South Florida Water Management District

GOVERNING BOARD MONTHLY MEETING AGENDA

This meeting is open to the public

September 12, 2013
9:00 AM
District Headquarters - B-1 Auditorium
3301 Gun Club Road
West Palm Beach, FL 33406

FINAL REVISED 09/11/2013 4:20 PM

Pursuant to Section 373.079(7), Florida Statutes, all or part of this meeting may be conducted by means of communications media technology in order to permit maximum participation of Governing Board members.

The Governing Board may take official action at this meeting on any item appearing on this agenda and on any item that is added to this agenda as a result of a change to the agenda approved by the presiding officer of the meeting pursuant to Section 120.525, Florida Statutes. The order of items appearing on the agenda is subject to change during the meeting and is at the discretion of the presiding officer. Public Comment will be taken after each presentation and before any Governing Board action(s) except for Governing Board hearings that involve the issuance of final orders based on recommended Orders received from the Florida Division of Administrative Hearings.

1. Call to Order - Dan O'Keefe, Chairman, Governing Board

2. Pledge of Allegiance - Dan O'Keefe, Chairman, Governing Board

3. Employee Recognitions - Presented by Blake C. Guillory, Executive Director

   - September Employee of the Month: Kristen McKeon, Lead Database Administrator, Administrative Services Division
   - September Team of the Month: Restoration Strategies Science Plan Team
   - 40 Year Service Recognition: Wesley P. Ficht, Jr., Field Station Crew Chief, Miami Field Station, Operations, Maintenance & Construction

4. Agenda Revisions - Reagan Walker, Director, Office of Governing Board & Executive Services

5. Abstentions by Board Members from items on the Agenda

6. Water Resources Advisory Commission (WRAC) Report - Tim Sargent, Chair

7. Big Cypress Basin Board Report - Rick Barber, Chair

Consent Agenda

Members of the public wishing to address the Governing Board are to complete a Public Comment Card and submit the card to the front desk attendant. You will be called by the Board Chair or designee to speak. If you want to request that an item be removed from the Consent Agenda and be discussed by the Governing Board, please advise the Governing Board when you are called upon to speak. Governing Board directives limit comments from the public to 3 minutes unless otherwise determined by the Governing Board Chair. Your comments will be considered by the Governing Board prior to adoption of the Consent Agenda.

Unless otherwise determined by the Chair, Board action on pulled Consent Agenda items will occur at or after 9:00 a.m. on Thursday. Regulatory items pulled from the Consent Agenda for discussion will be heard during the Discussion Agenda. ***Unless otherwise noted, all Consent Agenda items are recommended for approval.***

8. Public Comment on Consent Agenda

9. Pull Items for Discussion from Consent Agenda

10. Board Comment on Consent Agenda

Consent Items

11. Approval of the Minutes for the August 15, 2013, Regular Business meeting held in West Palm Beach, Florida

12. Waivers for Water Resources Advisory Commission (WRAC) members pursuant to Section 112.313, Florida Statutes

13. Regulatory Consent Items ***- ITEM REVISED***

- Denials
- Consent Orders
- Conservation Easements, Amendments and Releases
- Seminole Tribe Work Plans

Page 1 No 1 4W Farm (Denial): **Postponed**

14. Right of Way Regulatory Consent Items

- Right of Way Occupancy New Permits
- Right of Way Occupancy Permit Requests with Waiver of District Criteria
- Right of Way Occupancy Permit Requests for Denial

15. **Resolution No. 2013 - 0901** A Resolution of the Governing Board of the South Florida Water Management District approving release of District canal, mineral and road reservations, and issuance of non-use commitment; providing an effective date. (OMC, Kathy Massey, ext. 6835)

16. **Resolution No. 2013 - 0902** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into an Interagency Agreement between the South Florida Water Management District and St. Johns River Water Management District for designation of regulatory responsibility for permitting under Part IV of Chapter 373, Florida Statutes, for the project known as Lucky L Ranch Mitigation Bank that crosses jurisdictional boundaries of both Water Management Districts; providing an effective date. (REG, Anita Bain, ext. 6866) ***- SUPPORTING DOCUMENTS MODIFIED***

