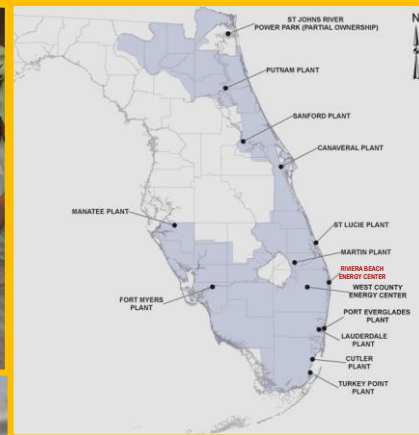


Riviera Beach

Energy Center



SITE CERTIFICATION APPLICATION

VOLUME I OF III

FEBRUARY 2009



**SITE CERTIFICATION APPLICATION
RIVIERA BEACH ENERGY CENTER**

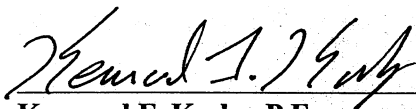
VOLUME 1 OF 3

Submitted by:

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February 2009

0838-7633



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ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standards
ABI	Applied Biology Inc.
ANSI	American National Standards Institute
APPZ	Avon Park Permeable Zone
BACT	Best Available Control Technology
BBtu/hr	billion British thermal units per hour
BMP	Best Management Practice
Btu/kWh	British thermal unit per kilowatt hour
Btu/lb	British thermal unit per pound
Btu/scf	British thermal unit per standard cubic foot
°C	degrees Celsius
CAA	Clean Air Act
CadnaA	Computer Aided Noise Abatement
C&D	construction and demolition
CEM	continuous emission monitoring
CFR	Code of Federal Regulations
cfs	cubic feet per second
cf/yr	cubic foot per year
CLG	Certified Local Government
CO	carbon monoxide
CO ₂	carbon dioxide
CPUE	catch per unit effort
CRA	Community Redevelopment Area
CT	combustion turbine
dB	decibel
dBA	A-weighted decibel
DHR	Division of Historical Resources
DLN	dry low-NO _x
DO	dissolved oxygen
EAI	Ecological Associates, Inc.
ECRWRF	East Central Regional Water Reclamation Facility
EDTA	ethylene diamine tetra-acetic acid
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERP	Environmental Resource Permit
°F	degrees Fahrenheit
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FCREPA	Florida Committee on Rare and Endangered Plants and Animals
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection

FDHR	Florida Division of Historical Resources
FEMA	Federal Emergency Management Agency
FFWCC	Florida Fish and Wildlife Conservation Commission
FGT	Florida Gas Transmission
FIND	Florida Inland Navigation District
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FMSF	Florida Master Site File
FNAI	Florida Natural Area Inventory
FP	fibropapillomatosis
FPL	Florida Power & Light Company
FPSC	Florida Public Service Commission
FR	Federal Register
F.S.	Florida Statutes
ft ² /day	square feet per day
ft-bgs	feet below ground surface
ft-msl	feet above mean sea level
g/bhp-hr	grams per brake horsepower-hour
GHG	greenhouse gas
GLO	General Land Office
gpm	gallons per minute
gr/100 scf	grains per 100 standard cubic feet
H ₂ SO ₄	sulfuric acid
HAP	hazardous air pollutant
HHV	high heating value
hp	horsepower
hr/yr	hour per year
HRSG	heat recovery steam generator
Hz	hertz
ICU	Intermediate Confining Unit
IRG	Inwater Research Group
KMIA	NWS station at Miami International Airport
KPBI	NWS station at Palm Beach International Airport
kg	kilogram
km	kilometer
kV	kilovolt
kW	kilowatt
lb/hr	pound per hour
lb/MW-hr	pound per megawatt-hour
lb/MMBtu	pound per million British thermal units
LEED	Leadership in Energy and Environmental Design
LFA	Lower Floridan Aquifer
LHV	low heating value

m	meter
MACT	maximum achievable control technology
MCU	Middle Confining Unit
MGD	million gallons per day
mg/L	milligrams per liter
MMBtu/hr	million British thermal units per hour
MMcf/hr	million cubic feet per hour
mph	miles per hour
MPS	Mitsubishi Power Systems
MSGP	Multi-sector Generic Permit
MSW	municipal solid waste
MW	megawatt
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGVD	national geodetic vertical datum
NO ₂	nitrogen dioxide
NOI	Notice of Intent
NOT	Notice of Termination
NO _x	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NP	National Park
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NWA	National Wilderness Area
NWS	National Weather Service
O ₂	oxygen
O ₃	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PBCERM	Palm Beach County Department of Environmental Resources Management
PEP	Partnership for Ecosystem Protection
PM	particulate matter
PM _{2.5}	particulate matter with an aerodynamic diameter of 2.5 micrometers or less
PM ₁₀	particulate matter with an aerodynamic diameter of 10 micrometers or less
POTW	privately owned treatment works
ppm	parts per million
ppmvd	parts per million by volume dry
PPSA	Power Plant Siting Act
ppt	parts per thousand
PSD	prevention of significant deterioration
PVC	polyvinyl chloride

QA/QC	quality assurance/quality control
RBEC	Riviera Beach Energy Center
RICE	reciprocating internal combustion engines
RO/MB	reverse osmosis/mixed bed
SAS	surficial aquifer system
SCA	Site Certification Application
scf/yr	standard cubic foot per year
SCR	selective catalytic reduction
SCRAM	Support Center for Regulatory Air Models
SFHA	Special Flood Hazard Area
SFWMD	South Florida Water Management District
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SPL	sound pressure level
SRPP	Strategic Regional Policy Plan
SWPPP	Stormwater Pollution Prevention Plan
TDS	total dissolved solids
TPY	ton per year
TTN	Technology Transfer Network
UFA	Upper Floridan Aquifer
UF/BEBR	University of Florida, Bureau of Economic and Business Research
µg/m ³	micrograms per cubic meter
µm	micrometer
µPa	micropascal
µS/cm	microsiemens per centimeter
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAMC	Veterans Administration Medical Center
VOC	volatile organic compound
vph	vehicle per hour

SCA DEFINITIONS

1. “Riviera Plant” or “existing Plant” – refers to the existing Florida Power & Light Company (FPL) power plant, including Units 3 and 4 and support facilities, located on the existing Site.
2. “Riviera Plant Site” or “existing Site” – refers to the approximately 46 acres of FPL-owned property: approximately 39 acres east of U.S. Highway 1 (including submerged lands and intake culvert and oil pipeline easements) and approximately 7 acres west of U.S. Highway 1 containing transmission lines.
3. “Riviera Beach Energy Center” or “RBEC” or “converted Plant” – refers to the proposed combined cycle generating unit and support facilities to be constructed and operated on a portion of the existing Site (i.e., on FPL-owned property east of U.S. Highway 1).
4. “Riviera Beach Energy Center Project” or “Project” – refers to the entire “Project” for which FPL seeks certification, including dismantlement of the existing Plant, construction of the converted Plant, the construction parking and laydown area, certain transmission-related activities, and the manatee viewing center.
5. “Riviera Beach Energy Center Site” or “Site” – refers to the property on which the converted Plant will be located, as the Site to be certified for the Riviera Beach Energy Center (i.e., 39 contiguous acres including leased submerged lands and intake culvert and oil pipeline easements).
6. “Power Block” – refers to the area that will be occupied by the proposed combined cycle unit that includes three combustion turbines/heat recovery steam generators (CTs/HRSGs), steam turbine generator, fuel heater, auxiliary boiler, emergency generators, and fire pump engine.
7. “Construction support area” – refers to the FPL-owned property located on the southern portion of the existing Site. This area will be used for temporary construction parking and office trailers during construction of the Project.
8. “Construction parking and laydown area” – refers to the 7 acres of FPL-owned property located to the west of U.S. Highway 1 across from the Site. This area will be used during construction of the Project for parking and construction laydown.
9. “Construction” – refers to work to be performed as part of the Project, including dismantlement of existing Plant facilities, as well as construction of the converted Plant, the construction parking and laydown area, certain transmission-related activities, and the manatee viewing center.
10. “Dismantlement” – refers to all activities associated with the removal of existing Riviera Plant facilities.
11. “Manatee embayment” – refers to the area previously used for the Units 1 and 2 discharge and which now is and in the future will receive a small portion of the once-through cooling water discharge from Units 3 and 4 for the manatees.
12. “Manatee viewing center” – refers to a manatee viewing area (overlooking the manatee embayment), a parking area, and a building for public access to be constructed and operated on the southern portion of the existing Site.. The parking area and building will be located in the portion of the Site to be used for the construction support area.

1.0 INTRODUCTION AND GENERAL INFORMATION

This chapter of the Site Certification Application (SCA) introduces Florida Power & Light Company (FPL or the Company), provides an overview of the Riviera Beach Energy Center Project (“Project”) for which FPL seeks certification, and provides a summary of FPL’s public outreach program for the Project.

1.1 Introduction

FPL proposes to convert the existing Riviera Plant [i.e., two nominal 300-megawatt (MW) conventional dual-fuel fired generating units and support facilities] into a modern, highly efficient, lower-emission next-generation clean energy center using the latest combined cycle technology. The converted Plant will be located wholly within the existing Plant Site boundaries. The conversion will result in increased power generation without using additional land and water sources. The converted Plant will be more energy efficient than the existing Plant and will provide cleaner energy to FPL’s customers. The converted Plant will use at least 33 percent less fuel than the existing Plant, for an equivalent amount of electricity production. Moreover, it will be capable of producing over 100 percent more power (i.e., 1,250 MW vs. current 600 MW). The existing Riviera Plant is expected to be renamed the Riviera Beach Energy Center (RBEC), with an in-service date for the converted Plant of June 2014. Once RBEC is constructed, a manatee viewing center open to the public will be built in the southern portion of the Site.

There will be significant benefits associated with the RBEC Project. The Project allows the beneficial reuse of the existing Plant Site and some Plant infrastructure, with a substantial increase in electrical generating capacity and less environmental impact. RBEC regulated air emissions will be more than 90 percent lower than the existing Riviera Plant’s emissions are, resulting in significant annual emissions reductions and air quality benefits. In addition, there will be significant reductions in FPL’s system-wide carbon dioxide (CO₂) emissions from 2014 through 2040 with the RBEC. CO₂ emissions will be lower with the conversion of the Riviera Plant – a cumulative reduction of about 8 million tons of CO₂ emissions from 2014 through 2040 as a direct result of the RBEC.

The existing FPL Riviera Plant Site is located primarily within the City of Riviera Beach with a small portion in the City of West Palm Beach on approximately 46 acres southwest of the Lake Worth Inlet and Peanut Island, and across the Intracoastal Waterway from Palm Beach, Florida. The Site includes approximately 39 acres bounded on the west by U.S. Highway 1, on the north by Port of Palm Beach,

on the south by 59th Street, and on the east by Lake Worth Lagoon (Intracoastal Waterway) and approximately 7 acres located to the west of U.S. Highway 1 where transmission lines are located. The Site location is presented in Figure 1.1.0-1.

FPL has operated a power plant at the Site since the mid-1940s. Units 1 and 2 went into service in 1946 and 1953, respectively. Both units have been permanently retired and removed from the Site. The commercial in-service dates for Units 3 and 4 were 1962 and 1963, respectively, and they have remained in service since those dates.

Exhibit A presents the RBEC Site legal description for Site Certification.

FPL is seeking approval of the RBEC Project under the Florida Electrical Power Plant Siting Act (PPSA), Chapter 403, Part II, Florida Statutes (F.S.). The PPSA provides a centralized review process for new electrical generating facilities in Florida, involving a balancing of “the increasing demand for electrical power plants with the broad interests of the public.” The Florida Public Service Commission (FPSC) is the sole forum for the determination of need for a proposed facility (Section 403.519, F.S.). On September 12, 2008, the FPSC issued an affirmative need determination order for the conversion of the Riviera Plant (see Chapter 2.0). The Florida Department of Environmental Protection (FDEP) acts as the coordinator for the remainder of the site certification process, with input from various State, regional, and local agencies, along with interested citizens. Ultimate disposition of the SCA is by either the Governor and Cabinet sitting as the Siting Board, or the Secretary of the FDEP. This SCA is being filed with the FDEP pursuant to Chapter 62-17, Florida Administrative Code (F.A.C.). The SCA describes the Project and addresses its environmental and socioeconomic aspects by presenting information on the existing natural and human environment, the facilities to be dismantled, constructed and operated, and the impacts of the converted Plant on those environments. The format for this SCA follows the draft “Application Instruction Guide: Electrical Power Plant Sites and Associated Facilities Electrical Transmission Lines” issued by FDEP and dated June 27, 2007 (draft DEP Form 62-17.900). FPL is also separately filing with FDEP an Air Construction Permit Application and an application to modify the Industrial Wastewater Facility Permit.

The filing of this SCA for the RBEC Project is consistent with, and demonstrates FPL’s ongoing compliance with, Condition of Certification XXXVI.B. of the West County Energy Center Unit 3 site certification (PA 05-47SA1, November 2008). Under that Condition, FPL is required to: “Take all

prudent and commercially reasonable actions to convert the Riviera Power Plant to natural-gas combined cycle generating technology by December 31, 2015.”

1.2 The Applicant

FPL, a subsidiary of FPL Group, Inc., is the largest electric utility in the State of Florida. FPL serves approximately 4.5 million customer accounts, approximately 8 million customers, in all or parts of 35 Florida counties (Figure 1.2.0-1).

FPL’s existing generating resources are located at power plant sites (Figure 1.2.0-1 distributed geographically around its service territory, and also include partial ownership of two units located in Jacksonville, Florida, and one unit in Georgia. The total net generating capability is 22,135 MW consisting of nuclear units (2,939 MW), coal units (896 MW), combined cycle units (9,033 MW), oil/gas fossil steam units (7,023 MW), combustion turbines (324 MW), and gas turbine/diesel units (1,920 MW) (FPL, 2008).

FPL’s bulk transmission system is composed of about 6,640 circuit miles of transmission lines. Integration of the generation, transmission, and distribution system is achieved through FPL’s approximately 560 substations.

In addition to its combined cycle projects, FPL is actively evaluating renewable energy technologies that may be suitable for the State. FPL is currently developing and constructing projects using solar photovoltaic and concentrating solar thermal technologies throughout the State, helping to provide platforms to refine the technology and reduce its cost. Currently, FPL is planning to build three Next Generation Solar Energy Centers in Florida, including the Country’s largest photovoltaic solar plant and the first “hybrid” energy center that will combine solar thermal technology with an existing combined-cycle generation unit. FPL is also proposing to construct a wind generation project on the east coast of Florida and is analyzing technologies that produce electricity on a commercial scale from ocean current, ocean thermal, and hydrogen technologies.

FPL is a leader among the nation’s electric utilities for its partnerships with customers in conservation and in energy management (see Appendix 10.8).

The following information addresses the applicant identification requirements:

Applicant's Official Name:	<u>Florida Power & Light Company (FPL)</u>
Address:	<u>700 Universe Boulevard, Juno Beach, FL 33408</u>
Address of Official Headquarters:	<u>700 Universe Boulevard, Juno Beach, FL 33408</u>
Business Entity (corporation, partnership, co-operative):	<u>Corporation</u>
Name and Title of Chief Executive Officer:	<u>Armando J. Olivera, President</u>
Name, Address, and Phone Number of Official Representative responsible for obtaining certification:	<u>Barbara Linkiewicz, Director of Environmental Licensing, New Generation Projects, Environmental Services, 700 Universe Boulevard, Juno Beach, FL 33408 Phone: (561) 691-7518 Fax: (561) 691-7049</u>
Site Location (county):	<u>Palm Beach County</u>
Nearest Incorporated Cities:	<u>City of Riviera Beach and City of West Palm Beach</u>
Latitude and Longitude:	<u>26°45' 55"; 80°03' 09"</u>
UTM Coordinates:	Northerly <u>2,960.632 kilometers (km) N;</u> Easterly <u>594.249 km E (Zone 17)</u>
Section, Township, Range:	<u>Portions of Sections 33 and 34, Township 42 South, Range 43 East and portions of Sections 3 and 4, Township 43 South, Range 43 East</u>
Name Plate Generating Capacity:	<u>Site Certification: Conversion of existing nominal 600 MW oil/gas steam electric generating facility into a nominal 1,250-MW combined cycle unit</u>

1.3 Overview of the Project

RBEC will be a 3-on-1 combined cycle unit, which will consist of three new advanced technology combustion turbines (CTs), three new heat recovery steam generators (HRSGs), and one steam turbine/electric generator. The CTs are similar to, but much larger and more efficient than, traditional jet engines. The CTs produce electrical energy by direct connection to an electric generator. The exhaust heat from the CTs, which would otherwise be wasted energy released to the atmosphere, will be routed through the HRSGs that act as boilers to produce steam for the new turbine generator to produce additional electricity. The HRSGs will have duct burners to maximize the converted Plant's generating capacity. Natural gas will be the primary fuel for the converted Plant. Ultra low-sulfur light oil will be used as a backup fuel for the CTs. The cooling water source for RBEC will be the

Lake Worth Lagoon (Intracoastal Waterway), which will continue to provide once-through cooling water. The existing municipal water supply from the City of Riviera Beach will continue to be used for process and potable water. By using natural gas as the primary fuel and technology that is recognized by FDEP as the Best Available Control Technology (BACT) for minimizing air emissions, the converted Plant will be among the cleanest and most efficient fossil fuel-fired electric power generating plants in the State of Florida.

Decommissioning and dismantling of the existing generating units will be part of the Project and will be required prior to the construction of RBEC. Certain components, such as the cooling water intake and discharge infrastructure and transmission facilities, will remain intact for use with the converted Plant. RBEC will interconnect with FPL's transmission network through two onsite switchyards.

The RBEC Project is estimated to generate \$313 million in property tax revenue from 2014 to 2040. This is comprised of \$121.6 million to the City of Riviera Beach, \$54.5 million to Palm Beach County, \$104.3 million to the school district, and \$32.6 million to other taxing authorities.

1.4 Summary of Public Outreach Program

FPL believes it is important to involve the community in the licensing process as projects are designed to generate and deliver reliable power to customers. Representatives of FPL have been involved with the local community surrounding the Riviera Plant for many years.

The Project was formally announced on April 28, 2008, at the Riviera Plant. In attendance were local and regional media as well as environmental and community leaders from around the State. FPL mailed out more than 20,000 letters and a questionnaire to residents and business owners within a 2-mile radius of the Project. As of January 2009, more than 1,000 responses have been received from the community. General findings show that almost two-thirds of the respondents wanted to know how their neighborhood would be affected during the construction, that they were concerned about the environment, and felt that a letter was the best way to inform them and the community of future updates. FPL will use this information to determine what communication channels are best to use with the community and help FPL understand community interests. Several presentations have been made to local community groups, including civic and neighborhood associations, as well as detailed project presentations at public local approval meetings. Throughout the Project, FPL will maintain contact with the community through the following methods:

- Internet: www.FPL.com/RBeach;
- Email: Riviera_email@FPL.com;
- Toll-free telephone number: 800-581-3990; and
- Direct mailing to adjacent and area property owners, FPL customers, and concerned citizens.

FPL is committed to responding to comments and questions in a timely manner. FPL's goal is to be the first and best source of information about the Project. FPL is committed to keeping the community updated on the Project through ongoing conversations, presentations, information on the FPL website, and in various print materials.

Exhibit A
Riviera Beach Energy Center Site Legal Description

Parcel A – Power Block: A Parcel of land lying in Section 33, Township 42, South, Range 43 East, Palm Beach County, Florida, being more particularly described as the North 663.19 feet of the South 844.19 feet of Government Lot 4, LESS and EXCEPT those lands described in the Order of Taking recorded in Official Record Book 10388, Page 799.

All that part of the South 181 feet (measured at right angles between parallel lines) of Government Lot 4, Section 33, Township 42 South, Range 43 East, Palm Beach County, Florida lying easterly of the right of way of State Road No.4 (U.S. Highway No. One), LESS and EXCEPT those lands described in the Order of Taking recorded in Official Record Book 10399, Page 799 and lying westerly of the westerly Mean High Water Line of the Intracoastal Waterway (Lake Worth).

Said lands situate in the City of Riviera Beach, Palm Beach County, Florida, and containing 1,175,953 square feet, 26.996 acres, more or less.

Parcel B – Construction Support Area (South) and Future Manatee Viewing Center: COMMENCING at the Southwest corner of Lot 3, Block 38, North Palm Beach Plat No.3, as recorded in Plat Book 6, Page 39, Public Records, Palm Beach County, Florida, said corner begin the Point of beginning (P.O.B.); thence run Northerly along the Easterly Right-of-Way Line of North Dixie Highway, a distance of 75.02 feet to the Northwest corner of Lot 1, Block 38, said North Palm Beach; thence continue Northerly along said Easterly Right-of-Way Line making a deflection to the East of 00° 13' 30", a distance of 253.39 feet to the North Line of Township 43, South Range 43 East, thence run Easterly along said North Line of Township 43 South, making an angle with the preceding course of 90° 03' 00" as turned from South to East, a distance of 581.20 feet to the intersection with the City of West Palm Beach 1963 Bulkhead line as recorded in Plat Book 27, Pages 231-239; thence run Southerly along said Bulkhead line a distance of 328.13 feet, more or less, to the intersection with the South Line of aforementioned Lot 3, Block 38; thence run Westerly along said South Line, a distance of 585.35 feet, more or less, to the Point of Beginning, and containing 4.396 acres more or less.

Parcel C – Landscaped Buffer Area: The Landscaped Buffer Area consists of 14 parcels acquired by FPL between 1989 and 2003, and includes: Lots 27 and 28 (acquired May 2003); Lots 25 and 26 (acquired May 2003); Lots 23 and 24 (acquired May 2003); Lots 21 and 22 (acquired May 2003); Lots 19 and 20 (acquired December 1992); Lots 17 and 18 (acquired May 2003); Lots 15 and 16

(acquired June 1990); Lots 13 and 14 (acquired May 2003); Lots 11 and 12 (acquired February 1994); Lots 8, 9 and 10 (acquired May 2003); Lots 3 and 4 (acquired November 1989); the westerly 50 feet of Lots 1 and 2 (acquired May 2003); and Lots 1 and 2, EXCEPT the West 50 feet thereof (acquired May 1994), of Knowles Court Addition to the city of West Palm Beach, according to the Plat thereof on file in the Office of the Clerk of the Circuit Court in Palm Beach County, Florida, recorded in Plat Book 9, Page 82, and containing 1.89 acres more or less.

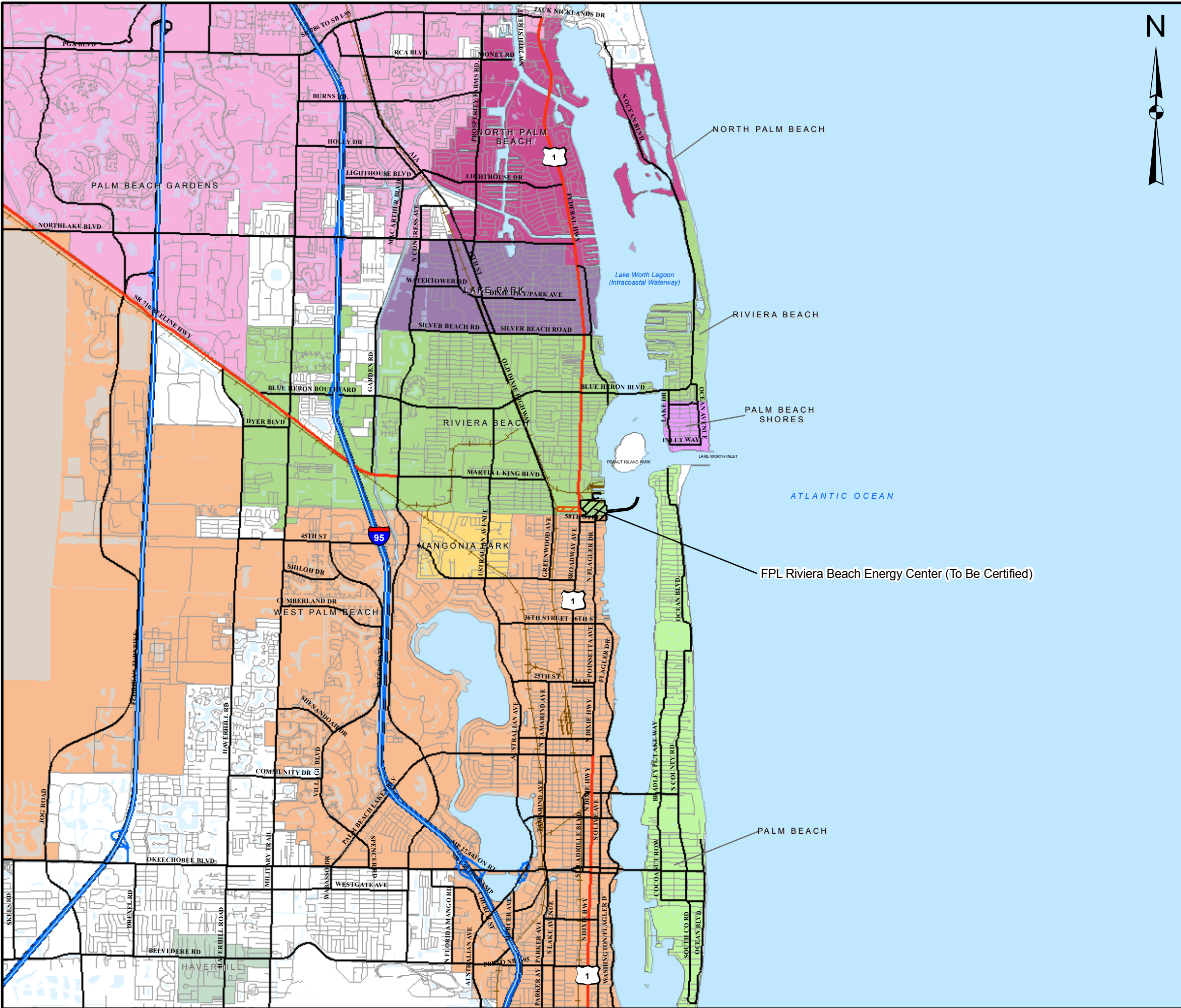
Parcel D – Intake Structure Easement: See description in Appendix 10.11.

Parcel E – Oil Pipeline Easement: See description in Appendix 10.11.

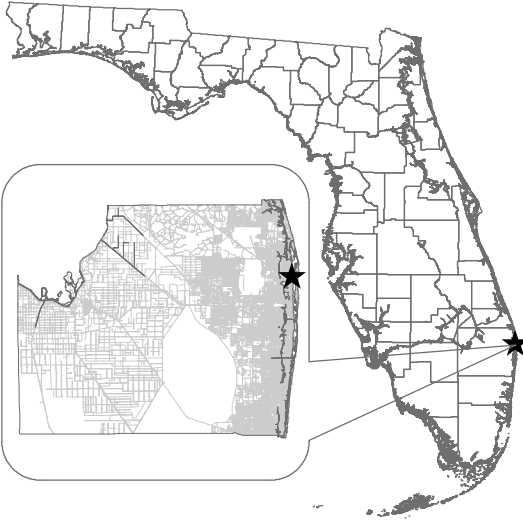
Parcel F – Sovereign Submerged Lands (Discharge Structure): A 100 foot-wide strip of submerged land, in Section 33, Township 42 South, Range 43 East in Palm Beach, Florida; said strip of submerged land lying 50 feet on each side and contiguous with the following described centerline:

Commence at the point of intersection of the easterly right of way line of Dixie Highway [State Highway 5] with the south line of Section 33, Township 42 South, Range 43 East; thence North 0° 13' 02" East along said easterly right of way line of Dixie Highway for 181.05 feet to the Southwest corner of that certain parcel of land owned by Florida Power & Light Company; thence South 88° 22' 22" East along the south line of said parcel of land for 1,411.03, feet more or less, to the bulkhead line on the westerly edge of Lake Worth; thence North 1° 00' 24" East along said bulkhead line for 28.81 feet to the center of an existing discharge structure and to the POINT OF BEGINNING of the hereinafter to be described centerline; thence along the centerline of an existing sub-aqueous pipe line for the following 4 courses: 1) South 88° 28' 28" East for 164.21 feet to a point, 2) thence North 83° 47' 52" East for 1,130.46 feet to the point of curvature of a circular curve concave to the northwest; 3) thence Northeasterly along the arc of said circular curve, having a radius of 774.8 feet and a central angle of 68° 00' 00" for an arc distance of 919.55 feet to a point of tangency; 4) thence North 15° 47' 52" East for 96.12 feet to the end of said sub-aqueous pipe line; thence continuous North 15° 47' 52" East for 50 feet to the point of termination of said centerline; all of the above in Palm Beach County, Florida, and containing 236,034 square feet more or less (5.42 acres more or less).

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\Riviera\RA_SCAAActiveMapDocuments\08387633RA021_Rev1_GenSiteMap.mxd / Modified 1/19/2009 1:14:45 PM / Plotted 1/27/2009 2:31:54 PM by dlamar



AREA MAP



★ RBEC Site Location

LEGEND

- ▨ FPL Riviera Beach Energy Center (To Be Certified)
- ▨ Construction Parking & Laydown Area
- HIGHWAY
- LIMITED ACCESS
- MAJOR ROADS
- RAMP

REFERENCES

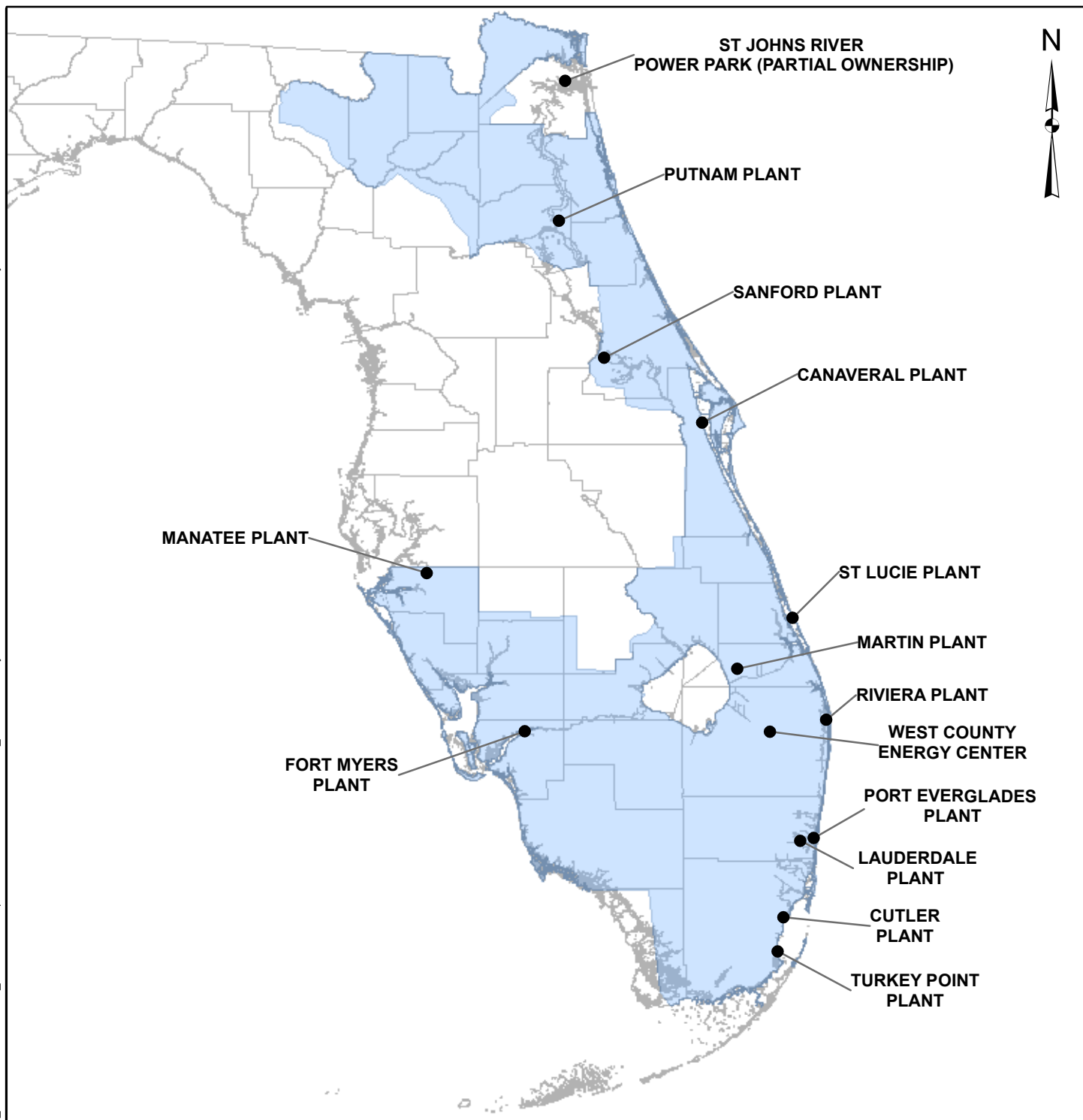
1. FPL Riviera Beach Energy Center (to be certified) FPL., 2009.
2. Construction Parking and Laydown Area, FPL, 2009.
3. Municipalities, Palm Beach County Planning, Zoning, and Building Departments, July 2008.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RWW
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
GENERAL EXISTING RIVIERA PLANT SITE LOCATION						
PROJECT No. 083-87633 FILE No. 08387633RA021						
DESIGN	RCM	12/17/2008	SCALE: AS SHOWN	REV.	1	
GIS	NRL	1/19/2009				
CHECK	RCM	1/27/2009				
REVIEW	KFK	1/27/2009				



FIGURE 1.1.0-1



LEGEND

- FPL Power Plants
- FPL Service Territory

REFERENCES

1. FPL Power Plant Locations, & Service Area, FPL, 2009



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
SERVICE TERRITORY						
			PROJECT No.	083-87633	FILE No.	08387633RA004
			DESIGN	RCM	12/17/2008	SCALE: AS SHOWN
			GIS	NRL	1/27/2009	REV. 0
			CHECK	RCM	1/27/2009	FIGURE 1.2.0-1
			REVIEW	KFK	1/27/2009	

2.0 NEED FOR THE PROPOSED FACILITIES

On September 12, 2008, the FPSC issued an affirmative need determination order for the conversion of the Riviera Plant. A copy of Order No. PSC-08-0591-FOF-EI, by which the FPSC also granted an affirmative need determination for West County Energy Center Unit 3 and the conversion of the Cape Canaveral Plant, is provided as the remainder of this Chapter.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition to determine need for West County Energy Center Unit 3 electrical power plant, by Florida Power & Light Company.	DOCKET NO. 080203-EI
In re: Petition for determination of need for conversion of Riviera Plant in Palm Beach County, by Florida Power & Light Company.	DOCKET NO. 080245-EI
In re: Petition for determination of need for conversion of Cape Canaveral Plant in Brevard County, by Florida Power & Light Company.	DOCKET NO. 080246-EI ORDER NO. PSC-08-0591-FOF-EI ISSUED: September 12, 2008

The following Commissioners participated in the disposition of this matter:

MATTHEW M. CARTER II, Chairman
LISA POLAK EDGAR
KATRINA J. McMURRIAN
NANCY ARGENZIANO
NATHAN A. SKOP

APPEARANCES:

BRYAN S. ANDERSON, ESQUIRE and JESSICA CANO, ESQUIRE, 700 Universe Boulevard, Juno Beach, Florida 33408-0420; R. WADE LITCHFIELD, ESQUIRE, 215 South Monroe Street, Suite 810, Tallahassee, Florida 32301-1859
On behalf of FLORIDA POWER & LIGHT COMPANY (FPL).

MARTHA CARTER BROWN, ESQUIRE and CAROLINE KLANCKE, ESQUIRE, Florida Public Service Commission, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850
On behalf of the FLORIDA PUBLIC SERVICE COMMISSION (Staff).

FINAL ORDER GRANTING PETITIONS FOR DETERMINATION OF NEED

BY THE COMMISSION:

BACKGROUND

On April 8, 2008, Florida Power & Light Company (FPL) filed a petition for determination of need for the proposed West County Energy Center Unit 3 (WCEC 3), pursuant

to Section 403.519, Florida Statutes (F.S.), and Rule 25-22.080, Florida Administrative Code (F.A.C.). WCEC 3 will be a combined cycle unit with a summer capacity rating of 1,219 megawatts (MW), built on an existing generating site in Palm Beach County, Florida, with an in-service date of June 1, 2011.

On April 30, 2008, FPL filed two additional petitions for determination of need at its existing Cape Canaveral and Riviera plants. Both petitions involve converting two oil and natural gas fueled steam electric generating units built in the 1960s into efficient combined cycle power plants. The Cape Canaveral Conversion will convert two operating 400 MW dual-fired steam generating units into a combined cycle power plant with a summer capacity of 1,219 MW. The proposed commercial operation date of the Cape Canaveral Conversion is June 1, 2013. The Riviera Conversion will convert two operating 280 MW dual-fired steam generating units into a combined cycle power plant with a summer capacity of 1,207 MW. The proposed commercial operation date of the Riviera Conversion is June 1, 2014.

Public Testimony

In addition to the prefiled testimony submitted by FPL, we received mailed comments and heard live testimony from two public witnesses at the formal administrative hearing in Tallahassee on June 23, 2008. Topics of interest addressed by the public witnesses included: system reliability and integrity, reasonable costs for electricity, renewable energy, demand-side management, conservation and cost-effectiveness.

Other areas of interest that were discussed during the public testimony focused on subjects beyond the scope of this proceeding under Section 403.519, F.S., or our general regulatory jurisdiction. They included: environmental concerns about water supply becoming contaminated and unavailable, health concerns about drinking contaminated water, safety concerns regarding the plant and associated facilities being located near a blasting area.

Section 403.519, F.S., authorizes us to examine FPL's projected costs for environmental controls necessary to meet current state and federal environmental requirements. The public testimony regarding the environmental concerns and health issues falls under the Department of Environmental Protection's (DEP) jurisdiction.

While safety is not a specific issue in a need determination proceeding conducted under Section 403.519, F.S., we do have jurisdiction to prescribe and enforce safety standards for transmission and distribution facilities of public utilities pursuant to Section 366.04(6), F.S. We also have jurisdiction over natural gas pipeline safety pursuant to Sections 368.01-368.61, F.S., and we have implemented this jurisdiction in Chapter 25-12, F.A.C., "Safety of Gas Transportation by Pipeline." At the hearing for these dockets, in response to the public testimony and questions by the Commissioners, FPL witness Gnecco testified that the project and the related natural gas lateral met safety standards.

Our ability to address some of the issues raised in public testimony is limited by the scope of Section 403.519, F.S., and other statutes which establish our jurisdiction. However,

these concerns may be relevant in certification proceedings before DEP, the Division of Administrative Hearings, and the Governor and Cabinet, sitting as the Siting Board.

Factors for Consideration

Pursuant to Section 403.519(3), F.S., this Commission is the sole forum for the determination of need for an electrical power plant. In making our determination, we must take into consideration the need for electric system reliability and integrity, the need for adequate electricity at a reasonable cost, the need for fuel diversity and supply reliability, whether the proposed plant is the most cost-effective alternative available, and whether renewable energy sources and technologies, as well as conservation measures, are utilized to the extent reasonably available.

This Order reflects our decision on the petitions for determination of need, and serves as our report under the Power Plant Siting Act, as required by Section 403.507, F.S. We have jurisdiction over the subject matter of this proceeding pursuant to Sections 403.519, 403.507, 366.01, 366.04, 366.05, 366.06, and 366.07, F.S. Our decision is explained in detail below.

DECISION

FPL has demonstrated a reliability need for additional resource capacity in 2013. Usually, when a company seeks to satisfy a need for additional resource capacity using natural gas facilities, a petition for need determination would be submitted approximately 3 years before the facility's in-service date. The company decided, however, that unique economic opportunities and site-specific circumstances made it more cost effective to build WCEC 3 for operation in 2011 and perform the conversions at Cape Canaveral and Riviera by 2013 and 2014. FPL contends that it will not be able to perform the conversions of Cape Canaveral and Riviera without approval of the proposed WCEC 3. FPL chose gas-fired combined cycle units as its resource option to meet its capacity needs. This decision was made primarily because coal and nuclear generation have longer construction times and would not be able to provide the additional capacity in the time needed. This approach will maintain FPL's reserve margin above 20 percent throughout the period.

FPL issued a Request for Proposals (RFP) for the WCEC 3 unit on December 13, 2007, according to the principles prescribed in Rule 25-22.082, F.A.C. (Bid Rule). FPL's analysis of the proposals revealed that WCEC 3 was more than \$600 million in cumulative present value revenue requirements (CPVRR) less costly than the next best alternative. FPL requested an exemption from the Bid Rule for the conversion petitions under the provisions of subsection 18 of the Bid Rule. FPL claimed that the WCEC 3 RFP results could provide a measure of the cost-effectiveness of the conversions because the WCEC 3 RFP was conducted recently, and FPL did not believe that the results would be materially different from an RFP for the conversions.

As explained below, we approve the need for the new WCEC 3, the conversions of the Cape Canaveral and Riviera plants, and the exemption from the Bid Rule for the conversions.

The Requirements of the Bid Rule

FPL states that its RFP related to the WCEC 3 facility was consistent with the requirements of the Bid Rule, and that specific content required by the Bid Rule was included in the RFP. FPL compared the proposed WCEC 3 to five other proposed resource plans that were received in response to the RFP. FPL's analysis of the proposals showed that WCEC 3 in 2011 was more than \$600 million CPVRR less costly than the next best alternative proposed in the RFP. An independent evaluator reviewed FPL's solicitation process and conducted his own evaluation of FPL's Next Planned Generating Unit and the proposals that were submitted in response to the RFP. As a result of his evaluation, the evaluator agreed with the results of the RFP.

The RFP evaluation was done using fuel and economic forecasts developed in 2007. FPL updated its fuel and economic forecast assumptions on March 13, 2008. Since all of the proposals were based on either natural gas or oil generation alternatives, the change in fuel and economic assumptions did not affect the relative rankings of proposals compared to constructing WCEC 3 in 2011.

We find that FPL has met the requirements of Rule 25-22.082, F.A.C. The record shows that WCEC 3 in 2011 is more than \$600 million CPVRR less costly than any of the proposals received through the RFP.

Exemption from the Bid Rule

While FPL conducted an RFP consistent with the requirements of the Bid Rule for the WCEC 3 project, FPL has requested an exemption from the Bid Rule for the Riviera and Cape Canaveral Conversion projects. FPL asserts that the conversion of the Riviera and Cape Canaveral plants satisfies each of the three available bases for an exemption from Rule 25-22.082, F.A.C., by providing CPVRR savings to customers, providing highly reliable capacity, and serving the public welfare by reducing emissions and fossil fuel usage.

Subsection 18 of the Bid Rule provides:

Upon a showing by a public utility and a finding by the Commission that a proposal not in compliance with this rule's provisions will likely result in a lower cost supply of electricity to the utility's general body of ratepayers, increase in the reliable supply of electricity to the utility's general body of ratepayers, or otherwise will serve the public welfare, the Commission shall exempt the utility from compliance with the rule or any part of it for which such justification is found.

FPL contends that if WCEC 3 is placed into service in 2011, the company will have the opportunity to convert the older, inefficient Riviera and Cape Canaveral plants into highly efficient combined cycle power plants. Together, the conversion projects are expected to result in customer savings of \$457 million CPVRR. FPL used the December 13, 2007, RFP that was conducted for WCEC 3 to compare the conversion projects. FPL asserted that the proposals

received for the WCEC 3 RFP are similar to proposals that would likely have been received in response to an RFP for the conversions. An independent evaluator reviewed FPL's evaluation and determined that the plan with the conversion projects was \$481 million CPVRR less expensive than the most economic resource plan using proposals received in response to the RFP. The conversion projects will be more cost-effective compared to using the purchased power proposals that were evaluated.

FPL has shown that its plan for WCEC 3 with conversions is more cost-effective than the plan that was compared to the RFP responses. We can infer from this evidence that the conversion projects will likely result in a lower cost supply of electricity, and therefore should be granted an exemption from the requirements of the Bid Rule. FPL has agreed to annually report the budgeted versus actual construction expenses for all three projects.

We grant FPL an exemption from the Bid Rule with respect to the Cape Canaveral and Riviera projects. FPL has shown that the conversion projects will result in a lower cost supply of electricity, increase the reliable supply of electricity.

Need for Electric System Reliability and Integrity

FPL contends that reliable forecasts show that, although growing at a slower rate, Florida's population is still on the rise. FPL asserts that the total growth in customers is the primary driver of its projected peak demand growth.

We have reviewed FPL's forecast assumptions, regression models, and the projected system peak demands, and find that this information is appropriate for use in this docket. The forecast assumptions were drawn from independent sources, which we have relied upon in prior cases. The regression models used to calculate the projected peak demands conform to accepted economic and statistical practices. Although slower customer growth could reduce actual peak demand from that forecasted, we find that the projected peak demands produced by the models used by FPL appear to be a reasonable extension of historical trends. FPL witness Morley's testimony indicated that FPL's forecasts accounted for the recent trend of a decreasing population growth rate.

FPL uses the University of Florida's Bureau of Economic and Business Research (BEBR) to develop its population projections. BEBR's population projections are normally updated every year, the most recent being in November 2007. Those projections show continued long-term growth in Florida, specifically, a 1.7 percent annual growth rate beginning in the 2008 through 2017 period. FPL also performed a sensitivity analysis using updated population projections from the University of Florida's BEBR dated February 2008. That analysis revealed that there will still be significant cost savings and other benefits realized with lower customer growth. Although slower customer growth could reduce actual peak demand from that forecasted, we find that the projected peak demands produced by the models used by FPL appear to be a reasonable extension of historical trends.

FPL's base case plan would add new combined-cycle generation in the years 2013, 2014, and 2016 in order to maintain a 20 percent reserve margin. If a 15 percent reserve margin

planning criterion is assumed, FPL's initial reliability need could be delayed until 2014. From 2011 through 2017, FPL has a need for 4,844 MW of additional generating capacity. WCEC 3 will supply approximately 1,219 MW of this need.

Under different circumstances, FPL would not file a petition for a determination of need for WCEC 3 until sometime in 2010. The decision to build WCEC in 2011, which is in advance of the identified reliability need, is driven by unique economic opportunities and site-specific circumstances. For example, the economic analytical results for WCEC 3 in 2011 show that costs of equipment, materials and labor are significantly lower than they would be if WCEC 3 were to be installed later, or at an alternative site. After the addition of WCEC 3 in 2011, FPL's reserve margin will be approximately 27.9 percent. FPL wishes to construct WCEC 3 in 2011 because it believes doing so will provide adequate generating capacity to allow for the removal from service of the existing Cape Canaveral and Riviera generating units in order to pursue the conversion of these facilities and not adversely impact system reliability. When the Canaveral and Rivera units are removed from service, FPL's reserve margin would drop to approximately 21.7 percent in the year 2011.

The table below summarizes the projected reserve margin for the scenarios mentioned previously:

Estimated Impact on Summer Reserve Margin (%)				
Year	No Additions	Base Case	WCEC 3 in 2011 without Conversions	WCEC 3 in 2011 with Conversions following
2011	22.3	22.3	27.9	21.7
2012	20.6	20.6	26.0	20.0
2013	18.7	24.0	24.0	23.4
2014	13.6	23.8	23.8	23.2
2015	11.1	21.1	21.1	20.5
2016	3.4	22.9	22.9	22.3
2017	1.1	20.1	20.1	19.5

FPL's need for additional capacity to meet rising electricity demands cannot be satisfied with additional purchased power from renewable generation. Additional DSM programs and renewables are not capable of deferring the need for the additional capacity. Renewable generation opportunities as well as DSM programs will be addressed below.

As discussed above, the conversion of the Riviera and Cape Canaveral units would add approximately 1,069 MW of incremental capacity to FPL's system. FPL's base case plan would add new combined-cycle generation in the years 2013, 2014, and 2016 to maintain a 20 percent reserve margin. If a 15 percent reserve margin planning criterion was assumed, FPL's initial reliability need could be delayed until 2014. Under different circumstances, FPL would not file a petition for a determination of need until sometime in 2010. The decision to convert the Riviera

generating unit is driven by unique economic opportunities and site-specific circumstances. After the addition of WCEC 3 in 2011, FPL's reserve margin will be approximately 27.9 percent. The construction of WCEC 3 in 2011 will provide adequate generating capacity to allow the existing Riviera generating unit to be removed from service during the conversion period without adversely impacting system reliability. When the Riviera and Cape Canaveral units are removed from service, FPL's reserve margin would drop to approximately 21.7 percent in the year 2011. If WCEC 3 were not added in 2011, and FPL continued to pursue the conversions of the Cape Canaveral and Riviera units, FPL's reserve margin would drop below 20 percent beginning in 2011 and beyond. The decision to convert the existing Riviera and Cape Canaveral units is more cost-effective than FPL's base case plan of adding new greenfield generation in 2013 and 2014.

We find that there is a need for the WCEC 3 project and the conversion of the Riviera plant and the Cape Canaveral plant, taking into account the need for electric system reliability and integrity, as this criterion is used in Section 403.519, F.S. The evidence shows that FPL will have a need for approximately 4,844 MW of additional capacity beginning in the 2011 through 2017 period. FPL performed a sensitivity analysis using updated population projections from the University of Florida's BEBR, dated February 2008. That analysis revealed that there would still be significant cost savings and other benefits realized with lower customer growth. FPL has demonstrated a reliability need in the summer of 2013 based on maintaining a 20 percent reserve margin planning criterion. The construction of WCEC 3 in 2011 will provide adequate generating capacity to allow for the conversions of the existing Cape Canaveral and Riviera generating units and will not adversely impact system reliability.

Need for Adequate Electricity at a Reasonable Cost

FPL contends that constructing WCEC 3 in 2011 will take advantage of construction cost efficiencies and provide more cost certainty than building a unit at a greenfield site at a later time. Moreover, adding WCEC 3 in 2011 will save customers \$137 to \$735 million CPVRR compared to the other available self-build alternatives.

The total installed cost estimate for WCEC 3 is \$864.7 million. FPL believes that the costs of WCEC 3 are reasonable and represent the most cost-effective option available. Compared to FPL's other self-build alternatives, FPL's original analysis revealed that the resource plan that included WCEC 3 in 2011 will save customers from \$137 million to \$460 million CPVRR. A later analysis was conducted using updated fuel and environmental cost forecasts. The results of that analysis depict savings increasing from \$460 million CPVRR to \$735 million CPVRR by the year 2040. The conversions will add approximately \$457 million in additional savings for FPL's ratepayers.

We find that FPL's fuel price forecasts are reasonable for purposes of evaluating its expansion and conversion plans. Although FPL did not compare its fuel forecasts to published forecasts, FPL represents that its forecasts are based on recognized, independent sources of forecast information. We note that, for natural gas, FPL used a real escalation rate – 1.14 percent for WCEC Unit 3 and 2.0 percent for the updated conversion forecasts – based on the average annual escalation from 2020 to 2030 from EIA's Annual Energy Outlook February 2007 price forecast. FPL states the escalation rates are "industry-accepted." FPL further states that the

“fuel price forecasts reflect the projected supply, demand, and price for fuel oil, natural gas, coal, and petroleum coke, as well as the transportation of these fuels to the existing and proposed sites.” According to witness Stubblefield, FPL is confident that there is enough natural gas to supply WCEC 3 and the conversion projects during their lifetimes.

Financial Assumptions

FPL’s analysis for WCEC 3 assumes an overall cost of capital of 8.40 percent with the federal manufacturer’s tax credit and 8.30 percent without the credit. A different discount rate was used for generation-related capital costs because the application of the federal production tax credit for new generating units results in a different effective tax rate for generation-related capital costs compared to other capital costs. These rates of return are based on a capital structure consisting of 55.8 percent equity at a cost rate of 11.75 percent and 44.2 percent debt at a cost rate of 6.43 percent. FPL applied the then current Allowance for Funds Used During Construction (AFUDC) rate of 7.42 percent. FPL used several of the same financial and economic assumptions for WCEC 3, such as the 2.50 percent escalation rate and the capital structure, that were used in the Company’s need determination filings for capacity uprates at its four existing nuclear units approved in Order No. PSC-08-0021-FOF-EI¹ and the Turkey Point Units 6 and 7 approved in Order No. PSC-08-0237-FOF-EI.² There was no evidence presented in the record that disputes the reasonableness of FPL’s financial assumptions. Based on this review, we find that the financial assumptions used for this evaluation are reasonable.

Generation Cost Estimates

The total cost of the proposed WCEC 3 is estimated at \$864.7 million and will provide 1,219 MW of capacity. The Riviera conversion total cost is estimated at \$1.3 billion, while the Cape Canaveral conversion total cost is estimated at \$1.1 billion. The estimated total installed cost for WCEC 3 is \$709/kilowatt. This cost estimate includes the benefits associated with utilizing an existing site and infrastructure. FPL has demonstrated that the cost of WCEC 3 is less than the cost of a new greenfield combined-cycle generating unit, which is estimated to be \$1,076/kW. West County Units 1 & 2 are currently under construction and FPL would be able to use those construction crews on the WCEC 3 project. If the decision to build any new generation is delayed until 2013, the WCEC site may not be feasible for expansion due to cooling water costs and availability, as well as increased costs due to the need to re-mobilize construction crews.

The estimated total installed cost for the conversion of the Cape Canaveral and Riviera plants are \$914/kw and \$1,057/kw. The Riviera and Cape Canaveral Conversions will take

¹ Order No. PSC-08-0021-FOF-EI, issued January 7, 2008, in Docket No. 070602-EI, In re: Petition for determination of need for expansion of Turkey Point and St. Lucie nuclear power plants, for exemption from Bid Rule 25-22.082, F.A.C., and for cost recovery through the Commission’s Nuclear Power Plant Cost Recovery Rule, Rule 25-6.0423, F.A.C.

² Order No. PSC-08-0237-FOF-EI, issued April 11, 2008, in Docket No. 070650-EI, In re: Petition to determine need for Turkey Point Nuclear Units 6 and 7 electrical power plant, by Florida Power & Light Company.

advantage of existing sites and infrastructure, with less cost uncertainty than building units at a greenfield site. FPL's analyses show that the resource plan with the Riviera and Cape Canaveral Conversions is projected to save customers \$457 million CPVRR.

Fuel Forecasts

The natural gas and oil price forecasts through 2020 are based on the forward curve for commodity prices and projections from PIRA Energy Group. After 2020, the prices are escalated for real price changes based on the Energy Information Administration's (EIA) long-term price forecast. Transportation costs are added to the commodity prices to obtain delivered prices. For WCEC 3, FPL's assumed gas transportation cost for evaluating the RFP responses is \$1.165 per MMBtu. For the conversion projects, FPL's assumed transportation cost for evaluation purposes is \$1.40 per MMBtu. For solid fuel, FPL used commodity price forecasts from JD Energy and added in marine and rail transportation costs and terminal charges. All fuel prices are converted to nominal dollars using the 2.5 percent annual escalation rate.

Environmental Costs

In preparing its economic analysis of WCEC Unit 3, FPL included a reasonable level of environmental compliance costs. The allowance costs used by FPL for WCEC Unit 3 were based on ICF International's report titled "U.S. Emission & Fuel Market Outlook, 2006 edition" (ICF's 2006 Report), as well as its updated version, "U.S. Emission & Fuel Market Outlook, 2007 edition" (ICF's 2007 Report). In particular, the mid-range ICF compliance cost forecast, namely ENV II, was used. This forecast is the same as what we recently reviewed and approved in Order No. PSC-08-0237-FOF-EI, for FPL's Turkey Point Units 6 & 7. The allocations of SO₂, NO_x, and H_g allowances were based on the Clean Air Interstate Rule (CAIR) and Clean Air Mercury Rule (CAMR) rules developed by the Environmental Protection Agency. For CO₂, it was assumed that allowances would be purchased under a cap-and-trade system similar to an auction. Apart from the consideration of air emission costs, FPL has also included all equipment and associated operating costs required to comply with current environmental laws and regulations in the economic analysis of the WCEC 3 resource plan.

The same methodology mentioned in the previous paragraph regarding allowance costs was used to evaluate the economic benefit of its conversion plans. FPL used its medium-level natural gas cost forecast and its medium-level CO₂ compliance cost forecast (ENV II). FPL conducted a sensitivity economic analysis that used both the original and the updated high CO₂ compliance cost forecasts provided in ICF's 2006 Report and ICF's 2007 Report. We find that FPL has included a reasonable level of environmental compliance costs in its economic analysis of WCEC 3 and the conversion options of the Cape Canaveral and Riviera plants.

Water Costs

Reclaimed water will be the primary source of cooling and process water for WCEC Unit 3. FPL's witness Gnecco testified that the East Coast Regional Water Reclamation Facility of the Palm Beach County Water Utilities will provide reclaimed water to the WCEC site. Witness

Gnecco asserted that the East Coast Regional Water Reclamation Facility is a very reliable source of reclaimed water. The capital and Operation and Maintenance costs associated with construction, operation, and maintenance of the treatment facility and pipeline will be included in the County's monthly water charge to FPL. Costs associated with the monthly water fee have been included in the economic analysis of this case.

The conversion of the Cape Canaveral and Riviera plants will not use additional water sources or exceed existing water permit limits. Water from the Indian River Lagoon (Intracoastal Waterway) is and will continue to be used for once-through cooling water for the Cape Canaveral conversion. After the conversion, the amount of cooling water required will not exceed current permit limits. In the Riviera conversion, water from Lake Worth (Intra-costal waterway) is and will continue to be used for once-through cooling water for the Riviera conversion. After the conversion, the amount of cooling water required will not exceed current permit limits.

We find that there is a need for the construction of the WCEC 3 plant and the conversion of the Riviera plant and the Cape Canaveral plant, taking into account the need for adequate electricity at a reasonable cost, as this criterion is used in Section 403.519, F.S. The cost information presented in the record demonstrates that the construction of WCEC 3 and the conversions of the Cape Canaveral and Riviera units will not only provide adequate electricity, but also ensure the most reasonable costs to ratepayers.

Need for Fuel Diversity and Supply Reliability

We review the need for fuel diversity in our evaluation of utility generation expansion plans as part of our annual Ten-Year Site Plan review process. In 2006, the Florida Legislature amended Section 403.519, F.S., to require that we specifically consider the need for fuel diversity on a utility's system when evaluating a petition for need.

The decision to build WCEC 3 is primarily driven by economic and environmental benefits. In addition, building WCEC 3 in 2011 will allow for the conversion of FPL's inefficient, 1960s-era Cape Canaveral and Riviera plants to highly efficient state of the art combined cycle units. Coal and nuclear generation have longer construction times and would not be able to provide the additional capacity in the time needed. Therefore, FPL's only available option for base load capacity is natural gas.

At the hearing, the question was raised whether there is an adequate supply of natural gas available to provide reliable service to customers. FPL asserts that there will be an adequate supply of natural gas available to fuel WCEC 3 for the life of the unit. FPL states that it was provided with projected natural gas supply and demand balance availability from the PIRA Energy Group. FPL asserts that those projections demonstrate the adequacy of natural gas supply.

We reviewed a document from the PIRA Energy Group, which contained information regarding the natural gas supply and demand balance. We agree with FPL that an adequate supply of natural gas will be available for the proposed WCEC and conversion projects.

FPL plans to supply WCEC 3 through existing capacity arrangements with the Gulfstream Natural Gas System's (Gulfstream) pipeline that now serves FPL's Martin and Manatee plants. Florida Gas Transmission will expand its pipeline system to begin serving the Martin and Manatee plants. For the conversions, FPL is in discussions with multiple pipeline companies regarding supply of gas to the Canaveral and Riviera plants. FPL expects to have firm transportation arrangements for these plants by late 2008.

FPL's generation mix is still predominately natural gas. The addition of WCEC 3 in 2011 will improve FPL's overall fuel efficiency by approximately 1.4 percent, resulting in a reduction of total oil and gas consumption by approximately 29 million MMBtu through 2017 compared to FPL's base case. Compared to the resource plan that includes WCEC 3 in 2011 without conversions, the addition of the conversions will improve FPL's system average heat rate by about 1.1 percent. The construction of WCEC 3 and the conversion of the Cape Canaveral and Riviera units will not change FPL's generation fuel mix as a percentage of net energy for load. Compared to FPL's base plan, adding WCEC 3 in 2011 followed by the conversion projects is projected to reduce total oil and gas consumption by approximately 87.8 million MMBtu through 2017 and is summarized in the table below:

Total Oil and Gas Usage		
Plan	Usage to 2017 (MMBtu x 1,000)	2017 Differential from Base Case (MMBtu x 1,000)
Base Case	5,655,313	0
WCEC 3 w/o Conversions	5,625,803	-29,510
WCEC 3 w/ Conversions	5,567,464	-87,849

As discussed above, the conversions will improve FPL's overall fuel efficiency by approximately 1.1 percent. The conversion projects are projected to result in a reduction of total oil and gas consumption by approximately 58.3 million MMBtu through 2017, compared to a plan that adds WCEC 3 in 2011 followed by a greenfield generating unit in 2014. Compared to FPL's base plan, adding WCEC 3 in 2011 followed by the conversion projects is projected to reduce total oil and gas consumption by approximately 87.8 million MMBtu through 2017.

We find that there is a need for the WCEC 3 plant and the conversion of the Riviera plant and the Cape Canaveral plant, taking into account the need for fuel diversity and supply reliability, as this criterion is used in Section 403.519, F.S. FPL has demonstrated that the addition of WCEC 3 and the conversions of the Cape Canaveral and Riviera plants will result in

a reduction of dependence on natural gas and fuel oil, because it will reduce FPL's total oil and gas consumption by approximately 87.8 million MMBtu through 2017. Building coal or nuclear generation by 2013 is not feasible because of the construction and permitting lead times for those types of generation. The addition of WCEC 3 and the conversions will also lead to an overall increase in system efficiency of 1.4 percent for WCEC 3 and 1.1 percent for the conversions for an overall system efficiency of 2.5 percent.

No Mitigating Renewable Energy Sources and Technologies or Conservation Measures

FPL contends that its forecasted need already accounts for all the cost-effective DSM identified through 2014 and projected through 2017, and available renewable resources, including the planned renewal of its existing firm renewable capacity purchase contracts and 126 MW of new renewable firm capacity.

In assessing the availability of DSM to meet its energy needs, FPL used the same assumptions that were used in the recently approved Turkey Point nuclear proceedings.³ An estimated 5,513,458 residential customers have participated in FPL's DSM programs through 2007, along with approximately 178,203 commercial customers. In 2007, 165,575 residential DSM audits were performed by FPL. For commercial customers, 11,755 DSM audits were performed by FPL. FPL described its recent and continuing efforts to educate customers on the benefits of energy conservation via DSM programs, including its outreach and participation at events attended by FPL customers. Accounting for reserve margin requirements, FPL's DSM efforts through 2007 have eliminated the need to construct the equivalent of approximately 12 new 400 MW generating units. FPL's initial projection indicates a savings of 3,030 MW of summer demand from the year 2008 through the year 2017. This represents an expected increase in DSM savings of 1,122 MW from 2008 through 2017. FPL evaluates DSM programs based on performance against the rate impact measure and participant tests, and screens out measures that would have a payback period of less than two years for consumers.⁴

In April of 2007, FPL issued an RFP for renewable generation extending to 2015. The responding bids equated to 126 MW of capacity. The amount of capacity that resulted from the bids of the April 2007 RFP would not be able to mitigate the need for the proposed WCEC 3 or conversion projects. No contracts resulted from the RFP due to FPL's determination that the costs were excessive. In 2008, FPL again issued an RFP for renewable generation, receiving proposals for 262 MW. The deadline for the proposals was less than two weeks prior to the date of the hearing in this docket, which allowed insufficient time for FPL to evaluate the responses. However, even if all contracts were signed, it would still not defer the need for WCEC 3 and the Riviera and Cape Canaveral conversion projects.

Witness Sim testified that if the \$3.26 billion of installed capital dollars that the proposed WCEC 3 and Conversion units are projected to cost were applied to a hypothetical installation of

³ Order No. PSC-08-0237-FOF-EI, issued April 11, 2008, in Docket No. 070650-EI, In re: Petition to determine need for Turkey Point Nuclear Units 6 and 7 electrical power plant, by Florida Power & Light Company.

⁴ Order No. PSC-04-0763-PAA-EG, issued August 9, 2004, in Docket No. 040029-EG, In re: Petition for approval of numeric conservation goals by Florida Power & Light Company.

renewables, that dollar amount would result in an estimated 90 MW of incremental firm summer capacity from photovoltaics, or 220 MW of summer demand reduction from solar water heaters. Further, FPL indicated that the photovoltaic capacity purchased would require approximately 2,800 acres of land to install, whereas the proposed WCEC 3 and the two conversions would be constructed on land already dedicated to power plants, and thus would not require the purchase of additional land. The hypothetical photovoltaic facility would serve an estimated 56,000 customers compared to Witness Sim's estimation that the three generating units would serve approximately 2 million customers. The customers to be served by the hypothetical solar water heaters would total approximately 1.1 million; however, those customers would have only those costs offset that relate to water heating.

FPL has proposed to install renewable resources in addition to the proposed plants. FPL identified three planned commercial scale solar projects: (1) a 75 MW solar thermal installation at FPL's Martin facility on 600 acres of land to be completed by 2010; (2) a 25 MW photovoltaic installation on FPL property on 180 acres in DeSoto County to be completed by 2010; and (3) a 10 MW photovoltaic installation at NASA's Kennedy Space Center in Brevard County on 60 acres of land. FPL also plans to install up to six wind turbine generators on FPL's property on Hutchinson Island in St. Lucie County. Local, state, and federal permits and approvals have not been attained, which could affect the estimated in-service date of 2010. The St. Lucie Wind Project would total an estimated 13.8 MW on approximately 20 acres.

We find that there are no additional renewable energy sources and technologies or cost-effective conservation measures available that might mitigate FPL's need for the proposed WCEC 3 in 2011 and conversions of the Cape Canaveral and Riviera plants as this criterion is used in Section 403.519(4), F.S. FPL states that while it will continue to pursue renewable resource opportunities, both purchased and self-built, DSM and renewable resources will not be sufficient to meet FPL's future need for more than 4,800 MWs of new generating capacity through 2017.

Most Cost-Effective Source of Power

FPL contends that adding WCEC 3 in 2011 is more cost-effective than its other self-build options, and more cost-effective than all proposals received in response to its 2007 RFP. Adding WCEC 3 in 2011 will result in customer savings of about \$460 million CPVRR compared to adding a similar unit at a greenfield site in 2013. If the conversion projects were added to the plan of the proposed WCEC 3 in 2011, FPL asserts that its customers would experience even greater cost savings. FPL states that if the environmental and fuel costs were higher, the economic benefits to customers would be greater.

The evidence in these proceedings demonstrates that the addition of WCEC 3 and the conversions is the most cost-effective optimization of FPL's required capacity additions. In order to optimize the base plan, FPL has strategically used the proposed WCEC 3 in 2011 followed by the conversions to reduce the amounts of fuel used and subsequent emission reductions to bring economic savings to its ratepayers.

FPL's fuel mix is still predominately natural gas. However, the addition of WCEC 3 and the conversions will improve FPL's overall fuel efficiency, resulting in a reduction of total oil and gas consumption by its customers. This in turn would lead to additional economic savings by displacing less efficient units with cleaner, more efficient generating units. In addition, WCEC 3 in 2011 would lead to a reduction of approximately 29,510 million MMBtu of oil and natural gas usage by year 2017. Including the conversions with WCEC 3 in 2011 would lead to additional savings and a reduction of approximately 87,849 million MMBtu of oil and natural gas over the same time period.

Compared to the base case, the addition of WCEC 3 in 2011 will reduce the overall emissions on FPL's system. The reduction in emissions will be even greater when including the conversions with the addition of WCEC 3 in 2011. Witness Silva testified that system fuel efficiency improvement achieved due to the conversion projects is the only way that FPL can significantly reduce CO₂ emissions until the new nuclear generating units are added to FPL's system in 2018. Witness Silva further testified that the conversions will also result in reduced emissions of SO₂ and NO_x. FPL states that the proposed WCEC 3 and the conversions will contribute significantly toward achieving the CO₂ emission targets reflected in the Governor's Executive Order 07-127. The following chart shows the emissions reductions associated with the proposed projects. The chart also reveals that, of the three gases emitted, NO_x, not CO₂, will have the greatest percentage emission savings:

Projected Emissions Analysis 2010-2017									
Plan	SO ₂ (tons)	Diff. from Base	SO ₂ % Diff.	NO _x (tons)	Diff. from Base	NO _x % Diff.	CO ₂ (million tons)	Diff. From Base	CO ₂ % Diff.
Base Case	453,874	0	0%	165,901	0	0%	493	0	0
WCEC 3 w/o Conv.	432,805	-21,069	-4%	154,346	-11,555	-7%	490	-3	0%
WCEC 3 w/Conv.	409,576	-44,298	-10%	134,713	-31,188	-23%	485	-8	-1%

FPL's fuel and environmental forecasts for WCEC 3 were based on 2007 forecasts. Those forecasts revealed that the addition of WCEC 3 in 2011 would result in customer savings of about \$460 million CPVRR compared to adding a similar unit at a Greenfield site in 2013. FPL provided updated 2008 fuel and environmental cost estimates for the proposed WCEC 3 in 2011 using the updated March 13, 2008, forecasts. The results demonstrated that projected savings for WCEC 3 in 2011 increased to \$735 million CPVRR. FPL's fuel and environmental forecasts for the conversion projects used the March 13, 2008 forecasts. The results revealed that the conversions alone would generate savings of \$457 CPVRR for FPL's ratepayers. As a result of the new forecasts, the package containing WCEC 3 and the conversions would bring savings of approximately \$1.2 billion CPVRR to FPL's ratepayers, compared to the base case.

The following chart addresses the financial assumptions that we analyzed regarding FPL's proposal. The chart shows that the savings to FPL's ratepayers will begin in the near term (2017) and become even greater through the projected life of the units (2040):

Projected Financial Assumptions thru 2040				
Plan	CPVRR (millions thru 2017)	Difference from Base (millions thru 2017)	CPVRR (millions thru 2040)	Difference from Base (millions thru 2040)
Base Case	\$54,194	\$0	\$168,105	\$0
WCEC 3 w/o Conv.	\$53,887	\$-307	\$167,370	\$-735
WCEC 3 w/Conv.	\$53,771	\$-423	\$166,913	\$-1,192

The construction of WCEC 3 and the conversion of the Riviera and Cape Canaveral plants are the most cost-effective alternatives available, as this criterion is used in Section 403.519, F.S. As discussed above, FPL's economic analyses utilized a reasonable range of fuel and environmental costs. As part of the discovery process, FPL provided an updated analysis based upon 2008 fuel and environmental costs estimates. When compared to adding greenfield units in 2013 and 2014, the updated analyses indicate that adding WCEC 3 in 2011 followed by the conversion projects would result in a reduction of approximately 44,298 tons of SO₂ (9.8 percent); 31,188 tons of NO_x (18.8 percent); and 8 million tons of CO₂ (1.6 percent) by the year 2017. In addition, the updated analyses indicate that adding WCEC 3 in 2011 followed by the conversion projects would save approximately 87,849 million MMBtu of oil and natural gas over the same time period. These environmental and fuel reduction benefits continue into the future and combine to result in an estimated savings to FPL's customers of approximately \$1.2 billion in present value savings by the year 2040. Compared to the base case and WCEC 3 without conversions plans, the analyses show that the proposed WCEC 3 in 2011 with conversions is the most cost-effective alternative available to FPL and its ratepayers. In fact, updated environmental and fuel cost forecasts revealed even greater savings for FPL's ratepayers. Together, these three projects will result in the greatest savings for FPL's ratepayers.

Need for West County Energy Center Unit 3 and the Conversions of Riviera and Cape Canaveral

FPL asserts that the evidence presented demonstrated that WCEC 3 in 2011, as well as the proposed conversions, satisfies all criteria listed in Section 403.519, F.S. FPL further contends that when compared to other self-build alternatives, WCEC 3 in 2011 without the conversions is the most cost-effective choice available by \$137 million to \$735 million CPVRR. When combined, the proposed WCEC 3 and the conversions are estimated to save FPL's ratepayers approximately \$1.2 billion by the year 2040. Furthermore, FPL argues that if the company were to delay the addition of WCEC 3 beyond 2011, it would not be able to move forward with its conversions of the Cape Canaveral and Riviera plants, thereby missing out on the benefits associated with those projects.

We find that the evidence in the record demonstrates that, based on maintaining a 20 percent reserve margin planning criterion, FPL will have a reliability need for additional capacity

in the summer of 2013. If WCEC 3 is built in 2011, FPL can remove the Cape Canaveral and Riviera plants from operation in 2010. FPL can then convert the steam electric generating units, which have been in operation since the 1960s, to high-efficiency combined cycle power plants, and return them to operation in 2013 and 2014. WCEC 3 is projected to be approximately \$735 million less expensive than FPL's base case expansion plan. The acceleration of WCEC 3 allows for the conversion of Cape Canaveral and Riviera plants, which are projected to increase savings to FPL ratepayers of approximately \$1.2 billion.

Annual Reporting of Costs

FPL has agreed that it will report, on an annual basis, budgeted and actual costs compared to the estimated total in-service cost of the proposed WCEC 3, Cape Canaveral, and Riviera units. The report shall be submitted to the Director of the Division of Economic Regulation. In addition, FPL also agreed that if a different combustion turbine design from the one presented in these proceedings is chosen, FPL will report to us regarding the comparative cost advantage of the alternate design chosen. Such a selection would only be made if the projected cost to FPL's customers would be lower as a result of the use of an alternate design.

CONCLUSION

FPL has demonstrated that its plan to build WCEC 3 and convert its existing Cape Canaveral and Riviera plants meets all of the requirements of Section 403.519, F.S. The new and converted units will provide nearly 2,300 MW of capacity needed through 2017, and ensure a 20 percent reserve margin. The assessments of various combinations of timings and generating resources used reasonable assumptions in demonstrating the proposed projects would provide adequate electricity at reasonable cost and, in fact, were the most cost-effective alternative. FPL demonstrated that use of all identified cost-effective conservation and reasonably available renewable generation will not provide the capacity or demand reduction necessary to mitigate the need for these projects.

Therefore, we approve the three need determinations and exemption from the Bid Rule for the two conversions. FPL shall report annually to the Director of Economic Regulation the budgeted and actual costs compared to the estimated total in-service cost of the proposed WCEC 3, Cape Canaveral Conversion and Riviera Conversion.

Based on the foregoing, it is

ORDERED by the Florida Public Service Commission that the three petitions for determination of need, filed by Florida Power & Light Company, are hereby granted as set forth herein. It is further

ORDERED that Florida Power & Light Company is granted an exemption from Rule 25-22.082, F.A.C., for the conversions of the Riviera and Cape Canaveral Plants. It is further

ORDERED that Florida Power & Light Company shall report, on an annual basis, budgeted and actual costs compared to the estimated total in-service cost of the West County Energy Center Unit 3, Cape Canaveral, and Riviera units, as set forth herein. It is further

ORDERED that these dockets shall be closed when the time for filing an appeal has run.

By ORDER of the Florida Public Service Commission this 12th day of September, 2008.

/s/ Ann Cole

ANN COLE

Commission Clerk

This is an electronic transmission. A copy of the original signature is available from the Commission's website, www.floridapsc.com, or by faxing a request to the Office of Commission Clerk at 1-850-413-7118.

(S E A L)

MCB/CMK

DISSENT BY: COMMISSIONER SKOP

COMMISSIONER SKOP, dissenting:

I respectfully dissent with the majority view on Issue 9 and Issue 17, to the extent that I am not comfortable waiving Section (15) of Rule 25-22.082 (Bid Rule), Florida Administrative Code for the two conversion projects.⁵

In relevant part, Section (15) of the Bid Rule requires that:

“If the public utility selects a self-build option, costs in addition to those identified in the need determination proceeding shall not be recoverable unless the utility can demonstrate that such costs were prudently incurred and due to extraordinary circumstances.”

From my perspective, it makes no sense to waive the requirement of a Commission rule that is directly on point, and which was clearly intended to protect consumers from cost overruns.⁶

⁵ FPL remains bound to the “self-build option” requirement of Rule 25-22.082(15) for the WEC-3 unit.

⁶ If changes to the existing rule are warranted, I would respectfully suggest that the Commission would be better served by revising the rule through the rulemaking process.

NOTICE OF FURTHER PROCEEDINGS OR JUDICIAL REVIEW

The Florida Public Service Commission is required by Section 120.569(1), Florida Statutes, to notify parties of any administrative hearing or judicial review of Commission orders that is available under Sections 120.57 or 120.68, Florida Statutes, as well as the procedures and time limits that apply. This notice should not be construed to mean all requests for an administrative hearing or judicial review will be granted or result in the relief sought.

Any party adversely affected by the Commission's final action in this matter may request:

- 1) reconsideration of the decision by filing a motion for reconsideration with the Office of Commission Clerk, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, within five (5) days of the issuance of this order in the form prescribed by Rule 25-22.060, Florida Administrative Code; or
- 2) judicial review by the Florida Supreme Court in the case of an electric, gas or telephone utility or the First District Court of Appeal in the case of a water and/or wastewater utility by filing a notice of appeal with the Office of Commission Clerk, and filing a copy of the notice of appeal and the filing fee with the appropriate court. This filing must be completed within thirty (30) days after the issuance of this order, pursuant to Rule 9.110, Florida Rules of Appellate Procedure. The notice of appeal must be in the form specified in Rule 9.900(a), Florida Rules of Appellate Procedure.

3.0 SITE AND VICINITY CHARACTERIZATION

3.1 Site and Associated Facilities Delineation

The existing FPL Riviera Plant Site is located primarily within the City of Riviera Beach with a small portion in the City of West Palm Beach southwest of the Lake Worth Inlet and Peanut Island, and across the Intracoastal Waterway in Palm Beach County, Florida. The existing Site consists of approximately 46 acres: approximately 39 acres located to the east of U.S. Highway 1 and are bounded on the west by U.S. Highway 1, on the north by Port of Palm Beach, on the south by 59th Street, and on the east by Lake Worth Lagoon (Intracoastal Waterway) of FPL-owned property, including the intake culvert and oil pipeline easements and approximately 5.4 acres of sovereign submerged lands; and approximately 7 acres located to the west of U.S. Highway 1, where FPL transmission lines are located. Figures 1.1.0-1 and 3.1.0-1 show the general vicinity around the existing Site. The converted Plant, or RBEC, will be located within the existing Site boundaries to the east of U.S. Highway 1.

The Project for which FPL seeks certification includes dismantlement of the existing Plant and construction of the converted Plant, the construction parking and laydown area, certain transmission-related activities, and the viewing center (see Figures 3.1.0-2 and 3.1.0-3).

3.1.1 Existing Uses

The existing Plant has been in the current location and operating since 1946. Units 1 and 2, which began operation in 1946 and 1953, respectively, have been permanently retired and removed from the Site. The commercial in-service dates for Units 3 and 4 were 1962 and 1963, respectively, and they have remained in service since those dates. The conventional steam boilers for Units 3 and 4 are permitted to burn No. 6 fuel oil, No. 2 fuel oil, and/or natural gas. The existing Plant Site is shown in Figure 3.1.1-1.

Existing onsite support facilities include service buildings, an administration building, fuel oil tanks, water treatment facilities, once-through circulating water intake, discharge and outfall structures, wastewater treatment basins, a system switchyard and substation, and a staging area used by Palm Beach County for the County's artificial reef program in the southern portion of the existing Site.

3.1.2 Adjacent Properties and Nearby Areas

The existing land uses that are adjacent to the Site consist of predominantly industrial/maritime/utilities to the north, residential/commercial/institutional to the west, and residential to the south (refer to Subsection 3.2.3).

The closest residences are within the Northwood Harbor and Northwood neighborhoods south of the Site. These residences are within 500 feet of the Site boundary.

3.1.3 Uses Within the Site

Figure 3.1.0-1 shows the Site, including Units 3 and 4 and the facilities that support plant operation. Survey maps that delineate the Site boundary and topography are presented in Figures 3.1.3-1a through 3.1.3-1d. (Note: Larger sized drawings can be supplied upon request.)

3.1.4 One Hundred-Year Flood Zone

The Federal Emergency Management Agency (FEMA) map for the Site is shown as an overlay to the aerial image of the Site in Figure 3.1.4-1. As recorded on the Flood Insurance Rate Map, most of the Site is situated within Zone X, with the eastern portion situated within Zone AE and Zone X500. Zone X is outside of the 100-year flood zone. Zone AE is identified as a Special Flood Hazard Area (SFHA) and within the 100-year floodplain. Zone X500 is between the limits of the 100-year flood and 500-year flood zones.

The construction parking and laydown area located west of U.S. Highway 1 is entirely within Zone X.

3.2 Social and Political Environment

3.2.1 Governmental Jurisdictions

The Site is located primarily within the City of Riviera Beach with a small portion in the City of West Palm Beach, within Palm Beach County, Florida. Within 5 miles of the Site there are a total of eight municipalities: City of Riviera Beach, City of West Palm Beach, Town of Palm Beach, Town of Mangonia Park, Town of Palm Beach Shores, Town of Lake Park, Village of North Palm Beach, and City of Palm Beach Gardens. The City of Riviera Beach, City of West Palm Beach, Town of Palm Beach, Town of Mangonia Park, and Town of Palm Beach Shores are all within 1 mile of the Site.

Figure 3.2.1-1 depicts an area map showing a 1-mile radius around the Site. Figures 3.2.1-2a through 3.2.1-2d depict area maps with 1-, 2-, 3-, 4-, and 5-mile radii around the Site for municipalities; federal and state jurisdictions; county jurisdictions; and city parks.

One National Historic Landmark is within 5 miles of the Site: Whitehall (Henry M. Flagler House). Lake Worth Lagoon is within 1 mile of the Site. Portions of the Lagoon are part of the U.S. Fish and Wildlife Service's (USFWS) designated Critical Habitat for the threatened species, Johnson's seagrass, and the endangered Florida manatee. Three County Managed Areas/Conservation Lands are within 5 miles of the Site: Winding Waters Natural Area; Lake Park Scrub Natural Area; and the Grassy Waters Preserve. One State park is within 5 miles of the Site: John D. MacArthur Beach State Park. Six County parks are within 5 miles of the Site: Dyer Park; Ocean Reef Park; Westgate Park and Recreation Center; Schall Circle/Old Trail Park; Peanut Island Park; and Phil Foster Memorial Park. Three estuarine habitat areas of concern identified by Palm Beach County are within 5 miles of the Site: Snook Island Natural Area; Peanut Island (within 1 mile); and Munyon Island.

3.2.2 Zoning and Land Use Plans

The following section describes relevant provisions of the State Comprehensive Plan, the Strategic Regional Policy Plan (SRPP) for the Treasure Coast Regional Planning Council the future land use element of the City of Riviera Beach and the City of West Palm Beach Comprehensive Plans and the applicable land development regulations and Codes of Ordinances.

3.2.2.1 State Comprehensive Plan

The State Comprehensive Plan provides long range policy guidance for the orderly social, economic, and physical growth of the State. The Plan does not create regulatory authority that is not otherwise authorized by State law. The Project is consistent with the Plan, specifically, the applicable provisions identified in the Water Resource, Air Quality, Land Use, and Energy Sections of the Plan.

3.2.2.2 Strategic Regional Policy Plan for the Treasure Coast Region

The SRPP for the Treasure Coast Region (comprised of four counties including Palm Beach County) was adopted December 15, 1995. The SRPP is a long range guide for the physical, economic and social development of the region. The Plan is described as a direction setting document and does not create regulatory authority or authorize the adoption of agency rules, criteria, or standards not otherwise authorized by law.

The two policies under the Future of the Region address the implementation of practices that minimize airborne dust and particulate emission and the design of efficient intersections and traffic light sequences. These regional goals are 9.1 (Decreasing vulnerability of the Region to fuel price increases and supply interruptions) and 13.1 (Maintenance of acceptable air quality levels). Strategy 9.1.1 calls to reduce the Region's reliance on fossil fuels. Regarding Regional Goal 13.1 (air quality), the strategy calls for the encouragement of patterns of development to minimize dependency on the automobile. Both of these are regional land development and vehicular goals, but are consistent with goals for the RBEC Project.

The Economic Development element identifies important regional issues including the importance of public infrastructure and recognizes that electrical generation and transmission systems are a component of basic supporting structures. The ability to attract and sustain economic development is predicated on the quality of its public facilities.

The RBEC Project will comply with the SRPP for the Treasure Coast Region.

3.2.2.3 Comprehensive Plan

Each Florida county and municipality is required to adopt a local comprehensive plan that meets the requirements of the Local Government Comprehensive Planning and Land Development Regulations Act of 1985 (also referred to as Florida's Growth Management Act), as presented in Chapter 163, Part II, F.S., and Chapter 9J-5, F.A.C. The City of Riviera Beach and the City of West Palm Beach have adopted Comprehensive Plans that are in compliance with the State requirement. The Project is consistent with both of these Comprehensive Plans.

City of Riviera Beach

The Objectives and Policies of the City's Future Land Use Element reflect the long term planning for the City. As stated in this Element, the Site has the Future Land Use designation of Utilities (U) (see Figure 3.2.2-1). Under Future Land Use Policy 1.8.1, which applies to the Site, utilities consist of municipal water and sewer, electrical, and communication uses.

Objective 1.2 (which includes Policies 1.2.1 – 1.2.27) identifies the City's Community Redevelopment Area (CRA) and the Community Redevelopment Plan. The CRA, that includes the Site, establishes the interest of the City to promote the redevelopment of blighted areas and to improve the image of depressed districts, by assisting in reshaping the City into a desirable place to

live, work, shop, and visit. The redevelopment plan establishes regulatory controls and review procedures that are applied to projects within the area boundaries. The interest in redevelopment incorporates waterfront access, environmentally conscious solutions, and economic and visual improvements. Policy 1.9.1 discusses the continued interests for streetscape improvement efforts along the City's gateways. This includes U.S. Highway 1 and states the initiative of establishing a beautification plan for this streetscape.

To ensure compatibility with the adjacent land uses and to minimize the potential impact the Project could have on these uses, the Project will comply with the relevant substantive provisions of the Coastal Management Element and the Conservation Element.

City of West Palm Beach

The Future Land Use Element was prepared to serve as a guide for the growth and future development of the City of West Palm Beach. The purpose of the element is intended to preserve and enhance present advantages; encourage the most appropriate use of land, water and resources; overcome present handicaps; deal effectively with future problems that may result from the use and development of land within the city; preserve, protect, promote and improve the public health, safety, comfort, good order, appearance and convenience; prevent overcrowding of land and avoid undue concentration of population; facilitate the adequate and efficient provision of public utilities/facilities; and, conserve, develop, utilize and protect the natural resources within the city limits. As stated in this Element, the southernmost portion of the Site has the Future Land Use designations of Multi-Family Residential (MF) and Single Family Residential (SF) (see Figure 3.2.2-1). Under Future Land Use Policy 1.1.4, which applies to the Site, the uses permitted in a multifamily land use category are identified in the City's Zoning Code.

To ensure compatibility with the adjacent land uses and to minimize the potential impact the Project could have on these uses, the Project will comply with the relevant substantive provisions of the Coastal Management Element, Conservation Element, and Historic Preservation Element.

3.2.2.4 Code of Ordinances

Potentially relevant substantive provisions of the Codes of Ordinances of the City of Riviera Beach and the City of West Palm Beach are summarized and discussed in the following paragraphs. The Project is consistent with the substantive provisions of these regulations.

City of Riviera Beach

The official zoning plan for the City of Riviera Beach was established to ensure the health, safety and general welfare of its residents and visitors and to ensure the most appropriate use of land throughout the City, in accordance with the comprehensive plan. In order to classify, regulate, and restrict the uses and activities within the City, the city area has been divided into 23 classes of districts. Each district has its own purpose and permitted uses and special exception uses and other regulations that control the use of land.

The portion of the Site located in the City of Riviera Beach is in the Utilities (U) District. As stated in Chapter 31, Article V, Division 21, the Utilities District is restricted to the provisions of utilities. The district provides for large scale utility operations. Electrical power generating plants were and remain a permitted use in this District, subject to property development standards, parking, landscaping, and site plan review. In addition, the Site is located within the CRA and, therefore, is required to follow the regulations outlined in the Community Redevelopment Plan as stated in Chapter 21 of the Code of Ordinances.

On October 1, 2008, the City Council of the City of Riviera Beach unanimously approved FPL's Site Plan Application for the Project. From the approval granted by the City Council, RBEC complies with the zoning regulations for the City (see Appendix 10.3).

City of West Palm Beach

The official zoning and land development regulations code for the City of West Palm Beach was established to carry out the general policies of the comprehensive plan for managing the use of land, water and resources within the City. In order to classify, regulate, and restrict the uses and activities within the City, the City area has been divided into 25 zoning districts. Each district has its own purpose and permitted uses and special exception uses and other regulations that control the use of land.

The portion of the Site located in the City of West Palm Beach is within the Multifamily High Density Residential (MF32) District and the Single Family Low Density Residential (SF7) District (see Figure 3.2.2-2). As stated in Table IX-1 of Section 94-273, the use of land within MF32 and SF7 zoning districts allows for temporary offices and construction activities, although use of the property within the SF7 district will remain the same, as a landscaped buffer.

By letter dated December 10, 2008, the City of West Palm Beach confirmed the use of FPL property within the Multi-Family Residential (MF) future land use category and Multifamily High Density Residential (MF32) zoning district for use as a construction support area (see Appendix 10.3). Use of the portion of the Site located in the City of West Palm Beach for construction support and ultimately for the planned manatee viewing center is consistent with the City's zoning regulations.

3.2.3 Demography and Ongoing Land Use

From 2000 to 2007, the population for the City of Riviera Beach was estimated to have increased 14.5 percent [University of Florida, Bureau of Economic and Business Research (UF/BEBR), 2008]. The median population projection for Palm Beach County for 2035 indicates continued growth, with an estimated population of about 2,370,900. According to the Florida Statistical Abstract (UF/BEBR, 2008), the estimated population in Palm Beach County was 1,295,033 in 2007.

Using the Florida Statistical Abstract information, the table below shows the existing populations using the data projections from Palm Beach County, the City of Riviera Beach, the City of West Palm Beach, and Unincorporated Palm Beach County.

	Census 2000	Estimate 2006	Percentage Change
Palm Beach County	1,131,191	1,295,033	14.5
City of Riviera Beach	29,884	34,470	15.4
City of West Palm Beach	82,103	105,068	28.0
Unincorporated	521,447	562,781	7.9

Existing land use patterns in the vicinity of the Site are depicted in Figure 3.2.3-1. Land use adjacent to the Site's property boundary includes residential, utilities, and commercial. The predominant land uses out to a 5-mile radius from the Site are comparable to those within a 1-mile radius. The closest residences are located on the south side of 59th Street.

3.2.4 Leases, Easements, Title, Agency Works

FPL utilizes 5.4 acres of sovereign submerged lands for the existing once-through cooling water discharge pipeline into Lake Worth Lagoon. By this SCA, FPL seeks a perpetual public easement over these sovereign submerged lands. This parcel is shown in Figure 3.1.0-3.

In 1978, FPL and the Port of Palm Beach entered into an Easement and Facilities Agreement ("Agreement"). In the Agreement, the Port of Palm Beach granted FPL an easement to install,

maintain, repair and improve FPL's underground pipelines that extend from both the north and south sides of the Port of Palm Beach's slip, known as Slip No. 2 (now known as Slip No. 3). The Agreement also authorized FPL to use adjacent lands at the Port of Palm Beach to install, maintain, operate, improve, and repair FPL's facilities. Pursuant to the Agreement, the Port of Palm Beach assigned ship berthing for marine vessels servicing and supplying the Riviera Plant.

All of the underground pipelines and facilities that FPL installed at the Port of Palm Beach pursuant to the Agreement remain. FPL continues to use the adjacent lands at the Port of Palm Beach to install, maintain, operate, improve, and repair its facilities. FPL uses berth slips at the Port of Palm Beach. In this SCA, FPL seeks to make the terms of the Agreement perpetual. In particular, FPL seeks a perpetual easement from the Port of Palm Beach to maintain, repair, and improve FPL's underground pipeline. FPL seeks perpetual use of adjacent lands at the Port of Palm Beach to install, maintain, operate, improve, and repair FPL's facilities. FPL also seeks continued use of berthing locations.

In 1961, the Port of Palm Beach granted FPL a perpetual easement to construct, install, operate, replace, repair, and maintain an intake structure in, under, and across the property of the Port of Palm Beach. The easement permits additions to or enlargement of FPL's original intake structure. Any modifications to the intake structure must permit fully loaded railroad cars and other vehicles to pass over the structures similar to railroad crossings and bridges and must restore the property back to its original appearance following construction and maintenance work.

