designed to encourage the use of high-efficiency heating, ventilating, and air conditioning (HVAC) systems in commercial/industrial facilities. Includes air-and water-cooled chillers, DX units, thermal energy storage, window/wall units, and duct repair measures.

Commercial/Industrial Efficient Lighting

A program designed to encourage the installation of energy-efficient lighting measures in commercial/industrial facilities.

Off-Peak Battery Charging

A program designed to shift the demand of commercial/industrial customers' battery charging applications from on-peak to off-peak time periods.

Business Custom Incentive

A program designed to encourage commercial/industrial customers to implement unique energy conservation measures or projects not covered by other FPL programs.

Commercial/Industrial Load Control

A program designed to reduce peak demand by controlling customer loads of 200 kW or greater during periods of extreme demand or capacity shortages. (This program has been closed to new potential participants).

Commercial/Industrial Building Envelope

A program for commercial/industrial customers which is designed to encourage the installation of energy-efficient building envelope measures such as window treatments and roof/ceiling insulation.

Business On Call

A program designed to offer load control of central air conditioning units to small non-demand-billed commercial/industrial customers.

2. Research and Development

FPL's DSM Plan contains a wide range of research and development activities. Historically, FPL has performed extensive DSM research and development, and FPL will continue such activities not only through its Conservation Research and Development program, but also through individual research projects. These efforts will examine a wide variety of technologies which build on prior FPL research where applicable and will expand the research to new and promising technologies as they emerge.

2a. Conservation Research and Development Program

FPL's Conservation Research and Development Program is designed to evaluate emerging conservation technologies to determine which are worthy of pursuing for program development and approval. FPL has researched a wide variety of technologies and from that research has been able to develop new programs such as Residential New Construction, Commercial/Industrial Building Envelope, and Business On Call.

2b. Marketing Conservation Research & Development Program

This program is designed to allow FPL the flexibility to test alternative incentive and/or marketing strategies for existing DSM programs.

2c. Research & Development Projects

Residential Thermal Energy Storage Project

This research project was intended to determine the technical feasibility of a program to encourage residential customers to cool their homes with thermal energy storage. Completed research has shown that this technology does not have sufficient support to develop a market-ready, consumer-viable product, and the project will be terminated.

Cool Communities Research Project

Cool Communities is a concept developed by American Forests to demonstrate the extent to which strategic tree planting and surface color lightening can cool ambient air temperature and impact energy consumption. This research project is designed to evaluate emerging conservation technologies and practices associated with residential structures to determine which are worthy of pursuing for program development and approval. The project which consist of data gathering, statistical regression analysis and economic evaluation will quantify savings from lightened roof color and tree shading of homes.

Natural Gas End-Use Technology Research & Development Projects

This research and development project is designed to determine Florida-specific operating characteristics of various natural gas end-use technologies. Three gas technologies: gas engine-driven heat pumps, gas engine-driven chillers, and gas water heating, are still being analyzed.

C/I Daylight Dimming Research Project

This research and development project is designed to assess the viability and feasibility of daylight dimming technology and to compare the demand and energy reductions and cost differentials of daylight dimming systems to conventional lighting systems. In addition, this project will attempt to discover and overcome potential barriers for the technology, quantity the cost-effectiveness of the technology, test acceptance of the technology with architectural and engineering consultants, qualitatively assess customer acceptance of the technology, and conduct market research to determine target markets and expected market penetrations.

Commercial/Industrial New Construction Research Project

The objective of this project is to identify cost-effective opportunities in the commercial/industrial new construction market which would provide energy efficiency measures beyond that required by the Florida Energy Efficiency Code.

Green Pricing Research Project

This research project was designed to test FPL customer responses to a Green Pricing initiative. In this initiative, FPL solicited voluntary contributions from customers which have been used to purchase, install, maintain, and operate photovoltaic (PV) modules on FPL's system. The project raised in excess of $89,500 and a 10.1 kW (dc) PV system has been constructed at FPL's Martin power plant site.

In an attempt to determine the customer acceptance of green pricing rates, FPL proposes a Green Energy Project as discussed below.

C/I Solar Desiccant Research Project

This project is designed to evaluate the potential demand and energy savings associated with, and the cost-effectiveness of, hybrid solar desiccant dehumidification systems combined with a traditional cooling system.[1]

The following proposed research and development projects were included in FPL's recently filed Demand Side Management Plan.

[1] Please refer to section III.F for additional information regarding FPL's efforts with renewable energy.

Low Income Weatherization Retrofit Project

The proposed project will investigate cost-effective methods of increasing the energy efficiency of FPL's low-income customers. This project will address the needs of low income housing retrofits by providing monetary incentives to housing authorities (both weatherization agency providers, (WAPS), and non-weatherization agency providers (non-WAPS), for individual homes they are retrofitting.

Photovoltaic Research, Development and Education Project

The proposed project will work with homebuilders to install five to ten photovoltaic (PV) roof systems in new single family homes. Each roof will be approximately 2 kW (dc) each, resulting in 10-to-20 kW (dc) of PV arrays in total.

Green Energy Project

Under this proposed project, FPL would purchase electric energy generated from new renewable resources including solar-powered technologies, biomass energy, landfill methane, wind energy, low impact hydroelectric energy, and/or other renewable resources.

2d. Real-Time Pricing

Although not part of FPL's approved DSM Plan, FPL continues to research new conservation/efficiency options such as Real-Time Pricing. This option is an experimental service offering for large C/I customers designed to evaluate customer load response to hourly marginal cost-based energy prices provided on a day-ahead basis.

3. FPL's DSM MW Goals

FPL's DSM implementation plan is designed to meet currently approved DSM goals for 2000 – 2009. The combined total residential and commercial/industrial Summer MW reduction values from FPL's DSM Goals for 2000 – 2009 are presented in Table III.C.1. These values are incremental values above the approximately 2,600 MW of DSM which has already been implemented on FPL's system through 1999.

FPL's Summer MW Reduction Goals for DSM

Year	Cumulative Summer MW
2000	122
2001	200
2002	269
2003	339
2004	410
2005	484
2006	554
2007	625
2008	697
2009	765

Table III.C.1

III.D Non-Utility Generation Additions

FPL has no incremental firm capacity purchase contracts from non-utility generating facilities which are scheduled to begin operation in the 2000-on timeframe.

Tables I.B.1 and I.B.2 present the currently contracted cogeneration/small power production facilities which are addressed in FPL's resource planning.

III.E Transmission Plan

The 2000 - 2009 transmission plan will allow for the reliable delivery of the required capacity and energy for FPL's retail and wholesale customers. The following table presents FPL's future additions of 230 KV and 500 KV proposed bulk transmission lines.

List of Proposed Power Lines
2000 – 2009

Owner	Line Terminal (From)	Line Terminal (To)	New Line Miles	Commercial In-Service Date(M0/YR)	Nominal Operating Voltage
FPL	DADE	LEVEE	4.57	Feb-00	230
FPL	AVENTURA	GREYNOLDS	2.49	Feb-00	230
FPL	BROWARD	YAMATO	2.50	Mar-00	230
FPL	BROWARD	RANCH	9.48	Jun-00	230
FPL	FLAGAMI	TURKEY POINT	1.80	Jun-00	230
FPL	SANFORD	VOLUSIA	2.60	Jun-00	230
FPL	FT. MYERS	ORANGE RIVER	2.60	Oct-00	230
FPL	CALUSA	FT. MYERS	1.60	Oct-00	230
FPL	FT MYERS	ORANGE RIVER	2.50	Dec-00	230
FPL	BROWARD	CORBETT	1.75	Jun-01	230
FPL	GREYNOLDS	LAUDANIA	6.70	Jun-01	230
FPL	POINSETT	SANFORD	45.00	Jun-01	230
FPL	POINSETT	SANFORD	45.00	Jun-01	230
FPL	BROWARD	CORBETT	10.50	Jun-03	230
FPL	YULEE	ONEIL	6.50	Jun-05	230

Table III.E.1

In addition, there will be transmission facilities needed to connect FPL's projected capacity additions to the system transmission grid. These "directly associated" transmission facilities for the projected capacity additions at FPL's existing Ft. Myers, Sanford, and Martin sites are described below. Since the projected capacity additions for 2007, 2008 and 2009 are as-yet unsited, no "directly associated" transmission facilities information is provided. This information will be provided in future Site Plan documents once a site is selected.

III.E.1 Directly Associated Transmission Facilities at Martin

The work required to integrate the incremental capacity projected to be added at Martin (from two new CT units) with the FPL grid is as follows:

I. Substation:

1. Build one collector bus with 3 breakers each to connect the CT's and the start-up transformer.
2. Add two main step-up transformers (2-200 MVA) one for each CT unit.
3. Add the start-up transformer.
4. Add bus breaker in bay #4 to connect the collector bus in between this new breaker and breaker 154.
5. Add relays and other protective equipment.

II. Transmission:

1. Construct one string bus to connect the collector and main switchyard.

MARTIN PLANT COMBUSTION TURBINES

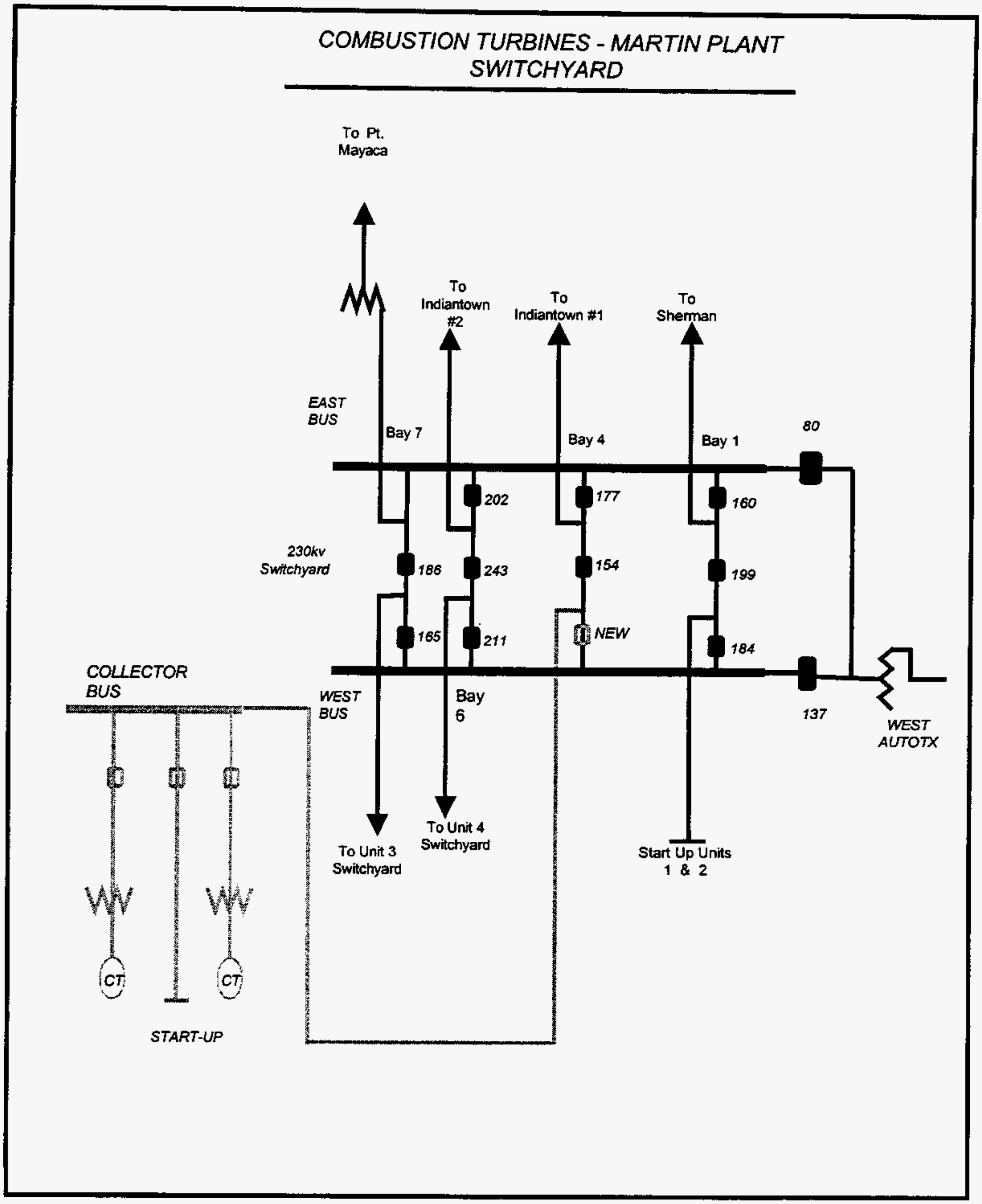


Figure III.E.1

III.E.2 Directly Associated Transmission Facilities at Ft. Myers

The work required to integrate the repowering capacity addition at Ft. Myers with the FPL grid is as follows:

I. Substation:

1. Build two collector busses with 3 breakers each to connect 3 CT's on each one. Add another breaker to one of those collector buses to connect the start-up transformer.
2. Add the six main step-up transformers (200MVA/each) one for each CT.
3. Add the start-up transformer.
4. Add a three breaker bay in the 230 kV substation to connect one of the collector buses and a new transmission line to Calusa.
5. Add a three breaker bay in the 230 kV substation to connect the other collector bus and a new transmission line to Orange River 230 kV.
6. Add a two breaker bay at Orange River 230 kV substation to connect the new line from Ft. Myers.
7. Add a two breaker bay at Calusa 230 kV substation to connect the new line from Ft. Myers.
8. Replace breakers 3 and 36 (rated 37.6kA) on bay 9N (See diagram below) with new ones rated 63 kA.
9. Add relay and other protective equipment at Ft. Myers, Orange River, and Calusa substations.

II. Transmission:

1. Build a new 230 kV line from Ft. Myers to Orange River (approximately 2.57 miles) similar to the existing circuits which are bundle 2-1431 ACSR 2580 Amps (1028 MVA) each.
2. Build a new 230 kV line from Ft. Myers to Calusa (approximately 1.58 miles) using 1431 ACSR conductor rated 1600 Amps (637 MVA).
3. Add protection and control equipment for the new lines.

FT MYERS REPOWERING PROJECT

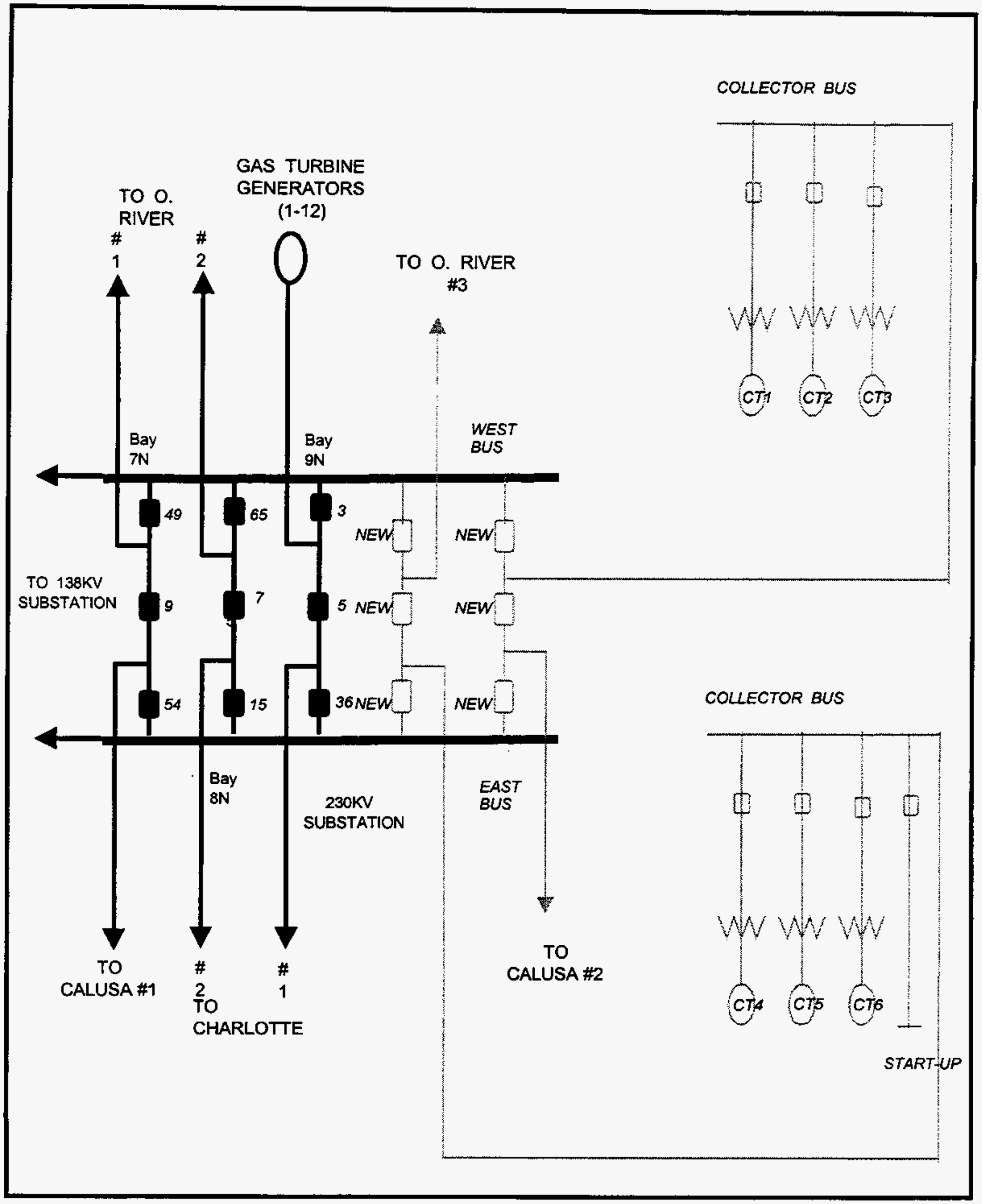


Figure III.E.2

III.E.3 Directly Associated Transmission Facilities at Sanford

The work required to integrate the repowering capacity additions at Sanford with the FPL grid is as follows:

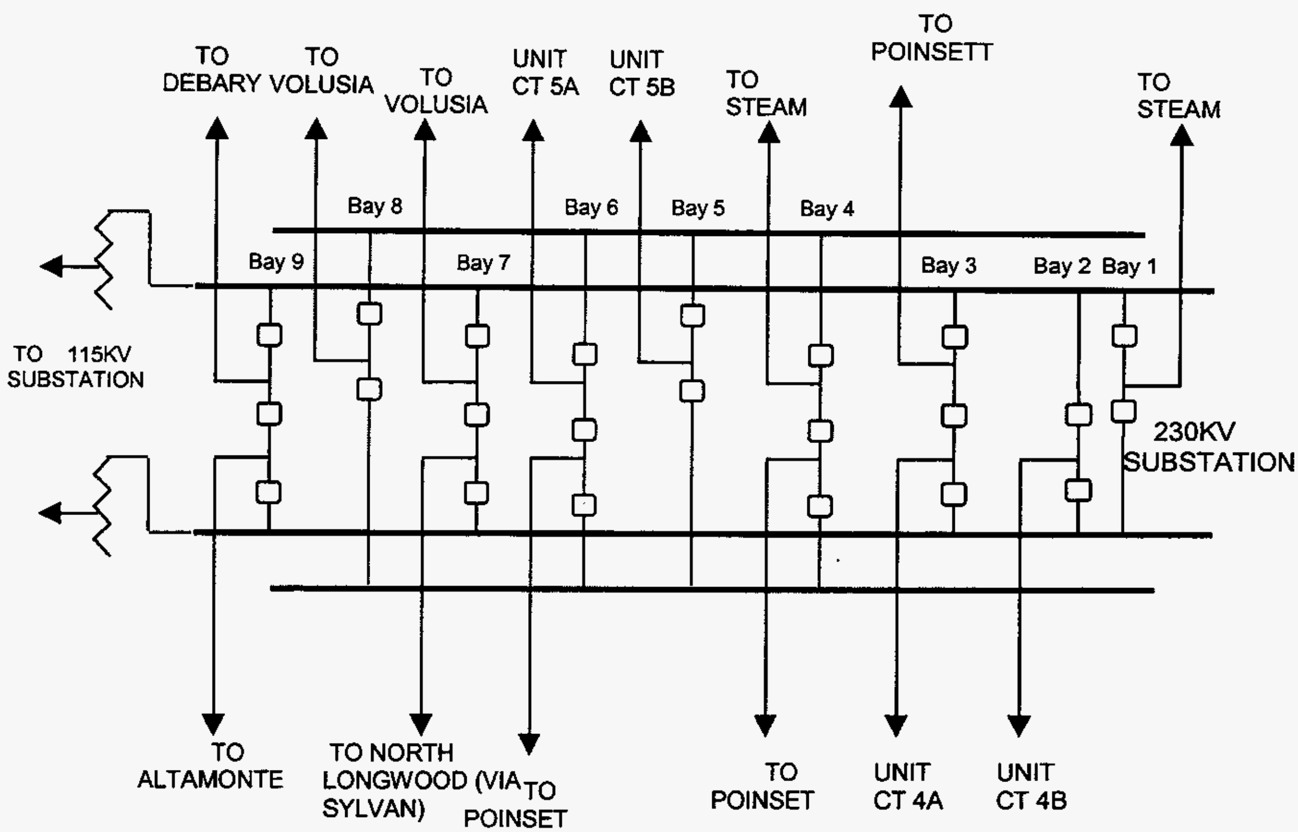
I. Substation:

1. Build four collector buses with 2 breakers each to connect 2 CT's on each one. Add another breaker to one of those collector buses to connect the start-up transformer.
2. Add the eight main step-up transformers (200MVA/each) one for each CT.
3. Add the start-up transformer.
4. Build a new substation with 1 new-three breaker bay, 1 new-two breaker bay, and using 2 existing-three breaker bays to connect 2 collector buses and the new transmission lines.
5. Build 2 new-three breaker bays and 1 new-two breaker bay at the existing substation to connect 2 collector buses.
6. Move the Volusia #2 line terminal from the existing yard to the new 230 kV yard.
7. Add a three breaker bay at Poinsett 230 kV substation to connect the new lines from Sanford.
8. Add relay and other protective equipment at Sanford and at Poinsett substations.

II. Transmission:

1. Build two new 230 kV lines from the new Sanford to Poinsett (approximately 45 miles each) with conductor rated for 1600 Amps.
2. Add protection and control equipment for the new lines.
3. Upgrade the Volusia #2 transmission line to 1475 Amps.

SANFORD REPOWERING PROJECT



•SANFORD #4 STEAM AND CT UNITS WILL BE CONNECTED TO THE INSIDE 230KV YARD

• SANFORD #5 STEAM AND CT UNITS WILL BE CONNECTED TO THE OUTSIDE 230KV YARD

Figure III.E.3

III.E.4 Directly Associated Transmission Facilities at Ft. Myers

The work required to integrate the two new CT units at Ft. Myers with the FPL grid is as follows:

I. <u>Substation:</u>

1. Build one collector bus with 2 breakers connecting a CT to each one. Add another breaker to the collector bus to connect the start-up transformer.
2. Add the two main step-up transformers (200MVA/each) one for each CT.
3. Add the start-up transformer.
4. Add two breakers at Orange River 230 kV substation to connect the new line from the Ft. Myers collector bus.
5. Replace 4 breakers at the existing Ft. Myers 230 kV switchyard.
6. Add relay and other protective equipment at Ft. Myers and Orange River substations.

II. <u>Transmission:</u>

1. Build a new 230 kV line from the Ft. Myers collector bus to Orange River (approximately 2.57 miles) similar to the existing circuits which are bundle 2-1431 ACSR 2580 Amps (1028 MVA) each.
2. Add protection and control equipment for the new line.