17. Authorize publication of Notice of Rule Development in the Florida Administrative Register and request review by the Office of Fiscal Accountability and Regulatory Reform, to amend Rules 40E-1.021 and 40E-1.6058, F.A.C., to promote regulatory streamlining, cost savings and increase transparency by defining the term "posting" and providing for website posting of the receipt of certain applications, as opposed to newspaper publication. (REG, Sharon Trost, ext. 6814)

18. Authorize publication of Notice of Proposed Rule in the Florida Administrative Register (FAR) to update, clarify and modify Public Use Rules 40E-7.511, 40E-7.520, 40E-7.521, 40E-7.523, 40E-7.525, 40E-7.526, 40E-7.527, 40E-7.528, 40E-7.529, 40E-7.530, 40E-7.532, 40E-7.534, 40E-7.535, 40E-7.537, 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383, 40E-7.5384, and 40E-7.539, F.A.C., based on public comments solicited and received, and authorize review from the Office of Fiscal Accountability and Regulatory Reform. (OMC, Dan Cotter, ext. 2301)

19. **Resolution No. 2013 - 0903** A Resolution of the Governing Board of the South Florida Water Management District authorizing payment of $10,000 from Big Cypress Basin Field Station FY14 operating budget for settlement of claim made by Wallace Homes of Southwest Florida, Inc., a Florida Corporation, against South Florida Water Management District regarding alleged unauthorized construction and use of an access boat ramp located west of the Cypress Way E Bridge on the Cocohatchee West Canal, Collier County and acquisition of a boat ramp easement; subject to Governing Board approval of the FY14 budget; providing an effective date. (OMC, Jorge Patino, ext. 6175)

20. **Resolution No. 2013 - 0904** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a 319 day contract with Overland Construction, Inc., the lowest responsive and responsible bidder, for the Emergency Operations and Data Center HVAC improvements, in the amount of $879,800.00, for which ad valorem funds of $75,000.25 is budgeted in FY13 and the remaining amount is subject to Governing Board approval of the FY14 Budget; providing an effective date. (Contract Number 4600002936) (Denise Palmatier, ext. 6758)

21. **Resolution No. 2013 - 0905** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a three-year contract with two (2) one-year renewal options with Toler Enterprises, Inc., the lowest responsive and responsible bidder, for Slope Mowing Services in the Fort Lauderdale Field Station area, in the amount of $486,000 for three years, of which $162,000 in ad valorem funds are budgeted in FY14 and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date. (OMC, Karen Estock, ext. 6282)

22. **Resolution No. 2013 - 0906** A Resolution of the Governing Board of the South Florida Water Management District authorizing the payment in lieu of taxes (PILT) to Okeechobee County Board of County Commissioners for actual ad valorem tax losses incurred as a result of land purchased by the District; providing an effective date. (OMC, Jayne Bergstrom, ext. 2672)

23. **Resolution No. 2013 - 0907** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Terremark Federal Group, Inc, for a disaster recovery alternate data center facility and services for the time period November 1, 2013 to October 31, 2014, using Broward College Contract #ITN-2010-001-BM, in the amount of $196,056 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

24. **Resolution No. 2013 - 0908** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Presidio Corporation for the annual renewal of Cisco Systems network hardware and software maintenance, for the time period November 1, 2013 to October 31, 2014 using State of Florida Contract #250-000-09-1, in the amount of $365,855 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

25. **Resolution No. 2013 - 0909** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Oracle Corporation for the annual renewal of Sun Microsystems server, storage, and peripheral hardware maintenance, for the time period November 1, 2013 to October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $318,085 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

26. **Resolution No. 2013 - 0910** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Mythics, Inc. for the annual renewal of Oracle software maintenance and upgrades, for the time period October 25, 2013 to October 24, 2014, using GSA Schedule #GS-35f-0153M, in the amount of $886,367 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