FPL granted an easement (approximately 0.2 acre) to Florida Gas Transmission Company (FGT), located on the northwest corner of the Site, for the right to construct, operate, and maintain a meter and regulator facility in connection with supplying natural gas to the Riviera Plant (see Appendix 10.11). The Project may require modification or relocation of the existing meter and regulator site. Modification to the easement will require coordination between FPL and FGT to accommodate RBEC requirements.

No other leases, easements, title, or agency works approvals are anticipated for the Project.

3.2.5 Regional Scenic, Cultural, and Natural Landmarks

One National Historic Landmark is within 5 miles of the Site: Whitehall (Henry M. Flagler House), a 55-room, 60,000 square-foot Gilded-age mansion that Henry M. Flagler built as a wedding present

for his wife in 1902. Upon the death of Henry Flagler (1913) and his wife (1917), the house was sold to investors who added a 10-story 300-room tower on the west side, and converted the entire structure into a hotel that was operated between 1925 and 1959. In 1959, to avoid demolition of the property, a granddaughter of Henry Flagler established a nonprofit corporation, the Henry Morrison Flagler Museum, to purchase the property and open it to the public.

Lake Worth Lagoon is a major estuarine water body in the State of Florida and is within 1 mile of the Site. Lake Worth Lagoon encompasses over 450 square miles that drain to the Lake Worth and South Lake Worth (Boynton) Inlets. Portions of the Lagoon are part of the USFWS-designated Critical Habitat for the threatened species, Johnson's seagrass (*Halophila johnsonii*), and the endangered Florida manatee (*Trichechus manatus*).

Three County Managed Areas/Conservation Lands are located within 5 miles of the Site: Winding Waters Natural Area; Lake Park Scrub Natural Area; and the Grassy Waters Preserve. Winding Waters Natural Area is a 550-acre natural area located approximately 5 miles northwest of the Site. It has large areas of pine flatwoods, cypress forests, freshwater marshes, and wet prairies. This natural area is managed by Palm Beach County and is open to the public for environmental education, scientific research, and passive recreational activities, such as bird watching, nature walks, and photography. Lake Park Scrub Natural Area is a 57-acre Natural Area located in the town of Lake Park approximately 3 miles northwest of the Site. It is characterized by a variety of habitats including scrub, scrubby flatwoods, mesic flatwoods, and disturbed scrub. Lake Park Scrub Natural Area is managed by the Palm Beach County Department of Environmental Resources Management and is open to the public for environmental education, scientific research, and passive recreational activities including bird watching, photography, and nature walks. Managed by the City of West Palm Beach Public Utilities Department, the Grassy Waters Preserve, located 4.5 miles southwest of the Site, offers a unique educational and guided recreational opportunity on the edge of the vast 20-square-mile wetland resource. With the vision to encourage water conservation through enjoyable, nature-based education and creative activities for all ages, the Preserve includes nature center pavilions, meandering boardwalk trails, hiking, canoeing, programs, and entertainment. The education programs include Apoxee Park, which means "Beyond Tomorrow", and is one of a series of planned parks within the region's urban wilderness parks system, set aside for preservation and public enjoyment.

Six county parks are located within 5 miles of the Site (see Figure 3.2.1-2c): Dyer Park, Ocean Reef Park, Westgate Park and Recreation Center, Schall Circle/Old Trail Park, Peanut Island Park, and Phil Foster Memorial Park. Dyer Park, located 4 miles west of the Site, is a 560-acre park that offers various recreational facilities. Ocean Reef Park, located 2.5 miles northeast of the Site in the City of Riviera Beach, is a 12.6-acre park that offers a dune ecosystem/overlook, picnic areas, and beachfront activities. Westgate Park and Recreation Center, located 5 miles southwest of the Site, is a 9-acre park that provides indoor and outdoor recreation. Schall Circle/Old Trail Park, also located 5 miles southwest of the Site, is a neighborhood park that offers a variety of recreational activities. Peanut Island Park is located within 1 mile northeast of the Site in Lake Worth Lagoon, and is an 80-acre island. The Florida Inland Navigation District (FIND) and the Port of Palm Beach are the primary land owners of the island and make the island available to the public as a park. Palm Beach County has a long-term arrangement with the Port of Palm Beach and FIND that allows the public to use the exterior portions of the island for recreational activities including fishing, snorkeling, camping, and swimming. Phil Foster Memorial Park is a 14.65-acre park, located in the City of Riviera Beach, identified as the gateway to the Lake Worth Lagoon and the Intracoastal Waterway. The park offers a variety of recreational opportunities, such as fishing, swimming, boating, picnic, and playgrounds. The park facilities also provide boater access to the Waterway and the Atlantic Ocean.

Three estuarine habitat areas of concern within the Lake Worth Lagoon, identified by Palm Beach County, are located within 5 miles of the Site: Snook Island Natural Area; Peanut Island (within 1 mile); and Munyon Island. The Snook Island Natural Area was created by the County and the City of Lake Worth in an effort to eliminate erosion and create a natural shoreline. In the early 1920s, the area was left as a series of oxygen-poor holes, which accumulated silt and muck following the dredge and fill activities of the City's municipal golf course. The Snook Island project has effectively added 10 acres of good quality wetland habitat to the central part of Lake Worth Lagoon and is starting to see increased seagrass, bird utilization, and fishing. Peanut Island was created in 1918 from excavated material when Lake Worth Inlet was created. By the 1920s, the Port of Palm Beach used the island as a spoil site for the maintenance of the inlet and shipping channel. FIND became part owner of the island in 1991. Both owners continue to use part of the island as a spoil site. Munyon Island is part of the John D. MacArthur Beach State Park and was originally a 15-acre island used to store dredged materials for the construction and maintenance of the Intracoastal Waterway in the 1930s and 1960s. The Munyon Island project has effectively restored 43 acres of habitat in the Lake Worth Lagoon, improved maritime hammock for wildlife (especially migratory songbirds and raptors), and wetland nursery habitats (creating a food source and shelter for fish and invertebrates).

John D. MacArthur Beach State Park is approximately 4 miles northeast of the Site on the northern end of Singer Island. The 325-acre park offers a mangrove fringed estuary, coastal hardwood forests, and 2 miles of beach. There are several different recreational activities available at the park including kayaking, fishing, bird-watching, and snorkeling. John D. MacArthur Beach State Park is managed by the DEP Division of Recreation and Parks and has a 4,000-square-foot nature center that offers aquariums, displays, and an educational video.

3.2.6 Archaeological and Historical Sites

A cultural resource survey was conducted to assist in identifying any previously recorded cultural resources and areas with the potential for containing unrecorded cultural resources within the Site. The findings of the cultural resource survey that was prepared for the Project were submitted to the Florida Department of State, Division of Historical Resources (DHR) in October 2008 for review and consideration. In November 2008, the DHR concurred with the report findings that there are no resources on the Site listed, potentially listed, or potentially eligible for listing on the National Register of Historic Places (NRHP). A copy of the complete survey report and response from DHR is provided in Appendix 10.7.2. In January 2009, an addendum to the cultural resource survey was prepared specifically evaluating the southernmost portion of the Site to be used as a construction support area and construction parking and laydown area west of U.S. Highway 1. A brief description of the survey findings are provided in this section and a discussion of potential impacts from the Project are discussed in Section 5.9.

The surveys consisted of researching and reviewing: the Florida Master Site File (FMSF); U.S. Geological Survey (USGS) quadrangle maps; General Land Office (GLO) historic plat maps; historical aerials; Certified Local Governments (CLGs); and previous investigations within and adjacent to (within 500 feet of) the evaluation areas. A field evaluation was also conducted to locate, verify, and evaluate research results.

The FMSF serves as an archive and repository of information about Florida's recorded cultural resources that are listed, eligible, or potentially eligible for the NRHP and resources with potential or confirmed human remains. A review of the USGS quadrangle maps, GLO historic plat maps, and historic aerials assist to establish the pre-development environment and land use history of a project area, as well as, identify any potential historic resources within a project area. A search to identify pertinent CLGs located within the boundaries of a project area assists in obtaining information regarding local resources, which may not be included in the FMSF. The work of previous

investigations is reviewed to gather information about the types of pre-Columbian and early historic period sites that could be expected to occur within a project area.

3.2.6.1 Florida Master Site File

The FMSF search identified 12 previously conducted cultural resource surveys (between 1995 and 2006) within and adjacent to the existing Site. Five of the 12 surveys were conducted within the boundaries of the existing Site east of U.S. Highway 1. The FMSF also identified three historic linear resources (8PB12192, 8PB13330, and 8PB13559) north of the existing Site. Linear resource 8PB12192, located approximately 450 feet from the northwest corner of the existing Site east of U.S. Highway 1, is a historic road segment that was recorded in 2002 but determined to be ineligible for listing in the National Register by Florida Division of Historical Resources/State Historic Preservation Office (FDHR/SHPO) in September 2005. Linear resource 8PB13559, located approximately 950 feet from the northwest corner of the existing Site, is a 19th century-American Florida East Coast Railway Corridor segment that was recorded in 2005. This resource has not been evaluated by SHPO for eligibility listing. Linear resource 8PB13330, located adjacent to the western boundary of the construction parking and laydown area, is the Old Dixie Highway.

The FMSF search identified 32 previously recorded historic structures within and adjacent to the existing Site. Based on the search results, 12 of the listings were dismantled following FPL's acquisition of the property. Two additional structures have also been dismantled. The remaining 18 previously recorded historic structures remain and are located on the 59th Street and 58th Street blocks south of the Site (within 110 to 350 feet of the southern Site boundary) and are located within the Northwood Harbor Neighborhood Historic District.

Based on the FMSF file search, there are no previously recorded archaeological sites, historic districts, historic cemeteries, or historic bridges within or adjacent to the existing Site. The City of West Palm Beach City Commission has designated the Northwood Harbor Neighborhood as a Historic District (in accordance with Chapter 94, Section 94-1 of the Codes of Ordinance). The northern edge of the district is within 500 feet southwest of the existing Site located east of U.S. Highway 1.

3.2.6.2 USGS Quadrangle Map Review

The preliminary review of the Riviera Beach (1946 PR 1983) USGS quadrangle map identified 11 potential historic resources within the southern-most area and one potential historic water tower

within the northern-most area of the existing Site east of U.S. Highway 1. Three potential historic resources are illustrated (within 500 feet) to the southeast and west of this portion of the Site. A review of the Palm Beach County Property Appraiser records reveals approximately 30 potentially historic resources located within 500 feet of the existing Site. These potential historic resources have been identified based on the age of the resources but have not been previously recorded in the FMSF, and an evaluation of National Register-eligibility has not been conducted.

3.2.6.3 GLO Historic Plat Maps

The historic plat maps are reviewed for evidence of homestead or other early settlement. A review of the 1859 GLO historic plat map and surveyor's field notes identifies that the existing Site as located on the western bank of Lake Worth Lagoon and is described as pine and scrub oak vegetation. The map review shows no indication of military forts, encampments, battlefields, land grants, homestead, farmstead, roads, or historical Native American villages located within these areas.

The 1953 historic aerial shows the construction of the Riviera Plant with Units 1 and 2 present in the north central portion of the existing Site east of U.S. Highway 1, as well as several buildings and structures. The construction support area appears to have been partially cleared with an area of natural vegetation remaining while the surrounding area is largely developed or under construction. The construction parking and laydown area is undeveloped; a residential development is located to the south.

The 1968 historic aerial shows the addition of Units 3 and 4 with residential development to the south of the existing Site east of U.S. Highway 1. U.S. Highway 1 is visible and the area has become largely industrial and residential, with the eastern border showing signs of disturbance through land modifications extending to the coast further into Lake Worth Lagoon. The construction parking and laydown area includes a transmission line corridor with residential development surrounding the area.

3.2.6.4 CLGs and Local Informants

Both Palm Beach County and the City of West Palm Beach are included on the August 2008 list of CLGs established by the FDHR.

3.2.6.5 Field Evaluation

The historic resources field reconnaissance investigation, conducted in September 2008, included a pedestrian survey of the plant property and a "windshield" survey of the properties within 500 feet of the existing Site east of U.S. Highway 1. An architectural historian and one technical assistant

conducted the investigation in order to ensure that significant historic buildings, structures, objects, and districts built during or before 1960 were identified and properly mapped. Any significant property with features indicative of 1960 or earlier construction materials, building methods, or architectural styles was noted on aerial photographs and a USGS quadrangle map. Photographs were taken with a high resolution digital camera. A log was kept to record the building's physical location and compass direction of each photograph. For resources located within the Site, built during or before 1960, FMSF forms were filled out with field data including notes from site observations and research findings. The estimated date of construction, distinctive features, and architectural styles were noted. The information contained on any FMSF form completed for this project was recorded in a database at Janus Research.

Because many of the structures on the existing Site date to the 1960s and are not yet 50 years old, research was also conducted to determine whether the Site meets the National Register Criteria Consideration G for properties that have achieved significance within the past 50 years.

FMSF forms were not completed for potentially significant resources identified within 500 feet of the Project areas. Any resource within 500 feet that appeared to be eligible for listing in the National Register was photographed and noted on aerial photographs and a USGS quadrangle map. Each resource's present condition, location relative to other resources, and distinguishing neighborhood characteristics were noted and photographed for accurate assessment of National Register historic district eligibility.

The pedestrian survey confirmed the industrial development and man-made nature of the majority of the existing Site east of U.S. Highway 1. With the presence of numerous above- and below-ground utilities, the Site provides very low probability of containing archaeological sites. With the landscaped buffer area once containing previously recorded historic structures, a subsurface survey was conducted in 2003 and no cultural materials were recovered.

The pedestrian survey confirmed the identification of several structures within the Riviera Plant footprint as newly identified historic resources. The identified resources are of common industrial forms found throughout Florida and are not individually significant architecturally resources. Several of the resources have undergone alterations that compromise their historic integrity; therefore, none of these resources are considered eligible for listing in the National Register. These resources were photographed, identified on a map, and FMSF forms for each resource were prepared. The field

survey also confirmed the location of the Northwood Harbor Historic District and the Florida East Coast Railway Corridor within the existing Site east of U.S. Highway 1.

3.2.7 Socioeconomics and Public Services

3.2.7.1 Labor Force

The total labor force in Palm Beach County for 2006 was 631,038, with employment of 608,515. Unemployment in 2007 was 27,527 or 3.4 percent. Average monthly private-sector employment by major industry groups in Palm Beach County for 2006 is depicted in Table 3.2.7-1.

The Service-Providing industry group provides the most employment in Palm Beach County, with approximately 88 percent, respectively, of total county-wide employment. Of this industry group Trade, Transportation, and Utilities (22 percent) and Professional and Business Services (21 percent) have the largest employment opportunities. The Construction industry provided about 42,276 jobs in 2007 (UF/BEBR, 2008).

3.2.7.2 General Income

Palm Beach County had an estimated per-capita personal income of \$55,311 in 2006 (BEA, 2008). This income level ranked eighth among the 67 counties in Florida.

3.2.7.3 Housing

The total number of housing units in Palm Beach County based on the 2006 American Community Survey conducted by the U.S. census for 2006, the City of Riviera Beach and the City of West Palm Beach based on the 2005-2007 American Community Survey conducted by the U.S. Census is shown below by occupancy type:

	Palm Beach County	City of Riviera Beach	City of West Palm Beach
Owner-occupied Units	380,000	7,233	16,398
Renter-occupied Units	124,518	4,806	20,305
Occupied Units	504,518	12,039	36,703
Vacant Units	126,628	3,908	10,673
Total	631,146	15,947	47,376

The City of West Palm Beach has increased its housing units (approximately 15 percent) and owner-occupied units (approximately 5.6 percent) since 2000. The city of Riviera Beach has

increased its housing units (approximately 10 percent) and owner-occupied units (approximately 36 percent) since 2000.

Transient accommodation in Palm Beach County is substantial. A total of 1,554 lodgings exist, representing 78,923 lodging units. The total number of apartment building, rooming house, rental, condominium, and transient apartment building units in the County totaled 62,874 in 2007 (UF/BEER, 2008).

3.2.8 Area Public Service and Utilities

3.2.8.1 Education

Public education in Florida is operated on a countywide basis. Each county's respective school district establishes educational policies and staffing requirements. Palm Beach County had a total enrollment of 169,454 for the 2008-2009 school year. This enrollment represents a 561-student decline since the 2006-2007 school year. Palm Beach County schools employed approximately 22,144 full-time employees and 12,739 teachers for the 2008-2009 school year (School District of Palm Beach County, 2008). By year 2013, the County anticipates an increase in the total elementary school enrollment by approximately 2,800 students, while the total high school enrollment is anticipated to decrease by approximately 4,145 students. The middle school enrollment is anticipated to remain the same over the next 5- year period (Palm Beach County School District, 2008).

A total of 163 public and charter elementary and secondary (junior and senior high) schools exist in the County. There are approximately 135 private schools within the County. Within 5 miles of the Site, there are approximately 82 existing public and private schools. Within 1 mile of the Site, there are approximately five public and private schools.

The schools within 1 mile of the Site are St. Mary's Pre-K Autistic School, a private preschool (about 0.5 mile) southwest of the Site; CARP – Alternative Program North, a public alternative school (about 0.8 mile) west of the Site; Kelly Center – 45th Street Advancement Center and Alternative Program Central, a public alternative school (about 0.9 mile) west of the Site; West Riviera Elementary School, a public elementary school (about 0.9 mile) northwest of the Site; and Noah's Ark – Hope Learning Community of Riviera Beach, Inc., a public charter school (about 1 mile) north of the Site.

CARP – Alternative Program North, in the City of West Palm Beach, is the closest public school to the Site. Noah's Ark International – Hope Learning Community of Riviera Beach, Inc, in the city of

West Palm Beach, is the closest charter school to the Site. St. Mary's Pre-K Autistic School, in the City of West Palm Beach, is the closest private school to the Site.

3.2.8.2 Transportation

The Site is accessible from U.S. Highway 1, which is a divided four-lane arterial roadway. Access to the Site on the east side of U.S. Highway 1 is provided by three access driveways (Gates 3, 9, and 10). Two gates (Gates 3 and 10) are accessible after turning east from U.S. Highway 1, and Gate 9 is accessible immediately north of the 59th Street and North Flagler Drive intersection. Access to the area west of the Site is provided from U.S. Highway 1 near the existing signalized intersection.

A baseline traffic analysis was conducted July 16 through 17, 2008, that identified the trip patterns for the existing Plant. Based on daily traffic volumes, the Plant generated approximately 368 daily trips (see Appendix 10.7.4). During the analysis time period, modifications to the existing substation on the Site were being made, which resulted in an increase in traffic due to the additional Plant personnel required to perform the work.

U.S. Highway 1 provides two through lanes in each direction between Blue Heron Boulevard (to the north of the Site) and 45th Street (to the south of the Site). The intersection of U.S. Highway 1 and the Port of Palm Beach access road (which provides access to the Site) is currently signalized. According to Palm Beach County, U.S. Highway 1 currently carries approximately 2,226 vehicles during the typical morning peak period and approximately 2,582 vehicles during the typical afternoon peak period in proximity to the Site. The U.S. Highway 1 roadway capacity is 3,110 vehicles per hour. Therefore, the roadway has an excess capacity to accommodate additional traffic during the morning and afternoon peak periods.

The closest rail system to the Site is approximately 0.2 mile to the north, within the Port of Palm Beach. The Palm Beach International Airport and its runways lie approximately 6 miles south of the Site.

3.2.8.3 Medical Facilities

The City of Riviera Beach Fire Rescue will respond and provide emergency medical services to the Site. Palm Beach County has approximately 21 hospitals (Palm Beach County Health Department, January 2009) and approximately 193 nursing and residential care facilities (UF/BEER, 2008). There are approximately 3,361 licensed doctors of medicine and 374 licensed doctors of osteopathy, 959 dentists, 809 dental hygienists, 1,588 dental radiographers, 4,894 health practitioners (including

chiropractors, optometrists, podiatrists, occupational therapist, physical therapists, massage therapists, nursing home administrators, and psychologists), 15,822 registered and practical nurses, 260 opticians, and 1,913 pharmacists and pharmacist interns in the County (UF/BEER, 2008).

With 21 hospitals located within the County, five are within about 5 miles of the Site: St. Mary's Medical Center, Columbia Hospital, Good Samaritan Medical Center, Palm Beach Gardens Medical Center, and the Veterans Administration Medical Center (VAMC) West Palm Beach. St. Mary's Medical Center is located at the corner of 45th Street and State Highway A1A, about 0.8 mile south of the Site. St. Mary's Medical Center is a 463-bed facility with a staff of 532 primary care, specialists, and subspecialists (St. Mary's Medical Center website, 2008). Columbia Hospital is located at the corner of 45th Street and Corporate Way, about 2 miles south of the Site. Columbia Hospital is a 250-bed acute care hospital with a medical staff of over 400 (Columbia Hospital website, 2008). Good Samaritan Medical Center is located at the corner of Palm Beach Lakes and North Flagler Drive, about 3 miles south of the Site. Good Samaritan Medical Center is a 326-bed hospital with a medical staff of approximately 300 (Hospital-data.com, 2009). Palm Beach Gardens Medical Center is located at the corner of Burns Road and East Gardens Drive, about 5 miles northwest of the Site. Palm Beach Gardens Medical Center is a 200-bed acute hospital with a medical staff of approximately 831 (PalmBeachPost.com, 2009). The VAMC is located at the corner of North Military Trail and West Blue Heron Boulevard, approximately 4 miles northwest of the Site. The VAMC serves veterans in southeastern Florida (U.S. Department of Veterans Affairs, 2008). The main center provides general medical, psychiatric, and surgical services. In addition, the teaching hospital provides a full range of patient care services.

Palm Beach County has two trauma centers that are both Level II: St. Mary's Medical Center and Delray Medical Center. St. Mary's Medical Center (closest to the Site) is the only trauma center within 5 miles of the Site. Delray Medical Center is about 20 miles south of the Site.

Trauma centers treat individuals who have incurred blunt or penetrating injuries or burns, and who require immediate medical intervention/treatment. A Level II trauma center provides initial trauma care, regardless of the injury, with physician subspecialists promptly available. Level II centers generally are the most prevalent facilities in a community that manage the majority of trauma patients. However, depending on geographic location, patient volume, personnel, and resources, the Level II trauma center may not be able to provide the same comprehensive care as a Level I trauma center, and patients may have to be transferred to a Level I center.

3.2.8.4 Firefighting Facilities

The City of Riviera Beach's Fire Rescue Department provides service to portions of Palm Beach County and the City of Riviera Beach, including the Site. The Fire Rescue Department offers a number of services including fire suppression, emergency medical services, ambulance transportation, fire protection inspections, and public education especially to the youth of Riviera Beach. The Fire Rescue Department is staffed with a fire chief, a deputy fire chief, a division chief of emergency medical services, three division chief of operations, two fire inspectors, nine fire captains, three emergency medical services lieutenants, 12 driver engineers, 24 firefighters/paramedics and 21 firefighters.

The closest fire station, Fire Station 1, is located approximately 2 miles northwest of the Site. Fire Station 1 resources consist of a Commander with five staff members and one engine truck and one rescue truck. The station has an approximate 7-minute response time to the Site.

The City of West Palm Beach Fire Rescue Department provides service to the City of West Palm Beach, including the West Palm Beach portion (manatee viewing center) of the Site. The City of West Palm Beach Fire Rescue Department offers a number of services including fire rescue, emergency medical services, ambulance transportation, fire protection inspections, and public education. Fire Station Three is approximately one-half mile from the Site and would service the West Palm Beach Portion of the Site.

3.2.8.5 Police Protection

The City of Riviera Beach's Police Department provides law enforcement to the City of Riviera Beach, including the Site. The Police Department responds to emergency and non-emergency situations. The Department consists of 105 sworn officers and 50 non-sworn employees who handle approximately 75,000 calls for service each year. The Police Department is located approximately 2 miles north of the Site.

The City of West Palm Beach Police Department provides law enforcement to the City of West Palm Beach. The Department consists of a Field Operations Bureau, Critical Services Bureau, Internal Affairs, Investigative Services Bureau, Support Services Bureau, and Police Services. The Police Department consists of 271 sworn officers, 121 civilians, and three K-9 dogs. The Police Department is located approximately 9 miles south of the Site (City of West Palm Beach Police Department, 2009).

The Field Operations Bureau is divided into three patrol districts (District 1 North, District 2 South, and District 3 West). The portion of the Site located within the City of West Palm Beach is within District 1 North. Within the district there are six primary patrol sectors (11, 12, 13, 14, 15, and 16); the portion of the Site within the City of West Palm Beach is situated within sector 14. District 1 North has 31 sworn officers.

3.2.8.6 Recreation Facilities

Palm Beach County and the surrounding region offer many recreational activities. The Palm Beach County Parks and Recreation Department manages over 8,000 acres and 74 facilities (64 county-operated and 10 leased to municipalities). There are four County parks within five miles of the Site; Dyer Park, Ocean Reef Park, Peanut Island Park (within one mile), and Phil Foster Memorial Park.

Within 5 miles of the Site, there are eight municipalities that offer parks and recreational facilities to residents and visitors. The City of Riviera Beach Parks and Recreation Department operates and maintains approximately 15 recreational facilities within 1 to 5 miles of the Site. The City of West Palm Beach Parks and Recreation Department operates and maintains approximately 32 recreational facilities within 5 miles of the Site. The Town of Palm Beach Parks and Recreation Department operates and maintains six recreational facilities within 5 miles of the Site. The Town of Mangonia Park operates and maintains one recreation facility within 5 miles of the Site. The Town of Palm Beach Shores operates and maintains three recreation facilities within 5 miles of the Site. The Town of Lake Park operates and maintains seven recreation facilities within 5 miles of the Site. The Village of North Palm Beach Parks and Recreation Department operates and maintains seven recreation facilities within 5 miles of the Site. The City of Palm Beach Gardens Park and Recreation Department operates and maintains seven recreation facilities within 5 miles of the Site.

Figure 3.2.1-2d provides a location of these facilities within their jurisdictional area.

3.2.8.7 Electricity and Gas

Electricity and natural gas are provided to areas within Palm Beach County businesses and residents by FPL, Florida Public Utilities Company, TECO Peoples Gas, and City of Lake Worth Utilities. The City of Riviera Beach and the City of West Palm Beach are provided electricity and natural gas by FPL and Florida Public Utilities Company.

Natural gas is supplied to parts of Florida by a FGT pipeline and distributed to commercial and residential customers by TECO Peoples Gas and Florida Public Utilities Company. The natural gas lateral to the Site for Units 3 and 4 is provided by FGT.

3.2.8.8 Water Supply Facilities

The Water Treatment and Distribution Division of the Utilities District is responsible for Administration, Sewage Collection, and Water Treatment/Distribution within the City of Riviera Beach, including the Site. Potable water in the City of Riviera Beach is obtained from the 27 ground production wells and three re-pump stations within the City limits. The Water Treatment Division of the City is responsible for the daily operations of the 17.5-million-gallon-per-day Class “A” Level II Lime Softening Treatment Plant and for the distribution of safe and pleasant drinking water to its service area (City of Riviera Beach Utility District, September 2008).

Stormwater is managed by the Stormwater Management Utility Division of the City of Riviera Beach Public Works Department. This Division oversees 8 miles of canals and over 900 stormwater inlets, in addition to sweeping over 80 miles of streets per month.

The Department of Public Utilities of the City of West Palm Beach is responsible for providing potable water to customers within the City. The Division of Water Treatment Plant operates and maintains the City’s water treatment plant, which is capable of producing 47 million gallons per day (MGD) of potable water. The source of the City’s water is surface water that is pumped from Clear Lake. The Division of Water Distribution and Sanitary Collection maintains the City’s water distribution, sanitary sewer infrastructure, and fire protection systems. This division also provides support to the Engineering Department, the water treatment plant, and the east central regional wastewater reclamation facility (City of West Palm Beach Public Utilities Division, 2009).

The Department of Public Works Division of Ground and Canal Maintenance is responsible for storm drains and interconnecting storm water lines. The Division’s responsibilities include 30.5 acres of canal banks and two flood control structures.

3.2.8.9 Sewage Treatment Facilities

The Sewage Collection Division of the City of Riviera Beach Utility District is responsible for the maintenance of sewer lines and sewer pumping stations, as well as the installation of new service connections and inspection of new sewer tie-ins from the owner’s lines to the City’s main (City of Riviera Beach Utility District, September 2008). The sewage collection system sends approximately

4 MGD of raw sewage water to the East Central Regional Water Reclamation Facility (ECRWRF), located within the City of West Palm Beach.

The ECRWRF is funded and governed by the entities it serves: City of West Palm Beach, City of Lake Worth, City of Riviera Beach, Town of Palm Beach, and Palm Beach County. The facility currently processes 55 million gallons of wastewater per day; with an expansion project currently underway to increase flows to approximately 70 MGD.

The Department of Public Utilities Division of Water Resources and Pumping Operations of the City of West Palm Beach is responsible for monitoring and maintaining the sewage pumps, lines and the life stations within the City of West Palm Beach. The Division of Water Distribution and Sanitary Collection maintains the sanitary sewer infrastructure system that collects sewage discharge and transports flows to the East Central Regional Water Reclamation Facility (City of West Palm Beach Public Utilities Division, 2009).

3.2.8.10 Solid Waste Disposal

The City of Riviera Beach Public Works Department provides solid waste disposal services to the City of Riviera Beach, including the Site. Within the City limits, Waste Management, Inc. is the contractor that performs the waste collection, transportation and disposal services (City of Riviera Beach Public Works, September 2008).

The Department of Public Works Division of Sanitation is responsible for solid waste disposal within the City of West Palm Beach. The Division operates three sanitation collection functions (residential refuse, commercial refuse, and yard waste collections), a street sweeping unit, and a street lighting unit (City of West Palm Beach Public Works, 2009).

3.3 Physical and Biological Environment

3.3.1 Geology and Hydrology

The geology and hydrology of the Site vicinity are discussed below. The information presented in this Section provides a brief summary of the geohydrologic baseline information and draws heavily upon previous regional studies. The regional studies include, but are not limited to:

- Synthesis of the Hydrogeologic Framework of the Floridan Aquifer System and Delineation of a Major Avon Park Permeable Zone in Central and Southern Florida (Reese and Richardson, 2008);
- Hydrogeology and the Distribution of Salinity in Floridan Aquifer System, Palm Beach County, Florida (Reese and Memberg, 2000); and
- Preliminary Hydrogeologic Framework, ASR Regional Study, Final Report [Ron Reese (USGS) and Emily Richardson (SFWMD), October 4, 2004].

Site-specific subsurface information was obtained from borings conducted in 1960 for Units 3 and 4 of the existing Plant.

3.3.1.1 Geologic Description of the Site and Area

The generalized geology and hydrogeology for Palm Beach County, including the Site, is shown in Figure 3.3.1-1. Based upon review of the USGS Riviera Beach, Florida, quadrangle map, dated 1946 and photo-revised 1983, bathymetry added 1986, the Site has a natural ground surface elevation of approximately 15 feet national geodetic vertical datum (NGVD) on the west side to less than 5 feet NGVD on the east side. According to the Soil Survey of Palm Beach County, Florida, published by the U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS), the majority of the Site is occupied by Urban Land. Soils near the Site include St. Lucie and Paola Sand, which are excessively drained and sandy throughout.

According to Dr. H. K. Brooks' publication "*Guide to the Physiographic Divisions of Florida*" (1981), the Site lies in the Eastern Valley near the Atlantic Coastal Ridge.

The undifferentiated deposits (uppermost unit near the Site) are primarily composed of sand and shell. Rock units ranging in age from Paleocene to recent underlay the Site. Formations and groups discussed in this report include (from oldest to youngest): the Cedar Keys Formation of Paleocene age; Oldsmar Formation of lower Eocene age; Avon Park Formation of middle Eocene age; Ocala Limestone of upper Eocene age; Hawthorn Group of Miocene; and undifferentiated deposits of Pliocene, Pleistocene, and Holocene age (Reese and Memberg, 2000).

The following is a summary of the lithology and approximate thickness of each geologic unit anticipated at the Site, based on regional geology. Figures 3.3.1-2 and 3.3.1-3 show regional hydrogeologic cross sections of Palm Beach County.

In general, the Cedar Keys Formation is subdivided by lithologic character and corresponding geophysical log characteristics into six units (Winston, 1994). In descending order they are: Unit A, characterized by a preponderance of anhedral and cryptocrystalline dolomite; euhedral dolomite is subordinate. Unit B is characterized by the presence of numerous relic grain textures in chalky to microcrystalline euhedral dolomite. Unit C is predominately anhydrite, with subordinate chalky to very fine microcrystalline euhedral dolomite. Unit D is characterized by a predominance of relic grains in a chalky to very fine microcrystalline euhedral dolomite, with few thin bedded anhydrites. Units E and F are similar in texture to Unit D, but contain fewer beds of relic grain texture. The top of the Cedar Keys Formation is found below the Boulder Zone. The massive anhydrite beds that form the base of the Floridan Aquifer System (FAS) are usually found 500-600 feet below the Boulder Zone (Reese and Memberg, 2000).

The Oldsmar Formation is limestone interbedded with dolomite. The Oldsmar Formation is about 1,100 to 1,500 feet thick in Palm Beach County. The lower 300 to 600 feet of the Oldsmar Formation, locally called the Boulder Zone, is predominantly dolomite and contains massively bedded, cavernous, or fractured dolomite of high permeability and dense, recrystallized dolomite of low permeability. At the Site, the top of the Boulder Zone is approximately -3,000 NGVD (Reese and Richardson, 2008).

The Avon Park Formation in Palm Beach County is composed predominantly of limestone interbedded with dolostones. Cherty dolostones are typical in the lower most Avon Park Formation. The Avon Park Formation is about 1,000 feet thick in the study area. In Palm Beach County, the top of the Avon Park Formation is -1,100 feet NGVD to -1,200 feet NGVD. The upper portion of the Avon Park Formation is part of the Upper Floridan Aquifer (UFA). Confining units separate the UFA from the Lower Floridan Aquifer (LFA).

The Ocala Limestone overlies the Avon Park. The Ocala Limestone is micritic or chalky limestone, to a medium grained calcarenitic limestone, to a coquinoid limestone. Regionally, this unit varies in thickness from 0 to 300 feet. This unit is part of the UFA.

Rocks of Miocene age at the Site belong to the Hawthorn Group. The Hawthorn Group is divided into lower carbonate and upper clastic sequences. The lower carbonate sequence is composed of poorly to moderately indurate phosphatic micrites and dolomites. The upper clastic sequence is composed primarily of greenish-gray phosphatic silts interbedded with coarse sand and sandstones.

Clay beds in the Hawthorn Group function as the upper confining units for the FAS (Duncan et al, 1994). In the area of the site, this unit ranges from 700 to 800 feet in thickness and the top of the Hawthorn Group is -250 feet NGVD. The top of the Hawthorn Group occurs at a poorly consolidated sand or sandy silt beneath the biogenic limestones of the Tamiami Formation.

The Tamiami Formation at the Site is thin and difficult to distinguish from the younger biogenic limestones of the Fort Thompson Limestone, which unconformably overlies the Tamiami Formation. The formation is of Pleistocene age and consists of alternating beds of marine shells and freshwater limestones, which are intermixed with the Pamlico Sands (Miller, 1986).

The undifferentiated deposits consist of unconsolidated shell beds, sandy clay, quartz sands and sandy and shelly limestone. At the Site, the thickness of the surficial aquifer is about 250 feet.

3.3.1.2 Detailed Site Lithologic Description

Site lithology was determined by numerous borings performed by EBASCO Services for FPL in 1960 (FPL/EBASCO Services, 1960). The borings extended 50 to 60 feet below ground surface (ft-bgs). Based on the results of the investigation, the subsurface soils at the Site consisted of organic material and sand for the first 10 to 15 ft-bgs, then a mixture of sand, shell and limerock. Sandy, shelly limerock is usually encountered about 30 ft-bgs.

3.3.1.3 Geologic Maps

Figures 3.3.1-1 through 3.3.1-3 present generalized geological and hydrological units for Palm Beach County.

3.3.1.4 Bearing Strength

The Site is suitable for RBEC from a geotechnical standpoint. Lightly loaded structures could be supported on shallow foundations established in structural fill. Paving for access roads or parking areas could also be supported by structural fill. Heavily loaded structures will be supported on deep foundations such as piles, augered cast piles, stone columns, or other ground improvement methods to limit settlement to acceptable levels.

3.3.2 Subsurface Hydrology

3.3.2.1 Subsurface Hydrology Data for the Site

There are four major components to the subsurface hydrogeologic framework of southern Florida: the unconfined surficial aquifer system (SAS); the nearly impermeable sediments of the Hawthorn

Group, which separates the surficial aquifer from the Floridan Aquifer; the confined FAS, which includes both the UFA and the LFA; and the Boulder Zone, which is part of the LFA. These components are discussed further below.

Surficial Aquifer System

The uppermost part of the SAS is primarily composed of sands, shell beds, and sandy limestones. The SAS is unconfined and contiguous with land surface. The SAS varies in thickness in Palm Beach County from 200 to 300 feet thick. At the Riviera Plant, the SAS is 200 to 250 feet thick. The SAS is a source of drinking water for the County.

Intermediate Confining Beds

The Intermediate Confining Unit (ICU) is present throughout the County and consists of phosphatic clay, silt, sand, limestone, and dolomite deposits of the Hawthorn Group. The Hawthorn Group sediments serve as a confining unit separating the SAS from the FAS. In the vicinity of the Site, the ICU is about 600 to 700 feet thick and well confined.

Floridan Aquifer

The FAS in the vicinity of the Site consists of the UFA, Middle Confining Unit (MCU), and LFA and ranges in age from Paleocene to Eocene. The uppermost permeable zones in the UFA occur in close association with an unconformity at the base of the Hawthorn Group. The top of the FAS near the site is approximately -900 feet NGVD. The thickness of the FAS near the site is between 2,800 and 2,900 feet. The MCU from -1,200 to -2,100 feet NGVD is the primary confinement between the UFA and the LFA. The MCU contains a permeable zone, which is about 150 feet thick, called the Avon Park Permeable Zone (APPZ). In the area of the site, the APPZ is likely found between -1,350 and -1,600 feet NGVD. The LFA is approximately 1,700 feet thick and includes the Boulder Zone.

Reese and Richardson (October 4, 2004) show the transmissivity of the UFA, in the area of the Site, to be about 35,000 square feet per day (ft^2/day). Water in the UFA and the APPZ, at the Site, is brackish [$1,000 \text{ mg/L}$ < total dissolved solids (TDS) < $10,000 \text{ mg/L}$]. A lower zone of water with salinity similar to that of seawater (saline-water zone) is present in the LFA. The brackish-water and saline-water zones are separated by a transition zone (typically 100 to 200 feet thick) in which salinity rapidly increases with depth. The transition zone has been defined by using a salinity of $10,000 \text{ mg/L}$ of dissolved-solids concentration (about $5,240 \text{ mg/L}$ of chloride

concentration) at its top and 35,000 mg/L of dissolved-solids concentration (about 18,900 mg/L of chloride concentration) at its base.

The middle confining unit that separates the UFA and LFA consists of sediments from the Middle Eocene era with compositions similar to the UFA and LFA. The middle confining unit is considered a leaky confining unit. Near the Site, the top of the middle confining unit is approximately -1,200 feet NGVD and the total thickness is 900 feet. The confining unit between the UFA and the APPZ is about 200 feet thick. The confining unit between the APPZ and the LFA is about 550 feet thick.

The LFA is below the middle confining unit and above the sub-Floridan confining unit. The LFA consists of the thick complex sequence of limestone and dolostone. The water in the LFA usually contains concentrations of greater than 10,000 mg/L TDS. The top of the LFA is approximately -2,100 feet NGVD. The thickness is estimated to be 1,700 feet. The LFA contains the Boulder Zone.

Boulder Zone

The deeply buried zone of cavernous permeability, which is called the Boulder Zone, is found in fractured dolomite in the LFA and underlies most of southern Florida. The top of the Boulder Zone is irregular and is approximately -3,000 feet NGVD near the Site. The permeability of the Boulder Zone is extremely high because of its cavernous nature. This anomalous permeability, which prevents pressure buildup in injection wells, coupled with the fact that the Boulder Zone contains saltwater, makes it a commonly used zone for receiving injected wastewaters. The Boulder Zone is overlain by about 700 feet of low-permeability limestone and dolomite, which retard the upward movement of injected fluids to shallower parts of the FAS that contain water that is less saline, although still brackish.

3.3.2.2 Karst Hydrogeology

Karst terrains develop in areas underlain by carbonate rocks such as limestone. They often have drainage systems that are reflected on the surface as sinkholes, springs, disappearing streams, or even caves (<http://www.dep.state.fl.us/geology/geologictopics/sinkhole.htm>).

According to Map Series No. 10, Sinkhole Type, Development, and Distribution in Florida, (William C. Sinclair and J.W. Stewart, USGS, 1985), the Site is located in Area II, where the cover is

reported to be 30 to 200 feet thick. In these areas, sinkholes are reported to be few, shallow, of small diameter, and develop gradually. Furthermore, within the prior borings drilled at the Site, indicators of karst geology, such as voids or losses of circulation were not encountered within 50 feet of the surface.

3.3.3 Site Water Budget and Area Users

3.3.3.1 Site Water Budget

Climate and Meteorology

The Site is located in southeast peninsular Florida, which has a climate characterized as mild subtropical. Temperatures in the vicinity (measured at West Palm Beach, Florida) range from an average low of about 57.3 degrees Fahrenheit (°F) in January, to an average high of about 90.1°F in August, with an annual average of about 75.3°F (refer also to Section 3.3.7).

The mean total annual rainfall in West Palm Beach, Florida, is 61.39 inches; with mean monthly totals ranging from 2.55 to 8.10 inches. Generally, the period of the year with the heaviest rainfall is from June to October.

Mean annual type-A pan evaporation is 71.6 inches [South Florida Water Management District (SFWMD), DBHYDRO Database, Station WPB.EEDD_E, 1983 to 2008]. Average pan evaporation is less than 6 inches per month from October through March and between 6.0 and 7.2 inches per month between April and September. Mean annual lake evaporation in eastern Palm Beach County is approximately 50 inches per year (Fernald and Patton, 1984). Evapotranspiration from plants and soil, which is less than lake evaporation, is approximately 39 inches per year (Fernald and Patton, 1984). Consequently, regional surface water runoff and surficial aquifer recharge is between 10 and 22 inches per year.

Groundwater Resources

The two major aquifers in Palm Beach County are recharged from separate sources. The shallow aquifer is primarily supplied by rainfall in Palm Beach County. A small amount of recharge to the shallow aquifer results from seepage of water used for irrigation. The Upper Floridan (artesian) aquifer is supplied by rainfall in the topographically high areas centered in Polk and Highlands Counties. A very small amount of water flow (i.e., less than 1 inch per year) recharges the surficial aquifer from the Floridan aquifer due to the artesian pressures in the Floridan aquifer.

The Riviera Plant currently has a water use permit (50-04187-W) issued by SFWMD that authorizes a maximum monthly withdraw from the Surficial Aquifer of 807,000 gallons and a maximum daily withdrawal of 100,000 gallons for irrigation. This permit expires on February 2, 2019.

The Riviera Plant also currently has a water use permit (50-04188-W) issued by the SFWMD that authorizes an average daily withdrawal of 86,400 gallons and a maximum daily withdrawal of 100,000 gallons for water pump bearing cooling. This permit also expires on February 2, 2019.

Both water use permits allow withdrawals from the same three surficial aquifer wells. Each well has a capacity of 225 gpm. The well depths are 85 feet, 100 feet and 175 feet.

Surface Water Resources

The Site is located directly adjacent to the Lake Worth Lagoon and the Intracoastal Waterway and southwest of Lake Worth Inlet. The inlet connects Lake Worth Lagoon with the Atlantic Ocean. There are no other significant surface water bodies in the vicinity. The existing Riviera Plant withdraws non-contact once-through cooling water from the Lake Worth Lagoon through an existing intake structure. The once-through cooling water is then discharged back to the Lake Worth Lagoon.

Groundwater/Surface Water Interactions

There is a complex hydrologic interaction between the Surficial Aquifer System and the extensive network of water supply and drainage canals in southeast Florida. These canals, levees, pumps, and water control structures were constructed by the U.S. Army Corps of Engineers (USACE) as part of the Central and South Florida Flood Control Project; they are currently operated by the SFWMD. The FAS is confined by more than 600 feet of low-permeability sediments. Therefore, there is very little interaction between the Floridan and the surficial aquifers. The upward recharge of the surficial aquifer from the FAS is approximately 1 inch per year.

3.3.3.2 Area Users

This section identifies the location of potable water wells currently in use within 1 mile of the Site and water use permits within 5 miles of the Site. Use of surface water (other than “seawater”) and fresh or saline groundwater is regulated by SFWMD. Information gathered from SFWMD was used to prepare the following summary of water uses near the Site.

There are no public supply wells permitted by the SFWMD within 1 mile of the Site. Furthermore, the Site is not located in any wellfield protection zone adopted by Palm Beach County (Map N-3B, Palm Beach County ERM, 5/2006).

Figure 3.3.3-1 and Table 3.3.3-1 show the permitted surface and groundwater uses within 5 miles of the Site, most of which are for agricultural irrigation, public supply, and industrial purposes. Sources of water used for these purposes include, but are not limited to, Canal C-17, the surficial aquifer, the Floridan aquifer, and small lakes/ponds. There are five Floridan Aquifer water supply wells in the SFWMD database within 5 miles of the Site. There are 70 permitted public supply withdrawals within 5 miles of the Site in the SFWMD database. The majority of the public supply is provided by the surficial aquifer.

3.3.4 Surficial Hydrology

3.3.4.1 Hydrologic Characterization

The existing Site is on the west shore of the Lake Worth Lagoon, which is the most prominent surface water feature in the vicinity. The Lake Worth Lagoon is approximately 20 miles in length and averages one-half mile in width, with an average depth of 6 feet and some dredged areas reaching up to 35 feet in depth. The Lake Worth Lagoon is the largest estuarine system in Palm Beach County and is connected to the Atlantic Ocean by two maintained inlets, the Lake Worth Inlet (also known as Palm Beach Inlet) and the South Lake Worth Inlet (also known as the Boynton Inlet). A barrier island separates the Lake Worth Lagoon from the Atlantic Ocean. The Intracoastal Waterway runs the entire length of the estuary, with eight bridges and causeways connecting the barrier island to the mainland. The Lake Worth Lagoon watershed is located in Palm Beach County and encompasses over 450 square miles that drain to the Lake Worth and South Lake Worth Inlets (see Figure 3.3.4-1). Major fresh water inflows to Lake Worth Lagoon are discharged via regional canals: the Earman River (C-17 Canal) in the north or upper segment of Lake Worth Lagoon; the West Palm Beach Canal (C51), which discharges to the central segment; and the Boynton Beach Canal (C-16), which discharges to the southern segment.

The Site is south of the Lake Worth Inlet and the Port of Palm Beach, within the northern segment of Lake Worth Lagoon. This segment is defined in the Lake Worth Lagoon Management Plan Revision [Palm Beach County Environmental Resources Management (PBCERM), May 2007] as all waters north of the Flagler Memorial Bridge in West Palm Beach. Lake Worth Inlet (also known as Palm Beach Inlet) is the largest inlet and primary source of ocean water in this segment of the lagoon, and

is also the primary outlet for fresh water. The C-17 canal serves as the primary source of fresh water for this segment of the lagoon just south of Munyon Island, on the west side of the Intracoastal Waterway in North Palm Beach.

Lake Worth Inlet is a dredged maintained channel with design depth of 33 feet for a mid-width of 200 feet [National Oceanic and Atmospheric Administration (NOAA) NOS Nautical Chart 11472, 1985, see Figure 3.3.4-2]. NOAA (2009) reports that the mean tidal range at the Port of Palm Beach is 2.72 feet, the spring range is 3.26 feet, and the mean tide level is 1.55 feet mean lower low water. NOAA also reports the maximum current through the Lake Worth Inlet (between the jetties) is 2.4 knots (4.0 feet per second) on the flood tide, and 3.6 knots (6.0 feet per second) on the ebb tide.

Lake Worth Lagoon is classified by FDEP as a Class III marine water. The Palm Beach County Department of Environmental Resources Management (PBCERM) reported that the flushing provided by the inlet has resulted in generally good water quality (2007). Applied Biology Inc. [(ABI) 1976] reported that when the tide is in, the salinity in the vicinity of the Site is about 30 parts per thousand (ppt), but that outgoing tides are characterized by some turbidity and reduced salinity from Intracoastal water. ABI further reported that salinity on outgoing tides during periods of heavy rainfall is lowered to as little as 20 ppt.

SFWMD and PBCERM jointly maintain a water quality network in the Lake Worth Lagoon. Figure 3.3.4-3 shows the locations of present water quality monitoring stations within the lagoon. The nearest station to the Site, Station LWL-6, was installed in 2007. The data available from LWL-6 are presented in Figures 3.3.4-4 through 3.3.4-8 for pH, salinity, dissolved oxygen (DO), nitrite plus nitrate, and specific conductivity, respectively.

Bathymetry in the Lake Worth Lagoon has been reported by PBCERM, as measured by Morgan & Ecklund, Inc. in 2003, and is shown for the Riviera Plant vicinity in Figure 3.3.4-9.

The existing Riviera Plant currently consists of two nominal 300-MW units with conventional dual-fuel fired steam boilers and steam turbine generators. Unit 3 entered service in 1962 and Unit 4 entered service in 1963.

The existing Plant configuration includes the withdrawal of once-through cooling water from the southwest corner of Slip Number 2 of the Port of Palm Beach via a 125-foot-long submerged culvert. Nearly all of the once-through cooling water is conveyed through a separate outlet for each unit's

cooling water (condenser and auxiliary cooling water) discharge through a 90-inch internal diameter buried pipe. These pipes discharge the heated water about 1,941 feet offshore near the ship's channel for the Port of Palm Beach (in the middle of Lake Worth) as shown in Appendix 10.9. The centerline elevation of the pipes at the discharge point is -16.58 feet above mean sea level (ft-msl), and the pipe centerlines are 12 feet apart. Each pipe has a design full-flow average discharge velocity of about 10.2 feet per second. The total discharge flow rate of the existing Plant is about 415,000 gallons per minute (gpm), with a discharge plant heat rate of about 2.78 Billion British thermal units per hour (BBtu/hr). This results in a full-load overall temperature rise of about 13.7°F for the existing Plant.

The remaining portion of the cooling water is discharged via a siphon to the location of the manatee embayment. This water is released to provide warm water for use by the manatees. The once-through cooling water discharges are discussed in further detail in Appendix 10.9.

The maximum extent of the thermal plume resulting from the existing Plant's offshore discharge has been predicted using a mathematical model (see Appendix 10.9 for details). The plumes reach the water surface after a horizontal distance of about 130 feet for the summer case, and 150 feet for the winter case. The summer plume has been diluted down to about 5.5°F above ambient when it reaches the surface; the winter plume about 3.4°F. The maximum areal extent of the plumes, projected to the water surface, is shown in Figure 10.9-6 in Appendix 10.9 with an aerial photo as background.

The discharge of once-through cooling water and other wastewaters is permitted under FDEP Industrial Wastewater Facility Permit FL0001546. A water use diagram showing all the discharges permitted therein is presented as Figure 3.3.4-10. Water quality data submitted with the most recent NPDES permit renewal application is shown in Table 3.3.4-1.

3.3.4.2 Measurement Programs

Water quality data for the Lake Worth Lagoon in the vicinity of the existing Plant are from the SFWMD DBHYDRO database. Additional water quality data for the existing Riviera Plant are from reports submitted to FDEP to meet requirements of the Industrial Wastewater Facility Permit, No. FL0001546.

3.3.5 Vegetation/Land Use

Vegetation/land use surveys of the Site and surrounding areas were completed in June 2008 and January 2009. The resulting vegetation/land use map of the Site is found in Figure 3.3.5-1. Vegetative communities in and adjacent to the Site are discussed in detail in Subsection 3.3.6.1.

The Site is located in a densely developed industrial and residential area of Riviera Beach and West Palm Beach. The Site is occupied by electric power generating facilities, buildings, parking lots, and other infrastructure of the existing Riviera Plant [Florida Land Use, Cover and Forms Classification System (FLUCFCS) 831].

The surrounding vicinity is dominated by the Port of Palm Beach and industrial land uses (FLUCFCS 155), located immediately north of the Site; Lake Worth Lagoon (FLUCFCS 510), located to the east of the Site; as well as medium density (FLUCFCS 121) and high density (FLUCFCS 131) single family residential areas (Figure 3.3.5-1). Additional land uses within the area surrounding the Site include commercial services (FLUCFCS Code 140), oil and gas storage (FLUCFCS 146), a cemetery (FLUCFCS 148), St. Mary's Medical Center (FLUCFCS 170), recreational lands associated with Peanut Island Park (FLUCFCS 180), undeveloped land in urban areas (FLUCFCS 191), spoil areas (FLUCFCS 743), disturbed lands (FLUCFCS 740), and electrical power transmission lines (FLUCFCS 832).

3.3.6 Ecology

3.3.6.1 Species-Environmental Relationships

The following subsections include descriptions of important flora and fauna within the Site and surrounding area. This discussion includes information related to the presence of important wildlife species and the value of the vegetative habitats present. The following descriptions of the flora and fauna at or near the Site follow the FLUCFCS-Level III codes.

Terrestrial Ecology Systems—Flora (Within the Existing Site)

Electric Power Facilities (FLUCFCS Code 831)

The majority of the Site is comprised of facilities related to electric power generation at the existing Riviera Plant. The existing electric power facilities do not include areas of significant natural vegetative habitats.

Electric Power Transmission Lines (FLUCFCS Code 832)

Transmission line right-of-way exists on approximately 7 acres of FPL-owned property west of U.S. Highway 1 in the City of Riviera Beach. The area within the right-of-way is highly disturbed and does not include areas of significant natural vegetative habitats. Species present include cabbage palm (*Sabal palmetto*), beach sunflower (*Helianthus debilis*), Brazilian pepper (*Schinus terebinthifolius*), Florida strangler fig (*Ficus aurea*), pepper vine (*Ampelopsis arborea*), napier grass

(*Pennisetum purpureum*), and wandering jew (*Tradescantia* sp.). This area will be used for construction parking and laydown.

Disturbed Lands (FLUCFCS 743)

An area of disturbed land occurs on the southern portion of the existing Site. This area will be used for the construction support area during construction of the converted Plant. This area is owned by FPL, but is used by Palm Beach County as a staging area for the County's artificial reef program. The dominant species in this area include cabbage palm, Brazilian pepper, and Australian pine (*Casuarina equisetifolia*). Other species present include Florida strangler fig, dogfennel (*Eupatorium capillifolium*), painted leaf (*Poinsettia cyathophora*), creeping oxeye (*Wedelia trilobata*), aloe (*Aloe vera*), and napier grass.

Reservoirs less than 10 acres (FLUCFCS Code 534)

Torpedo grass (*Panicum repens*), beggartick (*Bidens alba*), cattail (*Typha latifolia*), capeweed (*Phyla nodiflora*), and flatsedges (*Cyperus* spp.) are the dominant species present in the retention areas. These retention areas are part of the stormwater system for the existing Riviera Plant. The total acreage of the retention areas is 0.37 acres.

Open Land (FLUCFCS Code 190)

Within the existing Plant boundary, there are several small areas of open land. These areas are generally mowed and maintained lawn areas with a limited number of cabbage palm (*Sabal palmetto*), seagrape (*Coccoloba uvifera*), and mahogany (*Swietenia mahagoni*) interspersed.

Undeveloped Land In Urban Areas (FLUCFCS 191)

An area of undeveloped land is located in the southwest portion of the Site. This area is known as the landscaped buffer area. This area is primarily open and covered with grasses, landscape plants, and planted trees. Planted species include mahogany, seagrape, cabbage palm, oaks (*Quercus* spp.), oleander (*Nerium oleander*), cocoplum (*Chrysobalanus icaco*), and crape myrtle (*Lagerstroemia indica*).

Terrestrial Ecology Systems – Flora (Adjacent to the Site)

As described in Section 3.3.5, the area around the Site is comprised of densely developed industrial and residential areas. Natural terrestrial vegetative communities are scarce within the urban environment surrounding the Site. Limited areas of terrestrial vegetative communities occur

within perimeter of Peanut Island Park (FLUCFCS 180) and in undeveloped land in urban areas (FLUCFCS 191) as described below.

Recreational Lands (FLUCFCS 180)

Palm Beach County currently manages the perimeter of Peanut Island as a public park, providing swimming, boating, fishing and camping opportunities. The interior of the island is used for deposition of spoil materials, while areas of mangroves occur along the northwestern shore and areas of maritime hammock dominated by palms occur along the northeastern portion of the island. Peanut Island is located in Lake Worth Lagoon, approximately 0.3 miles from the Site.

Undeveloped Land In Urban Areas (FLUCFCS 191)

An area of undeveloped land occurs in the south of the Site. This area is primarily open and covered with grasses and other herbaceous species such as bahia grass (*Paspalum notatum*), smutgrass (*Sporobolus indicus*), creeping oxeye, dogfennel, and Spanish needles (*Bidens bipinnata*). The exotic shrub, Brazilian pepper is also present.

Terrestrial Ecology Systems—Fauna

Wildlife habitat was severely altered when the Site was cleared, graded, and filled in the 1940s for construction of the Riviera Plant. Natural vegetative communities have been cleared from the Site. Although small areas of mowed and maintained grass lawn are located within the Site, these areas do not provide quality wildlife habitat. Due to the prevalence of industrial and residential development, vegetative communities adjacent to the Site are also disturbed and do not provide quality wildlife habitat. Species observed within and adjacent to the Site are described below.

During field reconnaissance conducted in June 2008, only a limited number of species were observed, including osprey (*Pandion haliaetus*), laughing gull (*Larus atricilla*), and the exotic curly tailed lizard (*Leiocephalus carinatus armouri*). Other species likely to occasionally utilize the Site include common avian species known to occur in urban areas, such as mockingbird (*Mimus polyglottis*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), common ground dove (*Columbina passerina*), and European starling (*Sturnus vulgaris*).

Aquatic Systems

The only aquatic system that occurs within the Site is the manatee embayment (FLUCFCS 542).

Manatee Embayment (FLUCFCS 542)

The term “manatee embayment” refers to the discharge area previously used for Units 1 and 2 and now used to discharge a small portion of the once-through cooling water discharge from Units 3 and 4 for the manatees. The embayment opens directly into the Lake Worth Lagoon. Seagrass mapping was conducted within the embayment in August 2008 by Ecological Associates, Inc. (EAI, 2008). Results of the mapping indicate a sandy bottom, nearly devoid of seagrasses and harbottom resources, except for a 4 square foot area covered by Johnson’s seagrass (*Halophila johnsonii*).

Aquatic systems adjacent to the Site include the Lake Worth Lagoon (FLUCFCS 510) (see Figure 3.3.5-1), described below.

Lake Worth Lagoon (FLUCFCS 510)

The Lake Worth Lagoon (Lagoon) is approximately 20 miles long and averages 0.5 miles wide with water depths ranging between 6 and 10 feet. Historically, the Lagoon was a freshwater system with drainage through a swampy area on the western edge of the Lake Worth. The lake was converted into a marine system with the construction of permanent inlets in the late 1880s. Two permanent inlets allow exchange between the Lake Worth Lagoon and the Atlantic Ocean. The Lake Worth Inlet (closest to the Site) is approximately 800 feet wide and 34 feet deep in the channel. The South Lake Worth Inlet is approximately 131 feet wide with a depth that varies from approximately 6 to 12 feet.

Heated condenser cooling water from the existing Plant is discharged through two 90-inch internal diameter buried pipes to a location approximately 1,941 feet offshore near the ship channel for the Port of Palm Beach in the middle of the Lagoon. A small portion of the heated water is discharged into the manatee embayment area.

Most of the shoreline of the Lagoon is bulkheaded or otherwise developed, with less than 20 percent of the shoreline fringed by mangroves (PBCERM, 1992 in Crigger et al., 2005). There are no mangroves on the Site. Although not abundant, six species of seagrass are known to occur within the Lake Worth Lagoon: turtle grass (*Thalassia testudinum*), shoal grass (*Halodule wrightii*), manatee grass (*Syringodium filiforme*), Johnson’s seagrass, star grass (*Halophila engelmannii*), and paddle grass (*Halophila decipiens*) (Crigger et al., 2005). Shoal grass, which occurs primarily in shallower areas, is the most abundant species of seagrass in the Lagoon in terms of coverage. A seagrass survey conducted in 2001 found most seagrass (70 percent) to be in the northern portion of the Lagoon (Little Lake Worth just north of Ocean Drive), with 20 percent in the central portion of the Lagoon

(Royal Park Bridge to Ocean Avenue Bridge in Lantana) and 10 percent in southern portion of the Lagoon (Ocean Avenue Bridge in Lantana to Ocean Avenue Bridge in Boynton Beach) (PBCERM and Dames and Moore, 1990 in Crigger et al., 2005). Star grass was only observed from one location (in the northern portion of the Lagoon) during the 2001 survey (PBCERM and Dames and Moore, 1990 in Crigger et al., 2005). Seagrass mapping conducted within the Lagoon adjacent to the Riviera Plant (near the manatee embayment area) in August 2008 by Ecological Associates, Inc. (EAI) resulted in patchy distribution of seagrass areas with sparse to moderate coverage of paddle grass and Johnson's seagrass.

Seagrass fixed transect surveys by the PBCERM conducted from 2000 to 2004 showed fluctuations in seagrass cover with no obvious pattern of increase or decrease until after the hurricanes in 2004. The 2005 survey showed a major decrease in seagrass cover in most areas of the Lagoon. The loss of seagrass observed during the 2005 survey was believed to be due to increased turbidity caused by runoff from the hurricanes, discharges from Lake Okeechobee, and burial and scour from wave action (PBCERM, 2008).

Seagrasses were not mapped within the area of the existing discharge during PBCERM's 2001 seagrass mapping project (PBCERM, 2008). The existing off-shore discharge configuration includes a separate discharge outlet for each unit's cooling water discharge through a 90-inch internal diameter buried pipe. These pipes discharge the heated water about 1,941 feet offshore near the ship's channel for the Port of Palm Beach (in the middle of Lake Worth). The centerline elevation of the pipes at the discharge point is -16.58 ft-msl. Seagrasses were mapped by PBCERM in non-dredged areas to the north and south of the existing discharge. Seagrass beds within the Lagoon provide refugia for juvenile fish such as red drum (*Sciaenops ocellatus*), grouper (*Epinephelus* spp.), snook (*Centropomus undecimalis*), and spotted seatrout (*Cynoscion nebulosus*). A total of 261 species of fish have been collected in the Lagoon and inlet areas. The greatest numbers of fish have been collected near Munyon Island, northwest of Palm Beach Shores, near the Lake Worth Inlet, near Hunter's Island, and in the vicinity of the South Lake Worth Inlet. (Gilmore et al., 1992, in Crigger et al., 2005).

Many species of invertebrates and birds, as well as recreational and commercial fish species are found within the natural communities of the Lagoon and adjacent estuarine areas. Several bird sanctuaries and/or rookeries are found within the Lake Worth Lagoon including Bingham, Bird, Fisherman's, Hunter's, John's, and Munyon Islands (Crigger et al., 2005).

Surveys by the Florida Fish and Wildlife Conservation Commission (FFWCC) have identified a limited number of natural oyster reefs in the Lake Worth Lagoon. The areal extent of these oyster reefs is less than 5 acres and is confined primarily to the intertidal zone of the central portion of the Lagoon. The FFWCC studies appear to indicate the oyster population is limited by the lack of suitable substrate (PBCERM, 2008).

FPL performed a 316 study for the Riviera Plant from February 1974 through October 1974 and from January 1975 through December 1975. The 316(a) and 316(b) study culminated in a comprehensive report submitted to affected agencies including the U.S. Environmental Protection Agency (EPA) and the predecessor of the FDEP. The final report (dated September 1976) is titled “Ecological Parameter Monitoring at the Riviera Plant”, prepared by ABI. The objective of this study was to evaluate whether the operation of the Riviera Plant interfered with the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife or caused substantial damage to the biological community of the adjacent waters. General conclusions of the report were as noted:

- No statistically significant difference was found in macroinvertebrate density and diversity of the intake and discharge area;
- No statistically significant difference was found in the temperature of the intake and discharge area; and
- Entrainment rates were not considered to be detrimental to the invertebrate community or to commercial fisheries.

The data and conclusions of this report formed the technical basis for 316(a) and 316(b) decisions by EPA.

In accordance with the implementation of the Phase II 316(b) Rule for Existing Facilities (69 FR 41576) in July 2004, FPL performed an Impingement and Entrainment Characterization Study from May 18, 2006, to May 3, 2007. Similar species were impinged in both studies.

Threatened and Endangered Species—Flora and Fauna

Plant and animal species designated by the USFWS, the FFWCC, and the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, species of special concern, commercially exploited, or under review, were included in this category.

No threatened or endangered species were observed at or adjacent to the Site during field surveys with the exception of the manatee, which is classified as endangered by both the USFWS and FFWCC, and Johnson's seagrass, which is classified as endangered by the USFWS but is not classified as threatened or endangered within the State of Florida by the FDACS. Both the manatee and Johnson's seagrass were observed adjacent to the Site within the Lake Worth Lagoon, near the area known as the manatee embayment.

Threatened and Endangered Species—Methodology

Literature review, GIS database queries, and field reconnaissance were utilized to determine the species that could potentially be present in the habitats found on the Site. Primary sources of information are the Florida Natural Areas Inventory (FNAI) database (2008); Florida Committee on Rare and Endangered Plants and Animals (FCREPA) reports; Preservation of Native Flora of Florida Law, Rule Chapter 5B-40, F.A.C.; the Regulated Plant Index (5B-40.0055); and Notes on Florida's Endangered and Threatened Plants, FDACS, Division of Plant Industry, Bureau of Entomology, Nematology and Plant Pathology – Botany Section, Contribution No. 38, Addition 2, Gainesville. A Site Specific Data Report was also obtained from FNAI. In addition, previous reports of surveys conducted in and near the Site were reviewed.

Plant and Animal Surveys

Because of the rareness and seasonality of threatened and endangered species, either multiseason surveys or an evaluation of threatened and endangered species habitat conditions are necessary to determine their potential presence or absence on the Site. For this study a combination of evaluation of habitat conditions, literature reviews, previous studies, FNAI database queries, and field surveys were used to identify federally and state listed species whose ranges and habitat preferences include the Site.

Flora

Threatened, endangered, and/or plant species of special concern that occur within Palm Beach County are listed in Table 3.3.6-1. Due to the impacted nature of the Site, no suitable habitat for listed plant species exists within the Site, except in the manatee embayment area. Adjacent to the Site, patchy distribution of seagrass with sparse to moderate coverage of Johnson's seagrass was observed within the Lagoon near the Riviera Plant (EAI, 2008). Within the manatee embayment area, a very small patch of sparse (<5 percent coverage) Johnson's seagrass was observed, totaling 4 square feet (EAI,

2008). Johnson's seagrass is classified as a federally threatened species by the USFWS, but is not listed by the FDACS.

The Site Specific Data Report obtained from the FNAI did not include any documented occurrences of listed plant species within the Site (Appendix 10.7.1). Two historically documented occurrences of listed plant species were found within one mile of the Site according to the FNAI report, the large-flowered rosemary (*Conradina grandiflora*), a state threatened species, and Johnson's seagrass (Figure 3.3.6-1). Within a 5-mile radius of the Site, the FNAI report includes historical occurrences of Johnson's seagrass, large-flowered rosemary, sea lavender (*Argusia gnaphalodes*), a state endangered species; burrowing four o'clock (*Okenia hypogaea*), a state endangered species; and hand fern (*Ophioglossum palmatum*), a state endangered species (Figure 3.3.6-1).

Fauna

Threatened, endangered, and/or animal species of special concern that occur within Palm Beach County are listed in Table 3.3.6-1. Due to the lack of suitable habitat and highly developed industrial and residential surroundings, no threatened or endangered species occur within the Site. Although not observed during field reconnaissance, ditches and stormwater retention areas within urbanized areas in the vicinity of the Site provide potential low-quality habitat for species of wading birds classified as species of special concern by the FFWCC, including the little blue heron (*Egretta caerulea*), white ibis (*Eudocimus albus*), snowy egret (*Egretta thula*), and tricolor heron (*Egretta tricolor*).

The FNAI database review and Site Specific Data Report did not result in any occurrences of listed animal species at the Site (Appendix 10.7.1). However, a query of the FNAI database resulted in several documented occurrences of listed species within a 5-mile radius of the Site (see Figure 3.3.6-1). Green turtles and leatherback sea turtles (*Dermochelys coriacea*), which are both federally endangered species, as well as loggerhead sea turtles (*Caretta caretta*), which are a federally threatened species, were observed off the Atlantic Coast within a 5-mile radius of the Site. Gopher tortoises (*Gopherus polyphemus*), a state threatened species, were observed in a residential area within a 5-mile radius of the Site, but not on the Site.

Adjacent to the Site, a single manatee was observed during the June 2008 field survey and the January 2009 survey. Manatees are known to congregate near the manatee embayment area during the cooler winter months. The entire Lake Worth Lagoon is considered by the USFWS as Critical

Habitat for the manatee (42 FR 47840). Manatees are known to inhabit the Lagoon year-round. During cooler periods, manatees are observed congregating around the warm water discharge of the Plant. During a survey conducted by FFWCC in February 2007, 237 manatees were observed gathered near the existing Plant (PBCERM, 2008). Approximately 37 percent of the manatees observed during the 2007 survey were located in the northern part of the Lagoon where the most extensive seagrass beds area located (PBCERM, 2008). Aerial surveys for manatees were conducted by Mote Marine Laboratory on behalf of FPL in February 2007. On February 7, 2007, 288 manatees were observed in the vicinity of the existing Plant, including 25 calves, while on February 17, 2007, 141 manatees were observed, including 11 calves (Mote, 2007).

Sea turtles are known to nest in Palm Beach County on the Atlantic Beaches and have been observed within the Lake Worth Lagoon. All sea turtles are listed by the USFWS as either threatened or endangered species. Studies conducted from March 2005 to June 2006 by Inwater Research Group (IRG) on behalf of PBCERM showed 150 sea turtles were observed within approximately 175 meters (m) of visual transects within the Lagoon. Twenty-nine (29) sea turtles were captured through netting activities for a catch per unit effort (CPUE) of 2.61 turtles per kilometer net hour. Sea turtles were found frequenting areas of high seagrass and algal cover. The majority of sea turtles observed and captured were juvenile green sea turtles (*Chelonia mydas*). Fibropapillomatosis (FP), a potentially deadly disease affecting primarily green sea turtles in polluted estuarine waters, was found in 57 percent of the turtles captured (PBCERM, 2008).

3.3.6.2 Pre-Existing Stresses

Terrestrial Systems

The greatest pre-existing stress to terrestrial systems of the Site and surrounding area is the result of commercial, industrial, and residential development. The natural topography, soils, and hydrology of the Site are extensively altered as a result of the addition of fill material and topographic grading. Any natural ecosystems and wildlife habitat that may have previously been located at the Site have been lost, and natural drainage features have been modified.

Aquatic Systems

Aquatic systems in the vicinity of the Site are subjected to stress from numerous sources related to agricultural runoff, commercial, industrial and urban land use, development, and the construction and operation of water management systems. Pre-existing stresses include:

- Altered hydrology,
- Altered salinity,
- Elevated loads of nutrients and organic matter,
- Input of contaminants,
- Power plant intake/discharge,
- Port of Palm Beach,
- Physical alterations, and
- Boating and fishing pressure.

3.3.6.3 Measurement Programs

Terrestrial Ecology

Terrestrial ecological resources were evaluated through Site reconnaissance, previous studies, and literature searches. Vegetative communities, wildlife utilization, and potential for threatened and endangered wildlife occurrence were addressed during reconnaissance surveys.

Wetland Methodology

Within South Florida, three agencies, the USACE, FDEP, and SFWMD, have rules that apply to wetlands. To be jurisdictional, a wetland must ascribe to three characteristics defined by rule: presence of vegetation listed as belonging in wetlands, having a certain defined hydrology, and the presence of hydric soils. The applicable characteristics for wetland determination as prescribed by the regulatory agencies were used. There are no jurisdictional wetlands on the Site or the construction parking and laydown area.

3.3.7 Meteorological and Ambient Air Quality

Meteorological data collected at existing monitoring stations were used to describe the local and regional climatology in the vicinity of the proposed Site. The closest existing meteorological station to the Site with complete data is the National Weather Service (NWS) station located at the Palm Beach International Airport, situated approximately 10 kilometers (km) (6 miles) south-southwest of the Site. The NWS has recorded weather observations for more than 50 years at this station. These data are the most complete for and representative of the region surrounding the Site.

The climate in the vicinity of the Site is subtropical with a marine influence from the Atlantic Ocean. The monthly and annual average temperatures for this area are presented in Table 3.3.7-1. The annual average temperature is approximately 75.3°F with monthly average temperatures varying from

a maximum of 90.1°F to a minimum of 57.3°F. Record extreme temperatures range from a low of 27°F to a record high of 101°F. During the summertime, temperatures rarely exceed 100°F due to the high relative humidity with subsequent cloud cover formation and the abundant convective-type (e.g., thunderstorms) precipitation.

The monthly and annual average precipitation data are presented in Table 3.3.7-2. Approximately 64 percent of the annual precipitation falls during the six warmest months, May through October. The average annual precipitation is approximately 61 inches, but this has varied from as little as 39 inches to more than 86 inches in the past 30 years. The majority of rain is in the form of short-lived convection showers (e.g., thunderstorms). Large amounts of rain are also produced during the late summer or fall when tropical storms or hurricanes may pass near the Site. These events may result in heavy downpours that reach torrential proportions; 24-hour amounts from 6 to more than 10 inches are not uncommon.

Monthly and annual average relative humidities, which indicate the amount of moisture in the air at a given temperature, are presented in Table 3.3.7-2 for the morning hours of 1:00 a.m. and 7:00 a.m. and early afternoon and evening hours of 1:00 p.m. and 7:00 p.m. The highest humidities are coincident with the coolest ambient temperatures, which generally occur at 7:00 a.m., or near dawn. The lowest humidities coincide with the highest ambient temperatures.

Annual and seasonal windroses for the 5-year period from 2001 through 2005 are given in Figures 3.3.7-1 through 3.3.7-5. A summary of the seasonal and annual average wind direction and wind speed, including calm conditions, is presented in Table 3.3.7-3. As shown in these figures, the predominant winds during the year are from the east. The predominant easterly winds occur because the Site lies entirely within the trade wind belt (i.e., below 30 degrees N latitude). Also, because of the proximity of the Atlantic Ocean, the easterly winds are reinforced due to the moderate to strong late afternoon sea breezes that occur on days with strong land heating and produce localized onshore winds. The data for this period were also used in the air quality impact analyses.

Except during the passage of tropical storms or hurricanes, high wind speeds generally do not occur. During the winter and spring, there are usually a few days when wind speeds are greater than 30 miles per hour (mph).

Atmospheric stability is a measure of the atmosphere's capability to disperse pollutants and potentially reduce ground-level concentrations. During the daytime with strong solar heating, the atmosphere can disperse pollutants very quickly for a relatively short period of time. This condition is considered as very unstable and generally occurs infrequently during the year. During the nighttime under clear skies and light wind speeds, the atmosphere is considered stable with negligible potential to disperse pollutants. During the day or night when wind speeds are moderate to high, pollutants are dispersed at moderate rates (i.e., dispersion rates that are lesser than those during unstable conditions but greater than those during stable conditions). This condition is considered neutral and occurs frequently throughout the year. The seasonal and annual average occurrences of atmospheric stability classes for this area for 2001 to 2005 are shown in Table 3.3.7-4. During the summer months, unstable conditions occur more than 30 percent of the time due to strong solar heating, whereas unstable stability occurs less than 20 percent of the time in the winter months. Neutral stability occurs most frequently during the winter months due to the higher wind speeds that occur in this season.

The mixing height is a parameter used to define the vertical height to which pollutants can disperse and, therefore, is used in estimating the volume of air in which pollutants are emitted and can be dispersed. In general, the higher the mixing height, the greater the potential for pollutants to be dispersed and for ground-level concentrations to be reduced.

The seasonal and annual average morning and afternoon mixing heights estimated for this area for 2001 to 2005 are listed in Table 3.3.7-5. The highest afternoon mixing heights occur in the spring and the lowest morning mixing heights occur in winter.

Thunderstorms are the most frequent of severe storms, occurring an average of 79 days per year as reported by the NWS at Palm Beach International Airport. These storms occur throughout the year, but about 87 percent occur from May through October.

Hurricanes and tornadoes are other types of severe weather that can occur at the Site, but the probability of a hurricane or tornado passing over the Site is low.

In the 80-km (50-mile) coastal strip from West Palm Beach to Fort Lauderdale, there is about a 20-percent chance that a tropical storm will pass over the area during any given year (Gale Research Co., 1980). For storms of hurricane strength (i.e., wind speeds exceeding 73 mph), the chance

decreases to about 16 percent with a 7-percent chance that the winds will be greater than 124 mph (i.e., wind speeds of a great hurricane).

Statistics compiled by the severe local storms branch of the national severe storms forecast center (Pautz, 1969) show that an average of less than three tornadoes were spotted within the 1 degree latitude by 1 degree longitude square centered near the Site from 1955 to 1967. The tornado recurrence interval for any specific point location within the 1 degree square was estimated by the methodology of Thom (1963). The recurrence interval, r , is equal to $1/p$ where p is the probability of a tornado striking within the 1-square-mile area and is estimated as follows:

$$p = (2.8209 \times t) / a$$

where: t = mean annual frequency of tornadoes occurring, and

a = area (square miles) of the 1 degree square.

In this analysis, t was assumed to be 1.5 based on data collected from 1953 to 1962 and a was estimated to be 4,200 square miles. Therefore, the mean recurrence interval for a tornado striking a point within this square is more than 1,000 years. The month during which tornadoes occur most frequently is June.

3.3.7.1 Ambient Air Quality

Ambient Standards

The National and Florida ambient air quality standards (AAQS) are presented in Table 3.3.7-6. Primary National AAQS were promulgated to protect the public health, and secondary National AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in compliance with AAQS are designated as attainment areas. Pollutants for which AAQS have been established are referred to as criteria pollutants. These pollutants include particulate matter (PM) with an aerodynamic particle size of 10 micrometers (μm) or less (PM_{10}), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb).

Palm Beach County is classified as an attainment area for all criteria pollutants (Rule 62-204.340, F.A.C.). Adjacent counties, such as Martin and Broward Counties, are also classified as attainment areas for all criteria pollutants.

On July 18, 1997, the EPA promulgated revisions to the National AAQS for O₃ and PM (62 Federal Register No. 138). The O₃ standard was modified to be 0.08 parts per million (ppm) for an 8-hour average concentration. This standard is achieved when the 3-year average concentration of the 4th highest value is 0.08 ppm or less. The 1-hour average AAQS will no longer apply to an area 1 year after the effective date of the designation of that area for the 8-hour O₃ AAQS.

The revised PM AAQS included two new PM_{2.5} standards (PM_{2.5} represents PM with an aerodynamic diameter of 2.5 µm or less); a short-term 24-hour average standard and an annual average standard. In October 2006, EPA promulgated revised AAQS for PM₁₀ and PM_{2.5} [Federal Register, October 17, 2006 (71 FR 61144)]. For PM₁₀, the annual standard was revoked and the 24-hour standard was retained. The 24-hour PM_{2.5} standard was revised to 35 micrograms per cubic meter (µg/m³) from 65 µg/m³ in the promulgated 1997 AAQS. The 24-hour PM_{2.5} standard is based on a 3-year average of the 98th percentile of 24-hour average concentrations that must not exceed 35 µg/m³ (from population-orientated monitors) and a 3-year average of annual average concentrations that must not exceed 15 µg/m³ (from a single or community-orientated monitor). These AAQS are effective December 18, 2006.

FDEP has not yet adopted the revised O₃, PM₁₀, or PM_{2.5} AAQS. Based on evaluations performed by FDEP and EPA, Palm Beach County has been designated an attainment area for the revised 1997 O₃ AAQS [Federal Register, April 30, 2004 (69 FR 23996)], as well as an attainment area for the 1997 PM_{2.5} AAQS [Federal Register, January 5, 2005 (70 FR 944)]. Although FDEP and EPA have not yet designated areas for PM_{2.5} in Florida based on the 2006 PM_{2.5} AAQS, monitoring data collected over the last several years indicate that Palm Beach County and adjoining counties would be classified as attainment of the PM_{2.5} AAQS. These standards must be implemented in the 2008 to 2009 timeframe with a revision to the State Implementation Plan.

In promulgating the 1977 Clean Air Act (CAA) Amendments, Congress specified that certain increases above an air quality *baseline concentration* level of SO₂ and PM concentrations would constitute *significant deterioration* for sources located in attainment areas. The magnitudes of the allowable increases, or prevention of significant deterioration (PSD) increments, depend on the classification of the area in which a new source (or modification) will be located or have an impact. Three PSD increment classifications were designated based on criteria established in the 1977 CAA Amendments. Initially, Congress designated areas as either Class I [international parks, national wilderness areas (NWAs), and memorial parks larger than 5,000 acres, and national parks (NPs)

larger than 6,000 acres] or as Class II (all areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. EPA then promulgated as regulations the requirements for classifications and area designations.

On October 17, 1988, EPA promulgated regulations to prevent significant deterioration due to nitrogen oxide (NO_x) emissions and established PSD increments for NO₂ concentrations. The EPA class designations and allowable PSD increments are presented in Table 3.3.7-6. Florida has adopted the EPA allowable increments for PM₁₀, SO₂, and NO₂.

Palm Beach County is classified as a Class II area (Rule 62-204.340, F.A.C.) since it is an attainment area for all pollutants. The nearest Class I area to the Site is the Everglades NP, located about 120 km (72 miles) from the Site, and Chassahowitzka NWA, located about 326 km (196 miles) from the Site.

Existing Air Pollutant Sources

The Site is located in the eastern portion of Palm Beach County, with several existing major sources of SO₂, PM, or NO_x emissions with greater than 100 tons per year (TPY) located within 25 km (16 miles) of the Site. These major sources include the Riviera Power Plant, Solid Waste Authority of Palm Beach County, City of Lake Worth Utilities, Rinker Materials, and Community Asphalt Corporation.

Existing Ambient Air Quality

Ambient air quality monitoring data have been collected in Palm Beach County for more than 20 years. Air monitoring data currently are collected for SO₂, PM₁₀, NO₂, O₃, and CO. These data are generally representative of air quality for areas in the County with more industrial development than that around the Site. Thus, the measured air quality data from these sites provide a conservative indication of air quality around the Site.

A summary of the maximum pollutant concentrations measured in Palm Beach County from 2005 through 2008 is presented in Table 3.3.7-7. These data indicate that the maximum air quality concentrations measured in the region are well below applicable standards.

3.3.7.2 Measurement Programs

All information (i.e., meteorology and air quality data) was compiled from offsite monitoring stations maintained and operated by FDEP or cooperating governmental agencies (i.e., NWS). No significant changes in these programs are anticipated after the construction of RBEC.

Meteorological data were obtained from the NWS surface and upper-air stations at the Palm Beach International Airport and Miami International Airport, respectively. These data were obtained for a 5-year period from 2001 through 2005 from which the joint frequency of wind direction, wind speed, and atmospheric stability and a 5-year average of mixing heights were developed. Since 1986, the wind sensors at the Palm Beach International Airport have been located 33 feet above grade. Regular surface observations are taken just before each hour, 7 days per week. Upper-air soundings are conducted twice per day at 7:00 a.m. and 7:00 p.m., Eastern Standard Time.

Since the estimated increases in potential emissions due to the Project do not exceed the PSD significant emission rates for regulated pollutants, an ambient air monitoring analysis is not required under PSD regulations. In addition, as indicated in Table 3.3.7-7, available monitoring data collected from regional monitoring sites are well below the AAQS.

3.3.8 Noise

3.3.8.1 Background

Sound propagation involves three principal components: a noise source, a person or a group of people, and the transmission path. While two of these components, the noise source and the transmission path, are easily quantified (i.e., by direct measurements or through predictive calculations), the effect of noise on humans is the most difficult to determine due to the varying responses of humans to the same or similar noise patterns. The perception of sound (noise) by humans is very subjective and, just like odor and taste, it is very difficult to predict a response from any particular individual to another.

The magnitude of noise levels or loudness is referred to as sound pressure level (SPL) with units in decibels (dB). Decibels are calculated as a logarithmic function of SPL in air to a reference effective pressure, which is considered the hearing threshold, or:

$$\text{SPL} = 20 \log_{10} (P_e/P_o)$$

where: P_e = measured effective pressure of sound wave in micropascals (μPa), and
 P_o = reference effective pressure of 20 μPa .

To account for the effect of how the human ear perceives sound pressure, at moderate to low levels, SPLs are adjusted for frequency (or pitch). One of the most commonly used frequency filters is the A weighting [A-weighted decibel (dBA)], which adjusts measurements for the approximated response of the human ear to low frequency SPLs [i.e., below 1,000 hertz (Hz)] and high-frequency SPLs (i.e., above 1,000 Hz).

The existing Site is located primarily within the City of Riviera Beach and a small portion in the City of West Palm Beach. U.S. Highway 1, which runs along the Site's western boundary, is heavily traveled and a significant contributor to the overall existing noise levels in the vicinity of the Site.

3.3.8.2 Noise Monitoring Locations

Noise measurements were obtained at nine locations in March 2008 to assess the background noise levels within and near the existing Plant. Four of these locations were taken onsite at or near the Plant boundary. Five monitoring locations were offsite near residential and public receptors in the vicinity of the existing Plant. The monitoring conducted in March 2008 occurred when the existing Plant was operating at low loads. Figure 3.3.8-1 shows the nine baseline noise monitoring locations. In May 2008, noise measurements were obtained at seven of the nine monitoring locations where noise levels were determined in March 2008. Measurements in May 2008 were conducted when the existing Riviera Plant was operating at high loads.

3.3.8.3 Noise Measurement Procedures

Noise measurements were made using a sound level meter that was set to the slow response mode to obtain consistent, integrated, A-weighted SPL. Concurrent one-third octave band frequencies were also measured at all sites. The octave band data from each monitoring site have measured and stored during each monitoring period. Both daytime and nighttime monitoring measurements were performed to accurately assess the baseline noise conditions.

Integrated SPL data consisting of the following noise parameters were collected at each location:

- L_{eq} - The sound pressure level averaged over the measurement period; this parameter is the continuous steady sound pressure level that would have the same total acoustic energy as the real fluctuating noise over the same time period;
- L_{max} - The maximum sound pressure level for the sampling period;

- $L_{\min}$ - The minimum sound pressure level for the sampling period; and
- L_n - The sound pressure levels which were exceeded n percent of the time during sampling period. For example, L_{90} is the level exceeded 90 percent of the time.

The SPL data were analyzed and reported in both dB and dBA. The higher the decibel value, the louder the sound.

The SPL averages were calculated using the following formula:

$$\text{Average SPL} = 10 \log \frac{\sum_{i=1}^N 10^{(\text{SPL}_i/10)}}{N}$$

where: N = number of observations, and
 SPL_i = individual SPL in data set.

The SPLs and octave band data were collected during each monitoring event, using measurement techniques set forth by American National Standards Institute (ANSI) S12.9-1993/Part 3, 1993.

The noise monitoring equipment used during the study included:

- Larson Davis Model 824 Precision Integrating Sound Level Meter with Real Time Frequency Analyzer;
- Larson Davis Model PRM902 Microphone Preamplifier;
- Larson Davis Model 2560 Prepolarized ½-inch Condenser Microphone;
- Windscreen, tripod, and various cables;
- Sound Level Meter Calibration Unit; and
- Larson Davis Model CAL200 Sound Level Calibrator, 94/114 dB at 1,000 Hz.

Monitoring was conducted using the sound level meter mounted on a tripod at a height of 1.5 m (5 feet) above grade. A windscreen was used because all measurements were taken outdoors. The microphone was positioned so that a random incidence response was achieved. The sound level meter and octave band analyzer were calibrated immediately prior to and just after the sampling period to provide a quality control check of the sound level meter's operation during monitoring.

Local meteorological conditions (wind speed, wind direction, temperature, and relative humidity) were measured during the monitoring periods. The operator recorded detailed field notes during monitoring and included major noise sources in the area. The Larson Davis sound level meter complies with Type I - Precision requirements set forth for sound level meters and for one-third octave filters.

3.3.8.4 Measured Ambient Baseline Sound Pressure Levels with Existing Plant Offline

Baseline noise measurements were collected in March 2008 at the Riviera Plant while the existing Unit 4 was offline for scheduled maintenance and Unit 3 was operating at a low load. The baseline study shows that the major noise source in the area is the traffic noise on U.S. Highway 1 and Port of Palm Beach operations. The baseline noise results are presented Table 3.3.8-1. The table presents the L_{50} , L_{90} , L_{max} , and L_{min} sound levels. The L_{50} is defined as the appropriate parameter for “ambient noise” in the City of Riviera Beach Noise Ordinance (see Section 3.3.8.6).

3.3.8.5 Measured Ambient Baseline Sound Pressure Levels with the Existing Plant Online

Baseline noise measurements were collected in May 2008 while the existing Riviera Plant was operating at full load after the planned maintenance outage. The noise measurements were collected at seven of the same nine locations as the baseline noise study while the Plant was operating at baseload. The results show that the major noise sources in the Project area include the traffic noise due to U.S. Highway 1, the operations of the Port of Palm Beach, and the current Plant operations. The noise study results with the Plant operating at base load are presented in Table 3.3.8-2. The daytime L_{50} noise measurements ranged from a low of 52 dBA at Site 5 to a high of 72 dBA at Site 1. The nighttime L_{50} noise measurements ranged from a low of 46 dBA at Site 5 to a high of 67 dBA at Site 1.

3.3.8.6 Noise Regulations

There are no State of Florida noise regulations that are applicable to the Riviera Plant. The City of Riviera Beach has adopted a noise ordinance with numerical standards depending on the zoning (Chapter 11: Nuisances, Article IV Noise). The Riviera Beach Noise Ordinance establishes noise limits for industrial, commercial and residential zoned properties within the City of Riviera Beach. For the purposes of the ordinance, defines “ambient noise” as the level which is exceeded 50 percent of the time during an observation period or L_{50} .

The properties adjacent to the Riviera Plant within the City of Riviera Beach are zoned industrial to the north and commercial to the west. The applicable noise limitation for the Riviera Plant is 65 dBA day and night, contained in Section 11-171(c)(1) and (d)(1) for fixed mechanical equipment for commercial and industrial zoned properties. The ordinance under Section 11-141 defines a fixed source, which includes, but not limited to, industrial process machinery and equipment, pumps, and fans. The equipment associated with the existing Riviera Plant meets this definition.

A portion of the Site is located in the City of West Palm Beach. This area, located in the southeast portion of the Site, will be used as a construction support area and for a manatee viewing center after RBEC becomes operational. The City of West Palm Beach has noise control regulations codified in its Code of Ordinances, Part II, Chapter 34, Article II. These noise regulations do not include quantitative noise limit but regulate “unreasonably loud, excessive, unnecessary and unusual noise” (Section 34-55). The regulation provides 12 general acts that are identified to be unreasonably loud, excessive or unusual noises. These acts includes noise sources such as horns, radios, animals, whistles, exhausts, vehicles, loudspeakers, power tools, and shouting. Noise in the vicinity of schools and houses of worship are also regulated.

TABLE 3.2.7-1
PRIVATE SECTOR EMPLOYMENT BY MAJOR INDUSTRY
FOR PALM BEACH COUNTY

Major Industry Group	Average Employment
Total, All Industries	172,757
Goods Producing	37,247
<i>Natural Resources and Mining</i>	325
<i>Agriculture, Forestry, Fishing and Hunting</i>	245
<i>Mining</i>	81
Construction	13,601
Manufacturing	23,320
<i>Durable Goods Manufacturing</i>	22,078
<i>Nondurable Goods Manufacturing</i>	1,242
Service-Providing	135,510
Trade, Transportation, and Utilities	36,150
<i>Wholesale Trade</i>	5,142
<i>Retail Trade</i>	27,798
<i>Transportation and Warehousing</i>	2,767
<i>Utilities</i>	443
Information	2,751
Financial Activities	8,141
<i>Finance and Insurance</i>	5,168
<i>Real Estate and Rental and Leasing</i>	2,972
Professional and Business Services	34,156
<i>Professional, Scientific, and Technical Services</i>	12,074
<i>Management Companies and Enterprises</i>	1,175
<i>Administration and Support and Waste Management and Remediation Services</i>	20,907
Education and Health Services	28,118
<i>Educational Services</i>	3,081
<i>Health Care and Social Assistance</i>	25,037
Leisure and Hospitality	20,662
<i>Arts, Entertainment & Recreation</i>	3,064
<i>Accommodation and Food Services</i>	17,598
Other Services (except Public Administration)	5,494
Unclassified	39

Source: State of Florida, Labor Market Statistics, Quarter 4, 2007. "Quarterly Census of Employment and Wages" (ES-202), Annual NAICS files.