FT MYERS COMBUSTION TURBINES

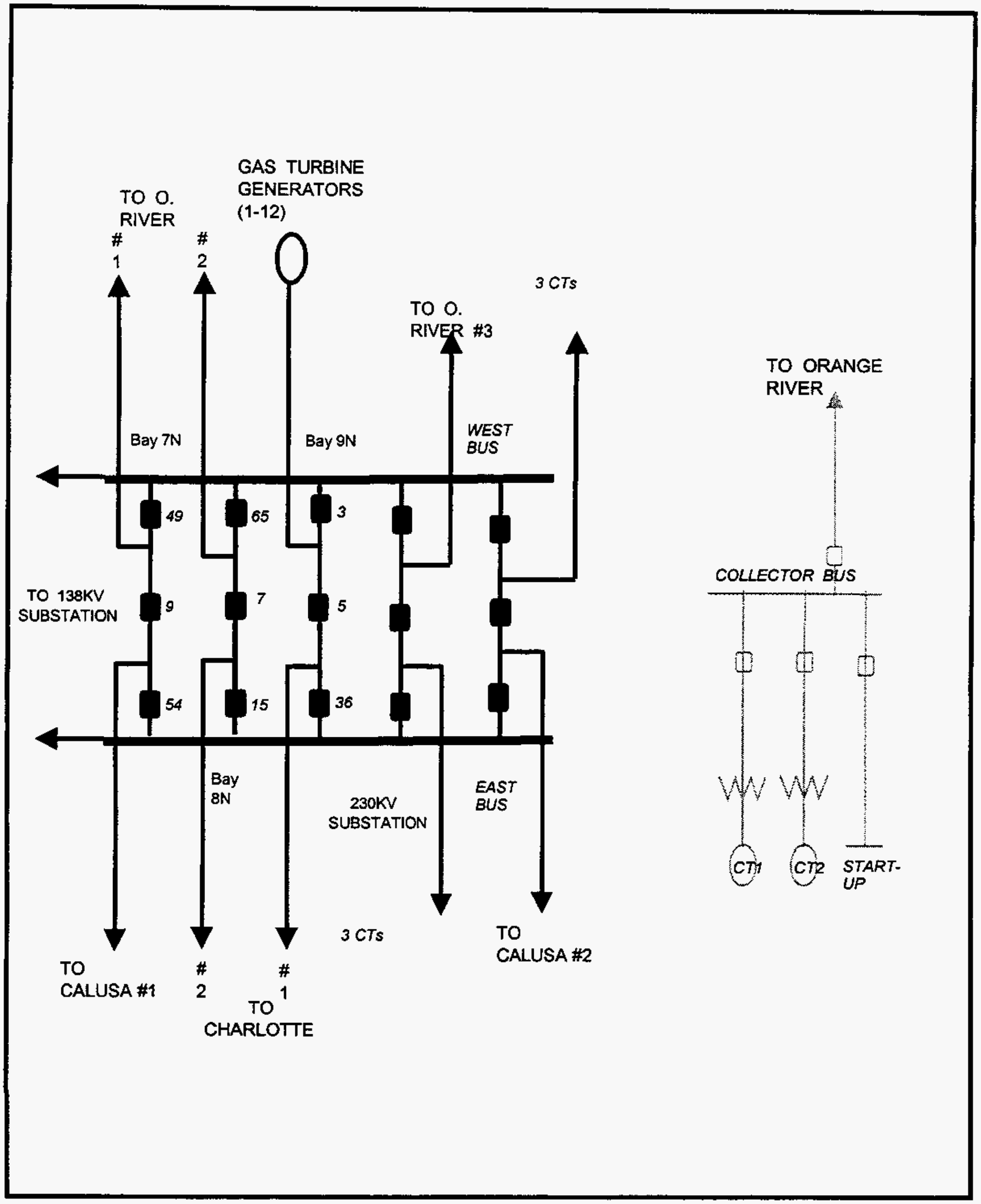


Figure III.E.4

III.E.5 Directly Associated Transmission Facilities at Martin

The work required to integrate the two new combined cycle units (Martin No. 5 and No. 6) at Martin with the FPL grid is as follows:

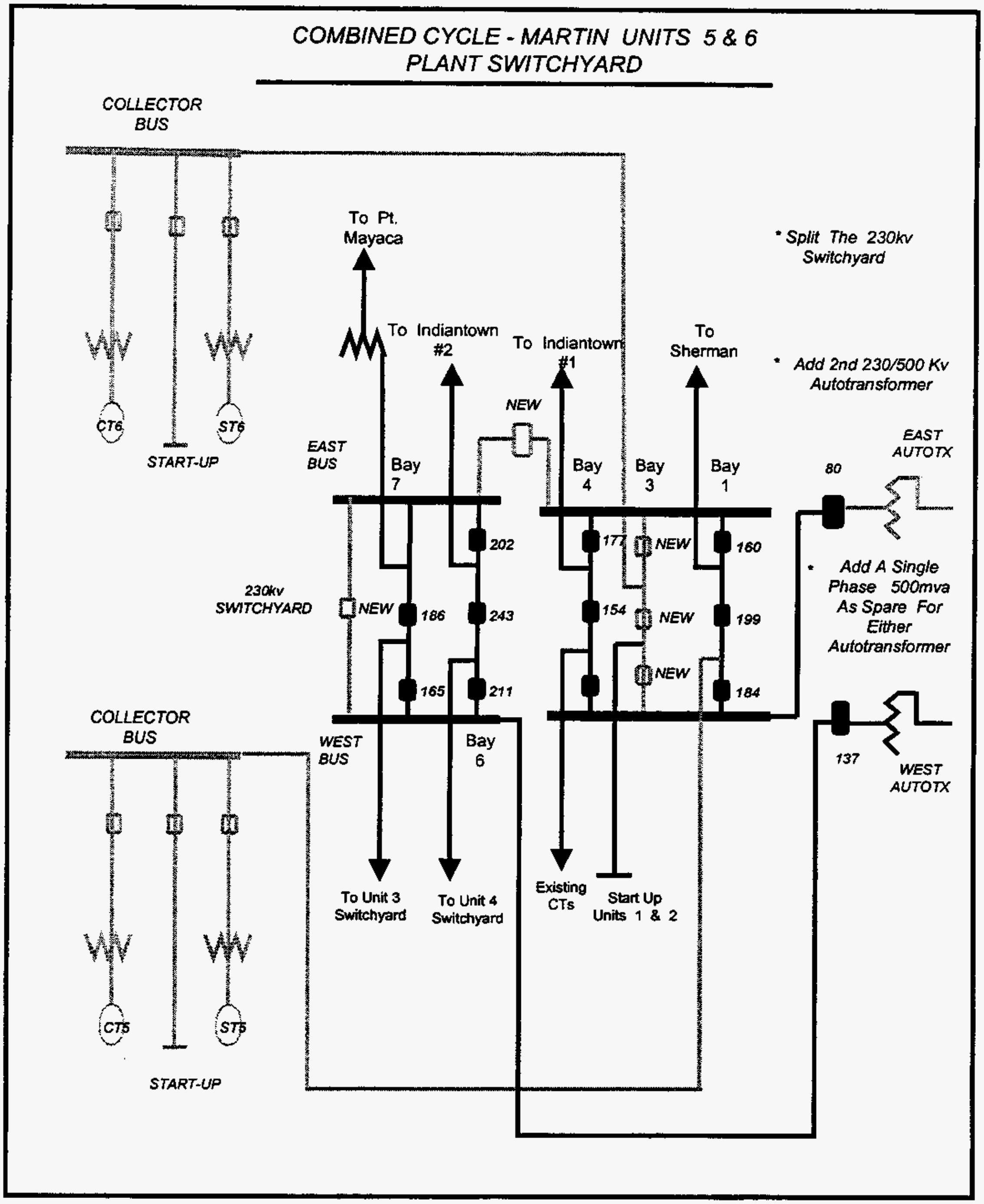
I. Substation:

1. Build two collector buses with 3 breakers each to connect the CT's, the ST units, and the start-up transformers.
2. Add the four main step-up transformers (2-400 MVA and 2-200 MVA) one for each CT and one for each ST unit.
3. Add the start-up transformers.
4. Add a new three-breaker bay (bay #3) to connect the Martin #6 collector bus and the existing start-up for units 1 & 2.
5. Connect the Martin #5 collector bus to bay #1 between breakers 199 and 184.
6. Add relays and other protective equipment.
7. Split the 230 kV bus in order to reduce fault current levels in the switchyard. This will effectively separate units 3 and 4 from the new units 5 and 6. The 500/230 kV autotransformer #1 will remain connected to the units 3 and 4 switchyard and the new autotransformer #2 will connect the units 5 and 6 switchyard to the 500 kV bus.
8. Add the second 500/230 kV autotransformer and connect it to breaker 80 and the 230 kV side which is tied to the switchyard for units 5 and 6.
9. Add a single phase 230/500 kV, 500 MVA transformer to be used as a spare for either autotransformer.
10. Add relays and other protective equipment.

II. Transmission:

1. Construct two string buses to connect the collector and main switchyards.
2. Uprate the Pratt & Whitney-Indiantown 230 kV circuit from 2020 Amps to 2520 Amps.
3. Uprate the Pratt & Whitney-Ranch 230 kV circuit from 2020 Amps to 2520 Amps.

MARTIN COMBINED CYCLE UNITS



* ALSO NEED TO UPRATE THE PRAT & WHITNEY - INDIATOWN AND PRATT& WHITNEY - RANCH 230KV LINES FROM 2020 AMPS TO 2520 AMPS.

Figure III.E.5

III.F. Renewable Resources

FPL has been the leading Florida utility in examining ways to utilize renewable energy technologies to meet its customers' current and future needs. FPL has been involved since 1976 in renewable energy research and development and in facilitating the implementation of various technologies.

FPL assisted the Florida Solar Energy Center (FSEC) in the late 1970's in demonstrating the first residential solar photovoltaic (PV) system east of the Mississippi. This PV installation at FSEC's Brevard County location was in operation for over 15 years and provided valuable information about PV performance capabilities on both a daily and annual basis in Florida. FPL later installed a second PV system at the FPL Flagami substation in Miami. This 10 kilowatt (KW) system was placed into operation in 1984. The testing of this PV installation was completed, and the system was removed in 1990 to make room for substation expansion.

For a number of years, FPL maintained a thin-film PV test facility located at the FPL Martin Plant site. The FPL PV test facility is used to test new thin-film PV technologies and to identify design, equipment, or procedure changes necessary to accommodate direct current PV facilities into the FPL system. Although this testing has ended, the site is now the home for PV capacity which was installed as a result of FPL's recent Green Pricing effort (which is discussed on the following page).

In terms of utilizing renewable energy sources to meet its customers' needs, FPL initiated the first and only utility-sponsored conservation program in Florida designed to facilitate the implementation of solar technologies by its customers. FPL's Conservation Water Heating Program, first implemented in 1982, offered incentive payments to customers choosing solar water heaters. Before the program was ended (due to the fact that it was not cost-effective), FPL paid incentives to approximately 48,000 customers who installed solar water heaters.

In the mid-1980's, FPL introduced another renewable energy program. FPL's Passive Home Program was created in order to broadly disseminate information about passive solar building design techniques which are most applicable in Florida's climate. Complete designs and construction blueprints for 6 passive homes were created by 3 Florida architectural firms with the assistance of the FSEC and FPL. These designs and blueprints were available to customers at a low cost. During its existence, this program was popular and received a U.S. Department of Energy award for innovation. The program was eventually phased out due to a revision of the Florida Model Energy Building code. This revision was brought about in part by FPL's Passive

Home Program. The revision incorporated into the Code one of the most significant passive design techniques highlighted in the program: radiant barrier insulation.

In early 1991, FPL received approval from the Florida Public Service Commission to conduct a research project to evaluate the feasibility of using small PV systems to directly power residential swimming pool pumps. This research project was completed with mixed results. Some of the performance problems identified in the test may be solvable, particularly when new pools are constructed. However, the high cost of PV, the significant percentage of sites with unacceptable shading, as well as customer satisfaction issues remain as significant barriers to wide acceptance and use of this particular solar application.

More recently, FPL has analyzed the feasibility of encouraging utilization of PV in another, potentially much larger way. FPL's approach does not require all of its customers to bear PV's high cost, but allowed customers who were interested in facilitating the use of renewable energy the means to do so. FPL's approach is to allow customers to make voluntary contributions into a separate fund, which FPL would then use to make PV purchases in bulk quantities. PV will be installed at one or more central sites and deliver PV-generated electricity directly into the FPL grid. Thus, when sunlight is available at this site(s), the PV-generated electricity will displace an equivalent amount of fossil fuel-generated electricity.

FPL's approach, which has been termed Green Pricing, was initially discussed with the FPSC in 1994. The concept was then formally presented to the FPSC as part of FPL's DSM Plan in 1995. FPL received approval from the FPSC in 1997 to proceed with Green Pricing. FPL initiated the project in 1998 and received approximately $89,000 in contributions which significantly exceeded the goal of $70,000. FPL has purchased the PV modules and has installed then at FPL's Martin plant site. FPL will further evaluate this PV concept.

Finally, FPL has also facilitated renewable energy projects (facilities which burn bagasse, waste wood, municipal waste, etc.). Firm capacity and energy, and as-available energy, have been purchased by FPL from these developers. (Please refer to Tables I.B.1 and I.B.2).

III.G FPL's Fuel Mix and Fuel Price Forecasts

1. FPL's Fuel Mix

Until the mid-1980's, FPL relied primarily on a combination of oil, natural gas, and nuclear energy to generate electricity. In 1986, coal was first added to the fuel mix, allowing FPL to meet its customers' energy needs with a more diversified mix of energy sources. Additional coal resources have been added with the acquisition (76%) of Scherer Unit # 4.

2. Fuel Price Forecasts

FPL's long-term oil price forecast assumes that worldwide demand for petroleum products will grow moderately throughout the planning horizon. Non-OPEC crude oil supply is projected to increase as new and improved drilling technology and seismic information will reduce the cost of producing crude oil and increase both recovery from existing fields and new discoveries. However, the rate of increase in non-OPEC supply is projected to be slower than that of petroleum demand, resulting in an increase in OPEC's market share throughout the planning horizon. As OPEC gains market share, prices for petroleum products are projected to increase.

FPL's natural gas price forecast assumes that domestic demand for natural gas will grow throughout the planning horizon, primarily due to increased requirements for electric generation. Domestic natural gas production will increase as new and improved drilling technology and seismic information will reduce the cost of finding, developing, and producing natural gas fields. The rate of increase in domestic natural gas production is assumed to be slower than that of demand, with the balance being supplied by increased Canadian and liquefied natural gas (LNG) imports. As demand for natural gas in Florida grows, it is anticipated that based on natural gas users' commitments, the Florida Gas Transmission pipeline system will be augmented/expanded and/or a new pipeline will be constructed to meet the growth in demand.

Schedule 5
Fuel Requirements 1/

	Fuel Requirements	Units	Actual 2/ 1998	1999	Forecasted 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
(1)	Nuclear	Trillion BTU	266	268	237	235	241	237	235	241	237	235	242	237
(2)	Coal	1,000 TON	3,241	3,107	3,903	3,663	3,447	3,030	2,976	2,994	3,034	2,708	2,602	3,424
(3)		Trillion BTU 3/												
(4)	Residual(FO6)- TOTAL	1,000 BBL	40,586	36,475	45,046	44,987	30,967	16,622	18,256	18,857	18,399	17,902	16,473	16,140
(5)	Steam	1,000 BBL	40,586	36,475	45,046	44,987	30,967	16,622	18,256	18,857	18,399	17,902	16,473	16,140
(6)	Distillate(FO2)- TOTAL	1,000 BBL	380	488	608	173	272	21	40	92	58	48	41	34
(7)	CC	1,000 BBL	30	3	0	0	0	0	1	0	0	2	5	0
(8)	CT	1,000 BBL	337	405	608	173	272	21	39	92	58	46	36	34
(9)	Steam	1,000 BBL	13	80	0	0	0	0	0	0	0	0	0	0
(10)	Natural Gas -TOTAL	1,000 MCF	195,269	193,723	172,446	185,066	258,547	57,323	363,671	361,839	382,317	396,665	406,473	411,832
(11)	Steam	1,000 MCF	67,044	73,309	21,835	22,192	17,186	8,090	8,848	8,947	8,253	7,486	7,056	7,067
(12)	CC	1,000 MCF	119,516	3,535	2,421	15,213	14,294	16,787	21,498	19,296	17,231	11,863	8,482	8,718
(13)	CT	1,000 MCF	8,709	116,879	148,190	147,661	227,067	32,446	333,325	333,596	356,833	377,316	390,935	396,047

1/ Reflects fuel requirements for FPL only.

2/ Source: A Schedules.

3/ Scherer actual coal is reported in terms of BTU's only, not in tons. However, as per the FRCC's requirements, Scherer's BTU's have been converted and reported as tons.

Schedule 6.1
Energy Sources

			Actual		Forecasted									
	Energy Sources	Units	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
(1)	Annual Energy Interchange 2/	GWH	6,850	8,180	9,424	11,582	11,490	10,925	11,385	11,459	11,055	10,255	9,752	9,615
(2)	Nuclear	GWH	24,305	24,706	23,082	22,909	23,465	23,022	22,977	23,462	23,020	22,908	23,531	23,020
(3)	Coal	GWH	6,434	6,146	7,094	6,671	6,336	5,629	5,512	5,574	5,639	5,074	4,936	6,272
(4)	Residual(FO6) -Total	GWH	25,142	22,903	28,693	28,606	19,654	10,568	11,601	11,954	11,670	11,357	10,459	10,241
(5)	Steam	GWH	25,142	22,903	28,693	28,606	19,654	10,568	11,601	11,954	11,670	11,357	10,459	10,241
(6)	Distillate(FO2) -Total	GWH	149	167	258	74	115	9	18	39	25	21	19	15
(7)	CC	GWH	22	2	0	0	0	0	1	0	0	1	4	0
(8)	CT	GWH	127	165	258	74	115	9	17	39	25	20	15	15
(9)	Steam	GWH	0	0										
(10)	Natural Gas -Total	GWH	23,778	23,098	20,305	20,095	31,043	44,913	45,102	45,178	48,798	52,312	54,648	55,898
(11)	Steam	GWH	7,032	7,038	1,924	1,957	1,504	689	755	761	697	626	590	592
(12)	CC	GWH	16,216	15,863	18,229	18,138	29,539	44,224	44,347	44,417	48,101	51,686	54,058	55,306
(13)	CT	GWH	530	197	152									
(14)	Other 3/	GWH	6,005	6,349	6,144	6,372	6,154	5,458	5,547	6,044	5,077	4,805	4,605	4,414
	Net Energy For Load 4/	GWH	92,663	91,549	95,000	96,309	98,257	100,524	102,142	103,710	105,284	106,732	107,950	109,475

1/ Source: A Schedules.

2/ The projected figures are based on estimated energy purchases from SJRPP and the Southern Companies.

3/ Represents a forecast of energy expected to be purchased from Qualifying Facilities, Independent Power Producers, etc.

4/ Net Energy For Load is Column 2 on Schedule 3.3 and Column 1 on EIA411 Form 11C.

Schedule 6.2
Energy % by Fuel Type

		Actual		Forecasted									
Energy Source	Units	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Annual Energy Interchange 2/	%	7.4	8.9	9.9	12.0	11.7	10.9	11.1	11.0	10.5	9.6	9.0	8.8
Nuclear	%	26.2	27.0	24.3	23.8	23.9	22.9	22.5	22.6	21.9	21.5	21.8	21.0
Coal	%	6.9	6.7	7.5	6.9	6.4	5.6	5.4	5.4	5.4	4.8	4.6	5.7
Residual(FO6) -Total	%	27.3	25.0	30.5	29.8	20.1	10.5	11.4	11.6	11.1	10.7	9.7	9.4
Steam	%	27.1	25.0	30.2	29.7	20.0	10.5	11.4	11.5	11.1	10.6	9.7	9.4
Distillate(FO2) -Total	%	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CC	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CT	%	0.1	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas -Total	%	25.7	25.2	21.4	20.9	31.6	44.7	44.2	43.6	46.3	49.0	50.6	51.1
Steam	%	7.6	7.7	2.0	2.0	1.5	0.7	0.7	0.7	0.7	0.6	0.5	0.5
CC	%	17.5	17.3	19.2	18.8	30.1	44.0	43.4	42.8	45.7	48.4	50.1	50.5
CT	%	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other 3/	%	6.5	6.9	6.5	6.6	6.3	5.4	5.4	5.8	4.8	4.5	4.3	4.0
		100	100	100	100	100	100	100	100	100	100	100	100

1/ Source: A Schedules.

2/ The projected figures are based on estimated energy purchases from SJRPP and the Southern Companies.

3/ Represents a forecast of energy expected to be purchased from Qualifying Facilities, Independent Power Producers, etc.

Schedule 7.1

Forecast of Capacity, Demand, and Scheduled

Maintenance At Time Of Summer Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Total Installed 1/ Capacity	Firm Capacity Import	Firm Capacity Export	Firm QF	Total Capacity Available 2/	Total Peak 3/ Demand	DSM 4/	Firm Summer Peak Demand	Reserve Margin Before Maintenance 5/		Scheduled Maintenance	Reserve Margin After Maintenance 6/	
Year	MW	MW	MW	MW	MW	MW	MW	MW	MW	% of Peak	MW	MW	% of Peak
2000	16,587	1,319	0	886	18,792	17,690	1,369	16,321	2,471	15.1	0	2,471	15.1
2001	17,799	1,319	0	886	20,004	17,926	1,468	16,458	3,546	21.5	0	3,546	21.5
2002	18,042	1,319	0	877	20,238	18,282	1,547	16,735	3,503	20.9	0	3,503	20.9
2003	19,297	1,319	0	877	21,493	18,658	1,626	17,032	4,461	26.2	0	4,461	26.2
2004	19,297	1,319	0	877	21,493	19,037	1,702	17,335	4,158	24.0	0	4,158	24.0
2005	19,297	1,319	0	867	21,483	19,446	1,782	17,664	3,819	21.6	0	3,819	21.6
2006	20,085	1,319	0	734	22,138	20,124	1,859	18,265	3,873	21.2	0	3,873	21.2
2007	20,479	1,319	0	734	22,532	20,565	1,937	18,628	3,904	21.0	0	3,904	21.0
2008	20,873	1,319	0	734	22,926	20,941	2,016	18,925	4,001	21.1	0	4,001	21.1
2009	21,267	1,319	0	683	23,269	21,366	2,091	19,275	3,994	20.7	0	3,994	20.7

1/ Capacity additions and changes projected to be in-service by June 1st are considered to be available to meet Summer peak loads which are forecasted to occur during August of the year indicated. All values are Summer net MW.

2/ Total Capacity Available=Col.(2)+Col.(3)-Col.(4)+Col.(5).

3/ These forecasted values reflect the Most Likely forecast without DSM.

4/ The MW shown represent cumulative load management capability plus incremental conservation from 1/99 - on. They are not included in total additional resources but reduce the peak load upon which Reserve Margin calculations are based.