27. **Resolution No. 2013 - 0911** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Forsythe Solutions Group for the annual renewal of infrastructure hardware and software maintenance, for the time period November 1, 2013 to October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $198,594 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

28. **Resolution No. 2013 - 0912** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Dyntek Services, Inc. for the annual renewal of Symantec storage software maintenance and upgrades, for the time period December 1, 2013 to November 30, 2014, using GSA Schedule #GS-35f-0119Y, in the amount of $225,820 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

29. **Resolution No. 2013 - 0913** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Environmental Systems Research Institute, Inc. (Esri) as an exception to the general standards of competition for an Enterprise License Agreement for geographic information systems software, for the time period October 1, 2013 to September 30, 2016 in the amount of $989,000 for which $389,000 of ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date. (AS, Duane Piper, ext. 2638)

30. **Resolution No. 2013 - 0914** A Resolution of the Governing Board of the South Florida Water Management District authorizing a three-year agreement with Audubon of Florida's Tavernier Science Center for hydrology, aquatic vegetation, and prey-base fauna monitoring in the Southern Everglades Mangrove Communities and authorize a sole source as an exception to the general standards of competition in an amount not to exceed $390,000 subject to Governing Board approval of the FY14 through FY16 budgets; providing an effective date. (Contract #4600002916) (WR, Joseph Stachelek, ext. 4543) ***- ITEM DELETED***

31. **Resolution No. 2013 - 0915** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with Collier County in the amount not to exceed $290,500, for the construction of the Northern Golden Gate Estate Flow Way Restoration project, for which dedicated Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

32. **Resolution No. 2013 - 0916** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with Collier County in the amount not to exceed $600,000, for the construction of the Livingston Road Aquifer Storage and Recovery (ASR) Well #2 project, for which dedicated Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

33. **Resolution No. 2013 - 0917** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with the City of Marco Island in the amount not to exceed $236,000, for the construction of the City's Swallow Avenue Drainage Improvements project, for which dedicated Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

34. **Resolution No. 2013 - 0918** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year cooperative agreement with the City of Naples in the amount not to exceed $600,000, for the construction of the City's Aquifer Storage and Recovery (ASR) Well #3 project, for which dedicated FY 14 Big Cypress Basin ad valorem funds are budgeted, subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

35. **Resolution No. 2013 - 0919** A Resolution of the Governing Board of the South Florida Water Management District authorizing the Governing Board chair to execute a certification that the District has completed the economic estimates required under paragraph 120.745(9)(b), Florida Statutes, and authorizing transmittal of the same to the Joint Administrative Procedures Committee; providing an effective date. (OC, Carolyn Ansay, ext. 6976)

36. **Resolution No. 2013 - 0920** A Resolution of the Governing Board of the South Florida Water Management District to authorize entry into a stipulated motion for order to pay costs with Kenneth G. Hyatt for payment of attorney's fees and expert witness costs of $865,220.96 which represents any and all costs incurred by Kenneth G. Hyatt in the Osceola County Kissimmee River restoration project styled South Florida Water Management District v. Kenneth G. Hyatt, et al., case no.: 2011CA-002798-ED, filed in the 9th Circuit Court in and for Osceola County, Florida; providing an effective date. (OC, Carolyn Ansay, ext. 6976)

37. **Resolution No. 2013 - 0921** A Resolution of the Governing Board of the South Florida Water Management District to authorize entry into a stipulated motion for order to pay costs with Arnold H. Mack for payment of attorney's fees and expert witness costs of $645,444.79 which represents any and all costs incurred by Arnold H. Mack in the Osceola County Kissimmee River restoration project styled South Florida Water Management District v. Kenneth G. Hyatt, et al., case no.: 2011CA-002798-ED, filed in the 9th circuit court in and for Osceola County, Florida; providing an effective date. (OC, Carolyn Ansay, ext. 6976)

38. Board Vote on Consent Agenda

39. General Public Comment

Discussion Agenda

40. Technical Reports

    A) Water Conditions Report - Tommy Strowd, Assistant Executive Director, Operations, Maintenance & Construction (ext. 6998)