TABLE 3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-06814-W	050204-10	167689	1194 WELL	WELL	30	P	Surficial Aquifer System	20	42	43
50-06543-W	040625-6	154600	13TH COURT WAREHOUSE	WELL	35	P	Surficial Aquifer System	32	42	43
50-07940-W	070530-31	214310	2275 PB LAKES INCORPORATED	WELL	40	P	Surficial Aquifer System	19	43	43
50-07560-W	060912-9	194514	3 ACRES LLC	WELL	60	P	Surficial Aquifer System	32	42	43
50-05256-W	011203-15	114671	3661 INTERSTATE PARK ROAD	WELL	15	P	Surficial Aquifer System	31	42	43
50-05592-W	020815-8	121610	36TH STREET RIGHT OF WAY LANDSCAPE IRRIGATION	WELL	120	P	Surficial Aquifer System	9	43	43
50-07800-W	070216-25	217282	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07800-W	070216-25	217283	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07800-W	070216-25	217284	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07800-W	070216-25	217285	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07800-W	070216-25	217286	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07800-W	070216-25	217287	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07800-W	070216-25	217288	45TH STREET (FROM JOG ROAD TO HAVERHILL ROAD)	PUMP	500	P	Water Table aquifer	1,2,3	43	42
50-07952-W	070516-5	214503	5760 CORPORATE WAY	PUMP	45	P	SFWMDC Canal (C-17)	6	43	43
50-03335-W	940822-9	5073	9421 SUN COURT TRIPLEX	WELL	25	E	Surficial Aquifer System	18	42	43
50-05000-W	010503-7	107521	ACADEMY FOR LITTLE PEOPLE	WELL	60	E	Surficial Aquifer System	12	43	42
50-04801-W	010215-10	104755	AHRENS COMPANIES OFFICE WAREHOUSE	WELL	198	P	Surficial Aquifer System	20	42	43
50-07965-W	080304-15	221468	ALLAMANDA ELEMENTARY	WELL	200	P	Surficial Aquifer System	8	42	43
50-07965-W	080304-15	214916	ALLAMANDA ELEMENTARY	WELL	0	P	Surficial Aquifer System	8	42	43
50-05923-W	021226-6	131604	ALPHA-FRY TECHNOLOGIES	WELL	20	E	Surficial Aquifer System	33	42	43
50-06063-W	030723-24	136966	ALVIN MATTHEWS PAINT AND BODY	WELL	50	P	Surficial Aquifer System	32	42	43
50-05563-W	020614-15	121077	AMERICAN HEART ASSOCIATION	WELL	30	P	Surficial Aquifer System	29	43	43
50-08183-W	071008-4	217531	AMERICAN LUNG	PUMP	45	P	Off-site Lake(s)	9	43	43
50-05785-W	021231-15	128359	AMOCO-RIVIERA BEACH	WELL	25	E	Surficial Aquifer System	25	42	42
50-04364-W	070404-27	21860	ANDE	WELL	0	E	Surficial Aquifer System	5	43	43
50-04364-W	070404-27	213042	ANDE	WELL	50	P	Surficial Aquifer System	5	43	43
50-05648-W	020925-9	123308	ANDERSON MOORE CORPORATE OFFICES	WELL	40	P	Surficial Aquifer System	20	42	43
50-07376-W	060509-2	192306	APARTMENTS AT TIMBERLAKES	WELL	45	P	Surficial Aquifer System	21	42	43
50-06486-W	040513-5	151498	APOLLO AIR CONDITIONING	WELL	60	P	Surficial Aquifer System	31	42	43
50-05055-W	010613-3	109473	APOSTOLIC PLAZA COMMERCIAL BUILDING	WELL	30	P	Surficial Aquifer System	5	43	43
50-03357-W	940908-7	34977	AVONDALE TRACT K	PUMP	35	P	CANAL	19	43	43
50-04905-W	010510-7	108153	AZALEA PLACE APARTMENTS SITE/BUILDING IMPROVEMENTS	PUMP	60	P	On-site Canal(s)	29	43	43
50-06238-W	031118-13	149279	BAK MIDDLE SCHOOL	WELL	0	E	Surficial Aquifer System	8	43	43
50-06238-W	031118-13	149276	BAK MIDDLE SCHOOL	WELL	150	P	Surficial Aquifer System	8	43	43
50-06238-W	031118-13	149278	BAK MIDDLE SCHOOL	WELL	150	P	Surficial Aquifer System	8	43	43
50-08068-W	070730-19	216216	BALLENISLES COMMUNITY COMMON AREAS	PUMP	120	E	On-site Lake(s)	39765	42	42
50-08068-W	070730-19	216218	BALLENISLES COMMUNITY COMMON AREAS	PUMP	53	E	On-site Lake(s)	39765	42	42
50-02371-W	021004-18	8523	BALLENISLES MILITARY TRAIL MEDIANS	WELL	35	E	Surficial Aquifer System	12,13	42	42
50-02371-W	021004-18	45048	BALLENISLES MILITARY TRAIL MEDIANS	WELL	35	E	Surficial Aquifer System	12,13	42	42
50-02370-W	070215-21	40069	BALLENISLES ROADWAYS & COMMON AREAS	PUMP	140	E	On-site Lake(s)/Pond(s)	39765	42	42
50-03071-W	930128-3	2221	BANI INC TANK N TUMMY	WELL	25	E	Surficial Aquifer System	33	42	43
50-03071-W	930128-3	2222	BANI INC TANK N TUMMY	WELL	15	P	Surficial Aquifer System	33	42	43
50-03071-W	930128-3	2223	BANI INC TANK N TUMMY	WELL	15	P	Surficial Aquifer System	33	42	43
50-06198-W	031014-11	147050	BANYAN TREE PLAZA	PUMP	100	P	SFWMDC Canal (C-17)	18	42	43
50-05864-W	060523-3	131987	BANYAN TREE PUD PHASE II	WELL	150	P	Surficial Aquifer System	18	42	43
50-07263-W	051020-17	190690	BARON SIGNS	WELL	30	P	Surficial Aquifer System	32	42	43
50-02034-W	070701-1	14196	BAY REACH APT CONDOS	WELL	150	E	Surficial Aquifer System	21	42	43
50-08108-W	070815-8	216592	BAYBERRY SUBSTATION	WELL	55	P	Surficial Aquifer System	28	42	43
50-01022-W	950824-4	35488	BEAR LAKES COUNTRY CLUB - NORTH & SOUTH COURSE	PUMP	750	E	On-site Lake(s)/Pond(s)	7,18,19	43	43
50-01022-W	950824-4	35489	BEAR LAKES COUNTRY CLUB - NORTH & SOUTH COURSE	PUMP	750	E	On-site Lake(s)/Pond(s)	7,18,19	43	43
50-01022-W	950824-4	35490	BEAR LAKES COUNTRY CLUB - NORTH & SOUTH COURSE	PUMP	250	E	On-site Lake(s)/Pond(s)	7,18,19	43	43
50-01022-W	950824-4	35485	BEAR LAKES COUNTRY CLUB - NORTH & SOUTH COURSE	PUMP	750	E	On-site Lake(s)/Pond(s)	7,18,19	43	43
50-01022-W	950824-4	35486	BEAR LAKES COUNTRY CLUB - NORTH & SOUTH COURSE	PUMP	750	E	On-site Lake(s)/Pond(s)	7,18,19	43	43
50-01022-W	950824-4	35487	BEAR LAKES COUNTRY CLUB - NORTH & SOUTH COURSE	PUMP	250	E	On-site Lake(s)/Pond(s)	7,18,19	43	43
50-01692-W	041221-14	14185	BEAR LAKES MIDDLE SCHOOL	WELL	160	P	Surficial Aquifer System	13	43	42
50-01692-W	041221-14	166387	BEAR LAKES MIDDLE SCHOOL	WELL	200	P	Surficial Aquifer System	13	43	42
50-01692-W	041221-14	14184	BEAR LAKES MIDDLE SCHOOL	WELL	0	P	Surficial Aquifer System	13	43	42
50-07355-W	060411-25	192039	BELL SOUTH - TELECOM BUILDING	WELL	0	E	Surficial Aquifer System	28	42	43
50-07355-W	060411-25	192040	BELL SOUTH - TELECOM BUILDING	WELL	30	P	Surficial Aquifer System	28	42	43
50-05482-W	070110-12	118644	BENJAMIN SCHOOL THE	WELL	0	E	Surficial Aquifer System	4	42	43
50-05482-W	070110-12	118643	BENJAMIN SCHOOL THE	WELL	50	E	Surficial Aquifer System	4	42	43
50-05482-W	070110-12	118645	BENJAMIN SCHOOL THE	WELL	30	E	Surficial Aquifer System	4	42	43
50-05482-W	070110-12	118642	BENJAMIN SCHOOL THE	WELL	50	E	Surficial Aquifer System	4	42	43
50-05482-W	070110-12	118641	BENJAMIN SCHOOL THE	WELL	30	E	Surficial Aquifer System	4	42	43
50-05482-W	070110-12	118646	BENJAMIN SCHOOL THE	WELL	35	E	Surficial Aquifer System	4	42	43
50-04838-W	010322-9	105692	BOBBY SOLES PROPELLORS	WELL	30	P	Surficial Aquifer System	5	43	43
50-06422-W	040406-1	149631	BOHRENS MOVING & STORAGE	WELL	30	P	Surficial Aquifer System	9	43	43
50-06833-W	041214-7	168379	BRAMAN FP & L LEASE PARCEL	PUMP	30	P	Off-site Canal(s)	19	43	43
50-04366-W	070622-12	141217	BREAKERS IRRIGATION WATER SUPPLY	WELL	0	E	Surficial Aquifer System	22	43	43
50-04366-W	070622-12	141215	BREAKERS IRRIGATION WATER SUPPLY	WELL	0	E	Floridan Aquifer System	22	43	43
50-04366-W	070622-12	30344	BREAKERS IRRIGATION WATER SUPPLY	WELL	400	E	Floridan Aquifer System	22	43	43
50-04366-W	070622-12	141241	BREAKERS IRRIGATION WATER SUPPLY	WELL	0	E	Surficial Aquifer System	22	43	43
50-04366-W	070622-12	42232	BREAKERS IRRIGATION WATER SUPPLY	PUMP	750	E	On-site Lake(s)/Pond(s)	22	43	43
50-04366-W	070622-12	141214	BREAKERS IRRIGATION WATER SUPPLY	WELL	0	E	Surficial Aquifer System	22	43	43
50-04366-W	070622-12	30697	BREAKERS IRRIGATION WATER SUPPLY	WELL	67	E	Surficial Aquifer System	22	43	43
50-04366-W	070622-12	141223	BREAKERS IRRIGATION WATER SUPPLY	WELL	0	E	Surficial Aquifer System	22	43	43
50-04366-W	070622-12	141216	BREAKERS IRRIGATION WATER SUPPLY	WELL	0	E	Surficial Aquifer System	22	43	43
50-06192-W	031003-8	141082	BRIGGS EQUIPMENT	WELL	100	P	Surficial Aquifer System	2	43	42
50-06192-W	031003-8	141079	BRIGGS EQUIPMENT	WELL	0	P	Surficial Aquifer System	2	43	42
50-05289-W	011218-6	115546	BRIGHTON GARDENS BY MARRIOTT	WELL	20	P	Surficial Aquifer System	7,18	43	43
50-05532-W	020723-13	120361	BURNS ROAD EAST PROJECT	WELL	50	P	Surficial Aquifer System	7,8	42	43
50-07026-W	060717-24	178872	CANNONSPORT CONDOMINIUMS AND MARINA	PUMP	2000	P	Water Table aquifer	27	42	43
50-07026-W	060717-24	178873	CANNONSPORT CONDOMINIUMS AND MARINA	PUMP	2000	P	Water Table aquifer	27	42	43
50-03460-W	950329-10	6558	CARROLL TIRE WAREHOUSE DISTRIBUTION CENTER	WELL	30	P	Surficial Aquifer System	28	42	43
50-07171-W	051018-14	186703	CDSJ PROPERTY	WELL	60	P	Surficial Aquifer System	32	42	43
50-03175-W	930827-6	34377	CENTREPARK	PUMP	300	E	On-site Lake(s)	28,29	43	43
50-03175-W	930827-6	34378	CENTREPARK	PUMP	60	E	On-site Lake(s)	28,29	43	43
50-03175-W	930827-6	34379	CENTREPARK	PUMP	280	E	On-site Lake(s)	28,29	43	43
50-06769-W	050106-7	166482	CENTREPARK LOT 2 NORTH	PUMP	40	P	On-site Lake(s)	29	43	43
50-06685-W	041026-10	160942	CENTREPARK LOT 5 NORTH	WELL	60	P	Surficial Aquifer System	28	43	43
50-04918-W	010406-10	107175	CENTREPARK MARRIOTT	WELL	32	P	Water Table Aquifer	28	43	43
50-05680-W	020830-4	123939	CENTREPARK WEST FLEX II	WELL	30	P	Surficial Aquifer System	29	43	43
50-05221-W	011101-2	113647	CENTREPARK WEST WAREHOUSE	WELL	30	P	Surficial Aquifer System	29	43	43
50-04755-W	030410-12	103913	CENTREPARK WEST	WELL	0	E	Water Table Aquifer	29	43	43
50-04755-W	030410-12	131930	CENTREPARK WEST	WELL	70	P	Water Table Aquifer	29	43	43
50-08180-W	071016-2	218247	CHARLESTON COMMONS	WELL	25	P	Surficial Aquifer System	11	43	42
50-03298-W	940420-10	34732	CHECKERS DRIVE IN RESTAURANTS	PUMP	100	P	On-site Lake(s)/Pond(s)	30	42	43

TABLE 3.3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-07415-W	060518-24	192681	CHENEY BROTHERS	WELL	21	P	Surficial Aquifer System	31	42	43
50-05600-W	020802-1	121789	CHILDREN'S PLACE AT HOMESAFE	PUMP	150	P	On-site Lake(s)	12	43	42
50-04723-W	070906-10	169150	CHRIST FELLOWSHIP CHURCH NORTH CAMPUS EXPANSION	PUMP	45	E	NBPCWCD Canal	14	42	42
50-04723-W	070906-10	159047	CHRIST FELLOWSHIP CHURCH NORTH CAMPUS EXPANSION	WELL	80	E	Surficial Aquifer System	14	42	42
50-04723-W	070906-10	159044	CHRIST FELLOWSHIP CHURCH NORTH CAMPUS EXPANSION	WELL	0	A	Surficial Aquifer System	14	42	42
50-07984-W	070613-22	214869	CHRISTIAN CHURCH	WELL	50	E	Surficial Aquifer System	8	42	43
50-07663-W	061020-21	195704	CHRISTIAN MANOR	WELL	75	P	Surficial Aquifer System	20	43	43
50-07663-W	061020-21	195701	CHRISTIAN MANOR	WELL	0	E	Surficial Aquifer System	20	43	43
50-03548-W	950828-3	39299	CIRCUIT CITY STORE #0862	PUMP	110	P	SFWMD Canal (C-51)	20	43	43
50-00615-W	050908-2	46277	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	5250	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	46278	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	10500	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	46279	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	10500	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	46280	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	17500	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	45663	CITY OF WEST PALM BEACH (UTILITIES)	WELL	4861	E	Floridan Aquifer System	23-26,35,36	42	41
50-00615-W	050908-2	45663	CITY OF WEST PALM BEACH (UTILITIES)	WELL	4861	E	Floridan Aquifer System	23-26,35,36	42	41
50-00615-W	050908-2	46281	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	8400	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	46282	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	8400	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	46283	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	8400	E	Clear Lake	23-26,35,36	42	41
50-00615-W	050908-2	46284	CITY OF WEST PALM BEACH (UTILITIES)	PUMP	8400	E	Clear Lake	23-26,35,36	42	41
50-04321-W	990505-7	30266	CITY PLACE	WELL	125	P	Surficial Aquifer System	21	43	43
50-07394-W	060418-6	192478	COLUMBIA 45TH ST COOLING TOWER WELL	WELL	30	P	Surficial Aquifer System	6	43	43
50-05607-W	020816-5	121977	COLUMBIA HOSPITAL	PUMP	0	E	On-site Lake(s)	6	43	43
50-05607-W	020816-5	121978	COLUMBIA HOSPITAL	PUMP	40	P	On-site Lake(s)	6	43	43
50-05226-W	011008-14	113713	COMMERCIAL DEVELOPMENT FOR DAVID P COSTAKOS	WELL	50	P	Surficial Aquifer System	18	42	43
50-06030-W	030303-14	135069	CONGRESS AVENUE PUD	PUMP	150	P	On-site Lake(s)	30	42	43
50-06030-W	030303-14	135071	CONGRESS AVENUE PUD	PUMP	150	P	On-site Lake(s)	30	42	43
50-06030-W	030303-14	135072	CONGRESS AVENUE PUD	PUMP	150	P	On-site Lake(s)	30	42	43
50-06852-W	050302-8	169075	CONGRESS COMMERCIAL CENTER	WELL	55	P	Surficial Aquifer System	29	43	43
50-08018-W	070705-25	215466	CONGRESS INDUSTRIAL	PUMP	250	P	On-site Lake(s)/Pond(s)	19	42	43
50-06534-W	040621-3	154880	CONRAD YELVINGTON DISTRIBUTORS INC	WELL	150	E	Surficial Aquifer System	32	42	43
50-06534-W	040621-3	154881	CONRAD YELVINGTON DISTRIBUTORS INC	WELL	150	P	Surficial Aquifer System	32	42	43
50-06609-W	040826-11	158259	CONSTRUCTION TRAILER	WELL	20	P	Surficial Aquifer System	31	42	43
50-06609-W	040826-11	158259	CONSTRUCTION TRAILER	WELL	20	P	Surficial Aquifer System	31	42	43
50-06664-W	041018-3	160417	CORNER BUILDING THE	WELL	67	P	Surficial Aquifer System	32, 33	42	43
50-04772-W	010102-7	104222	CORNERSTONE PRESBYTERIAN CHURCH	WELL	40	P	Surficial Aquifer System	13	42	42
50-05757-W	021030-3	126541	COSTCO WHOLESALE OF WEST PALM BEACH	PUMP	250	P	On-site Lake(s)	2	43	42
50-06700-W	041109-6	163388	CPW-3-7;CENTREPARK WEST LOT 3-7	PUMP	60	P	On-site Lake(s)	29	43	43
50-07543-W	060525-8	194217	CVS PHARMACY PROMENADE	PUMP	100	P	Water Table aquifer	18	42	43
50-07457-W	060614-7	193132	CVS PHARMACY PROMENADE PLAZA	PUMP	10	P	On-site Lake(s)/Pond(s)	8	42	43
50-02121-W	931223-245	35697	CYPRESS LAKES	PUMP	500	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35696	CYPRESS LAKES	PUMP	400	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35701	CYPRESS LAKES	PUMP	200	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35700	CYPRESS LAKES	PUMP	200	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35693	CYPRESS LAKES	PUMP	500	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35702	CYPRESS LAKES	PUMP	500	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35692	CYPRESS LAKES	PUMP	500	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35694	CYPRESS LAKES	PUMP	200	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35698	CYPRESS LAKES	PUMP	500	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35699	CYPRESS LAKES	PUMP	500	E	On-site Lake(s)	13,14	43	42
50-02121-W	931223-245	35695	CYPRESS LAKES	PUMP	200	E	On-site Lake(s)	13,14	43	42
50-05001-W	010615-5	108580	D-12 GENERATOR SUPPLY WELL	WELL	70	P	Surficial Aquifer System	15	43	43
50-06718-W	041201-8	164473	D-3 PUMP STATION	PUMP	1200	E	Water Table aquifer	15	43	43
50-06718-W	041201-8	164474	D-3 PUMP STATION	PUMP	3000	E	Water Table aquifer	15	43	43
50-06718-W	041201-8	164471	D-3 PUMP STATION	PUMP	400	E	Water Table aquifer	15	43	43
50-06718-W	041201-8	171782	D-3 PUMP STATION	PUMP	0	E	Off-site Canal(s)	15	43	43
50-06718-W	041201-8	164472	D-3 PUMP STATION	PUMP	400	E	Water Table aquifer	15	43	43
50-06964-W	050329-12	173620	D-8 STORM WATER PUMP STATION IMPROVEMENTS	PUMP	2400	P	Water Table aquifer	10	43	43
50-06964-W	050329-12	173621	D-8 STORM WATER PUMP STATION IMPROVEMENTS	PUMP	1200	P	Water Table aquifer	10	43	43
50-06964-W	050329-12	173624	D-8 STORM WATER PUMP STATION IMPROVEMENTS	PUMP	400	P	Water Table aquifer	10	43	43
50-07016-W	050620-8	176180	DAN CALLOWAY PARK	WELL	0	A	Surficial Aquifer System	32	42	43
50-07016-W	050620-8	175784	DAN CALLOWAY PARK	WELL	250	P	Surficial Aquifer System	32	42	43
50-06509-W	040608-6	152981	DEPT OF HOMELAND SECURITY	WELL	50	P	Surficial Aquifer System	28	42	43
50-04477-W	991110-1	32042	DILLARD DEPARTMENT STORE #0255	WELL	35	E	Surficial Aquifer System	18	43	43
50-03350-W	940812-14	5315	DISCOUNT AUTO PARTS	WELL	20	P	Surficial Aquifer System	20	42	43
50-05476-W	020423-13	118567	DIVERS OUTLET INCORPORATED	WELL	30	E	Surficial Aquifer System	24	42	42
50-07124-W	050915-15	184809	DOLCEVITA	PUMP	2000	P	Water Table aquifer	26	42	43
50-07124-W	050915-15	184147	DOLCEVITA	PUMP	2000	P	Water Table aquifer	26	42	43
50-07124-W	050915-15	184807	DOLCEVITA	PUMP	2000	P	Water Table aquifer	26	42	43
50-06918-W	050524-11	171523	DON & BOBBYE LYONS	WELL	0	E	Surficial Aquifer System	24	43	42
50-06918-W	050524-11	173838	DON & BOBBYE LYONS	WELL	20	P	Surficial Aquifer System	24	43	42
50-07281-W	060124-11	191021	DOVE LANDING	WELL	50	P	Surficial Aquifer System	18	42	43
50-07338-W	060324-14	191815	DUANE-MARK ENTERPRISES	WELL	30	P	Surficial Aquifer System	28	43	43
50-06940-W	050509-4	173439	DUNBAR ARMORED CARS	WELL	35	P	Surficial Aquifer System	29	43	43
50-06480-W	040504-1	151225	DUNKIN DONUTS - LAKE PARK	WELL	32	P	Surficial Aquifer System	21	42	43
50-01520-W	980512-15	27362	EAST CENTRAL REGIONAL WASTEWATER FACILITY	WELL	0	E	Surficial Aquifer System	11	43	42
50-01520-W	980512-15	27363	EAST CENTRAL REGIONAL WASTEWATER FACILITY	WELL	0	E	Surficial Aquifer System	11	43	42
50-07822-W	070105-24	198623	ECRWTF AERATION BASIN NO. 5 DEWATERING	PUMP	0	P	On-site Canal(s)	11	43	42
50-07822-W	070105-24	198622	ECRWTF AERATION BASIN NO. 5 DEWATERING	WELL	532	E	Surficial Aquifer System	11	43	42
50-07822-W	070105-24	198619	ECRWTF AERATION BASIN NO. 5 DEWATERING	WELL	532	E	Surficial Aquifer System	11	43	42
50-07822-W	070105-24	198621	ECRWTF AERATION BASIN NO. 5 DEWATERING	WELL	532	E	Surficial Aquifer System	11	43	42
50-07822-W	070105-24	198620	ECRWTF AERATION BASIN NO. 5 DEWATERING	WELL	532	E	Surficial Aquifer System	11	43	42
50-04907-W	010828-6	107037	ED MORSE HONDA	WELL	30	E	Surficial Aquifer System	30	42	43
50-04907-W	010828-6	111154	ED MORSE HONDA	WELL	30	P	Surficial Aquifer System	30	42	43
50-05865-W	030221-28	157228	EDWARD J. HEALEY REHABILITATION AND NURSING CENTER	WELL	30	E	Surficial Aquifer System	4	43	43
50-07481-W	070205-16	193532	EIGHTY POINTS WEST	PUMP	11000	P	Water Table aquifer	3,4	43	43
50-07193-W	051115-11	189012	ELAN IN THE CITY	WELL	60	P	Surficial Aquifer System	28	43	43
50-03122-W	930601-19	34333	ELEMENTARY SCHOOL "E"	PUMP	210	P	On-site Lake(s)/Pond(s)	11	43	42
50-03122-W	930601-19	34334	ELEMENTARY SCHOOL "E"	PUMP	140	P	On-site Lake(s)/Pond(s)	11	43	42
50-04433-W	990903-4	31491	ELEMENTARY SCHOOL 96C (RIVIERA BEACH)	WELL	175	P	Surficial Aquifer System	31	42	43
50-02573-W	041115-11	9099	EMBASSY PARK	WELL	100	P	Surficial Aquifer System	17	43	43
50-02573-W	041115-11	163605	EMBASSY PARK	WELL	100	P	Surficial Aquifer System	17	43	43
50-02573-W	041115-11	24844	EMBASSY PARK	WELL	0	A	Surficial Aquifer System	17	43	43
50-04891-W	010409-7	106896	EPISCOPAL CHURCH OF BETHESDA BY THE SEA	WELL	15	P	Surficial Aquifer System	23	43	43
50-04891-W	010409-7	106895	EPISCOPAL CHURCH OF BETHESDA BY THE SEA	WELL	60	P	Surficial Aquifer System	23	43	43
50-04891-W	010409-7	106894	EPISCOPAL CHURCH OF BETHESDA BY THE SEA	WELL	60	E	Surficial Aquifer System	23	43	43
50-04891-W	010409-7	106893	EPISCOPAL CHURCH OF BETHESDA BY THE SEA	WELL	15	E	Surficial Aquifer System	23	43	43
50-03413-W	070612-21	30850	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43

TABLE 3.3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-03413-W	070612-21	30850	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30851	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30851	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30852	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30856	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30860	EVERGLADES CLUB	WELL	600	E	Floridan Aquifer System	26,27	43	43
50-03413-W	070612-21	30860	EVERGLADES CLUB	WELL	600	E	Floridan Aquifer System	26,27	43	43
50-03413-W	070612-21	30857	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30853	EVERGLADES CLUB	WELL	70	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30858	EVERGLADES CLUB	WELL	70	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	42350	EVERGLADES CLUB	PUMP	750	E	On-site Lake(s)/Pond(s)	26,27	43	43
50-03413-W	070612-21	42351	EVERGLADES CLUB	PUMP	750	E	On-site Lake(s)/Pond(s)	26,27	43	43
50-03413-W	070612-21	42352	EVERGLADES CLUB	PUMP	250	E	On-site Lake(s)/Pond(s)	26,27	43	43
50-03413-W	070612-21	30854	EVERGLADES CLUB	WELL	70	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30881	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30859	EVERGLADES CLUB	WELL	70	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30855	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-03413-W	070612-21	30880	EVERGLADES CLUB	WELL	60	E	Surficial Aquifer System	26,27	43	43
50-08009-W	070629-39	215402	EVERNIA DIRECT BANK	PUMP	150	P	Water Table aquifer	21	43	43
50-06064-W	030723-18	155601	EXCELLER INC	WELL	50	P	Surficial Aquifer System	9	42	43
50-07778-W	070208-19	197352	EXXON MOBIL SITE 10314	PUMP	870	P	Water Table aquifer	13	43	42
50-03924-W	070930-3	40716	FAIRWAY VISTA APARTMENTS	PUMP	87	P	On-site Canal(s)	18	43	43
50-06617-W	040825-8	158630	FAITH LUTHERAN CHURCH	WELL	75	P	Surficial Aquifer System	16	42	43
50-06617-W	040825-8	158712	FAITH LUTHERAN CHURCH	WELL	0	E	Surficial Aquifer System	16	42	43
50-06617-W	040825-8	158713	FAITH LUTHERAN CHURCH	WELL	0	E	Surficial Aquifer System	16	42	43
50-08642-W	080527-1	223543	FATSO DEVELOPMENT	WELL	35	P	Surficial Aquifer System	30	42	43
50-04841-W	010322-5	105692	FINELINE FURNITURE	WELL	30	P	Surficial Aquifer System	5	43	43
50-07133-W	050916-6	184645	FIRST SEVENTH DAY ADVENTIST (SDA) CHURCH OF RIVIERA BEACH	WELL	30	P	Water Table Aquifer	29	42	43
50-04998-W	010507-10	108536	FLEET FUELING	WELL	25	P	Surficial Aquifer System	31	42	43
50-08040-W	070723-11	215786	FLORIDA POWER AND LIGHT EVERNIA SUBSTATION	WELL	60	P	Surficial Aquifer System	21	43	43
50-03714-W	960403-12	22403	FLORIDA RESOURCE MANAGEMENT	WELL	100	P	Surficial Aquifer System	31	42	43
50-03714-W	960403-12	39703	FLORIDA RESOURCE MANAGEMENT	PUMP	246	E	On-site Lake(s)/Pond(s)	31	42	43
50-03562-W	950602-10	20806	FORMER MAPCO EXPRESS	WELL	30	E	Surficial Aquifer System	4	43	43
50-06117-W	030819-9	137905	FPL GRAMMERCY SUBSTATION	WELL	30	P	Surficial Aquifer System	1	43	42
50-04187-W	990105-9	29405	FPL RIVIERA PLANT LANDSCAPING	WELL	225	E	Surficial Aquifer System	33	42	43
50-04187-W	990105-9	29406	FPL RIVIERA PLANT LANDSCAPING	WELL	225	E	Surficial Aquifer System	33	42	43
50-04187-W	990105-9	29407	FPL RIVIERA PLANT LANDSCAPING	WELL	225	E	Surficial Aquifer System	33	42	43
50-04188-W	990105-14	29411	FPL RIVIERA PLANT WATER PUMP BEARING COOLING	WELL	225	E	Surficial Aquifer System	33	42	43
50-04188-W	990105-14	29412	FPL RIVIERA PLANT WATER PUMP BEARING COOLING	WELL	225	E	Surficial Aquifer System	33	42	43
50-04188-W	990105-14	29413	FPL RIVIERA PLANT WATER PUMP BEARING COOLING	WELL	225	E	Surficial Aquifer System	33	42	43
50-06809-W	050125-5	167994	FREIGHTLINER TRUCK OF SOUTH FLORIDA INC	WELL	25	P	Surficial Aquifer System	19	42	43
50-06809-W	050125-5	167993	FREIGHTLINER TRUCK OF SOUTH FLORIDA INC	WELL	0	E	Surficial Aquifer System	19	42	43
50-04313-W	990420-7	30230	FRESHWATER LAKES	WELL	120	P	Surficial Aquifer System	16	43	43
50-03833-W	020523-13	23988	GAINES PARK	WELL	700	E	Surficial Aquifer System	16,17	43	43
50-03833-W	020523-13	121194	GAINES PARK	PUMP	150	E	On-site Lake(s)	16,17	43	43
50-03833-W	020523-13	121195	GAINES PARK	PUMP	60	P	On-site Lake(s)	16,17	43	43
50-03371-W	940922-12	5600	GALILEE ACLF	WELL	85	P	Surficial Aquifer System	11	43	42
50-08095-W	070815-5	216479	GANDER MOUNTAIN	WELL	100	P	Surficial Aquifer System	19	42	43
50-08095-W	070815-5	216484	GANDER MOUNTAIN	PUMP	100	P	On-site Lake(s)/Pond(s)	19	42	43
50-02335-W	980528-5	41300	GARDEN OAKS	PUMP	450	E	On-site Lake(s)	24	42	42
50-02335-W	980528-5	41299	GARDEN OAKS	PUMP	250	E	On-site Lake(s)	24	42	42
50-02335-W	980528-5	27487	GARDEN OAKS	WELL	175	E	Surficial Aquifer System	24	42	42
50-06880-W	050330-5	172348	GARDENS MEDICAL PARK	PUMP	30	E	Off-site Canal(s)	7	42	43
50-07413-W	050329-10	192675	GARDENS PROFESSIONAL ARTS BUILDING	WELL	30	E	Surficial Aquifer System	7	42	43
50-05027-W	010507-4	108851	GEMINI CONDOMINIUM	WELL	80	E	Surficial Aquifer System	9	42	43
50-03167-W	930826-3	2742	GEORGIA PACIFIC CORPORATION	WELL	10	P	Surficial Aquifer System	33	42	43
50-03167-W	930826-3	2739	GEORGIA PACIFIC CORPORATION	WELL	15	P	Surficial Aquifer System	33	42	43
50-04885-W	070213-24	106709	GLENWOOD MEMORIAL CEMETERY	WELL	40	E	Surficial Aquifer System	32	42	43
50-04885-W	070213-24	106710	GLENWOOD MEMORIAL CEMETERY	WELL	0	A	Surficial Aquifer System	32	42	43
50-08497-W	070816-8	220666	GOLD COAST LINEN	WELL	340	E	Surficial Aquifer System	16	43	43
50-07548-W	060711-7	194472	GOODWILL	WELL	25	P	Surficial Aquifer System	31	42	43
50-05464-W	020514-4	118238	GREENCO NURSERY	WELL	40	E	Surficial Aquifer System	1	43	42
50-02508-W	990202-14	29784	GROVE PARK ELEMENTARY	WELL	164	E	Surficial Aquifer System	24	42	42
50-05037-W	010615-13	109085	GROWERS' CHOICE	WELL	60	P	Surficial Aquifer System	13	42	42
50-05037-W	010615-13	109084	GROWERS' CHOICE	WELL	20	E	Surficial Aquifer System	13	42	42
50-08235-W	071114-5	219585	GUARDIAN TRANSPORTATION	WELL	35	P	Surficial Aquifer System	5	43	43
50-05766-W	021016-13	126892	GULF STREAM LUMBER CO	WELL	90	P	Surficial Aquifer System	32	42	43
50-03522-W	950822-3	6876	GULFSTREAM MOTORS	WELL	85	P	Surficial Aquifer System	25	43	42
50-06377-W	030605-16	147835	H.L. WATKINS MIDDLE SCHOOL	WELL	150	E	Surficial Aquifer System	18	42	43
50-04672-W	000809-10	101202	HAMPTON COURT APARTMENTS	WELL	150	P	Surficial Aquifer System	5	43	43
50-07077-W	050801-4	179382	HAMPTON INN (PALM BEACH)	WELL	30	P	Surficial Aquifer System	29	43	43
50-07972-W	070615-23	214705	HANLEY CENTER	WELL	50	P	Surficial Aquifer System	4	43	43
50-07328-W	060309-16	192410	HARBORMASTER OF PALM BEACH	WELL	50	E	Surficial Aquifer System	4	43	43
50-04404-W	990720-2	31260	HARBOUR ISLES SOUTH PARCEL	WELL	100	P	Surficial Aquifer System	8	42	43
50-04404-W	990720-2	31259	HARBOUR ISLES SOUTH PARCEL	WELL	100	P	Surficial Aquifer System	8	42	43
50-07669-W	061005-17	195763	HARMSCO, INC.	WELL	100	E	Surficial Aquifer System	26	42	42
50-08495-W	080208-16	220470	HARRELL CHAMPION	WELL	20	E	Surficial Aquifer System	24	42	42
50-08495-W	080208-16	220469	HARRELL CHAMPION	WELL	50	P	Surficial Aquifer System	24	42	42
50-06095-W	030723-23	136804	HAVERHILL BUSINESS PARK	PUMP	70	P	On-site Lake(s)/Pond(s)	26	42	42
50-07236-W	051216-22	190212	HAVERHILL INDUSTRIAL PARK - LOT 3 - 5	WELL	10	P	Water Table Aquifer	26	42	42
50-06083-W	030721-13	136430	HENNESSY LAND TRUST	WELL	60	P	Surficial Aquifer System	31	42	43
50-04881-W	010419-18	106625	HERITAGE VILLAGE	PUMP	200	E	On-site Lake(s)	1	43	42
50-04881-W	010419-18	106626	HERITAGE VILLAGE	PUMP	200	E	On-site Lake(s)	1	43	42
50-02988-W	921013-8	1747	HESS STATION # 09264 (RIVIERA BEACH)	WELL	10	P	Water Table Aquifer	33	42	43
50-02988-W	921013-8	1746	HESS STATION # 09264 (RIVIERA BEACH)	WELL	10	P	Water Table Aquifer	33	42	43
50-03633-W	920305-9	21410	HESS STATION 09240	WELL	25	P	Surficial Aquifer System	20	42	43
50-04371-W	990510-2	30848	HILLTOP GARDENS MOBILE HOME PARK	WELL	15	E	Surficial Aquifer System	18	42	43
50-04371-W	990510-2	30849	HILLTOP GARDENS MOBILE HOME PARK	WELL	15	E	Surficial Aquifer System	18	42	43
50-05814-W	021206-1	128747	HOLLAND NORTHLAKE DAY SCHOOL	WELL	35	P	Surficial Aquifer System	24	42	42
50-05814-W	021206-1	128746	HOLLAND NORTHLAKE DAY SCHOOL	WELL	35	E	Surficial Aquifer System	24	42	42
50-04562-W	990614-21	30533	HOME DEPOT	WELL	60	P	Surficial Aquifer System	17	43	43
50-04562-W	990614-21	30878	HOME DEPOT	WELL	60	P	Surficial Aquifer System	17	43	43
50-04562-W	990614-21	42360	HOME DEPOT	PUMP	105	P	M-1 CANAL	17	43	43
50-05667-W	021007-18	123538	HOSPICE OF PALM BEACH COUNTY INC	PUMP	140	P	On-site Lake(s)/Pond(s)	4	43	43
50-07566-W	060818-21	194632	HOUSE OF WORSHIP	WELL	30	P	Surficial Aquifer System	24	43	42
50-01469-W	000530-10	14100	HOWARD PARK	WELL	280	E	Surficial Aquifer System	28	43	43
50-07208-W	071226-8	189464	HYPOLUXO SCRUB NATURAL AREA	WELL	40	P	Surficial Aquifer System	10	45	43

TABLE 3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-05972-W	030505-21	133088	I-95 HOV LANE	WELL	100	P	Surficial Aquifer System	6	43	43
50-05972-W	080620-10	133088	I-95 HOV LANE	WELL	100	P	Surficial Aquifer System	6	43	43
50-05826-W	030207-23	129137	I-95 HOV LANE-PALM BEACH LAKES INTERCHANGE AREA	WELL	100	P	Surficial Aquifer System	13	42	42
50-05826-W	030207-23	129136	I-95 HOV LANE-PALM BEACH LAKES INTERCHANGE AREA	WELL	100	P	Surficial Aquifer System	13	42	42
50-06787-W	050110-22	166696	I-95 WIDENING (BLUE HERON TO PGA BLVD) # 231921 -1-52-01	WELL	80	P	Surficial Aquifer System	1,12,13,24	42	42
50-06787-W	050110-22	166695	I-95 WIDENING (BLUE HERON TO PGA BLVD) # 231921 -1-52-01	WELL	80	P	Surficial Aquifer System	1,12,13,24	42	42
50-06787-W	050110-22	166698	I-95 WIDENING (BLUE HERON TO PGA BLVD) # 231921 -1-52-01	WELL	80	P	Surficial Aquifer System	1,12,13,24	42	42
50-06787-W	050110-22	166697	I-95 WIDENING (BLUE HERON TO PGA BLVD) # 231921 -1-52-01	WELL	80	P	Surficial Aquifer System	1,12,13,24	42	42
50-05313-W	020116-3	115841	IMAGE COMPANIES OFFICE/WAREHOUSE	WELL	25	P	Surficial Aquifer System	20	42	43
50-05589-W	050302-4	121668	INDEPENDENT BLOOD & TISSUE SERVICES OF FLORIDA	WELL	150	P	Surficial Aquifer System	18	42	43
50-05465-W	020213-7	118258	INDIAN TRACE APARTMENTS	PUMP	200	P	On-site Lake(s)	36	42	42
50-06472-W	040507-1	150874	INTERIOR TEXTURES INC	WELL	30	P	Surficial Aquifer System	36	42	42
50-06493-W	040519-2	152024	INTOWN SUITES	WELL	30	P	Surficial Aquifer System	1	43	42
50-06536-W	040611-9	154281	JFK MIDDLE SCHOOL	WELL	240	P	Surficial Aquifer System	29-32	42	43
50-05946-W	030417-2	132559	JOHN MILLER 4 UNITS	WELL	53	P	Water Table Aquifer	34	42	43
50-05244-W	011113-12	114512	JONATHONS GROVE	WELL	25	P	Surficial Aquifer System	12	43	42
50-04003-W	980331-4	41087	KAPLAN JEWISH COMMUNITY CENTER	PUMP	175	P	On-site Lake(s)/Pond(s)	13	43	42
50-05336-W	020124-12	116301	KELSEY BUSINESS PARK	WELL	30	P	Surficial Aquifer System	20	42	43
50-08170-W	070924-3	217253	KELSEY STATION	WELL	10000	P	Surficial Aquifer System	20	42	43
50-08196-W	071026-5	217895	KOHL'S LAKE PARK	WELL	130	P	Surficial Aquifer System	19	42	43
50-07855-W	070403-16	213029	LAKE PARK 10TH STREET MEDIAN	WELL	50	P	Surficial Aquifer System	20	42	43
50-06503-W	040507-4	152668	LAKE PARK ELEMENTARY SCHOOL	WELL	145	E	Surficial Aquifer System	21	42	43
50-06437-W	050922-5	149972	LAKE SHORE APARTMENTS	WELL	125	P	Surficial Aquifer System	6	43	43
50-06393-W	031103-17	148788	LAKES OF LAGUNA	PUMP	200	E	On-site Lake(s)	12	43	42
50-06393-W	031103-17	148794	LAKES OF LAGUNA	PUMP	200	P	On-site Lake(s)	12	43	42
50-03605-W	960212-11	39323	LAKES OF LAGUNA	PUMP	125	P	On-site Lake(s)	12	43	42
50-06221-W	031118-4	142860	LAKESIDE COMMONS APARTMENTS	WELL	20	P	Surficial Aquifer System	20	43	43
50-06221-W	031118-4	142860	LAKESIDE COMMONS APARTMENTS	WELL	20	P	Surficial Aquifer System	20	43	43
50-06158-W	040826-10	160719	LAKESIDE COMMONS APARTMENTS	WELL	60	P	Surficial Aquifer System	20	43	43
50-06158-W	040826-10	139534	LAKESIDE COMMONS APARTMENTS	PUMP	0	P	Off-site Lake(s)	20	43	43
50-05922-W	030318-15	131610	LAKESIDE HOA NO IIB INC	WELL	120	P	Surficial Aquifer System	12	43	42
50-04514-W	000127-5	42917	LAKESIDE OF THE PALM BEACHES	PUMP	120	E	On-site Lake(s)/Pond(s)	29	43	43
50-04514-W	000127-5	42918	LAKESIDE OF THE PALM BEACHES	PUMP	150	E	On-site Lake(s)/Pond(s)	29	43	43
50-03885-W	970613-1	40503	LAKESIDE PLAZA AT CENTREPARK LOT 4	PUMP	70	E	On-site Lake(s)/Pond(s)	28,29	43	43
50-08104-W	070906-1	216709	LANDINGS EAST	WELL	30	P	Surficial Aquifer System	9	42	43
50-08104-W	070906-1	216710	LANDINGS EAST	WELL	0	P	Surficial Aquifer System	9	42	43
50-05430-W	020416-15	117649	LANDS OF THE PRESIDENT CONDOMINIUM 8-B	WELL	20	P	Surficial Aquifer System	7	43	43
50-08162-W	070921-1	217154	LANDSCAPE IRRIGATION AREAS GROUP A	PUMP	110	E	On-site Lake(s)	7,8,12,13,18	42	42
50-08162-W	070921-1	217162	LANDSCAPE IRRIGATION AREAS GROUP A	PUMP	30	E	On-site Canal(s)	7,8,12,13,18	42	42
50-08162-W	070921-1	217156	LANDSCAPE IRRIGATION AREAS GROUP A	WELL	30	E	Surficial Aquifer System	7,8,12,13,18	42	42
50-08162-W	070921-1	217155	LANDSCAPE IRRIGATION AREAS GROUP A	WELL	30	E	Surficial Aquifer System	7,8,12,13,18	42	42
50-08162-W	070921-1	217157	LANDSCAPE IRRIGATION AREAS GROUP A	PUMP	85	E	Thompson Canal	7,8,12,13,18	42	42
50-08162-W	070921-1	217158	LANDSCAPE IRRIGATION AREAS GROUP A	WELL	150	E	Surficial Aquifer System	7,8,12,13,18	42	42
50-08162-W	070921-1	217152	LANDSCAPE IRRIGATION AREAS GROUP A	PUMP	60	E	Thompson Canal	7,8,12,13,18	42	42
50-08162-W	070921-1	217153	LANDSCAPE IRRIGATION AREAS GROUP A	PUMP	70	E	On-site Canal(s)	7,8,12,13,18	42	42
50-08163-W	070921-7	217171	LANDSCAPE IRRIGATION AREAS GROUP B	PUMP	60	E	On-site Canal(s)	1,7,13	42	42
50-08163-W	070921-7	217178	LANDSCAPE IRRIGATION AREAS GROUP B	WELL	30	E	Surficial Aquifer System	1,7,13	42	42
50-08163-W	070921-7	217177	LANDSCAPE IRRIGATION AREAS GROUP B	PUMP	110	E	On-site Lake(s)	1,7,13	42	42
50-08134-W	070913-9	216841	LEWIS TERMINALS DISTRIBUTION CENTER	WELL	60	P	Surficial Aquifer System	32	42	43
50-07294-W	060213-18	191381	LIFE SPAN OF PALM BEACH COUNTY	WELL	30	P	Surficial Aquifer System	31	42	43
50-07294-W	060213-18	191380	LIFE SPAN OF PALM BEACH COUNTY	WELL	0	E	Surficial Aquifer System	31	42	43
50-00954-W	950630-11	35358	LONE PINE GOLF COURSE	PUMP	500	E	On-site Lake(s)/Pond(s)	36	42	42
50-00954-W	950630-11	35359	LONE PINE GOLF COURSE	PUMP	500	E	On-site Lake(s)/Pond(s)	36	42	42
50-05307-W	020118-5	115793	LOT 12 INTERSTATE INDUSTRIAL PARK	WELL	45	P	Surficial Aquifer System	31	43	42
50-07545-W	060814-16	194220	LOTS 1&2 WATER TOWER PARK	WELL	35	P	Surficial Aquifer System	20	42	43
50-05805-W	030114-8	128039	MAJESTIC GAS STATION	WELL	30	P	Surficial Aquifer System	9	43	43
50-06182-W	030923-10	140309	MALIBU BAY	PUMP	12	P	On-site Lake(s)	17, 19, 20	43	43
50-06109-W	030811-6	137744	MANGONIA PARK RMC AND BLOCK	WELL	200	E	Surficial Aquifer System	32	42	43
50-06109-W	030811-6	137743	MANGONIA PARK RMC AND BLOCK	WELL	300	P	Surficial Aquifer System	32	42	43
50-07278-W	051214-1	190958	MANGONIA SELF STORAGE	WELL	35	P	Surficial Aquifer System	5	43	43
50-06781-W	050110-13	166506	MARAVILLA	PUMP	220	P	On-site Lake(s)	13	43	42
50-05908-W	030331-11	131436	MARBELLA VILLAS PHASE I AND II	WELL	80	P	Surficial Aquifer System	17	42	43
50-08138-W	070913-7	216860	MARINE CENTER	WELL	60	P	Surficial Aquifer System	33	42	43
50-07352-W	060321-18	192014	MARINER COURT	WELL	50	P	Surficial Aquifer System	16	42	43
50-07352-W	060321-18	192015	MARINER COURT	WELL	50	P	Surficial Aquifer System	16	42	43
50-07494-W	060726-7	193692	MARINER'S KEY	WELL	75	E	Surficial Aquifer System	21	42	43
50-07494-W	060726-7	198487	MARINER'S KEY	WELL	75	E	Surficial Aquifer System	21	42	43
50-06827-W	050207-9	169579	MARSH HARBOR	PUMP	160	P	On-site Lake(s)	31	42	43
50-06827-W	050207-9	169578	MARSH HARBOR	PUMP	160	E	On-site Lake(s)	31	42	43
50-07068-W	050802-7	179218	MARTIN FENCE COMPANY (STORAGE YARD)	WELL	25	P	Surficial Aquifer System	20	42	43
50-05809-W	021106-8	128159	MASCHMEYER CONCRETE CO	WELL	75	E	Surficial Aquifer System	20	42	43
50-05809-W	021106-8	128158	MASCHMEYER CONCRETE CO	WELL	75	E	Surficial Aquifer System	20	42	43
50-04232-W	990210-16	41957	MEAGHER'S NURSERY INC	PUMP	900	E	On-site Canal(s)	25	42	42
50-04232-W	990210-16	41958	MEAGHER'S NURSERY INC	PUMP	800	E	On-site Canal(s)	25	42	42
50-04232-W	990210-16	29734	MEAGHER'S NURSERY INC	WELL	0	E	Surficial Aquifer System	25	42	42
50-04232-W	990210-16	29733	MEAGHER'S NURSERY INC	WELL	0	E	Surficial Aquifer System	25	42	42
50-05270-W	011214-16	114763	MEDITERRANEAN ROOF TILE	WELL	40	P	Surficial Aquifer System	32	42	43
50-05376-W	020313-8	116854	METROCENTRE CORPORATE PARK	WELL	90	P	Surficial Aquifer System	6	43	43
50-05376-W	020313-8	116855	METROCENTRE CORPORATE PARK	WELL	90	P	Surficial Aquifer System	6	43	43
50-03991-W	980107-4	41057	MEYER JEWISH ACADEMY	PUMP	175	P	Off-site Lake(s)	13	43	42
50-08091-W	070817-15	216467	MILITARY TRAIL COMMERCE CENTER	WELL	90	P	Surficial Aquifer System	1	43	42
50-03976-W	980217-5	27018	MILLER CONCRETE SERVICE	WELL	65	P	Surficial Aquifer System	5	43	43
50-07249-W	051221-9	190498	MIRASOL	PUMP	1500	P	Water Table aquifer	26	42	43
50-07249-W	051221-9	190497	MIRASOL	PUMP	1500	P	Water Table aquifer	26	42	43
50-03057-W	920818-7	1526	MOBIL # 02-FOY 2623 OKEECHOBEE RD WEST PALM BEACH FL	WELL	10	P	Surficial Aquifer System	19	43	43
50-03057-W	920818-7	1524	MOBIL # 02-FOY 2623 OKEECHOBEE RD WEST PALM BEACH FL	WELL	10	P	Surficial Aquifer System	19	43	43
50-02968-W	930209-20	2458	MOBIL STATION 02-F19	WELL	15	E	Surficial Aquifer System	13	42	42
50-02968-W	930209-20	2457	MOBIL STATION 02-F19	WELL	15	E	Surficial Aquifer System	13	42	42
50-05552-W	020627-5	120947	MORRIS BUILDING OFFICE WAREHOUSE	WELL	35	P	Surficial Aquifer System	20	42	43
50-05599-W	020826-10	121745	MORSE SENIORS CAMPUS	PUMP	170	P	On-site Lake(s)/Pond(s)	12	43	42
50-03421-W	950124-8	35190	MYSTIC WOODS APARTMENTS	PUMP	25	P	On-site Lake(s)	25	42	42
50-07954-W	070518-15	214553	NATIONAL CITY BANK-NORTHLAKE BRANCH #2	WELL	30	P	Surficial Aquifer System	20	42	43
50-06642-W	040921-14	159775	NATIVA	WELL	25	P	Surficial Aquifer System	8	42	43
50-06953-W	050506-1	177946	NEW ENGLAND INSTITUTE OF TECHNOLOGY	WELL	50	P	Surficial Aquifer System	5	43	43
50-06953-W	050506-1	177947	NEW ENGLAND INSTITUTE OF TECHNOLOGY	WELL	0	E	Surficial Aquifer System	5	43	43
50-06863-W	050309-9	169957	NEW FRITO-LAY D C	WELL	100	P	Surficial Aquifer System	2	43	42
50-08228-W	071108-2	218442	NEW GRACE PAVILION (AKA PEGGY ADAMS ANIMAL RESCUE LEAGUE)	WELL	40	P	Surficial Aquifer System	13	43	42

TABLE 3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-05771-W	021213-11	127027	NEXTEL FL NORTH PALM BEACH CELLULAR TOWER	WELL	20	E	Surficial Aquifer System	17	42	43
50-03299-W	940513-9	34733	NORMANDY VILLAGE TRACT Q-2B	PUMP	35	P	CANAL	18	43	43
50-05497-W	011227-4	117745	NORTH COUNTY P U D PHASE 1	PUMP	40	P	On-site Lake(s)	36	42	42
50-05497-W	011227-4	117744	NORTH COUNTY P U D PHASE 1	PUMP	40	P	On-site Lake(s)	36	42	42
50-05497-W	011227-4	117743	NORTH COUNTY P U D PHASE 1	PUMP	40	P	On-site Lake(s)	36	42	42
50-00084-W	950202-13	44749	NORTH PALM BEACH VILLAGE OF	CULVERT	0	E	SFWMD Canal (C-17)	17	42	43
50-00084-W	950202-13	35435	NORTH PALM BEACH VILLAGE OF	PUMP	950	E	SFWMD Canal (C-17)	17	42	43
50-00084-W	950202-13	35435	NORTH PALM BEACH VILLAGE OF	PUMP	950	E	SFWMD Canal (C-17)	17	42	43
50-06057-W	030505-8	138272	NORTHERN PALM BEACH COUNTY BUSINESS PARK	WELL	180	P	Surficial Aquifer System	19	42	43
50-06057-W	030505-8	138277	NORTHERN PALM BEACH COUNTY BUSINESS PARK	PUMP	180	P	On-site Lake(s)	19	42	43
50-06057-W	030505-8	138275	NORTHERN PALM BEACH COUNTY BUSINESS PARK	PUMP	70	P	On-site Lake(s)	19	42	43
50-06057-W	030505-8	138271	NORTHERN PALM BEACH COUNTY BUSINESS PARK	WELL	70	P	Surficial Aquifer System	19	42	43
50-07072-W	050627-2	179235	NORTHFIELD / PALM BEACH RV	WELL	60	P	Surficial Aquifer System	1	43	42
50-05433-W	020318-20	117690	NORTHLAKE CORPORATE PARK	WELL	85	P	Surficial Aquifer System	24	42	42
50-03472-W	950417-11	6560	NORTHLAKE MEDICAL BUILDING	WELL	30	P	Surficial Aquifer System	24	42	42
50-03472-W	950417-11	6561	NORTHLAKE MEDICAL BUILDING	WELL	30	P	Surficial Aquifer System	24	42	42
50-04506-W	000127-3	42905	NORTHLAKE PROMENADE SHOPPES	PUMP	120	P	On-site Lake(s)/Pond(s)	21	42	43
50-03609-W	960220-20	39374	NORTHLAKE SQUARE	PUMP	80	P	SFWMD Canal (C-17)	18	42	43
50-05832-W	030205-18	129197	NORTHLAKE SQUARE WEST	PUMP	140	P	SFWMD Canal (C-17)	19	42	43
50-04442-W	991014-11	42556	NORTHMILL PLAZA	PUMP	100	P	On-site Lake(s)/Pond(s)	13	42	42
50-04032-W	980515-15	27388	NORTHMORE ELEMENTARY SCHOOL	WELL	75	P	Surficial Aquifer System	4	43	43
50-04822-W	070629-38	105307	NORTHWOOD UNIVERSITY	WELL	125	E	Surficial Aquifer System	24	43	42
50-04822-W	070629-38	105306	NORTHWOOD UNIVERSITY	WELL	250	E	Surficial Aquifer System	24	43	42
50-04822-W	070629-38	105291	NORTHWOOD UNIVERSITY	PUMP	105	E	On-site Lake(s)	24	43	42
50-04822-W	070629-38	105308	NORTHWOOD UNIVERSITY	PUMP	80	E	On-site Lake(s)	24	43	42
50-04822-W	070629-38	105310	NORTHWOOD UNIVERSITY	PUMP	70	E	On-site Lake(s)	24	43	42
50-04822-W	070629-38	217778	NORTHWOOD UNIVERSITY	PUMP	70	P	On-site Lake(s)	24	43	42
50-04822-W	070629-38	105309	NORTHWOOD UNIVERSITY	PUMP	90	E	On-site Lake(s)	24	43	42
50-07168-W	051012-12	186588	NORTRAX RIVIERA BEACH	WELL	100	P	Surficial Aquifer System	31	42	43
50-06762-W	041206-14	166004	NPBC BUSINESS PARK	PUMP	1580	P	Water Table aquifer	19	42	43
50-06762-W	041206-14	166003	NPBC BUSINESS PARK	PUMP	1580	P	Water Table aquifer	19	42	43
50-06761-W	041206-12	165996	NPBC BUSINESS PARK	PUMP	1580	P	Water Table aquifer	19	42	43
50-06761-W	041206-12	165993	NPBC BUSINESS PARK	PUMP	1580	P	Water Table aquifer	19	42	43
50-06761-W	041206-12	165992	NPBC BUSINESS PARK	PUMP	1580	P	Water Table aquifer	19	42	43
50-05233-W	011109-18	114489	NWL CAPACITORS	WELL	40	P	Surficial Aquifer System	19	42	43
50-05233-W	011109-18	114489	NWL CAPACITORS	WELL	40	P	Surficial Aquifer System	19	42	43
50-05233-W	011109-18	114488	NWL CAPACITORS	WELL	40	E	Surficial Aquifer System	19	42	43
50-05233-W	011109-18	114488	NWL CAPACITORS	WELL	40	E	Surficial Aquifer System	19	42	43
50-04762-W	001120-3	104096	OAK RIDGE BUSINESS PARK	WELL	50	P	Surficial Aquifer System	29	43	43
50-04308-W	990127-20	30212	OAKS CENTER	WELL	25	P	Surficial Aquifer System	8	42	43
50-06592-W	040811-5	157610	OASIS PLACE	WELL	40	P	Surficial Aquifer System	29	42	43
50-07362-W	060330-9	192079	OCEANS EDGE	PUMP	500	P	Water Table aquifer	23	42	43
50-07362-W	060330-9	192080	OCEANS EDGE	PUMP	500	P	Water Table aquifer	23	42	43
50-07635-W	061019-13	195358	OFFICE BUILDING	PUMP	40	E	SFWMD Canal (C-17)	6	43	43
50-05783-W	030930-18	127321	OFFICE/WAREHOUSE FACILITY FOR FRED KELLER	WELL	30	E	Surficial Aquifer System	31	42	43
50-03091-W	930511-7	2342	OKEE SQUARE	WELL	120	P	Surficial Aquifer System	20	43	43
50-07946-W	070605-11	214454	OLD TRAIL PARK	WELL	50	P	Surficial Aquifer System	24	43	42
50-07767-W	070116-9	197126	ONE PARK PLACE	WELL	60	P	Surficial Aquifer System	20	42	43
50-07441-W	060613-17	193000	OSCEOLA FARMS CO	WELL	40	P	Surficial Aquifer System	33	42	43
50-07228-W	051219-4	190113	OSI	PUMP	1000	P	Water Table aquifer	22,23	42	43
50-07471-W	060628-22	193360	P B F PROVISIONERS	WELL	25	P	Surficial Aquifer System	36	42	42
50-05776-W	021206-9	127174	PALM BEACH ATLANTIC UNIVERSITY	WELL	35	E	Surficial Aquifer System	27	43	43
50-03835-W	070626-22	23986	PALM BEACH COUNTRY CLUB	WELL	550	E	Floridan Aquifer System	10	43	43
50-06633-W	040916-2	162689	PALM BEACH COUNTY BANK	WELL	50	P	Surficial Aquifer System	21	42	43
50-05791-W	021114-8	127453	PALM BEACH COUNTY BANK	WELL	120	P	Surficial Aquifer System	29	43	43
50-06630-W	050804-8	180240	PALM BEACH COUNTY TRI-RAIL	WELL	0	P	Surficial Aquifer System	21	43	43
50-05205-W	011023-4	113037	PALM BEACH GARDENS CITY OF	WELL	35	P	Surficial Aquifer System	8	42	43
50-04741-W	001211-5	103646	PALM BEACH GARDENS CITY OF FIRE/POLICE STATION NO 3	PUMP	80	P	On-site Lake(s)/Pond(s)	14	42	42
50-03154-W	930823-9	2681	PALM BEACH GARDENS ELEMENTARY SCHOOL	WELL	200	P	Surficial Aquifer System	7	42	43
50-01822-W	060202-14	191107	PALM BEACH GARDENS HIGH SCHOOL	WELL	250	E	Surficial Aquifer System	12	42	42
50-05801-W	021118-9	127953	PALM BEACH GARDENS MEDICAL CENTER	WELL	85	E	Surficial Aquifer System	7	42	43
50-05801-W	021118-9	127952	PALM BEACH GARDENS MEDICAL CENTER	WELL	75	E	Surficial Aquifer System	7	42	43
50-05801-W	021118-9	127954	PALM BEACH GARDENS MEDICAL CENTER	WELL	90	E	Surficial Aquifer System	7	42	43
50-05801-W	021118-9	127955	PALM BEACH GARDENS MEDICAL CENTER	WELL	60	E	Surficial Aquifer System	7	42	43
50-05801-W	021118-9	156315	PALM BEACH GARDENS MEDICAL CENTER	WELL	0	E	Surficial Aquifer System	7	42	43
50-05801-W	021118-9	156316	PALM BEACH GARDENS MEDICAL CENTER	WELL	0	E	Surficial Aquifer System	7	42	43
50-05801-W	021118-9	137810	PALM BEACH GARDENS MEDICAL CENTER	WELL	0	E	Surficial Aquifer System	7	42	43
50-07217-W	060303-13	189510	PALM BEACH LAKES BLVD BEAUTIFICATION PHASE III - IV	PUMP	125	P	On-site Lake(s)	16-17	43	43
50-07217-W	060303-13	191471	PALM BEACH LAKES BLVD BEAUTIFICATION PHASE III - IV	PUMP	125	P	On-site Lake(s)	16-17	43	43
50-04062-W	980625-13	41389	PALM BEACH LAKES CHURCH OF CHRIST	PUMP	60	P	On-site Canal(s)	25	42	42
50-04065-W	980715-9	21275	PALM BEACH MALL	WELL	60	P	Surficial Aquifer System	17-19	43	43
50-04065-W	980715-9	21273	PALM BEACH MALL	WELL	60	E	Surficial Aquifer System	17-19	43	43
50-07925-W	080407-13	215234	PALM BEACH PLAZA INN	PUMP	2000	P	On-site Borrow Pit(s)	26	43	43
50-07925-W	080407-13	215236	PALM BEACH PLAZA INN	PUMP	2000	P	On-site Borrow Pit(s)	26	43	43
50-07925-W	080407-13	215235	PALM BEACH PLAZA INN	PUMP	2000	P	On-site Borrow Pit(s)	26	43	43
50-07925-W	080407-13	215237	PALM BEACH PLAZA INN	PUMP	2000	P	On-site Borrow Pit(s)	26	43	43
50-05916-W	030318-7	131539	PALM CITY TRANSFER AND RECYCLING	WELL	60	P	Surficial Aquifer System	9	43	43
50-06462-W	040420-8	150407	PALM CLUB VILLAGE I	PUMP	120	E	On-site Lake(s)	13	43	42
50-06462-W	040420-8	150405	PALM CLUB VILLAGE I	WELL	30	P	Surficial Aquifer System	13	43	42
50-06462-W	040420-8	150406	PALM CLUB VILLAGE I	PUMP	100	E	On-site Lake(s)	13	43	42
50-05687-W	021009-10	124366	PALM CLUB WEST VILLAGE II	PUMP	85	E	On-site Lake(s)	13	43	42
50-05687-W	021009-10	124364	PALM CLUB WEST VILLAGE II	PUMP	85	E	On-site Lake(s)	13	43	42
50-05687-W	021009-10	124365	PALM CLUB WEST VILLAGE II	PUMP	85	E	On-site Lake(s)	13	43	42
50-05687-W	021009-10	124362	PALM CLUB WEST VILLAGE II	PUMP	85	E	On-site Lake(s)	13	43	42
50-05035-W	011066-18	108920	PALM CLUB WEST VILLAGE II	WELL	35	P	Surficial Aquifer System	13	43	42
50-08572-W	080501-15	222982	PALM GATE PLAZA BY ALLSTATE INVESTMENTS	WELL	40	E	Surficial Aquifer System	14	43	42
50-04956-W	060628-24	107772	PALM LAKE APARTMENTS	PUMP	75	E	On-site Lake(s)	13	43	42
50-04956-W	060628-24	193580	PALM LAKE APARTMENTS	WELL	75	P	Surficial Aquifer System	13	43	42
50-04956-W	060628-24	107771	PALM LAKE APARTMENTS	WELL	0	E	Surficial Aquifer System	13	43	42
50-05702-W	021024-8	125084	PALMBROOKE TOWNHOMES	PUMP	200	P	On-site Lake(s)	12	43	42
50-05367-W	020308-10	117175	PALMS EDGE	PUMP	60	P	NPBCWCD Canal	25	42	42
50-05439-W	020401-8	117750	PARADISE PLACE	WELL	30	P	Surficial Aquifer System	11	43	42
50-07184-W	051101-8	187976	PARK PLAZA	PUMP	100	E	SFWMD Canal (C-17)	6	43	43
50-08042-W	070424-20	215798	PARLIAMENT CONDOMINIUMS	PUMP	150	E	Off-site Lake(s)	7, 18	43	43
50-00063-W	061016-25	13807	PASSIONIST MONASTERY OF OUR LADY OF FLORIDA	WELL	125	E	Surficial Aquifer System	4	42	43
50-04437-W	990920-8	31669	PBC HEADSTART CHILD & DEVELOPMENT CENTER	WELL	120	P	Surficial Aquifer System	32	42	43
50-03479-W	020510-14	119805	PEGGY ADAMS ANIMAL RESCUE LEAGUE	WELL	70	P	Surficial Aquifer System	13	43	42

TABLE 3.3-3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-03479-W	020510-14	6660	PEGGY ADAMS ANIMAL RESCUE LEAGUE	WELL	70	E	Surficial Aquifer System	13	43	42
50-00201-W	931223-134	29284	PELICAN LAKE WATER LEVEL MAINTENANCE	WELL	1202	E	Water Table Aquifer	3	42	43
50-06516-W	040601-8	153256	PEPSI-COLA BOTTLING	WELL	40	E	Surficial Aquifer System	30	42	43
50-06516-W	040601-8	153247	PEPSI-COLA BOTTLING	WELL	0	E	Surficial Aquifer System	30	42	43
50-06516-W	040601-8	153248	PEPSI-COLA BOTTLING	WELL	80	P	Surficial Aquifer System	30	42	43
50-06516-W	040601-8	153252	PEPSI-COLA BOTTLING	WELL	30	E	Surficial Aquifer System	30	42	43
50-07090-W	050725-20	180443	PHILLIPS PALM BEACH INC	WELL	120	P	Surficial Aquifer System	28	43	43
50-05880-W	030313-5	131091	PINE RIDGE AT HAVERHILL	PUMP	150	E	On-site Lake(s)	13	43	42
50-05880-W	030313-5	131090	PINE RIDGE AT HAVERHILL	PUMP	150	E	On-site Lake(s)	13	43	42
50-05880-W	030313-5	130093	PINE RIDGE AT HAVERHILL	WELL	100	E	Surficial Aquifer System	13	43	42
50-05469-W	020515-6	118295	PINNACLE PALMS	WELL	65	P	Surficial Aquifer System	20	43	43
50-07876-W	070426-10	214260	PL GROUP INCORPORATED (816 PROSPERITY)	WELL	35	P	Surficial Aquifer System	8	42	43
50-03158-W	080123-16	29730	PLANTIQUE NURSERY	WELL	60	E	Surficial Aquifer System	26	44	42
50-03158-W	080123-16	29731	PLANTIQUE NURSERY	WELL	60	E	Surficial Aquifer System	26	44	42
50-04731-W	001113-1	103510	PLAZA AT LAKE PARK	WELL	80	P	Surficial Aquifer System	20	42	43
50-06901-W	050404-18	171198	PLAZA NORTH AND GARDENS MEDICAL CENTER	PUMP	30	E	Off-site Canal(s)	7	42	43
50-06901-W	050404-18	171197	PLAZA NORTH AND GARDENS MEDICAL CENTER	PUMP	30	E	Off-site Canal(s)	7	42	43
50-05474-W	020424-12	118521	PLEASANT CITY ELEMENTARY SCHOOL	WELL	85	P	Surficial Aquifer System	16	43	43
50-02872-W	060901-19	194823	PLOMOSUS	WELL	25	E	Surficial Aquifer System	12, 14	41	42
50-02872-W	060901-19	194823	PLOMOSUS	WELL	25	E	Surficial Aquifer System	12, 14	41	42
50-07694-W	061128-11	196084	POINT WEST	WELL	75	P	Surficial Aquifer System	25	42	42
50-07694-W	061128-11	196085	POINT WEST	PUMP	175	P	On-site Lake(s)/Pond(s)	25	42	42
50-07694-W	061128-11	196082	POINT WEST	WELL	75	P	Surficial Aquifer System	25	42	42
50-07694-W	061128-11	196086	POINT WEST	PUMP	175	P	On-site Lake(s)/Pond(s)	25	42	42
50-06363-W	040211-9	147328	POOL MOTEL	WELL	30	P	Surficial Aquifer System	9	43	43
50-06363-W	040211-9	147329	POOL MOTEL	WELL	30	P	Surficial Aquifer System	9	43	43
50-03736-W	960919-10	22921	PORT CENTER	WELL	60	P	Unspecified	31	42	43
50-07233-W	051209-3	191690	PORT COMMERCE CENTER	WELL	100	P	Surficial Aquifer System	33	42	43
50-06420-W	040329-11	149590	PORTOFINO AT LAKES OF LAGUNA	PUMP	210	E	On-site Lake(s)	12	43	42
50-06420-W	040329-11	149591	PORTOFINO AT LAKES OF LAGUNA	PUMP	210	E	On-site Lake(s)	12	43	42
50-06413-W	040329-10	149578	PORTOFINO AT LAKES OF LAGUNA PHASE 2	PUMP	210	P	On-site Lake(s)	12	43	42
50-06413-W	040329-10	149579	PORTOFINO AT LAKES OF LAGUNA PHASE 2	PUMP	210	P	On-site Lake(s)	12	43	42
50-05640-W	020924-4	122987	PREMIER AIRPORT CENTER, LLP	PUMP	200	P	On-site Canal(s)	29	43	43
50-06373-W	040224-14	154608	PREMIER PARK OF COMMERCE	PUMP	250	P	On-site Lake(s)/Pond(s)	2	43	42
50-00224-W	940718-10	24123	PRESIDENT COUNTRY CLUB	WELL	600	E	Surficial Aquifer System	7,8,17,18	43	43
50-00224-W	940718-10	4841	PRESIDENT COUNTRY CLUB	WELL	600	E	Surficial Aquifer System	7,8,17,18	43	43
50-00224-W	940718-10	4840	PRESIDENT COUNTRY CLUB	WELL	600	E	Surficial Aquifer System	7,8,17,18	43	43
50-00224-W	940718-10	4839	PRESIDENT COUNTRY CLUB	WELL	600	E	Surficial Aquifer System	7,8,17,18	43	43
50-08610-W	080508-24	223650	PRESIDENTIAL MEDICAL PLAZA IRRIGATION	PUMP	28	E	On-site Lake(s)/Pond(s)	17	43	43
50-04904-W	010405-3	107057	PRO-SOURCE	WELL	40	P	Surficial Aquifer System	36	42	42
50-07524-W	080211-3	193999	PROSPERITY ESTATES	WELL	20	E	Surficial Aquifer System	8	43	42
50-07524-W	080211-3	220561	PROSPERITY ESTATES	WELL	20	P	Surficial Aquifer System	8	43	42
50-05505-W	020520-14	119050	QUANTUM PARK/LOTS 73-A,73-B,74,75,76	WELL	200	P	Biscayne Aquifer	16,20,21	45	43
50-05690-W	021004-1	112488	R/W LANDSCAPE IRRIGATION - MILITARY TRAIL MEDIANS	WELL	30	E	Surficial Aquifer System	12,13	42	42
50-05690-W	021004-1	112489	R/W LANDSCAPE IRRIGATION - MILITARY TRAIL MEDIANS	WELL	30	E	Surficial Aquifer System	12,13	42	42
50-05690-W	021004-1	112490	R/W LANDSCAPE IRRIGATION - MILITARY TRAIL MEDIANS	WELL	30	E	Surficial Aquifer System	12,13	42	42
50-07595-W	060711-8	195182	RADICEN CARE	WELL	25	P	Surficial Aquifer System	31	42	43
50-03329-W	060524-10	5031	RAPIDS WATER PARK	WELL	0	E	Surficial Aquifer System	36	42	42
50-03329-W	060524-10	192848	RAPIDS WATER PARK	WELL	56	P	Surficial Aquifer System	36	42	42
50-05421-W	070514-11	152892	RECLAIMED WATER/SUPPLEMENTAL IRRIGATION SYSTEM	PUMP	1500	E	MD Canal C-17 via Merrill	35,36	41	42
50-06535-W	040526-2	170378	REGENCY CLUB	WELL	60	P	Surficial Aquifer System	3	43	43
50-05820-W	030124-13	128958	RENAISSANCE AT BEAR LAKES	PUMP	210	P	On-site Lake(s)	12	43	42
50-07287-W	060206-18	191088	REPLACEMENT IRRIGATION WELL	WELL	30	P	Surficial Aquifer System	27	43	43
50-04360-W	050510-13	30685	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	WELL	30	E	Surficial Aquifer System	36,6,31,34	42	42
50-04360-W	050510-13	30673	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	WELL	30	E	Surficial Aquifer System	36,6,31,34	42	42
50-04360-W	050510-13	30675	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	WELL	30	E	Surficial Aquifer System	36,6,31,34	42	42
50-04360-W	050510-13	30677	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	WELL	30	E	Surficial Aquifer System	36,6,31,34	42	42
50-04360-W	050510-13	30679	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	WELL	30	E	Surficial Aquifer System	36,6,31,34	42	42
50-04360-W	050510-13	42303	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	PUMP	30	E	On-site Canal(s)	36,6,31,34	42	42
50-04360-W	050510-13	30681	RESEARCH AND EVALUATION FACILITY (FPL CORBETT SUBSTATION)	WELL	30	E	Surficial Aquifer System	36,6,31,34	42	42
50-04767-W	001102-7	104151	RICHARD L WOLF TRUSTEE	WELL	30	P	Surficial Aquifer System	30	43	42
50-03678-W	960621-1	21584	RINKER MATERIALS CORPORATION (RIVIERA BEACH)	WELL	225	E	Surficial Aquifer System	32	42	43
50-03524-W	080619-8	30524	RINKER MATERIALS CORPORATION WEST PALM BEACH	WELL	240	E	Surficial Aquifer System	16,21	43	43
50-03524-W	080619-8	30525	RINKER MATERIALS CORPORATION WEST PALM BEACH	WELL	240	E	Surficial Aquifer System	16,21	43	43
50-03524-W	080619-8	223794	RINKER MATERIALS CORPORATION WEST PALM BEACH	WELL	240	P	Surficial Aquifer System	16,21	43	43
50-03273-W	070628-8	29022	RINKER MATERIALS/LAKE PARK CONCRETE FACILITY	WELL	20	E	Surficial Aquifer System	20	42	43
50-03273-W	070628-8	215157	RINKER MATERIALS/LAKE PARK CONCRETE FACILITY	WELL	50	P	Surficial Aquifer System	20	42	43
50-03273-W	070628-8	29024	RINKER MATERIALS/LAKE PARK CONCRETE FACILITY	WELL	400	E	Surficial Aquifer System	20	42	43
50-05165-W	030127-11	129488	RIVIERA BEACH AQUATIC FACILITY	WELL	120	P	Surficial Aquifer System	29	42	43
50-05165-W	030127-11	112456	RIVIERA BEACH AQUATIC FACILITY	WELL	70	E	Surficial Aquifer System	29	42	43
50-05165-W	030127-11	129487	RIVIERA BEACH AQUATIC FACILITY	WELL	120	P	Surficial Aquifer System	29	42	43
50-00460-W	960321-4	21722	RIVIERA BEACH CITY OF	WELL	700	P	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21722	RIVIERA BEACH CITY OF	WELL	700	P	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21721	RIVIERA BEACH CITY OF	WELL	700	P	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21721	RIVIERA BEACH CITY OF	WELL	700	P	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	155160	RIVIERA BEACH CITY OF	WELL	1250	E	Surficial Aquifer System	24-28,33-36	42	42
50-00460-W	960321-4	155160	RIVIERA BEACH CITY OF	WELL	1250	E	Surficial Aquifer System	24-28,33-36	42	42
50-00460-W	960321-4	21720	RIVIERA BEACH CITY OF	WELL	495	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21720	RIVIERA BEACH CITY OF	WELL	495	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21719	RIVIERA BEACH CITY OF	WELL	600	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21719	RIVIERA BEACH CITY OF	WELL	600	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	24619	RIVIERA BEACH CITY OF	WELL	500	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	24619	RIVIERA BEACH CITY OF	WELL	500	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	24618	RIVIERA BEACH CITY OF	WELL	600	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	24618	RIVIERA BEACH CITY OF	WELL	600	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	25486	RIVIERA BEACH CITY OF	WELL	550	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	25486	RIVIERA BEACH CITY OF	WELL	550	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	155170	RIVIERA BEACH CITY OF	WELL	0	E	Surficial Aquifer System	24-28,33-36	42	42
50-00460-W	960321-4	155170	RIVIERA BEACH CITY OF	WELL	0	E	Surficial Aquifer System	24-28,33-36	42	42
50-00460-W	960321-4	21714	RIVIERA BEACH CITY OF	WELL	400	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21714	RIVIERA BEACH CITY OF	WELL	400	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21713	RIVIERA BEACH CITY OF	WELL	310	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21713	RIVIERA BEACH CITY OF	WELL	310	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21703	RIVIERA BEACH CITY OF	WELL	450	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21703	RIVIERA BEACH CITY OF	WELL	450	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21711	RIVIERA BEACH CITY OF	WELL	600	E	Water Table Aquifer	24-28,33-36	42	42

TABLE 3.3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-00460-W	960321-4	21711	RIVIERA BEACH CITY OF	WELL	600	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21707	RIVIERA BEACH CITY OF	WELL	525	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21707	RIVIERA BEACH CITY OF	WELL	525	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21708	RIVIERA BEACH CITY OF	WELL	425	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21708	RIVIERA BEACH CITY OF	WELL	425	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21710	RIVIERA BEACH CITY OF	WELL	475	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21702	RIVIERA BEACH CITY OF	WELL	425	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21702	RIVIERA BEACH CITY OF	WELL	425	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21709	RIVIERA BEACH CITY OF	WELL	285	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21709	RIVIERA BEACH CITY OF	WELL	285	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21704	RIVIERA BEACH CITY OF	WELL	225	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21704	RIVIERA BEACH CITY OF	WELL	225	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21705	RIVIERA BEACH CITY OF	WELL	250	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21705	RIVIERA BEACH CITY OF	WELL	250	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21706	RIVIERA BEACH CITY OF	WELL	265	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21706	RIVIERA BEACH CITY OF	WELL	265	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21717	RIVIERA BEACH CITY OF	WELL	375	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21717	RIVIERA BEACH CITY OF	WELL	375	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21712	RIVIERA BEACH CITY OF	WELL	360	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21712	RIVIERA BEACH CITY OF	WELL	360	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21715	RIVIERA BEACH CITY OF	WELL	360	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21715	RIVIERA BEACH CITY OF	WELL	360	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21716	RIVIERA BEACH CITY OF	WELL	575	E	Water Table Aquifer	24-28,33-36	42	42
50-00460-W	960321-4	21716	RIVIERA BEACH CITY OF	WELL	575	E	Water Table Aquifer	24-28,33-36	42	42
50-03336-W	940727-9	34919	RIVIERA BEACH HOUSING AUTHORITY	PUMP	200	P	SFWM Canal (C-17)	31	42	43
50-07240-W	051227-4	190309	RMB CONCRETE & PRECAST PLANT	WELL	250	P	Water Table Aquifer	32	42	43
50-05511-W	040223-16	150094	ROAN LANE APARTMENTS	WELL	40	E	Surficial Aquifer System	18	42	43
50-05511-W	040223-16	119171	ROAN LANE APARTMENTS	WELL	100	P	Surficial Aquifer System	18	42	43
50-05511-W	040223-16	150093	ROAN LANE APARTMENTS	WELL	40	E	Surficial Aquifer System	18	42	43
50-06341-W	040126-6	147550	ROBERT ADENBAUM	WELL	60	P	Surficial Aquifer System	30	42	43
50-06341-W	040126-6	146839	ROBERT ADENBAUM	WELL	60	E	Surficial Aquifer System	30	42	43
50-06606-W	040824-3	158137	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158136	ROCKING HORSE ESTATES	WELL	100	E	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158138	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158142	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158135	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158139	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158134	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158140	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158141	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-06606-W	040824-3	158133	ROCKING HORSE ESTATES	WELL	100	P	Surficial Aquifer System	24	42	42
50-07902-W	070511-17	213875	ROEBUCK SUBSTATION	WELL	20	E	Surficial Aquifer System	12	43	42
50-02085-W	030224-20	24771	ROOSEVELT ELEMENTARY SCHOOL	WELL	0	E	Surficial Aquifer System	16	43	43
50-02085-W	030224-20	130674	ROOSEVELT ELEMENTARY SCHOOL	WELL	150	P	Surficial Aquifer System	16	43	43
50-02661-W	990129-29	29793	ROOSEVELT JUNIOR HIGH SCHOOL	WELL	40	E	Surficial Aquifer System	16	43	43
50-03440-W	950124-13	6442	ROOSEVELT MIDDLE SCHOOL	WELL	120	P	Surficial Aquifer System	16	43	43
50-00218-W	070620-14	3953	ROYAL PALM MEMORIAL GARDENS	WELL	310	E	Surficial Aquifer System	4	43	43
50-00218-W	070620-14	3955	ROYAL PALM MEMORIAL GARDENS	WELL	200	E	Surficial Aquifer System	4	43	43
50-00218-W	070620-14	3954	ROYAL PALM MEMORIAL GARDENS	WELL	40	E	Surficial Aquifer System	4	43	43
50-03478-W	950508-9	6534	ROYALE HARBOUR CONDOMINIUM	WELL	30	E	Surficial Aquifer System	5	42	43
50-03478-W	950508-9	6498	ROYALE HARBOUR CONDOMINIUM	WELL	30	E	Surficial Aquifer System	5	42	43
50-07010-W	050616-5	175612	SAIL CLUB AT CLEAR LAKE	PUMP	960	P	Clear Lake	20	43	43
50-05238-W	011120-17	114156	SAN MARINO AT BEAR LAKES	PUMP	150	P	On-site Lake(s)	12	43	42
50-05238-W	011120-17	114306	SAN MARINO AT BEAR LAKES	WELL	25	P	Biscayne Aquifer	12	43	42
50-05238-W	011120-17	114155	SAN MARINO AT BEAR LAKES	PUMP	200	P	On-site Lake(s)	12	43	42
50-05238-W	011120-17	114157	SAN MARINO AT BEAR LAKES	PUMP	150	P	On-site Lake(s)	12	43	42
50-03623-W	980804-10	28211	SANCTUARY COVE II	WELL	85	P	Surficial Aquifer System	8	42	43
50-03623-W	980804-10	28212	SANCTUARY COVE II	WELL	85	P	Surficial Aquifer System	8	42	43
50-03225-W	940106-8	3454	SANDALWOOD ESTATES	WELL	25	P	Surficial Aquifer System	7	42	43
50-03225-W	940106-8	34563	SANDALWOOD ESTATES	PUMP	25	P	Perimeter Ditch	7	42	43
50-03225-W	940106-8	34564	SANDALWOOD ESTATES	PUMP	25	P	Perimeter Ditch	7	42	43
50-03225-W	940106-8	34565	SANDALWOOD ESTATES	PUMP	25	P	Perimeter Ditch	7	42	43
50-03225-W	940106-8	34566	SANDALWOOD ESTATES	PUMP	25	P	Perimeter Ditch	7	42	43
50-03225-W	940106-8	3453	SANDALWOOD ESTATES	WELL	25	P	Surficial Aquifer System	7	42	43
50-03225-W	940106-8	3452	SANDALWOOD ESTATES	WELL	25	P	Surficial Aquifer System	7	42	43
50-07311-W	060222-4	191446	SANDTREE PLAZA	WELL	30	P	Surficial Aquifer System	19	42	43
50-05707-W	021016-11	125211	SCOTT LEWIS GARDENING AND TRIMMING	WELL	30	P	Surficial Aquifer System	21	43	43
50-08245-W	071119-19	218633	SEABREEZE HARBOR APARTMENT HOMES	PUMP	175	E	On-site Lake(s)/Pond(s)	30	42	43
50-00365-W	050830-19	32541	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	172114	SEACOAST UTILITY AUTHORITY	WELL	700	P	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32542	SEACOAST UTILITY AUTHORITY	WELL	0	A	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	125684	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	125684	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32546	SEACOAST UTILITY AUTHORITY	WELL	600	P	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32543	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32543	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32544	SEACOAST UTILITY AUTHORITY	WELL	0	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	172116	SEACOAST UTILITY AUTHORITY	WELL	700	P	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32545	SEACOAST UTILITY AUTHORITY	WELL	0	A	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	125685	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	125685	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	138245	SEACOAST UTILITY AUTHORITY	WELL	0	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32538	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32538	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32532	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32532	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	132916	SEACOAST UTILITY AUTHORITY	WELL	650	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	132916	SEACOAST UTILITY AUTHORITY	WELL	650	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32536	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32536	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32533	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32539	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32539	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32537	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32537	SEACOAST UTILITY AUTHORITY	WELL	500	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32540	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41

TABLE 3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-00365-W	050830-19	32540	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32535	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32535	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	138244	SEACOAST UTILITY AUTHORITY	WELL	0	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32531	SEACOAST UTILITY AUTHORITY	WELL	0	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	32531	SEACOAST UTILITY AUTHORITY	WELL	0	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	132917	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-00365-W	050830-19	132917	SEACOAST UTILITY AUTHORITY	WELL	600	E	Surficial Aquifer System	23-29,32-36	41	41
50-06254-W	031126-5	143958	SHIRLEY INVESTMENT PROPERTIES	WELL	36	P	Surficial Aquifer System	2	43	42
50-03267-W	061212-22	196373	SIENA OAKS	WELL	25	P	Surficial Aquifer System	8	42	43
50-03267-W	061212-22	4084	SIENA OAKS	WELL	30	E	Surficial Aquifer System	8	42	43
50-06767-W	041222-10	169664	SIERRA BAY	PUMP	1500	P	Water Table aquifer	30	42	43
50-06729-W	041209-17	164964	SIERRA BAY	PUMP	200	P	On-site Lake(s)	30	42	43
50-06328-W	040126-22	149212	SIERRA/SONOMA BAY DEVELOPMENT	PUMP	350	P	On-site Lake(s)	30	42	43
50-06328-W	040126-22	149214	SIERRA/SONOMA BAY DEVELOPMENT	PUMP	350	P	On-site Lake(s)	30	42	43
50-04777-W	010108-5	104284	SIGNATURE INDUSTRIAL WAREHOUSE	WELL	75	P	Surficial Aquifer System	19	42	43
50-06084-W	030716-18	136529	SMITH BROS CONTRACTING EQUIPMENT	WELL	50	P	Surficial Aquifer System	1	43	42
50-07357-W	060420-4	192113	SOUTH WIND PLAZA	WELL	85	P	Surficial Aquifer System	1	43	42
50-07421-W	060309-18	192946	SOUTHEASTERN FREIGHT LINES	PUMP	2000	P	On-site Borrow Pit(s)	29	43	43
50-03881-W	070703-11	25877	SOUTHEASTERN FREIGHT LINES	WELL	60	P	Surficial Aquifer System	32	42	43
50-04938-W	010508-11	107633	SOUTHERN STORAGE	WELL	85	E	Surficial Aquifer System	25,36	42	42
50-04938-W	010508-11	107634	SOUTHERN STORAGE	WELL	0	E	Surficial Aquifer System	25,36	42	42
50-05095-W	010622-12	110007	SPENCER GARDEN APARTMENTS	WELL	30	P	Surficial Aquifer System	19	43	43
50-08682-W	080717-19	224125	SPENCER SQUARE	WELL	40	E	Surficial Aquifer System	30	43	43
50-05203-W	011003-6	112991	SPERANZA	WELL	25	P	Biscayne Aquifer	32	42	43
50-03841-W	970425-6	25269	SPORTS AUTHORITY AT NORHTLAKE BLVD	WELL	0	E	Unspecified	19	42	43
50-03841-W	970425-6	25270	SPORTS AUTHORITY AT NORHTLAKE BLVD	WELL	85	P	Unspecified	19	42	43
50-03857-W	970514-4	25611	SPRINGBROOK COMMONS	WELL	100	P	Surficial Aquifer System	1	43	42
50-07736-W	061218-27	196634	SQUARE LAKES NORTH	WELL	80	P	Surficial Aquifer System	24	42	42
50-05917-W	030218-24	131558	ST MARYS MEDICAL CENTER	WELL	150	E	Surficial Aquifer System	4	43	43
50-05917-W	030218-24	131557	ST MARYS MEDICAL CENTER	WELL	150	E	Surficial Aquifer System	4	43	43
50-05917-W	030218-24	131559	ST MARYS MEDICAL CENTER	WELL	150	E	Surficial Aquifer System	4	43	43
50-03186-W	931008-5	2868	ST MARYS MEDICAL CLINICS	WELL	100	P	Surficial Aquifer System	4	43	43
50-07265-W	051129-8	190702	STATE ROAD 710 FROM MILITARY TRAIL TO AVENUE U	WELL	120	P	Surficial Aquifer System	36	42	42
50-07265-W	051129-8	190701	STATE ROAD 710 FROM MILITARY TRAIL TO AVENUE U	WELL	120	P	Surficial Aquifer System	36	42	42
50-07265-W	051129-8	190700	STATE ROAD 710 FROM MILITARY TRAIL TO AVENUE U	WELL	120	P	Surficial Aquifer System	36	42	42
50-06081-W	030806-12	136385	STEPHEN M AGNELLI	WELL	50	P	Surficial Aquifer System	18	42	43
50-04314-W	990423-13	30123	SUGAR SANDS CONDOMINIUM ASSOC INC	WELL	40	E	Surficial Aquifer System	27	42	43
50-08136-W	070717-14	216850	SUN TERRACE AT LAKE CATHERINE HOA	PUMP	200	E	On-site Lake(s)	18	42	43
50-03534-W	950830-7	19621	SUNCO BUILDING CORPORATION	WELL	15	P	Surficial Aquifer System	7	42	43
50-05053-W	010606-9	109355	SUNTRUST BANK	WELL	20	E	Surficial Aquifer System	5, 16, 18	42	43
50-05053-W	010606-9	109342	SUNTRUST BANK	WELL	20	E	Surficial Aquifer System	5, 16, 18	42	43
50-05053-W	010606-9	109351	SUNTRUST BANK	WELL	20	E	Surficial Aquifer System	5, 16, 18	42	43
50-07780-W	070122-25	197449	SURF SAND CONDOMINIUM ASSOCIATION	WELL	50	P	Surficial Aquifer System	0	0	0
50-08145-W	070711-21	216952	SYSCO FOOD SERVICES OF SE FL LLC	WELL	100	E	Surficial Aquifer System	31	42	43
50-06098-W	030813-10	136866	T & C INDUSTRIAL ASSOCIATES	WELL	60	P	Surficial Aquifer System	19	42	43
50-06629-W	040901-3	158801	TARGET - LAKE PARK / PALM BEACH GARDENS	PUMP	120	P	On-site Lake(s)	19	42	43
50-06231-W	031114-15	143092	TCPB CONDOMINIUM ASSOC INC	WELL	250	E	Surficial Aquifer System	24	43	42
50-06231-W	031114-15	143092	TCPB CONDOMINIUM ASSOC INC	WELL	250	E	Surficial Aquifer System	24	43	42
50-06231-W	031114-15	143094	TCPB CONDOMINIUM ASSOC INC	WELL	250	P	Surficial Aquifer System	24	43	42
50-06231-W	031114-15	143094	TCPB CONDOMINIUM ASSOC INC	WELL	250	P	Surficial Aquifer System	24	43	42
50-06231-W	031114-15	143090	TCPB CONDOMINIUM ASSOC INC	WELL	200	E	Surficial Aquifer System	24	43	42
50-03310-W	940614-14	34768	THE CLASSICS AT BEAR LAKES PARCELS KK & JJ	PUMP	200	P	CANAL	13,18	43	43
50-03310-W	940614-14	34769	THE CLASSICS AT BEAR LAKES PARCELS KK & JJ	PUMP	200	P	CANAL	13,18	43	43
50-02340-W	980625-5	41507	THE OAKS	PUMP	225	P	On-site Lake(s)/Pond(s)	7, 8	42	43
50-02340-W	980625-5	41506	THE OAKS	PUMP	225	P	On-site Lake(s)/Pond(s)	7, 8	42	43
50-02340-W	980625-5	41508	THE OAKS	PUMP	225	P	On-site Lake(s)/Pond(s)	7, 8	42	43
50-02340-W	980625-5	41509	THE OAKS	PUMP	225	P	On-site Lake(s)/Pond(s)	7, 8	42	43
50-05147-W	010515-9	111661	THE PALM CLUB - PALM CLUB VILLAGE III	PUMP	100	E	On-site Lake(s)	13	43	42
50-07083-W	050811-6	179982	THE PAVILLION APARTMENTS	WELL	150	P	Surficial Aquifer System	20	43	43
50-07083-W	050811-6	179980	THE PAVILLION APARTMENTS	WELL	150	P	Surficial Aquifer System	20	43	43
50-04497-W	991123-6	42864	THE STORAGE AUTHORITY WEST PALM BEACH	PUMP	75	P	CANAL	28	43	43
50-04453-W	991018-1	42659	THE VININGS AT GRAND ISLES	PUMP	120	P	On-site Lake(s)/Pond(s)	11	43	42
50-04453-W	991018-1	42658	THE VININGS AT GRAND ISLES	PUMP	120	P	On-site Lake(s)/Pond(s)	11	43	42
50-07385-W	060419-9	192516	TIFFANY DRIVE FLEX SPACE	PUMP	3600	P	Water Table aquifer	5	43	43
50-06644-W	040930-12	159557	TOCO TRANSLOAD	WELL	90	P	Surficial Aquifer System	32	42	43
50-07948-W	070604-32	214456	TOWN "N" COUNTRY	WELL	100	P	Surficial Aquifer System	24	42	42
50-04919-W	010419-19	107153	TOWN OF LAKE PARK	WELL	88	E	Surficial Aquifer System	21	42	43
50-04919-W	010419-19	107152	TOWN OF LAKE PARK	WELL	92	E	Surficial Aquifer System	21	42	43
50-04917-W	071220-10	107108	TOWN OF LAKE PARK- ILEX PARK	WELL	30	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107169	TOWN OF LAKE PARK- ILEX PARK	WELL	200	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107101	TOWN OF LAKE PARK- ILEX PARK	WELL	30	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107102	TOWN OF LAKE PARK- ILEX PARK	WELL	30	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107100	TOWN OF LAKE PARK- ILEX PARK	WELL	42	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107125	TOWN OF LAKE PARK- ILEX PARK	WELL	0	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107104	TOWN OF LAKE PARK- ILEX PARK	WELL	64	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107105	TOWN OF LAKE PARK- ILEX PARK	WELL	64	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107067	TOWN OF LAKE PARK- ILEX PARK	WELL	39	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107068	TOWN OF LAKE PARK- ILEX PARK	WELL	39	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107069	TOWN OF LAKE PARK- ILEX PARK	WELL	48	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107070	TOWN OF LAKE PARK- ILEX PARK	WELL	49	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107109	TOWN OF LAKE PARK- ILEX PARK	WELL	20	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	219247	TOWN OF LAKE PARK- ILEX PARK	WELL	50	P	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107071	TOWN OF LAKE PARK- ILEX PARK	WELL	49	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107124	TOWN OF LAKE PARK- ILEX PARK	WELL	30	E	Surficial Aquifer System	20,21	42	43
50-04917-W	071220-10	107103	TOWN OF LAKE PARK- ILEX PARK	WELL	54	E	Surficial Aquifer System	20,21	42	43
50-00030-W	050113-9	214725	TOWN OF MANGONIA PARK	WELL	400	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	214724	TOWN OF MANGONIA PARK	WELL	400	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	32383	TOWN OF MANGONIA PARK	WELL	400	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	32382	TOWN OF MANGONIA PARK	WELL	400	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	32379	TOWN OF MANGONIA PARK	WELL	250	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	32380	TOWN OF MANGONIA PARK	WELL	325	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	32384	TOWN OF MANGONIA PARK	WELL	325	E	Surficial Aquifer System	5	43	43
50-00030-W	050113-9	32381	TOWN OF MANGONIA PARK	WELL	325	E	Surficial Aquifer System	5	43	43
50-04128-W	981015-3	28838	TOWN OF PALM BEACH SHORES	WELL	50	P	Water Table Aquifer	26 & 35	42	43
50-04984-W	010502-4	108296	TRAIL COMMERCE PARK	WELL	50	E	Surficial Aquifer System	1	43	42
50-04202-W	981223-6	29465	TRINITY BAPTIST CHURCH	WELL	5	E	Water Table Aquifer	13	43	42