5/ Margin (%) Before Maintenance = Col.(10)/Col.(9)

6/ Margin (%) After Maintenance =Col.(13) /Col.(9)

Schedule 7.2
Forecast of Capacity , Demand, and Scheduled
Maintenance At Time of Winter Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Total Installed 1/ Capability	Firm Capacity Import	Firm Capacity Export	Firm QF	Total Capacity Available 2/	Total Peak 3/ Demand	DSM 4/	Firm Winter Peak	Reserve Margin Before Maintenance 5/		Scheduled Maintenance	Reserve Margin After Maintenance 6/	
Year	MW	MW	MW	MW	MW	MW	MW	MW	MW	% of Peak	MW	MW	% of Peak
1999/00	17,273	1,319	0	886	19,478	18,162	1,771	16,391	3,087	18.8	0	3,087	18.8
2000/01	17,896	1,319	0	886	20,101	18,585	1,892	16,693	3,408	20.4	0	3,408	20.4
2001/02	17,899	1,319	0	886	20,104	18,983	1,957	17,026	3,078	18.1	0	3,078	18.1
2002/03	20,166	1,319	0	877	22,362	19,432	2,008	17,424	4,938	28.3	0	4,938	28.3
2003/04	20,528	1,319	0	877	22,724	19,839	2,058	17,781	4,943	27.8	0	4,943	27.8
2004/05	20,528	1,319	0	867	22,714	20,251	2,105	18,146	4,568	25.2	0	4,568	25.2
2005/06	20,528	1,319	0	734	22,581	20,666	2,157	18,509	4,072	22.0	0	4,072	22.0
2006/07	21,386	1,319	0	734	23,439	21,088	2,203	18,885	4,554	24.1	0	4,554	24.1
2007/08	21,815	1,319	0	734	23,868	21,439	2,249	19,190	4,678	24.4	0	4,678	24.4
2008/09	22,244	1,319	0	734	24,297	21,860	2,295	19,565	4,732	24.2	0	4,732	24.2

1/ Capacity additions and changes projected to be in-service by January 1st are considered to be available to meet Winter peak loads which are forecast to occur during January of the "second" year indicated. All values are Winter net MW.
2/ Total Capacity Available = Col.(2)+ Col.(3) - Col.(4)+Col.(5).
3/ These forecasted values reflect the Most Likely forecast without DSM.
4/ The MW shown represent cumulative load management capability plus incremental conservation. They are not included in total additional
5/ Margin (%) Before Maintenance = Col.(10)/Col.(9)
6/ Margin (%) After Maintenance = Col.(13) /Col.(9)

Schedule 8
Planned And Prospective Generating Facility Additions And Changes

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Fuel		Fuel Transport		Const.	Commercial	Expected	Gen. Max.	Net Capability		
Plant Name	Unit No.	Location	Unit Type	Pri.	Alt.	Pri.	Alt.	Start Mo./Yr.	In-Service Mo./Yr.	Retirement Mo./Yr.	Nameplate KW	Summer MW	Winter MW	Status
ADDITIONS														
2001														
Martin Combustion Turbines	1*	Martin County 29/29S/38E	CT	NG	FO2	PL	PL	Apr-00	Jun-01	Unknown	190,000	149	181	P
Martin Combustion Turbines	2*	Martin County 29/29S/38E	CT	NG	FO2	PL	PL	Apr-00	Jun-01	Unknown	190,000	149	181	P
2003														
Ft. Myers Combustion Turbines	13*	Lee County;35/43S/25E	CT	NG	FO2	PL	PL	Apr-02	Apr-03	Unknown	190,000	149	181	P
Ft. Myers Combustion Turbines	14*	Lee County;35/43S/25E	CT	NG	FO2	PL	PL	Apr-02	May-03	Unknown	190,000	149	181	P
2006														
Martin Combined Cycle Units	5 & 6	Martin County 29/29S/38E	CC	NG	FO2	PL	PL	Jun-04	Jun-06	Unknown	940,000	788	858	P
2007														
Unsited Combined Cycle Unit		Unknown	CC	NG	FO2	PL	PL	Jan-05	Jun-07	Unknown	470,000	394	429	P
2008														
Unsited Combined Cycle Unit		Unknown	CC	NG	FO2	PL	PL	Jan-06	Jun-08	Unknown	470,000	394	429	P
2009														
Unsited Combined Cycle Unit		Unknown	CC	NG	FO2	PL	PL	Jan-07	Jun-09	Unknown	470,000	394	429	P

* Unit No. shown are preliminary and are for reporting purposes only.

Schedule 8
Planned And Prospective Generating Facility Additions And Changes (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Fuel		Fuel Transport		Const.	Commercial	Expected	Gen. Max.	Net Capability		
	Unit		Unit					Start	In-Service	Retirement	Nameplate	Summer	Winter	
Plant Name	No.	Location	Type	Pri.	Alt.	Pri.	Alt	Mo./Yr.	Mo./Yr.	Mo./Yr.	KW	MW	MW	Status
CHANGES/UPGRADES														
2000														
Pt. Everglades	3	City of Hollywood 23/50S/42E	ST	FO6	NG	WA	PL	Mar-99	May-99	Unknown		0	15	OT
Martin	3	Martin County; 29/29S/38E	CC	NG	FO2	PL	PL	Aug-99	Nov-99	Unknown		5	30	OT
Martin	4	Martin County; 29/29S/38E	CC	NG	FO2	PL	PL	Aug-99	Nov-99	Unknown		0	30	OT
Cape Canaveral	2	Brevard County 19/24S/36F	ST	FO6	NG	WA	PL	Mar-00	May-00	Unknown		3	0	OT
Cape Canaveral	1	Brevard County 19/24S/36F	ST	FO6	NG	WA	PL	Mar-00	May-00	Unknown		10	0	OT
Manatee	1	Manatee County 18/33S/20E	ST	FO6	No	WA	No	Mar-00	May-00	Unknown		21	0	OT
Manatee	2	Manatee County 18/33S/20E	ST	FO6	No	WA	No	Mar-00	May-00	Unknown		27	0	OT
											2000 Total:	**66**	**75**	
2001														
Cape Canaveral	2	Brevard County 19/24S/36F	ST	FO6	NG	WA	PL	Mar-00	May-00	Unknown		0	3	OT
Lauderdale	4	Broward County 30/50S/42E	CC	NG	FO2	PL	PL	Nov-00	Jan-01	Unknown		10	10	OT
Lauderdale	5	Broward County 30/50S/42E	CC	NG	FO2	PL	PL	Nov-00	Jan-01	Unknown		10	10	OT
Manatee	2	Manatee County 18/33S/20E	ST	FO6	No	WA	No	Aug-00	Nov-00	Unknown		0	27	OT
Cape Canaveral	1	Brevard County 19/24S/36F	ST	FO6	NG	WA	PL	Mar-00	May-00	Unknown		0	9	OT
Manatee	1	Manatee County 18/33S/20E	ST	FO6	No	WA	No	Mar-00	May-00	Unknown		0	21	OT
Ft Myers Repowering: Initial Phase		Lee County;35/43S/25E	CC	NG	No	PL	No	Nov-00	Jan-01	Unknown		894	543	RP,U
											2001 Total:	**914**	**623**	
2002														
Sanford Repowering: Initial Phase	4	Volusia County;16/19S/30E	ST	FO6	NG	WA	PL		----	2/1/02		-390 *	0	RP
Sanford Repowering: Initial Phase	5	Volusia County;16/19S/30E	ST	FO6	NG	WA	PL		----	9/1/01		0	-394 *	RP
Sanford Repowering:Second Phase	5	Volusia County;16/19S/30E	CC	NG	No	PL	No	May-02	Jul-02	Unknown		567	0	RP
Ft. Myers GT	1-12	Lee County;35/43S/25E	GT	FO2	No	WA	No	Nov-01	Jan-02	Unknown	744,000	31	40	OT
Ft. Myers Repowering:Second Phase		Lee County;35/43S/25E	CC	NG	No	PL	No	Nov-01	Jan-02	Unknown	960,000	35	-5	RP,U
											2002 Total:	**243**	**-359**	

Schedule 8
Planned And Prospective Generating Facility Additions And Changes (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Fuel		Fuel Transport		Const.	Commercial	Expected	Gen. Max.	Net Capability		
	Unit		Unit					Start	In-Service	Retirement	Nameplate	Summer	Winter	
Plant Name	No.	Location	Type	Pri.	Alt.	Pri.	Alt	Mo./Yr.	Mo./Yr.	Mo./Yr.	KW	MW	MW	Status
CHANGES/UPGRADES														
2003														
Sanford Repowering:Second Phase	4	Volusia County;16/19S/30E	CC	NG	No	PL	No	Sep-02	Dec-02	Unknown	960,000	957	671	RP
Sanford Repowering:Second Phase	5	Volusia County;16/19S/30E	CC	NG	No	PL	No	Sep-02	Dec-02	Unknown		0	1,065	RP
Ft. Myers Repowering:Second Phase		Lee County;35/43S/25E	CC	NG	No	PL	No	Nov-02	Jan-03	Unknown		0	531	RP,U
											2003 Total:	**957**	**2,267**	

Note: The Winter Total MW value consists of all generation additions and changes achieved by January. The Summer Total MW value consists of all generation additions and changes achieved by July. All other MW will be picked up in the following year. This is done for reserve margin calculation.

All MW differences are calculated based on using 1999 IRP Submittal as the base for all other years.

* Negative values for Sanford and Ft. Myers units reflect the units being temporary out of service during that seasonal period for repowering effort.

Schedule 9

Status Report and Specifications of Proposed Generating Facilities

(1)	**Plant Name and Unit Number:**	Martin Combustion Turbines No. 1 and No. 2 *	
(2)	**Capacity**		
	a. Summer	149 MW	
	b. Winter	181 MW	
(3)	**Technology Type:**	Combustion Turbine	
(4)	**Anticipated Construction Timing**		
	a. Field construction start-date:	2000	
	b. Commercial In-service date:	2001	
(5)	**Fuel**		
	a. Primary Fuel	Natural Gas	
	b. Alternate Fuel	Distillate	
(6)	**Air Pollution and Control Strategy:**	Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate	
(7)	**Cooling Method:**	Air Coolers	
(8)	**Total Site Area:**	11,179	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)
(12)	**Projected Unit Performnace Data:**		
	Planned Outage Factor (POF):	1%	
	Forced Outage Factor (FOF):	1%	
	Equivalent Availability Factor (EAF):	98%	
	Resulting Capacity Factor (%):	Approx. 30%	(First Year)
	Average Net Operating Heat Rate (ANHOR):	10,450	Btu/kWh
(13)	**Projected Unit Financial Data **,***		
	Book Life (Years):	25	years
	Total Installed Cost (In-Service Year $/kW):	371.21	
	Direct Construction Cost ($/kW):	323.50	
	AFUDC Amount ($/kW):	47.22	
	Escalation ($/kW):	0.49	
	Fixed O&M ($/kW -Yr.):	0.72	
	Variable O&M ($/MWH):	0.59	
	K Factor:	1.6003	

* Values shown are per unit values for the two units being added. Unit numbers shown (No. 1 and No. 2) are preliminary.

** $/KW values are based on Summer capacity.

*** Fixed O&M includes capital replacement.

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1)	**Plant Name and Unit Number:** Ft. Myers Repowering		
(2)	**Capacity**		
	a. Summer	930	MW Incremental (1473 MW Total After Repowering)
	b. Winter	1,073	MW Incremental (1617 MW Total After Repowering)
(3)	**Technology Type:** Combined Cycle		
(4)	**Anticipated Construction Timing**		
	a. Field construction start-date:	1999	
	b. Commercial In-service date:	2002	
(5)	**Fuel**		
	a. Primary Fuel	Natural Gas	
	b. Alternate Fuel	None	
(6)	**Air Pollution and Control Strategy:**	Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate	
(7)	**Cooling Method:**	Air Coolers	
(8)	**Total Site Area:**	466	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)
(12)	**Projected Unit Performnace Data:**		
	Planned Outage Factor (POF):	3%	
	Forced Outage Factor (FOF):	1%	
	Equivalent Availability Factor (EAF):	96%	
	Resulting Capacity Factor (%):	96%	(First Year)
	Average Net Operating Heat Rate (ANHOR):	6,830	Btu/kWh
(13)	**Projected Unit Financial Data, *,**,*** **		
	Book Life (Years):	25	years
	Total Installed Cost (In-Service Year $/kW):	557.34	
	Direct Construction Cost ($/kW):	502.81	
	AFUDC Amount ($/kW):	48.99	
	Escalation ($/kW):	5.54	
	Fixed O&M ($/kW -Yr.):	$ 13.30	
	Variable O&M ($/MWH):	0.37	
	K Factor:	1.6511	

* $/kW values are based on incremental Summer capacity.
** Note that cost values shown do not reflect the FPL system benefits which result from efficiency improvements to the existing steam capacity at the site.
*** Fixed O&M includes capital replacement.

Schedule 9

Status Report and Specifications of Proposed Generating Facilities

(1) **Plant Name and Unit Number:** Sanford Unit 4 Repowering

(2) **Capacity**

a. Summer	566	MW Incremental (957 MW Total After Repowering)
b. Winter	671	MW Incremental (1065 MW Total After Repowering)

(3) **Technology Type:** Combined Cycle

(4) **Anticipated Construction Timing**

a. Field construction start-date:	1999
b. Commercial In-service date:	2002

(5) **Fuel**

a. Primary Fuel	Natural Gas
b. Alternate Fuel	None

(6) **Air Pollution and Control Strategy:** Dry Low Nox Combustors and Natural Gas

(7) **Cooling Method:** Cooling Pond

(8) **Total Site Area:** 1,889 Acres

(9) **Construction Status:** P (Planned)

(10) **Certification Status:** P (Planned)

(11) **Status with Federal Agencies:** P (Planned)

(12) **Projected Unit Performnace Data:**

Planned Outage Factor (POF):	3%	
Forced Outage Factor (FOF):	1%	
Equivalent Availability Factor (EAF):	96%	
Resulting Capacity Factor (%):	96%	(First Year)
Average Net Operating Heat Rate (ANHOR):	6,860	Btu/kWh

(13) **Projected Unit Financial Data *,**,*****

Book Life (Years):	25	years
Total Installed Cost (In-Service Year $/kW):	716.05	
Direct Construction Cost ($/kW):	591.33	
AFUDC Amount ($/kW):	117.40	
Escalation ($/kW):	7.32	
Fixed O&M ($/kW -Yr.):	14.25	
Variable O&M ($/MWH):	0.37	
K Factor:	1.5339	

* $/kW values are based on incremental Summer capacity.

** Note that cost values shown do not reflect the FPL system benefits which result from efficiency improvements to the existing steam capacity at the site.

*** Fixed O&M includes capital replacement.

Schedule 9

Status Report and Specifications of Proposed Generating Facilities

(1) **Plant Name and Unit Number:** Sanford Unit 5 Repowering

(2) **Capacity**

a. Summer	566	MW Incremental (957 MW Total After Repowering)
b. Winter	671	MW Incremental (1065 MW Total After Repowering)

(3) **Technology Type:** Combined Cycle

(4) **Anticipated Construction Timing**

a. Field construction start-date:	1999
b. Commercial In-service date:	2002

(5) **Fuel**

a. Primary Fuel	Natural Gas
b. Alternate Fuel	Distillate

(6) **Air Pollution and Control Strategy:** Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate

(7) **Cooling Method:** Cooling Pond

(8) **Total Site Area:** 1,889 Acres

(9) **Construction Status:** P (Planned)

(10) **Certification Status:** P (Planned)

(11) **Status with Federal Agencies:** P (Planned)

(12) **Projected Unit Performnace Data:**

Planned Outage Factor (POF):	3%	
Forced Outage Factor (FOF):	1%	
Equivalent Availability Factor (EAF):	96%	
Resulting Capacity Factor (%):	96%	(First Year)
Average Net Operating Heat Rate (ANHOR):	6,860	Btu/kWh

(13) **Projected Unit Financial Data *,**,*****

Book Life (Years):	25	years
Total Installed Cost (In-Service Year $/kW):	690.49	
Direct Construction Cost ($/kW):	591.33	
AFUDC Amount ($/kW):	91.83	
Escalation ($/kW):	7.33	
Fixed O&M ($/kW -Yr.):	14.25	(1999$)
Variable O&M ($/MWH):	0.37	(1999$)
K Factor:	1.5890	

* $/kW values are based on incremental Summer capacity.

** Note that cost values shown do not reflect the FPL system benefits which result from efficiency improvements to the existing steam capacity at the site.

*** Fixed O&M includes capital replacement.

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1) **Plant Name and Unit Number:** Ft. Myers Combustion Turbines No. 13 and No. 14 *

(2) **Capacity**

a. Summer	149	MW
b. Winter	181	MW

(3) **Technology Type:** Combustion Turbine

(4) **Anticipated Construction Timing**

a. Field construction start-date:	2002
b. Commercial In-service date:	2003

(5) **Fuel**

a. Primary Fuel	Natural Gas
b. Alternate Fuel	Distillate

(6) **Air Pollution and Control Strategy:** Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate

(7) **Cooling Method:** Air Coolers

(8)	**Total Site Area:**	466	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)

(12) **Projected Unit Performnace Data:**

Planned Outage Factor (POF):	1%	
Forced Outage Factor (FOF):	1%	
Equivalent Availability Factor (EAF):	98%	
Resulting Capacity Factor (%):	Approx. 30%	(First Year)
Average Net Operating Heat Rate (ANHOR):	10,450	Btu/kWh

(13) **Projected Unit Financial Data **,*****

Book Life (Years):	25 years
Total Installed Cost (In-Service Year $/kW):	378.76
Direct Construction Cost ($/kW):	323.50
AFUDC Amount ($/kW):	51.40
Escalation ($/kW):	3.86
Fixed O&M ($/kW -Yr.):	0.72
Variable O&M ($/MWH):	0.59
K Factor:	1.5771

* Values shown are per unit values for the two units being added. Unit numbers shown (No. 13 and No. 14) are preliminary.
** $/KW values are based on Summer capacity.
*** Fixed O&M includes capital replacement.

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1)	**Plant Name and Unit Number:** Martin No. 5 and No. 6 *		
(2)	**Capacity**		
	a. Summer	394 MW	
	b. Winter	429 MW	
(3)	**Technology Type:** Combined Cycle		
(4)	**Anticipated Construction Timing**		
	a. Field construction start-date:	2004	
	b. Commercial In-service date:	2006	
(5)	**Fuel**		
	a. Primary Fuel	Natural Gas	
	b. Alternate Fuel	Distillate	
(6)	**Air Pollution and Control Strategy:**	Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate	
(7)	**Cooling Method:**	Cooling Pond	
(8)	**Total Site Area:**	11,179	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)
(12)	**Projected Unit Performnace Data:**		
	Planned Outage Factor (POF):	3%	
	Forced Outage Factor (FOF):	1%	
	Equivalent Availability Factor (EAF):	96%	
	Resulting Capacity Factor (%):	96%	(First Year)
	Average Net Operating Heat Rate (ANHOR):	6,346	Btu/kWh
(13)	**Projected Unit Financial Data **,*****		
	Book Life (Years):	25	years
	Total Installed Cost (In-Service Year $/kW):	679.49	
	Direct Construction Cost ($/kW):	484.66	
	AFUDC Amount ($/kW):	181.21	
	Escalation ($/kW):	13.62	
	Fixed O&M ($/kW -Yr.):	12.78	
	Variable O&M ($/MWH):	0.71	
	K Factor:	1.6467	

* Values shown are per unit values for the two units being added.
** $/KW values are based on Summer capacity.
*** Fixed O&M includes capital replacement.

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1)	**Plant Name and Unit Number:** Unsited Combined Cycle		
(2)	**Capacity**		
	a. Summer	394	MW
	b. Winter	429	MW
(3)	**Technology Type:** Combined Cycle		
(4)	**Anticipated Construction Timing**		
	a. Field construction start-date:	2005	
	b. Commercial In-service date:	2007	
(5)	**Fuel**		
	a. Primary Fuel	Natural Gas	
	b. Alternate Fuel	Distillate	
(6)	**Air Pollution and Control Strategy:**	Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate	
(7)	**Cooling Method:**	Cooling Pond	
(8)	**Total Site Area:**	Unknown	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)
(12)	**Projected Unit Performnace Data:**		
	Planned Outage Factor (POF):	3%	
	Forced Outage Factor (FOF):	1%	
	Equivalent Availability Factor (EAF):	96%	
	Resulting Capacity Factor (%):	96%	(First Year)
	Average Net Operating Heat Rate (ANHOR):	6,830	Btu/kWh
(13)	**Projected Unit Financial Data *,****		
	Book Life (Years):	25	years
	Total Installed Cost (In-Service Year $/kW):	783.77	
	Direct Construction Cost ($/kW):	552.44	
	AFUDC Amount ($/kW):	203.70	
	Escalation ($/kW):	27.63	
	Fixed O&M ($/kW -Yr.):	14.61	
	Variable O&M ($/MWH):	0.5	
	K Factor:	1.6444	

* $/KW values are based on Summer capacity.
** Fixed O&M cost includes capital replacement.

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1)	**Plant Name and Unit Number:** Unsited Combined Cycle		
(2)	**Capacity**		
	a. Summer	394	MW
	b. Winter	429	MW
(3)	**Technology Type:** Combined Cycle		
(4)	**Anticipated Construction Timing**		
	a. Field construction start-date:	2006	
	b. Commercial In-service date:	2008	
(5)	**Fuel**		
	a. Primary Fuel	Natural Gas	
	b. Alternate Fuel	Distillate	
(6)	**Air Pollution and Control Strategy:**	Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate	
(7)	**Cooling Method:**	Cooling Pond	
(8)	**Total Site Area:**	Unknown	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)
(12)	**Projected Unit Performnace Data:**		
	Planned Outage Factor (POF):	3%	
	Forced Outage Factor (FOF):	1%	
	Equivalent Availability Factor (EAF):	96%	
	Resulting Capacity Factor (%):	96%	*(First Year)*
	Average Net Operating Heat Rate (ANHOR):	6,830	Btu/kWh
(13)	**Projected Unit Financial Data *,****		
	Book Life (Years):	25	years
	Total Installed Cost (In-Service Year $/kW):	798.06	
	Direct Construction Cost ($/kW):	552.44	
	AFUDC Amount ($/kW):	207.40	
	Escalation ($/kW):	38.22	
	Fixed O&M ($/kW -Yr.):	14.61	
	Variable O&M ($/MWH):	0.5	
	K Factor:	1.6444	

* $/KW values are based on Summer capacity.
** Fixed O&M cost includes capital replacement.

Schedule 9

Status Report and Specifications of Proposed Generating Facilities

(1)	**Plant Name and Unit Number:** Unsited Combined Cycle		
(2)	**Capacity**		
	a. Summer	394	MW
	b. Winter	429	MW
(3)	**Technology Type:** Combined Cycle		
(4)	**Anticipated Construction Timing**		
	a. Field construction start-date:	2007	
	b. Commercial In-service date:	2009	
(5)	**Fuel**		
	a. Primary Fuel	Natural Gas	
	b. Alternate Fuel	Distillate	
(6)	**Air Pollution and Control Strategy:**	Dry Low Nox Combustors, Natural Gas, 0.05% S. Distillate, & Water Injection on Distillate	
(7)	**Cooling Method:**	Cooling Pond	
(8)	**Total Site Area:**	Unknown	Acres
(9)	**Construction Status:**	P	(Planned)
(10)	**Certification Status:**	P	(Planned)
(11)	**Status with Federal Agencies:**	P	(Planned)
(12)	**Projected Unit Performnace Data:**		
	Planned Outage Factor (POF):	3%	
	Forced Outage Factor (FOF):	1%	
	Equivalent Availability Factor (EAF):	96%	
	Resulting Capacity Factor (%):	96%	(First Year)
	Average Net Operating Heat Rate (ANHOR):	6,830	Btu/kWh
(13)	**Projected Unit Financial Data *,****		
	Book Life (Years):	25	years
	Total Installed Cost (In-Service Year $/kW):	812.81	
	Direct Construction Cost ($/kW):	552.44	
	AFUDC Amount ($/kW):	211.23	
	Escalation ($/kW):	49.14	
	Fixed O&M ($/kW -Yr.):	14.61	
	Variable O&M ($/MWH):	0.5	
	K Factor:	1.6444	

* $/KW values are based on Summer capacity.
** Fixed O&M cost includes capital replacement.