TABLE 3.3-1
WATER USE PERMITS WITHIN 5 MILES OF RBEC

Permit Number	Application No.	Facility ID	Permittee	Facility Type	Maximum Capacity (gallons per minute)	Status	Source	Section	Range	Township
50-07062-W	050714-9	178386	TUSCANY CENTER	WELL	30	P	Surficial Aquifer System		0	0
50-03831-W	970415-4	25204	TWIN LAKES HIGH SCHOOL FINE ARTS MAGNET	WELL	90	P	Surficial Aquifer System	21	43	43
50-03831-W	970415-4	25205	TWIN LAKES HIGH SCHOOL FINE ARTS MAGNET	WELL	180	P	Surficial Aquifer System	21	43	43
50-05490-W	020523-1	118878	TWIN LAKES VILLAGE	WELL	130	P	Surficial Aquifer System	16	43	43
50-07035-W	050531-15	177942	TWO CITY PLAZA	PUMP	2000	P	Water Table aquifer	22	43	43
50-07035-W	050531-15	177940	TWO CITY PLAZA	PUMP	2000	P	Water Table aquifer	22	43	43
50-07035-W	050531-15	177941	TWO CITY PLAZA	PUMP	2000	P	Water Table aquifer	22	43	43
88-00057-W	030411-8	132436	U B KINSEY ELEMENTARY SCHOOL (FKA PALMVIEW ELEMENTARY)	WELL	90	E	Surficial Aquifer System	16	43	43
50-07485-W	060628-21	193593	UNITED RENTALS	WELL	75	P	Surficial Aquifer System	1	43	42
50-04794-W	010207-1	104587	VACATION INN RESORT	PUMP	30	E	NPBCWCD Canal	31	42	43
50-04794-W	010207-1	104586	VACATION INN RESORT	PUMP	30	E	NPBCWCD Canal	31	42	43
50-05424-W	020329-21	117684	VARIABLE SPEED IRRIGATION PUMP	WELL	30	E	Surficial Aquifer System	32	42	43
50-05424-W	020329-21	117520	VARIABLE SPEED IRRIGATION PUMP	WELL	70	P	Surficial Aquifer System	32	42	43
50-03584-W	951120-9	20892	VETERANS ADMINISTRATIONS MEDICAL CENTER	WELL	65	P	Surficial Aquifer System	25	42	42
50-06910-W	050321-13	171439	VILLA DAVIDA	WELL	100	P	Surficial Aquifer System	32	42	43
50-06052-W	030702-16	136726	VILLA PALMA	WELL	110	P	Surficial Aquifer System	13	42	42
50-07139-W	050926-10	185045	VILLA PALMA PROFESSIONAL BUILDING	WELL	100	P	Surficial Aquifer System	13	42	42
50-05533-W	020614-3	120363	VILLAGE BLVD R/W LANDSCAPE IRRIGATION	PUMP	120	P	On-site Canal(s)	5-7,18,19	43	43
50-05533-W	020614-3	120364	VILLAGE BLVD R/W LANDSCAPE IRRIGATION	PUMP	120	P	On-site Canal(s)	5-7,18,19	43	43
50-05533-W	020614-3	120365	VILLAGE BLVD R/W LANDSCAPE IRRIGATION	PUMP	120	P	On-site Canal(s)	5-7,18,19	43	43
50-05533-W	020614-3	120366	VILLAGE BLVD R/W LANDSCAPE IRRIGATION	PUMP	120	P	On-site Canal(s)	5-7,18,19	43	43
50-05533-W	020614-3	120367	VILLAGE BLVD R/W LANDSCAPE IRRIGATION	PUMP	120	P	On-site Canal(s)	5-7,18,19	43	43
50-05533-W	020614-3	120368	VILLAGE BLVD R/W LANDSCAPE IRRIGATION	PUMP	120	P	On-site Canal(s)	5-7,18,19	43	43
50-03878-W	050527-8	174238	VILLAGE OF NORTH PALM BEACH COMMUNITY CENTER	WELL	125	P	Surficial Aquifer System	8	42	43
50-03878-W	050527-8	25887	VILLAGE OF NORTH PALM BEACH COMMUNITY CENTER	WELL	0	E	Surficial Aquifer System	8	42	43
50-03878-W	050527-8	25888	VILLAGE OF NORTH PALM BEACH COMMUNITY CENTER	WELL	0	A	Surficial Aquifer System	8	42	43
50-03878-W	050527-8	25889	VILLAGE OF NORTH PALM BEACH COMMUNITY CENTER	WELL	0	A	Surficial Aquifer System	8	42	43
50-03878-W	050527-8	25890	VILLAGE OF NORTH PALM BEACH COMMUNITY CENTER	WELL	0	A	Surficial Aquifer System	8	42	43
50-04910-W	010501-20	107789	VILLAGE OF SANDALWOOD LAKES NORTH HOA	PUMP	150	E	On-site Lake(s)	1	43	42
50-04910-W	010501-20	107788	VILLAGE OF SANDALWOOD LAKES NORTH HOA	PUMP	150	E	On-site Lake(s)	1	43	42
50-05044-W	080206-7	111536	VILLAGE OF SANDALWOOD LAKES SOUTH	PUMP	165	E	On-site Lake(s)	7	43	43
50-05044-W	080206-7	111537	VILLAGE OF SANDALWOOD LAKES SOUTH	PUMP	165	E	On-site Lake(s)	7	43	43
50-05044-W	080206-7	111539	VILLAGE OF SANDALWOOD LAKES SOUTH	PUMP	165	E	On-site Lake(s)	7	43	43
50-05044-W	080206-7	111538	VILLAGE OF SANDALWOOD LAKES SOUTH	PUMP	165	E	On-site Lake(s)	7	43	43
50-06455-W	040421-7	150205	VILLAGE SHOPPES	WELL	100	P	Surficial Aquifer System	21	42	43
50-05219-W	020516-20	113274	VILLAGE SQUARE PROFESSIONAL PARK PHASE II	WELL	40	E	Surficial Aquifer System	8	42	43
50-05197-W	010925-6	112897	VILLAGER THE	WELL	0	A	Water Table Aquifer	16	42	43
50-05197-W	010925-6	112898	VILLAGER THE	WELL	30	P	Water Table Aquifer	16	42	43
50-03363-W	940930-20	34988	VILLAGES OF PALM BEACH LAKES TRACT "M"	PUMP	110	P	On-site Lake(s)	18	43	43
50-02147-W	010416-5	106677	VISTA DEL LAGO	WELL	100	P	Surficial Aquifer System	17	43	43
50-06929-W	040525-21	172465	WAL-MART STORE 3348-00 PALM BEACH GARDENS / LAKE PARK FL	PUMP	120	P	On-site Lake(s)/Pond(s)	19	42	43
50-06494-W	040521-11	152099	WAREHOUSE FOR VCKVC PARTNERSHIP AT HAVERHILL PARK - LOT 2	WELL	300	P	Surficial Aquifer System	2	43	42
50-04727-W	001206-10	103380	WATER TOWER INDUSTRIAL PARK	WELL	30	P	Surficial Aquifer System	20	42	43
50-04383-W	990806-5	30911	WATERTOWER ROAD WAREHOUSES	WELL	50	P	Surficial Aquifer System	20	42	43
50-06352-W	040205-7	147170	WCI PARCEL 41 CITY SIDE	PUMP	400	P	Water Table aquifer	20	43	43
50-06295-W	040108-4	145538	WENDY'S AT PARADISE PLACE	WELL	55	P	Surficial Aquifer System	11	43	42
50-07544-W	060822-16	194221	WESLEY OLDHAM MANGONIA PARK WAREHOUSE	WELL	100	P	Surficial Aquifer System	5	43	43
50-04837-W	010313-2	105658	WEST GATE SHEET METAL	WELL	30	P	Surficial Aquifer System	33	42	43
50-05521-W	021031-19	119812	WEST LAKES APARTMENTS	WELL	70	E	Surficial Aquifer System	19	42	43
50-05521-W	021031-19	125553	WEST LAKES APARTMENTS	WELL	70	P	Surficial Aquifer System	19	42	43
50-05521-W	021031-19	125554	WEST LAKES APARTMENTS	WELL	70	P	Surficial Aquifer System	19	42	43
50-05521-W	021031-19	125555	WEST LAKES APARTMENTS	WELL	70	P	Surficial Aquifer System	19	42	43
50-06496-W	040720-2	153959	WEST PALM COMMERCE PARK	PUMP	100	P	On-site Lake(s)	2	43	42
50-05706-W	031031-22	125121	WEST PALM COMMERCE PARK AND HAVERHILL COMMERCE PARK	PUMP	40	P	On-site Lake(s)	2	43	42
50-05706-W	031031-22	125111	WEST PALM COMMERCE PARK AND HAVERHILL COMMERCE PARK	WELL	40	P	Surficial Aquifer System	2	43	42
50-05706-W	031031-22	125110	WEST PALM COMMERCE PARK AND HAVERHILL COMMERCE PARK	WELL	40	P	Surficial Aquifer System	2	43	42
50-02745-W	011210-19	29780	WESTGATE ELEMENTARY	WELL	100	E	Surficial Aquifer System	30	43	43
50-02745-W	011210-19	112325	WESTGATE ELEMENTARY	WELL	150	P	Surficial Aquifer System	30	43	43
50-07682-W	061013-22	195953	WESTGATE LOT 13	WELL	70	P	Surficial Aquifer System	31	42	43
50-07682-W	061013-22	195954	WESTGATE LOT 13	WELL	70	P	Surficial Aquifer System	31	42	43
50-05108-W	010720-2	110380	WESTROAD PLAZA	WELL	50	E	Surficial Aquifer System	36	42	42
50-07949-W	070605-22	214461	WESTWARD ELEMENTARY	WELL	175	E	Surficial Aquifer System	17	43	43
50-06799-W	050125-11	167945	WMIF DELTA RECYCLING RIVIERA BEACH FACILITY	WELL	33.3	P	Surficial Aquifer System	25	42	42
50-06799-W	050125-11	167945	WMIF DELTA RECYCLING RIVIERA BEACH FACILITY	WELL	33.3	P	Surficial Aquifer System	25	42	42
50-07113-W	050815-6	182420	WOODBINE COMMONS COMMERCIAL	WELL	90	P	Surficial Aquifer System	25	42	42
50-03320-W	070808-29	216305	WOODBINE TRAIL LANDSCAPE & IRRIGATION	PUMP	25	E	On-site Lake(s)	25	42	42
50-03320-W	070808-29	216304	WOODBINE TRAIL LANDSCAPE & IRRIGATION	PUMP	25	E	On-site Lake(s)	25	42	42
50-03320-W	070808-29	216303	WOODBINE TRAIL LANDSCAPE & IRRIGATION	PUMP	50	E	On-site Lake(s)	25	42	42
50-03320-W	070808-29	34777	WOODBINE TRAIL LANDSCAPE & IRRIGATION	PUMP	50	E	On-site Lake(s)	25	42	42
50-03320-W	070808-29	216302	WOODBINE TRAIL LANDSCAPE & IRRIGATION	PUMP	50	E	On-site Lake(s)	25	42	42
50-00257-W	931223-138	13836	WOODLAWN CEMETERY	WELL	260	E	Surficial Aquifer System	28	43	43
50-00247-W	931223-137	37537	WPB AUDITORIUM/STADIUM	PUMP	600	E	Clear Lake	17,20	43	43
50-08219-W	071106-12	218271	WPB H 45TH STREET CEV SLC	WELL	50	E	Surficial Aquifer System	5	43	43
50-08219-W	071106-12	218271	WPB H 45TH STREET CEV SLC	WELL	50	E	Surficial Aquifer System	5	43	43
50-04675-W	000816-1	101270	WPTV 5 - A SCRIPPS HOWARD TELEVISION STATION	WELL	45	P	Surficial Aquifer System	21	43	43
50-07761-W	070110-22	197072	ZEIGER CRANE (RIVIERA BEACH)	WELL	100	P	Surficial Aquifer System	36	42	42

Source: SFWMD, 2008 (Database for Consumptive Use Permits).

TABLE 3.3.4-1

**WATER QUALITY DATA SUBMITTED FOR RIVIERA PLANT PURSUANT TO FDEP INDUSTRIAL
WASTEWATER FACILITY PERMIT**

Parameter		D-013, D-014, D0183, D0184		D0163, D0164
		Intake Max. Daily	Effluent Max. Daily	Effluent Max. Daily
Carbonaceous Biochemical Oxygen Demand	mg/L	14.6	14	12.8
Chemical Oxygen Demand	mg/L	406	473	8
Total Organic Carbon	mg/L	0.57	1.6	1.5
Total Suspended Solids	mg/L	76	50	< 3
Total Nitrogen (as N)	mg/L	1.21	1.21	0.31
Total Phosphorus (as P)	mg/L	< 0.01	< 0.01	0.06
Ammonia (as N)	mg/L	0.13	< 0.1	0.18
Flow	MGD		439	0.036
Specific Conductivity	umhos	51,800	51,600	600
Temperature (summer)	°F		105.6	
pH			7.68	6.89
Bromide	mg/L	3.18	3.18	NA
Color	CU	5	5	10
Fecal Coliform	col/100 mL	2	2	NA
Fluoride	mg/L	< 1	< 1	NA
Nitrate-Nitrite (as N)	mg/L	< 2.3	< 2.3	< 0.5
Nitrogen, Total Organic (N)	mg/L	0	0.01	0
Oil and Grease	mg/L	< 1.4	< 1.4	< 1.4
Phosphorus, Total (P)	mg/L	< 0.01	0.01	0.06
Sulfate (as SO4)	mg/L	3000	2800	NA
Surfactants	mg/L	< 0.043	< 0.043	NA
Aluminum, Total	mg/L	< 130	< 130	< 40
Iron, Total	ug/L	550	570	< 5
Magnesium, Total	mg/L	1300	1300	NA
Molybdenum, Total	ug/L		NA	51.3
Manganese, Total	ug/L		NA	< 2
Antimony, Total	ug/L	< 13	< 13	< 5
Arsenic, Total	ug/L	< 5	< 5	< 2
Beryllium, Total	ug/L	< 0.6	< 0.6	< 0.1
Cadmium, Total	ug/L	< 5	< 5	< 0.5
Chromium, Total	ug/L	< 3	< 3	< 3
Copper, Total	ug/L	3.7	4.7	6.4
Lead, Total	ug/L	< 10	< 10	2.8
Mercury, Total	ug/L	0.00048	< 0.0004	< 2E-04
Nickel, total	ug/L	< 2	< 2	< 4
Selenium, Total	ug/L	< 4	< 4	< 3
Silver, Total	ug/L	< 0.8	< 0.8	< 2
Thallium, Total	ug/L	7.1	7.1	< 1.3
Zinc, Total	ug/L	< 6	< 6	< 6.2
Cyanide, Total	ug/L	< 0.0067	< 0.0067	< 0.007
Phenols, Total	ug/L	< 0.34	< 0.34	< 0.007
Acrolein	ug/L	< 2	< 2	< 2
Acrylonitrile	ug/L	< 2.4	< 2.4	< 2.4
Benzene	ug/L	< 0.28	< 0.28	< 0.28
Bromoform	ug/L	0.27	< 0.27	< 0.27
Carbon Tetrachloride	ug/L	< 0.44	< 0.44	< 0.44
Chlorobenzene	ug/L	< 0.33	< 0.33	< 0.033
Chlorodi-bromomethane	ug/L	< 0.18	< 0.18	< 0.18
Chloroethane	ug/L	< 0.42	< 0.42	< 0.42
2-Chloro-ethylvinyl Ether	ug/L	< 1.2	< 1.2	< 1.2
Chloroform	ug/L	< 0.26	< 0.26	< 0.26
Dichloro-bromomethane	ug/L	< 0.21	< 0.21	< 0.21
Dichloro-difluoromethane	ug/L	< 0.88	< 0.88	< 0.88
1,1-Dichloroethane	ug/L	< 0.23	< 0.23	< 0.23
1,2-Dichloroethane	ug/L	< 0.23	< 0.23	< 0.23
1,1-Dichloroethylene	ug/L	< 0.38	< 0.38	< 0.38
1,2-Dichloropropane	ug/L	< 0.21	< 0.21	< 0.21
1,3-Dichloropropylene	ug/L	< 0.19	< 0.19	< 0.19
Ethylbenzene	ug/L	< 0.25	< 0.25	< 0.25
Methyl Bromide	ug/L	< 0.36	< 0.36	< 0.36
Methyl Chloride	ug/L	< 0.89	< 0.89	< 0.89
Methylene Chloride	ug/L	0.43	< 0.34	< 0.34
1,1,2,2-Tetra-chloroethane	ug/L	< 0.36	< 0.36	< 0.36

TABLE 3.3.4-1

**WATER QUALITY DATA SUBMITTED FOR RIVIERA PLANT PURSUANT TO FDEP INDUSTRIAL
WASTEWATER FACILITY PERMIT**

Parameter		Intake Max. Daily	D-013, D-014, D0183, D0184	D0163, D0164
			Effluent Max. Daily	Effluent Max. Daily
Tetrachloroethylene	ug/L	< 0.32	< 0.32	< 0.32
Toluene	ug/L	< 0.25	< 0.25	< 0.25
1,2 Trans-Dichloroethylene	ug/L	< 0.3	< 0.3	< 0.3
1,1,1-Trichloroethane	ug/L	< 0.22	< 0.22	< 0.22
1,1,2-Trichloroethane	ug/L	< 0.3	< 0.3	< 0.3
Trichloroethylene	ug/L	< 0.35	< 0.35	< 0.35
Trichloro-fluoromethane	ug/L	< 0.26	< 0.27	< 0.26
Vinyl Chloride	ug/L	< 0.35	< 0.35	< 0.35
2-Chlorophenol	ug/L	< 1.6	< 1.5	< 1.7
2,4-Dichlorophenol	ug/L	< 1.8	< 1.5	< 1.9
2,4-Dimethylphenol	ug/L	< 1.3	< 1.3	< 1.4
4,6-Dinitro-O-Cresol	ug/L	< 1	< 1.1	< 1.1
2,4-Dinitrophenol	ug/L	< 1.2	< 1.2	< 1.3
2-Nitrophenol	ug/L	< 1.5	< 1.5	< 1.7
4-Nitrophenol	ug/L	< 2.9	< 2.9	< 3.2
P-Chloro-M-Cresol	ug/L	< 1.2	< 1.2	< 1.7
Pentachlorophenol	ug/L	< 1.8	< 1.8	< 2
Phenols, Total	ug/L	< 2	< 2	< 2.2
2,4,5-Trichloro-phenol	ug/L	< 1.6	< 1.6	< 1.7
Acenaphthene	ug/L	< 0.014	< 0.014	< 0.016
Acenaphthylene	ug/L	< 0.02	< 0.02	< 0.022
Anthracene	ug/L	< 0.013	< 0.013	0.88
Benzidine	ug/L	< 0.95	< 0.94	< 1
Benzo (a) Anthracene	ug/L	< 0.026	< 0.025	2.4
Benzo (a) Pyrene	ug/L	< 0.017	< 0.017	0.71
3,4-Benzo-fluoranthene	ug/L	< 0.0082	< 0.0081	0.83
Benzo (ghi) Perylene	ug/L	< 0.01	< 0.01	0.25
Benzo (k) Fluoranthene	ug/L	< 0.01	< 0.01	< 0.011
Bis (2-Chloroethoxy) Methane	ug/L	< 1.8	< 1.8	< 2
Bis (2-Chloroethyl) ether	ug/L	< 2.5	< 2.4	< 2.7
Bis (2-Chloroisopropyl) Ether	ug/L	< 1.6	< 1.6	< 1.7
Bis (2-Ethylhexyl) Phthalate	ug/L	< 2.4	< 2.4	< 2.6
4-Bromophenyl Phenyl Ether	ug/L	< 1.4	< 2.3	< 1.6
Butyl Benzyl Phthalate	ug/L	< 2	< 2	< 2.2
2-Chloronaphthalene	ug/L	< 1.2	< 1.2	< 1.3
4-Chlorophenyl Phenyl Ether	ug/L	< 1.5	< 1.5	< 1.7
Chrysene	ug/L	0.012	< 0.012	2.8
Dibenzo (a,h) Anthracene	ug/L	< 0.01	< 0.01	0.22
1,2-Dichlorobenzene	ug/L	< 0.92	< 0.91	< 1
1,3-Dichlorobenzene	ug/L	< 1.5	< 1.5	< 1.7
1,4-Dichlorobenzene	ug/L	< 0.48	< 0.47	< 0.52
3,3-Dichlorobenzene	ug/L	< 1.2	< 1.2	< 1.3
Diethyl Phthalate	ug/L	< 1.5	< 1.5	< 1.6
Dimethyl Phthalate	ug/L	< 1.7	< 1.7	< 1.9
Di-N-Butyl Phthalate	ug/L	< 0.88	< 0.87	< 1.6
2,4-Dinitrotoluene	ug/L	< 2.3	< 1.3	< 2.6
2,6-Dinitrotoluene	ug/L	< 1.3	< 2.3	< 1.4
Di-N-Octyl Phthalate	ug/L	< 1.5	< 1.5	< 1.6
1,2-Diphenylhydrazine (as Azobenzene)	ug/L	< 0.53	< 0.53	< 0.58
Fluoranthene	ug/L	< 0.022	< 0.022	1.5
Fluorene	ug/L	< 0.011	< 0.011	0.07
Hexachlorobenzene	ug/L	< 1.7	< 1.7	< 1.9
Hexachlorobutadiene	ug/L	< 1.8	< 1.8	< 2
Hexachlorocyclopentadiene	ug/L	< 1.4	< 1.4	< 1.5
Hexachloroethane	ug/L	< 1.4	< 1.4	< 1.5
Indeno (1,2,3-cd) Pyrene	ug/L	< 0.015	< 0.015	0.6
Isophorone	ug/L	< 1.8	< 1.8	< 2
Naphthalene	ug/L	< 0.012	< 0.012	< 0.013
Nitrobenzene	ug/L	< 1.8	< 1.8	< 2
N-Nitrosodimethylamine	ug/L	< 1.6	< 1.6	< 1.8
N-Nitrosodi-N-Propylamine	ug/L	< 1.4	< 1.4	< 1.6
N-Nitro-sodiphenylamine	ug/L	< 1.6	< 1.6	< 1.8
Phenanthrene	ug/L	< 0.018	< 0.018	10
Pyrene	ug/L	< 0.081	< 0.08	6.1
1,2,4-Trichlorobenzene	ug/L	< 1.6	< 1.6	< 1.7

Source: FPL, 2008.

TABLE 3.3.6-1

**THREATENED, ENDANGERED, AND SPECIES OF SPECIAL CONCERN KNOWN TO
OCCUR WITHIN PALM BEACH COUNTY, FLORIDA**

Scientific Name	Common Name	Federal Status	State Status
<u>Plants</u>			
<i>Acrostichum aureum</i>	Golden Leather Fern	N	T
<i>Argusia gnaphalodes</i>	Sea Lavender	N	E
<i>Asimina tetramera</i>	Four-petal Pawpaw	E	E
<i>Calopogon multiflorus</i>	Many-flowered Grass-pink	N	E
<i>Chamaesyce cumulicola</i>	Sand-dune Spurge	N	E
<i>Cladonia perforata</i>	Perforate Reindeer Lichen	E	E
<i>Coccothrinax argentata</i>	Silver Palm	N	T
<i>Conradina grandiflora</i>	Large-flowered Rosemary	N	T
<i>Cucurbita okeechobeensis</i>	Okeechobee Gourd	E	E
<i>Glandularia maritima</i>	Coastal Vervain	N	E
<i>Halophila johnsonii</i>	Johnson's Seagrass	T	N
<i>Jacquemontia reclinata</i>	Beach Jacquemontia	E	E
<i>Lantana depressa</i> var. <i>floridana</i>	Atlantic Coast Florida Lantana	N	E
<i>Lechea cernua</i>	Nodding Pinweed	N	T
<i>Lechea divaricata</i>	Pine Pinweed	N	E
<i>Linum carteri</i> var. <i>smallii</i>	Small's flax	N	E
<i>Nemastylis floridana</i>	Celestial Lily	N	E
<i>Okenia hypogaea</i>	Burrowing Four-o'clock	N	E
<i>Ophioglossum palmatum</i>	Hand Fern	N	E
<i>Panicum abscissum</i>	Cutthroat Grass	N	E
<i>Polygala smallii</i>	Tiny Polygala	E	E
<i>Pteris bahamensis</i>	Bahama Brake	N	T
<i>Pteroglossaspis ecristata</i>	Giant Orchid	N	T
<i>Sacoila lanceolata</i> var. <i>paludicola</i>	Fahkahatchee Ladies' -tresses	N	T
<i>Schizaea pennula</i>	Ray Fern	N	E
<i>Tephrosia angustissima</i> var. <i>curtissii</i>	Coastal Hoary-pea	N	E
<i>Thelypteris serrata</i>	Toothed Maiden Fern	N	E
<i>Tillandsia flexuosa</i>	Banded Wild-pine	N	T
<i>Tolumnia bahamensis</i>	Dancing-lady Orchid	N	E
<u>Gastropods</u>			
<i>Orthalicus reses reses</i>	Stock Island Tree Snail	T	E
<u>Amphibians</u>			
<i>Rana capito</i>	Gopher Frog	N	SSC
<u>Reptiles</u>			
<i>Alligator mississippiensis</i>	American Alligator	T (SA)	SSC
<i>Caretta caretta</i>	Loggerhead	T	T
<i>Chelonia mydas</i>	Green Turtle	E	E
<i>Crocodylus acutus</i>	American Crocodile	T	E

TABLE 3.3.6-1

**THREATENED, ENDANGERED, AND SPECIES OF SPECIAL CONCERN KNOWN TO
OCCUR WITHIN PALM BEACH COUNTY, FLORIDA**

Scientific Name	Common Name	Federal Status	State Status
<i>Dermochelys coriacea</i>	Leatherback	E	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	T	T
<i>Eretmochelys imbricata</i>	Hawksbill	E	E
<i>Gopherus polyphemus</i>	Gopher Tortoise	N	T
<i>Lepidochelys kempii</i>	Kemp's Ridley	E	E
<i>Pituophis melanoleucus mugitus</i>	Florida Pine Snake	N	SSC
<u>Birds</u>			
<i>Aphelocoma coerulescens</i>	Florida Scrub-jay	T	T
<i>Aramus guarauna</i>	Limpkin	N	SSC
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	N	SSC
<i>Caracara cheriway</i>	Crested Caracara	T	T
<i>Charadrius melodus</i>	Piping Plover	T	T
<i>Egretta caerulea</i>	Little Blue Heron	N	SSC
<i>Egretta thula</i>	Snowy Egret	N	SSC
<i>Egretta tricolor</i>	Tricolored Heron	N	SSC
<i>Eudocimus albus</i>	White Ibis	N	SSC
<i>Falco peregrinus</i>	Peregrine Falcon	N	E
<i>Falco sparverius paulus</i>	Southeastern American Kestrel	N	T
<i>Grus canadensis pratensis</i>	Florida Sandhill Crane	N	T
<i>Haematopus palliatus</i>	American Oystercatcher	N	SSC
<i>Mycteria americana</i>	Wood Stork	E	E
<i>Pelecanus occidentalis</i>	Brown Pelican	N	SSC
<i>Picoides borealis</i>	Red-cockaded Woodpecker	E	SSC
<i>Platalea ajaja</i>	Roseate Spoonbill	N	SSC
<i>Rostrhamus sociabilis plumbeus</i>	Snail Kite	E	E
<i>Rynchops niger</i>	Black Skimmer	N	SSC
<i>Sterna antillarum</i>	Least Tern	N	T
<u>Mammals</u>			
<i>Podomys floridanus</i>	Florida Mouse	N	SSC
<i>Puma concolor coryi</i>	Florida Panther	E	E
<i>Sciurus niger shermani</i>	Sherman's Fox Squirrel	N	SSC
<i>Trichechus manatus</i>	Manatee	E	E
<i>Ursus americanus floridanus</i>	Florida Black Bear	N	T

Notes:

E = Endangered

N = Not currently listed, nor currently being considered for listing

SSC = Species of Special Concern

T = Threatened

T (SA) = Threatened due to similarity of appearance to the American crocodile (*Crocodylus acutus*)

Source: Florida Natural Areas Inventory, 2008.

TABLE 3.3.7-1
MONTHLY AND ANNUAL AVERAGE TEMPERATURES
MEASURED AT PALM BEACH INTERNATIONAL AIRPORT

Month	Daily Temperatures (°F)^a			Extremes (°F)^b	
	Average	Maximum	Minimum	Maximum	Minimum
January	66.2	75.1	57.3	89	27
February	67.2	76.3	58.2	90	32
March	70.6	79.2	61.9	94	30
April	73.8	82.1	65.4	99	43
May	78.2	85.9	70.5	96	51
June	81.2	88.5	73.8	98	61
July	82.5	90.1	75.0	101	66
August	82.8	90.1	75.4	99	65
September	81.7	88.7	74.7	97	66
October	78.1	85.0	71.2	95	46
November	73.1	80.4	65.8	91	36
December	68.3	76.4	60.1	90	28
Annual	75.3	83.2	67.4	101	27

^a 30-year period of record, climatological normal, 1971 to 2000.

^b 70-year period of record, 1938 to 2007.

Source: National Oceanic and Atmospheric Administration (NOAA), 2007.

TABLE 3.3.7-2**MONTHLY AND ANNUAL AVERAGE PRECIPITATION AND RELATIVE HUMIDITY
MEASURED AT PALM BEACH INTERNATIONAL AIRPORT**

Month	Precipitation (inches)			Humidity (%) hour (LT)^a			
	Average^a	Maximum^b	Minimum^b	1 a.m.	7 a.m.	1 p.m.	7 p.m.
January	3.75	11.18	0.22	82	84	59	73
February	2.55	8.71	0.29	81	84	57	70
March	3.68	16.78	0.33	79	82	56	68
April	3.57	18.26	0.04	77	80	55	66
May	5.39	15.22	0.39	80	80	59	71
June	7.58	20.09	1.07	85	84	65	76
July	5.97	17.74	1.22	85	85	64	75
August	6.65	13.52	1.73	85	86	64	76
September	8.10	29.40	1.77	85	87	66	78
October	5.46	18.74	0.56	81	84	62	75
November	5.55	14.63	0.23	81	84	62	74
December	3.14	11.69	0.06	82	84	61	74
Year	61.39	85.89 ^c	38.66 ^c	82	84	61	73

Note: LT = local time.

^a 30-year period of record, climatological normal, 1971 to 2000.

^b 68-year period of record, 1940 to 2007.

^c 30-year period of record, 1978 to 2007.

Source: NOAA, 2007.

TABLE 3.3.7-3

**SEASONAL AND ANNUAL AVERAGE WIND DIRECTION AND WIND SPEED
MEASURED AT PALM BEACH INTERNATIONAL AIRPORT^a**

Season	Average Wind Speed (mph)	Calm (%)	Prevailing Wind Direction
Winter	9.0	9.6	East
Spring	9.6	9.2	East
Summer	7.7	16.3	East-southeast
Fall	9.3	9.7	East
Annual	8.9	11.2	East

^a 5-year period of record, 2001 to 2005. The data for this period were also used in the air quality impact analyses for the Project.

Source: NOAA, 2001-2005.

TABLE 3.3.7-4

**SEASONAL AND ANNUAL AVERAGE ATMOSPHERIC STABILITY CLASSES
DETERMINED AT PALM BEACH INTERNATIONAL AIRPORT^a**

Season	Occurrence (%) of Stability Class					
	Very Unstable	Moderately Unstable	Slightly Unstable	Neutral	Slightly Stable	Moderately Stable
Winter	0.2	3.3	10.5	44.1	17.7	24.3
Spring	0.9	5.6	15.8	43.0	16.6	18.1
Summer	1.5	10.6	20.9	25.1	13.8	28.1
Fall	0.5	4.8	13.5	40.2	17.9	23.1
Annual	0.8	6.1	15.2	38.1	16.5	23.4

^a 5-year period of record, 2001-2005. The data for this period were also used in the air quality impact analyses for the Project.

Source: NOAA, 2001-2005.

TABLE 3.3.7-5**SEASONAL AND ANNUAL AVERAGE MORNING AND AFTERNOON MIXING HEIGHTS DETERMINED AT PALM BEACH INTERNATIONAL AIRPORT^a**

Season	Mixing Height (m)	
	Morning	Afternoon
Winter	853	1,835
Spring	1,248	2,342
Summer	849	2,168
Fall	1,025	2,055
Annual	995	2,101

^a 5-year period of record, 2001 to 2005. The data for this period were also used in the air quality impact analyses for the Project. Mixing heights based on surface temperatures and upper-air data from the NWS stations at Palm Beach International Airport and Miami, respectively.

Source: NOAA, 2001-2005.

**TABLE 3.3.7-6
NATIONAL AND STATE AAQS, ALLOWABLE PSD INCREMENTS, AND SIGNIFICANT IMPACT LEVELS**

Pollutant	Averaging Time	National AAQS (µg/m³) ^a		Florida AAQS ^a (µg/m³)	Significant Impact			
		Primary Standard	Secondary Standard		PSD Increments (µg/m³) ^a		Levels (µg/m³) ^b	
					Class I	Class II	Class I	Class II
Particulate Matter ^c (PM ₁₀)	Annual Arithmetic Mean	NA	NA	50	4	17	0.2	1
	24-Hour Maximum	150	150	150	4	30	0.3	5
Particulate Matter ^c (PM _{2.5})	Annual Arithmetic Mean	15	15	NA	NA	NA	NA	NA
	24-Hour Maximum	35	35	NA	NA	NA	NA	NA
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	0.1	1
	24-Hour Maximum	365	NA	260	5	91	0.2	5
	3-Hour Maximum	NA	1,300	1,300	25	512	1.0	25
Carbon Monoxide	8-Hour Maximum	10,000	10,000	10,000	NA	NA	NA	500
	1-Hour Maximum	40,000	40,000	40,000	NA	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	0.1	1
Ozone ^d	1-Hour Maximum ^d	NA	NA	235	NA	NA	NA	NA
	8-Hour Maximum ^e	147	147	NA	NA	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA	NA

Note: Particulate matter (PM₁₀) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.

Particulate matter (PM_{2.5}) = particulate matter with aerodynamic diameter less than or equal to 2.5 micrometers.

NA = Not applicable, i.e., no standard exists or not promulgated yet.

^a Short-term maximum concentrations are not to be exceeded more than once per year, except for PM₁₀, PM_{2.5}, and O₃ AAQS which are based on a number of expected exceedances.

^b Maximum concentrations are not to be exceeded.

^c PM_{2.5}: 24-hour standard based on the 3-year averages of the 98th percentile values; annual standard based on 3-year average at community monitors. These standards must be implemented in the 2007-2008 timeframe. On October 17, 2006, EPA finalized the PM AAQS (71 FR 61236). The 24-hour PM_{2.5} standard was changed to 35 $\mu\text{g}/\text{m}^3$. Annual PM₁₀ standard was revoked by EPA. The FDEP has not yet adopted the revised PM₁₀ or PM_{2.5} standards.

^d 1-hour standard of 0.12 ppm was revoked by EPA on June 15, 2005; FDEP has not yet adopted this change.

^e 8-hour standard was lowered by EPA from 0.08 to 0.075 ppm on March 27, 2008, achieved when the 3-year average of 99th percentile values is 0.075 ppm or less. FDEP had not yet adopted the revised standard.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978; 40 CFR 50; 40 CFR 52.21; Florida Chapter 62.204, F.A.C. Golder, 2006.

TABLE 3.3.7-7
SUMMARY OF MAXIMUM MEASURED SO₂, NO₂, PM₁₀, PM_{2.5}, O₃, AND CO CONCENTRATIONS
2005 THROUGH 2008

Pollutant/ AIRS Site No.	Location	County	Measurement Period		Measured Concentration									
					1-Hour		3-Hour		8-Hour		8-Hour	24-Hour		Annual
					Highest	2nd Highest	Highest	2nd Highest	Highest	2nd Highest	3-year Average 4th Highest	Highest	2nd Highest	Average
<u>Sulfur dioxide</u> 12-099-3004	Florida AAQS Riviera Beach/ 1050 15th Street	Palm Beach	2008	Jan-Sep	NA	NA	NA	0.5 ppm	NA	NA	NA	NA	0.1 ppm	0.02 ppm
				Jan-Dec	NA	NA	0.004	0.004	NA	NA	NA	0.004	0.004	0.0017
				Jan-Dec	NA	NA	0.004	0.004	NA	NA	NA	0.002	0.002	0.0010
				Jan-Dec	NA	NA	0.003	0.002	NA	NA	NA	0.002	0.002	0.0011
				Jan-Dec	NA	NA	0.003	0.003	NA	NA	NA	0.003	0.003	0.0012
<u>Nitrogen dioxide</u> 12-099-1004	Florida AAQS Palm Beach/ 3700 Belvedere Road	Palm Beach	2008	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.053 ppm
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0075
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0080
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0096
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0086
<u>PM₁₀</u> ^a 12-099-0008	Florida AAQS Belle Glade/ 38754 State Road 80	Palm Beach	2008	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	NA	150 µg/m ³	50 µg/m ³
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	79	49	19.5
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	60	37	16.5
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	52	42	20.1
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	41	38	17.6
			2008	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	60	48	23.3
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	67	43	23.6
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	54	49	25.9
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	79	60	23.5
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
			2007	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	NA	17.1	6.67
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	18.6	7.19
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	7.2	4.90
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	18.8	7.95
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	17.6	7.34
<u>PM_{2.5}</u> ^a 12-099-0008	Florida AAQS Belle Glade/ 38754 State Road 80	Palm Beach	2008	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	NA	(35 µg/m ³)	(15 µg/m ³)
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	17.1	6.67
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	18.6	7.19
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	7.2	4.90
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	18.8	7.95
			2008	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	NA	17.6	7.34
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	20.5	7.03
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	17.0	7.76
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	17.7	7.84
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
			2007	Jan-Sep	NA	NA	NA	NA	NA	NA	NA	NA	17.1	6.67
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	18.6	7.19
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	7.2	4.90
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	18.8	7.95
				Jan-Dec	NA	NA	NA	NA	NA	NA	NA	NA	17.6	7.34
<u>Ozone</u> ^b 12-099-0009	Florida AAQS Royal Palm Beach/ 980 Crestwood Blvd. N. Wastewater Treatment Plant	Palm Beach	2008	Jan-Sep	NA	0.12 ppm	NA	NA	NA	NA	0.08 ppm	NA	NA	NA
				Jan-Dec	0.084	0.074	NA	NA	NA	NA	0.068	NA	NA	NA
				Jan-Dec	0.068	0.066	NA	NA	NA	NA	0.066	NA	NA	NA
				Jan-Dec	0.101	0.093	NA	NA	NA	NA	0.067	NA	NA	NA
				Jan-Dec	0.080	0.079	NA	NA	NA	NA	0.066	NA	NA	NA
			2008	Jan-Sep	0.105	0.070	NA	NA	NA	NA	0.066	NA	NA	NA
				Jan-Dec	0.098	0.092	NA	NA	NA	NA	0.065	NA	NA	NA
				Jan-Dec	0.095	0.086	NA	NA	NA	NA	0.057	NA	NA	NA
				Jan-Dec	0.089	0.078	NA	NA	NA	NA	NA	NA	NA	NA
				Jan-Dec	0.089	0.078	NA	NA	NA	NA	NA	NA	NA	NA
			2007	Jan-Sep	0.105	0.070	NA	NA	NA	NA	0.066	NA	NA	NA
				Jan-Dec	0.098	0.092	NA	NA	NA	NA	0.065	NA	NA	NA
				Jan-Dec	0.095	0.086	NA	NA	NA	NA	0.057	NA	NA	NA
				Jan-Dec	0.089	0.078	NA	NA	NA	NA	NA	NA	NA	NA
				Jan-Dec	0.089	0.078	NA	NA	NA	NA	NA	NA	NA	NA
<u>Carbon monoxide</u> 12-099-1004	Florida AAQS Palm Beach/ 3700 Belvedere Road	Palm Beach	2008	Jan-Sep	NA	35 ppm	NA	NA	NA	9 ppm	NA	NA	NA	NA
				Jan-Dec	1.6	1.5	NA	NA	1.1	1.0	NA	NA	NA	NA
				Jan-Dec	2.7	2.1	NA	NA	1.4	1.3	NA	NA	NA	NA
				Jan-Dec	5.8	2.8	NA	NA	1.9	1.8	NA	NA	NA	NA
				Jan-Dec	4.3	3.4	NA	NA	2.7	2.2	NA	NA	NA	NA

Note: NA = not applicable.
 AAQS = ambient air quality standard.

^a On October 17, 2006, EPA promulgated revised PM₁₀ and PM_{2.5} AAQS; the PM_{2.5} AAQS had been promulgated on July 18, 1997. For PM₁₀, the annual standard was revoked and the 24-hour standard was retained. The 24-hour PM_{2.5} standard was revised to 35 µg/m³ based on the 3-year averages of the 98th percentile values. The annual PM_{2.5} standard of 15 µg/m³, 3-year averages at community monitors, was retained. As of August 2008, Florida DEP has not yet adopted the revised standards.

^b On July 18, 1997, EPA promulgated revised AAQS for ozone. The O₃ standard was modified to be 0.08 ppm for the 8-hour average; achieved when the 3-year average of 99th percentile values is 0.08 ppm or less. On March 27, 2008, EPA revised the 8-hour average ozone AAQS to 0.075 ppm, effective May 27, 2008. The format of the standard remained the same as the previous promulgation. As of December 2008, Florida DEP has not yet adopted the revised standards.



TABLE 3.3.8-1

BASELINE AMBIENT SOUND PRESSURE LEVELS MEASURED AT THE FPL RIVIERA PLANT, MARCH 2008

Site	Coordinates	Date	Time	Sound Levels (dBA)				Observations
				Min	Max	L ₉₀	L ₅₀	
1: Onsite Northwest corner of Tank yard	26° 45' 56.1" N	27-Mar-08	Daytime	59	70	60	62	Unit 3 low load, gas yard, constant traffic on Rt. 1
	080° 03' 15.9"W	27-Mar-08	Nighttime	58	65	58	59	Unit 3 low load, gas yard, traffic on Rt. 1
2: Onsite Northeast corner of property	26° 45' 56.2" N	27-Mar-08	Daytime	58	75	60	61	Unit 3 low load, port noise, boat traffic
	080° 03' 02.8"W	27-Mar-08	Nighttime	57	61	58	58	Unit 3 low load, intercoastal noise, insect noise
3: Onsite Southwest corner by Gate #10	26° 45' 48.3" N	27-Mar-08	Daytime	57	74	58	59	Unit 3 low load, constant traffic on Rt. 1
	080° 03' 15.4"W	27-Mar-08	Nighttime	56	60	57	58	Unit 3 low load, traffic on Rt. 1, insect noise
4: Onsite Southeast corner by training building	26° 45' 48.1" N	27-Mar-08	Daytime	55	68	57	59	Unit 3 low load, bird noise
	080° 03' 03.9"W	27-Mar-08	Nighttime	54	59	56	57	Unit 3 low load, insect noise
5: At condo to the South of the Site	26° 45' 39.3" N	27-Mar-08	Daytime	47	68	49	55	Light traffic, air plane noise, Unit 3 low load
	080° 03' 08.0"W	27-Mar-08	Nighttime	47	69	48	50	Light traffic, insects, wind, Unit 3 low load
6: At the Marina to the North near Newcomb Hall	26° 46' 23.9" N	27-Mar-08	Daytime	49	74	51	53	Marina noise, light traffic
	080° 03' 09.9"W	27-Mar-08	Nighttime	48	68	49	50	Light traffic, insect noise
7: West of the Site along the transmission line	26° 45' 49.30" N	27-Mar-08	Daytime	50	67	52	54	Transmission line construction, traffic, Unit 3 low load
	080° 03' 30.6"W	27-Mar-08	Nighttime	47	57	49	51	Insect noise, Unit 3 low load
8: East of Site on Palm Beach Island	26° 45' 47.5" N 080° 02' 28.0"W	27-Mar-08	Daytime	44	65	46	47	Boat traffic, wind
9: South of Site at Gate #9	26° 45' 47.5" N 080° 03' 07.9"W	27-Mar-08	Nighttime	60	65	60	61	Unit 3 low load, light traffic, insects

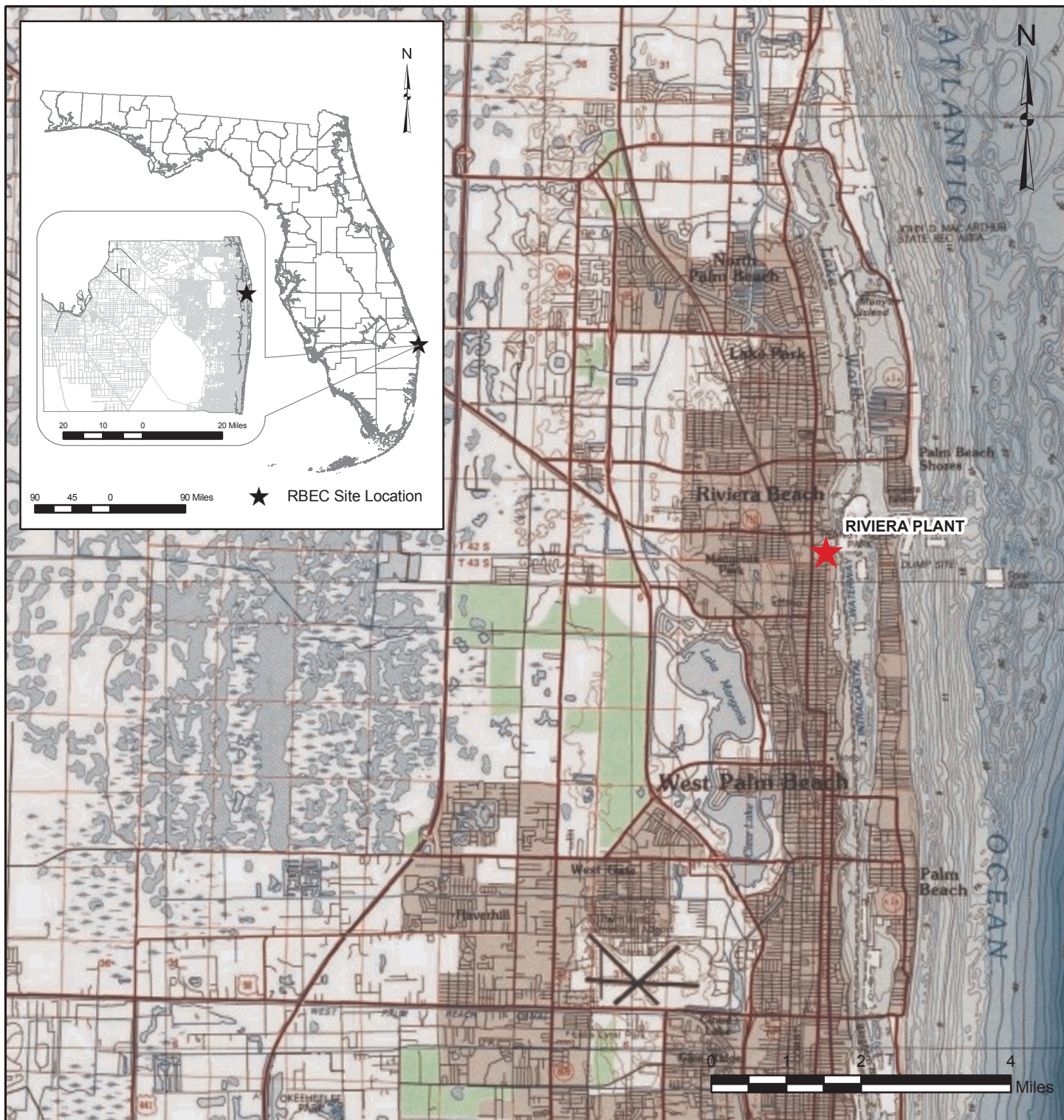
Source: Golder, 2008.

TABLE 3.3.8-2
AMBIENT SOUND PRESSURE LEVELS MEASURED WITH THE FPL RIVIERA PLANT OPERATING AT BASELOAD CONDITIONS, MAY 2008

Site ^a	Coordinates	Date	Time	Sound Levels (dBA)				Observations
				Min	Max	L ₉₀	L ₅₀	
1: Onsite Northwest corner of Tank yard	26° 45' 56.1" N	6-May-08	Daytime	70	78	71	72	Gas yard loud hiss, constant traffic on Rt. 1, Units 3 & 4
	080° 03' 15.9"W	6-May-08	Nighttime	66	69	67	67	Gas yard, traffic on Rt. 1, Units 3 & 4
2: Onsite Northeast corner of property	26° 45' 56.2" N	6-May-08	Daytime	60	66	61	62	Units 3& 4, port noise, boat traffic, air traffic
	080° 03' 02.8"W	6-May-08	Nighttime	59	65	60	61	Units 3 & 4
3: Onsite Southwest corner by Gate #10	26° 45' 48.3" N	6-May-08	Daytime	59	63	60	61	Units 3& 4, constant traffic on Rt. 1
	080° 03' 15.4"W	6-May-08	Nighttime	58	62	58	59	Units 3& 4, constant traffic on Rt. 1
4: Onsite Southeast corner by training building	26° 45' 48.1" N	6-May-08	Daytime	58	70	59	60	Units 3 & 4, air traffic, building AC
	080° 03' 03.9"W	6-May-08	Nighttime	60	71	60	61	Units 3 & 4
5: At condo to the South of the Site	26° 45' 39.3" N	6-May-08	Daytime	48	67	50	52	Light traffic, condo maintenance, air plane noise, plant noise
	080° 03' 08.0"W	6-May-08	Nighttime	44	66	45	46	Light trafic, plant noise
7: West of the Site along the transmission line	26° 45' 49.30" N	6-May-08	Daytime	50	69	51	52	Traffic, plant noise, house AC
	080° 03' 30.6"W	6-May-08	Nighttime	47	62	48	49	Plant noise, traffic
9: South of Site at Gate #9	26° 45' 47.5" N	6-May-08	Daytime	63	67	64	65	Units 3 & 4, light traffic, air traffic
	080° 03' 07.9"W	6-May-08	Nighttime	63	67	64	64	Units 3 & 4, birds

^a Noise monitoring was not conducted at Sites 6 and 8 during May 2008.

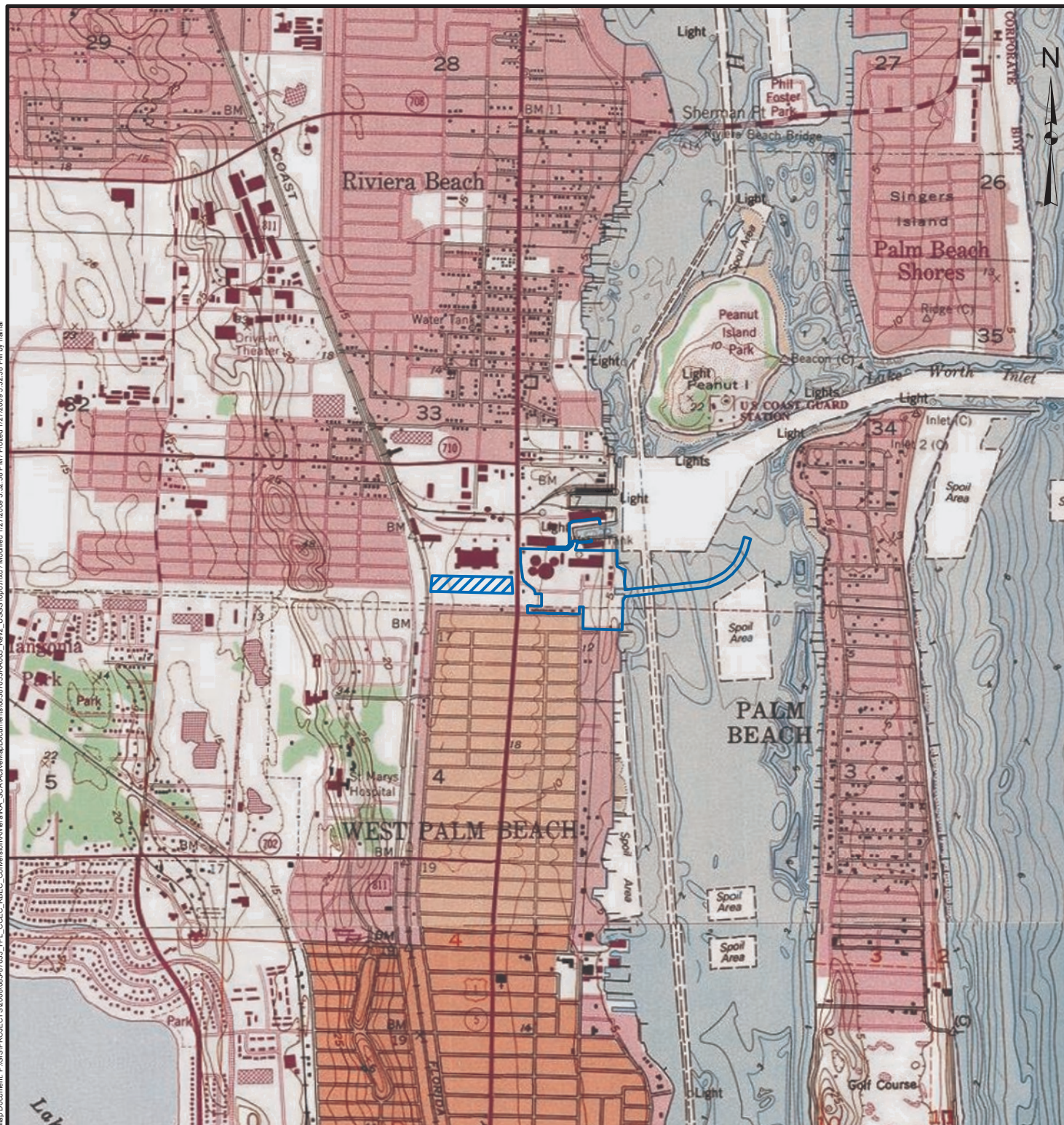
Source: Golder, 2008.



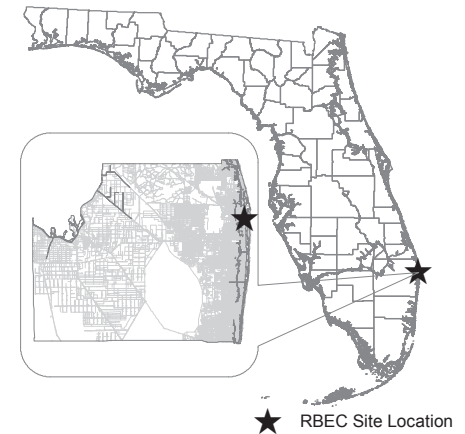
REFERENCES

1. Topographic Imagery, Quad name, Riviera Beach. Quad number, 2301. Date 1983. Quad name, Palm Beach. Quad number 2201. Date 1983. USGS.

			SCALE	AS SHOWN	LOCATION OF THE FPL RIVIERA PLANT IN PALM BEACH COUNTY, FLORIDA	
			DATE	12/18/2008		
			DESIGN	RCM		
			GIS	NRL		
			CHECK	RCM		
FILE No.	08387633RA001		REVIEW	KFK	FPL	FIGURE
PROJECT No.	083-87633	REV. 2			RIVIERA BEACH ENERGY CENTER	3.1.0-1



AREA MAP



LEGEND

-  FPL Riviera Beach Energy Center (To Be Certified)
-  Construction Parking & Laydown Area

REFERENCES

1. Topographic Imagery, Quad name, Riviera Beach. Quad number, 2301. Date 1983. Quad name, Palm Beach. Quad number 2201. Date 1983. USGS
2. FPL Riviera Beach Energy Center (to be certified), FPL. 2009.
3. Construction Parking and Laydown Area, FPL. 2009.

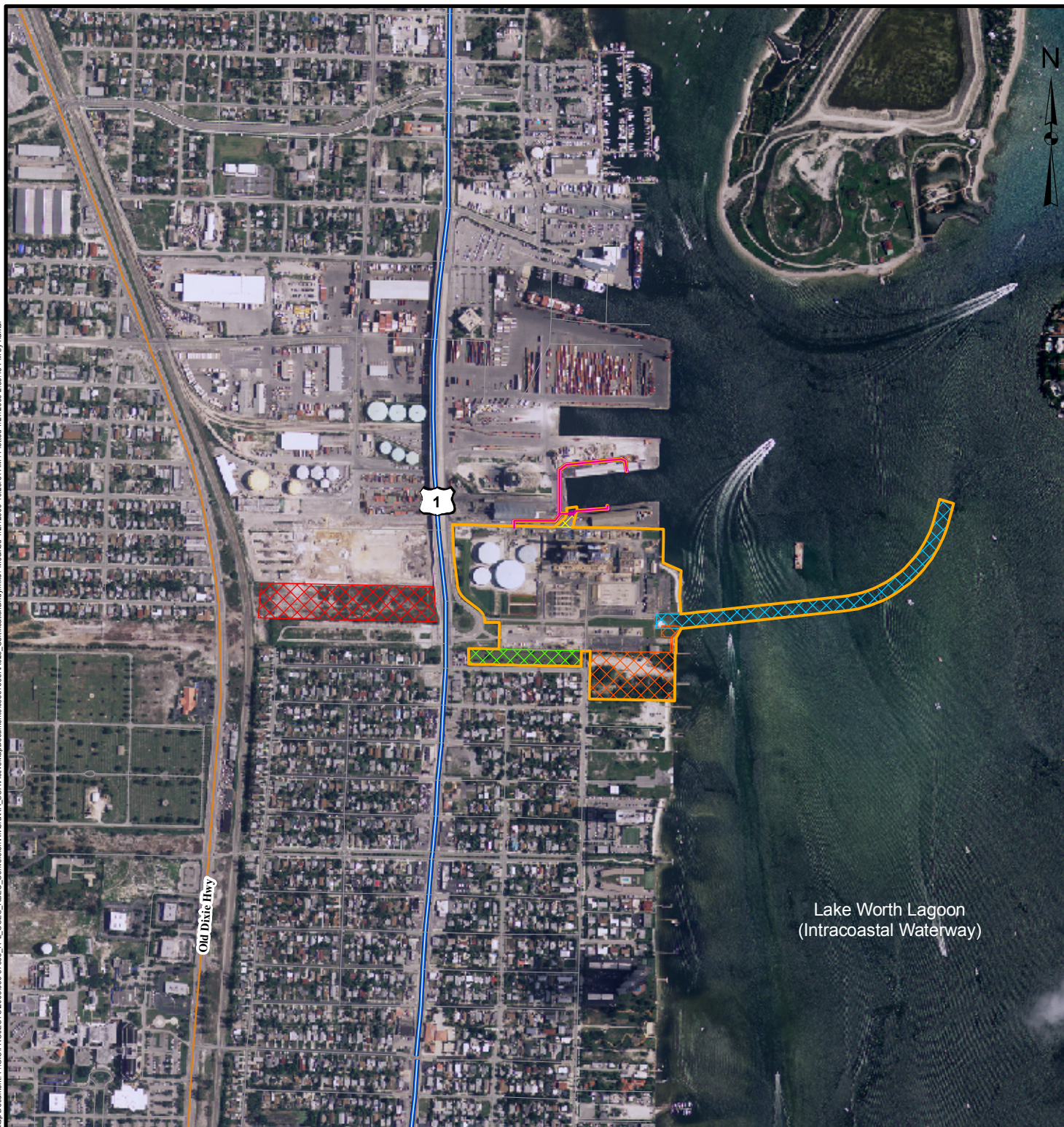


REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						



PROJECT No. 083-87633			FILE No. 08387633RA003	
DESIGN	RCM	12/17/2008	SCALE: AS SHOWN	REV. 2
GIS	NRL	1/27/2009	FIGURE 3.1.0-2	
CHECK	RCM	1/27/2009		
REVIEW	KFK	1/27/2009		

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LEGEND

FPL Riviera Beach Energy Center (To Be Certified)

Includes:

Intake Culvert Easement

Landscaped Buffer Area

Manatee Viewing Center

Oil Pipeline Easement

Submerged Lands

Construction Parking & Laydown Area

REFERENCES

1. FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
2. Construction Parking & Laydown Area, Intake Culvert Easement, Landscaped Buffer Area, Manatee Viewing Center, Submerged Lands, Oil Pipeline Easement, FPL, 2009
3. Imagery, National Imagery Mosaics, USGS, 2007.

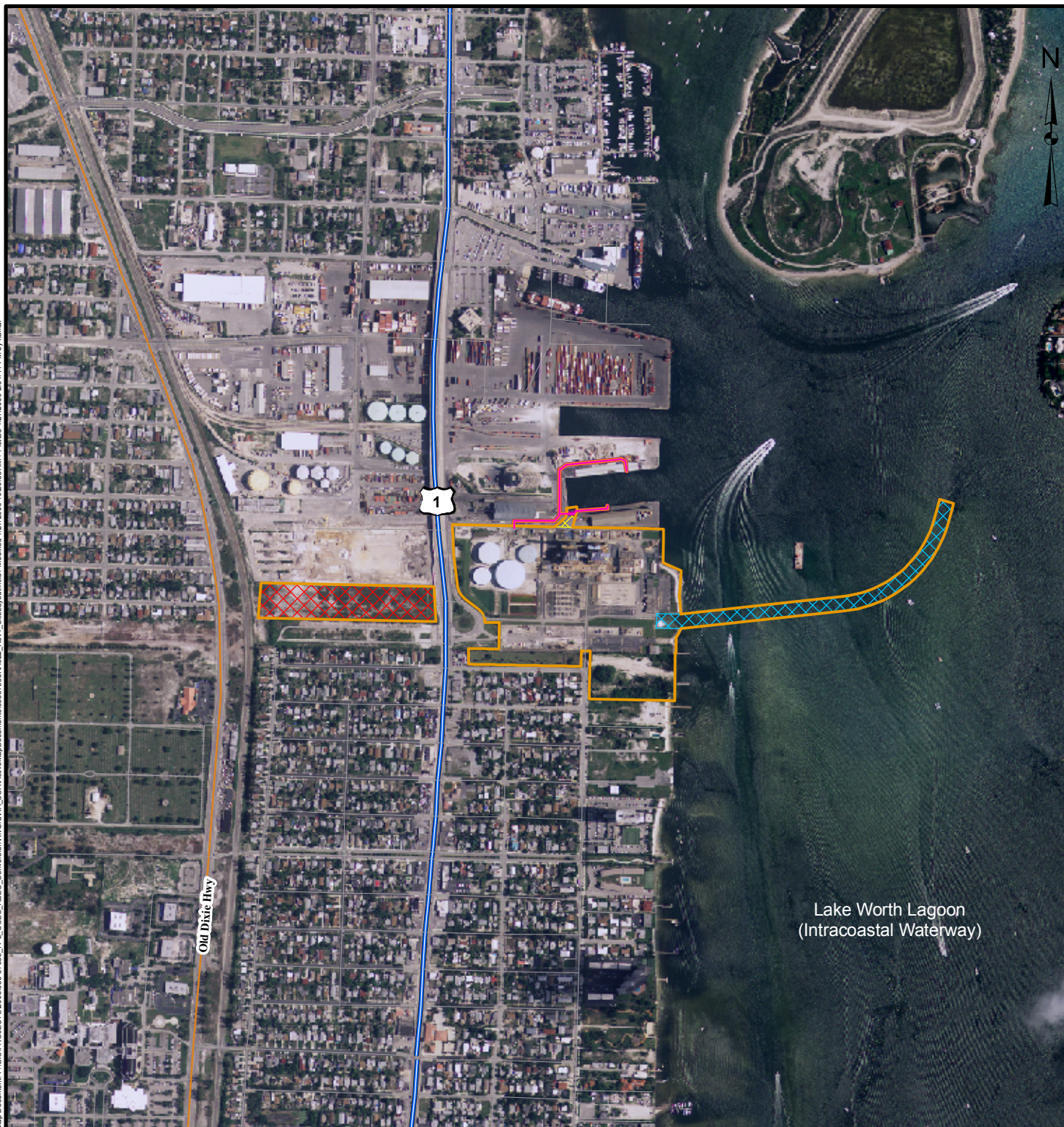


REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
CERTIFICATION BOUNDARY						
			PROJECT No.	083-87633	FILE No.	08387633RA023
			DESIGN	RCM	1/26/2009	SCALE: AS SHOWN REV. 1
			GIS	NRL	1/27/2009	
			CHECK	RCM	1/27/2009	
			REVIEW	KFK	1/27/2009	



FIGURE 3.1.0-3

Map Document: P:\GIS\PROJECTS\0808083-87633_FPL_CCEC_RBEC_Conversion\RivieraRA_SCAAA\MapDocuments\08387633RA022_Rev1_SiteLayout.mxd / Modified 1/27/2009 10:26:59 AM / Plotted 1/27/2009 2:34:14 PM by fmar



LEGEND

Existing FPL Riviera Plant Site

Includes:

- Existing Transmission Facilities
- Intake Culvert Easement
- Oil Pipeline Easement
- Submerged Lands

REFERENCES

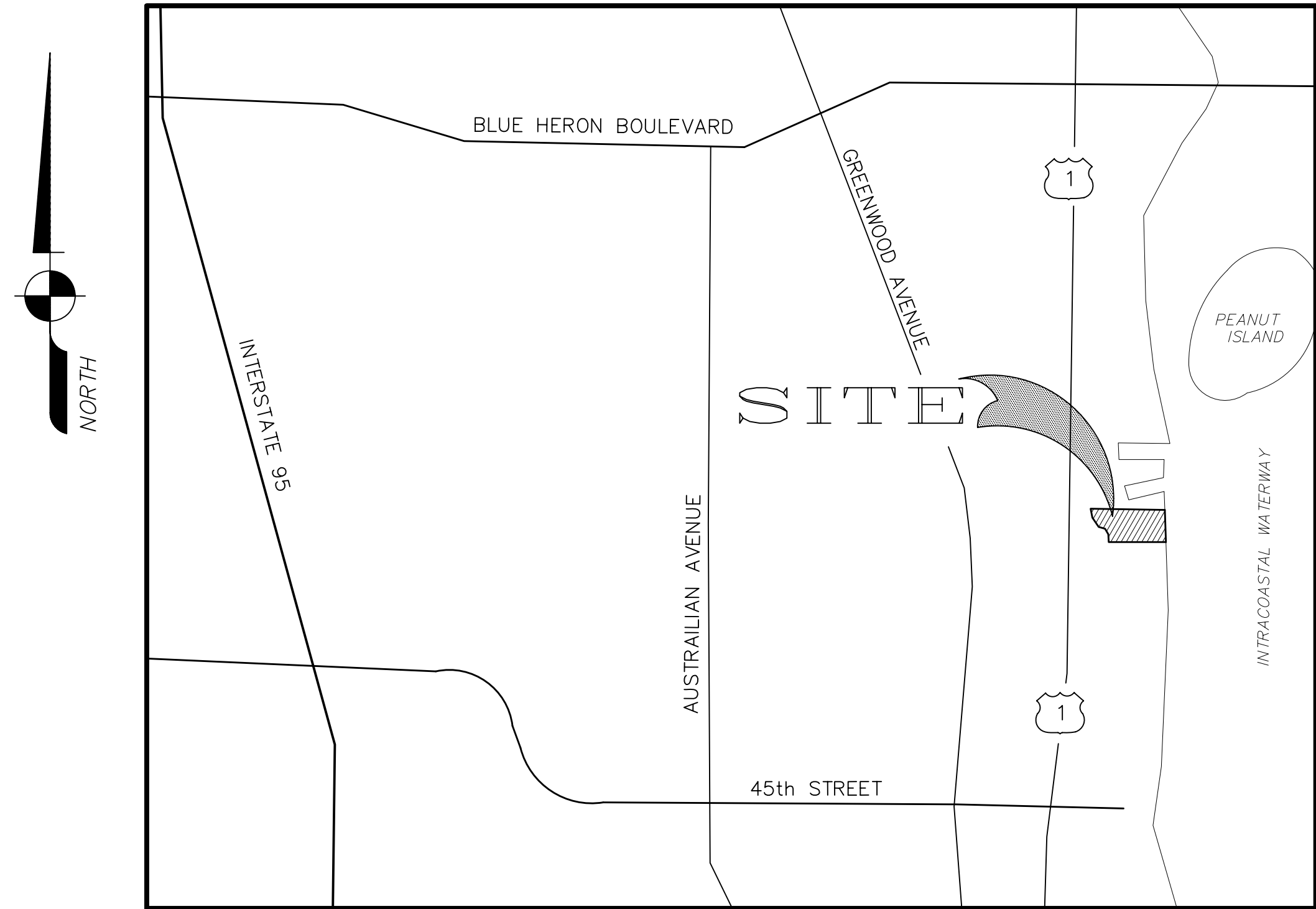
1. FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
2. Existing Transmission Facilities, Intake Culvert Easement, Oil Pipeline Easement, Submerged Lands, FPL, 2009.
3. Imagery, National Imagery Moasics, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
EXISTING PLANT SITE						
PROJECT No. 083-87633			FILE No. 08387633RA022			
DESIGN	RCM	1/26/2009	SCALE: AS SHOWN		REV. 0	
GIS	NRL	1/27/2009				
CHECK	RCM	1/27/2009				
REVIEW	KFK	1/27/2009				



FIGURE 3.1.1-1



LOCATION SKETCH
NOT TO SCALE

SURVEYOR'S REPORT:

- Not valid without the signature and original raised seal of a Florida licensed Surveyor and Mapper.
- The Legal Description is in accord with the Ownership and Encumbrance Search provided by the client, prepared by Southeast Guaranty & Title, Inc., and dated June 17, 2008. It is possible that there are Deeds, Easements, or other instruments (recorded or unrecorded) which may affect the subject property. No search of the Public Records has been made by the Surveyor.
- The undersigned surveyor has no knowledge as to whether any of the hereon property is filled formerly submerged lands.
- No underground improvements were located.
- Bearings and Coordinates shown hereon are referenced to Grid North, based on the 1990 adjustment of the North American Datum of 1983 (NAD 83/90) of the Florida State Plane Coordinate System (Traverse Mercator Projection), East Zone, with the south line of Section 33 having a bearing of N 88°49'47" W.
- Elevations shown hereon are based on the North American Vertical Datum of 1988.
- Benchmark Description: National Geodetic Survey Bench Mark R 402 (PID AD8029) Elevation =17.96 feet(NAVD 88) and P 232 Reset(PID AD5785), Elevation=13.29(NAVD 88).
- Mean High Water Line information was compiled from published datum provided by the Land Boundary Information System web site (www.labins.org). Mean High Water is based upon extending published datum from Mean High Water data point #36, Palm Beach County, Quad name Riviera Beach, Mean High Water Line = 0.16' (N.A.V.D. 88); Range = 2.61'; Mean Low Water Line = -2.45.
- Abbreviation Legend: P.B.C.= Palm Beach County; P.B.= Plat Book; PG.= Page; O.R.B.= Official Records Book; P.B.C.R.= Palm Beach County Records; A/C= Air Conditioning; CONC.= Concrete; DIA= Diameter; FFE= Finished Floor Elevation; INV.= Invert; L= Length; M.H.W.L.= Mean High Water Line; PRM= Permanent Reference Monument; R= Radius; RCP= Round Concrete Pipe; TRANS.= Transformer; W/= With; Δ= Delta Angle; F.P.L.= Florida Power & Light Company; G.P.S.= Global Positioning System; L.B.= Licensed Business; N.G.V.D.=National Geodetic Vertical Datum; P.S.M.= Professional Surveyor and Mapper; N.A.V.D.= North American Vertical Datum.
- Bearings shown hereon are based on a Real-Time Kinematic (RTK) G.P.S. survey which is certified to 2 Centimeter local accuracy relative to the nearest National Geodetic Survey (NGS) Geodetic Station as surveyed in the field on June 24, 2008.
Station Observed: "R 402" (PID — AD8029) Palm Beach County.
Equipment
GPS Receiver: Trimble R8 5800 RTK
Software: Trimble Geomatics Office, Version Number 1.63
Method: Wide Area Continuously Operating GPS Station Network.

LEGAL DESCRIPTION:

A Parcel of land lying in Section 33, Township 42 South, Range 43 East, Palm Beach County, Florida, being more particularly described as the North 663.19 feet of the South 844.19 feet of Government Lot 4, LESS and EXCEPT those lands described in the Order of Taking recorded in Official Record Book 10388, Page 799.

TOGETHER WITH:

PARCEL A and B:

All that part of the South 181 feet (measured at right angles between parallel lines) of Government Lot 4, Section 33, Township 42 South, Range 43 East, Palm Beach County, Florida, lying easterly of the right of way of State Road NO.4 (U.S. Highway No. One), LESS and EXCEPT those lands described in the Order of Taking recorded in Official Record Book 10388, Page 799 and lying westerly of the westerly Mean High Water Line of the Intracoastal Waterway (Lake Worth).

Said lands situate in the City of Riviera Beach, Palm Beach County, Florida and containing 1,175,953 square feet, 26.996 acres, more or less.

CERTIFICATION:

I HEREBY CERTIFY that the attached Boundary and Topographic Survey of the hereon described property is true and correct to the best of my knowledge and belief as prepared under my direction. I FURTHER CERTIFY that this Boundary and Topographic Survey meets the Minimum Technical Standards set forth in Chapter 61G17-6, Florida Administrative Code, pursuant to Section 472.027, Florida Statutes.

Date: _____

ALAN M. REYNOLDS, P.S.M.
Florida Registration No. 6346
AVIROM & ASSOCIATES, INC.
L.B. No. 3300



AVIROM & ASSOCIATES, INC.
SURVEYING & MAPPING
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TEL. (561) 392-2594, FAX (561) 394-7125
www.AVIROM-SURVEY.com

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SCALE	--	REVISIONS	DATE	F.B. / PG.	BY	CK'D	REVISIONS	DATE	F.B. / PG.	BY	CK'D
DATE	0/24/08										
BY	W.R.E.										
CK'D.	A.M.R.										
F.B.	S2	PG.	18-60								
JOB NO.	8461										

FIGURE 3.1.3-1a
BOUNDARY AND TOPOGRAPHIC
SURVEY
RIVIERA PLANT

SECTION 33, TOWNSHIP 42 S., RANGE 43 E.
PALM BEACH COUNTY
FLORIDA.

SHEET

1

OF

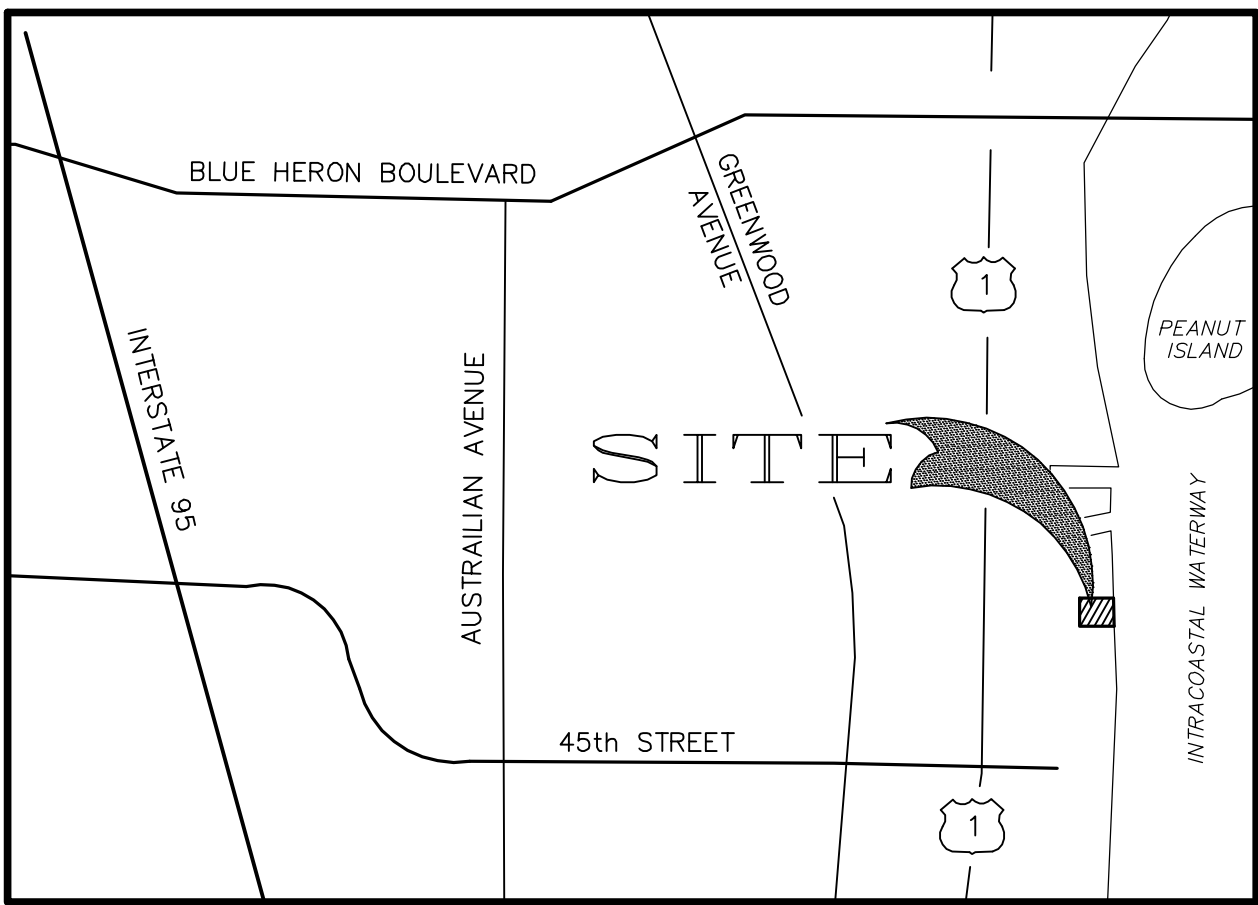
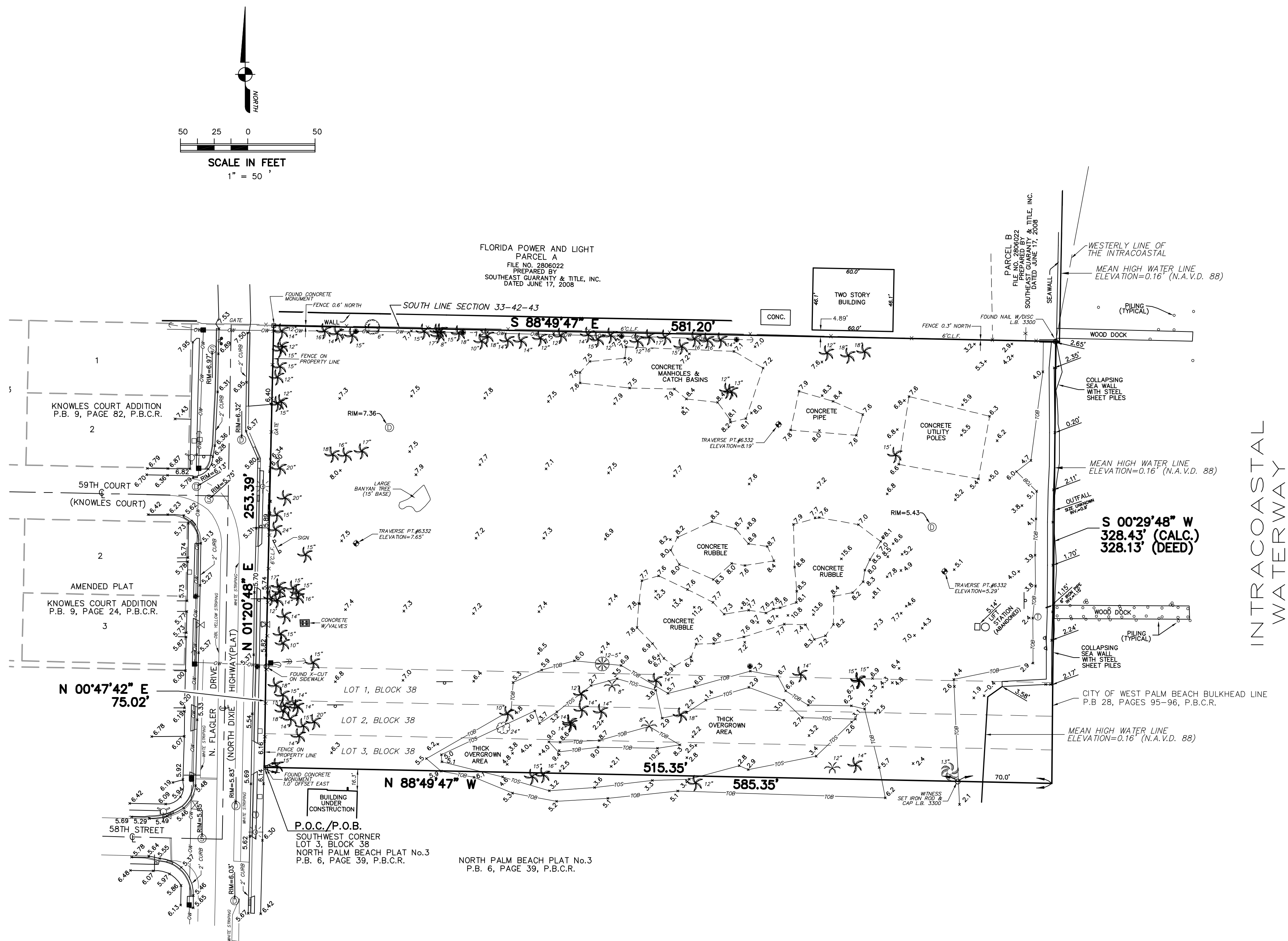
2

ALTA/ACSM LAND TITLE SURVEY

LEGEND	
	CATCH BASIN
	CHECK VALVE
	CONCRETE UTILITY POLE
	DRAINAGE MANHOLE
	FIRE HYDRANT
	GATE VALVE
	GUY ANCHOR
	LIGHT POLE
	SANITARY MANHOLE
	SIGN
	TELEPHONE MANHOLE
	WATER METER
	WOOD POLE
	OVERHEAD WIRE
	FENCE
	TOB OF BANK
	TOE OF SLOPE

TREE LEGEND	
	COCONUT PALM
	FICUS
	CABBAGE PALM
	SCHEFFLERA
	UNKNOWN

SUMMARY TABLE FOR: OWNERSHIP AND ENCUMBRANCE REPORT FILE NO. 200807273 (SEE SURVEYOR'S REPORT #2)		
EXCEPTION NUMBER AND RECORDING INFORMATION	AFFECTS SUBJECT PROPERTY	ACTION TAKEN
1. O.R.B. 968/49 P.B. 27, PGS. 231-239	Yes	PLAT
2. D.B. 1080/244	Yes	BLANKET
3. O.R.B.102/251	Yes	-
4. O.R.B.1474/542	Yes	-
5. O.R.B.855/449	Yes	DEED
6. D.B. 603/319	Yes	DEED
7. P.B. 8, PG. 46	Yes	PLAT
8. P.B. 9, PG. 82	Yes	PLAT
9. P.B. 6, PG. 39	Yes	PLAT
10. O.R.B.21096/1481	Yes	LIEN



LOCATION SKETCH
NOT TO SCALE

LEGAL DESCRIPTION:

Commencing at the Southwest corner of Lot 3, Block 38, NORTH PALM BEACH Plat No. 3 as recorded in Plat Book 6, Page 39, Public Records, Palm Beach County, Florida, said corner being the Point of Beginning (P.O.B.); thence run Northerly along the Easterly Right-of-Way line of North Dixie Highway, a distance of 75.02 feet to the Northwest corner of Lot 1, Block 38, said North Palm Beach; thence continue Northerly along said Right-of-Way line making a deflection to the East of 00 degrees 13' 30", a distance of 253.39 feet to the North Line of Township 43, South, Range 43 East; thence run Easterly along said North line of Township 43 South, making an angle with the preceding course of 90 degrees 03' 00" as turned from South to East, a distance of 581.20 feet to the intersection with the City of West Palm Beach 1963 Bulkhead line as recorded in Plat Book 27, Pages 231-239; thence run Southerly along said Bulkhead line a distance of 328.13 feet, more or less to the intersection with the South line of aforementioned Lot 3, Block 38; thence run Westerly along said South line, a distance of 585.35 feet, more or less, to the Point of Beginning.

Said lands situate in the City of West Palm Beach, Palm Beach County, Florida and containing 191,643 square feet, 4.400 acres, more or less.

SURVEYOR'S REPORT:

- Not valid without the signature and original raised seal of a Florida licensed Surveyor and Mapper.
- The Legal Description is in accord with the Ownership and Encumbrance Search provided by the client, prepared by Southeast Guaranty & Title, Inc., and dated June 17, 2008. It is possible that there are Deeds, Easements, or other instruments (recorded or unrecorded) which may affect the subject property. No search of the Public Records has been made by the Surveyor.
- The undersigned surveyor has no knowledge as to whether any of the hereon property is filled formerly submerged lands.
- No underground improvements were located.
- Bearings and Coordinates shown hereon are referenced to Grid North, based on the 1990 adjustment of the North American Datum of 1983 (NAD 83/90) of the Florida State Plane Coordinate System (Transverse Mercator Projection), East Zone, with the south line of Section 33 having a bearing of N 88°49'47" W.
- Elevations shown hereon are based on the North American Vertical Datum of 1988.
- Benchmark Description: National Geodetic Survey Bench Mark R 402 (PID AD8029) Elevation =17.96 feet (NAVD 88) and P 232 Reset (PID AD5785), Elevation=13.29 (NAVD 88).
- Mean High Water Line information was compiled from published datum provided by the Land Boundary Information System web site (www.labins.org). Mean High Water is based upon extending published datum from Mean High Water data point #36, Palm Beach County, Quad name Riviera Beach. Mean High Water Line = 0.16' (N.A.V.D. 88); Range = 2.61'; Mean Low Water Line = -2.45.
- Abbreviation Legend: P.B.C.= Palm Beach County; P.B.= Plat Book; PG.= Page; O.R.B.= Official Records Book; P.B.C.R.= Palm Beach County Records; A/C= Air Conditioning; CONC= Concrete; INV.= Invert; L= Length; P.O.B.=Point of Beginning; M.H.W.L.= Mean High Water Line; PRM= Permanent Reference Monument; R= Radius; RCP= Round Concrete Pipe; W/= With; Δ= Delta Angle; F.P.L.= Florida Power & Light Company; G.P.S.= Global Positioning System; L.B.= Licensed Business; N.G.V.D.=National Geodetic Vertical Datum; P.S.M.= Professional Surveyor and Mapper; N.A.V.D.= North American Vertical Datum.
- Bearings shown hereon are based on a Real-Time Kinematic (RTK) G.P.S. survey which is certified to 2 Centimeter local accuracy, relative to the nearest National Geodetic Survey (NGS) Geodetic Station as surveyed in the field on June 24, 2008. Station Observed: "R 402" (PID - AD8029) Palm Beach County.

Equipment GPS Receiver:
Trimble R8 5800 RTK Software:
Trimble Geomatics Office, Version Number 1.63
Method: Wide Area Continuously Operating GPS Station Network.

CERTIFIED TO:

Florida Power and Light Company,
Southeast Guaranty & Title, Inc.

CERTIFICATION:

This is to certify that this survey was made in accordance with the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA and NSPS in 2005, and includes Items 1, 2, 3, 4, 8, 9, 10, 11a, 13 and 15 of Table A thereof. Pursuant to the Accuracy Standards as adopted by ALTA and NSPS and in effect on the date of this certification, undersigned further certifies that in my professional opinion, as a land surveyor registered in the State of Florida, the Relative Positional Accuracy of this survey does not exceed that which is specified therein. I FURTHER CERTIFY that this Survey meets the Minimum Technical Standards set forth in Chapter 61G17-6, Florida Administrative Code, pursuant to Section 472.027, Florida Statutes. There are no above ground encroachments other than those shown hereon, subject to the qualifications noted hereon.

Date: _____

ALAN M. REYNOLDS, P.S.M.
Florida Registration No. 6346
AVIROM & ASSOCIATES, INC.
L.B. No. 3300



AVIROM & ASSOCIATES, INC.
SURVEYING & MAPPING
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BOCA RATON, FLORIDA 33432
TEL. (561) 392-2594, FAX (561) 394-7125
www.AVIROM-SURVEY.com

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SCALE	1"= 50'	REVISIONS				DATE	F.B. I PG.	BY	CK'D	REVISIONS				DATE	F.B. I PG.	BY	CK'D
DATE	10/29/08																
BY	A.M.R.																
CK'D.	M.D.A.																
F.B.	1486	PG.	17														
JOB NO.	8461-1																

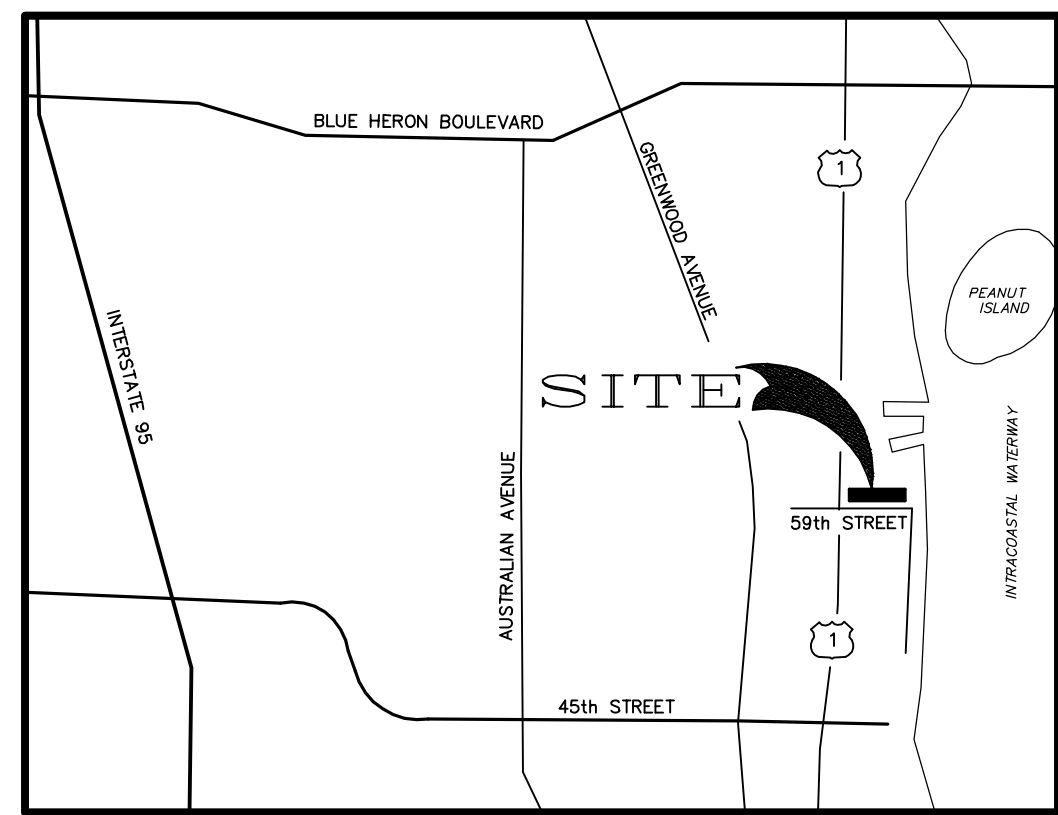
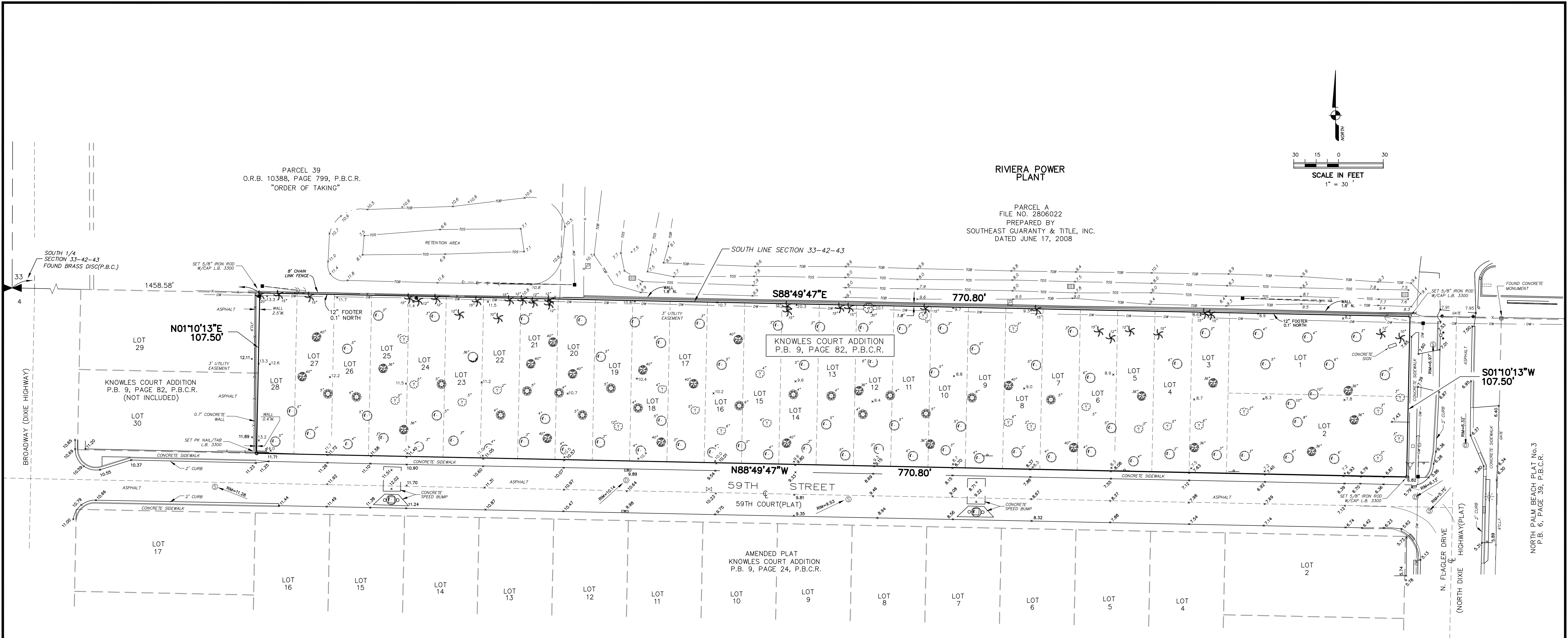
FIGURE 3.1.3-1c
ALTA/ACSM LAND TITLE SURVEY
RIVIERA PLANT
SOUTHEAST PARCEL
A PORTION OF SECTIONS 3 AND 4
TOWNSHIP 43 S., RANGE 43 E.
PALM BEACH COUNTY
FLORIDA.

SHEET

1

OF

1



LOCATION SKETCH
NOT TO SCALE

LEGEND

- BENCHMARK
- BOLLARD
- CATCH BASIN
- DOUBLE DETECTOR VALVE
- DRAINAGE MANHOLE
- ELECTRIC SERVICE
- EXISTING ELEVATION
- FIRE HYDRANT
- GUY ANCHOR
- LIGHT POLE
- OVERHEAD WIRES
- PULL BOX
- POWER POLE
- SANITARY MANHOLE
- SIAMESE CONNECTION
- TOE OF SLOPE
- TOP OF BANK
- UNKNOWN MANHOLE
- WATER VALVE
- WOOD POWER POLE

TREE LEGEND

- BANYAN
- CABBAGE PALM
- MAHOGANY
- OAK
- SEAGRAPE
- SHRUB
- UNKNOWN SPECIES

N.A.V.D. 1988
ELEVATIONS

SURVEYOR'S REPORT:

- Not valid without the signature and original raised seal of a Florida licensed Surveyor and Mapper.
- The Legal Description was prepared by the surveyor.
- It is possible that there are Deeds, Easements, or other instruments (recorded or unrecorded) which may affect the subject property. No search of the Public Records has been made by the Surveyor.
- No underground improvements were located.
- Bearings and Coordinates shown hereon are referenced to Grid North, based on the 1990 adjustment of the North American Datum of 1983 (NAD 83/90) of the Florida State Plane Coordinate System (Traverse Mercator Projection), East Zone, with the south line of Section 33 having a bearing of N 88°49'47" W.
- Elevations shown hereon are based on the North American Vertical Datum of 1988.
- Benchmark Description: National Geodetic Survey Bench Mark R 402 (PID AD8029) Elevation =17.96 feet(NAVD 88) and P 232 Reset(PID AD5785), Elevation=13.29(NAVD 88).
- Abbreviation Legend: P.B.C.= Palm Beach County; P.B.= Plat Book; PG.=Page; O.R.B.= Official Records Book; P.B.C.R.= Palm Beach County Records; PRM= Permanent Reference Monument; F.P.L.= Florida Power & Light Company; G.P.S.= Global Positioning System; L.B.= Licensed Business; N.G.V.D.=National Geodetic Vertical Datum; P.S.M.= Professional Surveyor and Mapper; N.A.V.D.= North American Vertical Datum; GP= Guy Pole.
- Data collected hereon is based on a Real-Time Kinematic (RTK) G.P.S. survey which is certified to 2 Centimeter local accuracy, relative to the nearest National Geodetic Survey (NGS) Geodetic Station as surveyed in the field on June 24, 2008.
Station Observed: "R 402" (PID - AD8029) Palm Beach County.

Equipment

GPS Receiver: Trimble R8 5800 RTK
Software: Trimble Geomatics Office, Version Number 1.63
Method: Wide Area Continuously Operating GPS Station Network.

LEGAL DESCRIPTION:

A Parcel of land lying in Section 4, Township 43 South, Range 43 East, Palm Beach County, Florida, being more particularly described as follows:

Lots 1 through 28, KNOWLES COURT ADDITION, according to the Plat thereof on file in the office of the Clerk of the Circuit Court in and for Palm Beach County, Florida recorded in Plat Book 9, Page 82.

Said lands situate in Palm Beach County, Florida and containing 82,861 square feet, 1.902 acres, more or less.

CERTIFICATION:

I HEREBY CERTIFY that the attached Boundary and Topographic Survey of the hereon described property is true and correct to the best of my knowledge and belief as prepared under my direction. I FURTHER CERTIFY that this Boundary and Topographic Survey meets the Minimum Technical Standards set forth in Chapter 61G17-6, Florida Administrative Code, pursuant to Section 472.027, Florida Statutes.

Date: _____

ALAN M. REYNOLDS, P.S.M.
Florida Registration No. 6346
AVIROM & ASSOCIATES, INC.
L.B. No. 3300



AVIROM & ASSOCIATES, INC.
SURVEYING & MAPPING
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SCALE	1" = 30'	REVISIONS	DATE	F.B. I PG.	BY	CK'D	REVISIONS	DATE	F.B. I PG.	BY	CK'D
DATE	01/21/09										
BY	A.M.R.										
CK'D.	M.D.A.										
F.B.	1486	PG.	41								
JOB NO.	8461-2										

FIGURE 3.1-1d
BOUNDARY AND TOPOGRAPHIC
SURVEY
RIVIERA PLANT
LANDSCAPE BUFFER AREA
SECTION 4, TOWNSHIP 43 S., RANGE 43 E.
PALM BEACH COUNTY
FLORIDA.

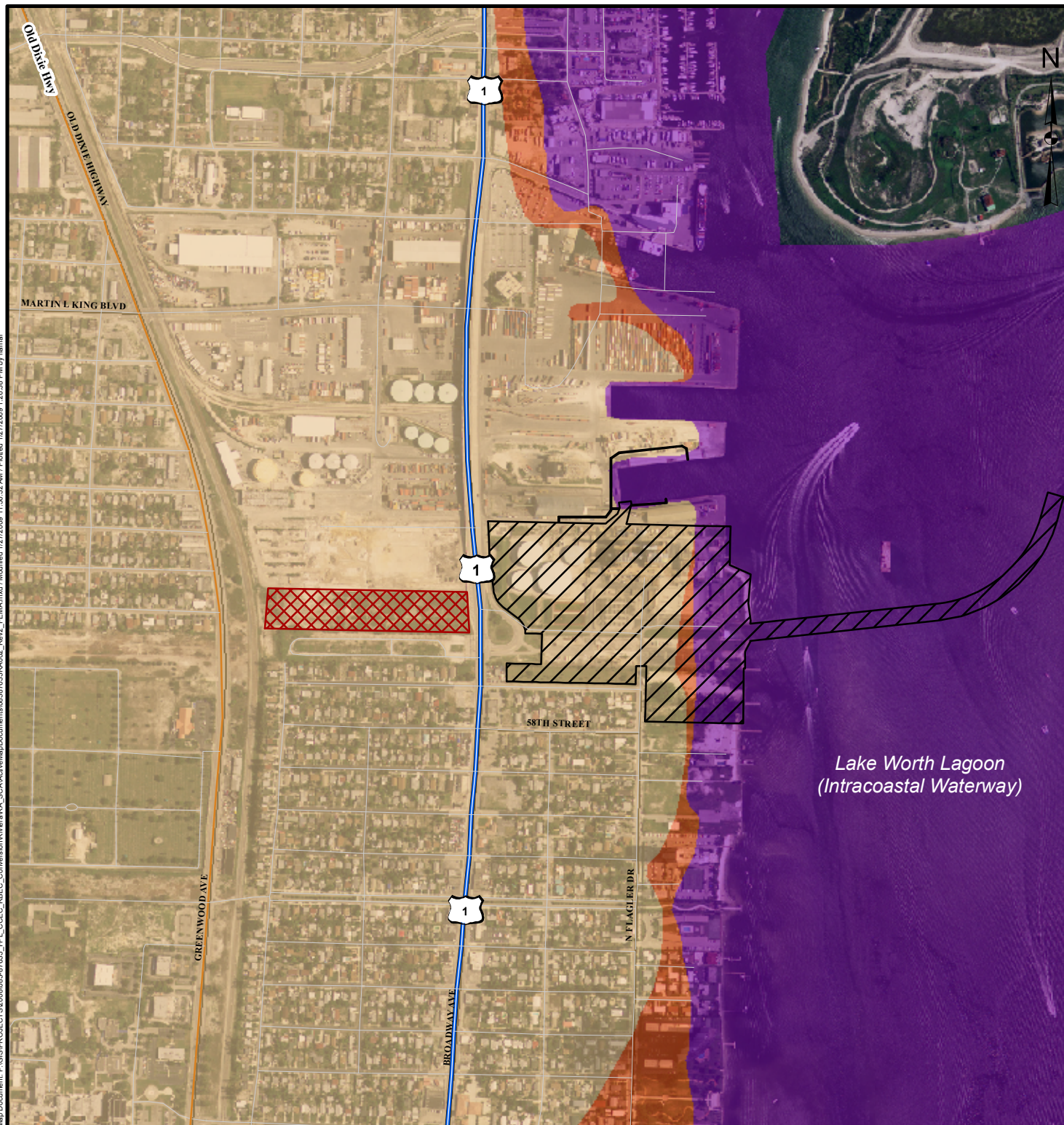
SHEET

1

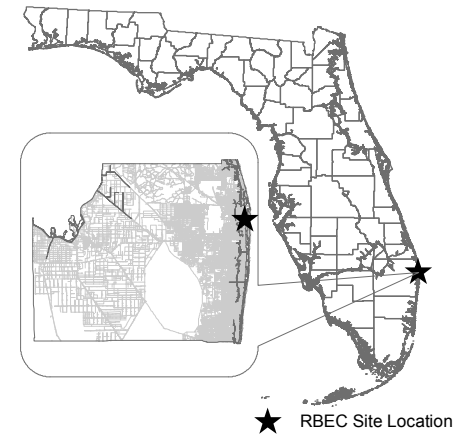
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1

Map Document: P:\GIS\PROJECTS\08083-87633_FPL_CCEC_RBEC_Conversion\RivieraRA_SCA\AvalMapDocuments\08083-87633RA002_Rev2_FEMA.mxd / Modified: 1/27/2009 11:50:32 AM / Plotted: 1/27/2009 1:26:38 PM by damar



AREA MAP



★ RBEC Site Location

LEGEND

FPL Riviera Beach Energy Center (To Be Certified)

Construction Parking & Laydown Area

ZONE

AE

X

X500

Zone	Zone Name	Description
AE	Zone AE	An area inundated by 100-year flooding, for which Base Foot Elevation's have been determined.
X	Zone X	An area that is determined to be outside the 100 and 500-year floodplain.
X500	Zone X (500-Year)	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

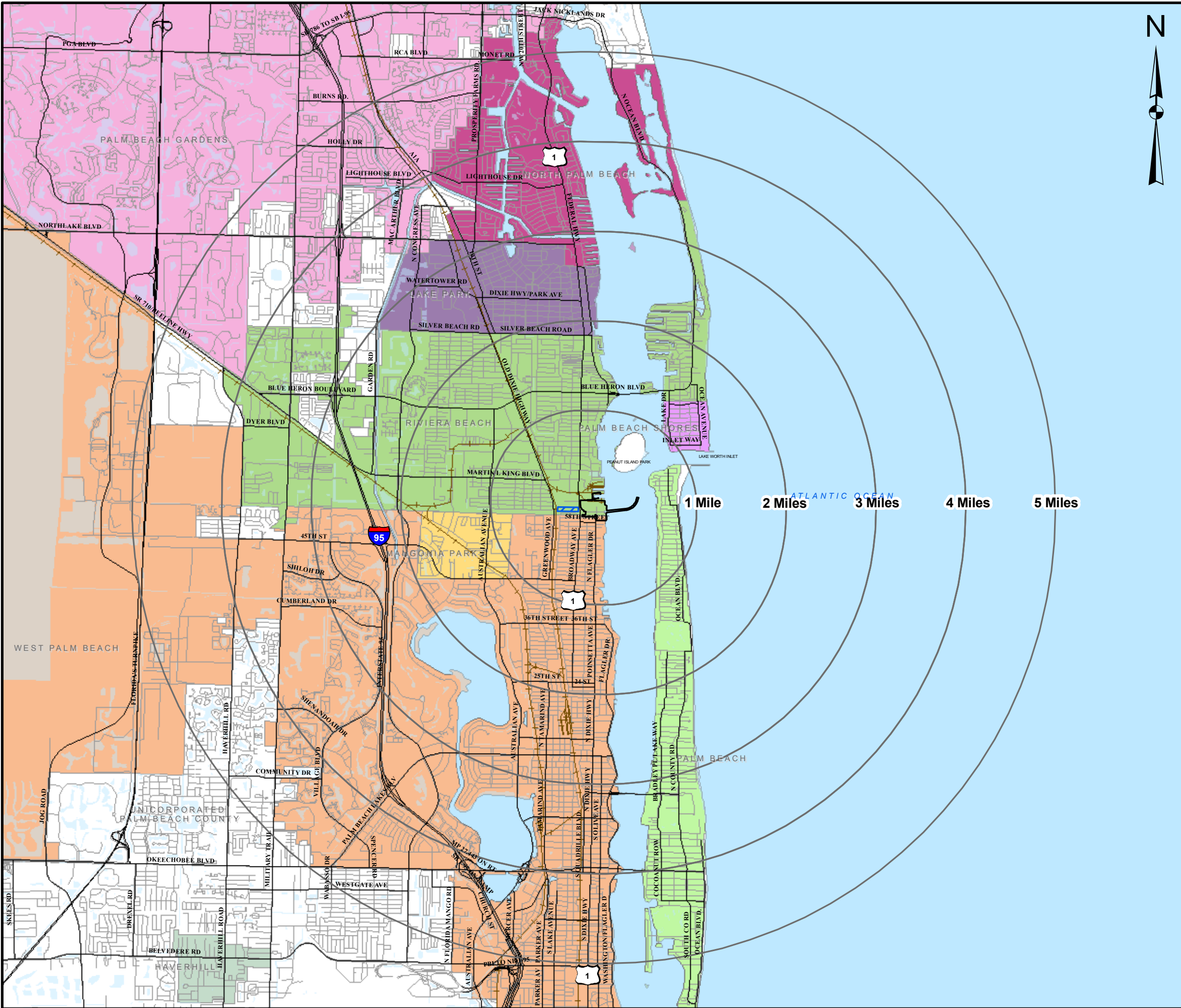
REFERENCES

1. Imagery, National Imagery Mosaics, USGS, 2007.
2. Flood Zone Categories, FEMA, 1995
3. Riviera Beach Energy Center (to be certified), FPL, 2009
4. Construction Parking & Laydown Area, FPL, 2009.



REV.	DATE	DES	REVISION DESCRIPTION				GIS	CHK	R/W
PROJECT									
FPL RIVIERA BEACH ENERGY CENTER									
TITLE									
100 - YEAR FLOOD ZONE									
									
PROJECT No.		083-87633			FILE No.		08387633RA002		
DESIGN	KJK	12/17/2008			SCALE: AS SHOWN		REV. 0		
GIS	NRL	1/27/2009			FIGURE 3.1.4-1				
CHECK	KJK	1/26/2009							
REVIEW	KFK	1/27/2009							

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\Riviera\RA_SCAActiveMapDocuments\08387633RA007_Rev1_GovJur_5miles(A).mxd / Modified 1/27/2009 11:26:43 AM / Plotted 1/27/2009 2:05:34 PM by riamar



LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)
- Construction Parking & Laydown Area
- Municipalities**
 - HAVERHILL
 - LAKE PARK
 - MANGONIA PARK
 - NORTH PALM BEACH
 - PALM BEACH
 - PALM BEACH GARDENS
 - PALM BEACH SHORES
 - RIVIERA BEACH
 - WEST PALM BEACH
 - UNINCORPORATED PALM BEACH COUNTY

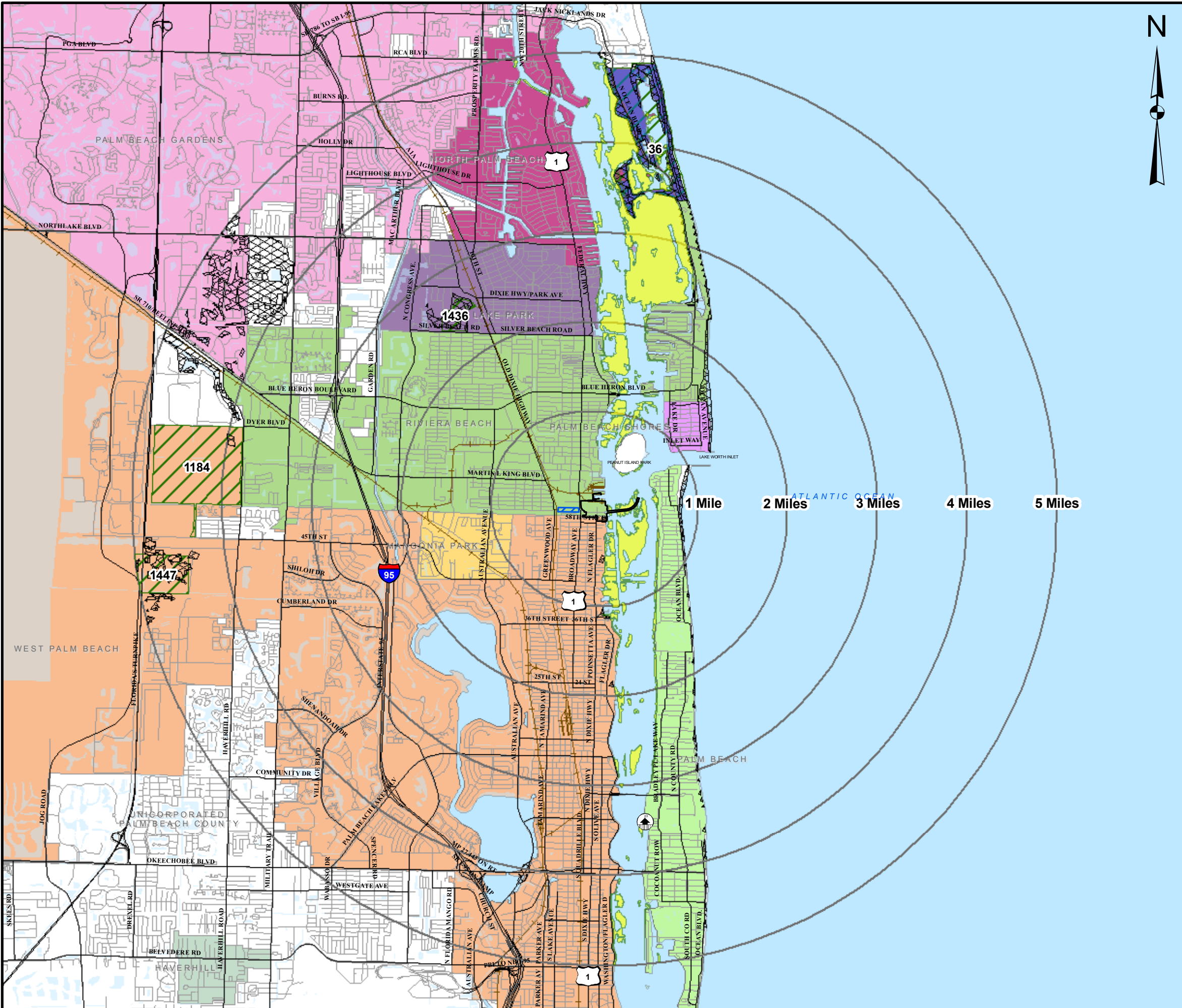
REFERENCES

- Riviera Beach Energy Center Site (to be certified), FPL, 2009.
- Construction Parking and Laydown Area, FPL, 2009.
- Municipalities, Palm Beach County Planning, Zoning, and Building Departments, July 2008.



REV.	DATE	DES	REVISION DESCRIPTION			GIS	CHK	RWW	
PROJECT									
FPL RIVIERA BEACH ENERGY CENTER									
TITLE									
GOVERNMENTAL JURISDICTIONS (MUNICIPALITIES) WITHIN 1,2,3,4, AND 5-MILE RADII									
			PROJECT No.		083-87633	FILE No.		08387633RA007	
			DESIGN	RCM	12/17/2008	SCALE: AS SHOWN		REV. 1	
			GIS	NRL	1/27/2009	FIGURE 3.2.1-2a			
			CHECK	KJK	1/26/2009				
			REVIEW	KFK	1/27/2009				

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\Riviera\RA_SCAActiveMapDocuments\08387633RA032_GovJurisMiles(B).mxd / Modified 1/27/2009 11:37:26 AM / Plotted 1/27/2009 2:59:10 PM by hmar



LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)
- Construction Parking & Laydown Area
- Seagrass
- FNAI Habitat Conservation Priority Areas
- National Historic Landmarks**
 - Flagler House
- State Parks**
 - JOHN D. MACARTHUR STATE PARK
- Florida Managed Areas**
 - 36 - JOHN D. MACARTHUR BEACH STATE PARK
 - 1184 - WINDING WATERS NATURAL AREA
 - 1436 - LAKE PARK SCRUB NATURAL AREA
 - 1447 - GRASSY WATERS PRESERVE

REFERENCES

- Riviera Beach Energy Center Site (to be certified), FPL, 2009.
- Construction Parking and Laydown Area, FPL, 2009.
- Seagrass, Florida Department of Environmental Protection, 2007.
- Florida Managed Lands, Florida Department of Environmental Protection, 2008.
- State Parks, Palm Beach County Department of Parks and Recreation, 2003.
- FNAI Habitat Conservation Priority Areas, FNAI, 2008.
- Flagler House, National Parks Service National Historic Landmarks, 2000.
- Municipalities, Palm Beach County Planning, Zoning, and Building Departments, July 2008.



REV.	DATE	DES				GIS	CHK	RWW
PROJECT								
FPL RIVIERA BEACH ENERGY CENTER								
TITLE								
GOVERNMENTAL JURISDICTIONS (FEDERAL & STATE) WITHIN 1,2,3,4, AND 5-MILE RADII								
			PROJECT No. 083-87633			FILE No. 08387633RA032		
DESIGN	RCM	12/17/2008	SCALE: AS SHOWN			REV. 1		
GIS	NRL	1/27/2009	FIGURE 3.2.1-2b					
CHECK	KJK	1/26/2009						
REVIEW	KFK	1/27/2009						

	FPL Riviera Beach Energy Center (To Be Certified)
	Construction Parking & Laydown Area
	Beach Restoration Borrow Areas
	Offshore Reefs
	Nearshore Reefs
	County Protected Shoreline Area

 DYER
 OCEAN REEF
 PEANUT ISLAND
 PHIL FOSTER
 SCHALL CIRCLE
 WESTGATE

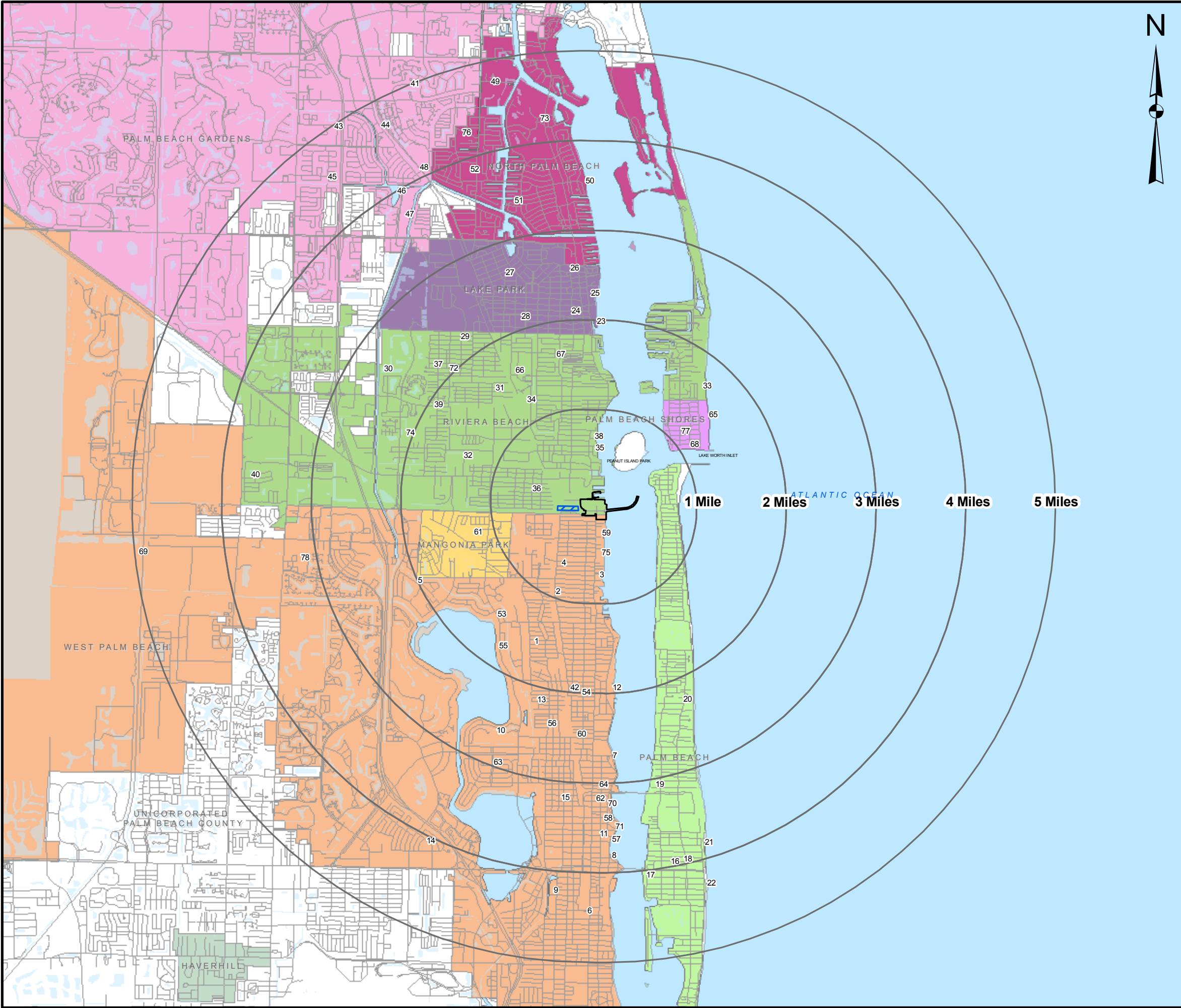
65 - PEANUT ISLAND PARK
81 - PHIL FOSTER PARK BOAT RAMP
84 - DYER PARK
87 - OCEAN REEF PARK

1. Riviera Beach Energy Center Site (to be certified), FPL, 2009.
2. Construction Parking and Laydown Area, FPL, 2009.
3. Nearshore Reefs, Palm Beach County Department of Environmental Resource Mangement, 2000.
4. Offshore Reefs, Palm Beach County GIS, 1993.
5. Borrow Area, Palm Beach County Department of Environmental Resource Mangement, 2001.
6. Shoreline, Palm Beach County GIS, 2001.
7. County Parks, Palm Beach County Property Appraisers Office, 2003.
8. County Property, Palm Beach County Engineering and Public Works, 2003.
9. Municipalities, Palm Beach County Planning, Zoning, and Building Departments, July 2008.



REV.	DATE	DES	REVISION DESCRIPTION						GIS	CHK	RWV		
PROJECT													
FPL RIVIERA BEACH ENERGY CENTER													
TITLE													
GOVERNMENTAL JURISDICTIONS (COUNTY) WITHIN 1,2,3,4, AND 5-MILE RADII													
			PROJECT No.			083-87633		FILE No.			08387633RA033		
			DESIGN		KK	1/8/2009		SCALE: AS SHOWN			REV. 1		
			GIS		NRL		1/27/2009						
			CHECK		KFK		1/26/2009		FIGURE 3.2.1-2c				
			REVIEW		KFK		1/30/2009						

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\Riviera\RA_SCAActiveMapDocuments\08387633RA034_GovJur5Miles(D).mxd / Modified 1/27/2009 4:07:31 PM / Plotted 1/27/2009 4:08:23 PM by tamar



LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)

Construction Parking & Laydown Area

CITY PARKS

1 - SULLIVAN PARK

2 - NORTHWOOD COMMUNITY CENTER

3 - GETTLER PARK

4 - FOGLEMAN PARK

5 - ECHO LAKE PARK

6 - FLAMINGO PARK

7 - PROVIDENCIA PARK

8 - TRINITY PARK

9 - HOWARD PARK

10 - GAINES PARK

11 - PALM BEACH POST CENTENNIAL PARK

12 - CURRIE PARK

13 - COLEMAN PARK

14 - CHILLINGWORTH PARK

15 - 3RD STREET PARK

16 - SEAVIEW AVENUE PARK

17 - MUNICIPAL DOCKS

18 - PHIPPS PARK PLAZA

19 - BRADLEY PARK

20 - TANGIER/MIRAFLORES PARK

21 - CLARKE AVENUE BEACH

22 - MUNICIPAL BEACH

23 - LAKE SHORE PARK

24 - LOTTIE MAE MILLER PARK

25 - KELSEY PARK

26 - S.J. BLAKLEY PARK

27 - ILEX PARK

28 - BERT BOSTROM BALLFIELD PARK

29 - GOODMARK PARK

30 - TIMBER PINE PARK

31 - MONROE HEIGHTS PARK

32 - DAN CALLOWAY REC COMPLEX

33 - RIVIERA MUNICIPAL BEACH

34 - WELLS RECREATION COMPLEX

35 - BICENTENNIAL PARK/MARINA

36 - GEORGE STREET PARK

37 - CUNNINGHAM PARK

38 - BICENTENNIAL PARK

39 - BARRACUDA BAY AQUATICS COMPLEX

40 - LONE PINE PARK

41 - THE OAKS COMMUNITY PARK

42 - BLUM PARK

43 - CITY PARK

44 - RIVERSIDE DRIVE COMMUNITY CENTER

45 - PLANT DRIVE

46 - LAKE CATHERINE AREA

47 - LAKE CATHERINE SPORTS COMPLEX

48 - HOLLY DRIVE

49 - NPB COMMUNITY CENTER

50 - LAKESIDE PARK

51 - ANCHORAGE PARK

52 - OSBORNE PARK

53 - SUNSET PARK

54 - PLEASANT CITY COMMUNITY CENTER

55 - LAKE MANGONIA PARK

56 - MELANIE JENKINS PARK

57 - MEYER AMPHITHEATRE

58 - CENTENNIAL SQUARE

59 - BRIAN CHAPPELL PARK

60 - NATHANIEL ADAMS PARK

61 - MANGONIA PARK

62 - FLAGLER PARK

63 - GOLF AVENUE LINEAR PARK

64 - NW CORNER OLIVE/QUADRILE

65 - PALM BEACH SHORES MUNICIPAL BEACH

66 - BEN FLINT PARK

67 - JERRY SCHULTZ PARK

68 - INLET PARK

69 - GRASSY WATERS NATURE PRESERVE

70 - JOSE MARTI PARK

71 - FLAGLER WATERFRONT WALKING PARK

72 - LINDSEY DAVIS SR. COMMUNITY CENTER

73 - NORTH PALM BEACH AQUATICS/TENNIS

74 - CONGRESS LAKES PARK

75 - OSPREY PARK

76 - ST. CLAIRE'S BALLFIELD

77 - PARKWAY

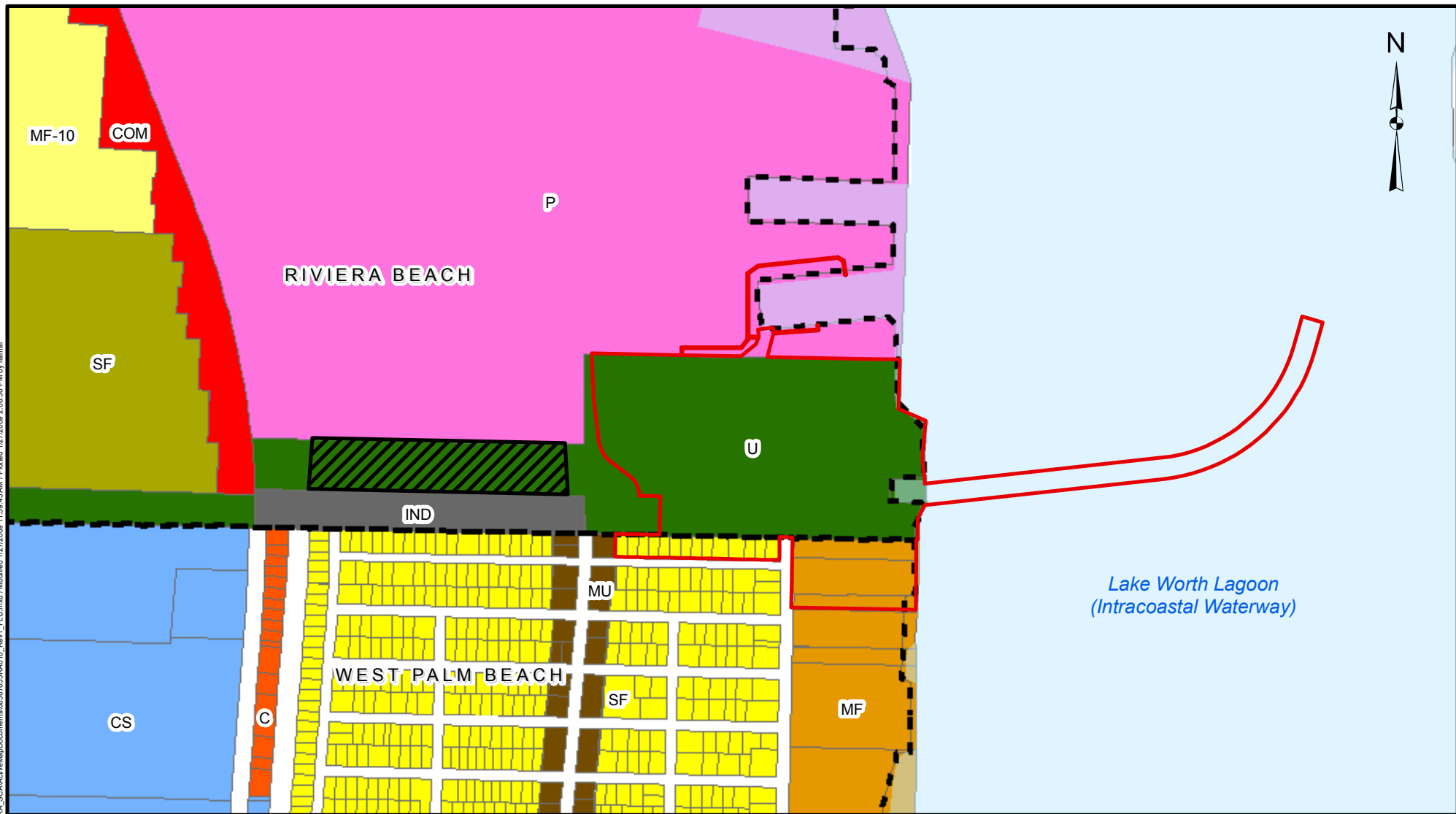
78 - HAVERHILL SPORTS COMPLEX
- REFERENCES
1. Riviera Beach Energy Center Site (to be certified), FPL, 2009.

2. Construction Parking and Laydown Area, FPL, 2009.

3. City Parks, Palm Beach County Parks and Recreation Department, 2003.

4. Municipalities, Palm Beach County Planning , Zoning, and Building Departments, July 2008.
-
- | | | | | | | |
|--|------|-----------|----------------------|------|-----|-----|
| REV. | DATE | DES | REVISION DESCRIPTION | GIS | CHK | RWW |
| PROJECT | | | | | | |
| FPL
RIVIERA BEACH ENERGY CENTER | | | | | | |
| TITLE | | | | | | |
| GOVERNMENTAL JURISDICTIONS (CITY PARKS)
WITHIN 1,2,3,4, AND 5-MILE RADI | | | | | | |
| PROJECT No. 083-87633 FILE No. 08387633RA034 | | | | | | |
| DESIGN | KJK | 1/8/2009 | SCALE: AS SHOWN | REV. | 1 | |
| GIS | NRL | 1/27/2009 | FIGURE 3.2.1-2d | | | |
| CHECK | KJK | 1/26/2009 | | | | |
| REVIEW | KFK | 1/27/2009 | | | | |

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LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)
- Construction Parking & Laydown Area

City of Riviera Beach Future Land Use

- COM - Commercial
- IND - Industrial
- MF-10 - Low Density Multiple Family Residential up to 10 du per acre
- P - Port
- SF - Single Family Residential up to 6 du per acre
- U - Utilities

City of West Palm Beach Future Land Use

- C - COMMERCIAL
- CS - COMMUNITY SERVICE
- MF - MULTIFAMILY RESIDENTIAL
- MU - MIXED USE
- SF - SINGLE FAMILY RESIDENTIAL

REFERENCES

1. FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
2. Construction Parking and Laydown Area, FPL, 2009.
3. Future Land Use, City of Riviera Beach Community Development Department, City of West Palm Beach, Planning Department, 2008.

Lake Worth Lagoon
(Intracoastal Waterway)



REV.	DATE	DES.	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
FUTURE LAND USE						
			PROJECT No.	083-87633	FILE No.	08387633RA010
			DESIGN	KJK	12/17/2008	SCALE: AS SHOWN REV. 1
			GIS	NRL	1/19/2009	
			CHECK	KJK	1/26/2009	
			REVIEW	KFK	1/27/2009	



FIGURE 3.2.2-1

Map Document: P:\GIS\PROJECTS\08080833\RA009 - Rev1_Zoning.mxd / Modified: 1/27/2009 11:56:01 AM / Plotted: 1/27/2009 2:07:14 PM by damar



LEGEND

FPL Riviera Beach Energy Center (To Be Certified)

Construction Parking & Laydown Area

City of Riviera Beach Zoning

- CG - General Commercial District
- CN - Neighborhood Commercial District
- IG - General Industrial District
- IL - Limited Industrial District
- OP - Office Professional District
- RM-15 - Multiple Family Dwelling District
- RS-8 - Single Family Dwelling District (RS-8)
- U - Utilities District

City of West Palm Beach Zoning

- BMUD TYPE II - BROADWAY MIXED USE DISTRICT TYPE II BUILDINGS
- CS - COMMUNITY SERVICE
- CSPD - COMMUNITY SERVICE PLANNED DEVELOPMENT
- GC - GENERAL COMMERCIAL
- MF32 - MULTIFAMILY HIGH DENSITY RESIDENTIAL
- RPD - RESIDENTIAL PLANNED DEVELOPMENT
- SF7 - SINGLE FAMILY LOW DENSITY RESIDENTIAL

REFERENCES

1. FPL Riviera Beach Energy Center (to be certified), FPL 2009
2. Construction Parking and Laydown Area, FPL, 2009
3. Zoning, City or Riviera Beach, Community Development Department, City of West Palm Beach, Planning Department, 2008



REV.	DATE	DES.	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
ZONING						
PROJECT No. 083-87633 FILE No. 08387633RA009						
DESIGN	KJK	12/17/2008	SCALE: AS SHOWN	REV.	1	
GIS	NRL	1/19/2009				
CHECK	KJK	1/26/2009				
REVIEW	KFK	1/27/2009				

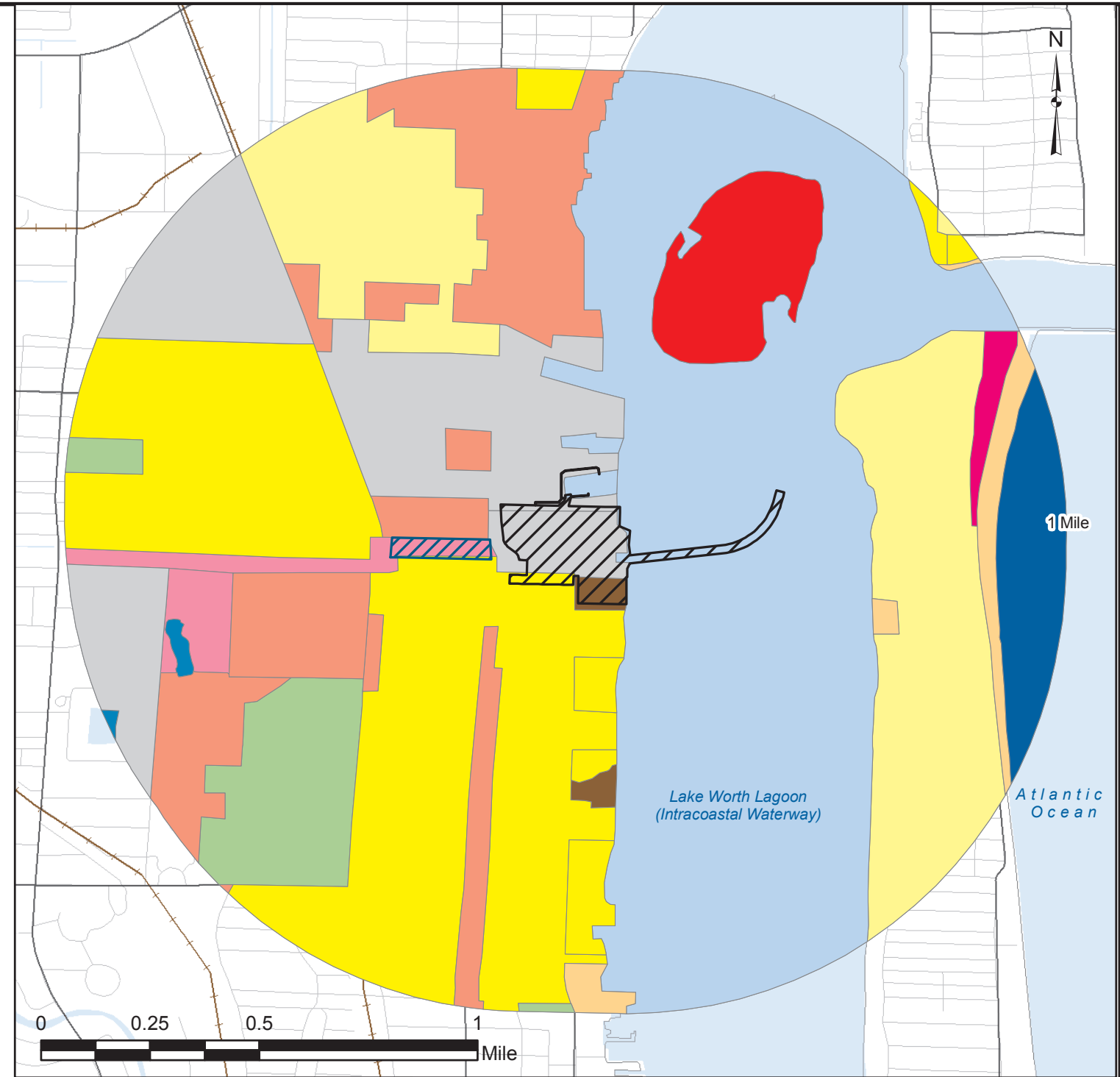


FIGURE 3.2.2-2

FPL Riviera Beach Energy Center (To Be Certified)	240 - NURSERIES AND VINEYARDS
Construction Parking & Laydown Area	310 - HERBACEOUS (DRY PRAIRIE)
Existing Land Use	320 - SHRUB AND BRUSHLAND
110 - RESIDENTIAL	330 - MIXED RANGELAND
120 - RESIDENTIAL	410 - UPLAND CONIFEROUS FORESTS
130 - RESIDENTIAL	420 - UPLAND HARDWOOD FORESTS
140 - COMMERCIAL AND SERVICES	430 - UPLAND HARDWOOD FORESTS CONTINUED
150 - INDUSTRIAL	510 - STREAMS AND WATERWAYS
170 - INSTITUTIONAL	520 - LAKES
180 - RECREATIONAL	530 - RESERVOIRS

1. FPL Riviera Beach Energy Center (to be certified), FPL 2009.
2. Construction Parking and Laydown Area, Florida Power & Light, 2009.
3. Existing Land Use, South Florida Water Management District, 2004.

Radii drawn from Riviera Beach Energy Center (To Be Certified)



REV.	DATE	DES	REVISION DESCRIPTION			GIS	CHK	RVV	
PROJECT									
FPL RIVIERA BEACH ENERGY CENTER									
TITLE									
EXISTING LAND USE									
			PROJECT No.		083-87633	FILE No.		08387633RA013	
			DESIGN	RCM	12/19/2008	SCALE: AS SHOWN		REV. 1	
			GIS	NRL	1/19/2009				
			CHECK	RCM	1/27/2009	FIGURE 3.2.3-1			
			REVIEW	KFK	1/27/2009				

Series		Geologic Unit		Approximate thickness (feet)	Lithology	Hydrogeologic unit		Approximate thickness (feet)		
HOLOCENE		PAMLICO SAND		0-50	Quartz sand with shelly intervals	SURFICIAL AQUIFER SYSTEM		150-380		
PLEISTOCENE		ANASTASIA FORMATION		0-200	Quartz sand, shell, and coquina					
		FT. THOMPSON FORMATION		0-40	Alternating marine molluscan limestone and freshwater marl					
PLIOCENE		TAMIAMI FORMATION		0-200	Sandy, shelly limestone, calcareous sandstone, quartz sand, and clayey sand	INTERMEDIATE CONFINING UNIT		600-700		
MIOCENE AND LATE OLIGOCENE		HAWTHORN GROUP		600-800	Clay, marl, dolosilt, micritic limestone, clayey sand, silt, and phosphate grains					
					90-130					Micritic limestone to marl, chert nodules, some phosphate grains
					30-355					Limestone, dolomite, shell, sand, sandstone, and calcareous clay or silt, abundant phosphate grains in places
?		MARKER UNIT				FLORIDAN AQUIFER SYSTEM	LOWER HAWTHORN PRODUCING ZONE		10-180	
EARLY OLIGOCENE		EOCENE GROUP	SUWANNEE LIMESTONE	0-150	Fossiliferous, calcarenitic limestone		UPPER FLORIDAN AQUIFER		500-700 ?	
EOCENE	LATE		OCALA LIMESTONE	0-300	Chalky to fossiliferous, calcarenitic limestone					
	MIDDLE		AVON PARK FORMATION	900-1,200	Fine-grained, micritic to fossiliferous limestone and dolomite		MIDDLE CONFINING UNIT		0?-900	
	EARLY		?	DOLomite UNIT 0-400	?					
		OLDSMAR FORMATION	1,100-1,500		LOWER FLORIDAN AQUIFER		BOULDER ZONE	300-650	1,800	
PALEOCENE		CEDAR KEYS FORMATION		500-600				Dolomite and dolomitic limestone		
				1,500?	Massive anhydrite beds		SUB-FLORIDAN CONFINING UNIT		1,500?	

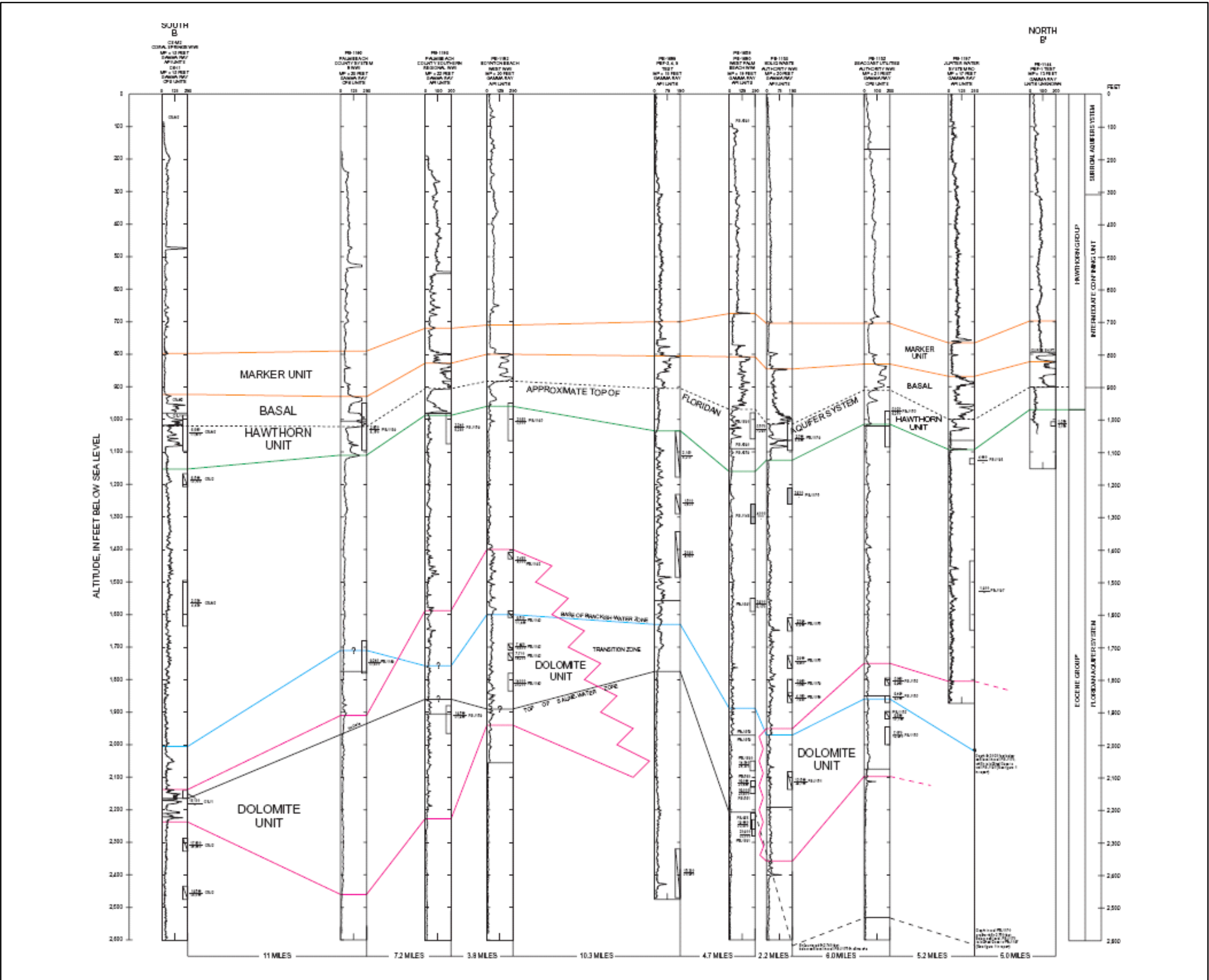
LEGEND

REFERENCE

1. HYDROGEOLOGIC SECTION A-A By Ron S. Reese and Steven J. Mernberg, 2000
2. U.S. GEOLOGICAL SURVEY Water-Resources Investigations Report 99-4061 Prepared in cooperation with the SOUTH FLORIDA WATER MANAGEMENT DISTRICT, Page 10

PROJECT		FPL RIVIERA BEACH ENERGY CENTER		
TITLE		GENERALIZED GEOLOGY AND HYDROGEOLOGY OF PALM BEACH COUNTY		
	PROJECT NO. 083-87633		SCALE AS SHOWN	REV. 0
	DESIGN	MF	08/28/08	FIGURE 3.3.1-1
	GIS	RL	09/01/08	
	CHECK	GP	12/16/08	
	REVIEW	KFK	01/27/09	

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LEGEND

EXPLANATION

- ? CORRELATION FORMATION BOUNDARY OR SALINITY ZONE BOUNDARY-Dashed line indicates position is uncertain. Question mark indicates depth of boundary in a well is uncertain.
- APPROXIMATE TOP OF FLORIDAN AQUIFER SYSTEM
- END OF LOG RUN INTERVAL-Fa multiple log run
- MP ALTITUDE OF MEASURING POINT-In feet above sea level
- CPS COUNTS PER SECOND
- API AMERICAN PETROLEUM INSTITUTE STANDARD-For gravity measurement
- WWI WASTE WATER INJECTION SITE
- RO REVERSE OSMOSIS WATER SUPPLY SITE
- * The Eocene group is informally defined in this report to include the Suwannee Limestone, Ocala Limestone, Avon Park Formation, and Ocala Formation. The Suwannee Limestone is interpreted to be present only in the western portion of the study area.

- WATER QUALITY DATA
- COMPLETED INTERVAL
 - PACKER TEST
 - GEO-PHYSICAL LOG EVALUATION INTERVAL

Analysis of water samples collected or intervals calculated from geophysical logs. Upper number is chloride concentration. Lower number is dissolved solids concentration. Both values in milligrams per liter. See appendix B and table 3 in report for additional information on these analyses.



NOTES ON DATA SOURCES
Determination of geologic boundaries:
Lithologic sample descriptions were available on all wells and were used together with the gamma-ray logs shown. See table 2 in report for additional information.
Determination of salinity zone boundaries:
Resistivity geophysical logs were available on most wells and were used together with the water quality data shown. See table 4 in report for additional information.

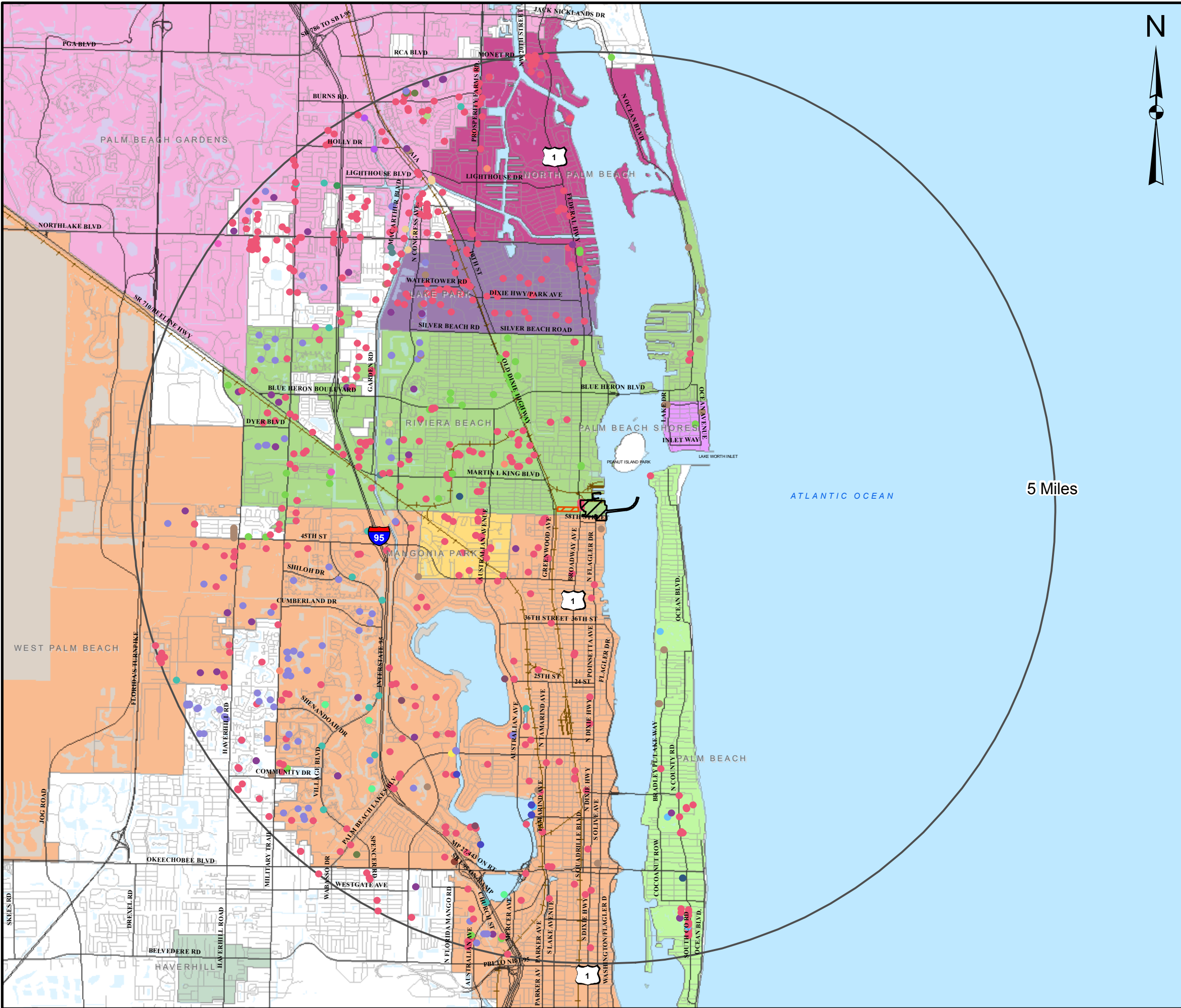


REFERENCE

- HYDROGEOLOGIC SECTION B-B By Ron S. Reese and Steven J. Mernberg, 2000
- U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 99-4061 Prepared in cooperation with the SOUTH FLORIDA WATER MANAGEMENT DISTRICT, Page 59

PROJECT	FPL RIVIERA BEACH ENERGY CENTER			
	TITLE NORTH - SOUTH HYDROGEOLOGICAL CROSS SECTION OF PALM BEACH COUNTY			
	PROJECT No. 083-87633		SCALE AS SHOWN	REV. 0
	DESIGN	MF	08/28/08	FIGURE 3.3.1-3
	GIS	RL	09/01/08	
	CHECK	GP	12/16/08	
	REVIEW	KFK	01/27/09	

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\Riviera\RA_SCAAActiveMapDocuments\08387633RA011_Rev1_WaterUsePermits_5Miles.mxd / Modified 1/27/2009 12:01:17 PM / Plotted 1/27/2009 2:09:51 PM by tamar



- LEGEND**
- FPL Riviera Beach Energy Center (To Be Certified)

Construction Parking & Laydown Area

Water Use Sources

Biscayne Aquifer

CANAL

Clear Lake

Floridan Aquifer System

M-1 CANAL

NPBCWCD Canal

Off-site Canal(s)

Off-site Lake(s)

On-site Borrow Pit(s)

On-site Canal(s)

On-site Lake(s)

On-site Lake(s)/Pond(s)

Perimeter Ditch

SFWMD Canal (C-17)

SFWMD Canal (C-51)

SFWMD Canal C-17 via Merrill Canal

Surficial Aquifer System

Thompson Canal

Unspecified

Water Table Aquifer

Water Table aquifer
- NOTES**

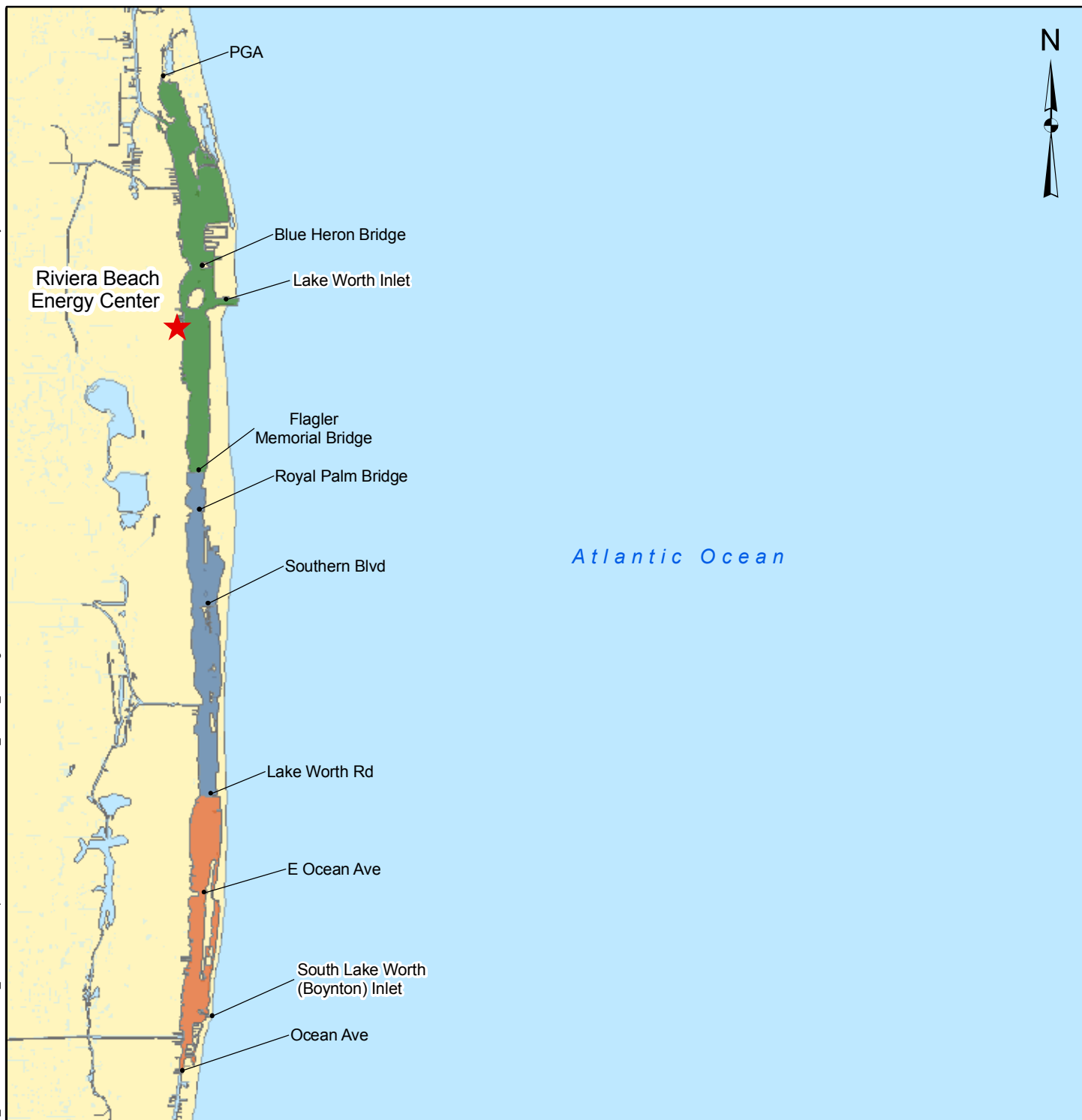
Radius drawn from FPL Riviera Beach Energy Center (To Be Certified)
- REFERENCES**

1. Riviera Beach Energy Center (to be certified), FPL , 2009.

2. Construction Parking and Laydown Area, FPL, 2009

3. Water Use Sources, South Florida Water Managment District, 2007.
-
- | | | | | | | | | | |
|---------|------|-----|---|-----|------------|-----------------|------|---|--|
| | | | | | | | | | |
| REV. | DATE | DES | REVISION DESCRIPTION | | | | | | |
| PROJECT | | | FPL
RIVIERA BEACH ENERGY CENTER | | | | | | |
| TITLE | | | WATER USE PERMITS
WITHIN A 5-MILE RADIUS | | | | | | |
| | | | PROJECT No. | | FILE No. | | | | |
| | | | DESIGN | RCM | 12/17/2008 | SCALE: AS SHOWN | REV. | 1 | |
| | | | GIS | NRL | 1/19/2009 | | | | |
| | | | CHECK | RCM | 1/27/2009 | | | | |
| | | | REVIEW | KFK | 1/27/2009 | | | | |
- FIGURE 3.3.3-1

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CoEC_RBEC_Conversion\Riviera\RA_SCA\ActiveMapDocuments\08387633RA025_8.5x11_LWL Segments.mxd / Modified 1/27/2009 10:06:46 AM / Plotted 1/27/2009 2:38:03 PM by rlamar



LEGEND

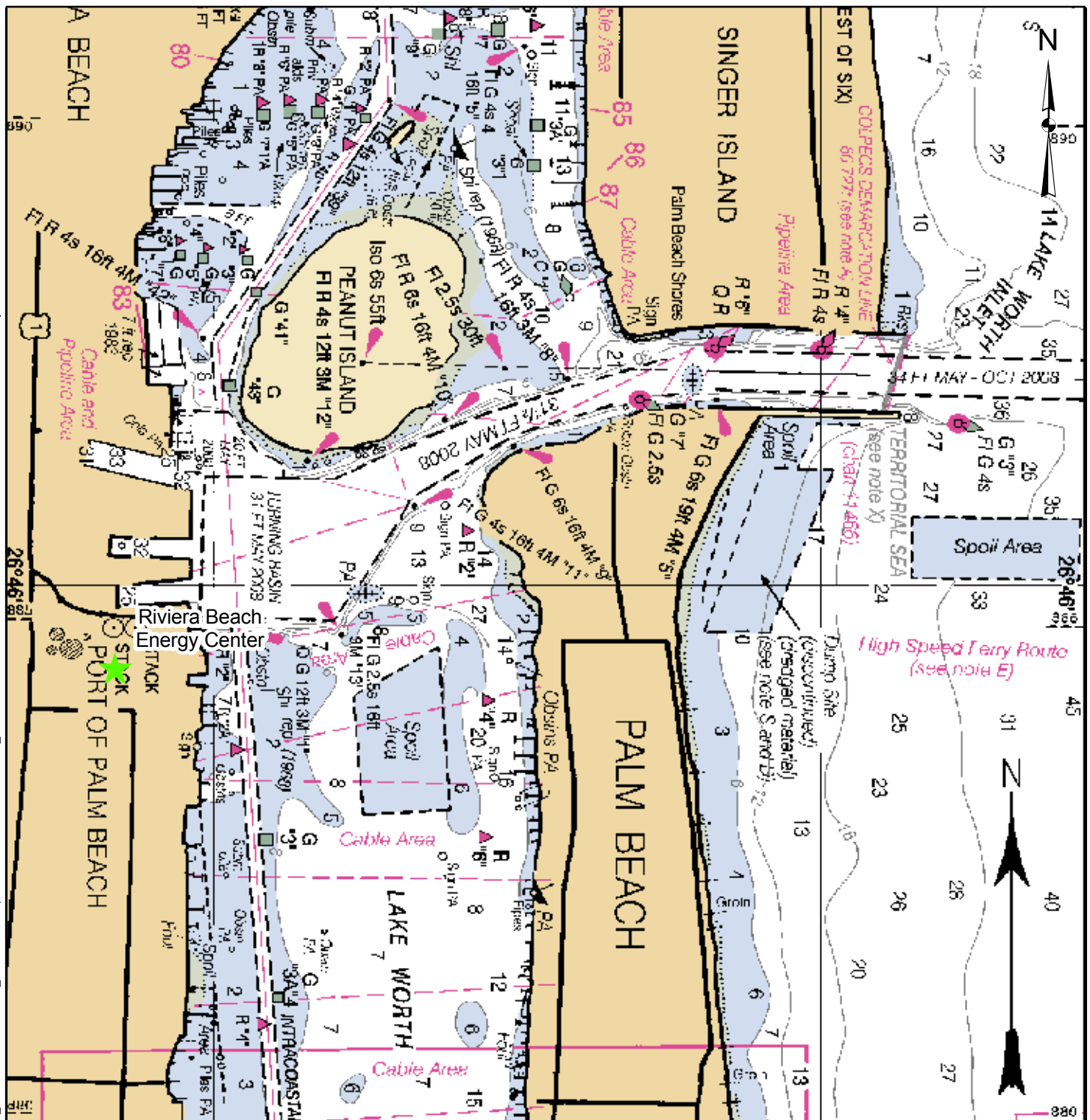
- ★ FPL Riviera Beach Energy Center
- LWL North
- LWL Central
- LWL South

REFERENCES

1. Lake Worth Lagoon Segments, Palm Beach County Department of Environmental Resources Management, 2007.
2. FPL Riviera Beach Energy Center, FPL, 2008.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
LAKE WORTH LAGOON SEGMENTS						
			PROJECT No.	083-87633	FILE No.	08387633RA025
			DESIGN	RCM	1/26/2009	SCALE: AS SHOWN
			GIS	NRL	1/27/2009	REV. 0
			CHECK	RCM	1/27/2009	FIGURE 3.3.4-1
			REVIEW	KFK	1/27/2009	



LEGEND

- ★ FPL Riviera Beach Energy Center

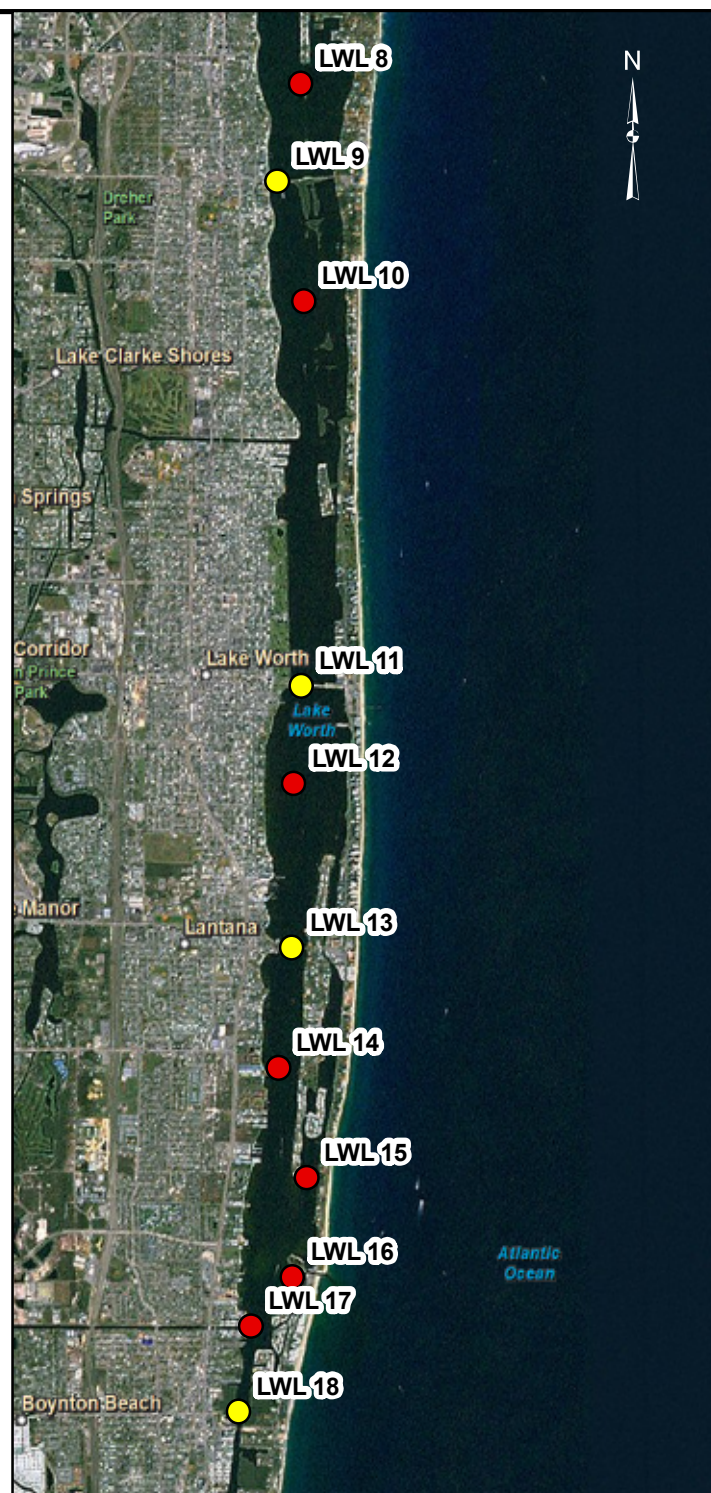
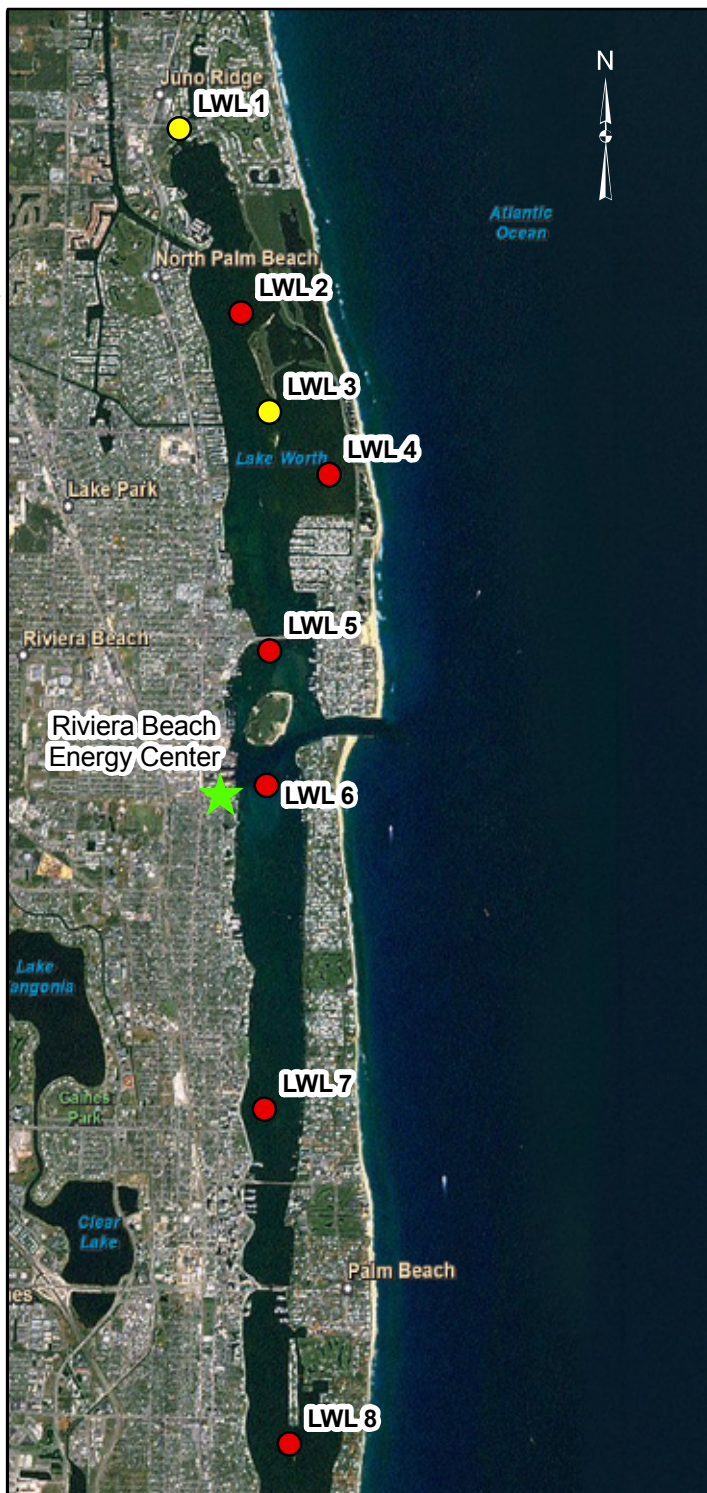
REFERENCES

1. Nautical Chart, NOAA Office of Coastal Survey.



REV.	DATE	DES.	REVISION DESCRIPTION	GIS	CHK	RVV
PROJECT						
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TITLE						
NOAA NAUTICAL CHART						
PROJECT No.			083-87633	FILE No.		
DESIGN			RCM	1/26/2009		
GIS			NRL	1/27/2009		
CHECK			RCM	1/27/2009		
REVIEW			KFK	1/27/2009		
SCALE: AS SHOWN				REV. 0		

FIGURE 3.3.4-2



LEGEND

★ FPL Riviera Beach Energy Center

Lake Worth Lagoon WQ Stations

● Former FDEP-Tidal (6)

● New LWL WQ (12)

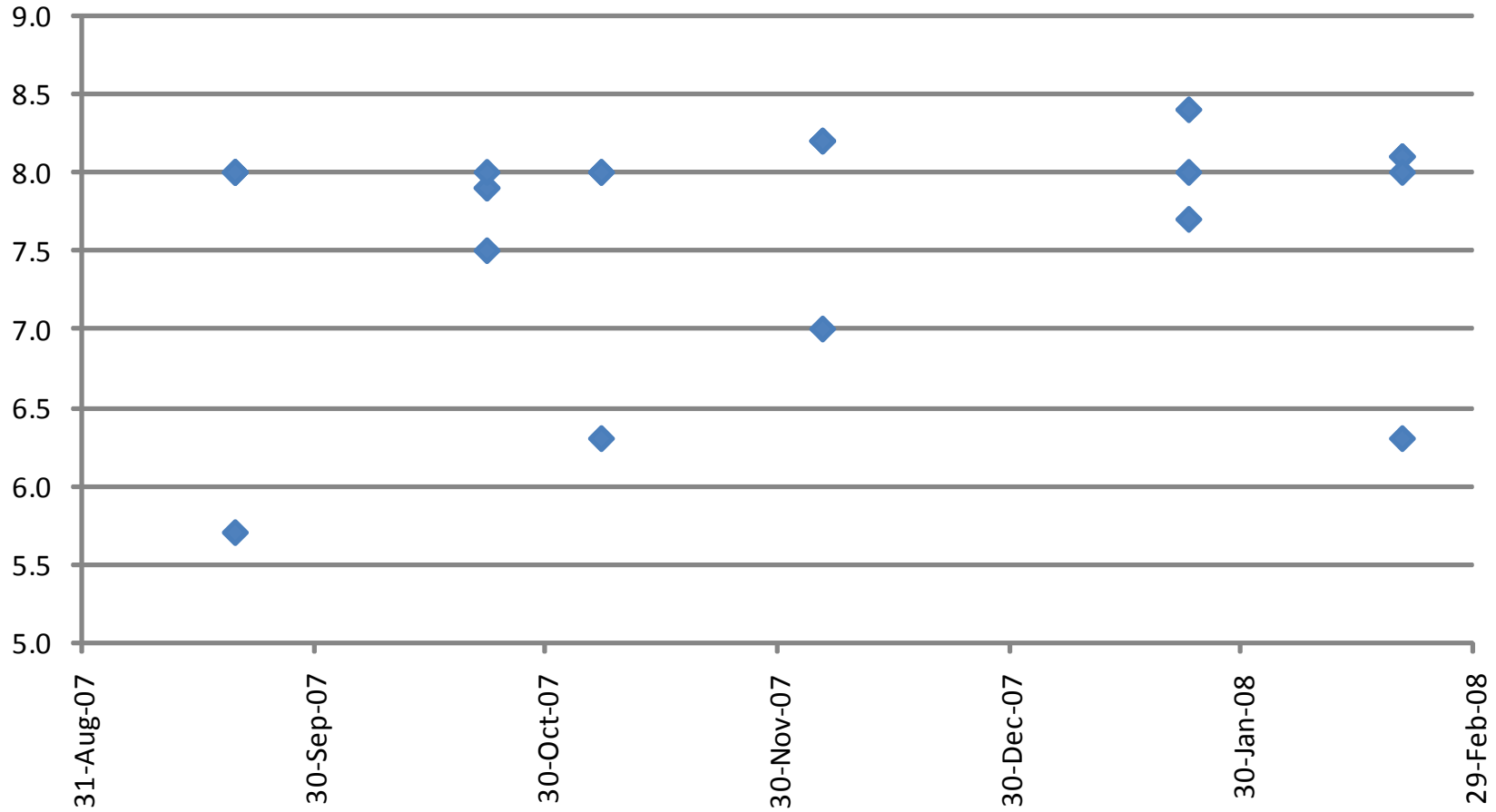
REFERENCES

1. Water quality stations, Palm Beach County Department of Resources Management. 2007.



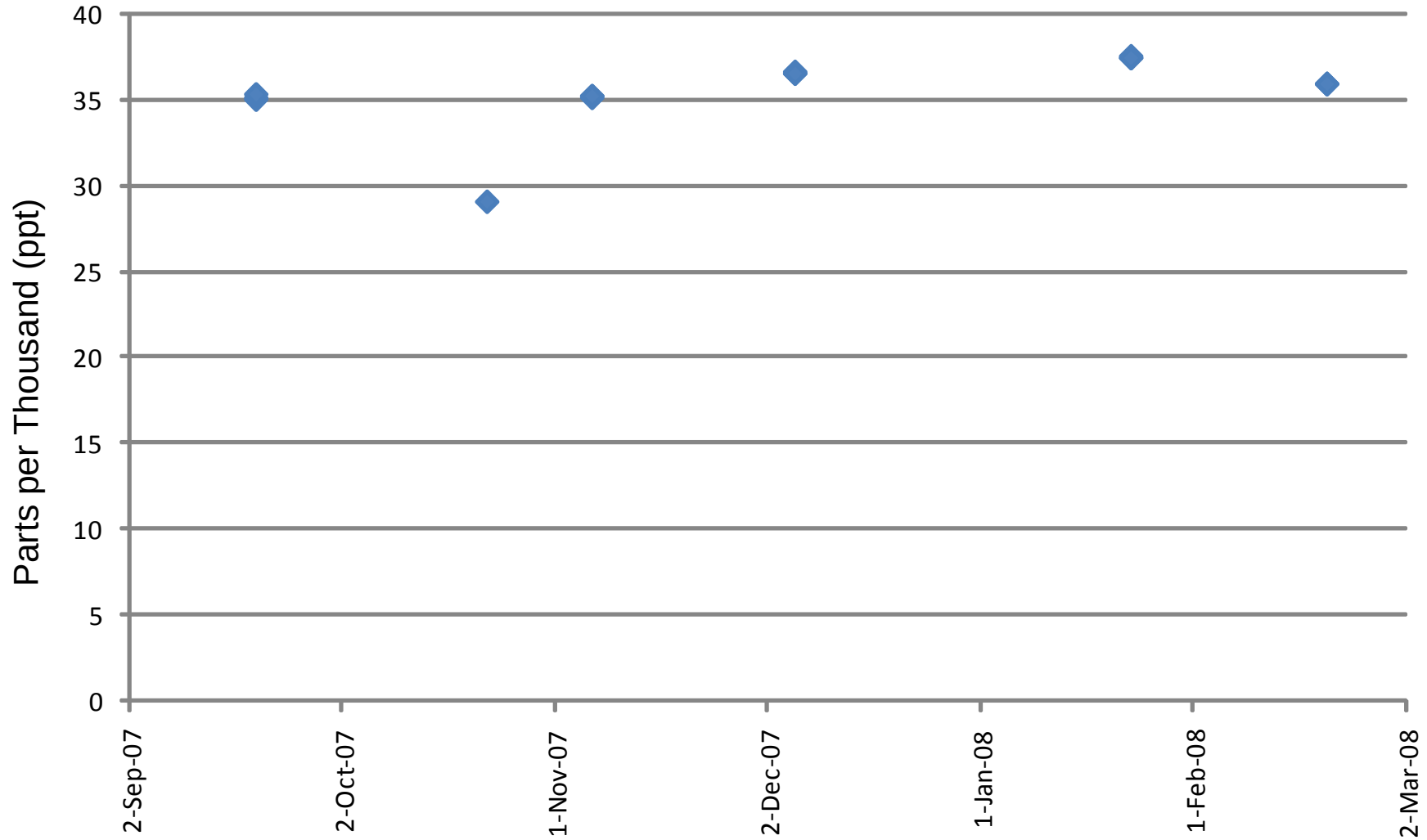
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PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
LAKE WORTH LAGOON WATER QUALITY STATIONS						
			PROJECT No.	083-87633	FILE No.	08387633RA027
			DESIGN	RCM	1/26/2009	SCALE: AS SHOWN
			GIS	NRL	1/27/2009	REV. 0
			CHECK	RCM	1/27/2009	FIGURE 3.3.4-3
			REVIEW	KFK	1/27/2009	

pH at LWL-6



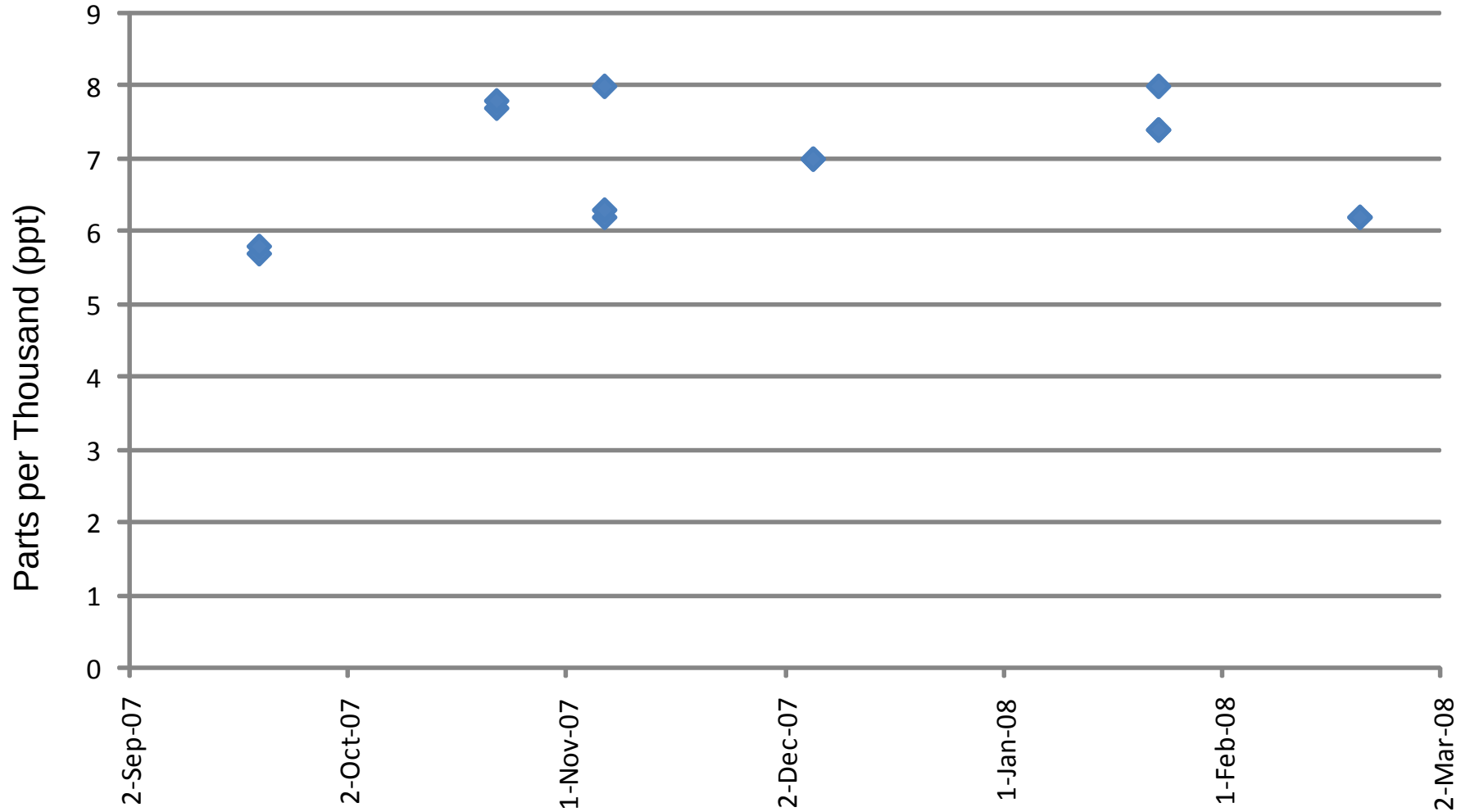
PROJECT		RIVIERA BEACH ENERGY CENTER			
TITLE		pH at Lake Worth Lagoon			
	PROJECT No. 083-87633		File No.		REV. 0
	DESIGN	KK	01/08/2009	FIGURE 3.3.4-4	
	GIS	KK	01/08/2009		
	CHECK				
REVIEW					