Schedule 10
Status Report and Specifications of Proposed Directly Associated Transmission Lines

Ft. Myers Units No. 1 and No. 2 Repowering

(1)	**Point of Origin and Termination:**	From Ft. Myers - To Calusa
(2)	**Number of Lines:**	1
(3)	**Right-of-way:**	FPL Owned
(4)	**Line Length:**	1.58 miles
(5)	**Voltage:**	230 kV
(6)	**Anticipated Construction Timing:**	Start date: May 1, 2000 End Date: October 1, 2000
(7)	**Anticipated Capital Investment:**	$354,000
(8)	**Substations:**	Ft. Myers and Calusa
(9)	**Participation with Other Utilities:**	None

---

(1)	**Point of Origin and Termination:**	From Ft. Myers - To Orange River
(2)	**Number of Lines:**	1
(3)	**Right-of-way:**	FPL Owned
(4)	**Line Length:**	2.57 miles
(5)	**Voltage:**	230 kV
(6)	**Anticipated Construction Timing:**	Start date: October 1, 2000 End Date: March 31, 2001
(7)	**Anticipated Capital Investment:**	$706,750
(8)	**Substations:**	Ft. Myers and Orange River
(9)	**Participation with Other Utilities:**	None

Note: The Anticipated Capital Investment for this project is included in the Direct Construction Cost value for the Ft. Myers Repowering on Schedule 9.

Schedule 10

Status Report and Specifications of Proposed Directly Associated Transmission Lines

Sanford Unit No. 4 and No. 5 Repowering

(1)	**Point of Origin and Termination:**	From Sanford - To Poinsett
(2)	**Number of Lines:**	2
(3)	**Right-of-way:**	FPL Owned
(4)	**Line Length:**	45 miles
(5)	**Voltage:**	230 kV
(6)	**Anticipated Construction Timing:**	Start Date: January 1, 2001 End Date: December 1, 2001
(7)	**Anticipated Capital Investment:**	$20,360,000
(8)	**Substations:**	Sanford and Poinsett
(9)	**Participation with Other Utilities:**	None

Note: The Anticipated Capital Investment for this project is included in the Direct Construction Cost value for the Sanford Repowering on Schedule 9.

Schedule 10
Status Report and Specifications of Proposed Directly Associated Transmission Lines

Martin 5 & 6

(1)	**Point of Origin and Termination:**	a. Pratt & Whitney to Indiantown b. Pratt & Whitney to Ranch
(2)	**Number of Lines:**	2
(3)	**Right-of-way:**	FPL Owned
(4)	**Line Length:**	a. 8.45 b. 20.74
(5)	**Voltage:**	230 kV
(6)	**Anticipated construction Timing:**	Start Date: May 1, 2005 End Date: December 1, 2005
(7)	**Anticipated Capital Investment:**	$775,000
(8)	**Substations:**	Pratt & Whitney, Ranch, and Indiantown
(9)	**Participation with Other Utilities:**	None

Note: There are no new directly associated transmission lines required with these units. The existing lines will be upgraded to a higher current rating.

The Anticipated Capital Investment for this project is included in the Direct Construction Cost value for the Martin 5 and 6 units, on Schedule 9.

Schedule 10

Status Report and Specifications of Proposed Directly Associated Transmission Lines

Ft. Myers: 2 CTs

(1)	**Point of Origin and Termination:**	From Ft. Myers Collector bus – To Orange River
(2)	**Number of Lines:**	1
(3)	**Right-of-way:**	FPL Owned
(4)	**Line Length:**	2.5 miles
(5)	**Voltage:**	230 kV
(6)	**Anticipated Construction Timing:**	Start date: January 1, 2003 End date: December 1, 2003
(7)	**Anticipated Capital Investment:**	$1,050,000
(8)	**Substations:**	Orange River and Ft. Myers collector bus
(9)	**Participation with Other Utilities:**	None

Schedule 10
Status Report and Specifications of Proposed Directly Associated Transmission Lines

Martin: 2 CTs

(1)	**Point of Origin and Termination:**	N/A
(2)	**Number of Lines:**	N/A
(3)	**Right-of-way:**	FPL Owned
(4)	**Line Length:**	N/A
(5)	**Voltage:**	N/A
(6)	**Anticipated Construction Timing:**	Start date: N/A End date: N/A
(7)	**Anticipated Capital Investment:**	N/A
(8)	**Substations:**	N/A
(9)	**Participation with Other Utilities:**	None

CHAPTER IV

Environmental and Land Use Information

(This page is left intentionally blank.)

IV. Environmental and Land Use Information

I.V.A Protection of the Environment

FPL operates in a sensitive, temperate/sub-tropical environment containing a number of distinct ecosystems with many endangered plant and animal species. Population growth in our service area is continuing, which heightens competition for air, land, and water resources which are necessary to meet the increased demand for generation, transmission, and distribution of electricity. At the same time, residents and tourists want unspoiled natural amenities, and the general public has an expectation that large corporations such as FPL will conduct their business in an environmentally responsible manner.

Over the years FPL has gained national recognition for its commitment to meeting its customers' energy needs in harmony with the environment. For example, in 1983, FPL won the U.S. Department of the Interior Conservation Service Award and received the Florida Audubon Society Corporate Service Award in 1986. In 1998, FPL won the prestigious U.S. Cost Guard's William M. Benkert Award for demonstrating "tremendous vision and dedication to excellence in marine environmental protection." FPL's environmental protection commitment is an integral part of how it conducts business and formal corporate policies have been established to protect the environment.

I.V.B FPL's Environmental Statement

To reaffirm its commitment to conduct business in an environmentally responsible manner, FPL developed an Environmental Statement in 1992 to clearly define the Company's position. This statement reflects how FPL incorporates environmental values into all aspects of the Company's activities and serves as a framework for new environmental initiatives throughout the Company. The FPL environmental statement further establishes a long-term direction of environmental responsibility for the Company. FPL's Environmental Statement is:

> It is the Company's intent to continue to conduct its business in an environmentally responsible manner. Accordingly, Florida Power & Light Company will:
>
> - Comply with the spirit and intent, as well as the letter of, environmental laws, regulations, and standards.
> - Incorporate environmental protection and stewardship as an integral part of the design, construction, operation, and maintenance of our facilities.
> - Encourage the wise use of energy to minimize the impact on the environment.

- Communicate effectively on environmental issues.
- Conduct periodic self-evaluations, report performance, and take appropriate actions.

I.V.C Environmental Management

In order to implement the Environmental Statement, FPL established an environmental management system to direct and control the fulfillment of the organization's environmental responsibilities. A key component of the system is an Environmental Assurance Program which is discussed below. Other components include: written environmental policies and procedures, delineation of organizational responsibilities and individual accountabilities, allocation of appropriate resources for environmental compliance management (which includes reporting and corrective action when non-compliance occurs), environmental incident/emergency response, environmental risk assessment/management, environmental regulatory development and tracking, and environmental management information systems.

I.V.D Environmental Assurance Program

FPL's Environmental Assurance Program consists of activities which are designed to: evaluate environmental performance, verify compliance with Company policy as well as with legal and regulatory requirements, and communicate results to corporate management. The principal mechanism for pursuing environmental assurance is the environmental audit. An environmental audit may be defined as a management tool comprising a systematic, documented, periodic, and objective evaluation of the performance of the organization and of the specific management systems and equipment designed to protect the environment. The environmental audit's primary objectives are to: 1) facilitate management control of environmental practices; and, 2) assess compliance with existing environmental regulatory requirement and Company policies.

IV.E Environmental Communication and Facilitation

FPL is involved in many efforts to enhance environmental protection through the facilitation of environmental awareness and public education. Some of FPL's 1999 environmental outreach activities are noted in Table IV.E.1.

1999 FPL Environmental Outreach Activities

Site	*Activity*	*# of Participants (approx.)*
St. Lucie Plant	Turtle Beach Nature Trail Visitation	3,300
Riviera Plant & Ft. Myers Plant	Manatee Awareness Activities	130,000
St. Lucie Plant	Turtle Walk Participation	1,400
St. Lucie Plant	FPL Energy Encounter	42,000
Not applicable	Inquiries - 800 enviromental information line and e-mails	4,500
Martin Plant	Barley Barber Swamp Visitation	3,500

Table IV.E.1

IV.F Preferred And Potential Sites

Based upon its projection of future resource needs, FPL has identified preferred and potential sites for future generation additions. These preferred and potential sites are discussed in separate sections below.

IV.F.1 Preferred Sites

FPL has identified three preferred sites: the existing Ft. Myers plant site, the existing Sanford plant site, and the existing Martin plant site. These three sites are currently the expected known locations for the capacity additions which FPL projects to make during the 2001 – 2006 period. (Other capacity additions, in the form of new combined cycle units, will be made in 2007 through 2009 time period. Selection of sites for these later capacity additions is not yet needed and has not been made. Please see Table III.B.1). The three preferred sites are discussed below. FPL has committed to repower existing units at both its Ft. Myers and Sanford sites, to add new combustion turbine (CT) capacity at the Martin and Ft. Myers sites, and to add new combined cycle (CC) capacity at the Martin site.

Preferred Site #1: Ft. Myers Plant, Lee County

The site is located on the 460-acre Ft. Myers property. Current facilities on the site include two steam electric generating units (nominally 150 MW and 400 MW, respectively) and a bank of 12 simple-cycle combustion turbine peaking units. The site has direct access to a four-lane highway, State Road (SR) 80, and barge access is available. The nearest town is Tice which is approximately 4 miles west of the site. The City of Ft. Myers is approximately 8 miles west of the site. The Ft. Myers site has been listed as a potential or preferred site in previous FPL Ten Year Power Plant Site Plans.

FPL is planning to add new capacity by replacing the existing oil-fired Units #1 and #2 with 6 advanced natural gas-fired combustion turbines (CT's) and 6 heat recovery steam generator (HRSGs). This type of steam generation replacement is commonly called "repowering". Repowering the existing two units in this manner will produce approximately 930 additional MW during Summer conditions, and approximately 1,073 additional MW during Winter conditions, beyond what is currently projected for the existing units. The repowered facility is scheduled to be in-service in mid-2002.

In addition, two new CT's will be added at the site which will increase capacity at the site 298 MW during Summer conditions and 362 MW during Winter conditions. These CT's are scheduled to be in-service by mid-2003.

The output capability of the existing bank of 12 CT's at the site will be unaffected by the repowering project or the addition of the two new CT's. FPL completed project permitting for the repowering capacity addition in July 1999. Site construction began in July 1999. Permitting for the two new CT's is expected to begin later this year with site construction beginning in 2001.

a. and b. U.S. geological Survey (USGS) May and Proposed Facilities Layout Map

A USGS map of the Ft. Myers plant site, plus a map of the general layout of the proposed generating facilities at the site, are found at the end of this chapter.

c. Map of Site and Adjacent Areas

An overview map of the site and adjacent areas is also found at the end of this chapter. It is pertinent to note that several designations on the current South Florida Water Management District Florida Land Use, Cover, and Forms Classification System (FLUCCS) appear to be in error, or to require some clarification. For example, the freshwater marsh identified toward the western boundary of the site is actually FPL's 50-acre evaporation/percolation pond. Similarly, while there are scattered mangroves along the shore, the central mangrove area shown is not mangrove but is the FPL switchyard for that site. The improved pasture shown towards the east of the site is currently the location of a tree nursery.

d. Existing Land Uses of Site and Adjacent Areas

The land on the site is primarily dedicated to industrial use with surrounding grassy and landscaped areas. There is the previously mentioned 50-acre evaporation/percolation pond on the site. Much of the site is currently being used for either direct construction activities, or in support of the repowering project.

Lee County operates Manatee Park (approximately 5 acres) with a manatee viewing area on FPL property to the east side of the discharge canal where it adjoins the Orange River south of SR 80. This manatee viewing area provides public viewing and education about the species. FPL leases the property to the county for a nominal amount.

The adjacent land uses are light commercial and retail to the south of the property and some residential areas located toward the west. Mixed scrub with some hardwoods and wetlands, plus agriculture land, can be found to the east and further to the south. The Caloosahatchee National Wildlife Refuge is located across the Caloosahatchee River, northwest of the power plant.

e. General Environmental Features On and In the Site Vicinity

1. Natural Environment

The site is adjacent to the south bank of the Caloosahatchee River near the confluence of the Orange River and the Caloosahatchee. Much of the site is no longer in its original natural condition. However, a scattering of mangroves can be found along the river shoreline. Some mixed scrub with some hardwoods and wetlands can be found to the east and further to the south. Other than the occasional congregation of manatees noted below, FPL is not aware of any significant environmental features on the site or in the vicinity.

2. Listed Species

Construction and operation of the repowered facility, plus the new CT's at the site, are not expected to affect any rare, endangered, or threatened species. The only known listed species associated with the site are the West Indian Manatees (Trichechus manatus: Federal and State listed as Endangered) which are attracted to the warmed waters in the vicinity of the site discharge and can be found congregating in the area during cool weather.

The Florida Natural Areas Inventory (FNAI) reports the presence of the Eastern Indigo Snake (Drymarchons corais couperi: Federal and State listed as Threatened) and Tricolored Heron (Egretta tricolor: State listed as a Species of Special Concern) within a two-mile radius of the site.

3. Natural Resources of Regional Significance Status

No Natural Resource of Regional Significance is identified on the plant site in the Southwest Florida Regional Strategic Policy Plan.

4. Other Significant Features

FPL is not aware of any other significant features of the site.

f. Design Features and Mitigation Options

The design options currently being pursued for the Ft. Myers site are the repowering of the two existing oil-fired boilers with natural gas-fired CT's and HRSG's, plus the installation of two stand-alone CT's. All of this new generation equipment will be installed on the existing facility property and make effective use of existing transmission facilities and infrastructure although some transmission line upgrades will be required. Steam developed in the new HRSGs will be directed to the existing steam turbines.

Operation of the repowered Ft. Myers units is dependent upon securing a firm natural gas supply to the site which is both sufficient for fueling the electrical capacity involved and economically attractive. FPL has contracted with Florida Gas Transmission (FGT) for this fuel supply.

Mitigation options being planned for the capacity additions at Ft. Myers include: the capture and reuse of plant process water, the use of combustion technology that is inherently low in air pollutant emissions, the reduction or cessation of heavy oil barge traffic on the Caloosahatchee River, plumbing the sanition system to Lee County's system and closing the on-site septic tanks, and closing the on-site ash basins.

g. Local Government Future Land Use Designations

The Local Government Future Land Use Plan designates the major portion of the site as Public Facilities and a small area as Resource Protection. Since there are no significant environmental resources on the site, and the Resource Protection designated area appears to be the location of a current tree nursery, FPL believes that this designation is in error.

h. Site Selection Criteria and Process

For the past several years, many of FPL's existing power plant sites have been considered potentially suitable sites for new, expanded, or repowered generation. The Ft. Myers plant has been selected as a preferred site due to a combination of electrical transmission and system load factors, plus economic considerations. Environmental issues were not a deciding factor in FPL's site evaluation since none of the existing preferred and potential sites exhibit significant environmental sensitivity or other environmental issues. All of these sites are considered permittable.

i. Water Resources

The available surface water source is the Caloosahatchee River and the available groundwater source is the shallow aquifer.

j. Geological Features of Site and Adjacent Areas

The geology underlying the Ft. Myers Plant consists of Quaternary Holocene and Pleistocene undifferentiated materials. The upper part of these undifferentiated materials consists of fine-to-medium-grained quartz sand with varying percentages of shell and clay. Hardpan frequently occurs at the base of the quartz sands. The lower section consists of shell beds with interbedded limestones. Underlying the undifferentiated materials are the Pliocene Tamiami formations, the Miocene Hawthorn formation, Oligocene Suwanee Limestone, the Eocene Crystal River and Williston formations, the Avon Park Limestone, and the Lake City Limestone.

Several stratigraphic units can be differentiated based upon shallow borings drilled on the plant property. Sand with some heterogeneous fill material related to past site construction activity covers most of the surface. It is underlain by layers of clayey sand and clay to a depth of approximately 23 feet. These units mantle a thicker clay unit with numerous shell fragments that occurs from 15 feet to about 55 feet below the surface. A silty sand with a trace of clay was encountered at 55 feet near the termination depth of one deep boring on the site.

The water table at the site occurs at levels from just under the surface to about 5 feet below grade. Locally, the Surficial aquifer and surface water will generally flow toward the Caloosahatchee River. However, at the site, the intake and discharge canal will affect groundwater near the power block area. A drainage canal that borders the plant property on the west will affect groundwater flow along the western portion of the waste treatment area.

k. Projected Water Quantities For Various Uses

It is estimated that 150 gallons per minute (gpm) will be needed for industrial processing water for uses such as boiler makeup and service water. For industrial cooling (once-through cooling water), no significant increase is projected in the current 451,000 gpm usage rate.

Other facility water uses may include irrigation, potable use, etc. The total volume of these uses is estimated to be about 5 gpm.

l. Water Supply Sources By Type

For industrial processing, FPL anticipates that groundwater will be available. For cooling water, FPL plans to continue to use its existing allocation from the Caloosahatchee River.

m. Water Conservation Strategies Under Consideration

A plan to treat and recycle equipment wash water, boiler blowdown, and equipment area runoff for use as service water would reduce ground water consumption. FPL would anticipate this site being designed and classified as a wastewater zero-discharge site following the completion of the repowering work.

n. Water Discharges and Pollution Control

Heated water discharge will be dissipated using both the existing once-through cooling water system and a multi-cell cooling tower. Non-point source discharges are not anticipated to be an issue because surface water runoff is planned to be collected and used to recharge the surficial aquifer. Treating and recycling equipment wash water, boiler blowdown, and equipment area runoff will minimize industrial discharges.

o. Fuel Delivery, Storage, Waste Disposal, and Pollution Control

A combustion turbine-based repowering project, plus the addition of two new CT's, at the Ft. Myers site requires a natural gas pipeline to be installed. Florida Gas Transmission has initiated permitting to install and operate such a facility. Virtually no waste is associated with natural gas firing.

p. Air Emissions and Control Systems

A natural gas-fired facility would generally have air pollutant emissions which are substantially lower than emissions from the current oil-fired boilers. While several technologies are available for nitrogen oxide (NOx) emissions control, FPL is planning to use a dry-low-NOx combustion turbine design. In these devices, combustion is staged in order to reduce the formation of combustion-derived oxides of nitrogen. FPL has proposed NOx emission limits for this facility that will be the lowest in the state once the facility is constructed. Sulfur dioxide and particulate emissions are intrinsically low due to the lack of sulfur and solids in natural gas fuel. Carbon monoxide and volatile organic compound emissions can each be controlled via the use of efficient combustion rather than through the use of add-on control devices. Carbon dioxide emission rates associated with burning natural gas are well below those of other liquid or solid fuels. While the Ft. Myers plant site is located within 100 kilometers of a Class I area (Everglades National Park), the reduction in emissions associated with repowering is expected to improve the air quality in the area as compared to current levels. Combined cycle/combustion turbine facilities have been permitted at several locations throughout the state of Florida including near Class I areas. Dry-low-NOx combustor systems have been repeatedly demonstrated to be the Best Available Control Technology (BACT) for the control of NOx emissions for this technology pursuant to the requirements of the Clean Air Act.

q. <u>Noise Emissions and Control systems</u>

Lee County has a noise ordinance which limits noise at the receiving property line to 75 decibels. Noise emissions from the Ft. Myers project are not anticipated to approach this level based upon demonstrated noise control at similar natural gas-fired facilities (the Lauderdale plant in Broward County and the Martin plant in Martin County) and computer modeling of the anticipated noise emissions from the Ft. Myers repowered plant. FPL will undertake studies to assure that noise level associated with the new CT's comply with Lee County noise standard.

r. <u>Status of Applications</u>

FPL has applied for and received an Air Construction permit, Environmental Resource Permit, N.P.D.E.S. Industrial Wastewater Facility permit, and a wastewater connection permit from the Florida Department of Environmental Protection (FDEP). Other permits from the Florida Department of Transportation (FDOT), the U.S. Army Corps of Engineers, and Lee County have also been obtained. FPL will apply for permits for the new CT's at the appropriate time.

<u>Preferred Site #2:</u> Sanford Plant, Volusia County

The site is located on the 1,718–acre FPL Sanford property just west of Lake Monroe on the north bank of St. Johns River in Volusia County. Current facilities on the site include three steam electric generating units (one with a nominal rating of 150 MW and two with nominal ratings of 400 MW). The site is within the city limits of Debary and the community of Debary is located approximately 2 miles to the northwest. The town of Deland is approximately 4 miles west of the site. The site has direct access to a four-lane highway, SR 17-92, and barge access is available. The Sanford site has been listed as a potential or preferred site in previous Ten Year Power Plant Site Plans.

FPL plans to add new capacity at the Sanford site by replacing two existing oil-and gas-fired units with advanced natural gas-fired combustion turbines (CT's) and heat recovery steam generators (HRSGs). This type of steam generation replacement is commonly called "repowering". FPL's 1999 Site Plan reported that FPL was then planning to repower Units #3 and #4, but was also considering as an alternate the repowering of units # 4 and # 5. FPL subsequently decided to repower units # 4 and # 5. This will enable FPL to produce even more electrical output with nearly the same environment impact. This decision is reflected throughout this document (in reserve margin tables, etc.) which show the projected incremental capacity which will result from the Sanford repowering. The repowering of units # 4 and # 5 will each produce approximately 566 additional MW during Summer conditions, and approximately 671 additional MW of generation during Winter conditions, beyond the current capabilities of these units. The two repowered units # 5 and # 4 are scheduled to be in-service by mid-2002 and late-2002, respectively. The existing 150 MW unit # 3 at Sanford would be unaffected by the repowering of units # 4 and # 5.

a. and b. U.S. Geological Survey (USGS) May and Proposed Facilities Layout Map

A USGS map of the Sanford plant site, plus a map of the general layout of the proposed generating facilities at the site, are found at the end of this chapter.

c. Map of Site and Adjacent Areas

An overview map of the site and adjacent areas is also found at the end of this chapter.

d. Existing Land Uses of Site and Adjacent Areas

A large part of the property is covered by the 1,100-acre closed-cycle-cooling pond which occupies almost all of the northern portion of the site. The remainder of the site is primarily rangeland and the power plant facilities.

The surrounding land use is largely cropland and pasture. To the east of the plant there is a small residential area and some commercial/industrial land use. There are some residential areas mixed in with the agricultural areas located between the site and the St. John's River to the west. To the south is the St. Johns River and residential homes and commercial/industrial businesses are located along the south side of the river.

e. General Environmental Features On and In the Site Vicinity

1. Natural Environment

Small, scattered wooded areas can be found on the site. There are two small areas of wetland marsh on the site and a few acres of wetland forest along the riverbank. There are some wooded areas on the site, primarily upland coniferous forest. Forested and non-forested wetlands can be found to the west, adjacent to the river. Rover and wetland areas towards the northwest are designated as part of the Wekiwa River Aquatic Preserve and Wekiwa River State Preserve.

2. Listed Species

One inactive bald eagle (Haliaeetus leucocephalus: Federal and State listed as Threatened) nest has been found on the site. Bald eagles have also nested in the Lake Monroe area. There are a number of other eagle nests in the vicinity of the site, primarily along the river. The Florida Natural Areas Inventory (FNAI) reports several Scrub Jay populations (Aphelocoma coerulescens: Federal and State listed as Threatened) located in scrub vegetation to the northwest of the site. West Indian Manatees (Trichechus manatus: Federal and State listed as Endangered) have also been found in this area.

3. Natural Resources of Regional Significance Status

The Wekiwa River Aquatic Preserve extends along the St. John's River in the vicinity of the plant.

4. Other Significant Features

FPL is not aware of any other significant features of the site.

f. Design Features and Mitigation Options

The design option for the Sanford site is the repowering of two existing oil-and gas-fired boilers with natural gas-fired combustion turbines and heat recovery steam generators (HRSGs). Advanced combustion turbines can be installed on the existing facility property to make effective use of existing transmission facilities and infrastructure although some transmission line upgrades will be required. Steam produced in the new HRSGs will be directed to two of the existing steam turbines. Natural gas-fired facilities represent one of the cleanest, most efficient technologies currently available for capacity additions to FPL's system.