Salinity at LWL-6

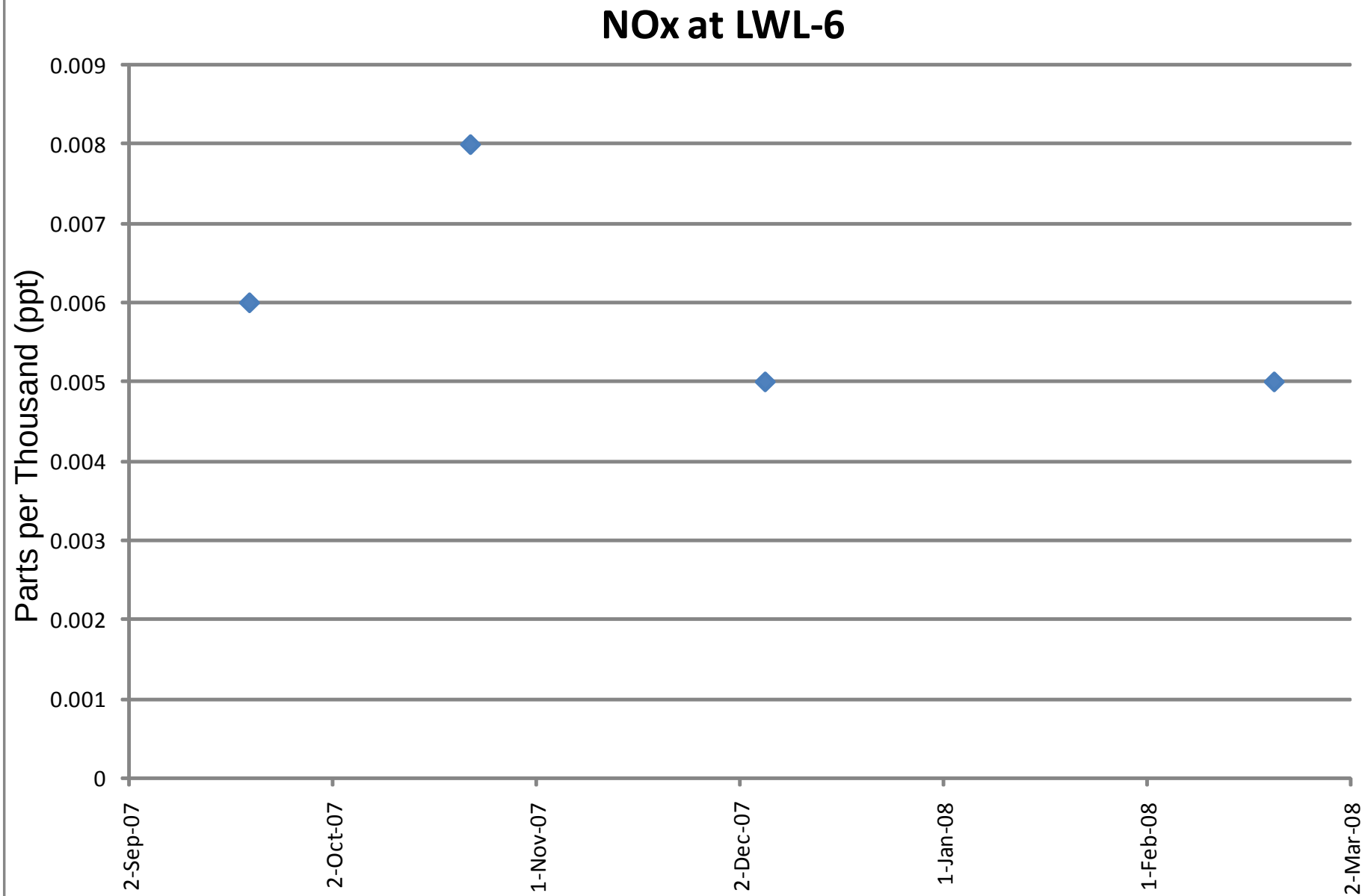


PROJECT		RIVIERA BEACH ENERGY CENTER	
TITLE		Salinity at Lake Worth Lagoon	
	PROJECT No. 083-87633		File No.
	DESIGN	KK	01/08/2009
	GIS	KK	01/08/2009
	CHECK		
	REVIEW		
			FIGURE 3.3.4-5

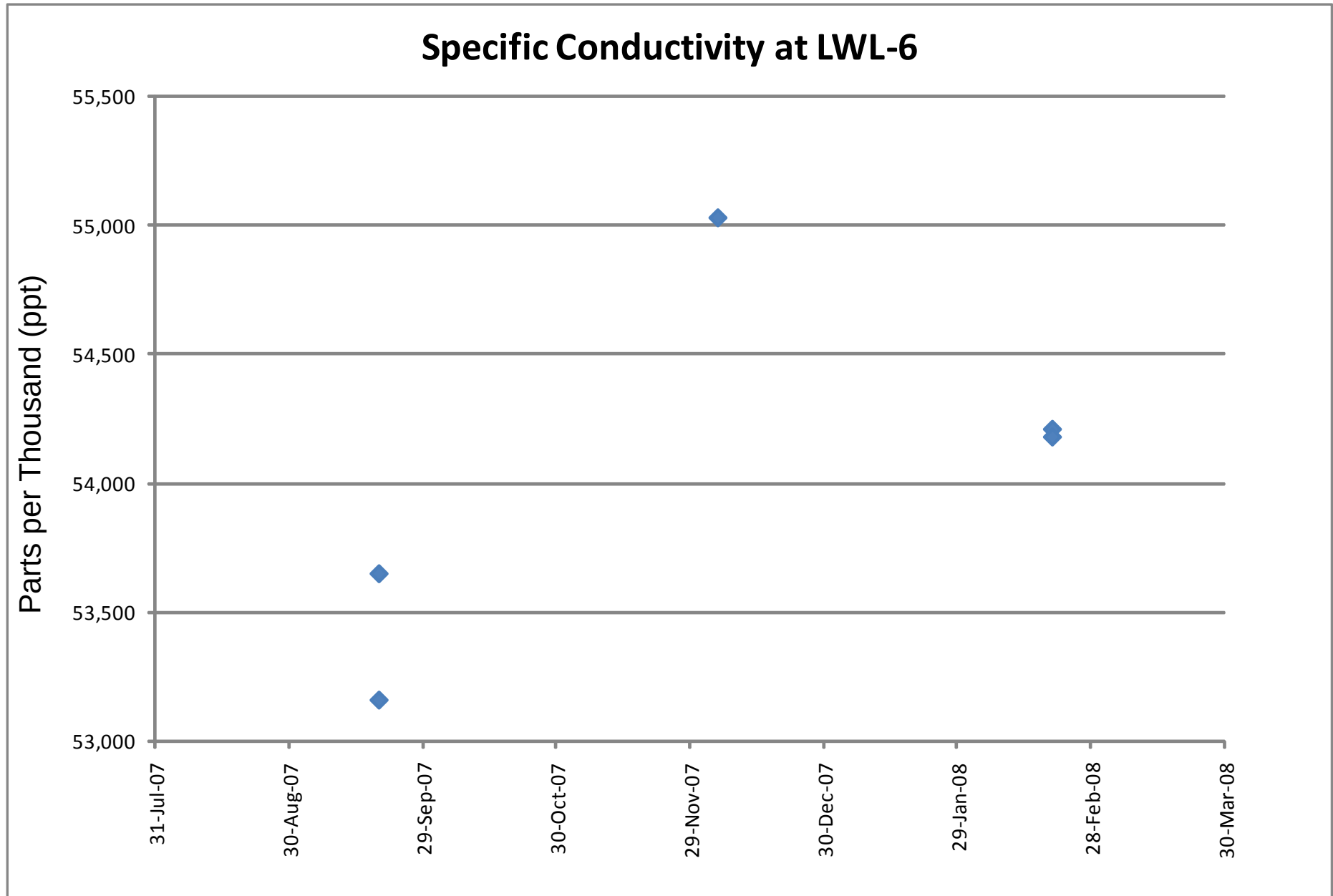
DO at LWL-6



PROJECT		RIVIERA BEACH ENERGY CENTER			
TITLE					
DO at Lake Worth Lagoon					
	PROJECT No. 083-87633			File No.	REV. 0
	DESIGN	KK	01/08/2009	FIGURE 3.3.4-6	
	GIS	KK	01/08/2009		
	CHECK				
	REVIEW				



PROJECT				RIVIERA BEACH ENERGY CENTER			
TITLE				NOx at Lake Worth Lagoon			
		PROJECT No. 083-87633			File No.		REV. 0
		DESIGN	KK	01/08/2009	FIGURE 3.3.4-7		
		GIS	KK	01/08/2009			
		CHECK					
		REVIEW					



PROJECT		RIVIERA BEACH ENERGY CENTER			
TITLE					
Specific Conductivity at Lake Worth Lagoon					
	PROJECT No. 083-87633			File No.	REV. 0
	DESIGN	KK	01/08/2009	FIGURE 3.3.4-8	
	GIS	KK	01/08/2009		
	CHECK				
	REVIEW				

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\RivieraIRA_SCNActiveMapDocuments\08387633RA029_Bathymetry.mxd / Modified 1/27/2009 5:43:26 PM / Plotted 1/27/2009 5:43:26 PM by rhamar



LEGEND

 FPL Riviera Beach Energy Center (To Be Certified)

REFERENCES

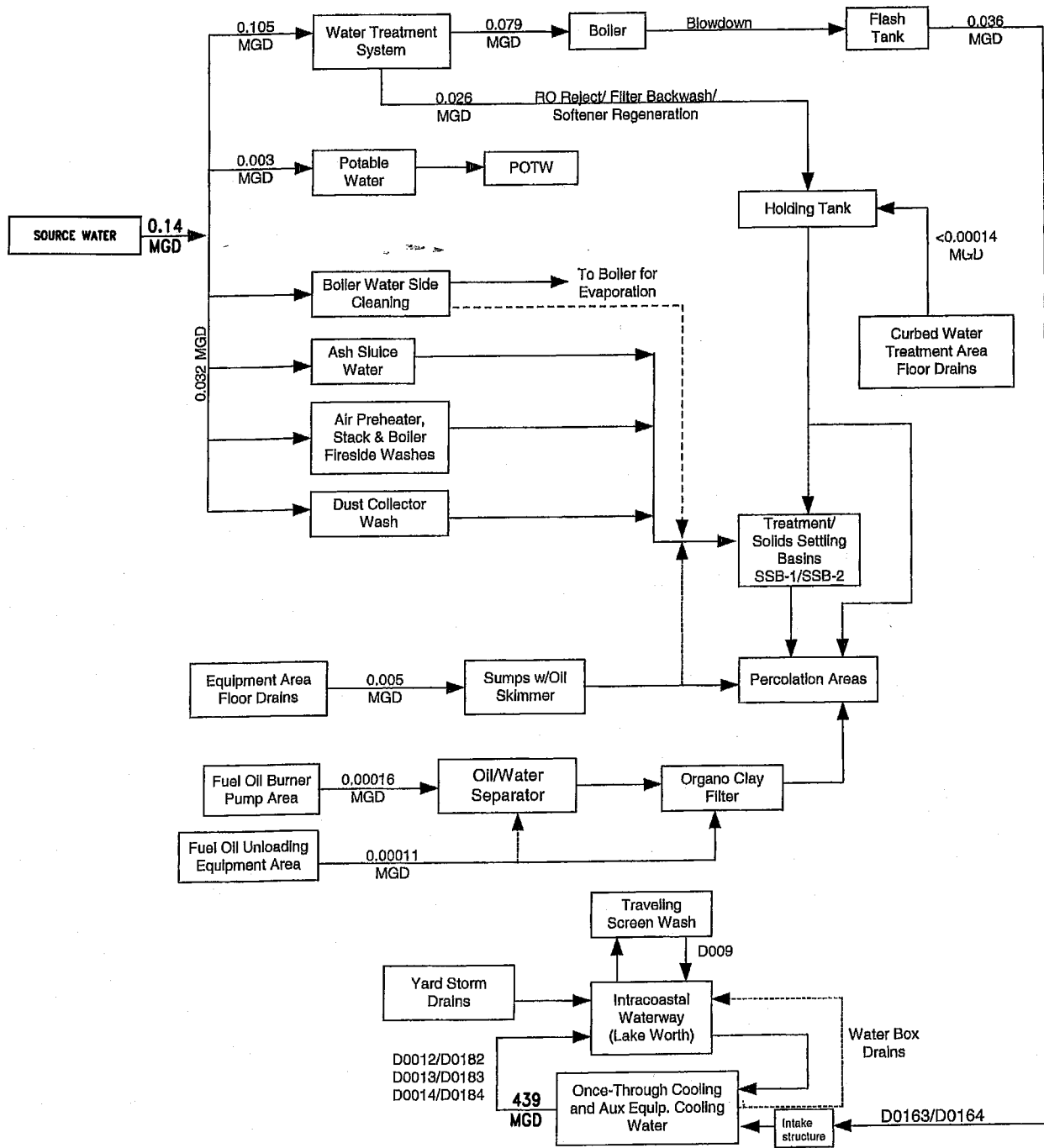
- 1. FPL Riviera Beach Energy Center, FPL, 2008.
- 2. Bathymetric Survey, Palm Beach County Department of Environmental Resources, 2003.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RWW
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
BATHYMETRIC SURVEY OF LAKE WORTH LAGOON						
			PROJECT No.	083-87633	FILE No.	08387633RA029
			DESIGN	HF	1/26/2009	SCALE: AS SHOWN
			GIS	NRL	1/27/2009	REV. 0
			CHECK	RCM	1/27/2009	FIGURE 3.3.4-9
			REVIEW	KFK	1/27/2009	

WALKDOWN INFORMATION				TECHNICAL ACCEPTANCE			
ORG	BY	DATE	AS-BUILT INFORMATION	ORG	BY	DATE	ENGINEERING ORGANIZATION

BAR CODE



Note:
The values on this table reflect historical use and are not design values. Please refer to SCA Figure 4.5.0-1 for the correct water flows for the converted facility.

* See Item IV E Attachment for derivation of flow rates

LEGEND

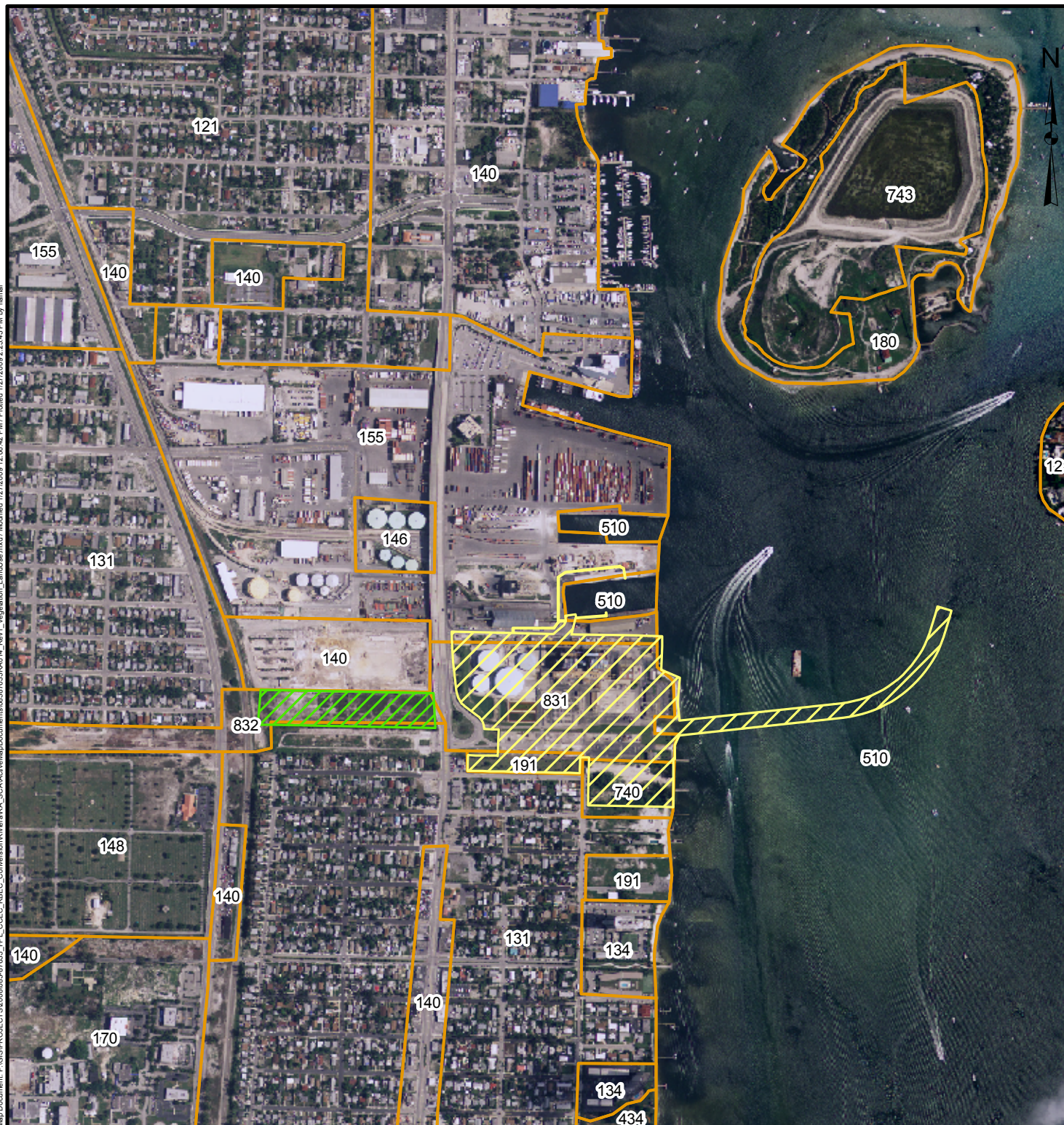
- PRIMARY PATH
- ALTERNATE FLOW PATH
- MGD - MILLION GALLONS PER DAY

	SYSTEM	WR	DISCIPLINE	M	PLANT/UNIT	RIVIERA PLANT
	SCALE	N/A	CAD FILE NAME		TITLE	WATER FLOW DIAGRAM
	DRAWING SIZE	A (8.5X11)	FPL ARCHIVE NAME			ITEM IV A ATTACHMENT
						Figure 3.3.4-10

REV	DATE	REVISION DESCRIPTION	BY	CH	COR	APR	ORG
0	7-16-08	ISSUED FOR 2008 NPDES PERMIT RENEWAL APPLICATION	JCS	AF		AF	PGD

DRAWING NUMBER	PRV3-M0113-WR	SHEET	1 OF 1	REV	0
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Map Document: P:\GIS\PROJECTS\02006\083-87633_FPL_CCEC_RBEC_Conversion\RivieraRA_SCA\ActivityMapDocuments\08387633RA014_Rev1_Vegetation_LandUse.mxd / Modified 1/27/2009 12:06:42 PM / Plotted 1/27/2009 2:23:43 PM by slmar



LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)
- Construction Parking & Laydown Area
- Vegetation / Land Use Classification**
- 121 - FIXED SINGLE FAMILY UNITS
- 131 - FIXED SINGLE FAMILY UNITS ≥ 6 PER ACRE
- 134 - MULTIPLE DWELLING UNITS, HIGH RISE
- 140 - COMMERCIAL AND SERVICES
- 146 - OIL AND GAS STORAGE
- 148 - CEMETARIES
- 154 - OIL AND GAS PROCESSING
- 155 - OTHER LIGHT INDUSTRIAL
- 170 - INSTITUTIONAL
- 180 - RECREATIONAL
- 191 - UNDEVELOPED LAND WITHIN URBAN AREAS
- 310 - HERBACEOUS (DRY PRAIRIE)
- 434 - HARDWOOD - CONIFER MIXED
- 510 - STREAMS AND WATERWAYS
- 740 - DISTURBED LANDS
- 743 - SPOIL AREAS
- 831 - ELECTRIC POWER FACILITIES
- 832 - ELECTRICAL POWER TRANSMISSION LINES

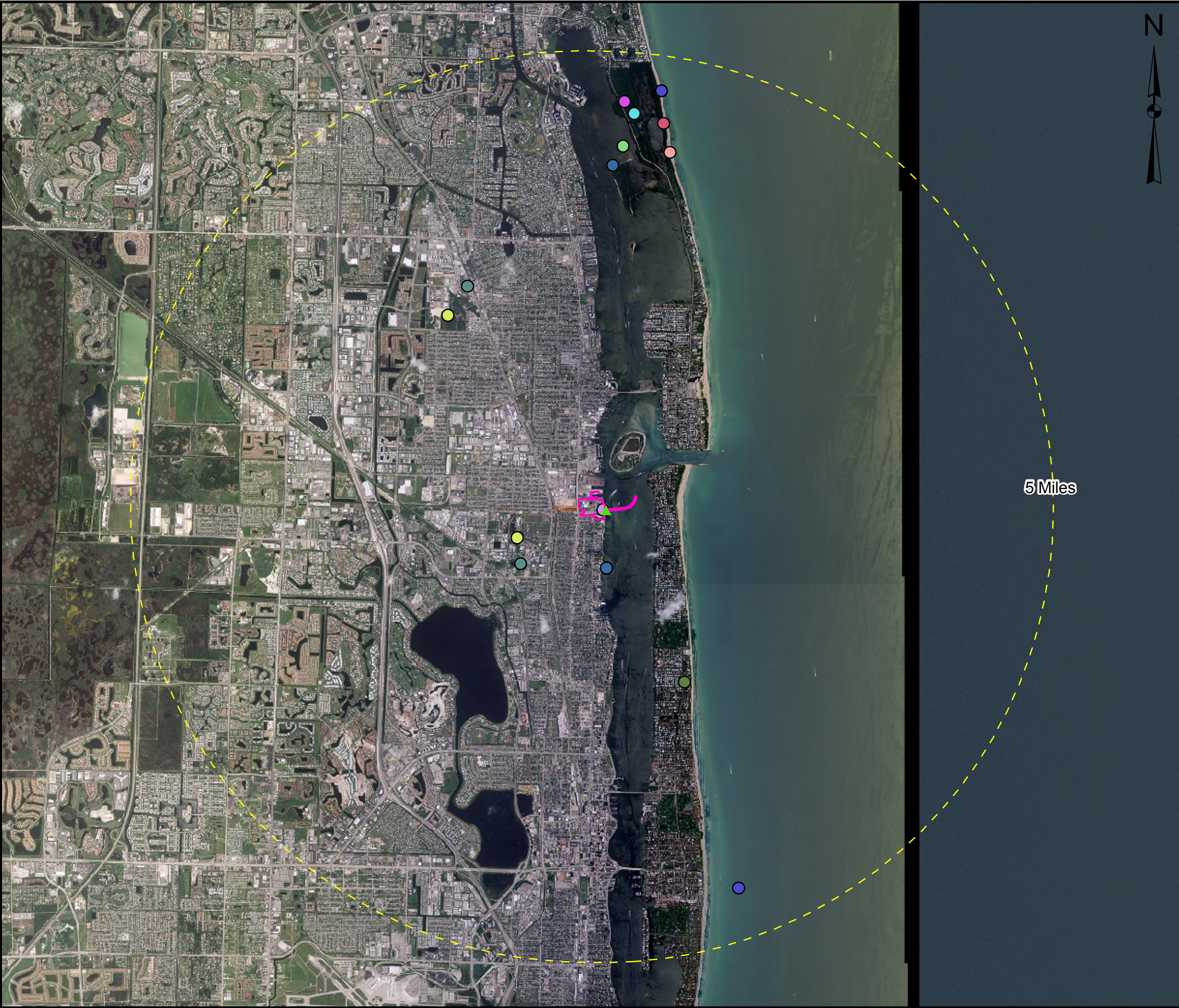
REFERENCES

1. FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
2. Construction Parking and Laydown Area, FPL, 2009.
3. Vegetation / Land Use, South Florida Water Management District, Golder Associates Inc., 2004, 2008.
4. Imagery, National Imagery Moaiscs, USGS, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
VEGETATION / LAND USE						
PROJECT No. 083-87633 FILE No. 08387633RA014						
DESIGN	CMC	12/18/2008	SCALE: AS SHOWN	REV.	1	
GIS	NRL	1/19/2009				
CHECK	RCM	1/27/2009	FIGURE 3.3.5-1			
REVIEW	KFK	1/27/2009				

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\Riviera\RA_SCAAActiveMapDocuments\08387633RA020_Rev1_FNAI_5Miles.mxd / Modified 1/19/2009 1:08:03 PM / Plotted 1/27/2009 2:25:41 PM by lamar



LEGEND

- Construction Parking & Laydown Area
- FPL Riviera Beach Energy Center (To Be Certified)

Observed Species

- Johnson's Seagrass

FNAI Reported Occurrences

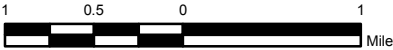
- Burrowing Four-o'clock
- DATA SENSITIVE ELEMENT OCCURRENCE - contact FNAI for more information
- Florida Scrub Lizard
- Gopher Tortoise
- Green Turtle
- Hand Fern
- Johnson's Seagrass
- Large-flowered Rosemary
- Leatherback
- Loggerhead
- Manatee aggregation site
- Sandwich Tern
- Sea Lavender

NOTES

Radii drawn from FPL Riviera Beach Energy Center (To Be Certified)

REFERENCES

- FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
- Construction Parking and Laydown Area, FPL, 2009.
- FNAI reported occurrences, FNAI, 2005
- Observed Species, Ecological Associates Inc., 2008
- Imagery, National Imagery Moasics, USGS, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RWW
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
LISTED AND OBSERVED SPECIES OCCURRENCES WITHIN 5-MILES						
PROJECT No. 083-87633 FILE No. 08387633RA020						
DESIGN	RCM	12/19/2008	SCALE: AS SHOWN	REV.	1	
GIS	NRL	1/19/2009	FIGURE 3.3.6-1			
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REVIEW	KFK	1/27/2009				

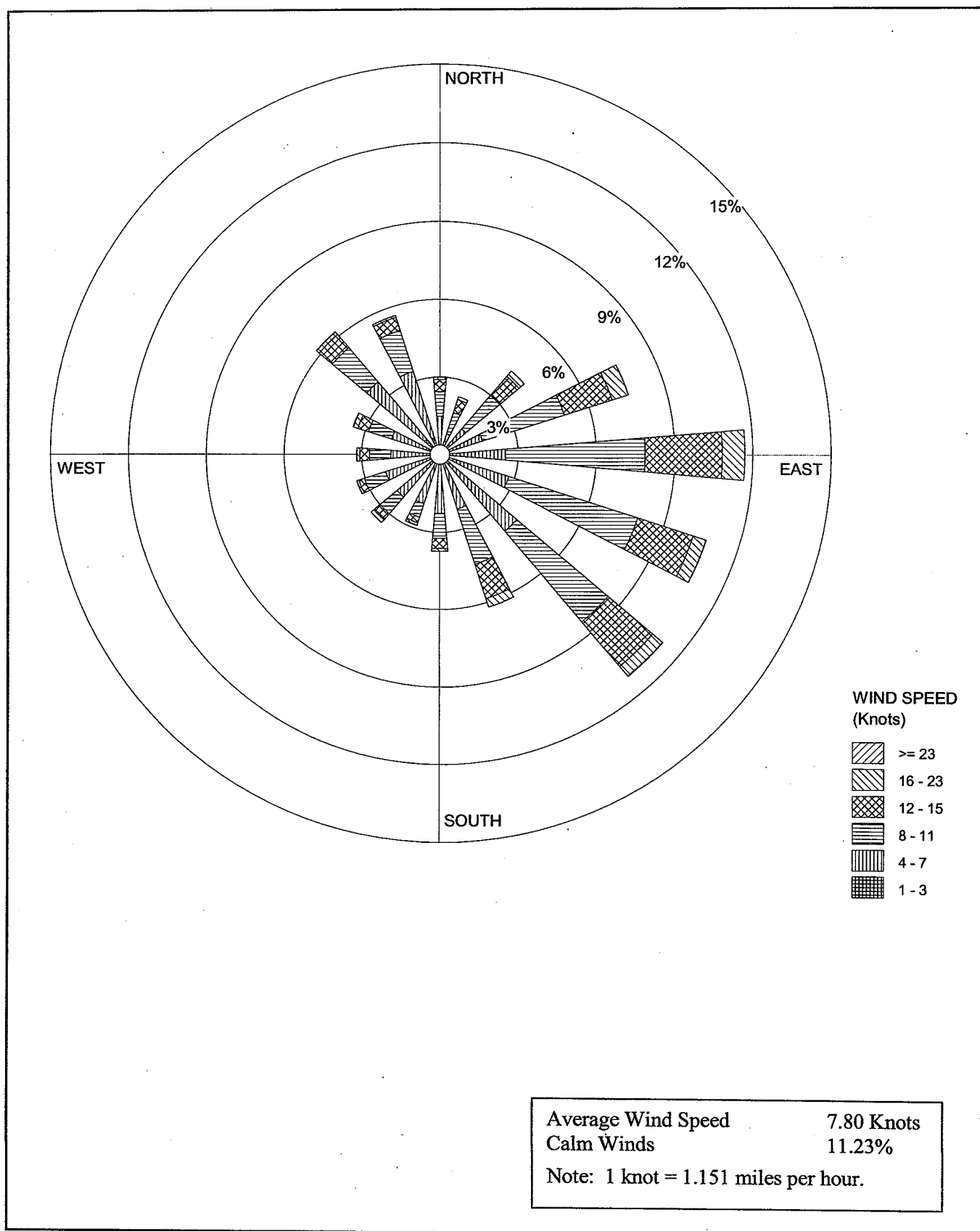


Figure 3.3.7-1.

Annual Wind Rose for 2001 to 2005

At Palm Beach International Airport, Florida (Station No. 12844)

FPL Riviera Beach Energy Center, Palm Beach County, Florida

Source: National Climatic Data Center, 2001–2005; Golder, 2008.



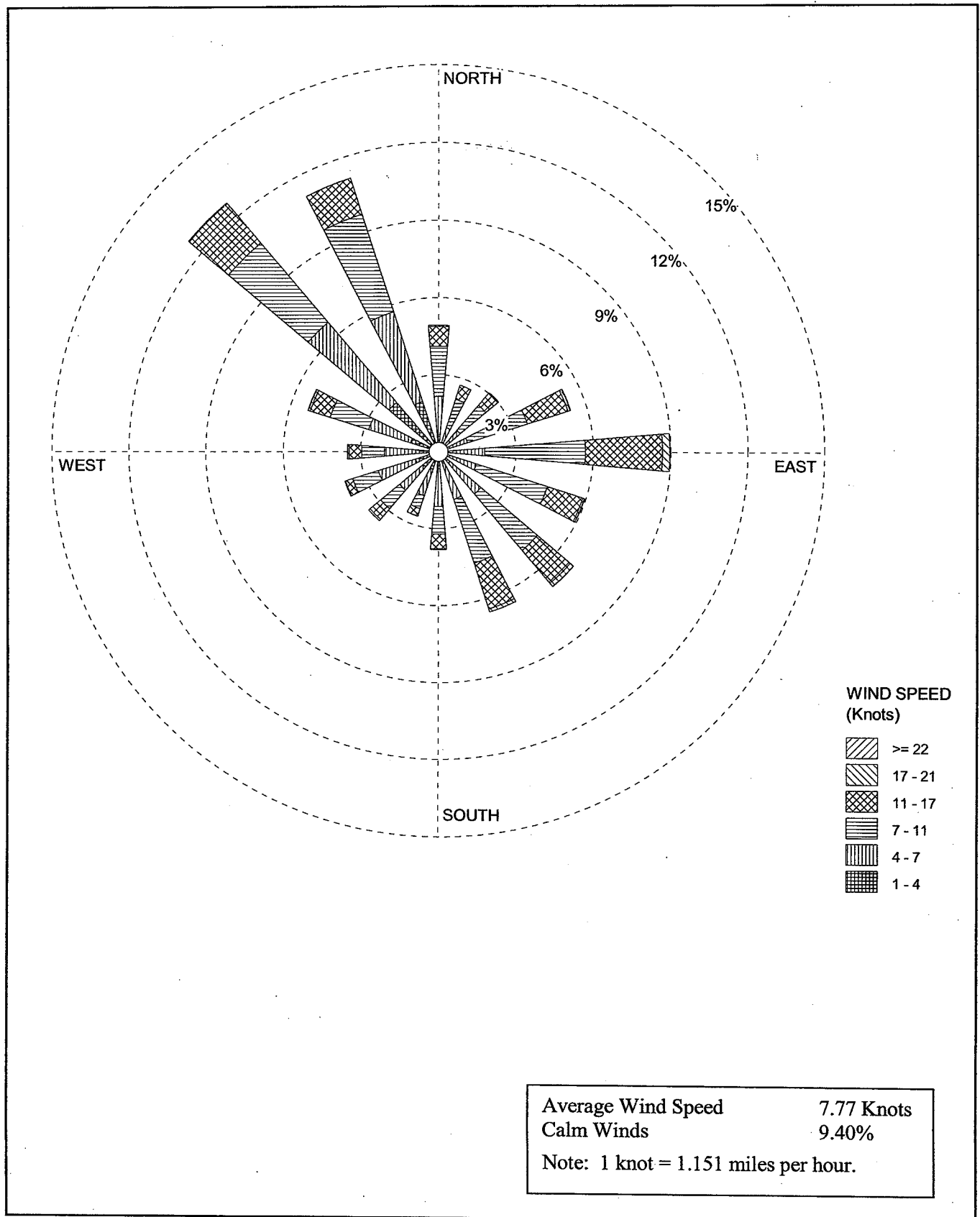


Figure 3.3.7-2.

Winter Wind Rose for 2001 to 2005

At Palm Beach International Airport, Florida (Station No. 12844)

FPL Riviera Beach Energy Center, Palm Beach County, Florida

Source: National Climatic Data Center, 2001–2005; Golder, 2008.



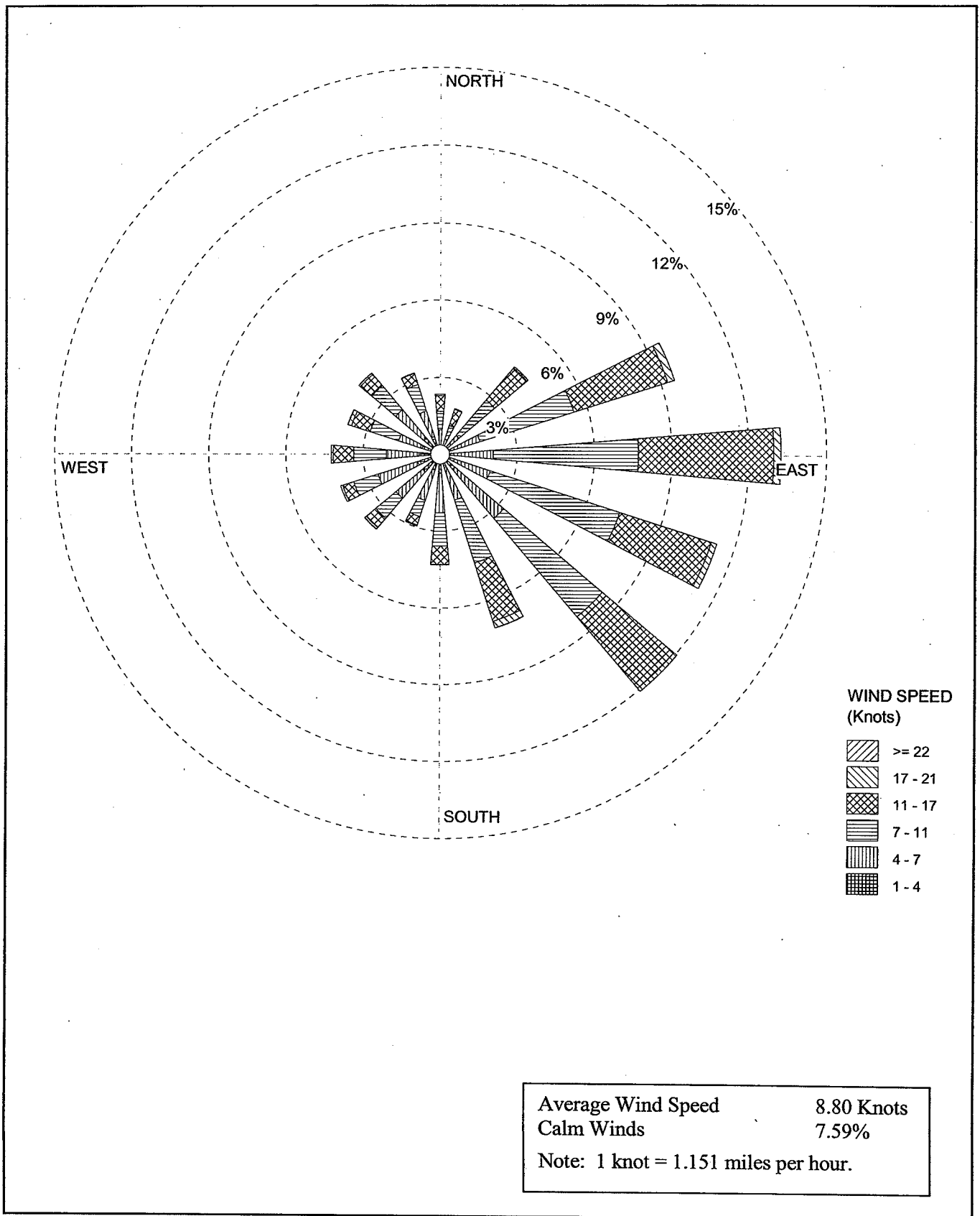


Figure 3.3.7-3.

Spring Wind Rose for 2001 to 2005

At Palm Beach International Airport, Florida (Station No. 12844)

FPL Riviera Beach Energy Center, Palm Beach County, Florida

Source: National Climatic Data Center, 2001–2005; Golder, 2008.



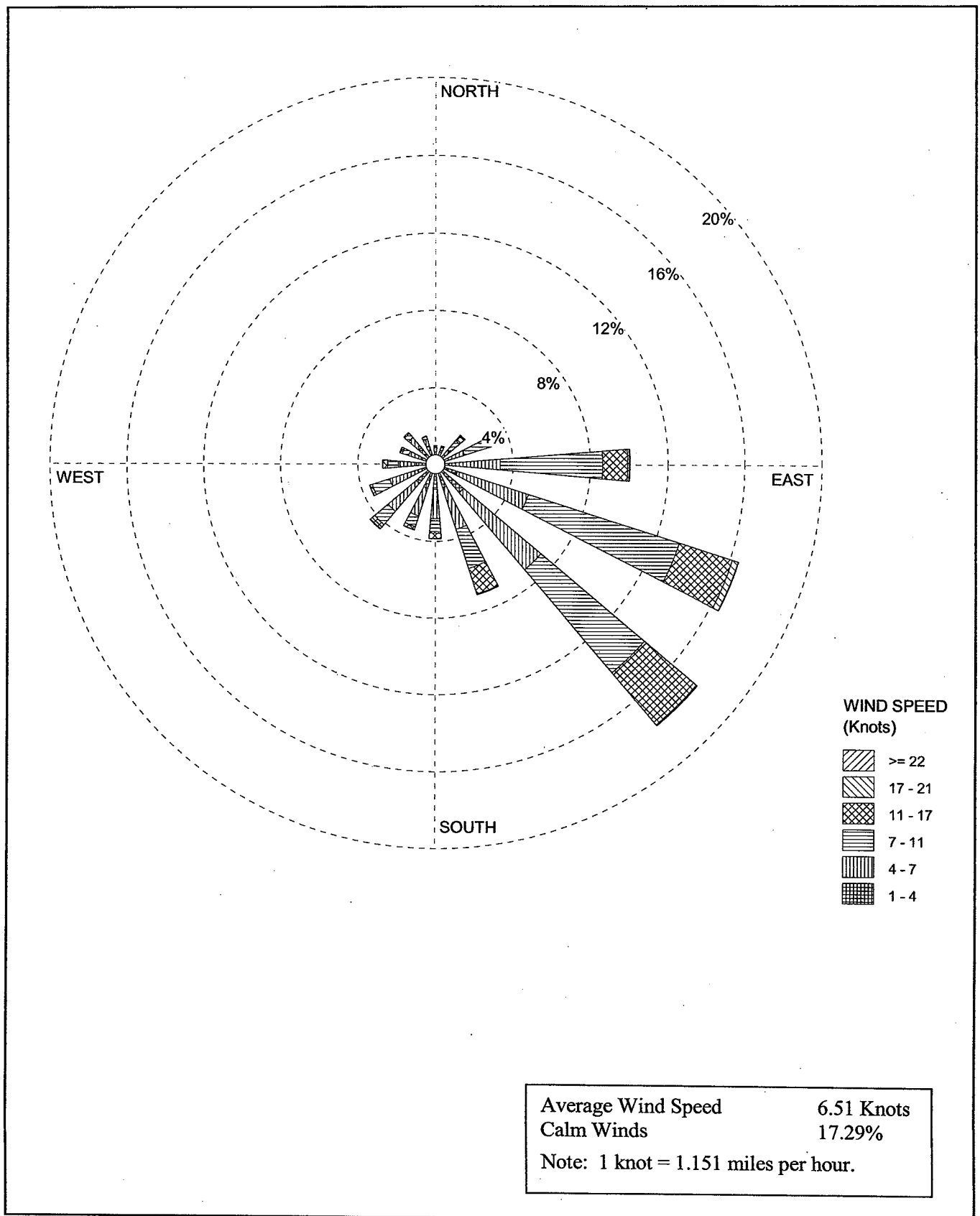


Figure 3.3.7-4.
 Summer Wind Rose for 2001 to 2005
 At Palm Beach International Airport, Florida (Station No. 12844)
 FPL Riviera Beach Energy Center, Palm Beach County, Florida

Source: National Climatic Data Center, 2001–2005; Golder, 2008.



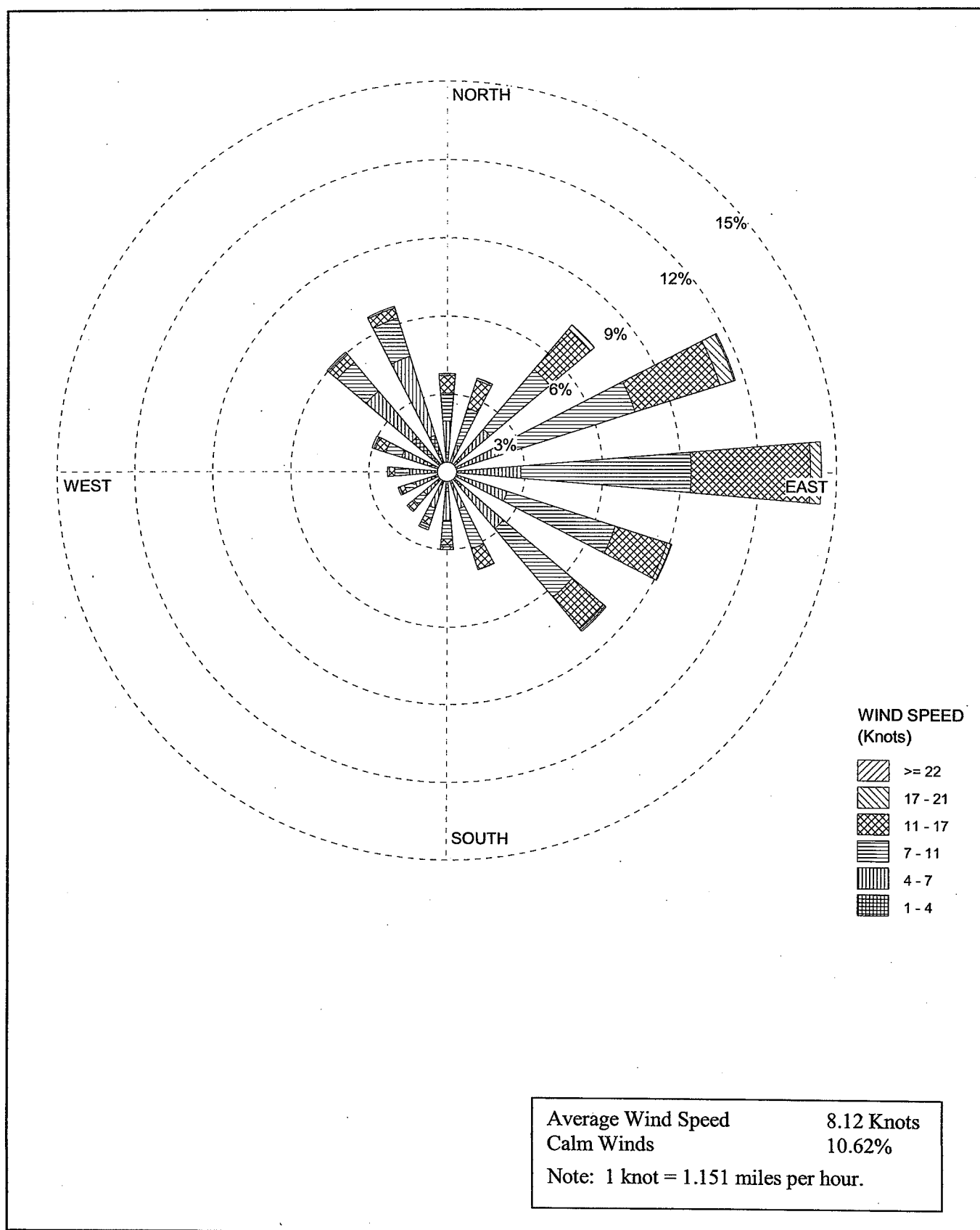


Figure 3.3.7-5.

Fall Wind Rose for 2001 to 2005

At Palm Beach International Airport, Florida (Station No. 12844)

FPL Riviera Beach Energy Center, Palm Beach County, Florida

Source: National Climatic Data Center, 2001–2005; Golder, 2008.



Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\RivieraRA_SCAActiveMapDocuments\08387633RA031_NoiseMonitoringLocations.mxd / Modified: 1/22/2009 10:22:57 AM / Plotted: 1/27/2009 2:57:52 PM by rlanar



LEGEND

-  FPL Riviera Beach Energy Center (To Be Certified)
-  Construction Parking & Laydown Area
-  Monitoring Locations

REFERENCES

1. FPL Riviera Beach Energy Center (to be certified), Construction Parking & Laydown Area, FPL, 2009.
2. Noise Modeling Locations, Source Locations, Golder Associates Inc. 2009
3. Imagery, National Imagery Mosaics, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
NOISE MONITORING LOCATIONS						
			PROJECT No.	083-87633	FILE No.	08387633RA031
DESIGN	KFK	1/19/2009	SCALE:	AS SHOWN	REV.	0
GIS	NRL	1/21/2009	FIGURE 3.3.8-1			
CHECK	RCM	1/21/2009				
REVIEW	KFK	1/27/2009				

4.0 THE PLANT AND DIRECTLY ASSOCIATED FACILITIES

4.1 Background

This chapter provides a description of the Project, a layout, key components and their operation, and proposed controls for air emissions and water discharges. Fuel specifications are provided for natural gas and ultra low-sulfur light oil. Estimates of the expected character, quality, and quantity of discharges and emissions from the RBEC are provided.

The existing Riviera Plant consists of two nominal 300-MW fossil fuel-fired steam-generating units. Units 1 and 2 began operation in 1946 and 1953, respectively. Both have been permanently retired from service and removed from the Site. The commercial in-service dates for Units 3 and 4 were 1962 and 1963, respectively, and both units have remained in service since these dates. The units are authorized pursuant to FDEP Final Title V Permit 0990042-004-AV to operate on natural gas, No. 6 fuel oil, and No. 2 fuel oil. Each unit has a permitted maximum heat input of 3,050 million British thermal units per hour (MMBtu/hr) on oil and 3,260 MMBtu/hr on natural gas. The air emissions from each unit are exhausted through two separate 298-foot stacks.

Figure 4.1.0-1 shows the RBEC Site including the manatee viewing center to be located in the southern portion of the Site. A land-based boat lift will also be located on the Site to provide a secure location for storage of an oil spill response boat.

Condenser cooling for RBEC will be accomplished using the existing Plant's once-through cooling system intake and discharge structures, which withdraw from and discharge to the Lake Worth Lagoon, currently authorized to operate under FDEP Industrial Wastewater Facility Permit No. FL0001546. Utilizing existing infrastructure, including a previously developed site, existing access roads, existing access to the FPL electric system, and existing cooling water intake and discharge structures, as well as the selection of the combined cycle technology, RBEC will maximize the beneficial use of the Site while minimizing environmental, land use, and cost impacts.

The RBEC Project consists of (but is not limited to) conversion of the existing Riviera Plant into a nominal 1,250-MW "3-on-1" combined cycle power plant. The "3-on-1" unit will consist of three nominal 250-MW advanced CTs and three HRSGs, which will utilize the waste heat from the CTs to produce steam to be utilized in a single steam turbine generator.

Two different classes of CT designs are being considered for the converted Plant: the Mitsubishi Power Systems (MPS) “G” Class CTs or equivalent, and the Siemens Power Generation, Inc. “H” Class CT. The MPS “G” Class CTs consist of the M501G, the M501G1PLUS, and the updated M501G3 or equivalent MPS CTs. Duct burners are proposed for each HRSG and will be fired during peak demand periods to achieve the total nominal generating capacity. Duct firing will be limited to an equivalent of 2,880 hours per CT per year at the maximum firing rate.

Each CT will utilize evaporative cooling for inlet air cooling. Evaporative cooling systems achieve adiabatic cooling using water evaporated from a treated paper material. The evaporated water extracts the latent heat of vaporization from the inlet air stream when the water droplet is converted to water vapor. The result is a cooler, more moisture-laden air stream. This allows additional power to be produced.

The CTs will use natural gas as the primary fuel with ultra low-sulfur distillate “light oil” used as a backup fuel. The HRSG duct burners will fire natural gas only. Gas for RBEC will be transported to the Site via a natural gas pipeline. New onsite gas compressors may be installed by FPL to raise the gas pressure to the appropriate level for the CTs. The Project may also involve installation of a new onsite gas yard and onsite gas pipeline. Ultra low-sulfur light oil will be delivered to the Site by truck or existing pipeline and stored in a new fuel oil tank. When firing natural gas, NO_x emissions will be controlled using dry low-NO_x (DLN) combustion technology and selective catalytic reduction (SCR). Demineralized water is utilized during firing of ultra low-sulfur light oil to reduce the combustion temperature and the generation of NO_x emissions from the CT. Water injection and SCR will be used to reduce NO_x emissions when firing ultra low-sulfur light oil.

Primary water uses at RBEC will be for cooling water and process water. Cooling water is required for condenser cooling and auxiliary equipment cooling. Condenser cooling for the steam cycle portion of the converted Plant will be accomplished using the existing once-through cooling water system intake and discharge structures. Process water is required for CT inlet air cooling, NO_x injection water, steam cycle makeup, service water, and fire protection. Minor uses will include intake screen wash water, potable water for employee use, and water for landscape irrigation.

The Site stormwater management system design for the converted Plant will handle a 25-year 72-hour storm event. Contact stormwater runoff from the Power Block and equipment areas will be treated through an oil/water separator and routed to the onsite stormwater detention ponds. Non-contact

stormwater from outside the Power Block will also be collected and routed to the stormwater ponds. The Site stormwater management system is designed to meet all federal, State, regional, and local requirements (see Subsection 4.8.2). The construction support area and construction parking and laydown area will meet stormwater management requirements through Best Management Practices (BMPs) (see Subsection 4.8.2).

RBEC will connect to the FPL transmission network through the existing 230-kV switchyard that will be expanded as part of this Project and relocation of a 138-kV switchyard, both located within the RBEC Site. No new transmission lines are required to connect RBEC to the existing transmission network.

For informational purposes, FPL is providing the following information about other transmission system changes. FPL will upgrade the existing transmission line between RBEC and the FPL 230-kV transmission line between the Ranch and Cedar Substations within an existing FPL transmission right-of-way (see Figure 4.1.0-2). FPL will modify transmission line routing within the existing right-of-way adjacent to the Ranch Substation and will upgrade the existing Ranch and Cedar substations within the fence lines to accommodate the additional generation from RBEC. In addition, FPL will install new distribution lines from existing rights-of-way to provide temporary electric service to RBEC during construction. Any individual permits or approvals required for these activities will be obtained separately from the PPSA certification process.

The design of these proposed changes to FPL's transmission system will be consistent with the applicable requirements of FDEP's rules regulating electric and magnetic fields (Chapter 62-814, F.A.C.) and the fields associated with the upgraded and modified facilities will comply with the applicable standards established in Rule 62-814.450, F.A.C.

4.2 Site Layout

The Power Block will be located in the central portion of the existing Site (Figure 4.2.0-1). Typical profiles of a CT/HRSG train are shown in Figures 4.2.0-2 (north-south) and 4.2.0-3 (east-west). New onsite gas compressors may be installed by FPL to raise the gas pressure to the appropriate level for the CTs.

Non-contact stormwater runoff from the Site will drain into stormwater detention ponds. Contact stormwater runoff from the Power Block for RBEC and equipment areas will be treated through an

oil/water separator and routed to stormwater detention ponds. Stormwater runoff that is collected in the detention ponds will be managed by a combination of detention, percolation, and evaporation.

4.3 Fuel

The primary fuel used by the CTs and for HRSG duct firing will be natural gas, delivered to the Site via a natural gas pipeline. Typical properties of natural gas are shown in Table 4.3.0-1. The heat content is typically about 21,000 British thermal units per pound (Btu/lb) [low heating value (LHV)] with a maximum sulfur content of 2 grains per 100 standard cubic feet (gr/100 scf) of gas.

Ultra low-sulfur light oil will be used as a backup fuel for an equivalent of 1,000 hours per year (hr/yr) per CT at baseload conditions. Typical properties of ultra low-sulfur light oil are shown in Table 4.3.0-2. The heat content is typically about 18,400 Btu/lb (LHV) with a maximum sulfur content of 0.0015 percent by weight.

No onsite storage will be provided for natural gas. Ultra low-sulfur light oil will be delivered to the Site by truck or by existing pipeline from the Port of Palm Beach and will be stored in a new 6.3-million-gallon fuel oil storage tank (150,000 barrels) with integral secondary containment. The existing tanks will be permanently retired and removed/dismantled according to applicable regulations.

The generating capacity of a combined cycle plant is affected by ambient temperature, with increased temperature resulting in less efficient electric production. Greater overall fuel consumption will occur at lower ambient temperatures. For the purpose of calculating maximum hourly fuel use quantities representative of a nominal 1,250-MW combined cycle unit, the following specific operating conditions for the CTs were used (see Appendix 10.2.5):

- 35°F dry-bulb turbine inlet temperature;
- 60-percent relative humidity;
- 38 feet NGVD elevation; and
- An equivalent of 20,909 Btu/lb and 918 British thermal units per standard cubic foot (Btu/scf) heating value (LHV) of natural gas and 18,387 Btu/lb and 129,900 Btu per gallon heating value (LHV) for ultra low-sulfur light oil.

The maximum heat input for the CTs being considered for RBEC ranges from 2,509 MMBtu/hr (LHV) to 2,421 MMBtu/hr (LHV) when firing natural gas (100-percent capacity, 35°F). The corresponding maximum fuel usage ranges from about 2.6 million cubic feet per hour (MMcf/hr) to 2.7 MMcf/hr of natural gas for each CT. Maximum potential fuel usage at 59°F turbine inlet temperature ranges from about 6.6×10^{10} cubic feet per year (cf/yr) to 6.9×10^{10} cf/yr of natural gas for RBEC.

The HRSG duct burners associated with each CT/HRSG train will have a maximum firing rate of 475 MMBtu/hr [high heating value (HHV)] or 428 MMBtu/hr (LHV). The HRSG duct burner maximum heat input rate will be the same for each CT being considered for the converted Plant. The maximum annual fuel usage for the duct burners is based on an equivalent 2,880 hours per HRSG per year at this heat input. The maximum potential annual fuel usage for the duct burners is calculated to be about 4 billion standard cubic feet per year (scf/yr).

Ultra low-sulfur light oil use will be limited to the equivalent of 1,000 hr/yr per CT at full load. The maximum fuel use is about 17,500 gallons per hour per CT at 59°F turbine inlet with an annual usage rate of 52 million gallons for three CTs each operating for 1,000 hours.

4.4 Air Emissions and Controls

4.4.1 Air Emissions Units

Air pollutants will be emitted from the CT/HRSGs when firing natural gas and ultra low-sulfur light oil. Air emissions result from either the combustion process or impurities in the fuel. Tables 4.4.1-1A through 4.4.1-2B present the performance and maximum estimated emission rates of regulated pollutants for each CT/HRSG being considered for RBEC. Information for the MPS “G” Class CTs or equivalent is presented in Tables 4.4.1-1A and 4.4.1-2A; and information for the Siemens “H” Class CT is presented in Tables 4.4.1-1B and 4.4.1-2B.

The maximum estimated emission rates when firing natural gas and ultra low-sulfur light oil were determined using the manufacturer’s information for the equipment proposed for the converted Plant. The design parameters are provided in Tables 4.4.1-1A through 4.4.1-2B for operating loads of 100 percent (baseload) and 75 percent, and a range of turbine inlet temperatures. Appendix 10.2.5, the Air Construction Permit Application, presents the basis for the emission rates and maximum annual emissions of regulated and non-regulated pollutants.

During combustion, two primary types of NO_x are formed: fuel NO_x and thermal NO_x . Fuel NO_x emissions are formed through the oxidation of a portion of the nitrogen contained in the fuel. Thermal NO_x emissions are generated through the oxidation of a portion of the nitrogen contained in the combustion air. NO_x formation can be limited by lowering combustion temperatures (through water or steam injection) and/or staging combustion (a reducing atmosphere followed by an oxidizing atmosphere, known as dry NO_x control). The proposed NO_x emissions rates for RBEC (concentrations) are 2.0 parts per million by volume dry (ppmvd), corrected to 15-percent oxygen (O_2) or less when firing natural gas and 8 ppmvd corrected to 15-percent O_2 or less when firing ultra low-sulfur light oil.

CO is formed by incomplete combustion of fuel. High combustion temperatures, adequate excess air, and good fuel/air mixing during combustion will minimize CO formation. CO formation is limited by ensuring complete efficient combustion of the fuel in the turbines. Recent improvements in CT combustor technology allow for both reduced NO_x emissions and low CO emissions.

The proposed CO emission rates for the MPS “G” Class CTs or equivalent when firing natural gas are 4.1 ppmvd corrected to 15-percent O_2 at baseload operation and 7.6 ppmvd corrected to 15-percent O_2 with maximum duct firing. For the Siemens “H” Class CTs, the proposed CO emission rates when firing natural gas are 5 ppmvd corrected to 15-percent O_2 at baseload operation and 7.2 ppmvd corrected to 15-percent O_2 with maximum duct firing.

The proposed CO emission rates for oil-firing at baseload conditions are 8 ppmvd corrected to 15-percent O_2 for the MPS “G” Class CTs or equivalent and 10 ppmvd corrected to 15-percent O_2 for the Siemens “H” Class CTs.

Similarly, volatile organic compound (VOC) emissions are formed by incomplete combustion of fuel. High combustion temperatures, adequate excess air, and good fuel/air mixing during combustion will minimize VOC formation. VOC formation is limited by ensuring complete efficient combustion of the fuel in the turbines. Recent improvements in CT combustor technology allow for both reduced NO_x emissions and low VOC emissions.

The proposed VOC emission rates for the MPS “G” Class CTs or equivalent when firing natural gas are 1.2 ppmvd corrected to 15-percent O_2 at baseload operation and 1.6 ppmvd corrected to 15-percent O_2 with maximum duct firing. For the Siemens “H” Class CTs, the proposed CO emission

rates when firing natural gas are 1.5 ppmvd corrected to 15-percent O₂ at baseload operation and 1.9 ppmvd corrected to 15-percent O₂ with maximum duct firing.

The proposed VOC emission rates for oil-firing at baseload conditions are 6 ppmvd corrected to 15-percent O₂ for the MPS “G” Class CTs or equivalent and 2 ppmvd corrected to 15-percent O₂ for the Siemens “H” Class CTs.

Maximum SO₂ emission rates are controlled and minimized by the very low sulfur content in the fuels, which will be 2 grains sulfur/100 scf for natural gas and 0.0015-percent sulfur by weight for ultra low-sulfur light oil.

RBEC will be equipped with two 100-percent capability, 2,250-kilowatt (kW) emergency generators. These emergency generators will be used when electric power is not available. This would primarily occur during catastrophic events such as hurricanes. Appendix 10.2.5 contains emissions and manufacturer’s information for the emergency generators proposed for the converted Plant. Normally, these emergency generators would be operated 1 to 2 hours per month for maintenance and reliability testing.

The converted Plant will also include one natural gas-fired fuel heater and a spare. These heaters will utilize a heat transfer fluid for heating the natural gas and be fired with only natural gas. These heaters will have a heat input of 10 MMBtu/hr or less and will be used as necessary to heat natural gas above the dew point. Only one fuel heater will be necessary for the operation of RBEC. Appendix 10.2.5 contains performance and emissions information for the fuel heaters.

The auxiliary boiler will be used as necessary for startup. The limited-use auxiliary boiler will have a maximum heat input of 99.8 MMBtu/hr firing natural gas. Appendix 10.2.5 contains performance and emissions information for the auxiliary boiler. For construction, a temporary boiler will be required for steam blows and cleaning. This boiler is described in Appendix 10.2.5.

RBEC may include a new gas compressor station to increase pressure from the existing FGT pipeline to the CTs. The gas compressor station would consist of up to seven reciprocating gas compressors. These gas compressors will be equipped with oxidation catalysts to reduce the emissions of CO and VOCs. Appendix 10.2.5 contains performance and emissions information for the gas compressors.

A new 6.3-million-gallon fuel oil storage tank will be used to store the ultra low-sulfur light oil at the Site. Appendix 10.2.5 contains VOC emissions information for the fuel oil tank.

Finally, RBEC will be equipped with a 300-horsepower (hp) fire pump engine. This engine will be used when necessary during catastrophic events such as fires. Appendix 10.2.5 contains emissions and manufacturer's information for the engine proposed for the converted Plant. Normally, this fire pump engine would be operated only 1 to 2 hours per month for maintenance and reliability testing.

The total annual emissions from RBEC include air emissions from the CTs, duct burners, fuel heater, emergency generators, auxiliary boiler, fire pump engine, compressor station, and fuel oil tank. Tables 4.4.1-3A to 4.4.1-3B present the annual potential emissions for RBEC for the MPS "G" Class or equivalent, and Siemens "H" Class CTs, respectively. Annual emissions were based on maximum emissions for baseload operation and ambient temperatures of 59°F. The maximum CT emissions are based on 7,760 hours firing natural gas and 1,000 hr/yr firing oil (see below for VOC emissions for the MPS 501G CTs). Natural gas firing includes 2,880 hours with maximum duct firing. The potential emissions are based on the 59°F turbine inlet temperature at 100-percent load condition since it represents a conservative average when the annual average temperatures are slightly higher than 70°F.

For VOC emissions for the MPS 501G CTs, a plant-wide emission cap of 99.1 tons per year (TPY) is proposed (i.e., a net increase of 39.7 TPY) to ensure the Project will not result in a significant net increase in VOC emissions. Given the conservative nature of the emission estimates (100 percent capacity factors for all emission units; 59°F turbine inlet) and the potential variability of operating conditions, FPL proposes a Plant-wide VOC emission cap. To retain maximum operating flexibility due to this conservatism, it is possible that in any given year, all of the CTs could fire oil for an equivalent of 1,000 hr/yr and the compressors could operate without limitations, yet total VOC emissions would still be below the proposed emission cap. Since for every hour of CT oil firing, the compressor station would operate less, there would be lower actual emissions from the compressor station. For the purposes of comparison with the significant emission rate, the VOC emissions for RBEC are capped at 99.1 TPY (see Table 4.4.1-3A). However, individual emission units in this summary table (i.e., the CTs and compressor engines) are presented at their maximum potential emissions. Because of the conservative nature of the emission estimates, FPL believes that actual RBEC emissions would be below a VOC plant-wide emission cap even if 1,000 hr/yr of oil firing per CT were realized. FPL proposes to implement a plant-wide VOC emission cap and to track and

report annual VOC emissions from RBEC in accordance with Title 40, Part 52.21(b)(33) of the Code of Federal Regulations [40 CFR 52.21(b)(33)], which is adopted and incorporated by reference in Rule 62-204.800, F.A.C.

Tables 4.4.1-3A to 4.4.1-3B present the net emission changes resulting from the conversion of the existing Plant to the RBEC reflecting the maximum projected RBEC emissions and the resulting changes compared to the existing Plant, and the PSD significant emission rates, which are thresholds for PSD review for modifications to major sources. PSD review is required for emissions of a pollutant greater than the listed PSD significant emission rate. Figure 4.4.1-1 presents the net emissions reductions for SO₂, NO_x, and PM₁₀ resulting from the conversion of the existing Plant to the RBEC. As shown in these tables and this figure, the net emission changes for RBEC are less than the PSD significant emission rates for all pollutants. The Air Construction Permit Application (see Appendix 10.2.5) is being filed for the purpose of establishing federally enforceable emission limitations that ensure the Project will not result in a significant net increase in emissions of any regulated air pollutant, in accordance with the Department's federally approved minor source air construction permit program under Florida's federally required State Implementation Plan. Nevertheless, as discussed in Subsection 4.4.3, the air emission controls are representative of BACT emission limits under PSD regulations.

4.4.2 Air Emission Controls

The use of clean fuel (i.e., natural gas), combustion controls, and air pollution control equipment will minimize air emissions and ensure compliance with applicable emission-limiting standards. Using clean fuels will minimize emissions of SO₂, PM/PM₁₀, and other fuel-bound contaminants. Combustion controls will minimize the formation of NO_x and the formation of CO and VOCs by combustor design. Further NO_x reduction will be achieved by SCR. The combination of these techniques has been determined to represent BACT on previous combined cycle projects based on an evaluation of economic, energy, and environmental impacts. The following subsection presents a summary of the Air Pollution Control Technology proposed for RBEC, which is presented in detail in the Air Construction Permit Application (Appendix 10.2.5).

RBEC, among other measures, will continue FPL's major efforts to reduce CO₂ emissions in FPL's system. The maximum CO₂ emission rate after the conversion of the Riviera Plant will be about one-half the maximum CO₂ emission rate for the existing Plant. This reduction in CO₂ emission rate is a result of the efficiency of advanced combined cycle technology and the use of natural gas. The

RBEC will be among the most efficient natural gas-fired generating units in FPL's system and will displace generation that would otherwise be produced by less efficient units in FPL's system, thereby reducing system CO₂ emissions. The increased efficiency can be shown by the CO₂ emission rate in pounds of CO₂ emitted per megawatt of energy produced per hour (lb/MW-hr). Figure 4.4.2-1 shows the lb/MW-hr emission rates before and after the conversion of the Riviera Plant to combined cycle technology. As shown in this figure, the CO₂ emission rate for RBEC will be 753 lb/MW-hr, while the CO₂ emission rate for the existing Riviera Plant is 1,547 lb/MW-hr, or about 100 percent higher than RBEC. Moreover, RBEC will reduce FPL's system emissions of CO₂ by nearly 8 million tons from 2013 through 2040, which will be a significant reduction in CO₂ emissions in FPL's system as a direct result of the Project (see Appendix 10.8).

4.4.3 Control Technology Description

FDEP has adopted PSD rules in Rule 62-212.400, F.A.C. The BACT review is part of the evaluation of control technology under the Florida PSD rules. BACT review is required only for those pollutants that trigger PSD review. BACT is applicable to all pollutants for which PSD review is required and is pollutant specific. It is an emission limitation that is based on the maximum degree of reduction for each regulated pollutant, which is determined to be appropriate after taking into account the energy, environmental, and economic impacts and other costs. The emission limits proposed for RBEC are reflective of BACT, even though PSD review is not required for the converted Plant.

The EPA updated the New Source Performance Standards (NSPS) for stationary CTs that will commence construction after February 18, 2005. The Subpart KKKK requirements apply to units with a gross capacity of greater than 1 MW. The Subpart KKKK requirements applicable to CTs greater than 30 MW apply to the CT/HRSG trains associated with RBEC. The NO_x emissions are limited to 15 ppm corrected to 15-percent O₂ or 0.43 lb/MW-hr for gas-firing and 42 ppm corrected to 15-percent O₂ or 1.3 lb/MW-hr for light oil firing. For SO₂ emissions, Subpart KKKK requirements limit emissions to 0.9 lb/MW-hr or a potential total sulfur content equivalent to 0.06 pound per million British thermal units (lb/MMBtu) if multiple fuels are fired.

NSPS are also applicable to the auxiliary boiler, fuel heaters, gas compressors, fire pump engine, and emergency generators. The EPA NSPS Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, applies to the auxiliary boilers and fuel heaters. For the emergency generators, gas compressors, and fire pump engine, NSPS Subpart IIII,

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, is applicable.

EPA has promulgated maximum achievable control technology (MACT) standards under the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations. As presented in Appendix 10.2.5, RBEC will not be a major source of hazardous air pollutant (HAP) emissions since maximum potential emissions are not projected to exceed 10 TPY of a single HAP, nor exceed 25 TPY for all HAPs. Therefore, with one exception, because RBEC is a minor source of HAPs, none of the MACT standards under the NESHAP regulations would apply. The exception would be 40 CFR 63, Subpart ZZZZ addressing reciprocating internal combustion engines (RICE). Under this rule, if the facility is not a major source of HAPs, it would still be categorized as an area source and be subject to the rule. However, the method of compliance under this provision would be to demonstrate compliance with 40 CFR 60, Subpart IIII, which was previously cited in this section.

Appendix 10.2.5 of the SCA contains the Air Construction Permit Application for RBEC. The application describes the air pollution control technology proposed for RBEC and addresses air quality impacts for compliance with AAQS. The remainder of this section briefly describes those control technologies that are proposed for RBEC.

4.4.3.1 Nitrogen Oxides

The Project will result in a net emissions decrease of more than 3,000 TPY for NO_x emissions (i.e., more than 85-percent reduction from historical emissions). PSD review, including a BACT determination, is not applicable. However, the NO_x control technology and emission limits proposed for RBEC are consistent with emission limits established as BACT in Florida and EPA Region IV for similarly designed projects. The use of DLN combustors and SCR for RBEC with NO_x emission levels of 2 ppmvd corrected to 15-percent O₂ when firing natural gas and 8 ppmvd corrected to 15-percent O₂ is consistent with recently established BACT emission limits for other combined cycle units when firing ultra low-sulfur light oil. Similarly, the NO_x emission rates proposed for the auxiliary boiler, natural gas heaters, emergency generators, and gas compressors have been established as BACT in previous PSD permits.

When firing natural gas, NO_x emissions will be controlled using DLN combustors. DLN combustor technology has been offered and installed by CT manufacturers to reduce NO_x emissions by inhibiting thermal NO_x formation through premixing fuel and air prior to combustion and providing

pre-mix combustion to reduce flame temperatures. The DLN combustors have premixed fuel zones plus a standard diffusion flame pilot burner for startup. Low NO_x levels are achieved by introducing fuel primarily to the pre-mix zones and reducing the amount of fuel being combusted from the pilot nozzle.

NO_x emissions will be further controlled by SCR systems when firing either natural gas or ultra low-sulfur light oil. SCR is a post-combustion process where NO_x in the gas stream is reacted with ammonia in the presence of a catalyst to form nitrogen and water. The reaction occurs typically between about 320 and 400 degrees Celsius (°C) (600 and 750°F). These temperatures occur within the HRSG where the SCR catalyst and ammonia injection grid is installed. Ammonia will be stored onsite in tank(s). The SCR system will be designed for additional NO_x reduction. Flue gas NO_x emissions when firing natural gas will be reduced to 2 ppmvd, corrected to 15-percent O₂. When firing ultra low-sulfur light oil, SCR will reduce NO_x emissions by 80 percent or more to 8 ppmvd corrected to 15-percent O₂ or less.

The NO_x emissions from the auxiliary boiler, fuel heaters, emergency generators, pump fire engine, and gas compressors will be limited using combustion techniques. The auxiliary boiler will be equipped with low-NO_x burners to limit NO_x emissions to 0.05 lb/MMBtu. The fuel heaters will use combustion controls to limit NO_x emissions to 0.095 lb/MMBtu. The emergency generators will meet the NSPS Subpart IIII NO_x emission requirements of 6.5 grams per brake horsepower-hour (g/bhp-hr). The gas compressors will be lean-burn engines with a maximum NO_x emission rate of 0.7 g/bhp-hr.

4.4.3.2 Carbon Monoxide

The Project will result in a net emissions decrease of 30 TPY for CO emissions (i.e., 5-percent decrease from historical emissions). PSD review, including a BACT determination, is not applicable. However, the use of combustion controls to limit CO emissions in the range proposed for natural gas and ultra low-sulfur light oil firing has been the technology used to achieve emission rates established as BACT.

The proposed emission rates are based upon the CTs being considered for RBEC. The CTs will utilize advanced combustion technology, and the proposed emission rates are consistent with emission rates established as BACT for similar projects. The proposed CO emission rates for the MPS “G” Class CTs or equivalent when firing natural gas are 4.1 ppmvd corrected to 15-percent O₂

at baseload operation and 7.6 ppmvd corrected to 15-percent O₂ with maximum duct firing. When firing oil, the CO emissions from the MPS “G” Class CTs or equivalent will be limited to 8 ppmvd corrected to 15-percent O₂. The Siemens “H” Class CTs CO emissions will be limited to 5 ppmvd corrected to 15-percent O₂ when firing natural gas at baseload operation and 7 ppmvd corrected to 15-percent O₂ when duct firing. For the Siemens “H” Class CTs when firing oil, the CO emissions will be limited to 10 ppmvd corrected to 15-percent O₂.

Combustion techniques will be used to limit the CO emissions from the auxiliary boiler, fuel heaters, fire pump engine, and emergency generators. The auxiliary boiler will be equipped with low-NO_x burners designed to limit CO emissions to 0.08 lb/MMBtu. The fuel heaters will use combustion controls to limit CO emissions to 0.08 lb/MMBtu. The emergency generators will meet the NSPS Subpart IIII CO emission requirements of 8.5 g/bhp-hr. Each gas compressor will be equipped with an oxidation catalyst to reduce CO emissions by about 80 percent and have an emission rate of 0.5 g/bhp-hr.

The CO emission rates proposed for the auxiliary boiler, fuel heaters, emergency generators, and gas compressors have also been established as BACT in previous PSD permits.

4.4.3.3 Sulfur Oxides (SO₂ and H₂SO₄ Mist)

The Project will result in net emissions decreases of more than 10,000 TPY for SO₂ emissions and 400 TPY for sulfuric acid (H₂SO₄) mist (i.e., reductions of more than 95 percent for SO₂ and 90 percent for H₂SO₄ from historical emissions). PSD review, including a BACT determination, is not applicable. The only feasible control for the combined cycle unit, auxiliary boilers, fuel heaters, emergency generators, fire pump engine, and gas compressors is combustion of clean fuels. Natural gas and ultra low-sulfur light oil are the cleanest fuels available with maximum sulfur contents of 2 gr/100 scf for natural gas and 0.0015-percent sulfur for ultra low-sulfur light oil proposed for RBEC. H₂SO₄ emissions will also be minimized by the use of low-sulfur fuels. SO₂ and sulfuric acid mist emission limits based on use of natural gas and ultra low-sulfur light oil have been established as BACT in previous PSD permits.

4.4.3.4 Particulate Matter and Other Regulated Pollutants

The Project will result in a net emissions decrease of more than 700 TPY for PM/PM₁₀ (i.e., more than 75-percent reduction from historical emissions). PSD review, including a BACT determination, is not applicable. The use of clean fuels, characterized by low PM and trace contaminant contents

and advanced combustion techniques, result in negligible PM and PM₁₀ emissions from the combined cycle unit, auxiliary boiler, fuel heaters, emergency generators, fire pump engine, and gas compressors. Emission limits based on the use of clean fuels (i.e., natural gas and ultra low-sulfur light oil) have been established as BACT for PM/PM₁₀ emissions in previous PSD permits.

4.4.3.5 Volatile Organic Compounds

The Project will result in a net emissions increase of less than 40 TPY for VOC. For the MPS 501G CTs, FPL proposes to implement a plant-wide VOC emission cap to ensure that the net increase will be less than 40 TPY. Therefore, PSD review, including a BACT determination, is not applicable. Combustion techniques will be used to limit the VOC emissions from the combined cycle unit, auxiliary boiler, fuel heaters, emergency generators, fire pump engine, and gas compressors.

The CTs will utilize advanced combustion technology, and the proposed emission rates are consistent with those established as BACT for these turbines. The proposed VOC emission rates for the MPS “G” Class CTs or equivalent when firing natural gas are 1.2 ppmvd corrected to 15-percent O₂ at baseload operation and 1.6 ppmvd corrected to 15-percent O₂ with maximum duct firing. When firing oil, the VOC emissions from the MPS “G” Class CTs or equivalent will be limited to 6 ppmvd corrected to 15-percent O₂. VOC emissions for the Siemens H CTs will be limited to 1.5 ppmvd (corrected to 15-percent O₂) when firing natural gas at baseload operation and 1.9 ppmvd (corrected to 15-percent O₂) when duct firing. For the Siemens “H” Class CTs when firing oil, the VOC emissions will be limited to 2 ppmvd corrected to 15-percent O₂.

The auxiliary boiler is designed with proper combustion techniques to limit VOC emissions to 0.005 lb/MMBtu. The fuel heaters will use combustion controls to limit VOC emissions to 0.005 lb/MMBtu. The emergency generators will meet the NSPS Subpart IIII VOC emission requirements of 1 g/bhp-hr as total hydrocarbons. Each gas compressor will be equipped with an oxidation catalyst to reduce VOC emissions by 50 percent and attain an emission rate of 0.18 g/bhp-hr.

4.4.4 Design Data for Control Equipment

Design data for the air pollution control equipment are presented in Appendix 10.2.5 (Air Construction Permit Application).

4.4.5 Design Philosophy

The RBEC Project will convert an existing 1960s vintage oil- and gas-fired steam electric facility to an advanced, natural gas-fired combined cycle plant that minimizes air pollutant emissions by using the most fuel efficient and pollution-preventing technology. This concept has been incorporated with the selection of a combined cycle process utilizing advanced CTs. Combined cycle plants can be expected to achieve fuel conversion rates of approximately 6,585 British thermal units per kilowatt hour (Btu/kWh) (75°F, baseload). The converted Plant will have an approximate generating capacity of 1,250 MW (nominal) at a location where only (nominal) 600 MW is now generated. The RBEC emission rates will be reduced by more than 90 percent compared with the existing Riviera Plant, resulting in significant annual emissions reductions and air quality benefits. By maximizing the megawatt output per unit of fuel consumed, the air pollutant emissions per MW output are minimized. In addition, the efficiency of RBEC and the use of natural gas minimizes the emissions of CO₂ (see Subsection 4.4.2 and Appendix 10.8).

Pollution prevention is incorporated in the design by the use of clean fuels and advanced combustion technology. Natural gas and ultra low-sulfur light oil will be used. Moreover, advanced DLN combustion technology will be used to minimize NO_x emissions while ensuring that CO and VOC emissions are within accepted limits. SCR will be installed to further reduce NO_x emissions. Taken together, the design of RBEC will incorporate features that will make the converted Plant one of the most efficient and lowest polluting power plants in the State of Florida.

In 2000, the FDEP recognized FPL's environmental stewardship through its Partnership for Ecosystem Protection (PEP) program for the Fort Myers Repowering Project. PEP is an incentives-based recognition program developed by the FDEP Division of Air Resources to enhance the FDEP's ability to encourage, promote, and reward facilities in Florida through appropriate recognition of their commitment toward pollution prevention and environmental stewardship. RBEC involves technology that is even more advanced than the previous FPL repowering projects and furthers the goals for FDEP's Environmental Stewardship plans. Moreover, the conversion of the existing Riviera Plant supports FPL's commitment to reduce CO₂ emissions toward the targets specified in the Governor's 2007 Executive Order (see Appendix 10.8).

4.5 Plant Water Use

Primary water uses for RBEC, like the existing Plant, will include cooling water and process water. Cooling water is required for condenser cooling, auxiliary cooling, and cooling pump seal water. Process water is required for CT inlet air cooling, NO_x injection water when firing ultra low-sulfur light oil, steam cycle makeup, service water, and fire protection. Other uses will include intake screen wash water, potable water for employee use, and water for landscape irrigation. Condenser cooling for the steam cycle portion of the converted Plant and auxiliary cooling will be accomplished using the existing once-through cooling system intake and discharge structures. Water for screen wash will continue to come from downstream of the traveling screens from the cooling water intake system. Water for cooling pump seals and irrigation will continue to come from onsite surficial aquifer wells (SFWMD Permit Nos. 50-04187-W and 50-04188-W). Process and potable water for the converted Plant will continue to come from the existing City of Riviera Beach potable water supply.

The stormwater management system for RBEC will be designed to meet local, regional, State, and federal permit requirements (see Section 4.8). Contact stormwater runoff from the Power Block area will be routed to oil/water separators and then to onsite stormwater detention ponds. Non-contact stormwater from outside the Power Block will also be collected and routed to stormwater ponds.

The Water Supply Alternatives and Water Conservation Plan in Appendix 10.10 discusses water supply alternatives for RBEC and water conservation technology, methods, and procedures that will be used at the converted Plant. The converted Plant will continue to use the existing Plant's once-through cooling water intake and discharge structures for condenser and auxiliary cooling, withdrawing surface water from the Lake Worth Lagoon, and discharging through the existing system. Cooling towers are not acceptable or feasible at the RBEC Site.

The salinity of surface and groundwater sources at the Site is too high to be used economically for potable or process water supply. Reclaimed water is not currently available for RBEC from Palm Beach County, the City of Riviera Beach, the City of West Palm Beach, the City of Lake Worth, or the Town of Palm Beach. These five entities own and contribute municipal wastewater to the ECRWRF. Palm Beach County and FPL have signed a Reclaimed Water Agreement that will provide up to 27 MGD of reclaimed water from the ECRWRF to FPL's West County Energy Center for cooling purposes. This commitment, together with other existing commitments, will use all of the

reliable reclaimed water supply through at least 2012. Available supplies beyond 2012 are uncertain and will depend on future population growth. If a reliable source of reclaimed water can be delivered to the Site that meets the facility's quantity and quality requirements, FPL will evaluate the economic and technical feasibility of using the reclaimed source. If use of the reclaimed water source should become acceptable and feasible in the future, FPL will provide a plan to the appropriate regulatory agencies for implementation at that time.

Stormwater reuse also is not practicable at the Site. The size of the Site does not allow for efficient reuse of stormwater. First, only 10 percent to 12 percent of the process and irrigation water demand can be supplied by this source. Second, a significant onsite storage capacity would be required, at least 0.5 million gallons. Third, this supply would require additional treatment. The limited benefit does not justify the additional cost. Therefore, the only feasible source for process and potable water, at this time, is the existing supply from the City of Riviera Beach.

The RBEC water balance is presented schematically in Figure 4.5.0-1. Process, potable, and fire protection water will be obtained from the existing City of Riviera Beach water connection. The Lake Worth Lagoon will be used as the source of cooling water. Information on water quality has been derived from information described in Subsection 3.3.4. Subsections 4.5.1 through 4.5.4 provide detailed descriptions of RBEC water uses.

4.5.1 Heat Dissipation System

The converted Plant will continue to use the existing Plant's once-through cooling water intake structure for condenser and auxiliary cooling, withdrawing surface water from the Lake Worth Lagoon and discharging through the existing system, as described in Subsection 3.3.4. The RBEC cooling system, including auxiliary cooling flows, will have a total design intake flow capacity of 599 MGD. Water from the Lake Worth Lagoon that is used for the intake screen wash (flow 1,200 gpm) will be released back to the Lake Worth Lagoon.

Operation of RBEC during periods of Plant startup and shutdown, steam turbine shutdowns, or other atypical/emergency operating conditions where steam is being produced in the heat recovery steam generators and discharged directly into the condenser before passing through the steam turbine, is defined as steam turbine bypass or "Bypass Operation". During the majority of the operating scenarios while in Bypass Operation, the thermal energy discharged to the condenser falls within the design full-load thermal discharge.

The design intake flow for RBEC will be the same as for the existing Plant and the existing intake structures will be used for RBEC. Therefore, the design intake velocity will remain the same.

4.5.2 Domestic/Sanitary Wastewater

Sanitary wastewater from the RBEC will continue to be routed to the ECRWRF via the City of Riviera Beach sewer system. Restroom facilities will be constructed to accommodate the employees of RBEC using the same connection. Sanitary wastewater flows are expected to average approximately 1 gpm, about the same as the existing Plant. The sanitary wastewater flows from the manatee viewing center will also be routed to the ECRWRF via the City of Riviera Beach or the City of West Palm Beach sewer system.

4.5.3 Potable Water Systems

Potable water for RBEC will continue to be obtained from the City of Riviera Beach. Potable water demand is expected to average 1 to 3 gpm, about the same as for the existing Plant. Potable water for the manatee viewing center will be obtained from the City of Riviera Beach or the City of West Palm Beach. See Appendix 10.10 for a letter from the City of Riviera Beach confirming potable water availability for RBEC.

4.5.4 Process Water Systems

Water from the City of Riviera Beach will continue to be used as process water treatment system influent and may be used as service water for RBEC.

4.5.4.1 Demineralized Water

RBEC will require the use of demineralized water [i.e., conductivity <0.1 microsiemens per centimeter ($\mu\text{S}/\text{cm}$)]. Demineralized water is required for:

- Makeup to replace blowdown from the HRSG and evaporative cooler blowdown (necessary to maintain a low dissolved solids content in these systems);
- Makeup to replace miscellaneous steam losses in the steam cycle; and
- Injection into the CTs for NO_x control when firing ultra low-sulfur light oil.

FPL will continue to use a reverse osmosis/mixed bed (RO/MB) demineralizer system for RBEC process water treatment using water from the City of Riviera Beach. The demineralized water will be pumped into a new onsite storage tank. RO reject water (average flow 46 gpm) will be mixed with

the cooling water flow used for condenser cooling. The HRSG and evaporative cooler blowdown (average flow of 36 gpm) will be mixed with the cooling water flow before discharge.

4.5.4.2 General Service Water

General service water uses, including cleaning and flushing water and fire protection water, will be provided by the process/service water system. Pump seal cooling water and irrigation water will be provided from three onsite surficial aquifer wells. The allocation required for these two uses will not exceed current allocations permitted by the SFWMD under General Water Use Permit Numbers 50-04187-W and 50-04188-W.

4.6 Chemical and Biocide Waste

The wastewaters generated by RBEC will include cooling water, HRSG and evaporative cooler blowdown, process water treatment system wastewater, wash water, and equipment area stormwater. HRSG and evaporative cooler blowdown will be routed to the cooling water discharge or possibly be reused as cooling water. Contact stormwater will be passed through an oil/water separator and then routed to the stormwater ponds. Water treatment wastewaters and non-hazardous, low-volume wastewaters (e.g., wash water and equipment drains) will be treated, as necessary and appropriate, and routed to the cooling system outfall.

The principal uses of chemicals and biocides will be for steam cycle water quality control and chemical cleaning of the HRSGs and pre-HRSG piping systems.

Table 4.6.0-1 presents a list of the waste streams associated with RBEC, their characterization, and proposed method of disposal. The following sections provide further information on the characteristics of these waste streams (see also Section 4.7).

4.6.1 Cooling System Water Chemical Treatment

Intermittent shock chlorination, as authorized under FDEP Industrial Wastewater Facility Permit FL0001546 (major), will continue to be used for RBEC to prevent biofouling of the heat rejection system.

4.6.2 Steam Cycle Water Treatment

The steam-condensate-feedwater will be chemically treated to prevent corrosion or scaling of the condensate piping and the HRSG. The steam cycle water will be treated with ammonia or an amine

for pH control. Sodium phosphate will be fed to the HRSGs for control of pH and hardness. Residual phosphate in the HRSG will react with hardness to form a non-adherent precipitate that will be permanently removed through HRSG boiler blowdown.

4.6.3 Sanitary Wastewater Treatment

The sanitary system for RBEC will utilize the existing sanitary system connection to a lift station in Riviera Beach. No pretreatment will be provided for the converted Plant. The sanitary system for the manatee viewing center will be routed to the City of Riviera Beach or the City of West Palm Beach sewer system.

4.6.4 Makeup Water Demineralization

As discussed in Subsection 4.5.4, the makeup water to the steam cycle will be demineralized using portable RO/MB type demineralizer trains. The resulting RO reject will be routed to the condenser cooling system intake and reused for condenser cooling. Regeneration of the MB ion exchange units will be performed offsite.

4.6.5 Chemical Cleaning

The HRSG and feedwater piping will be chemically cleaned initially during commissioning and also periodically during the life of the converted Plant. The chemicals used will not be permanently stored onsite but will be delivered to the Site by a licensed contractor at the time of the scheduled periodic cleanings. The chemical cleaning solutions to be used for acid and alkaline cleaning of the HRSG must be consistent with the HRSG manufacturer's recommendations. Chemicals typically used in HRSG and feedwater pipe cleaning may include the following:

- Inhibited citric acid;
- Aqueous ammonia;
- Organic chelates, such as ethylene diamine tetra-acetic acid (EDTA);
- Disodium phosphate;
- Trisodium phosphate;
- Nonfoaming wetting agents; and
- Foam inhibitors.

Wastewaters will consist of the cleaning solutions and material removed during the cleaning process. Chemical cleaning is an infrequent maintenance operation; it does not contribute to the liquid wastes produced by the normal operation of RBEC.

Chemical cleaning wastes will be maintained onsite and tested and, if meeting the requirements authorized under FDEP Industrial Wastewater Facility Permit FL0001546, will be routed to the condenser cooling system outfall. Hazardous wastes will be managed according to applicable local, State, and federal rules and regulations.

4.6.6 Miscellaneous Drains

Wastewater can result from draining a storage tank or from cleaning and maintenance operations such as washdown of storage areas. Wastewater from these processes that meet the requirements authorized under FDEP Industrial Wastewater Facility Permit FL0001546 may be routed to the condenser cooling system outfall. Flows from the miscellaneous RBEC drains will be intermittent and will not normally contribute to the wastewater flows. Periodic offline washes of the CTs, using water or a detergent-water solution, will also produce wastewaters. CT offline wash wastewater will be managed by draining these wastewaters into a tank and transferring by a portable pump to tank trucks for offsite disposal by a services contractor.

4.7 Solid and Hazardous Wastes

All non-hazardous and hazardous wastes associated with the operation of RBEC will be managed according to federal, State, and local regulations and FPL's "Waste Guidelines" (see Table 4.7.0-1). The RBEC may periodically generate hazardous waste [less than 100 kilograms (kg) per month], including spent solvents, boiler chemical cleaning wastes, and other wastes. These wastes will be collected and managed as hazardous waste until tested to determine their characteristics. Wastes generated during dismantlement are discussed in Section 5.1.

Solvent rags will be separated and either laundered or disposed of appropriately. If aerosol cans are punctured prior to disposal, the residual will be collected and managed as hazardous waste. Paint waste, polyvinyl chloride (PVC) cleaner, and PVC cement wastes will be minimized by implementation of programs requiring use of all material prior to issuance of additional material.

4.7.1 Solid Wastes

Solid wastes will be generated by the operation of RBEC, but generally in small quantities. Such solid wastes will be limited to municipal solid waste, infrequent replacement of inlet air filters, and solids from water pretreatment process. An approved solid waste disposal contractor will dispose of all solid wastes. There will be no facilities requiring a permit under FDEP Rule 62-701.300(2), F.A.C., for the converted Plant. As a result, information required by this FDEP rule pertaining to waste containment design, leachate control, surface water control, geotechnical investigations, water quality monitoring plan, closure plan and long-term care, and financial assurance are not applicable to RBEC.

4.7.2 Hazardous Wastes

FPL will operate RBEC to minimize, if not eliminate, the generation of hazardous waste. Any hazardous waste associated with the RBEC will be less than 100 kg per month and may include spent solvents, HRSG chemical cleaning wastes, and other wastes. Hazardous wastes, if any, will be collected onsite and disposed of by a licensed hazardous waste contractor. Hazardous waste will be managed according to applicable rules and regulations.

4.8 Onsite Drainage System

4.8.1 Design Criteria and Applicable Regulations

The surface water management system for RBEC will be designed to meet the requirements of applicable local, regional, State, and federal requirements, which include the rules of the SFWMD, the City of Riviera Beach, the City of West Palm Beach, FDEP, and EPA. The design rainfall event, based on a 25-year 72-hour storm, is approximately 13.5 inches. The basic design philosophy is that the required water quality treatment volume of runoff from RBEC will be treated by onsite dry detention. Drainage from the manatee viewing center will be treated by a combination of dry retention and detention.

The Project drainage system of catch basins, pipes, channels, swales, and culverts will convey runoff to stormwater detention ponds. Preliminary surface water and stormwater management calculations that include RBEC and the manatee viewing center are presented in Appendix 10.4.

4.8.2 Construction Site Drainage

The existing Riviera Plant stormwater is managed under FDEP's Multi-Sector Generic Permit (MSGP) for Stormwater Discharge Associated with Industrial Activity. The associated facility

identification number is FLROSA771. The coverage will expire on December 8, 2010. Prior to commencement of dismantlement of the existing plant, FPL will submit a Notice of Termination (NOT) for the MSGP and a Notice of Intent (NOI) to seek coverage for the site under FDEP's Generic Permit for Stormwater Discharge from Large and Small Construction Activities. Since May 1, 2003, construction sites in Florida that will result in a disturbance of 1 acre or more are required to seek coverage under the Generic Permit for Stormwater Discharge from Large and Small Construction Activities [FDEP Document 62-621.300(4)(a)]. The NOI will be submitted to FDEP at least 2 days prior to commencement of construction.

Prior to submitting the NOI for the construction permit, FPL will prepare a comprehensive Storm Water Pollution Prevention Plan (SWPPP), as required under the Generic Permit, addressing both the dismantlement of the existing plant and the construction of RBEC.

The construction drainage plan is presented in Figure 4.8.2-1 for the Site. Prior to beginning any earth-disturbing activities, perimeter controls such as hay bales and/or silt fences will be installed in accordance with the SWPPP around the Site along the Site boundary line as shown in Figure 4.8.2-1.

Prior to dismantlement and construction activities associated with the Site, silt fences will be installed in accordance with the SWPPP along the perimeter of areas designated for dismantlement and those areas to be used for new construction support area, and where runoff to offsite areas may occur. Stormwater detention ponds will be installed and will serve as sedimentation ponds during dismantlement of Units 3 and 4 and the construction of RBEC.

During construction, the extent of earth disturbances will be minimized as much as is practical in accordance with the SWPPP. Areas outside of cut-and-fill operations will be protected against unnecessary equipment traffic. Aggregate-surfaced areas will be provided for roads, while limerock surfacing will be provided for the construction support area.

Construction runoff ponds (Dry Detention Areas on Figure 4.8.2-1) will be installed to intercept and store runoff from earth-disturbing activities. Temporary erosion and sedimentation control measures will be designed to prevent sediment from being displaced. Construction personnel and equipment will enter the Site over paved roads. Temporary construction entrances will be provided and maintained as required to minimize migration of sediment from construction areas onto public roads. Within the construction support area, temporary swales, ditches, silt fences, and hay bales will be

provided as necessary to divert runoff to detention areas and/or temporary sedimentation ponds. If necessary, public roads impacted by construction activities will be swept periodically to remove excess sediment tracked from the Site. Sediment collected in the sedimentation ponds during construction will be removed as required, and properly disposed to maintain proper functioning of these measures. All temporary sediment and erosion control measures will be removed at the end of construction or when areas have been stabilized or incorporated into the permanent facilities.

4.8.3 Operational Site Drainage

At the completion of construction, FPL will submit a NOT to terminate coverage of Site stormwater management under the generic construction permit, and will submit a NOI to be covered under the MSGP, or its successor if the MSGP has been replaced.

At the completion of construction, the areas of the Site not used for RBEC other than the manatee viewing center will be seeded and their runoff will be routed to non-contact stormwater detention ponds (see Figure 4.8.3-1). A detailed description of the pre-construction and post-construction site drainage features and associated modeling of design stormwater runoff is presented in Appendix 10.4. The pre-existing peak runoff resulting from the occurrence of the design storm is estimated to be about 81 cubic feet per second (cfs) for RBEC and about 6.0 cfs for the manatee viewing center.

Operational Site runoff that is unaffected by industrial activity will be handled by the new stormwater management system. This stormwater management system will provide the required water quality treatment in a series of interconnected dry detention areas located throughout the Site (see Figure 4.8.3-1). Runoff in excess of the water quality treatment volume will be discharged to the Lake Worth Lagoon. The peak discharge flow resulting from the design storm is estimated to be about 57 cfs for RBEC and about 5.7 cfs for the manatee viewing center.

Runoff from the RBEC Power Block and equipment areas will be routed through an oil/water separator and then routed to the stormwater ponds. Stormwater runoff from the potentially oil-contaminated areas (containment areas for transformers, oil tanks, and other oil-containing or -handling equipment) will also be routed through an oil/water separator and then routed to the stormwater ponds.

4.9 Heavy Equipment and Materials

4.9.1 Construction Materials and Equipment

Construction materials and equipment will be delivered to the Site including the construction parking and laydown area by existing roadways. U.S. Highway 1 will be used during construction of the Project.

The construction activities for the Project will occur within the existing Site construction parking and laydown area located on the west side of U.S. Highway 1. As necessary, additional fill materials suitable for the construction of the Project will be placed within the appropriate areas. Limestone and aggregate will be used as necessary for stabilization of the construction parking and laydown area associated with the Project.

Equipment and component parts of the combined cycle unit will be unloaded and moved around the Site using portable cranes and trucks. Some of the heaviest items such as the new CTs, steam turbine, electric generator, HRSGs, and transformers may require special transport. Pollution control measures for the laydown areas will include runoff collection as discussed above in Section 4.8. As necessary, additional roads required for the construction support areas and the construction parking and laydown area will be surfaced with aggregate/limerock and may be treated with dust palliative to reduce dust. Alternatively, water sprays may be used, as required, to control dust due to traffic.

4.9.2 Roads

Trucks and equipment associated with the construction of the Project will travel to the Site, including the construction support area (east of U.S. Highway 1), and the construction parking and laydown area (west of U.S. Highway 1), by using U.S. Highway 1. Existing Plant Gates 3 and 10 provide access from U.S. Highway 1 and will be used as the main access to the Site (refer to Figure 1 in Appendix 10.7.4.). The construction support area, located on the southern portion of the Site, will be accessed near Gate 9. Construction trucks and equipment will not be directed through the residential streets located south of the Site. Analysis of construction traffic impacts is presented in greater detail in Subsection 5.7.2 and Appendix 10.7.4. U.S. Highway 1 will continue to be used for trucks and equipment necessary to support the operation of RBEC. Operational traffic is also discussed in greater detail in Subsection 6.9.1 and Appendix 10.7.4.

4.10 Associated Linear Facilities

RBEC will connect to the FPL transmission network through the existing 230-kV switchyard (that will be expanded as part of the Project) and relocation of a 138-kV switchyard; both located within the Site. No new transmission lines are required to connect RBEC to the existing transmission network.

For informational purposes, FPL is providing the following information about other transmission system changes. FPL will upgrade the existing transmission line between RBEC and the FPL Ranch Substation within the existing FPL transmission right-of-way and will install a new 230-kV transmission line between the Ranch and Cedar Substations within an existing FPL transmission right-of-way (see Figure 4.1.0-2). FPL will modify transmission line routing within the existing right-of-way adjacent to the Ranch Substation and will upgrade the existing Ranch and Cedar substations within the fence lines to accommodate the additional generation from RBEC. In addition, FPL will install new distribution lines from existing rights-of-way to provide temporary electric service to RBEC during construction. Any individual permits or approvals required for these activities will be obtained separately from the PPSA certification process. The design of these proposed changes to FPL's transmission system will be consistent with the applicable requirements of FDEP's rules regulating electric and magnetic fields (Chapter 62-814, F.A.C.) and the fields associated with the upgraded and modified facilities will comply with the applicable standards established in Rule 62-814.450, F.A.C.

4.11 Emergency Disaster Preparedness Plans

FPL has comprehensive emergency disaster preparedness plans for both operational emergencies and natural disasters that can occur in Florida (e.g., hurricanes). FPL has been an industry leader in the preparation for hurricanes and in the recovery after a storm. FPL will continue with these efforts in the future, and enhance emergency preparedness plans for new projects like RBEC. The existing Riviera Plant currently has an Emergency Action Plan. This Emergency Action Plan will be updated based on the design and operation of RBEC.

TABLE 4.3.0-1
TYPICAL NATURAL GAS COMPOSITION

Composition	Mole %
Nitrogen (N ₂)	0.27 - 0.45
Helium (He)	0.01
Carbon Dioxide (CO ₂)	0.44 - 0.88
Methane (CH ₄)	96 - 97.0
Ethane (C ₂ H ₆)	1.8 - 2.6
Propane (C ₃ H ₈)	0.16 - 0.29
Butane (C ₄ H ₁₀)	0.011 - 0.017
Pentanes (C ₅ H ₁₂)	0.007 - 0.03
Hexanes (C ₆ H ₁₄)	0.03
Heptanes (C ₇ H ₁₆)	0.01
Octanes (C ₈ H ₁₈)	0.0
Argon, Oxygen (Ar, O ₂)	0.0
Sulfur (S)	2 grains per 100 scf
Water Vapor (H ₂ O)	0.6 lb/MMscf
Low Heating Value (LHV) = 21,000 Btu/lb; 920 Btu/scf (approximate). High Heating Value (HHV) = 23,300 Btu/lb; 1,020 Btu/scf (approximate). Note: scf = standard cubic feet. MM = million.	

TABLE 4.3.0-2
EXPECTED ULTRA LOW-SULFUR LIGHT OIL COMPOSITION

Elements	Maximum
Carbon Residue	0.35 % on 10% Bottoms
Water and Sediment	0.05 %
Ash	0.01 %
Vanadium	0.5 ppm
Sodium and potassium	0.5 ppm
Lead	1 ppm
Calcium	2 ppm
Sulfur	0.0015 wt. %
Low Heating Value (LHV) = 18,400 Btu/lb; 129,900 Btu/gallon (approximate). High Heating Value (HHV) = 19,500 Btu/lb; 137,700 Btu/gallon (approximate).	
Note: ppm = parts per million.	

TABLE 4.4.1-1A
STACK, OPERATING, AND EMISSION DATA FOR
THE COMBUSTION TURBINES/HRSGS AND DUCT BURNERS FOR
RBEC OPERATION—NATURAL GAS COMBUSTION, MPS 501G CLASS CT

Parameter	Operating and Emission Data ^a for Ambient Temperature							
	Combustion Turbine/ HRSG				Combustion Turbine/ HRSG/ Duct Burner			
	35 °F	59 °F	75 °F	95 °F	35 °F	59 °F	75 °F	95 °F
<u>CT/HRSG Stack Data (feet)</u>								
Height	149	149	149	149	149	149	149	149
Diameter	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
<u>100 Percent Load</u>								
Temperature (°F)	196	195	195	195	186	185	185	184
Velocity (ft/sec)	63.1	60.9	59.1	57.3	62.6	60.3	58.6	56.7
<u>Maximum Hourly Emissions per Unit</u>								
SO ₂ lb/hr	15.6	15.0	14.5	14.0	18.3	17.6	17.1	16.6
PM/PM ₁₀ lb/hr	8.1	7.4	7.2	6.9	11.7	11.0	10.8	10.5
NO _x lb/hr	20.1	19.3	18.7	18.0	23.6	22.8	22.1	21.5
CO lb/hr	25.1	24.1	24.0	23.0	54.5	52.7	52.0	50.3
VOC (as methane) lb/hr	4.2	4.1	4.0	3.8	6.6	6.4	6.2	6.0
Sulfuric Acid Mist lb/hr	3.0	2.9	2.8	2.7	4.0	3.8	3.7	3.6
<u>75 Percent Load</u>								
Temperature (°F)	184	185	186	187	NA	NA	NA	NA
Velocity (ft/sec)	50.4	48.7	47.4	46.0	NA	NA	NA	NA
<u>Maximum Hourly Emissions per Unit</u>								
SO ₂ lb/hr	12.0	11.5	11.1	10.6	NA	NA	NA	NA
PM/PM ₁₀ lb/hr	6.2	6.0	5.9	5.8	NA	NA	NA	NA
NO _x lb/hr	15.5	14.8	14.3	13.7	NA	NA	NA	NA
CO lb/hr	48.0	45.5	44.0	42.0	NA	NA	NA	NA
VOC (as methane) lb/hr	3.2	3.1	3.0	2.9	NA	NA	NA	NA
Sulfuric Acid Mist lb/hr	2.34	2.23	2.16	2.06	NA	NA	NA	NA

^a Refer to Appendix 10.2.5, Subappendix A for detailed information on basis of pollutant emission rates and operating data. Duct firing is assumed for 100% operating load. No duct firing is assumed for loads less than 100%.

Source: MPS, 2008 - CT Performance Data; Golder Associates, 2008.

TABLE 4.4.1-2A
STACK, OPERATING, AND EMISSION DATA FOR
THE COMBUSTION TURBINES/HRSGS FOR RBEC OPERATION -
ULTRA LOW SULFUR LIGHT OIL COMBUSTION, MPS 501G CLASS CT

Parameter	Operating and Emission Data ^a for Ambient Temperature			
	Combustion Turbine/ HRSG			
	35 °F	59 °F	75 °F	95 °F
<u>CT/HRSG Stack Data (feet)</u>				
Height	149	149	149	149
Diameter	22	22	22	22
<u>100 Percent Load</u>				
Temperature (°F)	359	357	355	354
Velocity (ft/sec)	79.4	75.6	72.9	69.6
Maximum Hourly Emissions per Unit				
SO ₂ lb/hr	3.8	3.6	3.4	3.2
PM/PM ₁₀ lb/hr	38.8	36.7	35.3	33.4
NO _x lb/hr	77.1	72.6	69.6	65.9
CO lb/hr	47.0	44.2	43.0	40.1
VOC (as methane) lb/hr	20.1	18.9	18.1	17.2
Lead lb/hr	0.033	0.031	0.029	0.028
Sulfuric Acid Mist lb/hr	0.74	0.69	0.67	0.63
<u>75 Percent Load</u>				
Temperature (°F)	350	348	346	345
Velocity (ft/sec)	75.9	73.0	70.9	68.2
Maximum Hourly Emissions per Unit				
SO ₂ lb/hr	3.0	2.8	2.7	2.6
PM/PM ₁₀ lb/hr	37.7	36.1	34.9	33.3
NO _x lb/hr	60.0	57.0	54.9	52.5
CO lb/hr	228.3	217.0	209.0	200.0
VOC (as methane) lb/hr	26.1	24.8	23.9	22.8
Lead lb/hr	0.025	0.024	0.023	0.022
Sulfuric Acid Mist lb/hr	0.58	0.55	0.53	0.50

^a Refer to Appendix 10.2.5, Subappendix A for detailed information on basis of pollutant emission rates and operating data.

Source: MPS, 2008 - CT Performance Data; Golder Associates, 2008.

TABLE 4.4.1-3A
SUMMARY OF MAXIMUM POTENTIAL ANNUAL EMISSIONS FOR RBEC OPERATION, MPS 501G CLASS CT

Pollutant	RBEC Conversion Project Maximum Potential Annual Emissions (TPY)								Netting Calculations		PSD Significant Emission Rate (TPY)
	3 CTs/HRSGs with Duct Burners ^b	Auxiliary Boiler ^c	2 Emergency Generators	1 Natural Gas Heater	7 Gas Compressors	Fuel Oil Storage Tank	Fire Pump Engine	TOTAL	Maximum 2-Year Average from Existing Units ^a (TPY)	Change (TPY)	
SO ₂	208	0.14	0.005	0.24	1.74	NA	0.00014	210	10,999	-10,789	40
PM	157	0.17	0.45	0.08	3.10	NA	0.011	161	889	-728	25
PM ₁₀	157	0.17	0.45	0.08	3.10	NA	0.011	161	889	-728	15
NO _x	349	1.25	7.79	4.15	135.9	NA	0.18	498	3,752	-3,255	40
CO	470	2.00	9.59	3.49	8.6	NA	0.069	494	560	-66	100
VOC (as methane)	82.5 ^d	0.13	1.13	0.23	12.7	2.40	0.026	99.1	59.4	39.7	40
Sulfuric Acid Mist	42.2	Neg.	Neg.	Neg.	Neg.	NA	Neg.	42.2	489	-447	7
Lead	0.046	Neg.	Neg.	Neg.	Neg.	NA	Neg.	0.046	0.12	-0.071	0.6

Source: Golder, 2008.

^a Based on actual emissions from Annual Operating Reports from 2003-2007.

^b Based on oil-firing for 1,000 hr/yr except for VOC.

^c An auxiliary boiler is only required to supply steam to the MPS 501G1 CT during startup.

^d VOC emissions reflect worst-case of 850 hr/yr of oil-firing and replacing the same number of hours for the compressors.

Note: Neg.= negligible; NA= not applicable

TABLE 4.4.1-1B
STACK, OPERATING, AND EMISSION DATA FOR
THE COMBUSTION TURBINES/HRSGS AND DUCT BURNERS
FOR RBEC OPERATION - NATURAL GAS COMBUSTION, SIEMENS H CT

Parameter	Operating and Emission Data ^a for Ambient Temperature							
	Combustion Turbine/ HRSG				Combustion Turbine/ HRSG/ Duct Burner			
	35 °F	59 °F	75 °F	95 °F	35 °F	59 °F	75 °F	95 °F
<u>CT/HRSG Stack Data (feet)</u>								
Height	149	149	149	149	149	149	149	149
Diameter	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
<u>100 Percent Load</u>								
Temperature (°F)	196	195	195	195	186	185	185	184
Velocity (ft/sec)	61.3	59.0	57.0	54.9	60.8	58.5	56.5	54.3
Maximum Hourly Emissions per Unit								
SO ₂ lb/hr	15.1	14.4	13.9	13.3	17.7	17.1	16.5	16.0
PM/PM ₁₀ lb/hr	13.3	13.0	12.2	11.7	17.0	16.4	15.8	15.3
NO _x lb/hr	20.0	19.1	18.4	17.6	23.5	22.6	21.9	21.1
CO lb/hr	30.0	29.0	28.0	27.0	49.0	48.0	47.0	46.0
VOC (as methane) lb/hr	5.1	4.8	4.7	4.5	7.4	7.2	7.0	6.8
Sulfuric Acid Mist lb/hr	2.9	2.8	2.7	2.6	3.8	3.7	3.6	3.5
<u>75 Percent Load</u>								
Temperature (°F)	184	185	186	187	NA	NA	NA	NA
Velocity (ft/sec)	49.3	47.3	45.8	43.9	NA	NA	NA	NA
Maximum Hourly Emissions per Unit								
SO ₂ lb/hr	12.1	11.4	10.9	10.2	NA	NA	NA	NA
PM/PM ₁₀ lb/hr	11.0	11.0	9.9	9.4	NA	NA	NA	NA
NO _x lb/hr	16.1	15.0	14.4	13.5	NA	NA	NA	NA
CO lb/hr	49.0	46.0	44.0	41.0	NA	NA	NA	NA
VOC (as methane) lb/hr	4.1	3.8	3.6	3.4	NA	NA	NA	NA
Sulfuric Acid Mist lb/hr	2.36	2.21	2.11	1.99	NA	NA	NA	NA

^a Refer to Appendix 10.2.5, Subappendix A for detailed information on basis of pollutant emission rates and operating data.

Duct firing is assumed for 100% operating load. No duct firing is assumed for loads less than 100%.

Source: Siemens, 2008; CT Performance Data; Golder, 2008.

TABLE 4.4.1-2B
STACK, OPERATING, AND EMISSION DATA FOR
THE COMBUSTION TURBINES/HRSGS FOR RBEC OPERATION -
ULTRA LOW SULFUR LIGHT OIL COMBUSTION, SIEMENS H CT

		Operating and Emission Data ^a for Ambient Temperature			
		Combustion Turbine/ HRSG			
		35 °F	59 °F	75 °F	95 °F
Parameter					
<u>CT/HRSG Stack Data (feet)</u>					
Height		149	149	149	149
Diameter		22	22	22	22
<u>100 Percent Load</u>					
Temperature (°F)		359	357	355	354
Velocity (ft/sec)		77.8	73.5	70.5	66.6
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	3.9	3.7	3.5	3.3
PM/PM ₁₀	lb/hr	0.0	0.0	0.0	0.0
NO _x	lb/hr	85.3	80.0	76.2	71.4
CO	lb/hr	65.0	61.0	58.0	54.0
VOC (as methane)	lb/hr	7.4	7.0	6.6	6.2
Lead	lb/hr	0.036	0.034	0.032	0.030
Sulfuric Acid Mist	lb/hr	0.77	0.72	0.69	0.64
<u>75 Percent Load</u>					
Temperature (°F)		350	348	346	345
Velocity (ft/sec)		61.9	59.2	57.2	54.6
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	3.2	3.0	2.9	2.7
PM/PM ₁₀	lb/hr	30.0	30.0	30.0	30.0
NO _x	lb/hr	69.1	64.8	61.9	58.1
CO	lb/hr	53.0	49.0	47.0	44.0
VOC (as methane)	lb/hr	6.0	5.6	5.4	5.1
Lead	lb/hr	0.029	0.028	0.026	0.025
Sulfuric Acid Mist	lb/hr	0.63	0.59	0.56	0.53

^a Refer to Appendix 10.2.5, Subappendix A for detailed information on basis of pollutant emission rates and operating data.

Source: Siemens, 2008; CT Performance Data; Golder, 2008.

TABLE 4.4.1-3B
SUMMARY OF MAXIMUM POTENTIAL ANNUAL EMISSIONS FOR RBEC OPERATION, SIEMENS H CT

Pollutant	RBEC Conversion Project Maximum Potential Annual Emissions (TPY)							Netting Calculations		PSD Significant Emission Rate (TPY)
	3 CTs/HRSGs with Duct Burners ^b	2 Emergency Generators	1 Natural Gas Heater	4 Gas Compressors	Fuel Oil Storage Tank	Fire Pump Engine	TOTAL	Maximum 2-Year Average from Existing Units ^a (TPY)	Change (TPY)	
SO ₂	201	0.01	0.24	0.99	NA	0.00014	203	10,999	-10,797	40
PM	185	0.45	0.08	1.77	NA	0.011	188	889	-701	25
PM ₁₀	185	0.45	0.08	1.77	NA	0.011	188	889	-701	15
NO _x	358	7.8	4.15	77.6	NA	0.18	447	3,752	-3,305	40
CO	511	9.6	3.49	4.9	NA	0.069	529	560	-30.5	100
VOC (as methane)	77.1	1.13	0.23	8.0	2.8	0.026	89	59.4	29.6	40
Sulfuric Acid Mist	40.9	Neg.	Neg.	Neg.	NA	Neg.	40.9	489	-448	7
Lead	0.050	Neg.	Neg.	Neg.	NA	Neg.	0.050	0.12	-0.066	0.6

Source: Golder, 2008.

^a Based on actual emissions from Annual Operating Reports from 2003-2007.

^b Based on oil-firing for 1,000 hours.

Note: Neg.= negligible; NA= not applicable

TABLE 4.6.0-1
RBEC WASTE STREAMS, CHARACTERIZATION AND DISPOSAL METHOD (Page 1 of 2)

Waste Streams (Process Water Systems)	Non Hazardous Basis for Characterization	Hazardous Basis for Characterization	Disposal Management Process
Demineralized Water RO Reject	Based on analytical characterization of historical data	—	Disposed of depending upon source. Refer to Sections 4.5.4 and 4.6.4.
Heat Recovery Steam Generator Blowdown	Based on analytical characterization of historical data	—	Reused in wastewater process or disposed of as industrial wastewater into the circulating water system (cooling water discharge).
Cooling System Water (Biocide Addition Chlorine, Scale Inhibitor, Pretreatment Chemicals)	Based on analytical characterization by vendor supplying chemical	—	Disposed of as industrial wastewater into the circulating water system.
Steam Cycle Water Treatment (Hydrazine, Ammonia, Sodium Phosphate)	Based on analytical characterization by historical data	—	Chemicals breakdown in steam cycle, any residual chemicals are disposed of by HRSG blowdown into circulating water system (cooling water discharge).
Heat Recovery and Steam Generator as Well as Pre-boiler Piping Chemical Cleaning	Based upon analytical waste stream characterization.	Based upon analytical waste stream characterization	If non-hazardous, will be disposed into circulating water system. If hazardous, then disposed of by a licensed approved contractor.
Miscellaneous Drains	Based on analytical characterization of historical data	—	Disposed of as industrial wastewater into the circulating water system.



TABLE 4.6.0-1
RBEC WASTE STREAMS, CHARACTERIZATION AND DISPOSAL METHOD (Page 2 of 2)

Waste Streams (Construction and Operations)	Non Hazardous Basis for characterization	Hazardous Basis for characterization	Disposal Management Process
Construction-Related Waste Water (e.g., ammoniated process water for hydrostatic testing and backfilling, groundwater from dewatering and steam blow quench water, etc.)	Based on historical data	—	Disposed of depending on source. Refer to Chapter 5.
Water Pretreatment Solid Waste	Based on analytical results	—	Disposed of by an approved disposal contractor.
Rags	As per EPA in 40 CFR 279	—	Recycled via laundering by FDEP-approved vendor or disposed of in landfill.
Punctured Aerosol Cans	As per EPA characterization letter	—	Disposed of by an approved scrap metal contractor.
Captured Paint Residuals from Punctured Aerosol Cans	—	Analytical data from waste characterization	As hazardous waste in accordance with 40 CFR, Part 261.
X-ray Weld Testing	—	—	Process does not generate waste chemicals onsite. Vendor is responsible for their waste generation.
Florescent Bulbs and Batteries	—	As per 40 C.F.R. 273 EPA determination	Recycled as universal waste.
Oily Separated Waste Water	Based on analytical results	—	Separated water is routed to onsite ponds. Oil is disposed of by an approved waste disposal contractor.
Oily Solid Wastes	As per EPA in 40 CFR 279	—	Disposed of by an approved waste disposal contractor.

Note: Wastes during dismantlement of Units 3 and 4 are discussed in Section 5.1.

TABLE 4.7.0-1
FPL GENERAL WASTE HANDLING GUIDELINES (Page 1 of 2)

GENERAL WASTE HANDLING GUIDELINES

1. All effort should be taken to reduce and/or eliminate waste generation.
2. All effort should be taken to reuse and/or recycle wastes.
3. Label all containers so that contents can easily be determined and products used.
4. If waste is hazardous due to a hazardous constituent in the original product, try to substitute with a non-hazardous product, if feasible.
5. If waste is generated, see attached list for disposal options and instructions.
6. If waste is hazardous and is required to be placed into satellite accumulation drums, contact Environmental Plant Leader.
7. If waste cannot be identified, contact Environmental Plant Leader.

WASTE HANDLING INSTRUCTIONS**Recycling**

1. Cardboard: flatten and place in designated area.
2. Pallets (poor condition) and scrap wood: place in designated area.
3. White paper and file stock: place in designated bin.
4. Aluminum cans: place in designated bin marked "Aluminum Cans".
5. Metal scrap: place in "metal" designed dumpster.
6. Empty drums (poor condition): empty, crush and place in "metal" dumpster.
7. Fluorescent bulbs (intact): place into original box and store in Universal Waste Storage Area.
8. Lead acid batteries: place on pallet in Hazardous Waste Area.
9. Dry alkaline cell batteries: place in appropriate designated universal waste bin.
10. Ni Cad batteries (includes all communication type batteries, i.e., cell phone/pager batteries): place in appropriate bin.
11. Empty aerosol cans: puncture with can puncturing device and place can into scrap metal drum designated for this purpose. Residual materials in drum are managed as Hazardous Waste.

TABLE 4.7.0-1

FPL GENERAL WASTE HANDLING GUIDELINES (Page 2 of 2)

Recycling (continued)

12. Used oil filters: drain filters for at least 24 hours and place drained oil filters into appropriate drums. Do not put plastic bags into drum.
13. Metal shavings: place in designated scrap metal drum.
14. Mercury liquid: notify Environmental Plant Leader.

Non-Regulated Waste Disposal

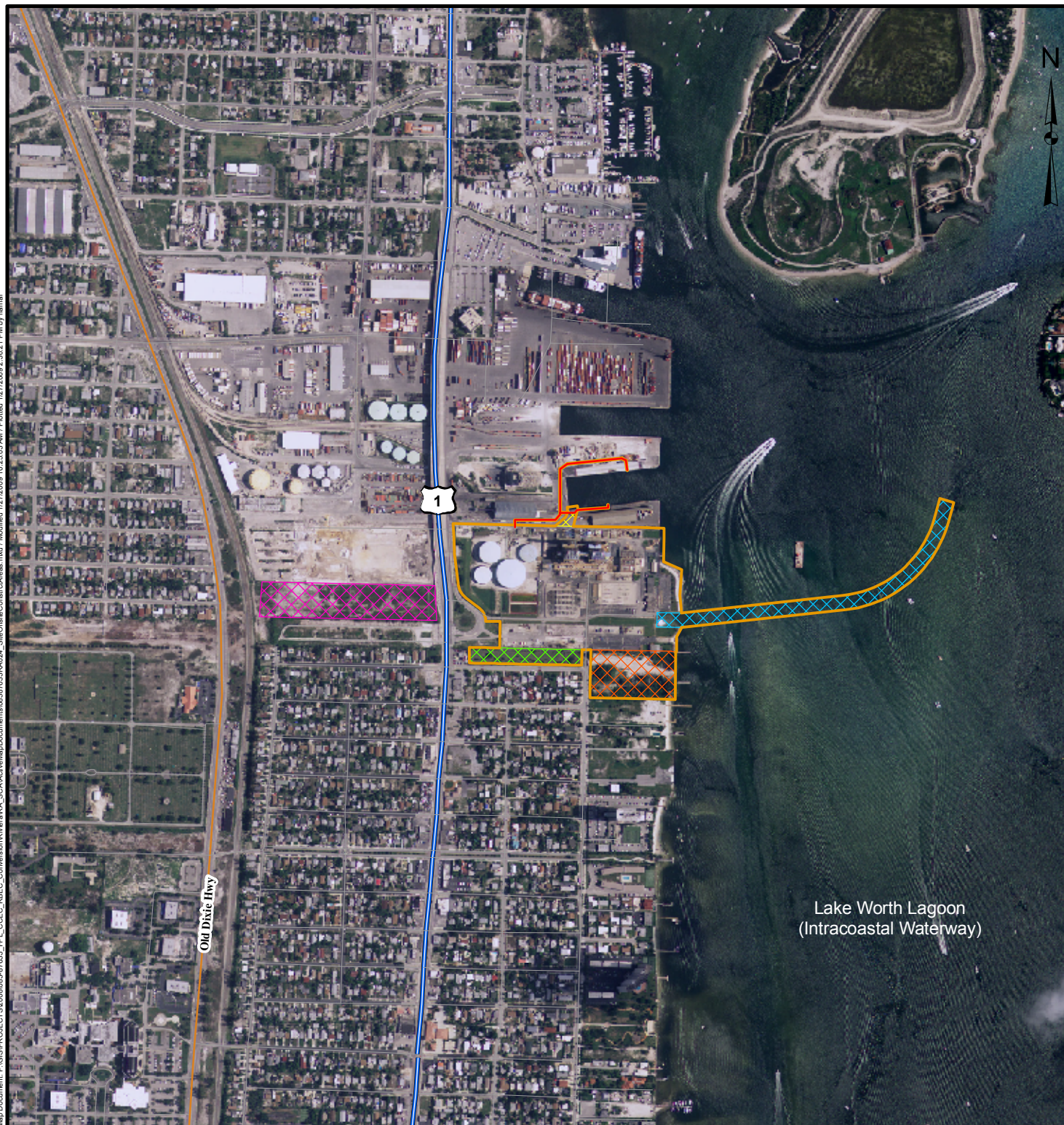
1. Normal trash: minimize and dispose, place into Plant dumpster.
2. Used oil: place into Accumulation Area designated for this purpose.
3. Solid oily waste: place into Solid Oily Waste Dumpster designated for this purpose.
4. Parts cleaning solution: use parts cleaner for all parts cleaning. For special parts cleaning applications, see Environmental Plant Leader for instructions. Also contact Environmental Plant Leader when parts cleaning fluid is spent.

Hazardous Waste Disposal *

1. Solvent-contaminated rags: place into "Solvent Rag" Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area unless rag laundering program has been implemented. Where rag laundering program has been implemented, place rags into designated bins.
2. Solid paint cleanup material: place into Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area.
3. Laboratory waste: place in Satellite Accumulation Drum Area. This drum is for use by on-shift production personnel performing water chemistry. When full, place in Hazardous Waste Area.
4. Outdated lab chemicals: these chemicals will be lab packed by the Environmental Plant Leader.
5. Aerosol can waste (punctured and non-punctured): collect in Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area.
6. Waste paint-related material: place in Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area.
7. Bead blasting material: place in drum designated for this purpose. When full, place in Hazardous Waste Area.

*** While accumulated onsite, hazardous waste drums must include the words "Hazardous Waste" and the accumulation start date. Drums used for satellite accumulation of hazardous waste may use words that identify the contents until moved to storage for disposal and then the words "Hazardous Waste" and the accumulation date(s) must be added.**





LEGEND

 FPL Riviera Beach Energy Center (To Be Certified)

Includes:

 Construction Support Area

 Intake Culvert Easement

 Landscaped Buffer Area

 Oil Pipeline Easement

 Submerged Lands

 Construction Parking & Laydown Area

REFERENCES

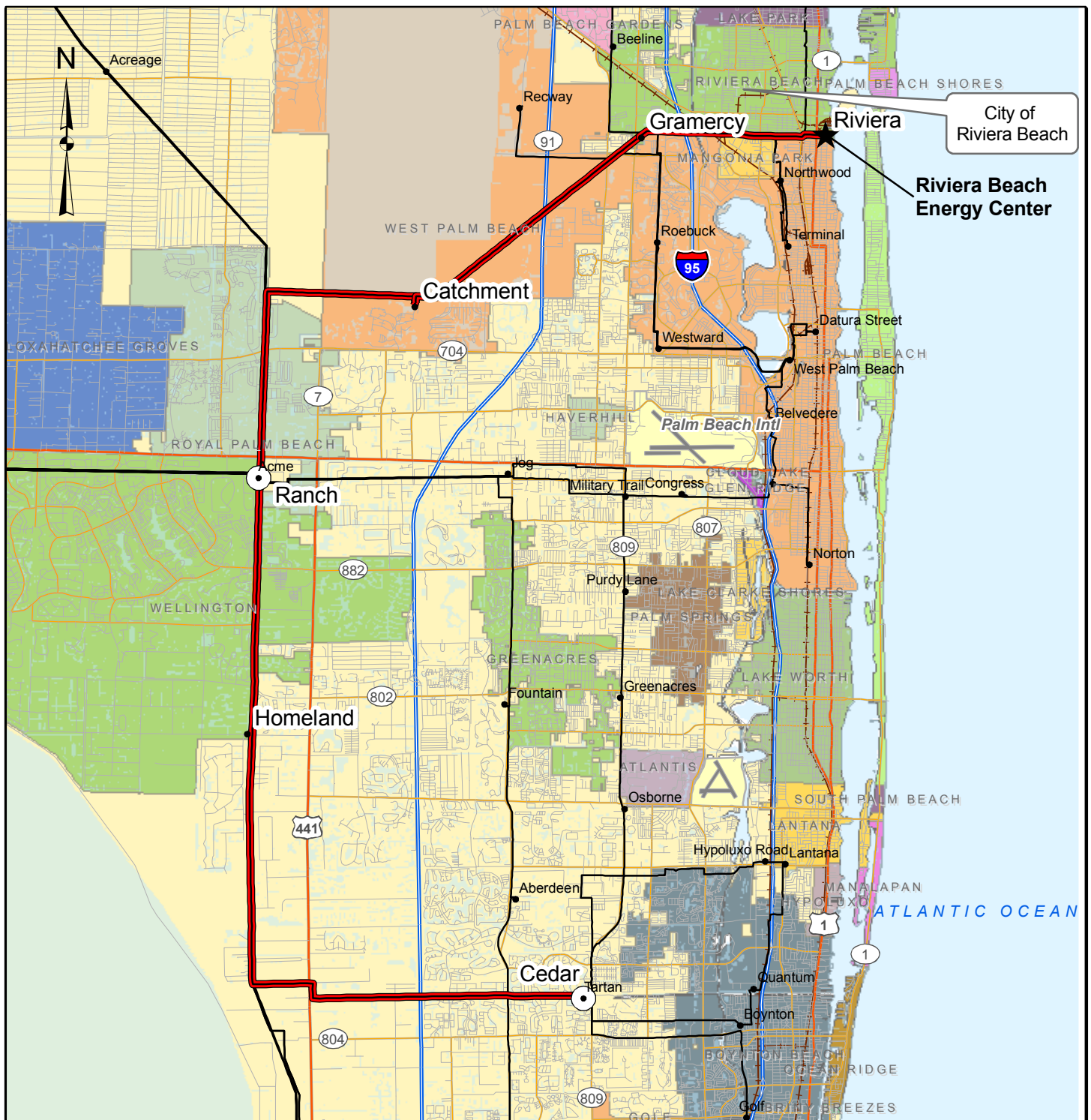
1. FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
2. Construction Parking & Laydown Area, Intake Culvert Easement, Landscaped Buffer Area, Manatee Viewing Center, Submerged Lands, Oil Pipeline Easement, FPL, 2009
3. Imagery, National Imagery Mosaics, USGS, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
SITE AND OFF-SITE CONSTRUCTION AREAS						
PROJECT No. 083-87633			FILE No. 08387633RA024			
DESIGN	RCM	1/26/2009	SCALE: AS SHOWN		REV.	1
GIS	NRL	1/27/2009				
CHECK	RCM	1/27/2009				
REVIEW	KFK	1/27/2009				



FIGURE 4.1.0-1



LEGEND

- ★ FPL Riviera Beach Energy Center
- Proposed Substation Improvements
 - Existing Substations
- Proposed Transmission Line Improvements
- Existing Transmission Lines

REFERENCES

1. Existing transmission lines, existing substations, FPL, 2008.
2. Riviera Beach Energy Center, FPL, 2008.
3. Municipalities, Palm Beach County Planning, Zoning, and Building Departments, July 2008



REV.	DATE	DES.	REVISION DESCRIPTION	GIS	CHK	RWV
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
FPL TRANSMISSION LINE BETWEEN THE RIVIERA BEACH ENERGY CENTER, RANCH SUBSTATION, & CEDAR SUBSTATION						
PROJECT No. 083-87633 FILE No. 08387633RA028						
DESIGN	RCM	1/15/2009	SCALE: AS SHOWN	REV.	0	
GIS	NRL	1/21/2009	FIGURE 4.1.0-2			
CHECK	RCM	1/21/2009				
REVIEW	KFK	1/27/2009				



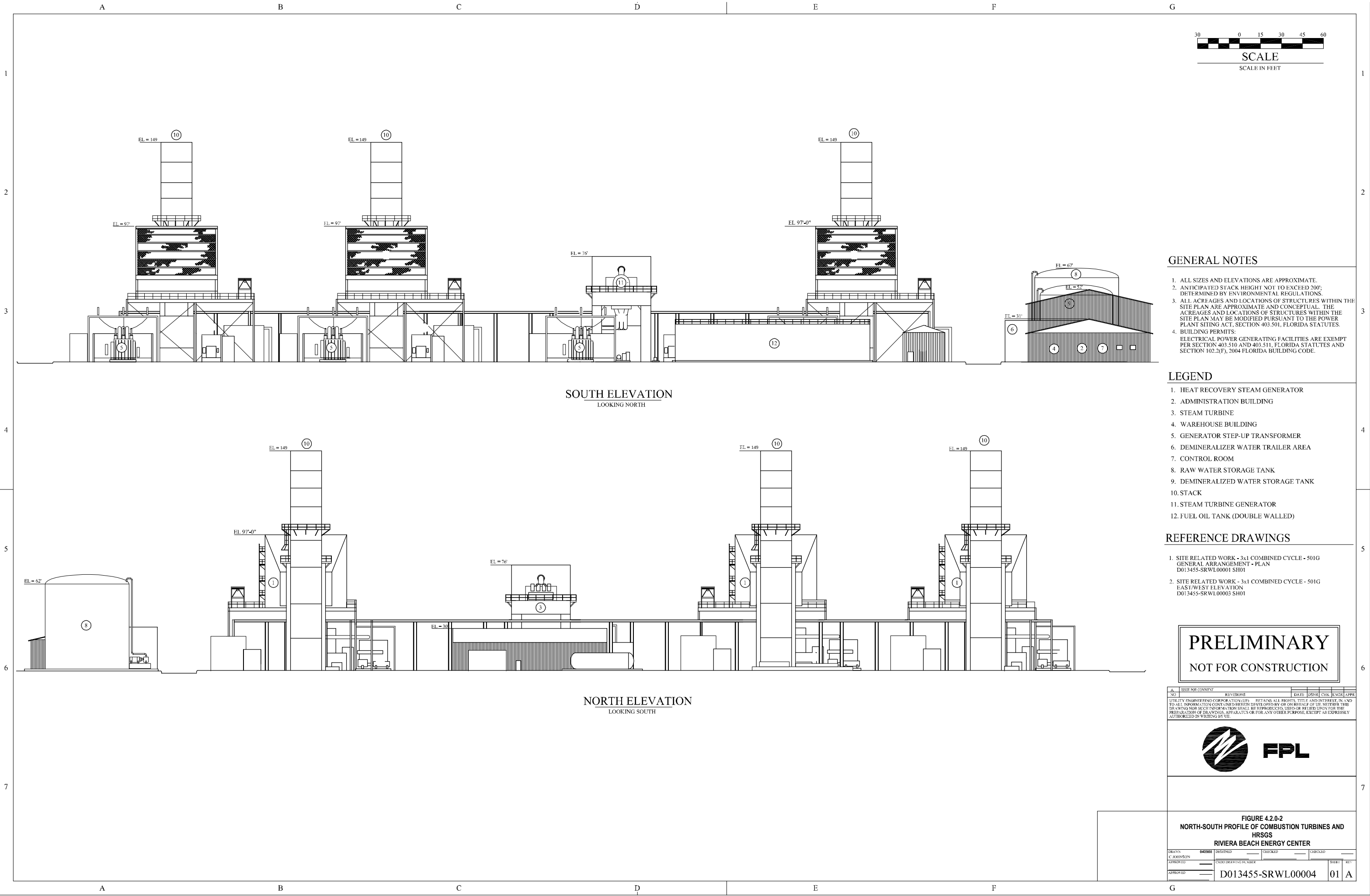
■ ■ FPL Riviera Beach Energy Center (To Be Certified)



1. FPL Riviera Beach Energy Center (to be certified), FPL, 2009.
2. Conceptual Site Plan, FPL drawing srw100002s1.dwg, 2008.
3. Stormwater, Boyle Engineering Corp. Post Development Detention Areas Siting Exhibit, 2008.



REV.	DATE	DES	REVISION DESCRIPTION						GIS	CHK	RWV	
PROJECT												
FPL RIVIERA BEACH ENERGY CENTER												
TITLE												
CONCEPTUAL SITE PLAN												
			PROJECT No.		083-87633	FILE No.		08387633RA037				
			DESIGN	RCM	1/21/2009	SCALE:		AS SHOWN		REV.	0	
			GIS	NRL	1/22/2009							
			CHECK	RCM	1/22/2009	FIGURE 4.2.0-1						
			REVIEW	KFK	1/27/2009							



GENERAL NOTES

- 1. ALL SIZES AND ELEVATIONS ARE APPROXIMATE.
- 2. ANTICIPATED STACK HEIGHT NOT TO EXCEED 200'; DETERMINED BY ENVIRONMENTAL REGULATIONS.
- 3. ALL ACREAGES AND LOCATIONS OF STRUCTURES WITHIN THE SITE PLAN ARE APPROXIMATE AND CONCEPTUAL. THE ACREAGES AND LOCATIONS OF STRUCTURES WITHIN THE SITE PLAN MAY BE MODIFIED PURSUANT TO THE POWER PLANT SITING ACT, SECTION 403.501, FLORIDA STATUTES.
- 4. BUILDING PERMITS:
ELECTRICAL POWER GENERATING FACILITIES ARE EXEMPT PER SECTION 403.510 AND 403.511, FLORIDA STATUTES AND SECTION 102.2(F), 2004 FLORIDA BUILDING CODE.

LEGEND

- 1. HEAT RECOVERY STEAM GENERATOR
- 2. ADMINISTRATION BUILDING
- 3. STEAM TURBINE
- 4. WAREHOUSE BUILDING
- 5. GENERATOR STEP-UP TRANSFORMER
- 6. DEMINERALIZER WATER TRAILER AREA
- 7. CONTROL ROOM
- 8. RAW WATER STORAGE TANK
- 9. DEMINERALIZED WATER STORAGE TANK
- 10. STACK
- 11. STEAM TURBINE GENERATOR
- 12. FUEL OIL TANK (DOUBLE WALLED)

REFERENCE DRAWINGS

- 1. SITE RELATED WORK - 3x1 COMBINED CYCLE - 501G GENERAL ARRANGEMENT - PLAN D013455-SRWL00001 SH01
- 2. SITE RELATED WORK - 3x1 COMBINED CYCLE - 501G EAST/WEST ELEVATION D013455-SRWL00003 SH01

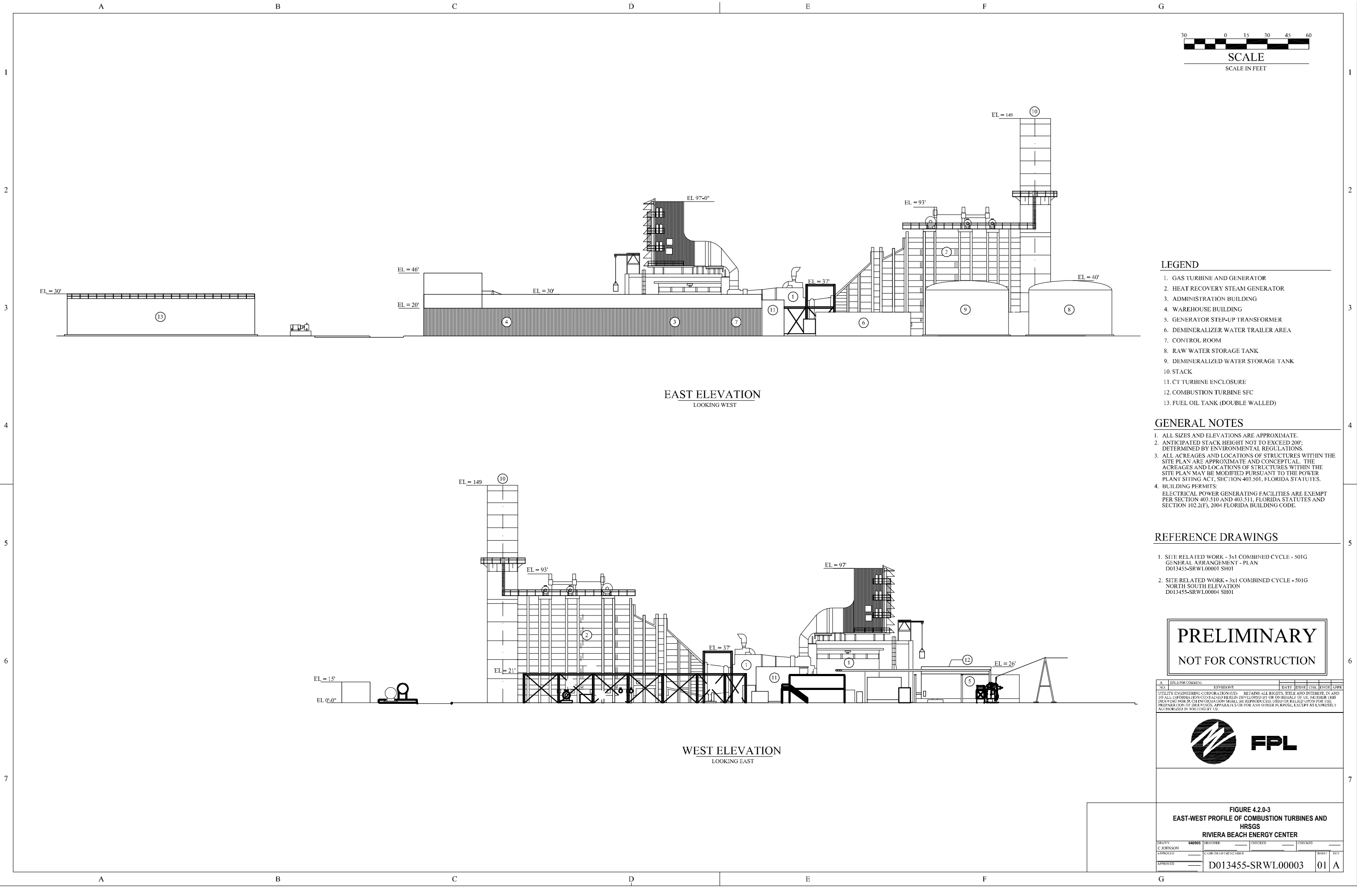
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FIGURE 4.2.0-2
NORTH-SOUTH PROFILE OF COMBUSTION TURBINES AND HRSGS
RIVIERA BEACH ENERGY CENTER

DRAWN C. JOHNSON	DESIGNED 040900	CHECKED	CHECKED
APPROVED	CADD DRAWING NUMBER	SHEET	REV
APPROVED	D013455-SRWL00004	01	A



- LEGEND**
1. GAS TURBINE AND GENERATOR
 2. HEAT RECOVERY STEAM GENERATOR
 3. ADMINISTRATION BUILDING
 4. WAREHOUSE BUILDING
 5. GENERATOR STEP-UP TRANSFORMER
 6. DEMINERALIZER WATER TRAILER AREA
 7. CONTROL ROOM
 8. RAW WATER STORAGE TANK
 9. DEMINERALIZED WATER STORAGE TANK
 10. STACK
 11. CT TURBINE ENCLOSURE
 12. COMBUSTION TURBINE SFC
 13. FUEL OIL TANK (DOUBLE WALLED)

- GENERAL NOTES**
1. ALL SIZES AND ELEVATIONS ARE APPROXIMATE.
 2. ANTICIPATED STACK HEIGHT NOT TO EXCEED 200'; DETERMINED BY ENVIRONMENTAL REGULATIONS.
 3. ALL ACREAGES AND LOCATIONS OF STRUCTURES WITHIN THE SITE PLAN ARE APPROXIMATE AND CONCEPTUAL. THE ACREAGES AND LOCATIONS OF STRUCTURES WITHIN THE SITE PLAN MAY BE MODIFIED PURSUANT TO THE POWER PLANT SITING ACT, SECTION 403.501, FLORIDA STATUTES.
 4. BUILDING PERMITS: ELECTRICAL POWER GENERATING FACILITIES ARE EXEMPT PER SECTION 403.510 AND 403.511, FLORIDA STATUTES AND SECTION 102.2(F), 2004 FLORIDA BUILDING CODE.

- REFERENCE DRAWINGS**
1. SITE RELATED WORK - 3x1 COMBINED CYCLE - 501G
GENERAL ARRANGEMENT - PLAN
D013455-SRWL00001 SH01
 2. SITE RELATED WORK - 3x1 COMBINED CYCLE - 501G
NORTH SOUTH ELEVATION
D013455-SRWL00004 SH01

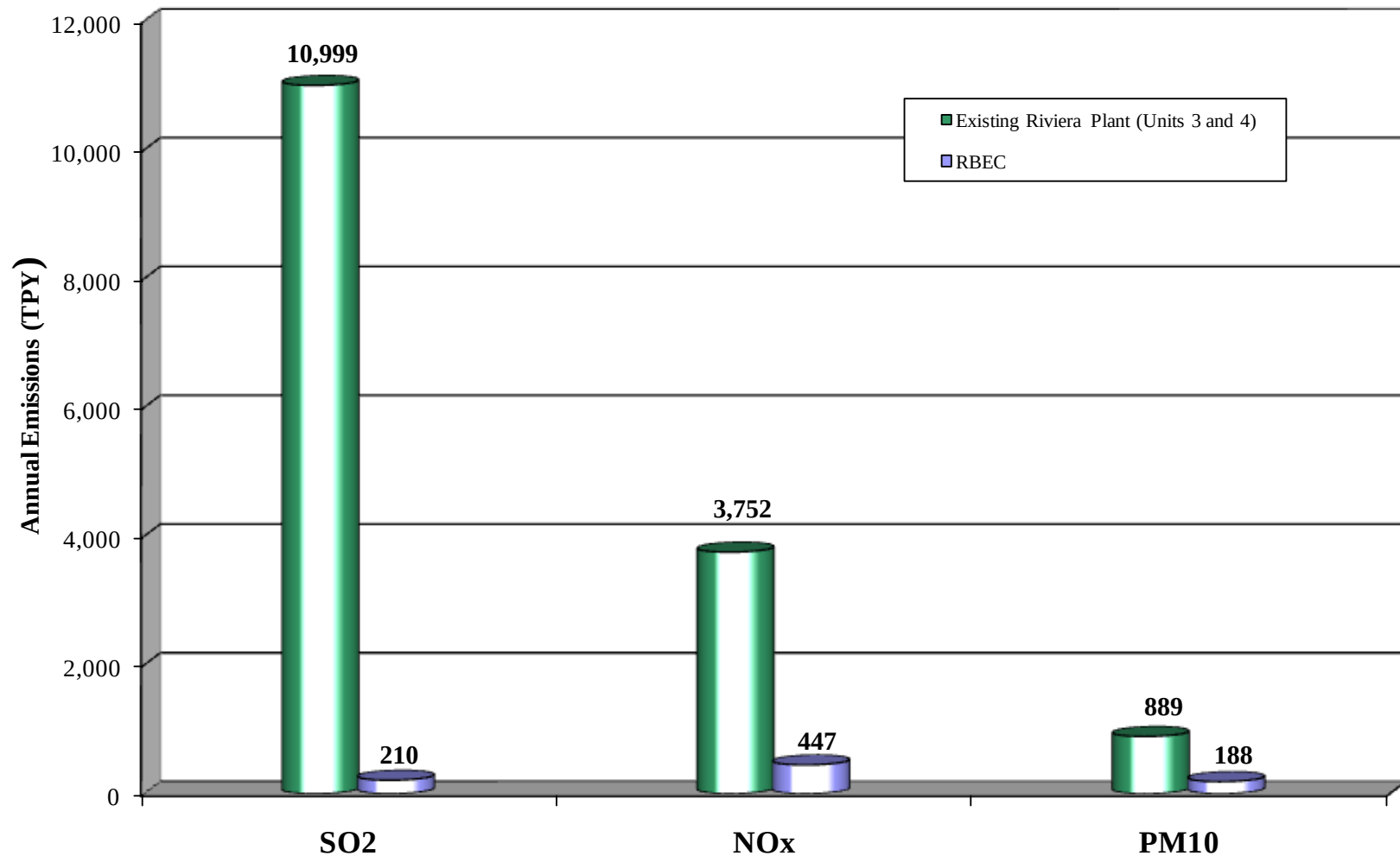
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A. ISSUED FOR COMMENT		REVISIONS		DATE	DSNR	CHK	ENGR	APPR
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FIGURE 4.2.0-3
EAST-WEST PROFILE OF COMBUSTION TURBINES AND HRSGS
RIVIERA BEACH ENERGY CENTER

DRAWN	046903	DESIGNED		CHECKED		BOBT	REV
APPROVED		CADD DRAWING NUMBER					
APPROVED		D013455-SRWL00003	01	A			



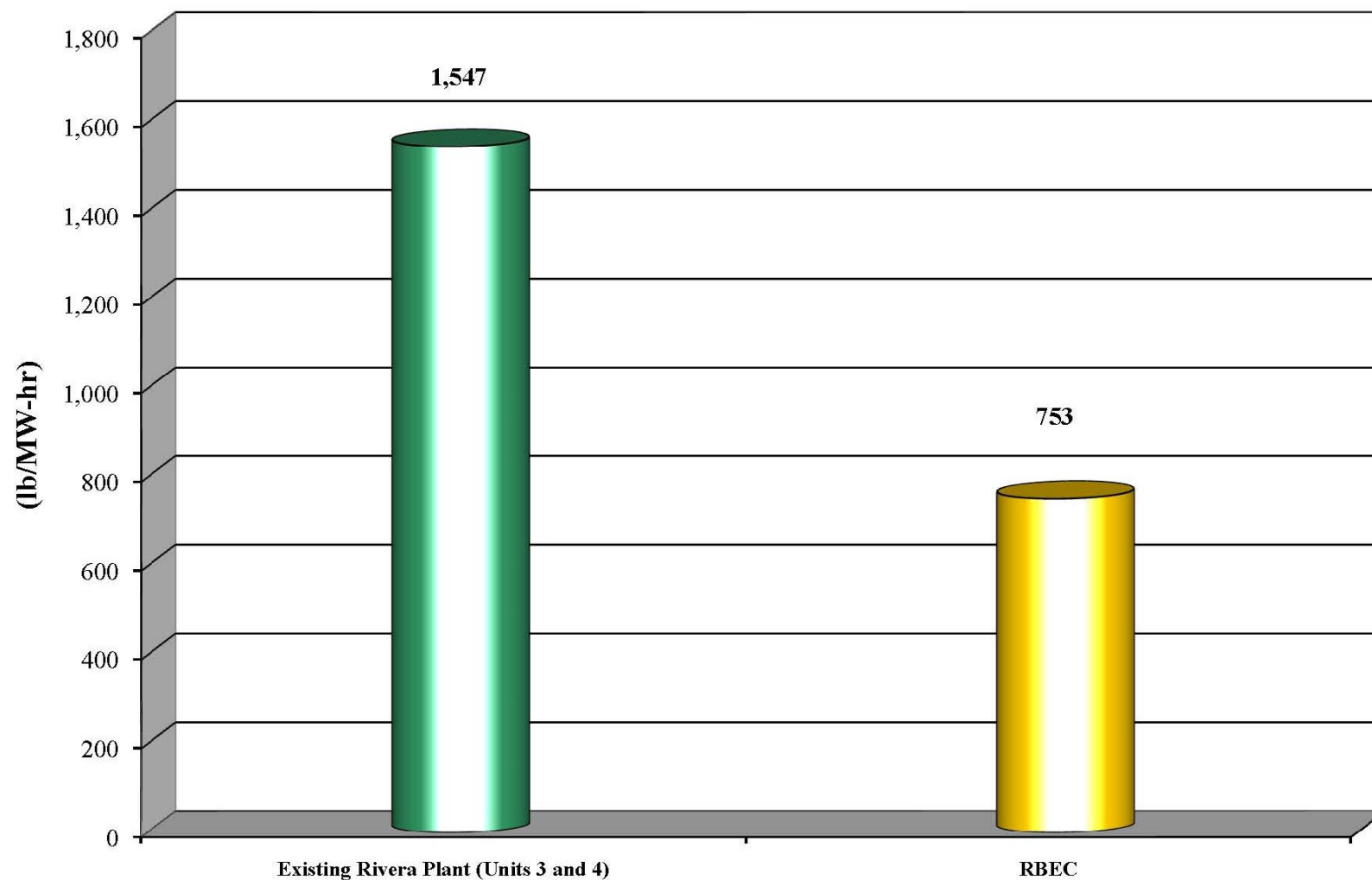
Notes: Emissions for Existing Riviera based on 2004 and 2005 operation and AOR data (43.1% capacity factor).
Emissions for RBEC based on 100% capacity factor on firing natural gas and light oil; 7,760 hours on gas and 1,000 hours of oil at full load. Based on proposed performance and emission limits..
Nominal Capacity: existing Plant = 600 MW; RBEC = 1,250 MW

Figure 4.4.1-1
Comparison of Historical Actual SO₂, NO_x, and PM₁₀ Annual Emissions (TPY) for the Existing Riviera Plant
Compared to Projected Maximum Potential Annual Emissions (TPY) for RBEC

Fig 4.4.1-1.docx

Source: Golder, 2008.





Notes: Emissions for Existing Riviera Plant based on 2004 and 2005 operation and AOR data (43.1% capacity factor).
Emissions for RBEC based on 100% capacity factor on firing natural gas and light oil; 7,760 hours on gas and 1,000 hours of oil at full load. Based on proposed performance and emission limits.
Nominal Capacity: existing = 600 MW; 3-on-1 = 1,250 MW

Figure 4.4.2-1
Comparison of CO₂ Emission Rates (lb/MW-hr) for the Existing Riviera Plant and RBEC
Fig 4.4.2-1.docx

Source: Golder, 2008.



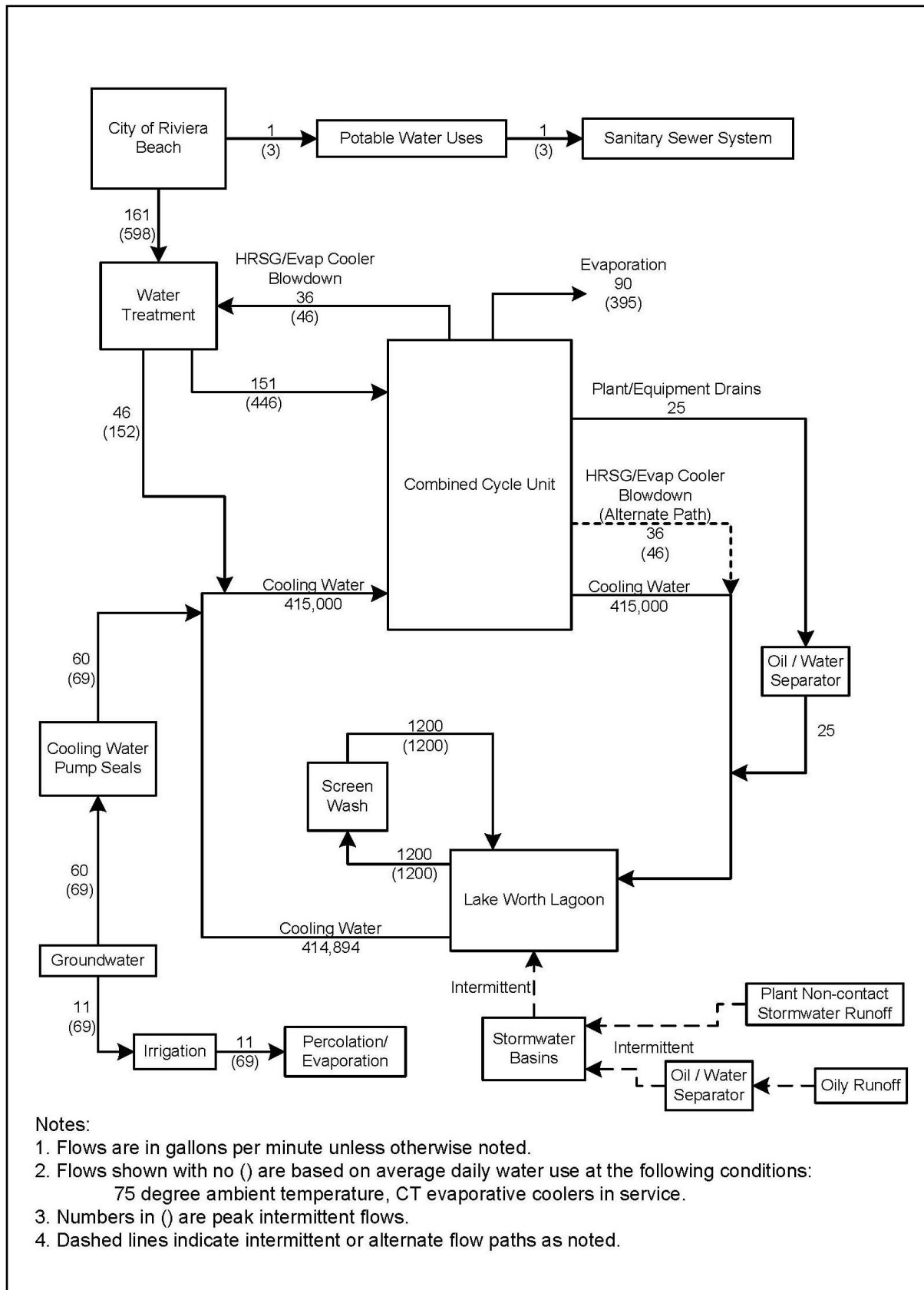
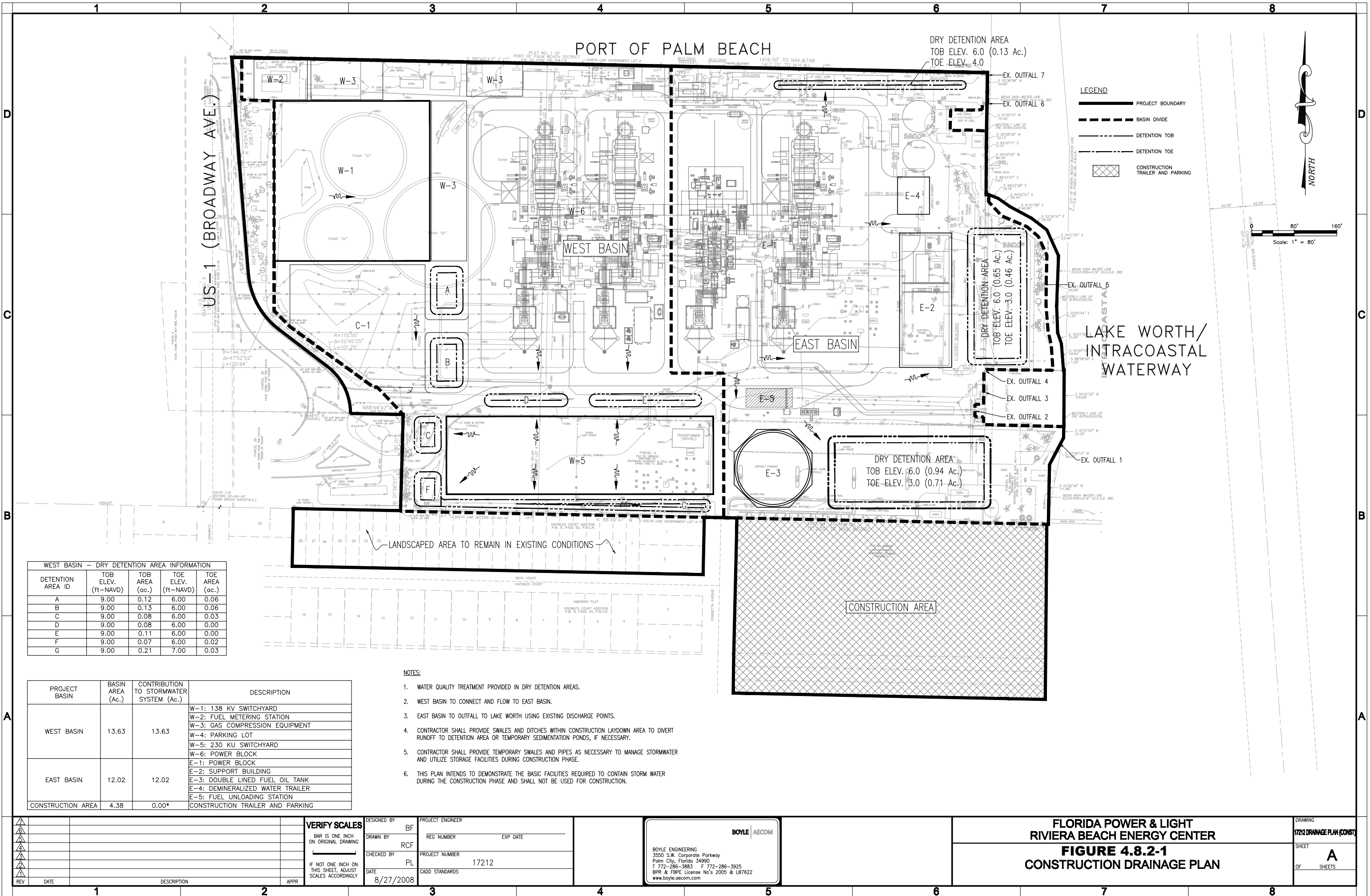


Figure 4.5.0-1
Water Balance for RBEC
Fig 4.5.0-1.docx

Source: FPL, Golder; 2009.



DWG: F:\17212\Permit\SCA\Exhibits\17212 DRAINAGE PLAN (CONST).dwg
PLOT: 17212 DRAINAGE PLAN (CONST).pl
DATE: 8/27/2008 9:46 AM
PLOT BY: Fesko, Ben



WEST BASIN - DRY DETENTION AREA INFORMATION				
DETENTION AREA ID	TOB ELEV. (ft-NAVD)	TOB AREA (ac.)	TOE ELEV. (ft-NAVD)	TOE AREA (ac.)
A	9.00	0.12	6.00	0.06
B	9.00	0.13	6.00	0.06
C	9.00	0.08	6.00	0.03
D	9.00	0.08	6.00	0.00
E	9.00	0.11	6.00	0.00
F	9.00	0.07	6.00	0.02
G	9.00	0.21	7.00	0.03

PROJECT BASIN	BASIN AREA (Ac.)	CONTRIBUTION TO STORMWATER SYSTEM (Ac.)	DESCRIPTION
WEST BASIN	13.63	13.63	W-1: 138 KV SWITCHYARD
			W-2: FUEL METERING STATION
			W-3: GAS COMPRESSION EQUIPMENT
			W-4: PARKING LOT
			W-5: 230 KV SWITCHYARD
			W-6: POWER BLOCK
EAST BASIN	12.02	12.02	E-1: POWER BLOCK
			E-2: SUPPORT BUILDING
			E-3: DOUBLE LINED FUEL OIL TANK
			E-4: DEMINERALIZED WATER TRAILER
			E-5: FUEL UNLOADING STATION
CONSTRUCTION AREA	4.38	0.00*	CONSTRUCTION TRAILER AND PARKING

NOTES:

- WATER QUALITY TREATMENT PROVIDED IN DRY DETENTION AREAS.
- WEST BASIN TO CONNECT AND FLOW TO EAST BASIN.
- EAST BASIN TO OUTFALL TO LAKE WORTH USING EXISTING DISCHARGE POINTS.
- CONTRACTOR SHALL PROVIDE SWALES AND DITCHES WITHIN CONSTRUCTION LAYDOWN AREA TO DIVERT RUNOFF TO DETENTION AREA OR TEMPORARY SEDIMENTATION PONDS, IF NECESSARY.
- CONTRACTOR SHALL PROVIDE TEMPORARY SWALES AND PIPES AS NECESSARY TO MANAGE STORMWATER AND UTILIZE STORAGE FACILITIES DURING CONSTRUCTION PHASE.
- THIS PLAN INTENDS TO DEMONSTRATE THE BASIC FACILITIES REQUIRED TO CONTAIN STORM WATER DURING THE CONSTRUCTION PHASE AND SHALL NOT BE USED FOR CONSTRUCTION.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DESIGNED BY
BF
DRAWN BY
RCF
CHECKED BY
PL
DATE
8/27/2008

PROJECT ENGINEER
REG NUMBER
EXP DATE
PROJECT NUMBER
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FLORIDA POWER & LIGHT
RIVIERA BEACH ENERGY CENTER
FIGURE 4.8.2-1
CONSTRUCTION DRAINAGE PLAN

DRAWING
17212 DRAINAGE PLAN (CONST)
SHEET
A
OF
SHEETS

5.0 ENVIRONMENTAL EFFECTS OF SITE PREPARATION, AND PLANT AND ASSOCIATED FACILITIES CONSTRUCTION

The following sections address the environmental effects of site preparation and construction of the Project, including the construction support area, the construction parking and laydown area, and the manatee viewing center. The environmental effects are discussed with respect to impacts on land, surface water, groundwater, ecology, air quality, solid waste, landmarks and sensitive areas, and impacts on archaeological and historic sites. It is important to note that during this approximately 4-year construction period, the existing Riviera Plant facilities will no longer be in operation. Therefore, while the Project construction activities will have the impacts discussed in the following sections, impacts of the operation of the existing Plant will be eliminated during this period.

5.1 Land Impacts

5.1.1 General Construction Impacts

Many of the existing Riviera Plant facilities including, but not limited to, the steam generators, steam turbines, electric generators, condensers, stacks, and associated equipment, will be dismantled prior to the start of construction of the converted Plant. Construction and demolition materials will be either recycled or disposed.

Dismantlement activities will include dismantling of mechanical and electrical equipment and may include explosive dismantlement of certain structures. Facilities such as the steam turbines, electric generators, and mechanical, electrical, and instrumentation equipment may be manually dismantled prior to any use of explosives. Dismantlement will involve the use of cranes, robotic demolition machines, jackhammers, loaders, and dump trucks. Demolition debris will be transported offsite for recycling for beneficial reuse or disposed of in a licensed landfill. As necessary, to protect the public during Project dismantlement work, appropriate protective enclosures will be installed along the perimeter of the Site or as appropriate at other Site locations.

During decommissioning and prior to dismantlement, all insulation and hazardous materials will be removed from the structures. Utility and fuel systems, including water, sewer, oil, gas, and electrical systems will be disconnected and isolated.

The existing Plant stacks will be pre-washed and evaluated for hazardous materials, and all insulation will be removed, prior to being dismantled. As required for the converted Plant construction, underground piping, pilings, and tanks will be excavated, drained, and removed.

Controlled explosive techniques may be used to dismantle large structures. Explosives would be used to implode portions of the structure to safely lower structures for subsequent removal from the Site. The large structures where explosives may be used include the steam generator buildings, steam turbine/electric generator pedestals, and other large concrete components. Explosive charges would be placed by experienced contractors to weaken the supporting structures and foundations to lower the infrastructure to the ground. The controlled, directed explosions would be of extremely short duration, lasting only seconds.

Any use of explosives will be coordinated with local government authorities to minimize any potential impacts to traffic on U.S. Highway 1 and nearby residents and businesses. Appropriate and timely notice will be given to nearby residences and business prior to the use of explosives.

Structures to be dismantled by explosives will be prepared by removing materials that can cause fugitive emissions. Water will be used to control fugitive emissions during the use of explosives or other dismantlement activities that could generate fugitive emissions.

Waste material (e.g., concrete, scrap metal) will be recycled, or disposed of in accordance with local and State requirements (see Table 5.1.1-1). Structural material such as concrete may be used as fill. Material that cannot be recycled will be disposed of in an approved landfill [i.e., a construction and demolition (C&D) or municipal solid waste (MSW) Class I landfill, as appropriate]. Any hazardous waste will be managed according to applicable rules and regulations (see Table 5.1.1-1).

Similar dismantlement techniques have been used for the FPL Lauderdale, Fort Myers, and Sanford Repowering Projects. In these Projects, the steam generators, associated mechanical and electrical equipment, and stacks were removed. Based on this experience, only localized impacts are expected to occur during this phase of construction, which will last for about 1 year.

The Site has been occupied by an operating power generation facility for more than 60 years and contains minimum vegetation. The areas to be used for Project construction, including the construction support area that will ultimately become the manatee viewing center, will be cleared of such minimal vegetation as necessary. The Site soils are generally suitable for the development of the

RBEC, obviating the need for substantial filling. Unsuitable soils will be removed and fill added, as necessary.

The construction parking and laydown area, located on FPL-owned property west of U.S. Highway 1, comprises about 7 acres and may be stabilized with rock, limestone, and shell. Other more lightly used areas may be seeded or sodded with grass to prevent erosion.

5.1.2 Roads

Access to the Site including the construction support area (east of U.S. Highway 1) and the construction parking and laydown area (west of U.S. Highway 1), will be from U.S. Highway 1. U.S. Highway 1, a four-lane divided highway, is located immediately west of the Site. The Riviera Plant has three existing entrances (Gate 3, Gate 9, and Gate 10). Gates 3 and 10 provide access from U.S. Highway 1 and will be used as the main access to the Site. Gate 9 is located off of North Flagler Road and 59th Street. The construction support area, located on the southern portion of the Site, is situated at the end of 59th Street and will be accessed from Gate 9. No equipment or heavy truck traffic will be directed through the residential streets located south of the Site. The construction parking and laydown area is located across U.S. Highway 1 from the main gate (see Figure 3.1.0-3) and will be accessed directly from U.S. Highway 1.

The construction workforce for the Project is expected to average approximately 290 workers during most of the construction period from 2010 to 2014. Dismantlement of the existing Plant facilities is anticipated to commence in the fall of 2010 and Project construction is anticipated to conclude in the summer of 2014. Peak construction is estimated at approximately 650 workers in mid-2013. Subsection 5.7.2 presents the construction traffic analysis performed for the Project.

Fugitive dust generation from construction traffic will be minimized through paving roads and the use of water sprinkling or other dust-suppressant techniques.

5.1.3 Flood Zones

The vast majority of the Site is within Zone X and is not within the 100-year floodplain. The eastern portion (shoreline) of the Site is shown on the current FEMA flood zone map as being within Zone AE (within the 100-year floodplain) with a portion of the Site within Zone X500 (between the limits of the 100-year flood and 500-year flood zones). Structures that will be constructed within Zone AE will be constructed at an elevation to accommodate the design requirements of the 100-year flood zone.



The construction parking and laydown area situated west of the Site is located entirely within Zone X.

5.1.4 Topography and Soils

The existing grade of the Site is nominally 20 ft-msl. The finished grade of the Site, which includes the Power Block and supporting facilities and equipment for RBEC, will remain at the existing nominal site elevation of 20 ft-msl. After dismantling Units 3 and 4, site preparation will be minimal due to the existing industrial nature of the Site. As necessary for structural stability, material will be backfilled for foundations of structures and piping. Areas will be graded and some amounts of rock fill will be used to help support the Plant/foundations, piping, electrical duct banks, trenches, and manholes. Foundations required to support heavy loads (e.g., building columns, CTs, generators) are expected to be spread foundations supported by pilings or stone columns.

Dewatering will be required for equipment foundations and maintenance, repair and refurbishment of the existing once-through cooling water system. Such dewatering will be localized and last for less than 1 year. Impacts of dewatering on surficial groundwater are addressed in Section 5.3. There will be no impacts on the underlying deeper aquifers because excavation and dewatering activities will be limited to the Site.

Current topographic features of the Site reflect its historic use as a power plant site. No adverse impact to soil stability or bearing strength is anticipated from the Project because spread foundations, pilings, or stone columns will be used for RBEC; therefore, overall settling of the land area will be negligible. Slight settling may take place in areas of construction, but this will be minor and localized in extent due to the existing conditions of the Site.

Elevations of the land surface during construction will be approximately the same as the existing Site elevation. As a result, no significant changes in topography will be observable from offsite locations and site topography will not be affected by construction-related activities. The structures associated with the construction of RBEC will include temporary construction cranes for use in construction of three new 149-foot-tall exhaust stacks. The existing Plant stacks are about 300 feet high and the existing boiler structures are about 140 feet high. Because the construction cranes will be temporary and lower in height than the existing structures, the impacts of construction on viewshed will not be significant.

Groundwater levels will not be significantly affected by modifications to soil percolation from the construction activities at the Site due to the proximity of surface water and the interconnection between these surface water bodies and the surficial aquifer. Slight changes in percolation rates will have negligible impacts on groundwater levels, because the surface infiltration will affect only localized areas within the Site and construction parking and laydown area.

The construction support area will remain at its existing elevation. This area will contain the construction office trailers and will be used for parking during construction. As described in Subsection 4.9.1, limestone and aggregate will be used as necessary for stabilization. Construction of the manatee viewing center will not significantly change the area's existing elevation.

The construction parking and laydown area will also not significantly change from its existing elevation.

5.2 Impact on Surface Water Bodies and Uses

5.2.1 Impact Assessment

5.2.1.1 Construction Water Use

Water used during Project construction will be obtained from the City of Riviera Beach and from existing permitted onsite wells. Construction water uses include soil improvement, hydrostatic testing, chemical cleaning, steam blows, fugitive dust control, potable supply, and irrigation.

Chemicals may be added to the water used for hydrostatic testing to meet manufacturer's specifications for pH control. The water from hydrostatic testing of HRSGs, piping, and tank systems will be contained onsite after such testing is completed. Hydrostatic test water will be treated if necessary, tested, and either routed to the stormwater ponds for percolation/evaporation or discharged to Lake Worth Lagoon. Alternatively, the water may be trucked from the Site and disposed at a licensed disposal facility.

Chemical cleaning of the HRSGs and steam piping systems will be performed near the end of the construction period (Section 4.6). The steam blow process involves cleaning steam-piping systems to remove accumulated weld spatter, slag, filings, and other debris. If this material is not removed prior to steam turbine operation, the steam turbine may be damaged by the metal particles, which would strike the blades and steam path at very high velocities. Blowing through the piping system with steam removes this material, along with rust, grease, and other fabrication and construction residues

prior to commencement of combined cycle operation. The steam blow process requires treated water for a short time period. The proposed auxiliary boiler for RBEC or a temporary boiler will be used to generate steam for cleaning. Non-hazardous wastewaters from chemical cleaning of the HRSGs and steam piping will be routed to the City of Riviera Beach (or Palm Beach County ECRWRF) privately owned treatment works (POTW) or other approved facility. During construction, the construction labor force will use portable chemical toilets and/or permitted holding tanks. A licensed contractor will pump all sanitary sewage from the portable toilets and holding tanks as needed and transport the waste to an approved disposal facility. A temporary connection to the existing POTW may be used during construction.

Potable water for consumption, emergency eyewash, and shower stations during construction will be obtained from the existing City of Riviera Beach potable water connection or contractor-supplied potable water.

As necessary, water from the City of Riviera Beach or the existing permitted surficial wells will be used to mitigate fugitive dust emissions for Project construction.

5.2.1.2 Construction Dewatering

During construction of RBEC, dewatering activities will be required for various structures to be located at depths below the surficial groundwater table, including excavations for major foundations, installation of underground circulating water pipe, and miscellaneous trenching activities. In order to meet regulatory requirements for discharge to the Lake Worth Lagoon, the dewatering effluent may require treatment for pH, turbidity and metals. Potential processes considered in the design of any dewatering treatment system will be similar to those used to create high quality process water. The dewatering effluent treatment system will be designed to ensure that any discharge to surface waters will meet Class III water quality standards.

If necessary, chemical dosing and clarification will be the initial dewatering effluent treatment processes used. Coagulant and polymer will be added to the influent water to facilitate settling of the suspended particulate matter. Particulate matter will settle out of the water in the clarifier as a semi-solid. In order to create a disposable product, the semi-solid material may be further dewatered in a filter press, producing a solid with low moisture content.

If necessary, following clarification to remove the smaller particulate which does not settle out in the process, filtration will be employed. After the filtration process, testing will be performed to assess water quality. Ion exchange processes may be required to further remove selected ions from the effluent water before release to the existing intake or discharge areas. In the ion exchange process, elevated ions in concentrations exceeding surface water quality standards, will be replaced by sodium or hydrogen. The regeneration process will be performed offsite by a contracted water treatment company.

Up to 1,750 gpm of groundwater could be produced during dewatering activities over several months of the Project construction period. An onsite lined holding pond or a day tank would be provided to collect dewatering effluent from various locations onsite, routing the water to the dewatering effluent treatment processes. This treatment process will continuously treat dewatering effluent before discharge to surface water. Solid waste produced from the dewatering effluent treatment process is estimated at up to 600 pounds per hour (lb/hr) and, depending upon its characteristics, will be placed onsite or disposed of at an approved facility.

No dewatering activities will be required for the construction support area construction of the manatee viewing center and for the construction parking and laydown area.

5.2.2 Measuring and Monitoring Programs

Discharge of treated stormwater associated with construction activities will be monitored as required under applicable regulations. Dewatering effluent will be monitored and reported as required by Chapter 62-621.300 (2) F.A.C., under the Generic Permit for the Discharge of Produced Groundwater from any Non-contaminated Site Activity. In addition, turbidity will be measured weekly at all points of discharge to Lake Worth Lagoon and at a background station in Lake Worth Lagoon to ensure that turbidity is not more than 29 NTU above background. If the dewatering effluent does not meet the screening requirements of the generic permit, FPL will sample the dewatering effluent for Class III (marine) water quality parameters and treat the dewatering effluent, as necessary, to meet Class III (marine) water quality standards at the point of discharge. Otherwise, FPL will not discharge the dewatering effluent to Lake Worth Lagoon.

5.3 Groundwater Impacts

5.3.1 Impact Assessment

Activities associated with the construction of RBEC are not expected to produce any significant changes to groundwater quality, quantity, or levels in the vicinity of the Site or construction parking and laydown area. Dewatering will be confined to localized onsite areas associated with construction on the Power Block and maintenance, repair and refurbishment of portions of the existing once-through cooling system. As a result, no adverse impacts to groundwater resources or offsite wells will occur from dewatering activities.

As discussed in Subsection 5.2.1.1, construction contractors will be required to implement appropriate practices to minimize spills. Maintenance and refueling will be performed only in designated areas. Any spills will be cleaned up and wastes disposed of in accordance with applicable requirements.

5.3.2 Measuring and Monitoring Programs

During construction dewatering, the effluent will be monitored as discussed above in Subsection 5.2.2.

5.4 Ecological Impacts

5.4.1 Impact Assessment

5.4.1.1 Terrestrial Systems

The terrestrial systems on the entire Site were cleared and previously impacted in connection with the construction of the Riviera Plant in the 1940s. Construction of the RBEC upon these previously impacted areas, which have been used for power plant operations for more than 60 years, will not cause adverse ecological impacts.

The Site does not contain unique wildlife species and is not considered important wildlife habitat because of its disturbed nature (see Subsection 3.3.6.2, Pre-Existing Stresses, Terrestrial Systems).

No adverse impacts to federal- or state-listed terrestrial plants and animals are expected in association with the construction at the Site, due to the existing developed nature of the Site and lack of suitable habitat for listed species.

Fugitive dust generated by construction activities will be minimized through BMPs (see Subsection 5.5.2). Any localized fugitive dust will not adversely affect offsite terrestrial systems in the vicinity.

Noise from construction activities is not anticipated to significantly affect wildlife in the vicinity of the Site. Presently, the area experiences noise from U.S. Highway 1, human activity, and the operation of the existing Plant. Wildlife that occurs in the vicinity of the Site is acclimated to such activities. No noise-sensitive wildlife is known to occur on the Site or in its vicinity since wildlife in the area would have been acclimated to noise associated with the existing Plant operations.

5.4.1.2 Aquatic Systems/Wetlands

Stormwater retention areas on the existing Plant Site will be impacted by construction of RBEC. The total acreage of these areas is approximately 0.37 acre. Although these areas meet the criteria for a wetland (hydric soil, hydrophytic vegetation, hydrology), according to Section 62-340.700, F.A.C., they do not require compensatory mitigation if impacted, since they are part of a previously permitted spill containment system or stormwater management system and are less than 0.5 acre in combined area.

The construction of RBEC will require the following: 1) repair of existing seawall; 2) repair of stormwater outfalls; 3) maintenance/repair/refurbishment of intake/discharge structures; 4) maintenance dredging of the manatee embayment area; and 5) construction of a temporary manatee heating system. FPL intends to repair several portions of the existing, functioning seawall along the eastern boundary of the Site including placing fill on the landward side of the seawall. This repair is exempt from State Environmental Resource Permit (ERP) requirements pursuant to Rule 62-312.050(1)(j), F.A.C., which allows for seawall restoration in upland areas or within 1 foot waterward of its previous location.

FPL intends to conduct repair, refurbishment, and maintenance work on the existing intake and discharge structures, both of those formerly used for Units 1 and 2 and those currently used for Units 3 and 4. The intake structure for Units 1 and 2 will be temporarily incorporated into the manatee heating system. After construction is complete, the intake and discharge structures for Units 1 and 2 will be closed off at the existing seawall and backfilled. The intake and discharge structures for Units 3 and 4 will remain and be incorporated into RBEC. The dredging required for the replacement of equipment within the intake and discharge areas for Units 3 and 4 qualifies for an exemption from

State permitting requirements for performance of maintenance dredging of existing manmade canals, channels, basins, berths, and intake and discharge structures.

In accordance with Section 403.813(2)(f), F.S., FPL will also conduct maintenance dredging within the manatee embayment during the Project construction period to restore the area to its historical design depth and enhance the area as a manatee refuge.

The manatee heating system (see Subsection 5.4.1.3 for description) intake pumps will be installed on the existing Units 1 and 2 intake structure. Suction pipes or vertical pumps will be placed into the intake wells to supply water to electric heaters. After being warmed in the electric heaters, the warm water will be discharged into the manatee embayment area adjacent to the existing Units 3 and 4 seal well structures where warm water is currently discharged for the manatees.

5.4.1.3 *Endangered and Threatened Species*

Manatees (*Trichechus manatus*), an endangered species protected under the Endangered Species Act and the Marine Mammal Protection Act, have regularly been observed in the vicinity of the cooling water intake and discharge system. Operation of the existing Plant will cease prior to dismantlement and construction activities associated with the conversion Project. Consequently, there will be a 4-year period, until operation of RBEC commences, during which the Plant's normal warm water discharge will not occur. FPL will comply with the Manatee Protection Plan, pursuant to the Plant's Industrial Wastewater Facility Permit, to avoid potential adverse impacts to manatees during this 4-year period.

FPL proposes to install a 30-MMBtu/hr electric heater system to provide a temporary "manatee refuge" by discharging warm water while the Plant is converted to RBEC. The electric heater system will be located to discharge adjacent to the Units 3 and 4 seal well, which is where the existing Plant discharges heated water for manatee protection. The water depth in this area is approximately 4 to 6 feet. The intake for the system will be located approximately 500 feet north of the system discharge, in the existing Units 1 and 2 intake structure. Warm water will be discharged from November 15 through March 31 (to coincide with the time of greatest manatee abundance) if the ambient water temperature falls below 61°F. The temporary heating system is predicted to provide approximately 0.9 acres of water at or above 68°F during conditions under which the present Manatee Protection Plan requires that FPL endeavor to release heated water for manatee protection.

Additional information regarding the analysis of the comparative extent of the thermal plume for the temporary manatee heating system in comparison with that for the existing Plant is provided in Appendix 10.9.

According to a 2008 survey, approximately 4 square feet of Johnson's seagrass (*Halophila johnsonii*), a federally threatened species, is located in the manatee embayment within the area proposed for maintenance dredging (EAI, 2008). The purpose of the dredging is to increase the depth of the area used by manatees as a thermal refuge. Potential impacts to Johnson's seagrass will be addressed in consultation with the National Marine Fisheries Service and other agencies. If required, FPL will provide mitigation to offset the loss of Johnson's seagrass. Typically, mitigation of seagrass impact involves habitat enhancement, transplanting seagrasses outside of an impact site prior to disturbance, and/or restoration of other impacted areas of seagrass within the vicinity.

5.4.2 Measuring and Monitoring Programs

5.4.2.1 **Terrestrial Systems**

No monitoring programs are needed at the Site due to the lack of habitat for protected species.

5.4.2.2 **Aquatic Systems/Wetlands**

All repair, refurbishment, and maintenance activities (including any maintenance dredging) will be performed in accordance with the Standard Manatee Conditions for In-water Work (USFWS, 2005) or the *Standard Manatee Construction Conditions for Artificial Warm Water Refugia During the Period of November 15 Through March 31* (as outlined in the FPL Riviera Plant Manatee Protection Plan approved by the FDEP on December 21, 2000) as appropriate for the season. FPL will continue to monitor water temperature within the manatee embayment area throughout the construction period during November 15 through March 31. FPL will endeavor to release heated water for manatee protection pursuant to the Plant's Manatee Protection Plan when the ambient water temperature falls below 61°F.

5.5 **Air Impacts**

5.5.1 Air Emissions

Construction activities will result in the generation of fugitive PM₁₀ emissions and vehicle exhaust emissions. Fugitive PM₁₀ emissions will result primarily from onsite vehicular travel over paved and unpaved roads. Onsite construction traffic will include heavy-equipment traffic and traffic due to construction workers entering and leaving the Site. Construction personnel and equipment will enter

the Site, including the construction support area, primarily over paved surfaced roadways. Exposed land areas may also generate fugitive dust due to wind erosion.