Mitigation options being considered in the repowering project at Sanford include the reduction in the use of ground water, the use of combustion technology that is inherently low in air pollutant emissions, reduction in the amount of solid waste generated, plumbing the sanitary waste system into the Volusia county system, and the significant reduction of oil barge traffic on the St. Johns River.

g. Local Governmental Future Land Use Designations

The site is designated as Industrial Utilities in the Local Government land use plan. The city is currently updating its Land Use Plan. It is expected that the name, but not the expected use designation, may change. Land use designation of the surrounding area is primarily agricultural. There is an area of Public Institution around Lake Monroe to the southeast and a small area of mixed use to the west along Barwick Road.

h. Site Selection Criteria and Process

The Sanford plant has been selected as a preferred site due to a combination of system load and economic factors. Environmental issues were not a deciding factor in FPL's site evaluation since none of the existing preferred and potential sites exhibit significant environmental sensitivity or other environmental issues. All are considered permittable.

i. Water Resources

For surface water supply, the available water resource is the St. John's River and / or the on-site cooling pond, which is periodically refilled from the St. John's River. For groundwater supply, the available resources are the shallow aquifer or the Floridan Aquifer.

j. Geological Features of Site and Adjacent Areas

The near-surface geology of Volusia County, like that of most of north central Florida, is represented by late Tertiary and Quaternary geologic units. Soils in the vicinity of the plant include unconsolidated Pleistocene to Recent sands, with intervening beds of shells and clay. These deposits form the reservoir for the Surficial aquifer in the county. Deposits of Pliocene or Miocene clay with some sand underlie the aquifer. These low-permeability units serve to confine groundwater under pressure in the underlying porous limestone formations of Eocene age. These formations are part of the principal hydrologic unit referred to as the Floridian Aquifer. This aquifer, the top of which generally occurs through the region at or below 100 feet, is the major source of potable groundwater in Volusia County. Two faults, one trending north-to-south, the other trending east-to west, intersect a number of miles north of the site. Downward displacement of the fault is hypothesized as being approximately 60 to 100 feet.

k. Projected Water Quantities for Various Uses

FPL has estimated that 150 gallons per minute (gpm) would be required for industrial processing purposes (boiler makeup, service water, etc.). Note that Units # 4 and # 5 both currently take their cooling water directly from an on-site FPL cooling pond. The cooling water needs for the repowered facilities are expected to increase over what is currently used, due primarily to the increased heat loading to the cooling pond that will result from operating the larger repowered units more than they have been operated in the past, the corresponding evaporative losses and resultant need to make up greater quantities of water from the St. John's River.

FPL also evaluated alternative sources of water to meet the expected needs of the site. It is anticipated that the existing off-site wells and the existing once-through cooling water system and cooling pond would continue to be used after the repowering project is completed, albeit the use of groundwater is expected to decrease significantly from past usage

.

l. Water Supply Sources by Type

The available surface water supply source is the St. Johns River. The Floridan Aquifer is an available groundwater source for service water and boiler water.

m. Water Conservation Strategies Under Consideration

A plan to treat and recycle equipment wash water, boiler blowdown, and equipment area runoff for use as service water would reduce groundwater consumption.

n. Water Discharges and Pollution Control

Heated water discharge will be dissipated using the existing once-through cooling water system and, possibly, a small cooling tower. Non-point source discharges are not anticipated to be an issue because surface water runoff is planned to be collected and reused. Industrial discharges will be minimized by treating and recycling equipment wash water, boiler blowdown, and equipment area runoff.

o. Fuel Delivery, Storage, Waste Disposal, and Pollution Control

The repowered facilities at the Sanford site would require a larger natural gas pipeline to be installed. An independent gas transmission company would permit, install, and operate such a facility. Virtually no waste is associated with natural gas firing.

p. Air Emissions and Control Systems

A natural gas-fired facility would generally have air pollutant emissions which are substantially lower than emissions from the current oil-fired boilers. While several technologies are available for nitrogen oxide (NOx) emissions control, the most appropriate candidate for the Sanford site would be a dry-low-NOx combustion turbine design type. In these types of devices, combustion is staged in order to reduce the formation of combustion-derived oxides of nitrogen. Sulfur dioxide and particulate emissions are intrinsically low, due to the lack of sulfur and solids in natural gas fuel. Carbon monoxide and volatile organic compound emissions can each be controlled via the use of efficient combustion, rather than through the use of add-on control devices. Combustion turbine/combined cycle facilities have been permitted at several locations throughout the state of Florida. Dry-low-NOx combustor systems have been repeatedly demonstrated to be the Best Available Control Technology (BACT) for the control of NOx emissions for this technology pursuant to the requirements of the Clean Air Act.

q. Noise Emissions and Control Systems

Noise emissions from the project are not anticipated to be significantly different from current levels at the existing plant. FPL will install appropriate sound attenuation devices such as insulation on high-energy piping systems in order to ensure that sound levels do not exceed allowable levels. Similar natural gas-fired facilities (the Lauderdale plant in Broward County and the Martin plant in Martin County) have been constructed and operated without exceeding allowable noise levels.

r. Status of Applications

FPL has now acquired all permits needed to commence construction. Modifications to operating permits will continue to be pursued through 2000.

Preferred Site #3: Martin Plant, Martin County

The Martin site is located approximately 40 miles northwest of West Palm Beach, 5 miles east of Lake Okeechobee, and 7 miles northwest of Indiantown in Martin County, Florida. The site is bounded on the west by the Florida East Coast Railway (FEC) and the adjacent South Florida Water Management District (SFWMD) L-65 Canal, on the south by the St. Lucie Canal (C-44 or Okeechobee Waterway), and on the northeast by SR 710 and the adjacent CSX Railroad.

The Martin site was identified in 1987 as a preferred location for development of coal gasification/combined cycle electric generation facilities and subsequent Ten Year Power Plant Site Plans have continued to identify this site as a preferred site.

The existing 2,581 MW of Summer generating capacity at FPL's Martin plant occupies a portion of the approximately 11,300-acre Martin site which is wholly owned by FPL. The generating capacity is made up of two steam units (units # 1 and # 2), plus two combined cycle units (units # 3 and # 4). The site includes a 6,800-acre cooling pond (6,500 acres of water surface and 300 acres of dike area) and approximately 300 acres for the existing power plant units and related facilities.

Two additional combined cycle units, Units # 5 and # 6, plus two combustion turbines (CT's), are projected to be added to the site. Units # 5 and # 6 are currently projected to begin operation by mid- 2006. Each of these units would add 394 MW of additional capacity during Summer conditions and 429 MW of additional capacity during Winter conditions.[2]

The two new CT's are currently projected to begin operation in mid-2001. Together, the two CT's will add 298 MW of additional capacity during Summer conditions and 362 MW of additional capacity during Winter conditions.

a) and b) U.S. Geological Survey (USGS) Map and Proposed Facilities Layout Map

A USGS map of the Martin plant site, plus a map of the general layout of the proposed generating facilities at the site, are found at the end of this chapter.

c) Map of Site and Adjacent Areas

An overview map of the site and adjacent areas is also found at the end of this chapter.

d) Existing Land Uses of Site and Adjacent Areas

A major portion of the site consists of a 6,800-acre cooling pond. The existing power plant facilities are located on approximately 300 acres. To the east of the power plant there is an area of mixed pine flatwood with a scattering of small wetlands. To the north of the reservoir there is a 1,200-acre area which has been set aside as a mitigation area. There is peninsula of wetland forest on the west side of the reservoir, the Barley Barber Swamp, which

[2] Ultimately, coal gasification facilities may be constructed and operated to supply coal-derived gas to Units #3 and #4 and/or Units #5 and #6, if economically justified. FPL currently has no plans to introduce coal gasification at the site. A retrofit to coal gasification / combined cycle would not produce additional megawatts, so it is not discussed further in this document. Up to 1,300 acres could potentially be used for Units # 5 and # 6 to accommodate the associated coal handling, coal storage, by-product handling, and storage facilities which would be constructed if coal gasification is implemented. In such a case, natural gas and/or distillate fuel coil could serve as backup fuels.

encompasses 400 acres and is preserved as a natural area. There is also a 10-kilowatt (KW) photovoltaic energy facility at the south end of this site.

e) General Environment Features On and In The Site Vicinity

1) Natural Environment

As noted above, the Barley Barber Swamp is located on the site. There is also a 1,200-acre mitigation area in the northern area of the site where wetlands and uplands have been restored. Along the south and west sides of the cooling pond is an area where the vegetation has been allowed to return to its natural state in order to serve as a wildlife corridor. FPL has preserved a Florida Panther corridor along the west side of the cooling pond. There are pine flatwoods and small scattered wetlands to the east of the plant.

2) Listed Species

Construction and operation of new units at the site are not expected to affect any rare, endangered, or threatened species. There are two active Bald Eagle (Haliaeetus leucocephalus: Federal and State listed as Threatened) nests that have been on the site for many years. The FNAI database notes a record of Eastern Indigo Snakes (Drymachon coralis coupert. Federal and state listed as Threatened) in the Barley Barber Swamp. A number of other Bald Eagle nests and sightings of Eastern Indigo Snakes are reported by the FNAI database within a two-mile radius of the site. Infrequent sightings of Florida Panther have been made in the site area.

3) Natural Resources of Regional Significance Status

The Treasure Coast Regional Planning Council lists the “FPL Preserve”, including the Barley Barber Swamp, as a Significant Regional Facility. Natural communities such as uplands and wetlands are also generically listed as Resources of Regional Significance.

4) Other significant features

FPL is not aware of any other significant features of the site.

f) Design Features and Mitigation Options

The design options are to add four additional CT’s and four HRSG’s which will comprise the Martin # 5 and # 6 units, plus two new CT’s which will operate in a stand-alone mode. Natural gas delivered via pipeline is envisioned as the fuel type for these units (with distillate serving as a backup fuel for the stand-alone CT’s.). Natural gas-fired facilities are among the cleanest, most efficient technologies currently available.

Mitigation options being considered in the addition of this capacity at the existing Martin site include the capture and reuse of plant process water and rainwater. The facility already encompasses several preserved areas where wildlife is abundant.

g) Local Government Future Land Use Designations

Local government future land use designation for the site is Public Utilities. Designations for the surrounding area are primarily Agricultural. There are also limited areas of Agricultural Ranchette, Industrial, and a small Commercial area designation. To the southeast of the property, fronting on the St. Lucie Canal, there is an area designated for Public Conservation.

h) Site Selection Criteria and Process

For the past several years, a number of FPL's existing power plant sites have been considered as potentially suitable sites for new or repowered generation. The Martin plant has been selected as a preferred site due to a combination of site, location, and economic factors.

One of the primary factors considered in power plant siting has been the availability of existing transmission and infrastructure. The availability of land, water, transmission facilities, and existing infrastructure all contribute to the selection of this site as "preferred" from a practical and an economic perspective.

i) Water Resources

Surface water resources currently used at the Martin facility include the cooling pond which takes its water from the St. Lucie canal. The available groundwater resource is the shallow aquifer which is used as a source of potable water and for service water for Units # 1 and # 2. Both of these sources are available for use with the site expansion.

j) Geological Features of Site and Adjacent Areas

FPL's Martin site is underlain by approximately 13,000 feet of sedimentary rock strata. The basement complex in this area consists of Paleozoic igneous and metamorphic rocks about which little is known due to their great depth.

Overlying the basement complex to the ground surface are sedimentary rocks and deposits that are primarily marine in origin. Below a depth of about 400 feet these rocks are predominantly limestone and dolomite. Above 400 feet the deposits are largely composed of sand, silt, or clay. The deepest formation in Martin County on which significant published data are available is the Eocene Age Avon Park. Limited information is available from wells penetrating the underlying Lake City formation. The published information on the sediments comprising the formations below the Avon Park Limestone in western Martin County is based on projections from deep wells in Okeechobee, St. Lucie, and Palm Beach counties.

k) Projected Water Quantities for Various Uses

The estimated additional quantity of water required for industrial processing is 130 gallons per minute (gpm) for uses such as boiler water and service water. FPL operates on-site water treatment systems for each of these uses. Industrial cooling water will be supplied from the on-site 6,700-acre cooling pond. Makeup water for the pond is taken from the St. Lucie canal. The current makeup water quantity to the cooling pond (approximately 4,800 gpm) is expected to be adequate for the proposed expansion. Water quantities needed for other uses such as irrigation and potable water are estimated to be approximately 5 gpm.

l) Water Supply Sources by Type

All additional capacity at the site will utilize the existing on-site cooling pond as the source of cooling water and as a heat sink for the dissipation of cooling water heat. The cooling pond operates as a "closed cycle" system in which heated water from the generating units loses its heat as it is circulated within the pond and back around to the plant intake. Makeup water to the pond is withdrawn from the St. Lucie Canal as needed to replace net evaporation and seepage losses from the pond. Such needs will comply with the existing agreement between FPL and the South Florida Water Management District (SFWMD) regarding allocation of cooling water to the pond and with SFWMD's regulations for consumptive water use.

To avoid impacts to the surficial aquifer, FPL and SFWMD have agreed that the process water for Units # 3 and # 4 can be obtained initially from the cooling pond, but upon completion of Units # 5 and # 6, process water for all four units will be obtained solely from the Floridan Aquifer via approximately 1,500-foot deep wells.

m) Water Conservation Strategies Under Consideration

A plan to treat the boiler blowdown and other equipment wash water, then recycle it for use as service water, will reduce both the ground and surface water consumption.

n) Water Discharges and Pollution Control

Heated water discharges will be dissipated in the cooling pond. Non-point source discharges are not an issue since there are none at this facility. Industrial discharges will be minimized by treating and recycling equipment wash water, boiler blowdown water, and equipment area runoff.

o) Fuel Delivery, Storage, Waste Disposal, and Pollution Control

The site is already serviced by multiple fuel delivery facilities. However, the addition of future natural gas-fired combined cycle units would require an enlargement of the existing pipeline(s), the installation of a new pipeline, or the addition of another natural gas pipeline compressor station. There are currently two natural gas supply lines into the facility, as well as an oil pipeline, which serve the existing steam boilers and combined cycle generating units. The existing natural gas line will also serve the new CT's.

p) Air Emissions and Control Systems

FPL's plan for the two new CC's (Units # 5 and # 6) are subject to "New Source Review" under Federal and state Prevention of Significant Deterioration (PSD) regulations. This review required these units to meet New Source Performance Standards (NSPS) and that Best Available Control Technology (BACT) be selected to control emissions of those pollutants emitted in excess of applicable PSD significant emission rates. The CT's will also be subject to New Source Review and PSD regulations. The primary purpose of BACT analysis is to minimize the allowable increases in air pollutants and thereby increase the potential for future economic growth without significantly degrading air quality.

Air emission rates will be limited to levels far below NSPS requirements. In addition, BACT determination was established for the following pollutants: sulfur dioxide (SO_2) , sulfuric acid mist (H_2SO_4), nitrogen oxides (NO_x), particulates (PM_{10} and TSP), carbon monoxide (CO), volatile organic compounds (VOC), lead, beryllium, mercury, and inorganic arsenic. By stipulation, the Department of Environmental Protection (DEP) has determined final BACT for Units # 3 and # 4 firing natural gas and distillate oil. Emission limitations and conditions concerning development of subsequent units at the site reflect a preliminary BACT determination for those phases to support certification of ultimate site capacity and shall be determined finally upon review of supplemental applications.

For sulfur dioxide, carbon monoxide, volatile organic compounds, fluorides, lead, beryllium, mercury, and arsenic emissions from the combined cycle Units # 3 and # 4, BACT has been determined to be of efficient design and operation of the fuel combustor in the combustion turbine and the use of low sulfur fuels, either natural gas or low sulfur oil (0.5 percent sulfur, maximum; 0.3 percent, annual average). The most effective control strategy (BACT) for particulates and sulfuric acid mist is inlet air filtering, low sulfur fuels, clean combustion, and steam injection.

For nitrogen oxide emissions, BACT for Units # 3 and # 4 has been determined to be the use of dry-low-NO_x combustors capable of achieving emissions of 25 parts-per-million (PPM) when burning natural gas and 65 PPM when burning oil, limiting oil-firing to an annual aggregate of 2,000 hours for the four combustion turbines comprising Units # 3 and # 4, and limiting allowable NO_x emissions from Units # 3 and # 4 to a total of 3,108 tons per year.

For both the new CT's and CC capacity planned to be added at Martin, FPL projects that lower emission levels to those listed above for Units # 3 and # 4 will be required.

q) Noise Emissions and Control Systems

A field survey and impact assessment of noise expected to be caused by unit construction at the site indicated that construction noise will be below current noise levels at the residents nearest the site. Noise from the operation of the new units will also be within allowable levels.

r) Status of Applications

A Site Certification application was filed in December, 1989, for the construction and operation of the Martin Coal Gasification/Combined Cycle project under the Florida Electrical Power Plant Siting Act.

On June 15, 1990, the Public Service Commission issued a Determination of Need Order for proposed Martin Units # 3 and # 4. This determination of need applies only to the first phase of the Project, or 832 MW of combined cycle generation. The Siting Board issued a Land Use Order on June 27, 1990. The Certification Hearing was held on November 5-7, 1990. As mentioned earlier, on February 12, 1991, the Governor and Cabinet, serving as the Siting Board, approved the construction and operation of natural gas-fired combined cycle Units # 3 and # 4 and determined that the Martin Site has capacity to accommodate additional combined cycle units fueled by natural gas, fuel oil, or coal-derived gas produced at the site which encompasses new units # 5 and # 6.

Since the initial certification in 1991, the certification has been modified five times to provide authorization for items such as CT testing, increasing the cooling pond elevation, incorporating changes from other permits, and incorporating a custom fuel monitoring program. For the addition of the two CT's mentioned above, FPL will seek a sixth modification to the existing site certification.

IV.F.2. Potential Sites

Three FPL-owned sites are identified as the most likely potential sites for future generation after the three preferred sites just discussed. These three sites are considered the next most likely potential sites due to considerations of space, infrastructure, and accessibility to fuel and transmission facilities. These sites are located in Brevard, Palm Beach, and Broward Counties. These sites are suitable for different capacity levels and technologies, and they will remain as potential sites pending future decisions on how best to meet the timing and magnitude of FPL's future capacity needs.[3]

Each of these potential sites offers advantages and disadvatanges relative to engineering considerations and/or costs associated with the construction and operation of feasible technologies. In addition, each potential site has different characteristics, which could require further definition and attention. For purposes of estimating water usage amounts, it is assumed that a natural gas-fired combined cycle unit would be the technology of choice for any capacity additions at the sites.

Permits are presently considered to be obtainable for all three sites, assuming measures can be taken to mitigate any particular site-specific environmental concerns. None of the sites exhibit any significant environmental constraints. The potential sites are briefly discussed below. (Note: The order in which the sites are discussed below does not reflect a relative ranking of these sites in regard to how likely it is for FPL to add capacity at the site.)

Potential Site #1: Cape Canaveral Plant, Brevard County

The site is located on the FPL Cape Canaveral property in unincorporated Brevard County. The city of Port St. Johns is located less than a mile away. The site has direct access to a four-lane highway, US 1, and barge access is available. A rail line is located near the plant. The existing facility consists of two 400 MW (nominal) steam boiler type generating units.

a) U.S. Geological Survey (USGS) Map

A USGS map of the Cape Canaveral plant site is found at the end of this chapter.

b) and c) Land Uses and Environmental Features

This site is located on the Indian River. The land is primarily dedicated to industrial use with surrounding grassy areas and a few acres of remnant pine forest. The land adjacent to the site is

[3] As has been described in former Ten-Year Power Plant Site Plans, FPL also considers a number of other sites as possible sites for future generation additions. These include the remainder of FPL's existing generation sites as well as non-FPL-owned sites located in Hardee, Highlands, Glades, and Hendry Counties.

dedicated to light commercial and residential use. There are no significant environmental features on the site.

d) and e) Water Quantities and Supply Sources

FPL projects that an increase of up to 260 gallons per minute (gpm) would be required for industrial processing use (boiler makeup, service water, etc.) It is expected that industrial cooling water needs could be met using the current 550,000 gpm once-through cooling water quantity. For industrial processing, FPL would use existing on-site wells. For industrial cooling, the Indian River would continue to be utilized.

Potential Site #2: Riviera Plant, Palm Beach County

This site is located on the FPL Riviera Plant property in Riviera Beach, Palm Beach County. The site has direct access to a four-lane highway, US 1, and barge access is available. A rail line is located near the plant. The facility currently houses two operational 300 MW (nominal) steam boiler generating units and one retired 50 MW generating unit.

a) U.S. Geological Survey (USGS) Map

A USGS map of the Riviera plant site is found at the end of this chapter.

b) and c) Land Uses and Environmental Features

The land on the site is primarily covered by the existing generation facilities with some open maintained grass areas. There is a small manatee viewing area on the site which is operated seasonally by FPL. Adjacent land uses include port facilities and associated industrial activities, as well as light commercial and residential development. The site is located on the Intracoastal Waterway near the Lake Worth Inlet.

d) and e) Water Quantities and Supply Sources

Additional industrial processing water needs are estimated to be up to 40 gallons per minute (gpm). Industrial cooling water needs are estimated to be up to 54,000 gpm using the existing once-through cooling water system. The existing municipal water supply would be used for industrial processing water if additional generating capacity is placed at Riviera. For once-through cooling water, FPL would continue to use Lake Worth as a source of water.