Emissions of fugitive PM_{10} from these activities are difficult to quantify because of their variable nature. They can only be estimated since emissions are dependent upon a number of factors, including specific activities conducted, level of activity, meteorological conditions, and control measures utilized.

Table 5.5.1-1 shows the estimated maximum air emissions during dismantlement of the existing Plant and construction of RBEC including use of the construction parking and laydown area and construction of the manatee viewing center.

Fugitive PM_{10} emissions may occur from wind erosion from open areas. The areas subject to wind erosion will generally be small due to the nature of construction activities and control measures taken, such as seeding. Fugitive PM_{10} emissions from wind erosion have been estimated to be a total of 1.4 tons during the construction period.

Fugitive PM_{10} emissions will also result from onsite construction traffic. Based on the average construction workforce, PM_{10} emissions from paved and unpaved roads have been estimated to be a total of 0.5 ton during the construction period. Reasonable precautions pursuant to FDEP Rule 62.296.320(4)(c)3., F.A.C., will be used to limit the amount of fugitive emissions from onsite paved and unpaved roads (e.g., watering).

Emissions will also result from construction equipment operating onsite with diesel and gasoline engines including cranes, trucks, compressors, etc. This equipment will produce emissions of CO, NO_x , VOC, PM, and SO_2 . Exhaust emissions were based on EPA emission factors (AP-42) for diesel engines. Based on the EPA emission factors and the estimated maximum number of vehicles, the CO, NO_x , VOC, PM_{10} , and SO_2 emissions are estimated to be 2.99, 3.10, 0.34, 0.17, and 0.19 TPY, respectively, over the construction period. These levels of emissions will not cause significant impacts to air quality in the vicinity of the Site.

A temporary boiler may be used during construction of the converted Plant for chemical cleaning and steam blow activities. A description of the temporary boiler is contained in Appendix 10.2.5. The maximum emissions from the temporary boiler are less than 2.5 TPY for CO, NO_x , VOC, PM_{10} , and SO_2 .

Table 5.5.1-1 includes emission estimates for construction activities at the construction support area and parking and laydown areas. Reasonable precautions pursuant to FDEP Rule 62-296.320(4)(c)3, F.A.C., will be used to minimize fugitive particulate emissions.

The construction support area and construction parking and laydown area have vegetation that will be cleared. The vegetation may be removed from these areas by open burning and removal of remaining debris. The vegetation may also be removed by clearing and cutting. Any open burning will be conducted according to Chapter 62-256, F.A.C. Open burning will be conducted after notification of the Florida Division of Forestry and conducted under the requirements of Rule 62-256.300(3), F.A.C. After these areas are cleared of all vegetation, the area will be stabilized by shell or rock. Watering will be used, as necessary, to minimize the emissions of fugitive dust.

5.5.2 Control Measures

A number of control measures will be implemented during the construction period to minimize air emissions and potential impacts pursuant to Rule 62-296.320(4)(c)3, F.A.C. The Site consists of compacted soils that are difficult for wind to pick up, thereby reducing fugitive emissions due to wind. After grading, the untraveled or lightly used areas will be either paved, provided with an erosion-resistant covering, or vegetated to minimize fugitive PM and wind erosion. Watering on an as-needed basis will control fugitive dust from highly traveled areas.

5.6 Solid Wastes

Solid waste materials generated during Project construction will be disposed of in accordance with applicable rules and regulations. Construction and dismantlement wastes, such as scrap wood and metal, will be transferred to a specified storage area on the Site where they will be separated and stockpiled for salvage and recycling. General waste materials (i.e., typical of municipal solid wastes) will be collected in appropriate waste collection containers for disposal at an approved offsite location. Solid wastes from dismantlement will be managed according to Table 5.1.1-1.

As described in Section 4.6 and listed in Table 4.6.0-1, there are a variety of potential solid waste streams resulting from the construction and operation of RBEC. During construction, the solid waste streams will be managed as presented in Table 4.6.0-1. Solvent rags will be separated and either laundered or disposed appropriately. If aerosol cans are punctured prior to disposal, the residual will be collected and managed as hazardous waste. Paint waste, PVC cleaner, and PVC cement wastes

will be minimized by implementation of programs requiring use of all material prior to issuance of additional material. All hazardous wastes will be collected onsite and disposed of by a licensed hazardous waste contractor. All non-hazardous waste will be managed according to the Waste Handling Guidelines identified in Table 4.7.0-1 with appropriate modifications to accommodate the construction of the Project.

Used oil from construction vehicles and equipment will be collected in appropriate containers and transported offsite for recycling or disposal at an approved facility. The approved disposal facility will be an existing facility that has been previously permitted for commercial recycling or disposal of used oils.

Individual contractors will be responsible for handling any hazardous materials used or created as part of their work. This responsibility includes the proper recordkeeping, transportation, storage, handling, and offsite disposal of such wastes. Contractors will be required to coordinate with FPL and provide documentation of all activities related to hazardous material and/or wastes.

5.7 Impact on Human Populations

Construction projects can affect human populations by altering demographic patterns; by placing demands on infrastructure elements such as housing, transportation, and educational facilities; by contributing noise to the environment; and by creating inconveniences due to the movement of workers, materials, and machinery. Construction activities will be contained within the existing Site and follow applicable regulations; all traffic and equipment deliveries will remain on identified roadways; and practices will be maintained to reduce potential disruption to surrounding areas and eliminate unnecessary air, noise and traffic impacts. Chapter 7.0 of this SCA provides information on income, employment, tax revenue, and service needs associated with the construction workforce. This section focuses on workforce requirements and the impacts of construction-related traffic, housing, education, and noise.

5.7.1 Construction Workforce

The construction workforce for the Project is expected to average approximately 290 workers from 2010 to 2014. Dismantlement of the existing Plant is anticipated to commence in the fall of 2010 and Project construction to conclude in the summer of 2014. Peak construction employment for the

Project is estimated at approximately 650 workers in mid-2013. The construction workforce trade categories (by percentage) for the Project will be approximately as follows:

Estimated Construction Workforce

Trade Category	Percent	Trade Category	Percent
Laborers	12	Pipefitters	19
Carpenters	6	Insulators	2
Operators	5	Electricians	22
Ironworkers	4	Painters	1
Millwrights	10	Supervision	<u>13</u>
Boilermakers	6	Total	100

FPL will promote employment of local workers by distributing Project information to the community about types of jobs and skills required, and local training opportunities. Notice of Project employment opportunities will appear in local media and FPL will sponsor or participate in area job fairs. Contractors will be solely responsible for hiring the construction workforce.

The majority of the construction workers are expected to commute to the Site from within a commuting distance of up to 100 miles, primarily from locations within Martin, Palm Beach, Broward, and Miami-Dade Counties. A more detailed discussion of the workforce, payrolls, and economic impacts of the workforce upon the City of Riviera Beach, the City of West Palm Beach, and Palm Beach County is found in Chapter 7.0.

5.7.2 Transportation

Traffic associated with the Project construction will affect area roadways on a temporary basis for the duration of the construction period. Subsection 3.2.7.2 presents the existing traffic conditions. This section presents a summary of the construction traffic impact analysis. A complete traffic impact analysis is also provided in Appendix 10.7.4.

The construction workforce for the Project is expected to average approximately 290 workers from 2010 to 2014. Dismantlement is anticipated to commence in the fall of 2010 and Project construction conclude in the summer of 2014. Peak construction is estimated at approximately 650 workers in mid-2013. Assuming a trip generation rate of 1.3 workers per vehicle, approximately 500 vehicles are anticipated during the peak construction period. This peak construction traffic would occur during the morning peak hour and during the evening peak hour.

The trip distribution and traffic assignment for this analysis is based on the existing traffic patterns and examination of the surrounding street system. The morning peak hour is listed below (evening peak hour would be in the opposite direction):

- 57 percent to and from the north via U.S. Highway 1; and
- 43 percent to and from the south via U.S. Highway 1.

In order to assess impacts with a conservative approach, all Project traffic was assumed to access the Site (including the construction support area east of U.S. Highway 1), and the construction parking and laydown area (west of U.S. Highway 1) near the existing signalized intersection located on U.S. Highway 1 (see Figure 1 of Appendix 10.7.4). The anticipated 500 construction-related vehicles will be provided parking at the following temporary parking areas:

- 100 vehicles will park onsite at the construction support area (the future manatee viewing center) located south and east of Gate 9 (east side of N. Flagler Drive at 59th Street).
- 400 vehicles will park at the construction parking and laydown area on the west side of U.S. Highway 1 near the existing signalized intersection (with access to be provided by the existing signalized T-intersection).

To develop year 2013 traffic volumes for the peak construction period, a growth rate, in combination with the seasonal factor, has been estimated at approximately 19 percent (see Appendix 10.7.4). Additionally, the peak construction traffic documented in the trip generation evaluation was added to the year 2013 background traffic to develop 2013 peak construction period traffic conditions.

**RBEC – PEAK CONSTRUCTION PERIOD
INTERSECTION CAPACITY/LEVEL OF SERVICE ANALYSES**

Intersection	Existing (2008) Conditions		Future (2013) Volumes		Future (2013) Volumes	
	Delay	LOS	Conditions w/o Construction Traffic		w/Construction Traffic	
			Delay	LOS	Delay	LOS
U.S. Highway 1/Drive	12.7 (16.2)	B (B)	14.4 (20.1)	B (C)	35.2 (25.8)	D (C)

Source: Highway Capacity Software (HCS+ Version 5.2). LEGEND: AM Peak (PM Peak)

Intersection capacity/level of service analyses were performed for the critical signalized intersection of U.S. Highway 1 and the main entrance/exit driveway. As indicated in the table above, the main

signalized access driveway intersection is currently operating at an acceptable level of service and will continue to operate adequately during the peak construction period. To accommodate traffic associated with construction activities, the following roadway improvements are proposed by FPL:

- Construct the westbound roadway (“west leg”) of the existing signalized T-intersection in order to provide temporary access to the construction parking and laydown area (west of U.S. Highway 1), signalize the driveway’s egress movements, and provide one inbound and two outbound lanes; and
- Provide a northbound left-turn lane on U.S. Highway 1 by re-stripping the median near 59th Street and extending north approximately 150 feet.

In addition, during the peak construction period, the signal timing of the intersection of U.S. Highway 1 and the main project driveway will require adjustment in order to provide additional time for the southbound left-turn movement. With signal timing adjustments, the intersection is projected to operate at an acceptable level of service.

5.7.3 Housing

An average of 290 construction workers will be required during Project construction, with a peak of 650 workers. Many of these workers will be employed for only a portion of the construction period due to the changing skill requirements throughout Project construction.

There is a significant labor pool of construction workers in Martin, Palm Beach, Broward, and Miami-Dade Counties, which is estimated at over 158,000 (UF/BEER, 2008). With only a portion of the construction labor to be specialized and potentially come from areas outside these four counties, only a small percentage of these workers could require temporary local accommodations. Although some of these workers could select permanent housing, generally owner-occupied for the duration of their stay, the majority are expected to live in temporary housing (e.g., renting). Still others could elect to reside in transitional housing, such as residential hotels, motels, rooms in private homes, or to bring their own housing in the form of campers and mobile homes. With an abundance of lodging accommodations (approximately 78,000 public lodging units), Palm Beach County (UF/BEER, 2008) will be able to accommodate both the general and specialized construction workers during their temporary stay within the area.

5.7.4 Education

Because of the short duration of employment (based on anticipated skill requirements and construction activities, few workers are anticipated to permanently relocate with their families. As a result, there will be little in-migration of school-aged children resulting from Project construction. No significant adverse effects on local elementary, middle, or high school enrollment are, therefore, anticipated.

5.7.5 Construction Noise Impacts

The impacts of noise on human populations are dependent upon the proximity of institutional and residential land uses to construction activities and the type and extent of noise sources. The nearest residential locations that could potentially be impacted by the construction activities are south and west of the Site (see Figure 3.3.8-1).

Construction will require installation of foundations and erection of major components of the combined cycle unit such as the CTs, HRSGs, steam turbines, and refurbishment of the once-through cooling system. The use of construction equipment, such as dump trucks, cranes, bulldozers, graders, front-end loaders, and air compressors will be required. These sources have maximum noise levels ranging from about 70 to 90 dBA (measured at a distance of 50 feet).

The evaluation of noise impacts from Project construction activities was performed using results from previous noise propagation computer program (CadnaA) runs to estimate noise source levels. Noise source levels are entered as octave band SPLs. The user can specify coordinates, either rectangular or polar. All noise sources are assumed to be point sources; line sources can be simulated by several point sources. Sound propagation is calculated by accounting for hemispherical spreading and three other user-identified attenuation options: atmospheric attenuation, path-specific attenuation, and barrier attenuation. Atmospheric attenuation is calculated using International Organization for Standards, ISO 9613-1, *Attenuation of Sound During Propagation Outdoors – Part 1: Calculation of the Absorption of Sound by the Atmosphere*. Path-specific attenuation can be specified to account for the effects of vegetation, foliage, and wind shadow. Direction source characteristics and reflection can be simulated using path-specific attenuation. Attenuation due to barriers can be calculated using the coordinates and height of the barrier. Barrier attenuation is calculated by assuming an infinitely long barrier perpendicular to the source-receptor path. Total and A-weighted SPLs (filtered to approximate human hearing) are calculated. Background noise levels can be incorporated into the program and are used to calculate overall SPLs.

The model was performed to predict the maximum noise levels produced by a combination of likely noise sources with and without background noise levels. A conservative estimate of the numbers and types of construction equipment was assumed to calculate construction noise levels.

Table 5.7.5-1 lists the major categories of equipment that will be used during the construction of RBEC and their associated noise characteristics. A total of 18 noise sources were used to predict maximum SPLs from construction at the Site and the construction parking and laydown areas. This included a full array of construction equipment from bulldozers to forklifts that would be used for Site preparation to cranes and welders used to assemble Plant components. For the purpose of the construction noise impact analyses, it is assumed that the equipment will only operate a fraction of the time over the construction period. In order to account for this intermittent equipment operation, usage factors were incorporated into the model for each piece of equipment. These usage factors can be found in EPA document *Noise From Construction Equipment and Operations, Building Equipment, and Home Appliance*, 1971 and are also presented in Table 5.7.5-1. These heavy construction activities are expected to occur during the daytime hours. Most of the heavy construction activities will occur during the first 6 to 8 months after dismantlement of Riviera Plant Units 3 and 4.

The noise levels resulting from these combinations of equipment were input as multiple sources into the model. Octave bands were estimated from *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances* (EPA, 1971). Only the atmospheric attenuation option was enabled during the noise modeling runs.

Figure 5.7.5-1 presents the maximum predicted noise levels associated with the construction of the Project. This figure represents the average SPLs with the construction equipment operating in accordance to their usage factors throughout a 12 hour work day. The predicted results can be considered somewhat conservative in that it is unlikely that all of the equipment would operate in accordance to their usage rate on the same day. The predicted impacts shown in Figure 5.7.5-1 were compared to the L_{50} noise levels observed during the noise monitoring conducted in May 2008 when the plant was operating. Table 5.7.5-2 presents the existing and the predicted sound levels during construction. The difference between the existing sound level and predicted sound level in dBA is also shown in the table. Table 5.7.5-2 indicates that the intermittent sound levels during the construction of the Project are predicted to be at or below the existing sound levels at monitoring Sites 1, 2, 3, 5, and 9. These monitoring sites were located both on and off the Site. The sound levels

are only predicted to increase at Site 4. This is primarily due to the proximity of construction noise sources to that specific location.

Heavy construction activities associated with the Project, as represented by the predicted noise concentrations, are expected to occur only during the daytime hours. Certain deliveries and other construction activities, including mechanical and electrical installation activities, may occur at night; however, these activities are expected to have noise levels much lower than those predicted in Table 5.7.5-2.

There are no State of Florida noise regulations that are applicable for the construction of RBEC. The maximum predicted sound levels from RBEC were evaluated to assess compliance with Article IV. Noise, in Chapter 11: Nuisances of Riviera Beach Noise Ordinance. The Riviera Beach land use designations for property in close proximity to the Project are commercial and industrial. The applicable noise limits for commercially zone property are 60 dBA during the daytime and 55 dBA during the nighttime. For property zoned industrial, the noise limits are 65 dBA during the daytime and 60 dBA during the nighttime. These sound pressure limits apply within the City of Riviera Beach, which is located west and north of the Site. As shown in Figure 5.7.5-1, the predicted SPLs from RBEC will not exceed 65 dBA in adjoining industrial areas to the north and will not exceed 60 dBA in commercially zoned areas to the west.

Areas to the south and southwest of the Site boundary are located in the City of West Palm Beach. The City of West Palm Beach does not have quantified sound pressure level limits. Rather, the City of West Palm Beach has established limitations on unreasonably loud, excessive, unnecessary and unusual noise (see Subsection 3.3.8.6). The City of Riviera Beach has also established a general noise disturbance prohibition that makes it unlawful to make excessive, unnecessary or unusually loud noise to adjoining neighbors of the surrounding municipalities (Section 11-173, Article IV, Riviera Beach Noise Ordinance). As shown in Figure 5.7.5-1, the predicted maximum SPLs due to the construction of RBEC within the residential areas located to the south and southwest of the Site in the City of West Palm Beach do not exceed 65 dBA and are 55 dBA or less at further distances from the Site. As shown in Table 5.7.5-2, the maximum predicted noise level at Site 5 located in the City of West Palm Beach is 54.1 dBA, which is about the same as the existing SPLs. Based on these results, the predicted SPLs would not be considered excessive, unnecessary, or unusually loud noise.

Based on the results of the computerized noise modeling analysis, it is concluded that the maximum sound levels predicted to be emitted from the construction of RBEC will not exceed the maximum permissible sound levels in Section 11-152 of Riviera Beach's Noise Ordinance. In addition, the sound pressure levels within the residential areas south and southwest of the Site in the City of West Palm Beach will comply with Section 11-173 of the Riviera Beach Noise Ordinance by not creating excessive, unnecessary, or unusually loud noise.

The noise modeling included noise sources located in the southeast portion of the Site that will be used during construction. This area is located in the City of West Palm Beach. The City of West Palm Beach has noise control regulations that regulate "unreasonably loud, excessive, unnecessary and unusual noise" (Code of Ordinances, Part II, Chapter 34, Article II, Section 34-55). The SPLs from all construction noise sources, including construction noise sources within the City of West Palm Beach, are predicted to be similar in magnitude than the existing noise levels observed within the City of West Palm Beach (i.e., south and southwest of the Site). These predicted results demonstrate that unreasonably loud, excessive, or unusual noise would not result from the construction of the Project. As a result, the RBEC construction noise sources located within the City of West Palm Beach will comply with the City's noise ordinance.

The potential use of explosives and the resulting noise will cause elevated noise levels for a very short duration (several seconds). Such activities will be performed in accordance with all applicable regulations. Nearby residences and business will receive appropriate prior notice of such activities. During the initial startup of the Project, steam blows will be conducted to clean piping. Steam blows used during construction to clean out new piping and equipment will result in elevated noise levels for short durations (i.e., minutes) over several weeks. Prior to these events, notification will be made to those locations that may be able to notice elevated noise levels.

5.8 Impact on Landmarks and Sensitive Areas

As discussed in Subsection 3.2.5 (Regional Scenic, Cultural, and Natural Landmarks), Subsection 3.2.8.1 (Education), and Subsection 3.2.8.6 (Recreational Facilities), there exists within 5 miles of the Site:

- One National Historic Landmark [the Whitehall (Henry M. Flagler House)];
- Three County Managed Areas/Conservation Lands (Winding Waters Natural Area, Lake Park Scrub Natural Area, and the Grassy Waters Preserve);



- Six County parks [Dyer Park, Ocean Reef Park, Westgate Park and Recreation Center, Schall Circle/Old Trail Park, Peanut Island Park (within 1 mile), and Phil Foster Memorial Park];
- Three estuarine habitat areas of concern identified by Palm Beach County [Snook Island Natural Area, Peanut Island (within 1 mile), and Munyon Island];
- One State park (John D. Macarthur Beach State Park);
- Approximately 82 existing public and private schools (with approximately five public and private schools within 1 mile); and
- Approximately 78 municipal recreational and park amenities.

Project construction activities will be contained within the existing Site and will meet all regulatory requirements for the activities and associated equipment. Construction activities will not result in changes to the accessibility or use of these facilities and construction traffic patterns will be kept to major thoroughfares and away from residential streets. Emissions of fugitive PM resulting from dismantlement of the existing Plant, Site preparation, and construction of RBEC will be mitigated through BMPs.

Notification of high noise activities will be adequately distributed to the surrounding areas to make neighbors aware of these activities. These activities are anticipated to be infrequent and of short duration and will primarily occur during the daytime. FPL will provide communication and coordination with regulatory agencies, neighborhood associations, and the general public to distribute information on the Project and the construction activities.

Occasional construction noise may be heard at the Peanut Island Park and the various municipal educational and recreational facilities within 1 mile of the Site during the Project construction period if pile drivers are used. The noise is anticipated to be infrequent, of short duration, and at or near existing noise levels. Visual impacts will be minor since the construction equipment such as cranes will be lower in height and less visible than the existing Units 3 and 4. Temporary cranes may be visible offsite from some vantage points. No use-related impacts are anticipated from Project construction at any other public recreational facilities since these areas are a considerable distance from the Site.

5.9 Impact on Archaeological and Historic Sites

In November 2008, the DHR concurred with the conclusions of the cultural resource survey conducted for the Project. The survey consisted of researching and reviewing: the FMSF; USGS quadrangle maps; General Land Office historic plat maps; historical aerials; CLGs; previous investigations; and a field evaluation of the Site and an area extending approximately 500 feet from the Site. The survey concluded that there are no previously recorded archaeological sites, historic districts, historic cemeteries, or historic bridges, listed, potentially listed, or potentially eligible for listing resources on the NRHP on the Site, including the construction support area (east of U.S. Highway 1), the construction parking and laydown area (west of U.S. Highway 1), or within areas extending approximately 500 feet from the Site.

The field evaluation confirmed the identification of several structures within the Riviera Plant as newly identified historic resources. These resources are common industrial forms found throughout Florida and are not individually significant architectural resources. Because alterations were made to these structures that affected their historic integrity, they are not considered eligible for listing in the National Register. The resources were photographed, documented, and FMSF forms were prepared. The field evaluation also confirmed the location of the Northwood Harbor Historic District and the Florida East Coast Railway Corridor in reference to the Site. Photographs were taken and information on the locations was documented.

With concurrence from DHR, no additional archaeological or historic resource investigations of the Site are recommended. With the location of the historic district within 500 feet of the Site, Janus Research recommends coordination between FPL, Palm Beach County, and the City of West Palm Beach Planning Department regarding the historic district with respect to the structures and construction activities at the Site. RBEC's tallest structures will be lower than those of the Plant structures, which will result in less visual impacts to the local historic districts and the surrounding area as documented in photographs taken during the field evaluation.

If historical or archaeological artifacts are discovered during construction, the FDEP Southwest District Office, the Bureau of Historic Preservation, and DHR will be notified and proper procedures will be followed.

5.10 Special Features

There will be no unusual products, raw materials, solid waste disposal, incinerator effluents, or residues produced during construction of the Project that will have adverse influences on the environment or ecological systems of the Site or adjacent areas.

5.11 Benefits from Construction

The construction phase of the Project will contribute both short- and long-term economic benefits to the surrounding region. Construction benefits will include construction employment that will average 290 workers during most of the construction period with approximately 650 workers during peak construction in mid-2013. Construction wages will increase the demand for goods and services in the region. Direct purchases of construction materials will have both direct and indirect economic benefits. This includes construction materials (e.g., concrete and steel for foundations), rental equipment (e.g., construction cranes, pumps), food services, and transportation services. Chapter 7.0 provides more detail on the social and economic benefits of the Project.

TABLE 5.1.1-1**POTENTIAL DISMANTLEMENT MATERIAL AND DISPOSAL OPTIONS**

Potential Material	Potential Media and Location	Management Options
Asbestos	Buildings, tiles, cables and lines.	Asbestos will be abated consistent with the State's rules and by a licensed contractor in accordance with 469.003, F.S.
Lead Paint	Buildings, tanks, handrails and miscellaneous structures.	Paint chips will be cut and drummed for characterization, if necessary, and proper disposal.
Tanks/Structure and Washwater	Tanks and structures on site that require washing prior to dismantling.	Decontaminated tanks cut for recycling and salvaged or disposed of as solid waste Washwater characterized and disposed by an approved contractor.
Special Materials with Polychlorinated Biphenyls (PCBs)	PCB-containing ballasts, transformers, electrical equipment, caulk, concrete joints, cable insulation, flow meters, etc.	Characterized and disposed of in accordance with state/federal requirements.
Soil and Other Contaminated Media	No current knowledge of contamination.	Soil excavation will be conducted in accordance with FPL's spill response procedures and FDEP Bureau of Waste Cleanup requirements.
Ash, Concrete, Scrap Metal	Buildings, structures, etc.	Material will be recycled or disposed of in an approved construction and demolition (C&D) or MSW landfill as appropriate.
Hazardous / Universal Wastes and Hazardous Materials	Multiple types of unused or spent media including batteries, lamps, thermostats and pesticides.	Recycled or reused, or stored and managed in accordance with FPL's waste management procedures and applicable regulations.

TABLE 5.5.1-1
MAXIMUM ESTIMATED AIR EMISSIONS DURING CONSTRUCTION OF FPL RBEC

Construction Activity	Type Operation	Amount	Units	Pollutant	Emissions	Units	Controls
Open Areas	Wind Erosion	12 acres		PM ₁₀	1.4 tons		Watering
Onsite Construction Traffic	Paved Roads	15,121 VMT		PM ₁₀	0.2 tons		Watering as necessary
	Unpaved Roads	7,561 VMT		PM ₁₀	0.3 tons		Watering
Installation	IC Engines	55,210 gallons/yr		PM ₁₀	0.17 tons/yr		EPA Non-Road Tier 3
				NO _x	3.10 tons/yr		EPA Non-Road Tier 3
				SO ₂	0.19 tons/yr		EPA Non-Road Tier 3
				CO	2.99 tons/yr		EPA Non-Road Tier 3
				VOC	0.34 tons/yr		EPA Non-Road Tier 3

Note: VMT = vehicle miles traveled; acres based on open areas at any one time.

Sources: USEPA, 1992 Fugitive Dust Background and Technical Information Document for Best Available Control Measures;

Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles.

USEPA, 2004; Exhaust and Crankcase Emissions Factors for Nonroad Engine Modeling-Compression Ignition.

TABLE 5.7.5-1
SUMMARY OF NOISE SOURCE DATA USED TO PREDICT SOUND PRESSURE DURING THE CONSTRUCTION OF RBEC

Sources	Source Height (m)	Sound Power Level (dB) for Octave Band Center Frequency (Hz)									Overall Sound Power Level	Equipment Usage Factor ^a
		31.5	63	125	250	500	1000	2000	4000	8000	(dBA)	
Onsite												
Bulldozer 1	2	0	106.6	103.6	101.6	102.6	99.6	96.6	94.6	96.6	105.3	0.4
Bulldozer 2	2	0	106.6	103.6	101.6	102.6	99.6	96.6	94.6	96.6	105.3	0.4
Crane 1	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.16
Crane 2	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.16
Crane 3	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.16
Crane 4	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.16
Front End Loader 1	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.4
Front End Loader 2	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.4
Front End Loader 3	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.4
Front End Loader 4	2	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	115.6	0.4
Welder 1	2	0	102.6	110.6	105.6	98.6	98.6	93.6	88.6	84.6	103.6	0.16
Welder 2	2	0	102.6	110.6	105.6	98.6	98.6	93.6	88.6	84.6	103.6	0.16
Welder 3	2	0	102.6	110.6	105.6	98.6	98.6	93.6	88.6	84.6	103.6	0.16
Welder 4	2	0	102.6	110.6	105.6	98.6	98.6	93.6	88.6	84.6	103.6	0.16
Welder 5	2	0	102.6	110.6	105.6	98.6	98.6	93.6	88.6	84.6	103.6	0.16
Welder 6	2	0	102.6	110.6	105.6	98.6	98.6	93.6	88.6	84.6	103.6	0.16
Pile Driver 2	2	130.6	131.6	126.6	115.6	118.6	121.6	123.6	116.6	109.6	127.5	0.04
Pile Driver 1	2	130.6	131.6	126.6	115.6	118.6	121.6	123.6	116.6	109.6	127.5	0.04

^a Equipment Usage Factor is based on *Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances*, Appendix A.

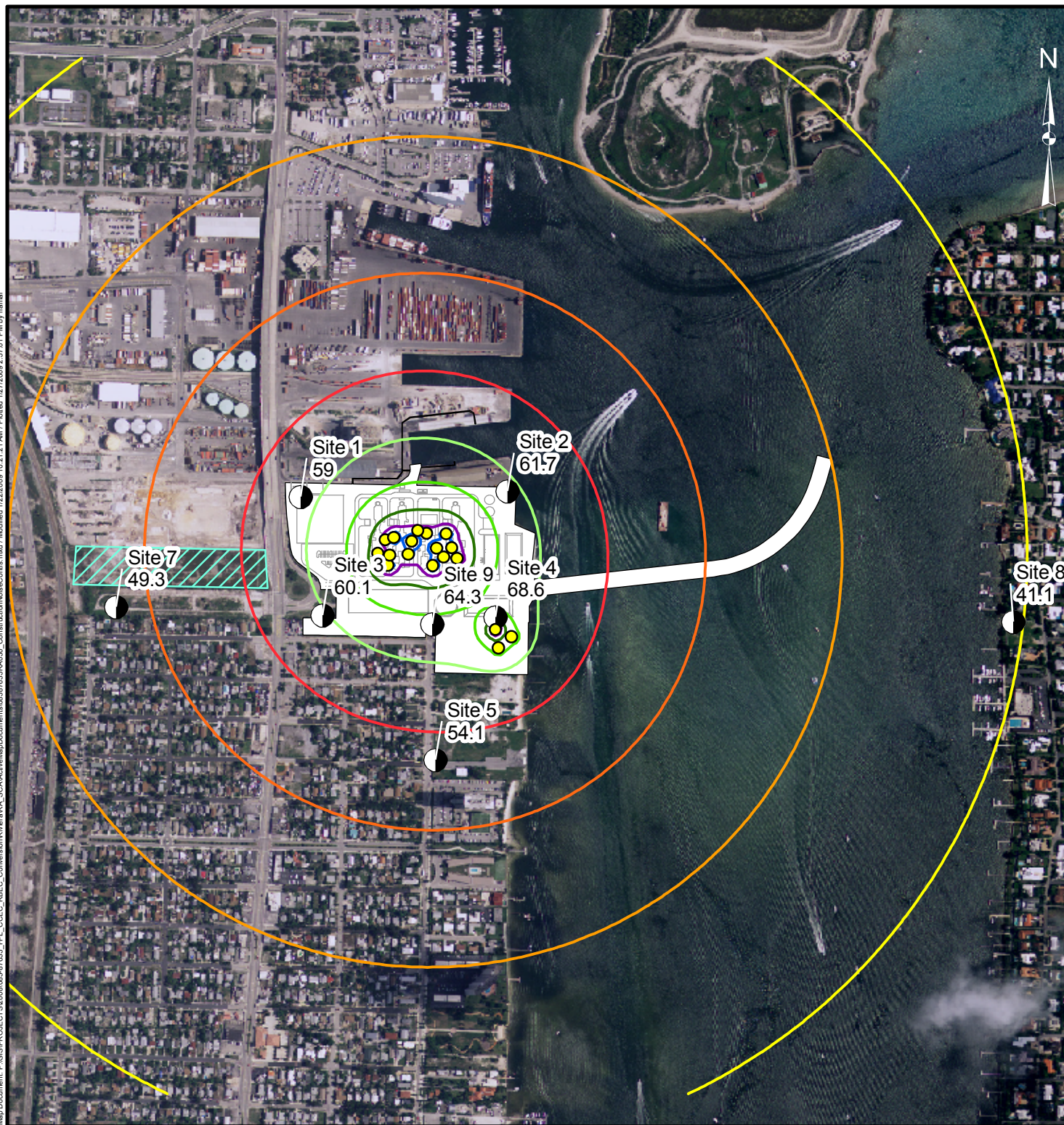
TABLE 5.7.5-2
EXISTING AND PREDICTED SOUND PRESSURE LEVELS FOR THE
CONSTRUCTION OF RBEC

Site	Sound Levels (dBA)		Difference (dBA)
	Existing ^a	Predicted	
1: Onsite Northwest corner of Tank yard	71.7	59.0	-12.7
2: Onsite Northeast corner of property	62.1	61.7	-0.4
3: Onsite Southwest corner by Gate #10	60.6	60.1	-0.5
4: Onsite Southeast corner by training building	60.8	68.6	7.8
5: At condo to the south of the Site	54.0	54.1	0.1
7: West of the Site along the transmission line	54.3	49.3	-5.0
9: South of Site at Gate #9	64.8	64.3	-0.5
	Overall sound level difference:		-11

^a L₅₀ noise level observed during May 2008 (See Table 3.3.8-2).

Source: Golder, 2009

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\RivieraRA_SCA\ActiveMapDocuments\08387633RA030_ConstructionNoiseContour.mxd / Modified: 1/22/2009 10:21:21 AM / Plotted: 1/27/2009 2:57:01 PM by dlanar



LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)
- Construction Parking & Laydown Area
- Noise Impact Contours**
 - > 40 dB
 - > 45 dB
 - > 50 dB
 - > 55 dB
 - > 60 dB
 - > 65 dB
 - > 70 dB
 - > 75 dB
 - > 80 dB
- Monitoring Locations
- Source Locations

REFERENCES

1. FPL Riviera Beach Energy Center (to be certified), Construction Parking & Laydown Area, FPL, 2009.
2. Noise Impact Contours, Monitoring Locations, Source Locations, Golder Associates Inc. 2009
3. Imagery, National Imagery Mosaics, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
CONSTRUCTION NOISE IMPACT CONTOURS						
PROJECT No. 083-87633			FILE No. 08387633RA030			
DESIGN	KFK	1/16/2009	SCALE: AS SHOWN	REV.	0	
GIS	NRL	1/22/2009				
CHECK	KFK	1/22/2009				
REVIEW	KFK	1/27/2009				



FIGURE 5.7.5-1

6.0 EFFECTS OF PLANT OPERATION

As discussed in this chapter, operation of RBEC will comply with all applicable regulatory standards, and impacts will be minimized through available and reasonable methods.

6.1 Effects of the Operation of the Heat Dissipation System

6.1.1 Temperature Effect on Receiving Body of Water

The converted Plant's once-through cooling system will be connected to the existing Plant's intake and discharge structures.

The steam electric generating capacity of RBEC will be similar to that of the existing Plant. The full-load discharge heat rejection rate for the existing Plant is approximately 2.78 BBtu/hr and the full-load discharge heat rejection rate for the converted Plant will also be about 2.78 BBtu/hr. The total discharge flow rate for the converted Plant will be about 415,000 gpm, the same as the existing Plant. Because the discharge heat rejection rate and the discharge flow rate will be the same, the full-load overall temperature rise across the condenser will be the same (13.7°F).

As described in Subsection 4.5.1, atypical steam turbine bypass operation during periods of Plant startup and shutdown, steam turbine shutdowns, or other atypical/emergency operating conditions, where steam is being produced in the heat recovery steam generators and discharged directly into the condenser without passing through the steam turbine, is referred to as "Bypass Operation". During the majority of the operating scenarios while in Bypass Operation, the amount of thermal energy delivered to the condenser does not exceed the design full-load thermal discharge.

The Riviera Plant thermal discharge existed on July 1, 1972, and thus is subject to the thermal surface water criteria established by Rule 62-302.520(1), F.A.C. Conversion of the existing Plant will not increase the potential thermal loading to the Lake Worth Lagoon compared to the potential thermal loading from the existing Plant. Consequently, the thermal surface water criteria for existing power plants will still be applicable to the thermal discharge from RBEC.

A comparative analysis of the areal extent of the thermal plume for both the existing Plant and RBEC was performed for four cases:

Case 1	Existing Plant	100% Capacity Factor	Winter
Case 2	Existing Plant	100% Capacity Factor	Summer
Case 3	Converted Plant	100% Capacity Factor	Winter
Case 4	Converted Plant	100% Capacity Factor	Summer

The results of the analysis are presented in Appendix 10.9 and provide details regarding the analysis of the extent of the thermal plume from the converted Plant in comparison with the thermal plume from the existing Plant. As expected, the size of the thermal plume is minimal in both summer and winter, even assuming worst-case conditions of tidal flushing. The high velocity of the subsurface discharge results in a high level of mixing with ambient water.

6.1.2 Effects on Aquatic Life

Because the size of RBEC's offshore thermal plume is negligible in both summer and winter, even assuming worst-case conditions of tidal flushing, no significant impacts of the converted Plant's offshore thermal discharge on aquatic life are expected. The offshore thermal plume is small, the estuary is wide, and there will be no significant thermal blockage of transient aquatic organisms. Furthermore, the offshore discharge is in a relatively deep area and the discharge is directed toward the dredged shipping channel. Therefore, no significant impact to submerged aquatic vegetation is expected due to the offshore discharge.

The onshore discharge from RBEC will remain similar to the onshore discharge from the existing Plant, with 1 percent or less of the converted Plant's discharge released to the manatee embayment area. Therefore, no significant impact to submerged aquatic vegetation is expected due to the onshore discharge.

The existing once-through cooling water system for Units 3 and 4 has been in operation for over 45 years. During this time, there has been no documented adverse impact to the values of the Lake Worth Lagoon from the operation of the once-through cooling water system, so as to cause harm to the abundance and diversity of fish, wildlife and listed species, or their habitat. Therefore, significant adverse impacts to aquatic life from impingement or entrainment are not expected from continued

operation of the once-through cooling water system, at the same location and with the same intake structure and intake flow rate.

Similarly, the existing Riviera Plant has operated with thermal discharges at both the off-shore and on-shore locations for more than 45 years. Because the heat rejection rate for the converted Plant will not exceed the heat rejection rate from the existing Plant, impacts to Lake Worth Lagoon from both thermal discharges will be minimal.

All of Lake Worth is within the USFWS designated Critical Habitat for the Florida manatee. Manatees are known to use the area around the existing Plant as a thermal refuge during the colder winter months. The converted Plant will continue to provide a wintertime thermal refuge for manatees as FPL will continue to endeavor to release heated water to the manatee embayment period during the period of November 15 through March 31 when the ambient water temperature falls below 61°F pursuant to the Plant's Manatee Protection Plan.

6.1.3 Biological Effects of Modified Circulation

Because the cooling water flow for the converted Plant will be withdrawn from the same intake structure, the cooling water discharge will be via the existing discharge structures and the flow rate will be the same, the circulation patterns will not change.

6.1.4 Effects of Off-stream Cooling

There will be no adverse effects of off-stream cooling with RBEC because off-stream cooling will not be utilized.

6.1.5 Measurement Program

The existing measurement program associated with the Riviera Plant's Industrial Wastewater Facility Permit (see Appendix 10.6) will continue to be adequate for measuring the physical and chemical parameters of waters that may be affected by operation of the converted Plant.

6.2 Effects of Chemical and Biocide Discharges

6.2.1 Industrial Wastewater Discharges

RBEC will discharge three wastewater streams in addition to the once-through cooling water as described in Section 4.6:

- An estimated 36 gpm average (46 gpm peak) of HRSG blowdown and evaporative cooler blowdown, which is relatively pure water;
- An estimated average of 46 gpm (152 gpm peak) of RO reject/demineralizer regeneration water which will have a relatively high TDS content; and
- An estimated average of 25 gpm of wash water and Plant/equipment drain discharge wastewater.

The combined peak discharge of 223 gpm will be mixed with the once-through cooling water discharge, resulting in a significant dilution ranging from approximately 1,000 to 1 up to 2,000 to 1. The constituents in these wastewaters are basically concentrated dissolved solids from the potable water source, and the discharge is to a high TDS estuarine environment. At these dilution rates, these small flows will have no adverse effect on the Lake Worth Lagoon, and therefore, the antidegradation considerations specified in Section 43.088(2)(b) of the Florida Statutes are not applicable to the RBEC project.

6.2.2 Cooling Tower Blowdown

RBEC will not have cooling towers. Therefore, there will not be any cooling tower blowdown.

6.2.3 Measurement Programs

Because the characteristics of the industrial wastewater discharges will be essentially the same for the converted Plant, the existing measurement program associated with the Industrial Wastewater Facility Permit (see Appendix 10.6) will be adequate for measuring the physical and chemical parameters of waters that may be affected by operation of RBEC. FPL proposes to continue the measurement programs required under the current Industrial Wastewater Facility Permit with the exception of groundwater monitoring requirements, which will no longer be necessary because of the elimination of the existing onsite evaporation/percolation ponds.

6.3 Impacts on Water Supplies

6.3.1 Surface Water

Operation of RBEC will not cause any significant changes in hydrologic or water quality conditions due to diversion, interception, or additions to surface water flow compared to those from the existing Plant. Surface water from the Lake Worth Lagoon will continue to provide cooling water for the converted Plant, as it is used today for the existing Plant.

6.3.2 Groundwater

Cooling water for the pump seals and irrigation for the converted Plant will continue to be withdrawn from the surficial aquifer through surficial aquifer wells. The withdrawal rate will not exceed the existing water use allocation. Therefore, no additional impacts to existing water supplies are expected.

As part of the Project, the onsite evaporation/percolation ponds will be eliminated. Therefore, these discharges to groundwater will be eliminated.

6.3.3 Drinking Water

RBEC will continue to use municipal potable water from the City of Riviera Beach to provide drinking water for Plant employees and to provide process water makeup, as does the existing Plant. In addition, a small potable water supply will be required for the manatee viewing center. This water will be obtained from the municipal potable supply system. Because the RBEC wastewater discharges will be to only the Lake Worth Lagoon and the sanitary sewer system, there will be no impact to drinking water sources from the Project.

6.3.4 Leachate and Runoff

Operation of the RBEC will not generate leachate and the stormwater management system has been designed to prevent direct discharge to surface waters. Therefore, no adverse impact to water supplies is expected due to runoff or leachate from RBEC.

6.3.5 Measurement Programs

Withdrawals from the surficial aquifer supply wells will continue to be measured and reported to the SFWMD as required by that agency's permitting rules and regulations.

6.4 Solid/Hazardous Waste Disposal Impacts

As discussed in Section 4.7, the potential solid and hazardous waste associated with the operation of RBEC will be handled according to the waste handling guidelines presented in Table 4.7.0-1.

6.4.1 Solid Waste

The operation of RBEC will generate only minor amounts of solid wastes (e.g., used turbine inlet filters, municipal solid waste, and water pretreatment solids). As explained in Section 4.7, all solid wastes generated during operation of RBEC will be disposed of in appropriately licensed offsite

landfills or by other approved methods. There will be no adverse impacts resulting from solid waste generated by the converted Plant.

6.4.2 Hazardous Waste

The handling of any hazardous wastes resulting from the operation of RBEC is described in Section 4.7. FPL will contract with an approved and licensed disposal company to transport and dispose of small quantities of hazardous waste at licensed facilities in a manner that complies with all federal, State, and local environmental regulations. Therefore, no adverse environmental impacts are anticipated from hazardous wastes generated from the operation of the converted Plant.

6.5 Sanitary and Other Waste Discharges

Sanitary wastes from operation of RBEC will be routed using the existing connection to the City of Riviera Beach wastewater system for treatment and disposal. Quantities will remain approximately the same as they historically have been for the existing Plant. In addition, a small sanitary wastewater flow will be generated at the manatee viewing center. This wastewater will be routed to the municipal sanitary sewer system. No adverse environmental impacts are expected from sanitary wastes generated by RBEC or the manatee viewing center.

6.6 Air Quality Impacts

In general, RBEC will significantly improve air quality in the vicinity of the Site. RBEC will reduce emissions of air pollutants by more than 17,000 TPY compared to recent Plant operation, or more than a 90-percent reduction.

As shown in Table 6.6.0-1, the predicted maximum total air quality impacts for both the existing Plant and RBEC are below the AAQS and, therefore, comply with the AAQS. Total air quality impacts include the maximum impacts predicted for the existing Plant or RBEC, added to appropriate background concentrations. Background concentrations are based on the maximum measured concentration from representative air quality data in the vicinity of the Site (see Subsection 3.3.7).

For SO₂, the predicted maximum total impacts for the existing Plant are about 80 percent or less of the AAQS. By comparison, the predicted maximum total impacts for RBEC will be less than 10 percent of the AAQS.

For PM₁₀, the predicted maximum total impacts for the existing Plant are about 60 percent or less of the AAQS. By comparison, the predicted maximum total impacts for RBEC will be 55 percent or less of the AAQS. As shown in Table 6.6.0-1, the predicted maximum impacts for RBEC are less than 50 percent of those from the existing Plant. Background concentrations are the major contributors to the maximum total air quality impacts.

For NO₂ and CO, the predicted maximum total air quality impacts are also primarily due to background concentrations. For both the existing Plant and RBEC, the predicted maximum total NO₂ impacts are about 35 percent or less of the AAQS. The maximum NO₂ impacts for RBEC are predicted along the Site boundary nearest the gas compressor station, with more than 50 percent due to background concentration. The predicted maximum total CO impacts for RBEC are about 30 percent or less of the AAQS, with more than 95 percent due to background concentration.

The following sections present a summary of the air quality modeling methodology for the air quality impact analyses for the Project. Detailed information is contained in Appendix 10.2.5, Air Construction Permit Application.

6.6.1 Impact Assessment

6.6.1.1 Regulatory Applicability

The emission reductions resulting from the retirement of the existing Units 3 and 4 classify the Project as a minor modification of a major source. Since the existing Plant units will be permanently retired before the converted Plant begins operation, PSD review is not applicable to RBEC; the net changes in emissions do not exceed the PSD significant emission rates (see Tables 4.4.1-3A to 4.4.1-3B). For the MPS 501G CTs, FPL proposes to implement a plant-wide VOC emission cap to keep the net emissions increase less than 40 TPY.

An air quality impact analysis is not required under FDEP air regulations. As summarized above, air quality impacts were nonetheless estimated for the existing Riviera Plant and RBEC in the vicinity of the Site for comparison with the AAQS. The general modeling approach followed EPA and FDEP modeling guidelines.

6.6.1.2 Analysis Approach and Assumptions

General Modeling Approach

The AAQS analysis performed for the Project is a source impact analysis that evaluates whether the predicted concentrations from air emission sources will comply with the AAQS. These

concentrations include the modeled impacts from sources at the Site added to a background concentration. The background concentration accounts for sources not included in the modeling analysis.

Air Quality Models

The selection of air quality models to calculate air quality impacts for the existing Riviera Plant and RBEC must be based on the models' ability to simulate impacts in the vicinity of the Site. The American Meteorological Society and EPA Regulatory Model (AERMOD) dispersion model was used to evaluate the pollutant impacts due to the proposed sources at RBEC. AERMOD (Version 07026) is available on the EPA's Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technology Transfer Network (TTN).

The EPA and FDEP recommend that AERMOD be used to predict pollutant concentrations at receptors located within 50 km from a source. AERMOD calculates hourly concentrations based on hourly meteorological data. AERMOD is applicable for most analyses since it is recognized as containing the latest scientific algorithms for simulating plume behavior in all types of terrain.

AERMOD was used to predict the maximum pollutant concentrations due to the existing Plant and converted Plant in nearby areas surrounding the Site.

Meteorological Data

Meteorological data used in AERMOD to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and upper air sounding data collected from the NWS stations located at Palm Beach International Airport (KPBI) and Miami International Airport (KMIA), respectively. The 5-year period of the meteorological data was from 2001 through 2005. The NWS office at KPBI is located approximately 10 km (6 miles) south-southwest of the Site and is the closest primary weather station to the study area considered to have meteorological data representative of the Site.

Emission Inventory

Existing FPL Units- The emissions and stack parameters for the existing Units 3 and 4 at the Riviera Plant are presented in Appendix 10.2.5. Units 3 and 4 will be retired and dismantled before RBEC begins operation.

The short-term emission rates were based on the maximum rate allowed by the permit for each unit (Permit No. 0990042-004-AV, January 2009), EPA AP-42 emission factors for combustion of fuel oil, or, in the case of SO₂, the maximum historical sulfur content of 1 percent used over the last 5 years (equivalent to about 1.1 lb/MMBtu). It should be noted that under the FDEP Title V permit, the existing units' SO₂ emission limits are 1.9 lb/MMBtu for the 3-hour average and 1.3 lb/MMBtu for the 24-hour average.

RBEC Sources- Summaries of the criteria pollutant emission rates, physical stack and stack operating parameters for the combined cycle units for RBEC that were used in the air modeling analysis are presented in Tables 4.4.1-1A to 4.4.1-2A for the MPS "G" Class CTs for natural gas-firing and fuel oil-firing, respectively. Similarly, summaries are presented in Tables 4.4.1-1-B to 4.4.12-B for the Siemens "H" Class CTs for natural gas-firing and fuel oil-firing, respectively.

The maximum air quality impacts for RBEC were predicted for a range of possible operating conditions. The emission and stack operating parameters are presented for two operating loads and 35°F, 59°F, and 95°F ambient temperatures for the CTs firing both natural gas and ultra low-sulfur light oil. A total of 12 modeling scenarios were considered for combined cycle configurations with the CTs operating in the following conditions:

- CTs firing natural gas for ambient temperatures of 35°F, 59°F, and 95°F at:
 - 100 percent operating load, including duct-firing
 - 75 percent operating load
- CTs firing oil for ambient temperatures of 35°F, 59°F, and 95°F at:
 - 100 percent operating load
 - 75 percent operating load

For these analyses, as a conservative estimate of impacts during natural gas-firing, the pollutant emissions at 100 percent load included duct-firing for every hour in the year even though duct firing will be limited to 2,880 hr/yr.

The load analysis was performed using the exit gas operating data for the MPS "G" Class CT and the Siemens "H" Class CT. Once the worst-case operating condition was determined for each CT, subsequent analyses were performed with exit gas operating data specific to each CT vendor.

Additional analyses were performed for SO₂, NO_x, PM₁₀, and CO emissions to address the combined impact of the CTs and other RBEC sources. Detailed descriptions of the other RBEC sources are presented in Appendix 10.2.5.

The proposed combined cycle unit will have HRSG stack heights of 149 feet. Because the proposed stack heights are less than GEP, building downwash effects were included in the modeling analysis. In addition, since the stack heights for the other RBEC sources are also less than GEP, building downwash effects were included in the modeling analysis for these sources.

Receptor Locations

To determine the maximum impact for all pollutants and averaging times in the vicinity of the Site, concentrations were predicted at receptors located in detailed receptor grids centered on the proposed combined cycle unit, the modeling origin, and extended from the Site boundary out 5 km. More than 3,000 receptors were used in the analysis to determine the maximum impacts for the existing Plant and the converted Plant.

Concentrations were also predicted at elevated receptors located on the higher elevations of the Palm Beach House, a condominium complex, located about 1,700 feet (530 m) to the south of Units 3 and 4 and the proposed RBEC CTs. The receptors at the Palm Beach House were located at elevations of 50, 60, 70, 80, and 90 m to represent the middle to higher elevations of the Palm Beach House.

Background Concentrations

Background concentrations are necessary to determine total predicted ambient air concentrations for comparison with the AAQS. Background concentrations are defined as concentrations due to sources (natural and anthropogenic) other than those specifically included in the modeling analysis. For all pollutants, background would include other point sources not included in the modeling, fugitive emission sources, and natural background sources. The maximum measured pollutant concentrations from monitoring data, representative of air quality near the Site and presented in Table 3.3.7-1, were used for this purpose.

Greenhouse Gas Emissions (CO₂)

The use of natural gas combined with the most efficient combined cycle technology available through the MPS Frame G or Siemens H CTs will result in one of the lowest greenhouse gas (GHG) emitting fossil fuel-fired generating units in the United States. Indeed, the emissions on a lb/MW-hr basis will be about 30 percent lower than the proposed California standard. RBEC will reduce FPL's system

emissions of CO₂ by nearly 8 million tons from 2013 to 2040 (see Section 4.4). Nuclear additions (uprates for existing nuclear units and new nuclear units) are also part of FPL's GHG emission reduction strategy. A discussion of FPL Group's and FPL's commitment to lower GHG emissions and the strategy to meet Florida's goals are presented in Appendix 10.8.

6.6.2 Monitoring Programs

6.6.2.1 Ambient Air Quality Monitoring

FDEP has air monitoring stations that measure air quality in Palm Beach County and surrounding areas (see Table 3.3.7-7). The air quality concentrations measured at these stations comply with, and as demonstrated in the previous sections, are anticipated to continue to comply with, all applicable ambient standards with RBEC in operation.

6.6.2.2 Air Emissions Monitoring

The CTs for the converted Plant, along with the duct burners, will be subject to NSPS and the acid rain program (40 CFR 75). Continuous monitoring will be required pursuant to applicable NSPS and the acid rain program. Monitoring of fuel sulfur content will also be performed pursuant to these programs. Initial performance testing of the CTs for SO₂ and NO_x emissions will be conducted as required by Subpart KKKK.

Continuous emission monitoring (CEM) for SO₂ and NO_x is required for gas- and oil-fired affected units in accordance with the provisions of 40 CFR 75. SO₂ emissions may be determined using procedures established in Appendix D, 40 CFR Part 75. CO₂ emissions must also be determined either through CEM (e.g., as a diluent for NO_x monitoring) or calculation. Alternate procedures, test methods, and quality assurance/quality control (QA/QC) procedures for CEM are specified (Part 75 Appendices A through I). The Part 75 CEM requirements, including QA/QC procedures, are in general more stringent than those specified in the NSPS for Subpart KKKK. New units are required to meet the requirements not later than 90 days after the unit commences commercial operation. RBEC will be required to either install continuous emission monitors for NO_x or otherwise meet the Part 75 requirements.

Initial and periodic compliance testing of pollutants emitted by RBEC will be conducted pursuant to the FDEP requirements as proposed in FPL's application for an FDEP Air Construction Permit for the Project (Appendix 10.2.5).

6.7 Noise Impacts

Sound propagation involves three principal components: a noise source, a person or a group of people, and the transmission path. While two of these components, the noise source and the transmission path, are easily quantified (i.e., direct measurements or through predictive calculations), the effects of noise upon humans is the most difficult to determine due to the varying responses of humans to the same or similar noise patterns. The perception of sound (noise) by humans is very subjective, and just like odors and taste, is very difficult to predict a response from one individual to another.

The noise predictions for RBEC operation were developed using the Computer Aided Noise Abatement (CadnaA) computer model, a computerized software program for calculation, presentation, assessment and prediction of environmental noise (DataKustik, 2008).

CadnaA is an environmental noise propagation computer program that was developed to assist with noise propagation calculations for major noise sources and projects. Noise sources are entered as octave band sound power levels, L_w . Locations of the noise sources, buildings, and receptors are input directly on the base map and can be edited throughout the modeling process. All noise sources are assumed to be a point, line, area, or vertical area source, and can be specified by the user. Sound propagation is calculated by accounting for hemispherical spreading and three other user-identified attenuation options: atmospheric attenuation, path-specific attenuation, and barrier attenuation. Atmospheric attenuation is calculated using International Organization for Standards, ISO 9613-1 *Attenuation of Sound During Propagation Outdoors -- Part 1: Calculation of the Absorption of Sound by the Atmosphere*. The CadnaA path-specific attenuation can be specified to account for the effects of soil, vegetation, foliage, and wind shadow. Directional source characteristics and reflection can be simulated using path-specific attenuation. Barrier attenuation is calculated by assuming an infinitely long barrier perpendicular to the source-receptor path. Total and A-weighted SPLs are calculated.

The noise impacts of RBEC operation were evaluated using the sound power levels (L_w) for the various equipment associated with RBEC. The sound power levels represent far-field sound pressure levels (SPLs) that the vendors guaranteed for other similar projects. The location of each noise source was based on its location in the site plan (see Figure 4.2.0-1). The computerized drawing was imported into the CadnaA model for the noise analysis. The heights of the major buildings were also

input into CadnaA, developing a three-dimensional representation of the units. Sources were input as point, area, and vertical area sources with appropriate dimensions.

The design of RBEC includes components that reduce noise levels emitted to the surrounding environment. The majority of the noise sources associated with RBEC, such as the CTs, steam turbine/electric generator, and gas compressors are located within enclosures or buildings that reduce the sound levels. The noise from many sources such as boiler feed pumps and electric transformers is partially shielded by other structures that also mitigate noise.

The SPLs used in the analysis are presented in Table 6.7.0-1. A total of 29 point sources, 8 line sources, 3 area sources, and 17 vertical area sources were input to CadnaA. Noise sources such as the boiler feed pumps and transformers were input as point sources. Sources that generate noise over a linear distance, such as the CT exhaust ducts, were input as line sources. Large sources, such as the HRGSs, CTs, and steam turbine/gas generators were input as area sources that are horizontal. The vertical area noise sources represent sides of structures or buildings from which noise can be emitted. The atmospheric attenuation was set at the CadnaA default value, which is 10°C (50°F) and 70-percent relative humidity. For Florida, the default value would produce conservative results. The ground attenuation for the area was set to be equivalent to porous soil.

Figure 6.7.0-1 presents the predicted noise levels for RBEC operation. Table 6.7.0-2 presents the measured baseline ambient SPLs with the existing Riviera Plant offline and online as discussed in Subsection 3.3.8. This table also presents the predicted noise impact at each noise monitoring location. As shown in the table, the predicted sound levels for RBEC for locations onsite are lower than the existing measured sound levels with the exception of monitoring Site 2. The predicted sound levels are only slightly higher at Site 1 due to RBEC Power Block being closer to this site than the existing units. The predicted sound levels from RBEC are lower than the measured baseline ambient sound levels with the existing Plant either offline or operating. As indicated in Subsection 3.3.8, traffic on U.S. Highway 1 contributes significantly to baseline ambient sound levels at locations near the highway.

There are no State of Florida noise regulations that are applicable for the operation of RBEC. The maximum predicted sound levels from RBEC were evaluated to assess compliance with Article IV. Noise, in Chapter 11: Nuisances of Riviera Beach Noise Ordinance. The applicable noise limit for the Project is for fixed mechanical equipment, which has an SPL limit of 55 dBA for

residential zone areas and 65 dBA for commercial and industrial zoned areas. These SPL limits apply to both the daytime and nighttime. These sound pressure limits apply within the City of Riviera Beach, which is located west and north of the Site. As shown in Figure 6.7.0-1, the predicted SPLs from RBEC will be less than 60 dBA in adjoining industrial areas to the north and less than 45 dBA in residential areas located in Riviera Beach.

The manatee viewing center will be located in the City of West Palm Beach, as are areas to the south and southwest of the Site boundary. The City of West Palm Beach does not have quantified SPL limits. Rather, the City of West Palm Beach established limitation on unreasonably loud, excessive, unnecessary and unusual noise (see Subsection 3.3.8.6). The City of Riviera Beach has established a general noise disturbance prohibition that makes it unlawful to make excessive, unnecessary, or unusually loud noise to adjoining neighbors of the surrounding municipalities (Section 11-173, Article IV, Riviera Beach Noise Ordinance). Since the City of Riviera has established SPL limits for residential land uses, these limits are an appropriate measure of excessive, unnecessary, or unusually loud noise. As shown in Figure 6.7.0-1, the predicted maximum SPLs due to the operation of RBEC within the residential areas located to the south and southwest of the City of West Palm Beach are less than 55 dBA. This SPL is less than the City of Riviera Beach's SPL limit for residential areas.

Based on the results of the computerized noise modeling analysis, it is concluded that the maximum sound levels predicted to be emitted from RBEC operation will not exceed the maximum permissible sound levels in Section 11-152 of Riviera Beach's Noise Ordinance. In addition, the SPLs within the residential areas south and southwest of the Site in the City of West Palm Beach will meet Section 11-173 of the Riviera Beach Noise Ordinance by not creating excessive, unnecessary, or unusually loud noise to properties adjoining the City of Riviera Beach.

The parking and access area associated with manatee viewing is located City of West Palm Beach. The City of West Palm Beach has noise control regulations that regulate "unreasonably loud, excessive, unnecessary and unusual noise" (Code of Ordinances, Part II, Chapter 34, Article II, Section 34-55). The regulation provides 12 general acts that are identified to be unreasonably loud, excessive, or unusual noises. The activities associated with the manatee viewing center that include parking and walking access to the manatee embayment will not create noise that is unreasonably loud, excessive, or unusual. As a result, the Project will comply with the City of West Palm Beach noise ordinance.

No noise-sensitive wildlife is known to occur in or near the Site or vicinity. Since wildlife in the area has been acclimated to noise associated with the existing Riviera Plant and other background sources, noise from operation of RBEC will not adversely affect wildlife in the vicinity of the Site.

Intermittent noise sources during routine startup, testing and maintenance, and emergency conditions may include steam venting. Such activities would not normally occur simultaneously and would last for a short duration.

6.8 Changes in Non-Aquatic Species Populations

6.8.1 Impacts

No adverse impacts to non-aquatic species are anticipated as a result of the operation of RBEC and the manatee viewing center. The existing Site has been disturbed during prior construction of the existing facilities and used continuously over the last 60 years of Plant operation. Vegetative communities were removed, topography was graded, and hydrology has been altered over that time period.

No adverse impacts to federal- or State-listed terrestrial plants or animals are expected during RBEC operations, due to the existing developed nature of the Site. No long-term change in the populations of any non-aquatic threatened or endangered species is anticipated as a result of the operation of RBEC.

No changes in wildlife populations, including listed species populations, are anticipated as a result of the operation of RBEC. The noise and lighting impacts associated with the converted Plant will be reduced when compared to the existing Plant. Operation of RBEC is not anticipated to deter the continued use by wildlife of undeveloped areas in the vicinity of the Site.

6.8.2 Monitoring

Because no significant impacts to non-aquatic species populations are anticipated, no monitoring program is proposed.

6.9 Other Plant Operation Effects

6.9.1 Operations Traffic

The operational workforce for RBEC is expected to be comparable to the current conditions as described in Subsection 3.2.7.

Since the number of employees at the converted Plant will be similar to the current conditions, the number of traffic trips is not anticipated to increase. That is, during normal operation the morning and evening peak hour trips are estimated at approximately 46 and 37 vehicles per hour (vph) (see Appendix 10.7.4). Because the number of daily and peak hour trips are not anticipated to increase as a result of the operation of RBEC, no adverse impacts on traffic are anticipated. The proposed manatee viewing center is projected to generate approximately 66 vehicles per day and eight peak hour trips (four inbound and four outbound) during peak season (see Appendix 10.7.4 for assumptions of trip generation for the manatee viewing center). As indicated in the Tables 6.9.1-1, the main signalized access driveway intersection is currently operating at an acceptable level of service and will continue to operate adequately during operation of RBEC and the manatee viewing center.

**RBEC – NORMAL OPERATION (INCLUDING THE MANATEE VIEWING CENTER)
INTERSECTION CAPACITY/LEVEL OF SERVICE ANALYSES**

Intersection	Existing (2008) Conditions		Future (2014) Volumes w/o ConversionProject		Future (2014) Volumes w/Conversion Project	
	Delay	LOS	Delay	LOS	Delay	LOS
U.S. Highway 1/Drive	12.7 (16.2)	B (B)	16.2 (20.5)	B (C)	16.2 (20.7)	B (C)

Source: Highway Capacity Software (HCS+ Version 5.2). LEGEND: AM Peak (PM Peak)

6.9.2 Lighting

The existing Riviera Plant lighting will be dismantled and new outdoor area lighting will be provided for RBEC and the manatee viewing center, as required. Outdoor lighting will be necessary to satisfy Occupational Safety and Health Administration (OSHA) requirements for worker safety, including lighting walkways, parking areas and various equipment areas. Lighting is also necessary and required for security. Unconstrained lighting can cause light pollution and light trespass. Light pollution or sky glow is the term used to describe sky brightness caused by scattering of light in the atmosphere. Light trespass is the term used to describe light that strays from its intended purpose and becomes an annoyance.

The impact of RBEC lighting will be much less than the impact of existing Riviera Plant lighting. The reasons for this are twofold. First, the profile of RBEC will be much lower than the profile of the existing Riviera Plant. The existing Riviera Plant stacks and boiler structures are about 300 feet and about 140 feet high, respectively. The existing lighting causes these structures to be visible from considerable distances due to their height. In contrast, the profile of RBEC is much lower. The stacks associated with RBEC will be about 150 feet high and the tallest structures will be less than about 100 feet high. Necessary lighting will therefore be less visible.

Second, light pollution and light trespass will be addressed when designing the outdoor lighting systems. Guidelines specifically addressing potential lighting issues are available from the Illuminating Engineering Society of North America. These guidelines will be incorporated into the outdoor lighting design to the extent possible while meeting OSHA and security requirements. Typical features to be incorporated are: minimize upward light from luminaries, minimize upward light in general so that light reaches its intended target, turn off lighting not needed for safety and security between 11:00 p.m. and sunrise, contain light within its intended target area by suitable choice of luminaries for light distribution, by selection of mounting height and physical location, and by minimizing glare in the horizontal or vertical directions. These features will result in lower lighting impacts from RBEC and the manatee viewing center and much lower visibility of RBEC than the existing Riviera Plant.

6.10 Archaeological Sites

No sites of historic or archaeological significance will be directly or indirectly impacted due to operation of RBEC or the manatee viewing center. No sites listed or eligible for listing in the NRHP are located in close proximity to the Site. No direct or indirect impacts are anticipated from the operation of RBEC.

6.11 Resources Committed

The major irreversible and irretrievable commitments of national, State, and local resources due to RBEC are the continued use of the existing Site, the continued use of water for Plant cooling and processes, and the continued use of fuels that include natural gas and ultra low-sulfur light oil. The continued use of these resources is more than offset by the higher efficiency of RBEC and the additional generating capacity provided by the converted Plant (600 MW versus 1,250 MW).

RBEC will be located within that portion of the existing Site on the east side of U.S. Highway 1, which has already been significantly impacted by previous and continuing power plant operation. RBEC will provide beneficial reuse of that area while minimizing impacts to the environment.

The use of water by the proposed RBEC units will be for condenser cooling, pollution control equipment (NO_x control when firing ultra low-sulfur light oil), other process water requirements, and potable water.

Natural gas and light oil will be consumed during the operation of RBEC. With the use of advanced combined cycle technology, the consumption of fossil fuels will be lower (approximately 33 percent less) than the existing Plant for the same amount of electricity generated.

Ammonia will be required for the operation of the RBEC's SCR system. While ammonia will be consumed, emissions of NO_x will be substantially reduced (greater than 80 percent) as a result.

RBEC's use of national, State, and local resources will be minimal given the production of efficient electric power, low environmental impacts, and the use of an existing and previously impacted site.

6.12 Variances

No variances from any applicable standards of any State, regional or local government agencies are being requested as part of this application.

TABLE 6.6.0-1
SUMMARY OF PREDICTED POLLUTANT CONCENTRATIONS
FOR THE EXISTING RIVIERA PLANT AND RBEC
COMPARED TO AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Maximum Concentration (ug/m ³) ^a		Total Concentration (ug/m ³) including Background ^b		Ambient Air Quality Standard (AAQS) (µg/m ³)
		Existing Units 3&4 Only	RBEC Only ^c	Units 3&4	RBEC ^c	
SO ₂	Annual	20.6	0.9	25.0	5.4	60
	24-Hour	199	9.1	210	19.6	260
	3-Hour	746	42	756	52.2	1,300
PM ₁₀	Annual	2.3	0.9	28.2	26.8	50
	24-Hour	22.7	8.3	82.7	68.3	150
NO ₂	Annual	8.7	17.1	26.7	35.2	100
CO	8-Hour	13.8	92.5	2,531	2,610	10,000
	1-Hour	28.0	234	3,919	4,125	40,000

^a Based on maximum concentrations predicted in general grid in the plant vicinity and at Palm Beach House.

^b Background concentration based on the maximum measured concentration from representative air quality data for the Site.

^c RBEC sources include the 3 CTs/HRSGs, fuel heater, and gas compressors.

TABLE 6.7.0-1
SOUND PRESSURE LEVELS FOR NOISE SOURCES ASSOCIATED WITH RBEC

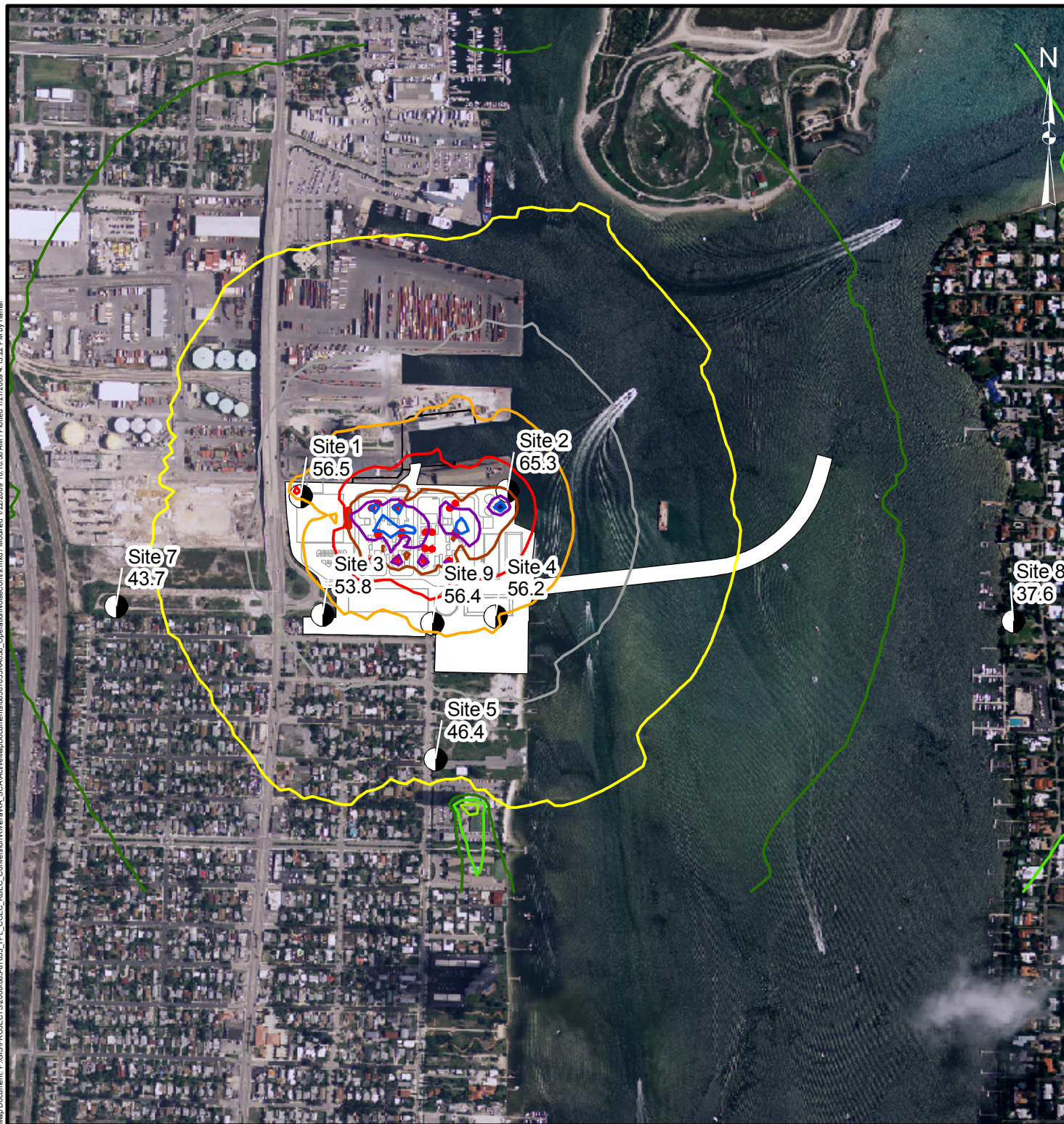
Sources	Interior Noise Source	Source Type	Number of Sources	Source Height (m)	Sound Pressure Level (dB) for Octave Band Center Frequency (Hz)									Overall Sound Pressure Level (dBA)
					31.5	63	125	250	500	1000	2000	4000	8000	
1A HRSG Stack	No	Point	1	47.00	49.0	55.0	68.0	71.0	80.0	106.5	100.0	74.0	56.0	107.6
1B HRSG Stack	No	Point	1	47.00	49.0	55.0	68.0	71.0	80.0	106.5	100.0	74.0	56.0	107.6
1C HRSG Stack	No	Point	1	47.00	49.0	55.0	68.0	71.0	80.0	106.5	100.0	74.0	56.0	107.6
1A CT Transformer	No	Point	1	2.00	96.0	102.0	104.0	103.0	99.0	93.0	88.0	83.0	76.0	100.1
1B CT Transformer	No	Point	1	2.00	96.0	102.0	104.0	103.0	99.0	93.0	88.0	83.0	76.0	100.1
1C CT Transformer	No	Point	1	2.00	96.0	102.0	104.0	103.0	99.0	93.0	88.0	83.0	76.0	100.1
1A Boiler Feed Pump	No	Point	1	2.00	103.0	100.0	97.0	96.0	97.0	96.0	97.0	89.0	77.0	101.7
1B Boiler Feed Pump	No	Point	1	2.00	103.0	100.0	97.0	96.0	97.0	96.0	97.0	89.0	77.0	101.7
1C Boiler Feed Pump	No	Point	1	2.00	103.0	100.0	97.0	96.0	97.0	96.0	97.0	89.0	77.0	101.7
Unit 1 STG Transformer	No	Point	1	2.00	99.0	105.0	107.0	106.0	102.0	96.0	91.0	86.0	79.0	106.1
Turbine Vent Fan 1A1	No	Point	1	14.33	104.0	104.0	109.0	102.0	99.0	93.0	104.0	106.0	107.0	111.2
Turbine Vent Fan 1B1	No	Point	1	14.33	104.0	104.0	109.0	102.0	99.0	93.0	104.0	106.0	107.0	111.2
Turbine Vent Fan 1C1	No	Point	1	14.33	104.0	104.0	109.0	102.0	99.0	93.0	104.0	106.0	107.0	111.2
Load Comp Vent Fan 1A	No	Point	1	6.50	102.0	103.0	103.0	99.0	94.0	92.0	95.0	91.0	84.0	100.2
Load Comp Vent Fan 1B	No	Point	1	6.50	102.0	103.0	103.0	99.0	94.0	92.0	95.0	91.0	84.0	100.2
Load Comp Vent Fan 1C	No	Point	1	6.50	102.0	103.0	103.0	99.0	94.0	92.0	95.0	91.0	84.0	100.2
Circulating Water Pump	No	Point	2	2.00	96.0	103.0	101.0	101.0	98.0	97.0	96.0	95.0	91.0	103.1
STG Ventilation Fan	No	Point	4	23.00	95.0	95.0	91.0	87.0	84.0	82.0	80.0	76.0	76.0	87.8
Gas Compressor Exhaust	No	Point	7	12.19	125.0	113.0	119.4	119.7	116.4	119.1	118.1	118.7	114.0	90.7
Unit 1A Exhaust Duct North	No	Line	1	6.62 - 22.47	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Unit 1A Exhaust Duct South	No	Line	1	6.62 - 22.47	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Unit 1B Exhaust Duct North	No	Line	1	6.62 - 22.47	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Unit 1B Exhaust Duct South	No	Line	1	6.62 - 22.47	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Unit 1C Exhaust Duct North	No	Line	1	6.62 - 22.47	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Unit 1C Exhaust Duct South	No	Line	1	6.62 - 22.47	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Unit 1 Condenser	No	Line	1	12.00	115.0	116.0	115.0	113.0	114.0	108.0	103.0	98.0	94.0	114.1
Gas Compressor Piping	No	Line	1	1.50	108.0	106.0	105.0	104.0	102.0	100.0	98.0	96.0	92.0	105.6
Unit 1 Steam Turbine Generator	No	Area	1	24.00	81.0	86.8	98.2	91.6	82.4	82.5	81.7	78.8	76.3	89.7
Gas Yard	No	Area	1	0.00	96.3	100.6	95.2	88.5	86.0	87.7	90.7	86.6	87.9	95.6
Gas Compressor Enclosure Area Roof	Yes	Area	1	6.11	99.0	94.0	93.0	86.0	81.0	85.0	100.0	104.0	103.0	83.3
Unit 1A Air Inlet	No	Vert_Area	1	29.60	96.0	100.0	93.0	88.0	80.0	72.0	68.0	76.0	71.0	84.7
Unit 1B Air Inlet	No	Vert_Area	1	29.60	96.0	100.0	93.0	88.0	80.0	72.0	68.0	76.0	71.0	84.7
Unit 1C Air Inlet	No	Vert_Area	1	29.60	96.0	100.0	93.0	88.0	80.0	72.0	68.0	76.0	71.0	84.7
Unit 1A HRSG North	No	Vert_Area	1	23.47	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Unit 1A HRSG South	No	Vert_Area	1	23.47	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Unit 1B HRSG North	No	Vert_Area	1	23.47	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Unit 1B HRSG South	No	Vert_Area	1	23.47	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Unit 1C HRSG North	No	Vert_Area	1	23.47	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Unit 1C HRSG South	No	Vert_Area	1	23.47	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Unit 1 Steam Turbine Generator	No	Vert_Area	4	24.00	81.0	86.8	98.2	91.6	82.4	82.5	81.7	78.8	76.3	89.7
Gas Compressor Enclosure Area	Yes	Vert_Area	4	6.10	99.0	94.0	93.0	86.0	81.0	85.0	100.0	104.0	103.0	81.6

TABLE 6.7.0-2
MEASURED BASELINE AMBIENT SOUND PRESSURE LEVELS AND
PREDICTED IMPACT OF RBEC

Site	Time	Sound Levels (dBA)		RBEC Maximum Impact
		Existing Plant Off line L_{eq}	Existing Plant On Line L_{eq}	
1: Onsite Northwest corner of Tank yard	Daytime	62	72	57
	Nighttime	59	68	57
2: Onsite Northeast corner of Site	Daytime	65	62	65
	Nighttime	58	61	65
3: Onsite Southwest corner by Gate #10	Daytime	59	61	53
	Nighttime	58	59	53
4: Onsite Southeast corner by training building	Daytime	59	61	56
	Nighttime	57	62	56
5: At condo to the south of the Site	Daytime	55	54	46
	Nighttime	52	49	46
7: West of the Site along the transmission line	Daytime	55	54	43
	Nighttime	51	50	43
9: South of Site at Gate #9	Daytime	61	65	56
	Nighttime	61	64	56

Source: Golder, 2008.

Map Document: P:\GIS\PROJECTS\2008\083-87633_FPL_CCEC_RBEC_Conversion\RivieraRA_SCAActiveMapDocuments\08387633RA036_OperationNoiseContours.mxd / Modified: 1/22/2009 10:10:58 AM / Plotted: 1/27/2009 4:13:22 PM by: lamar

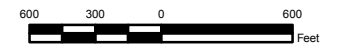


LEGEND

- FPL Riviera Beach Energy Center (To Be Certified)
- Noise Impact Contours**
- > 30 dB
 - > 35 dB
 - > 40 dB
 - > 45 dB
 - > 50 dB
 - > 55 dB
 - > 60 dB
 - > 65 dB
 - > 70 dB
 - > 75 dB
 - > 80 dB
- Monitoring Locations
- Source Locations

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1. FPL Riviera Beach Energy Center (to be certified), Construction Parking & Laydown Area, FPL, 2009.
2. Noise Impact Contours, Monitoring Locations, Source Locations, Golder Associates Inc. 2009
3. Imagery, National Imagery Mosaics, 2007.



REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	R/W
PROJECT						
FPL RIVIERA BEACH ENERGY CENTER						
TITLE						
OPERATION NOISE IMPACT CONTOURS						
		PROJECT No.	083-87633	FILE No.	08387633RA036	
		DESIGN	KFK 1/21/2009	SCALE:	AS SHOWN	REV. 0
		GIS	NRL 1/22/2009	FIGURE 6.7.0-1		
		CHECK	KFK 1/22/2009			
		REVIEW	KFK 1/27/2009			

7.0 ECONOMIC AND SOCIAL EFFECTS OF PLANT CONSTRUCTION AND OPERATION

The purposes of this chapter are to identify the direct and indirect economic and social benefits and costs of the Project based on both temporary (construction) and long-term (operation) time periods, with an emphasis on effects not directly concerned with the use of electricity.

Socioeconomic impacts may occur when a project directly or indirectly changes a population, housing stock, or economic activities within a given area. Construction activities could also have temporary direct and indirect impacts, as well. In addition, an indirect effect upon a project area could result from the potential significant impacts involving land use/neighborhood character, traffic, and noise.

Direct effects are those that are the result of the construction or operation of the Project. Indirect effects are those that are the result of changes in the livelihood of the people and business interests in the vicinity of the Project who, because of their proximity to the site, may experience changes in their local environment, such as increased spending by the Project construction and operation personnel. Many of these effects are difficult to measure and qualitative assumptions are often made to assess the relative values of anticipated costs and benefits.

This chapter is divided into two parts: benefits and costs. Section 7.1 addresses the economic and social benefits of the Project, including analyses of the direct and indirect effects of Project construction and operation of RBEC and the manatee viewing center. Section 7.2 addresses the economic and social costs of the Project and includes analyses of the temporary and long-term indirect costs involving Project construction and operation of RBEC and the manatee viewing center. All costs and benefits are based on 2008 dollar values.

7.1 Economic and Social Benefits

7.1.1 Direct Economic and Social Benefits

The Project is anticipated to benefit the economies of the City of Riviera Beach, the City of West Palm Beach, Palm Beach County, and the State of Florida. Direct benefits from construction will include construction workforce jobs and sales of equipment and materials. Direct benefits from the

operation of RBEC and the manatee viewing center include the capital expenditures, operation and maintenance expenditures, employment, and property tax revenues.

FPL estimates that the total Project costs will be approximately \$1.3 billion. Principal components include the Power Block (\$997 million), transmission, interconnection and integration (\$132 million), and allowance for funds used during construction (\$147 million).

Onsite construction activities are anticipated to begin in the fall of 2010 and conclude in the summer of 2014. During the dismantlement of the existing Plant, workers will be employed that are specialized in removing recyclable materials and dismantling equipment, removing insulation, preparing structures for demolition, and material removal.

The peak construction workforce (mid-2013) is estimated to be approximately 650 people, with an average construction workforce estimated at 290 people from 2012 to 2014. The categories of workers anticipated over the Project construction period are presented in Table 7.1.1-1. The construction payroll for the Project is estimated to be \$19.5 million during the peak year (2013) and an annual average of \$8.7 million.

**TABLE 7.1.1-1
ANTICIPATED CONSTRUCTION WORKFORCE**

Category	Percent	Category	Percent
Laborers	12	Pipefitters	19
Carpenters	6	Insulators	2
Operators	5	Electricians	22
Ironworkers	4	Painters	1
Millwrights	10	Supervision	13
Boilermakers	6	Total	100

RBEC will become operational in mid-2014. The total direct employment for operation of the converted Plant will similar to the existing Riviera Plant at approximately 40 full-time jobs. The annual operational payroll will be approximately \$2.8 million. Other fixed operational costs of RBEC, excluding fuel costs, are estimated to be approximately \$300,000 annually. The manatee viewing center will become operational as early as 2014.

Due to the proximity of the Site to the large labor markets in Martin, Palm Beach, Broward, and Miami-Dade Counties, the labor demand for the Project construction and operation is anticipated to be met by workers living in this area, as well as skilled labor from elsewhere outside the area.

The operation of RBEC is expected to generate \$313 million in property tax revenue from 2014 to 2040. This is comprised of \$121.6 million to the City of Riviera Beach, \$54.5 million to Palm Beach County, \$104.3 million to the school district, and \$32.6 million to other taxing authorities. The new manatee viewing center, to be located within the City of West Palm Beach, will generate approximately \$7,500 per year in property taxes for the City.

7.1.2 Indirect Economic Benefits

It is anticipated that the majority of wages paid by the Project will be spent within Palm Beach County and the surrounding region. These wages will create additional demands for goods and services. As this money is spent, it will create a multiplier effect within the area, thereby generating additional jobs and earnings. These earnings are indirect or secondary benefits of the Project, which will be enjoyed by other businesses whose sales will increase as a result of the Project. For example, sales could increase for commercial services including gas stations, convenience stores, and restaurants. If construction workers were to frequent businesses before, during, or after their workday, it would result in increased business to area merchants. During the 4-year construction period, area suppliers could also benefit by supplying needed materials such as concrete, stone, drainage piping, and other building materials that are normally manufactured or produced in the region. In addition, construction equipment may be rented locally.

Using an economic multiplier for this effect, wages paid directly to Project construction workers could indirectly generate up to \$9.1 million in additional indirect earnings during peak construction in 2013. A total indirect economic benefit is estimated to be \$49.2 million for the 4-year construction period from 2010 through 2014. With RBEC in operation, the anticipated indirect earnings will average approximately \$2.5 million annually over the assumed life of the converted Plant. The total indirect economic job benefit (i.e., jobs and earnings) will be approximately \$7 million annually during the operational life of RBEC.

7.1.3 Fiscal Benefits to Local Governments

The net economic impact of the Project on the City of Riviera Beach, the City of West Palm Beach, Palm Beach County, and other governmental entities, from years 2014 to 2040, is the difference between the total benefits and costs.

Operating revenues to government entities include *ad valorem* tax revenue, occupational licenses, building permit fees, utility taxes, State revenue proceeds, and charges for services (e.g., potable water and wastewater disposal) paid by FPL. Services are required for all residents who are working in the City and County. As a result, the City of Riviera Beach, the City of West Palm Beach, and Palm Beach County will incur costs for these services related to the Project and its employees. To estimate these costs, a weighting procedure was used based on the full-time equivalent population of the three governmental entities.

Operating costs to government entities include costs for services such as financial and administrative expenses, emergency and disaster relief, legislative and executive expenses, and comprehensive planning. The cost of these services is estimated to be approximately \$434,000 to the City of Riviera Beach and approximately \$460,000 to Palm Beach County.

Both the City and County governments also receive capital revenues and pay capital expenses. Capital revenues are based on impact fees and capital expenses are costs related to purchases for roads, fire rescue, law enforcement, etc.

For RBEC, annual property taxes will accrue to the City of Riviera Beach, Palm Beach County, the Palm Beach County School District, and other taxing authorities. These funds are then distributed to the various entities within the governmental jurisdictions. The fiscal benefit of the RBEC Project is estimated over the assumed life of the converted Plant to be \$121.8 million to the City of Riviera Beach, \$195,000 to the City of West Palm Beach, and \$54.8 million to Palm Beach County.

Together, the total benefits and total costs result in a net benefit/cost of the Project. The net fiscal benefit of the Project is estimated to be \$121.4 million to the City of Riviera Beach, \$195,000 to the City of West Palm Beach, and \$54.4 million to Palm Beach County.

7.1.4 Overall Economic Benefits

The Project will have significant economic benefits in the City of Riviera Beach, the City of West Palm Beach, and Palm Beach County. During construction, the average annual economic benefit will

be \$57.3 million. During operation, the total direct and indirect economic benefits will be \$488.1 million from 2014 to 2040. This consists of a total direct economic benefit during the operational period of \$305.3 million and an indirect economic benefit of \$182.8 million.

7.1.5 Environmental Benefits

Construction and operation of the Project will not cause any adverse environmental impacts or impacts to the recreational values of the area. Environmental impacts of Project construction will be minimized.

Most importantly, the Project allows for the beneficial reuse of an existing power plant site while increasing generating capacity by over 100 percent. This conversion Project will result in increased power generation without using any additional land, water sources, or transmission line rights-of-way. The converted Plant will have a much lower profile, with the height of the tallest structure (i.e., stacks) only 50 percent of the height of the existing stacks. The converted Plant will reduce actual air emissions by over 90 percent and will reduce the rate of CO₂ emissions at the facility by about 50 percent. During the operation of RBEC, from years 2014 to 2040, the CO₂ reduction in FPL's system with RBEC will be about 8 million tons. In addition, the administration/control room/warehouse building will feature rooftop solar panels to help power the facilities and the building itself will be certified as environmentally sustainable under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system.

The existing Riviera Plant has been a refuge for the endangered manatee during the wintertime for decades. With the completion of RBEC, the Site will continue to serve as a refuge for this important Florida species long into the future. During the dismantlement and construction period, FPL will continue to provide a warm water refuge for the manatees during the winter consistent with the Manatee Protection Plan established pursuant to the existing Plant's Industrial Wastewater Facility Permit. In addition, once RBEC is constructed, a manatee viewing center open to the public will be built in the southern portion of the Site, with a manatee viewing area adjacent to the manatee embayment area. The viewing area will offer visitors educational opportunities on manatees and their habitat. The center will also include parking, and a building with conference/classroom space, exhibits, and restrooms.

7.2 Economic and Social Costs

7.2.1 Temporary External Costs

Over 158,000 construction workers reside within Martin, Palm Beach, Broward, and Miami-Dade Counties (UF/BEER, 2008). Ample labor supply for the Project exists within commuting distance of the Site and thus a labor surplus exists within the region. As is typical with shorter construction projects, it is not anticipated that workers will relocate to the immediate area and alter the demands on public facilities and services.

As is typical with similar construction projects, some skilled workers from outside the region will commute from longer distances and will choose to live in transient accommodations (i.e., motels and hotels). Transient accommodations are plentiful in the area.

Since workers will predominately commute and not relocate permanently into the region, it is not anticipated that construction will create new or unusual impacts or demands on public facilities or services.

Labor demands associated with the construction of the Project and operation of RBEC and the manatee viewing area are not anticipated to create any labor shortages. Expenditures for equipment and materials and consumption by construction workers will boost incomes within the City, County, and surrounding counties. Population and housing impacts associated with the Project will be slight due to minimal in-migration expected into the area.

Temporary external social costs of the Project include the generation of traffic and noise during construction. Project construction will last approximately 4 years with a peak period of about 12 months (mid-2013). The roadways utilized for the construction traffic associated with the Project will continue to operate at an acceptable level of service with appropriate roadway improvements identified as necessary, which may include using traffic management specialists and proposed roadway/driveway improvements.

Construction-related activities will be contained within the Site and the construction parking and laydown area.

Construction of the Project will not significantly impact residential, commercial, or recreational values and will improve the visual qualities in the vicinity of the Site.

Although the local community may experience some temporary impacts during the construction period, overall socioeconomic impacts associated with the construction of the Project will be favorable.

7.2.2 Long-Term External Costs

The external social cost impacts of RBEC operation will be minimal and localized. The Site provides access to FPL's existing transmission system, which will minimize interconnection requirements. The external social costs related to operation of the manatee viewing center will be minimal and localized. The operation of RBEC and the manatee viewing center will not cause any adverse impacts to public or private facilities used for recreational purposes or impairment to recreational values, result in any deterioration of aesthetic and scenic values, or restrict access to areas of scenic values.

The operational workforce for the converted Plant is anticipated to be about the same as for the existing Plant. As a result, there will be no adverse impacts of the operation of RBEC upon local services (e.g., schools, police, and transportation). RBEC and the manatee viewing center will result in modifications of the current FPL property values that will in turn increase the *ad valorem* revenue. The long-term revenue source that will be paid to the City of Riviera Beach, City of West Palm Beach, Palm Beach County, the School District, and other taxing authorities will be significantly greater than current sources and, with the operational practices to remain consistent with current practices, there will not be an increase of costs upon the local government for public facilities or services.

FPL will minimize RBEC's impacts on the environment and the community, and the RBEC design will incorporate features that reduce the visual and other impacts. These major features include the lower profile, noise attenuation, and air pollution control equipment. The manatee viewing center will introduce an enhanced manatee viewing area to the community and increase recreational and educational opportunities along the waterfront.

8.0 SITE AND DESIGN ALTERNATIVES

This optional Chapter of the SCA is not included in this application because it is not anticipated that an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) would be required for the Project.

9.0 ELECTRICAL TRANSMISSION LINES

FPL will upgrade the existing transmission line between RBEC and the FPL 230-kV transmission line between the Ranch and Cedar Substations within an existing FPL transmission right-of-way (see Figure 4.1.0-2). FPL will modify transmission line routing within the existing right-of-way adjacent to the Ranch Substation and will upgrade the existing Ranch and Cedar substations within the fence lines to accommodate the additional generation from RBEC. In addition, FPL will install new distribution lines from existing rights-of-way to provide temporary electric service to RBEC during construction. Any individual permits or approvals required for these activities will be obtained separately from the PPSA certification process.

The design of these proposed changes to FPL's transmission system will be consistent with the applicable requirements of FDEP's rules regulating electric and magnetic fields (Chapter 62-814, F.A.C.) and the fields associated with the upgraded and modified facilities will comply with the applicable standards established in Rule 62-814.450, F.A.C.



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