Potential Site #3: Port Everglades Plant, Broward County

This site is located on the 94-acre FPL Port Everglades plant site in Port Everglades, Broward County. The site has convenient access to SR 84 and Interstate 595. Currently, direct barge access is not available. A rail line is located near the plant. The existing plant consists of four steam boiler generating units: two 200 MW (nominal) and two 400 MW (nominal) sized units.

a) U.S. Geological Survey (USGS) Map

A USGS map of the Port Everglades plant site is found at the end of this chapter.

b) and c) Land Uses and Environmental Features

The land on the site is primarily industrial. The adjacent land uses are port facilities and associated industrial activities, oil storage, cruise ships, and light commercial.

d) and e) Water Quantities and Supply Sources

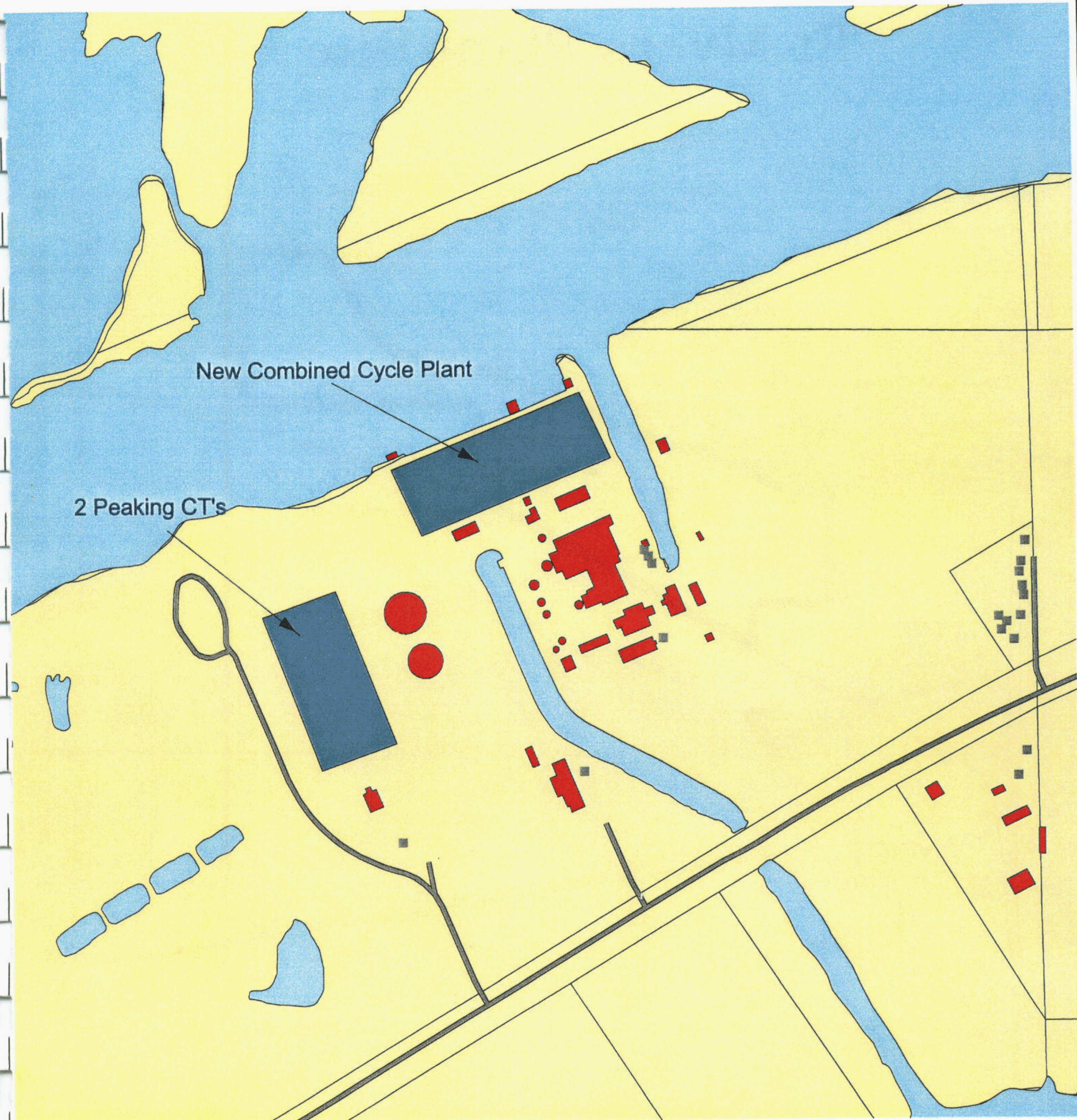
FPL estimates that up to 130 gallons per minute (gpm) of industrial processing water would be required for uses such as boiler makeup, fogger usage, and service water. FPL would expect to use the existing municipal water supply for industrial process water. For cooling water, FPL would anticipate that the existing 320,000 gpm once-through cooling seawater source would continue to be used.

(This page is left intentionally blank)

IV. Environmental and Land Use Information: Supplemental Information

Preferred Site: Ft. Myers Plant

(This page is left intentionally blank)



Fort Myers Plant Site Plan Showing Location of New Facility

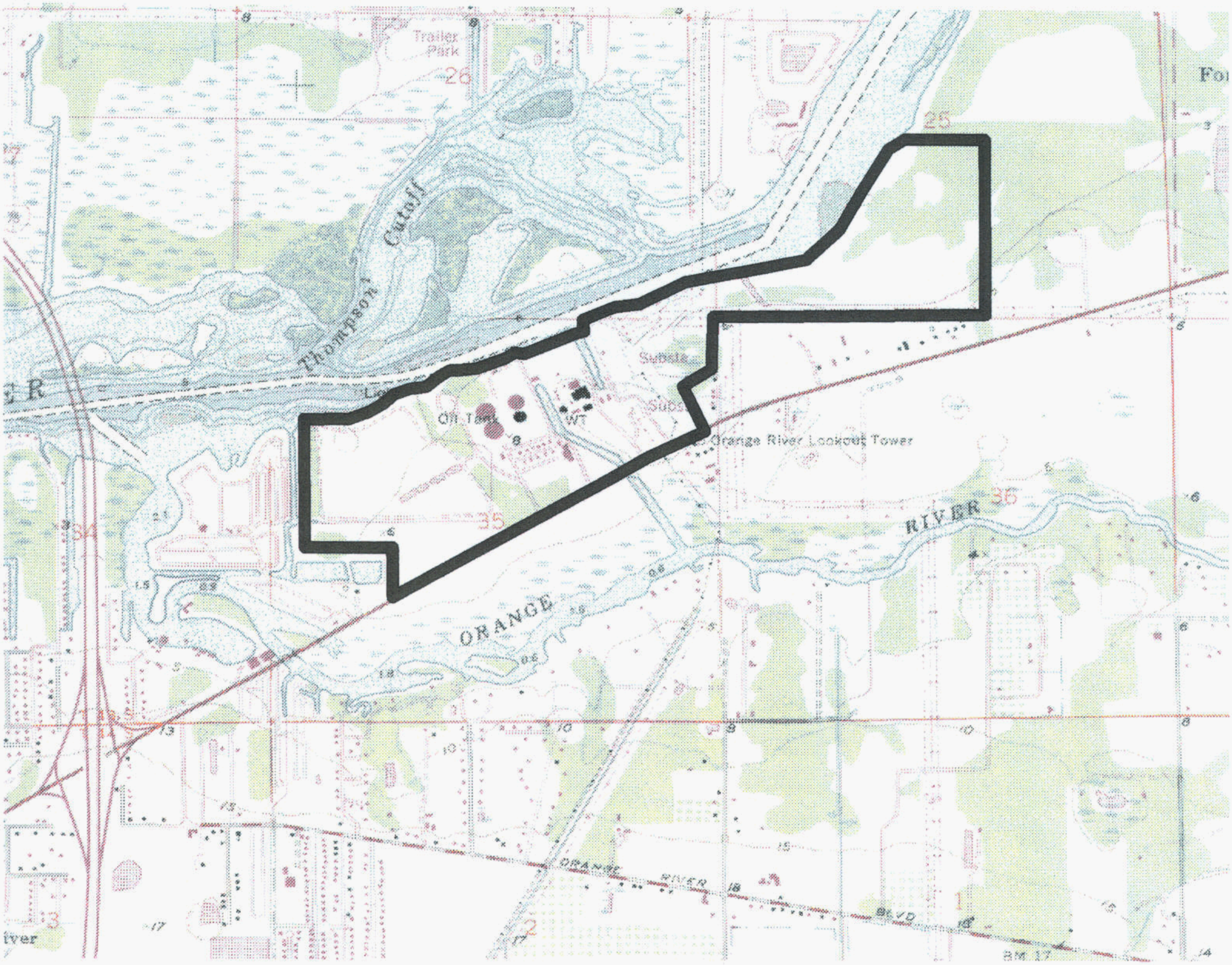
Figure IV.F.3

0.1 0 0.1 0.2 Miles

N W E S

FPL

Ft Myers Plant Site



N
W E
S

FPL

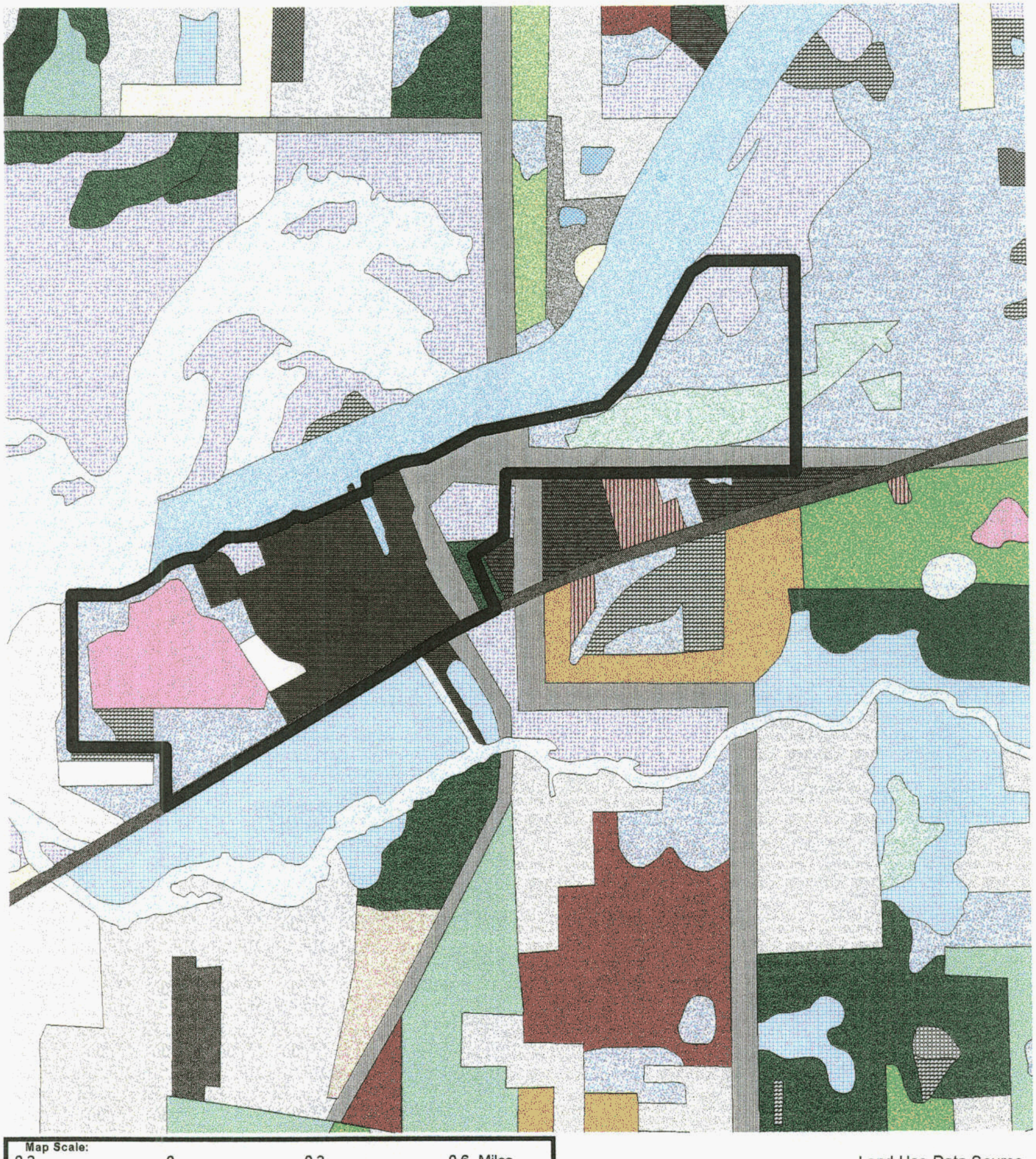
Figure IV.F.4

124

2000 0 2000 Feet

G I S

Ft. Myers Plant



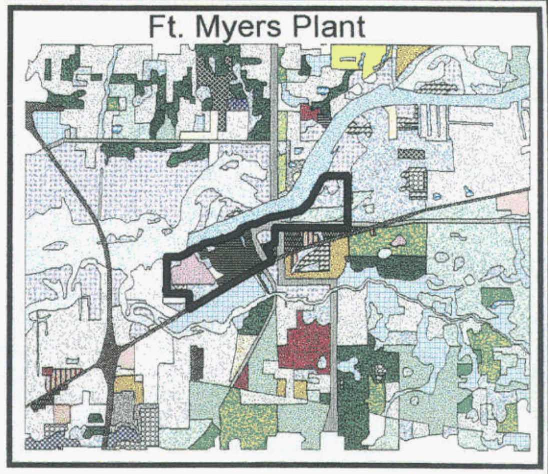
Land Use Data Source
1995 SFWMD Data level 3

FPL

N
W E
S

Figure IV.F. 1
Ft.Myers Plant
Level 3 Land Usage

G
I
S



Land Usage Legend
Level 3

- Ft Myers Plant Boundary

Surrounding Land Usage

- Mobile Homes
- Fixed Single Family Units
- Fixed Single Family Units 2-5 du/ac
- Fixed & Mobile Units
- Fixed Single Family Units
- Multiple Dwelling Units Low Rise
- Multiple Dwelling Units High Rise
- Retail Sales & Service
- Shopping Centers
- Wholesale Sales & Service
- Junkyards
- Professional Services
- Tourists Services
- Oil & Gas Storage
- Mixed Commercial & Services
- Cemeteries
- Food Processing
- Other Light Industrial
- Other Heavy Industrial
- Strip Mines
- Sand & Gravel Pits
- Rock Quarries
- Educational Facilities
- Religious
- Medical & Health Care
- Governmental
- Correctional
- Other Institutional
- Commercial Child Care
- Swimming Beach
- Golf Courses
- Marinas & Fish Camps
- Parks & Zoos
- Community Recreatioal Facilities
- Historical Sites
- Other Recreational
- Undeveloped Land Within Urban Areas
- Inactive Land W/Street Pattern
- Urban Land In Transaction
- Other Open Land
- Improved Pastures
- Unimproved Pastures
- Woodland Pastures
- Row Crops
- Field Crops
- Sugar Cane Fields
- Citrus Groves
- Tree Nurseries
- Sod Farms
- Ornamentals
- Floriculture
- Horse Farms
- Dairies
- Aquaculture
- Fallow Crop Land
- Herbaceous Rangeland
- Palametto Praries
- Coastal Scrub
- Other Scrubs & Brush
- Mixed Rangeland
- Pine Flatwoods
- Melaleuca Infested
- Longleaf Pine - Xeric Oak
- Sand Pine
- Pine - Mesic Oak

Continued Legend

- Xeric Oak
- Brazilian Pepper
- Melaleuca
- Temperate Hardwood
- Tropical Hardwoodw
- Live Oak
- Cabbage Palm
- Sand Live Oak
- Hardwood Conifer Mixed
- Austrailian Pine
- Mixed Hardwoods
- Streams & Waterways
- Lakes > or = to 500 Acres
- Lakes > or = to 10 Acres - < or = to 500 Acres
- Lakes < or = to 10 Acres
- Reservoirs > or = to 500 Acres
- Reservoirs > or = to 100 Acres - < or = to 500 Acres
- Reservoirs > or = to 10 Acres - < or = to 100 Acres
- Reservoirs < or = to 10 Acres
- Embayments Opening
- Bay Swamps
- Mangrove Swamps
- Stream & Lake Swamps
- Inland Ponds & Sloughs
- Mixed Wetland Hardwoods
- Willows
- Mixed Shrubs
- Cypress
- Cypress - w/Wet Praries
- Cypress - Pine - Cabbage - Pine
- Wetland Forested Mixed
- Freshwater Marshes
- Freshwater Sawgrass Marshes
- Freshwater Cattail Marshes
- Saltwater Marshes
- Wet Praries
- Wet Praries - with Pine
- Emergent Aquatic Vegetation
- Submergent Aquatic Vegetation
- Sand Other Than Beaches
- Rural Land In Transition
- Borrow Areas
- Spoil Areas
- Fill Areas Highways & Railways
- Airports
- Roads & Highways
- Canals & Locks
- Auto Parking Facilities
- Transmission Towers
- Communication faciiities
- Electrical Power Facilities
- Electrical Power Transmission
- Water Supply Plants
- Sewage Treatment

Land Use Data Source
1995 SFWMD Data Level 3

Figure IV.F.2

Ft. Myers Plant

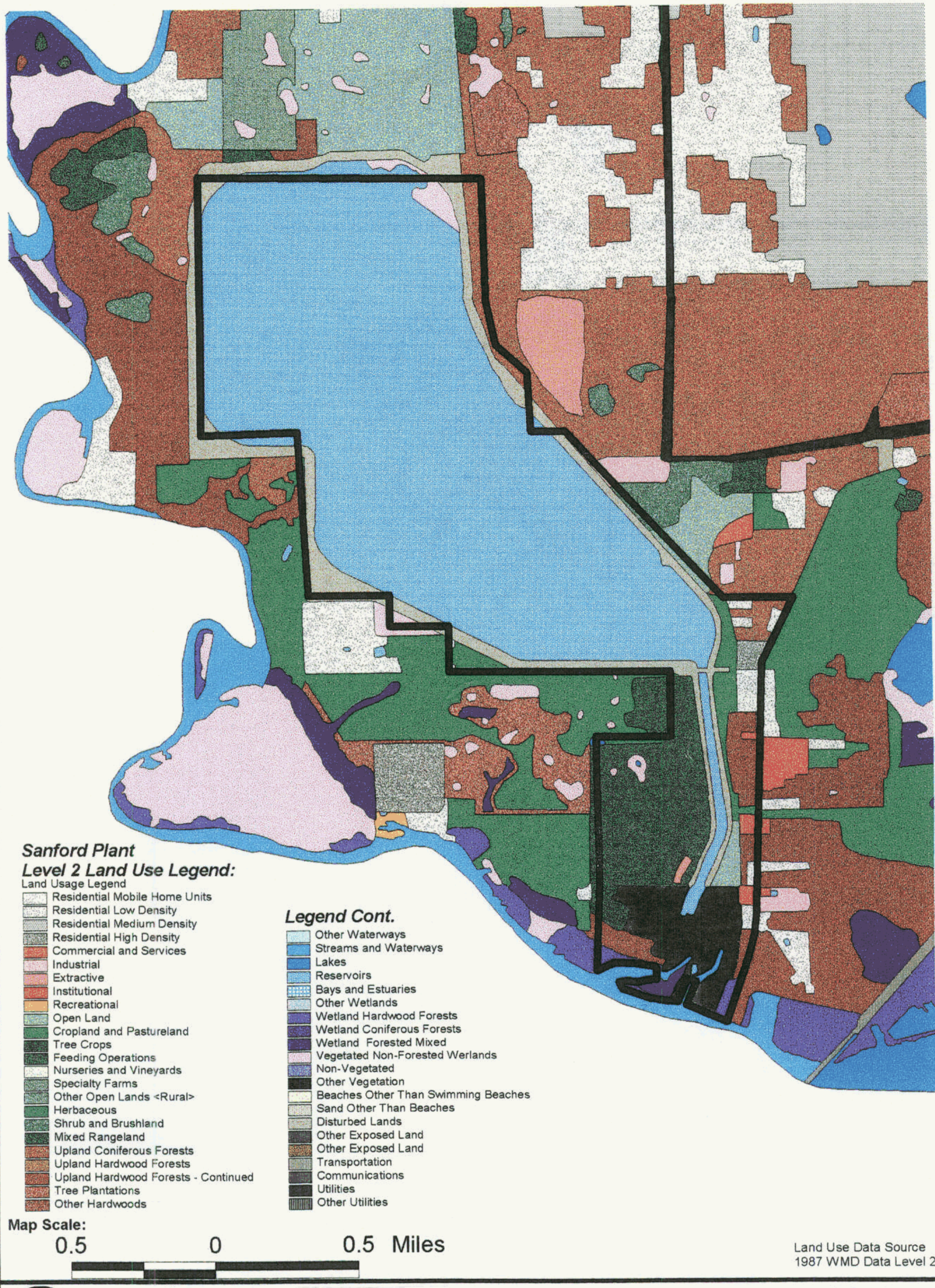
Land Usage Legend

G I S

IV. Environmental and Land Use Information: Supplemental Information

Preferred Site: Sanford Plant

(This page is left intentionally blank)



FPL

N
W E
S

Figure IV.F.5

Sanford Plant Land Use

Level 2 Land Use

Last Rervised 2/4/98

G I S

G:\landfla\pltu.apr

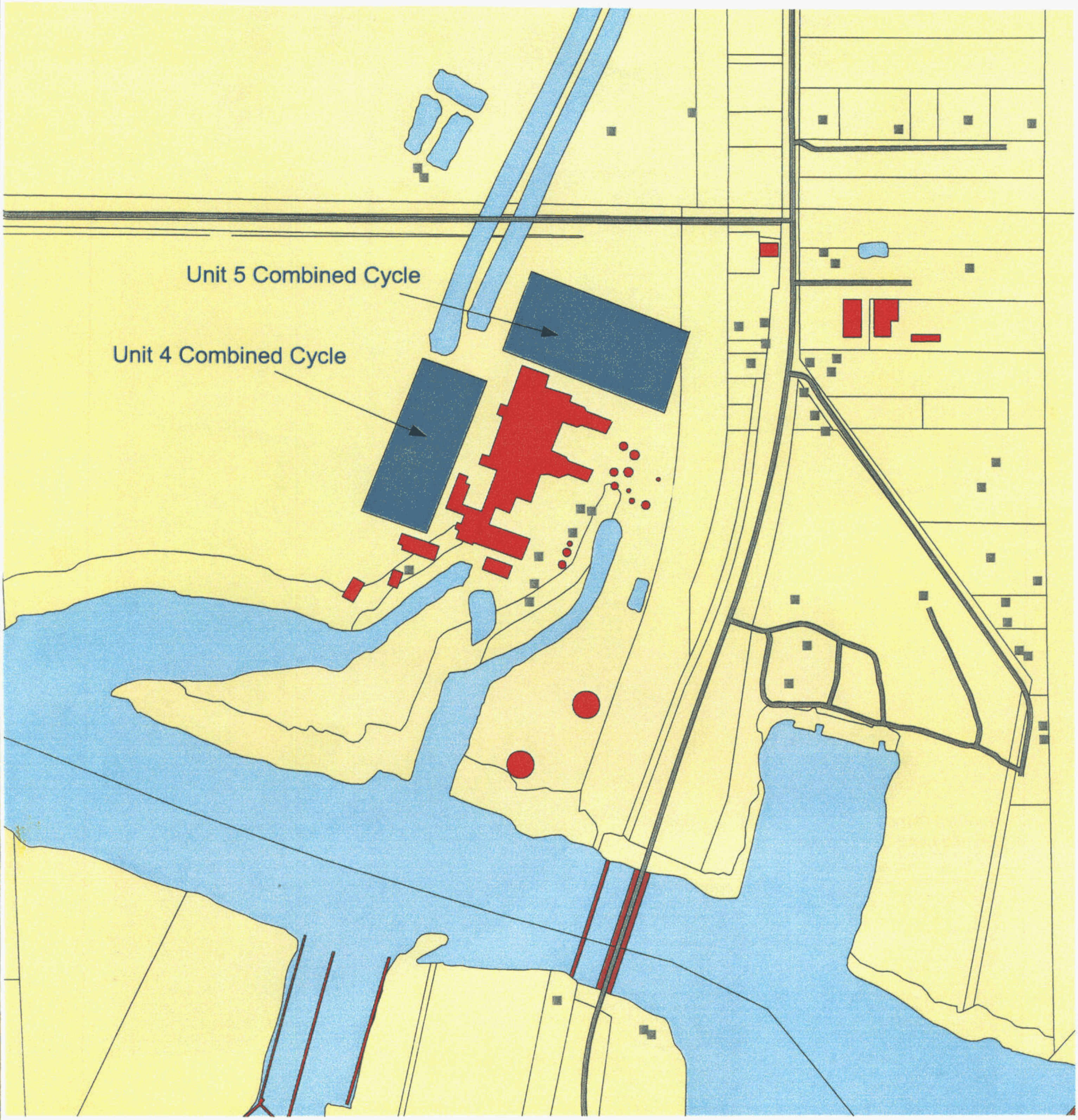


Figure IV.F.6

Sanford Plant Site Plan Showing Location of New Facility

FPL

0.1 0 0.1 0.2 Miles

N W E S

FPL Sanford Plant Site

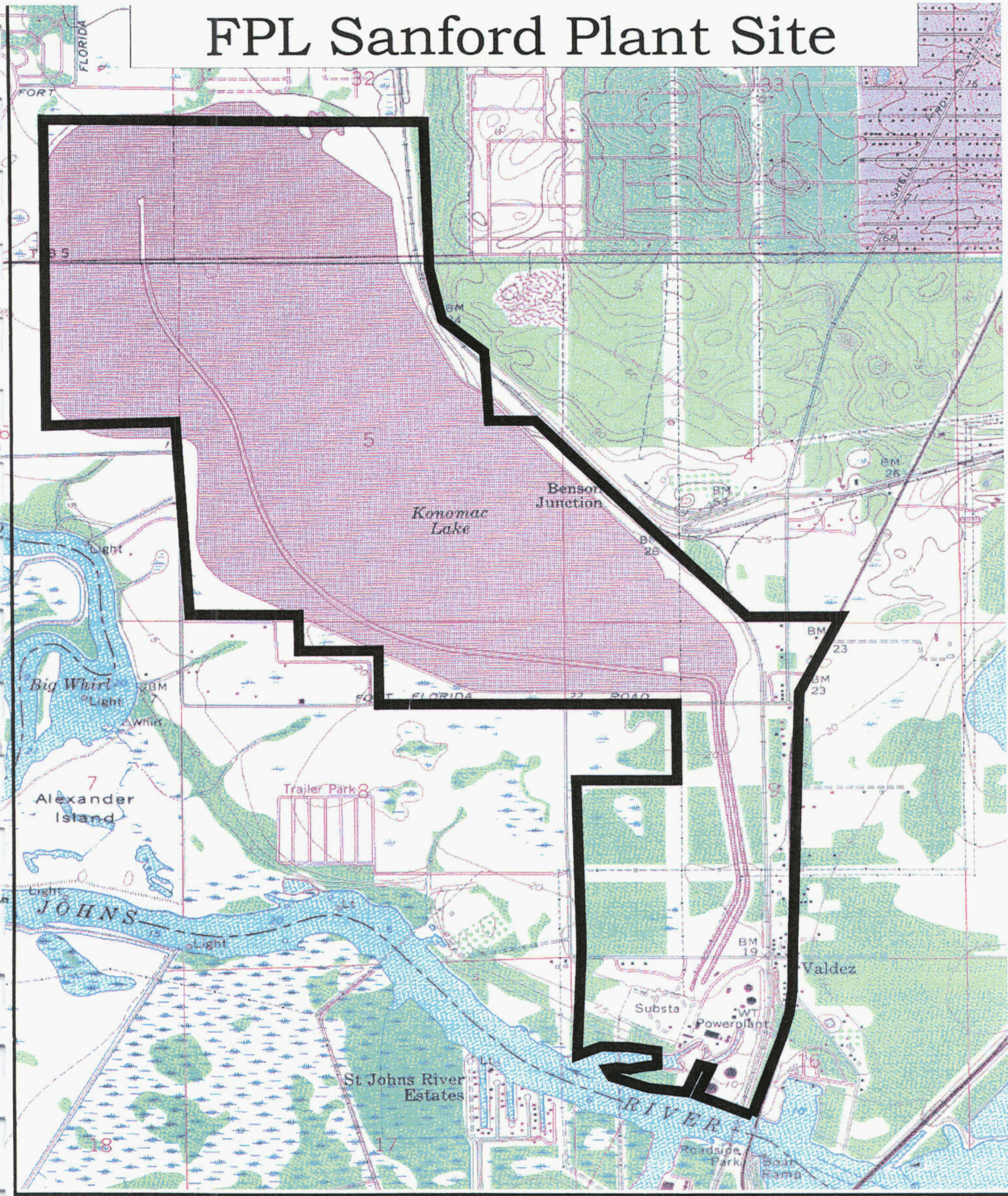


Figure IV.F.7

900 0 900 1800 Feet

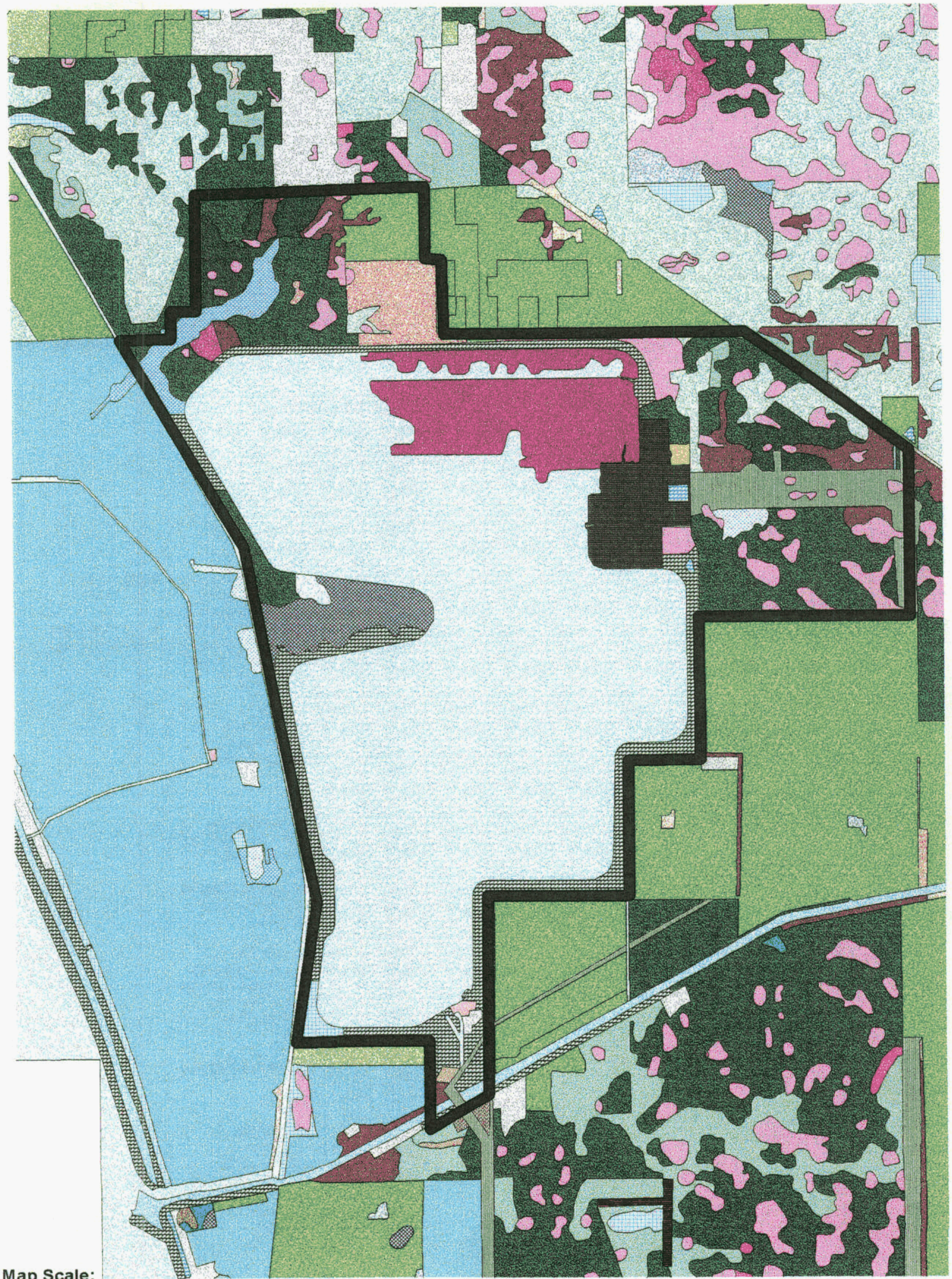
G I S

(This page is left intentionally blank)

IV. Environmental and Land Use Information: Supplemental Information

Preferred Site: Martin Plant

(This page is left intentionally blank)



Map Scale:
1 0 1 Miles

Land Use Data Source
1995 SFWMD Data Level 3

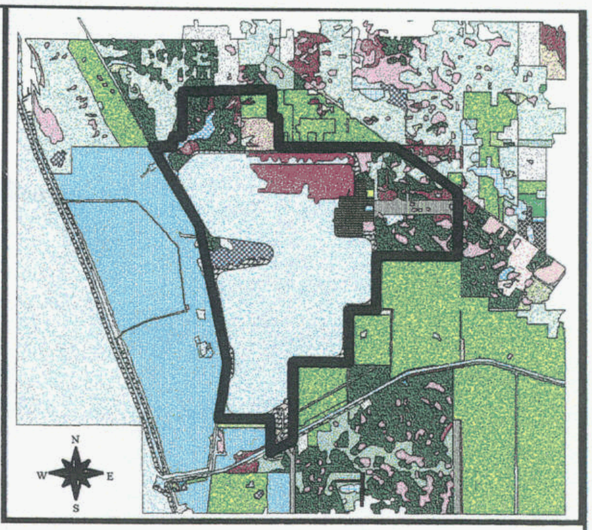
N
W E
S

FPL

Figure IV.F.8
Martin Plant Land Use
Level 3 Land Use
Last Revised 2/4/98

G I S

G:\landfla\pltu.apr



Martin Plant
Level 3 Land Use Legend:

Land Usage Legend
- Mobile Homes
- Fixed Single Family Units
- Fixed Single Family Units 2-5 du/ac
- Fixed & Mobile Units
- Fixed Single Family Units
- Multiple Dwelling Units Low Rise
- Multiple Dwelling Units High Rise
- Retail Sales & Service
- Shopping Centers
- Wholesale Sales & Service
- Junkyards
- Professional Services
- Tourists Services
- Oil & Gas Storage
- Mixed Commercial & Services
- Cemeteries
- Food Processing
- Other Light Industrial
- Other Heavy Industrial
- Strip Mines
- Sand & Gravel Pits
- Rock Quarries
- Educational Facilities
- Religious
- Medical & Health Care
- Governmental
- Correctional
- Other Institutional
- Commercial Child Care
- Swimming Beach
- Golf Courses
- Marinas & Fish Camps
- Parks & Zoos
- Community Recreational Facilities
- Historical Sites
- Other Recreational
- Undeveloped Land Within Urban Areas
- Inactive Land with Street Pattern
- Urban Land In Transaction
- Other Open Land
- Improved Pastures
- Unimproved Pastures
- Woodland Pastures
- Row Crops
- Field Crops
- Sugar Cane Fields
- Citrus Groves
- Tree Nurseries
- Sod Farms
- Ornamentals
- Floriculture
- Horse Farms
- Dairies
- Aquaculture
- Fallow Crop Land
- Herbaceous Rangeland
- Palmetto Prairies
- Coastal Scrub
- Other Scrubs & Brush
- Mixed Rangeland
- Pine Flatwoods
- Melaleuca Infested
- Longleaf Pine - Xeric Oak
- Sand Pine
- Pine - Mesic Oak
- Xeric Oak
- Brazilian Pepper
- Melaleuca
- Temperate Hardwood

Legend Cont.

- Tropical Hardwood
- Live Oak
- Cabbage Palm
- Sand Live Oak
- Hardwood Conifer Mixed
- Austrailian Pine
- Mixed Hardwoods
- Streams & Waterways
- Lakes > or = to 500 Acres
- Lakes > or = to 10 Acres - < or = to 500 Acres
- Lakes < or = to 10 Acres
- Reservoirs > or = to 500 Acres
- Reservoirs > or = to 100 Acres - < or = to 500 Acres
- Reservoirs > or = to 10 Acres - < or = to 100 Acres
- Reservoirs < or = to 10 Acres
- Embayments Opening
- Bay Swamps
- Mangrove Swamps
- Stream & Lake Swamps
- Inland Ponds & Sloughs
- Mixed Wetland Hardwoods
- Willows
- Mixed Shrubs
- Cypress
- Cypress - with Wet Prairies
- Cypress - Pine - Cabbage - Pine
- Wetland Forested Mixed
- Freshwater Marshes
- Freshwater Sawgrass Marshes
- Freshwater Cattail Marshes
- Saltwater Marshes
- Wet Prairies
- Wet Prairies - with Pine
- Emergent Aquatic Vegetation
- Submergent Aquatic Vegetation
- Sand Other Than Beaches
- Rural Land In Transition
- Borrow Areas
- Spoil Areas
- Fill Areas Highways & Railways
- Airports
- Roads & Highways
- Canals & Locks
- Auto Parking Facilities
- Transmission Towers
- Communication Facilities
- Electrical Power Facilities
- Electrical Power Transmission
- Water Supply Plants
- Sewage Treatment

Land Use Data Source
1995 SFWMD Data Level 3

FPL

Figure IV.F.9
Martin Plant Land Use
Level 3 Land Use Legend
Last Revised 2/4/98

G I S

G:\land\fla\pltlu.apr

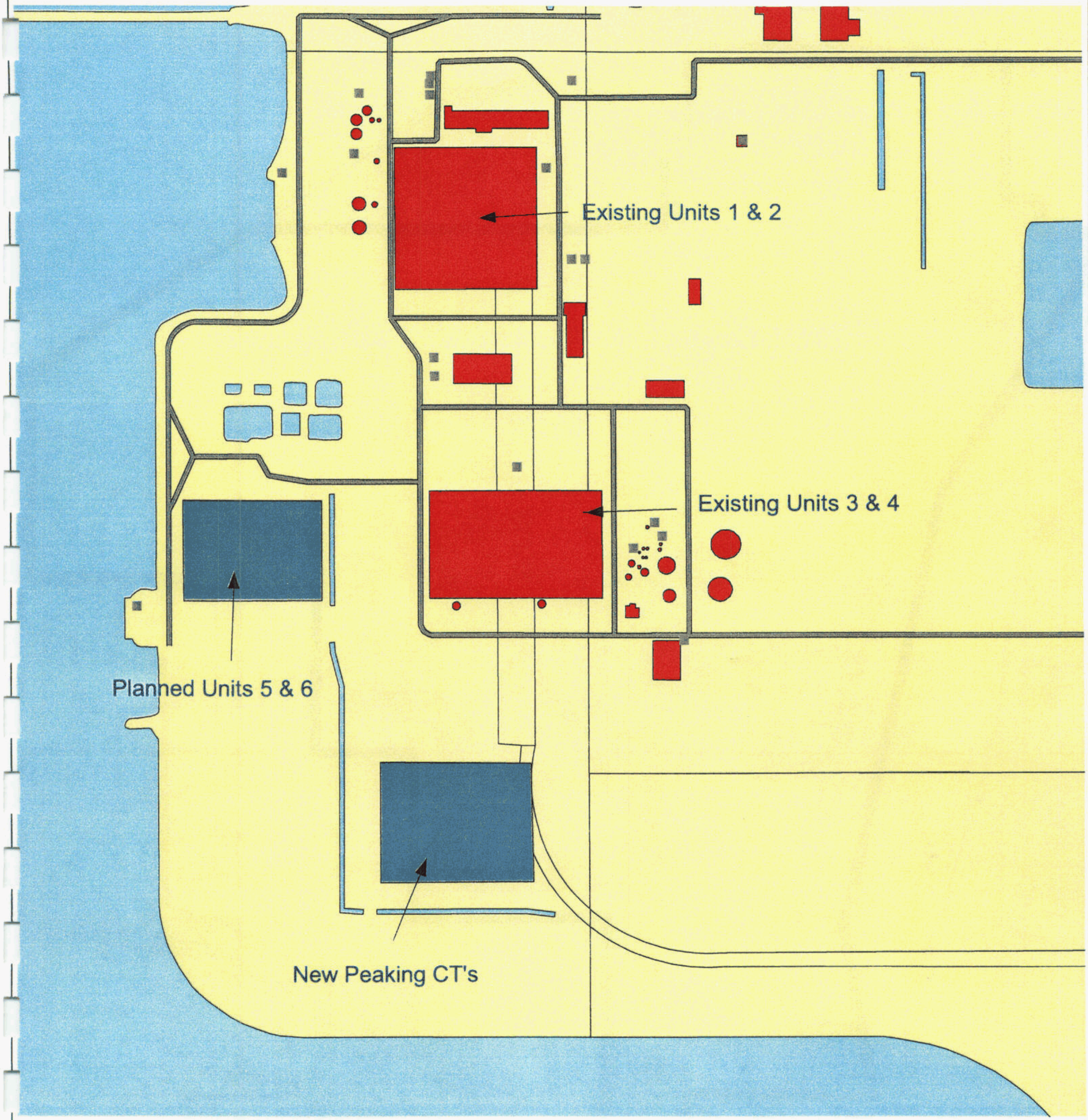


Figure IV.F.10

Martin Plant Site Plan
Showing Location of New Facility

FPL

0.1 0 0.1 0.2 Miles

N
W E
S

FPL Martin Plant Site

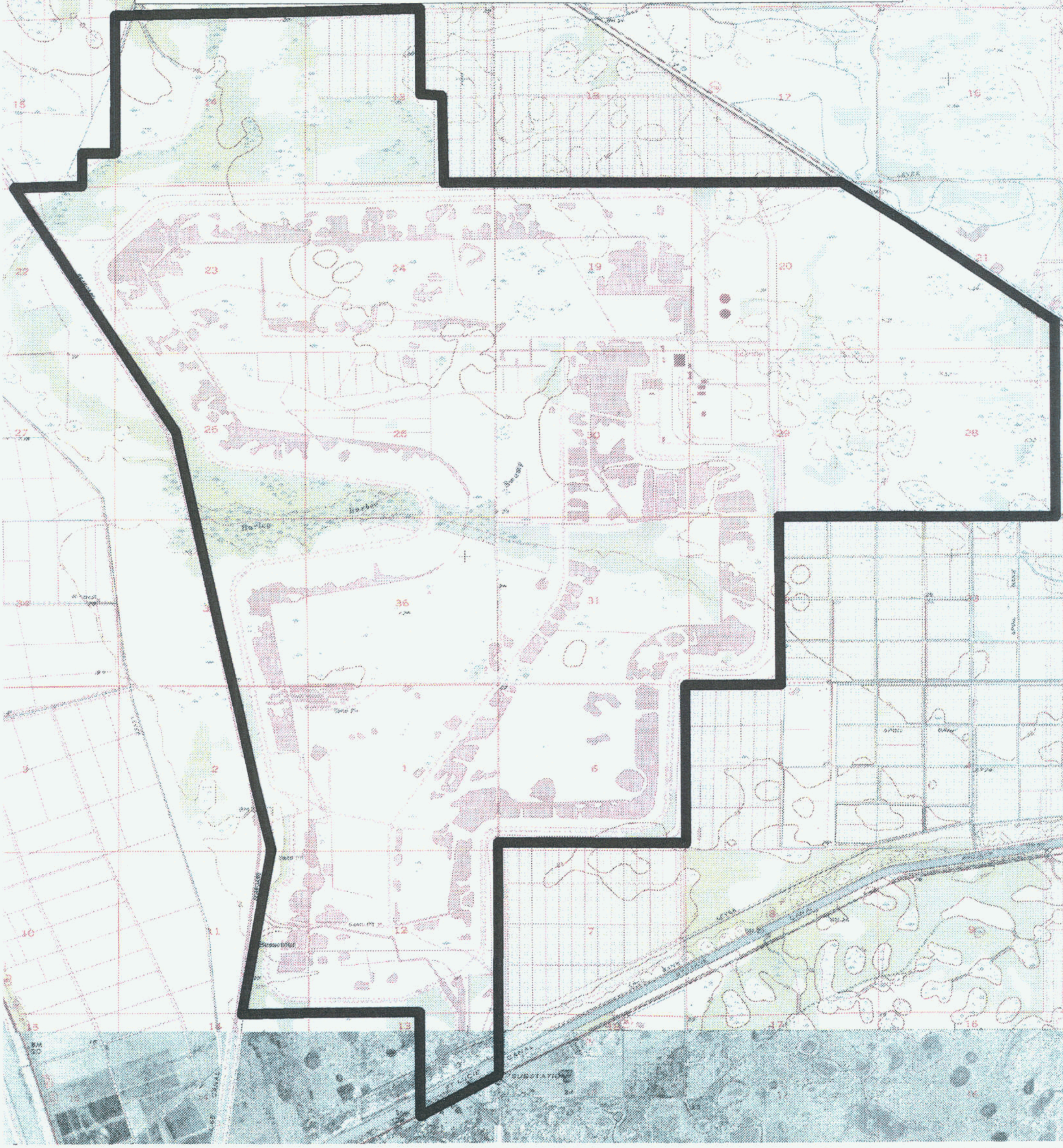


Figure IV.F.11

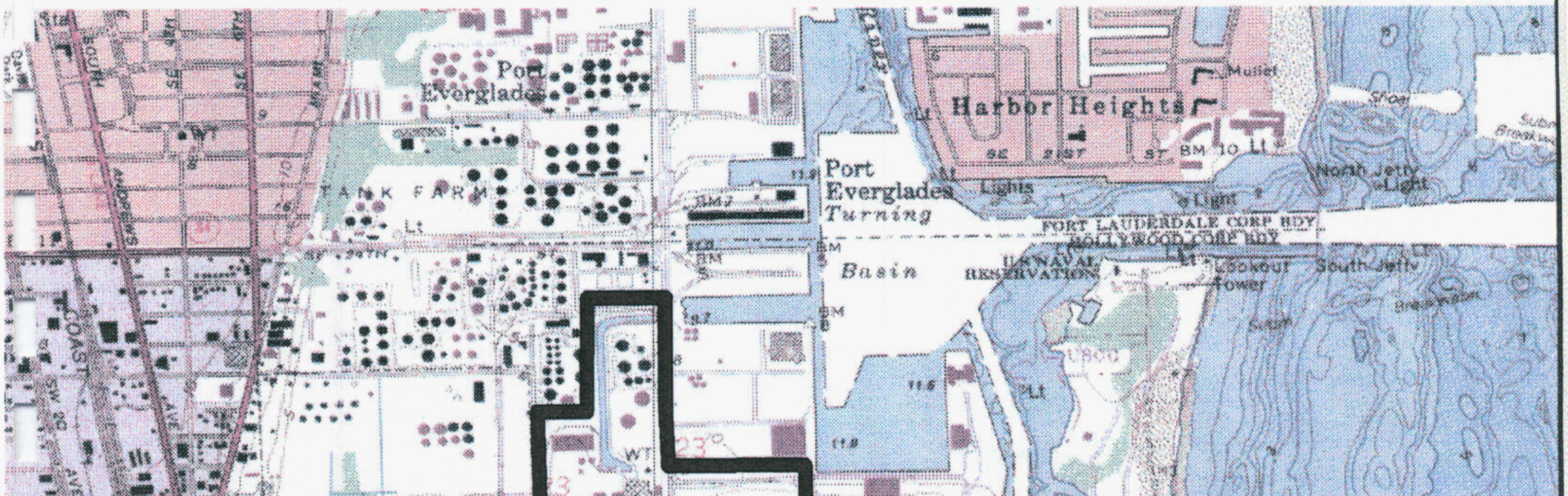
136

IV. Environmental and Land Use Information: Supplemental Information

Potential Sites

(This page is left intentionally blank)

FPL Port Everglades Plant Site



N

W E

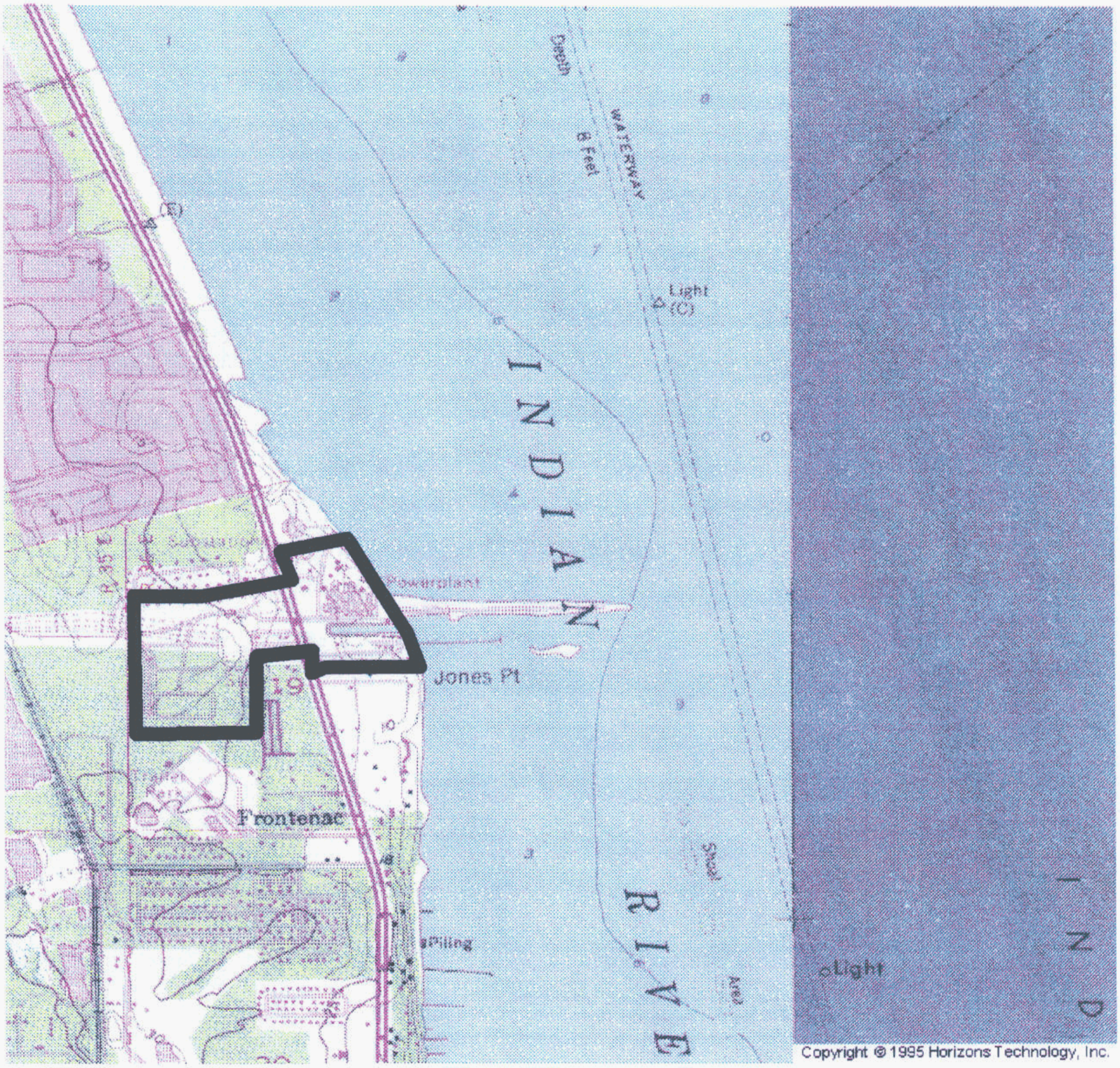
S

2000 0 2000 Feet

Figure IV.F.12

G I S

FPL Canaveral Plant Site



N
W E
S

Figure IV.F.13

140

2000 0 2000 Feet

G I S

FPL Riviera Plant Site

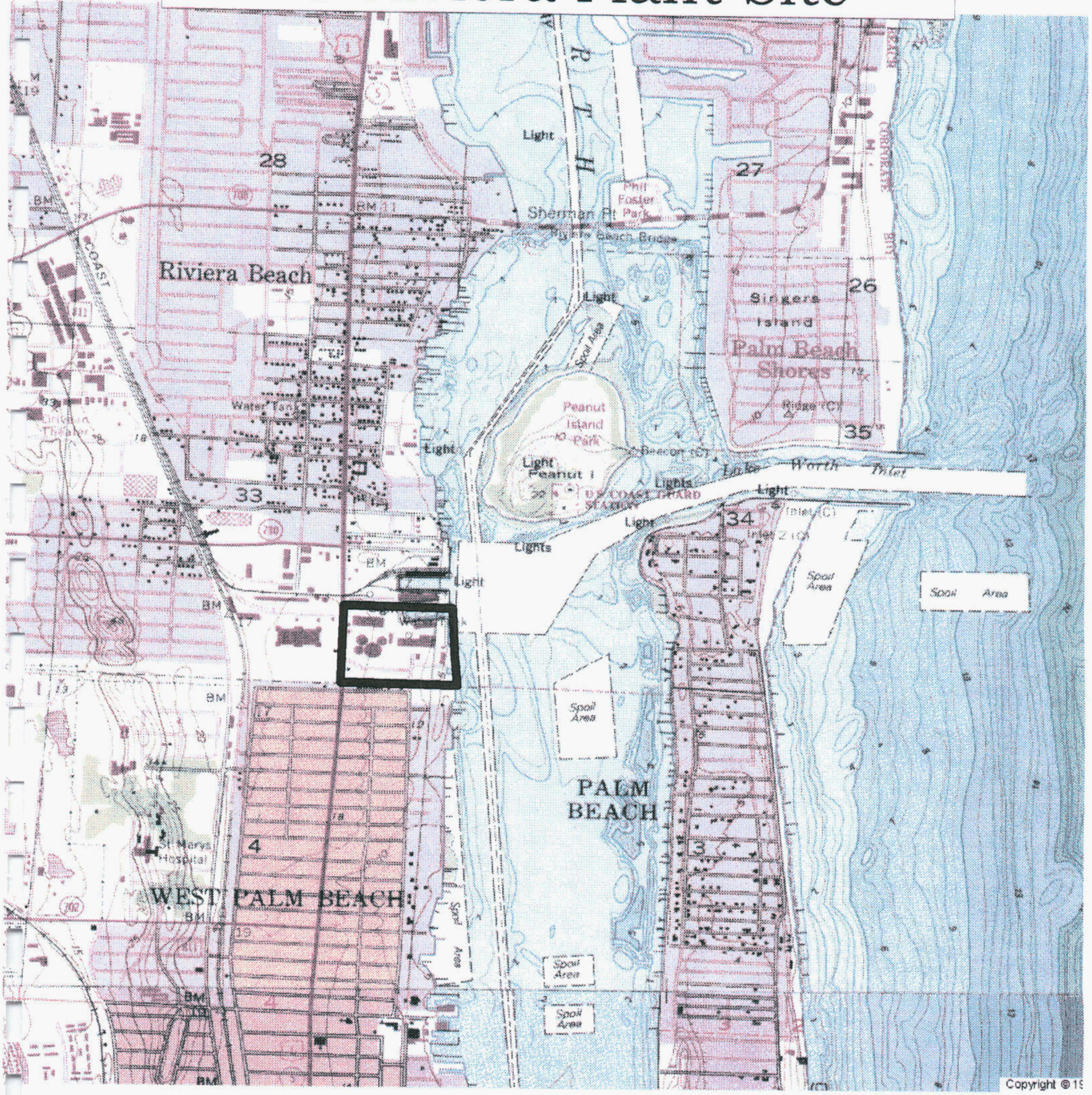


Figure IV.F.14

W E N S

2000 0 2000 Feet

G I S

(This page is left intentionally blank)

CHAPTER V

Other Planning Assumptions & Information

(This page is left intentionally blank.)

Introduction

The Florida Public Service Commission (FPSC), in Docket No. 960111-EU, specified certain information that was to be included in an electric utility's Ten Year Power Plant Site Plan filing. Among this specified information was a group of 12 items listed under a heading entitled "Other Planning Assumptions and Information". These 12 items basically concern specific aspects of a utility's resource planning work. The FPSC requested a discussion or a description of each of these items.

These 12 items are addressed individually below as separate "Discussion Items".

Discussion Item # 1: Describe how any transmission constraints were modeled and explain the impacts on the plan. Discuss any plans for alleviating any transmission constraints.

FPL's resource planning considers two type of transmission constraints. External constraints deal with FPL's ties to its neighboring systems. Internal constraints deal with the flow of electricity within the FPL system.

The external constraints are important since they affect the development of assumptions for the amount of external assistance which is available and the amount and price of economy energy purchases. Therefore, these external constraints are incorporated both in the reliability analysis and economic analysis aspects of resource planning. The amount of external assistance which is assumed to be available is based on the transfer capability as well as historical levels of available assistance. FPL models this amount of external assistance as an additional generator within FPL's system which provides capacity in all but the peak load months. The assumed amount and price of economy energy are based on historical values and projections from production costing models.

Internal transmission constraints or limitations are addressed in developing the costs for siting new units at different locations. Site-specific transmission costs are developed for each different unit/unit location option.

Discussion Item # 2: Discuss the extent to which the overall economics of the plan were analyzed. Discuss how the plan is determined to be cost-effective. Discuss any changes in the generation expansion plan as a result of sensitivity tests to the base case load forecast.

As discussed in Chapter III of this document, FPL performs economic analyses of competing resource plans using the EGEAS (Electric Generation Expansion Analysis System) computer model from the Electric Power Research Institute (EPRI) and Stone and Webster Management Consultants, Inc. The resource plan reflected in this document emerged as the resource plan with the least impact on FPL's levelized system average electric rates (i.e., a Rate Impact Measure or RIM approach)and on the present value of revenue requirements for the FPL system.[4]

FPL performed three sensitivity analyses as part of its 1999 resource planning work or in preparation for this site plan filing. One of these analyses used a load forecast which differed from FPL's base case or "Most Likely" load forecast. (The other two sensitivity analyses are discussed in Discussion Items # 4 and # 6.)

The first sensitivity analysis examined a case in which a "High Load" forecast was combined with a "Low Price" fuel forecast. In this case, FPL's need for incremental resources moved forward in time to the year 2000. This accelerated need, if assumed to be met solely through the construction of new units (as is the primary focus of the Site Plan filing), could only be addressed by combustion turbines in the early years. Subsequent years would be addressed by a combination of new combined cycle units and repowering/expansion of existing units.

In its 1999 resource planning work, FPL did not conduct a sensitivity case involving a "Low Load" forecast. Since the system reliability analysis which utilized the "Most Likely" load forecast showed that new units were not needed until 2006, it was clear that a "Low Load" case would not have shown a power plant decision needed prior to 2006. Therefore, FPL saw no value in analyzing such a "Low Load" case in its 1999 planning work.

The construction options selected in the resource plans for FPL's "Most Likely" case, and for the first sensitivity case discussed above, are presented on the following page in Table V.1.

---

[4] FPL's basic approach in its resource planing work is to base decisions on a lowest electric rate basis. However, when DSM levels are considered a "given" in the analysis, the lowest rate basis and the lowest system revenue requirements basis are identical. In such cases (as in FPL's 1999 resource planning work), FPL evaluates options on the simpler – to – calculate (but equivalent) lowest system revenue requirements basis.

Table V.1

Selected Power Plant Construction Options For Base and Sensitivity Cases

Year	"Most Likely" Load and "Most Likely" Fuel Price Base Case	"High" Load and "Low" Fuel Price Scenario Case
1999	----	6 Unsited CT's
2000	----	----
2001	2 CT's at Martin Ft. Myers Repowering: Initial Phase	2 CT's at Martin Ft. Myers Repowering: Initial Phase
2002	Ft. Myers Repowering: Second Phase Sanford Repowering: Initial Phase	Ft. Myers Repowering: Second Phase Sanford Repowering: Initial Phase
2003	Sanford Repowering: Second Phase 2 CT's at Ft. Myers	Sanford Repowering: Second Phase 2 CT's at Ft. Myers
2004	----	3 Unsited CT's
2005	----	Martin 5 CC
2006	Martin 5 & 6	4 Unsited CT's
2007	Unsited CC	3 Unsited CT's
2008	Unsited CC	Martin 6
2009	Unsited CC	Unsited CC

Key: CT = Combustion Turbine
CC = Combined Cycle Unit

Discussion Item # 3: Explain and discuss the assumptions used to derive the base case fuel forecast. Explain the extent to which the utility tested the sensitivity of the base case plan to high and low fuel price scenarios. If high and low fuel price sensitivities were performed, explain the changes made to the base case fuel price forecast to generate the sensitivities. If high and low fuel price scenarios were performed as part of the planning process, discuss the resulting changes, if any, in the generation expansion plan under the high and low fuel price scenario. If high and low fuel price sensitivities were not evaluated, describe how the base case plan is tested for sensitivity to varying fuel prices.

The basic assumptions FPL used in deriving its base case or "Most Likely" fuel price forecast are discussed in Chapter III of this document.

The "High Price" and "Low Price" fuel forecasts are developed based on a review of major supply and demand assumptions for oil and natural gas. The "High Price" forecast assumes that the worldwide demand for petroleum products will grow somewhat rapidly throughout the planning horizon. Non-OPEC crude oil supply will remain unchanged as improved drilling technology permits only the replacement of depleting fields. As a result, OPEC's market share will grow more rapidly than in the base case which would result in higher oil prices. In addition, this forecast assumes that domestic natural gas demand will grow somewhat rapidly, primarily due to significant increases in the construction of combined cycle generation. Domestic natural gas production will increase slowly as improved drilling technology permits only the replacement of depleting fields. This will result in higher natural gas imports, including Liquified Natural Gas (LNG), than in the base case which, in turn, results in higher natural gas prices.

The "Low Price" fuel forecast assumes that worldwide demand for petroleum products will grow slowly over the forecast horizon. It also assumes that non-OPEC crude oil supply will grow rapidly due to significant improvement in drilling technology and that OPEC's market share will only make small gains relative to the base case. In regard to natural gas, the "Low Price" forecast assumes that domestic demand for natural gas will grow slowly over the forecast horizon and that domestic production will increase faster than in the base case. These assumptions result in lower oil and gas price forecasts.

FPL did test the sensitivity of its resource plan to a "Low Price" fuel forecasts in conjunction with a "High Load" forecast. The results of these analyses are presented above in FPL's response to Discussion Item # 2. FPL did not test the sensitivity of its resource plan to a "High Price" fuel forecast in its 1999 IRP work. Although FPL typically performs a sensitivity analysis on a combined "Low Load"/ "High Price" fuel forecast, such an analysis would not have shown a need for new power plants before 2006 (as discussed in Discussion Item #2.) Consequently, this analysis was not performed in FPL's 1999 planning work.

Discussion Item # 4: Describe how the sensitivity of the plan was tested with respect to holding the differential between oil/gas and coal constant over the planning horizon.

In addition to the sensitivity analyses discussed above which examined the impact of "High Load" and "Low Price" fuel forecasts, FPL also performed a sensitivity analysis in which the differentials between oil prices, gas prices, and coal prices were kept constant over the planning horizon. FPL performed this analysis solely due to the fact that it was included in the FPSC's list of specified information for the Site Plan filing. FPL believes that the likelihood of a constant differential between fuel prices occurring over the planning horizon is very small. In order to perform this "acid test" analysis, FPL used the initial year price forecast for each fuel and kept those prices constant throughout the planning horizon

The results of this scenario analysis were identical to that of the Base Case except for the year 2008. For that year, two unsited CT's were selected in this scenario analysis instead of the one unsited CC selected in the Base Case.

Discussion Item # 5: Describe how generating unit performance was modeled in the planning process.

The performance of existing generating units on FPL's system was modeled using current projections for scheduled outages, unplanned outages, and capacity output ratings and heat rate information. Schedules 1 and 8 present the capacity output ratings of FPL's existing units. The values used for outages and heat rates are consistent with the values FPL has used in planning studies in recent years.

In regard to new unit performance, FPL utilized current projections for the capital costs, fixed and variable operating & maintenance costs, capital replacement costs, construction schedules, heat rates, and capacity ratings for all construction options which were considered in the resource planning work. A summary of this information for the new capacity options FPL projects to add over the planing horizon is presented on Schedule 9. Please refer to that schedule.

Discussion Item # 6: Describe and discuss the financial assumptions used in the planning process. Discuss how the sensitivity of the plan was tested with respect to varying financial assumptions.

The key financial assumptions used in FPL's 1999 resource planning work were 45% debt and 55% equity FPL capital structure; projected debt cost of 6.7%; and an equity return of 11.8%. These assumptions resulted in a weighted average cost of capital of 9.5% and an after-tax discount rate of 8.4%. These assumptions were used in FPL's base case or "Most Likely" forecast case analysis, and in its sensitivity analyses of alternate load and/or fuel price forecasts.

In order to test the sensitivity of the resource plan to a different set of financial assumptions, FPL performed an analysis in which the capital financing structure was changed to one which might be more typical of a case involving third-party financing of a new power plant. This alternate financing structure was assumed to be one made of 80% debt and 20% equity. The returns on debt and equity were assumed to be the same as for FPL's "Most Likely" case 6.7% and 11.8% respectively. These assumptions result in a weighted average cost of capital of 7.7% and an after-tax discount rate of 5.7%.

The results of this "alternate financial case" sensitivity analysis were the same as for FPL's "Most Likely" or Base Case analysis. The Martin 5 and 6 combined cycle units were selected for 2006, followed by one unsited combined cycle unit in each of the years 2007, 2008, and 2009. These plant additions followed the already committed-to repowering of existing units at Ft. Myers and Sanford, and the committed-to new combustion turbine additions at Martin and Ft. Myers.

Discussion Item # 7: Describe in detail the electric utility's Integrated Resource Planning process. Discuss whether the optimization was based on revenue requirements, rates, or total resource cost.

FPL's integrated resource planning (IRP) process is described in detail in Chapter III of this document.

The standard basis for comparing the economics of competing resource plans in FPL's basic IRP process is the impact of the plans on FPL's electricity rate levels with the intent of minimizing FPL's levelized system average rate (i.e., a Rate Impact Measure or RIM approach). However, in its 1999 planning work FPL utilized a net present value of system revenue requirements as the basis for comparing options and plans. (As discussed in response to Discussion Item # 2, both the electricity rate basis and the system revenue requirement basis are identical when DSM levels are unchanged between competing plans. Such was the case in FPL's 1999 planning work.)

Discussion Item # 8: Define and discuss the electric utility's generation and transmission reliability criteria.

FPL traditionally uses two generation reliability criteria in its resource planning work. These are a minimum 15% Summer and Winter reserve margin and a maximum of 0.1 days per year loss-of-load-probability (LOLP). However, in its 1999 planning work, FPL also used a third criterion: a minimum 20% Summer and Winter reserve margin which applies starting with the Summer of 2004. This new criterion was the result of an agreement reached between FPL, FPC, TECO, and FPSC in Docket No. 981890-EU. These reliability criteria are discussed in Chapter III of this document. Please refer to those pages.

In regard to transmission reliability, FPL has adopted transmission planning criteria that are consistent with the planning criteria established by the Florida Reliability Coordinating Council (FRCC). The FRCC has adopted transmission planning criteria that are consistent with the planning criteria established by the North American Electric Reliability Council (NERC) in its *Planning Standards*. FPL has applied these planning criteria in a manner consistent with prudent utility practice. The *NERC Planning Standards* are available on the internet (http://www.nerc.com/~filez/pss-psg.html).

In addition, FPL has developed a Facility Connection Requirements (FCR) document as well as a Facility Rating Methodology document that are also available on the internet (http://www.enx.com/FPL/fpl_home.html).

Thermal ratings for specific transmission lines or transformers are found in the load flow cases that are available on the internet (http://www.enx.com/FPL/fpl_home.html). The normal voltage criteria for FPL stations is given below:

Voltage Level (kV)	Vmin (p.u.)	Vmax (p.u.)
69, 115, 138, 500	0.95	1.05
230	0.95	1.06

There may have been isolated cases for which FPL may have determined it prudent to deviate from the general criteria stated above. The overall potential impact on customers, the probability of an outage actually occurring, as well as other factors may have influenced the decision in such cases.

The criteria referenced above are used for planning purposes and not for operating the transmission system. Some operating parameters such as time - limited emergency ratings may be factored into the planning process provided there is sufficient time for operator actions without jeopardizing the safety and reliability of the transmission system.

Discussion Item # 9: Discuss how the electric utility verifies the durability of energy savings for its DSM programs.

The impact of FPL's DSM Programs on demand and energy consumption is evaluated over time. Data is collected from non-participants in order to establish a non-DSM technology baseline. Participants' data is compared against non-participants' data to establish usage patterns, demand impacts and to validate engineering assumptions.

FPL utilizes any or all of three major impact evaluation analysis methods in a manner that most cost-effectively meets the overall impact evaluation objectives. These three major impact evaluation analysis methods are: engineering analysis, statistical billing analysis, and on-site metering research. As DSM evaluations proceed over time, the components to be analyzed and the periods for which data is available will increase, resulting in continual enhancements in the scope and accuracy of reported evaluation results.

Finally, for those DSM measures which involve the utilization of load management, FPL conducts periodic tests of the load control equipment to ensure that it is functioning correctly.

Discussion Item # 10: Discuss how strategic concerns are incorporated in the planning process.

FPL's resource planning process is designed to address various "strategic concerns" or areas of uncertainty. There are 6 areas of uncertainty that FPL seeks to address in its resource planning work: load growth, fuel price, transmission system constraints, environmental regulations, evolving technology, and competitive risk.

In regard to uncertainty about both load growth and fuel price, FPL addressed this by developing a resource plan which used a combination of a "High Load" forecast and a "Low Price" fuel forecast, as is discussed in Discussion Item # 3.(In response to the list of information specified by the FPSC for inclusion in the Site Plan filing, FPL also developed a resource plan which used an "acid test" fuel price forecast. This is discussed in regard to Discussion Item # 4.) In addition, uncertainty about fuel prices is addressed in fuel conversion efforts such as repowering projects now planned at FPL's Ft. Myers and Sanford sites and in retaining the capability to burn more than one fuel in a number of FPL generating units.

Uncertainty regarding transmission system constraints is addressed by annually updating assumptions about how much assistance may be available to FPL from outside FPL's service territory as well as assumptions relating to transmission constraints within FPL's system. In regard to uncertainty about environmental regulations, FPL's policy has always been that it will comply with all existing environmental laws and regulations. In that regard, FPL's resource planning analyses include all reasonably known costs of complying with these laws and regulations. Furthermore, in regard to potential new environmental regulations, FPL believes that its efforts to maintain the ability to burn varying grades of oil or burning either oil or natural gas at numerous plants, and to expand the use of natural gas (through the planned repowering projects at Ft. Myers and Sanford, and the planned addition of new natural gas-fired combined cycle units), should allow FPL to reasonably respond to a variety of potential environmental regulations.

Uncertainty about evolving technology's potential impact on resource plans is best addressed by not committing to resource additions before it is necessary to do so. (In most cases, this approach also benefits the economics of the resource plan.) This minimizes the chance that a newly emerged technology will turn out to be a more economical choice than what the utility has already committed to. Uncertainty about evolving technology is also reduced by maintaining close contact with equipment vendors in order to better understand what the developmental status is of various generating technologies.

Finally, an increasingly important consideration in FPL's planning process is that of competitive risk. FPL's resource planning process is designed to identify the resource plan which best minimizes system average electric rates in order to keep FPL's service competitive in the evolving utility industry. Also, because of the inherent uncertainty associated with an evolving industry, long-term purchase commitments are undesirable. FPL seeks to avoid/minimize such commitments in its planning.

Discussion Item # 11: Describe the procurement process the electric utility intends to utilize to acquire the additional supply-side resources identified in the electric utility's ten-year site plan.

As has been discussed, the principal elements of FPL's capacity additions during the next 10 years are the repowering of its Ft. Myers and Sanford plants in 2002 and 2003, respectively, plus the addition of new combustion turbines (CTs) at Martin commencing in 2001 and at Ft. Myers starting in 2003. The incremental capacity from the two repowering projects comes from the addition of new CTs and heat recovery steam generators (HRSGs). FPL is acquiring these CTs and HRSGs through a bid process which will combine cost and performance considerations.

The later capacity additions projected in FPL's Site Plan document, the new Martin # 5 and # 6 units, plus new unsited combined cycle units currently projected for the 2007 through 2009 time period, will likely be carried out following the issuance of a capacity solicitation to potential suppliers at an appropriate time, if that approach represents the best vehicle to offer the lowest cost new generating capacity.

Discussion Item # 12: Provide the transmission construction and upgrade plans for electric utility system lines that must be certified under the Transmission Line Siting Act (403.52 – 403.536, F. S.) during the planning horizon. Also, provide the rationale for any new or upgraded line.

FPL's plans do not include any new or upgraded transmission lines during the 1999 – 2009 time period which would need to be certified under the Transmission Line Siting Act (403.52 – 403.536, F.S.)

(This page is left intentionally blank.)