    B) Ecological Conditions Report - Terrie Bates, Division Director, Water Resources (ext. 6952)

41. Enter a Final Order Approving the 2013 Lower East Coast Water Supply Plan Update - Mark Elsner, Section Administrator, Water Supply Development Section (ext. 6156) ***- SUPPORTING DOCUMENTS ADDED***

42. Central Florida Water Initiative (CFWI) Update - Len Lindahl, Assistant Executive Director, Business & Regulatory (ext. 6283)

43. Overview of Aquifer Storage and Recovery (ASR) Technology: Opportunities and Challenges - Dean Powell, Bureau Chief, Water Supply (ext. 6787)

44. Broward County East Coast Protective Levee Update - John Mitnik, Bureau Chief, Engineering & Construction Bureau (ext. 2679)

45. **Resolution No. 2013 - 0922** A Resolution of the Governing Board of the South Florida Water Management District, directing staff to move forward to analyze options, including but not limited to, disposal of land interests containing 12,341 acres, more or less, in Palm Beach, Broward, and Miami-Dade Counties, together with any structures and improvements and personal property appurtenant thereto, and thereafter propose recommendations to the Governing Board for further approval; providing an effective date. (OMC, Ray Palmer, ext. 2246)

46. Dispersed Water Management Update - Temperince Morgan, Division Director, Office of Everglades Policy & Coordination (ext. 6987)

47. FY14 Budget Update - Doug Bergstrom, Division Director, Administrative Services (ext. 6214)

48. Patient Protection and Affordable Healthcare Act Overview - Len Lindahl, Assistant Executive Director, Business & Regulatory (ext. 6283)

49. **Resolution No. 2013 - 0923** A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with the City of Naples in the amount not to exceed $1,000,000, for the construction of Phase III of the City's Reclaimed Water System Distribution Expansion project, for which dedicated FY14 Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

50. General Public Comment

Staff Reports

51. Monthly Financial Statement - Doug Bergstrom, Division Director, Administrative Services

52. General Counsel's Report - Carolyn S. Ansay

53. Executive Director's Report - Blake C. Guillory

    Report on permits issued by authority delegated to the Executive Director from August 1-31, 2013.

54. Board Comment

Attorney Client Sessions

55. Attorney Client Session ***- ITEM DELETED***

Attorney client session pursuant to Section 286.011(8), Florida Statutes (2012), to discuss strategy related to litigation expenditures and/or settlement negotiations in United States of America v. South Florida Water Management District, et al., United States District Court, Southern District of Florida, Case No. 88-1886-CIV-Moreno.

ATTENDEES: Governing Board Members F. Barber, S. Batchelor, M. Hutchcraft, J. Moran, D. O'Keefe, J. Portuondo, K. Powers, T. Sargent, G. Waldman; Executive Director B. Guillory; District attorneys C. Ansay, K. Burns, C. Kowalsky, D. MacLaughlin. (Carolyn S. Ansay, ext. 6976)

Action Items (if any) Stemming from Attorney Client Session

Attorney client session pursuant to Section 286.011(8), Florida Statutes (2012), to discuss strategy related to litigation expenditures and/or settlement negotiations in United States of America v. South Florida Water Management District, et al., United States District Court, Southern District of Florida, Case No. 88-1886-CIV-Moreno. (Carolyn S. Ansay, ext. 6976)

56. Adjourn

September Employee of the Month

Kristen McKeon – Lead Database Administrator

Administrative Services Division

Kris works in the IT Bureau as a Database Administrator and supports many systems that have Oracle and Microsoft databases. Her dedication to her job helps make technology easy to use so all of us are able to work more efficiently.

Recently, she worked 10 hours on a Saturday to resolve *single-sign-on* issues with Kinexa and Performance Manager. Most outstanding is her work to manage Oracle licenses as part of a team effort to implement the server consolidation. Kris persevered to stay on top of the licensing process for more than a year and the District realized a savings of $344,000.00.

Kris is an asset to the District's Information Technology team. Congratulations for being selected as our September Employee of the Month!

September Team of the Month

Restoration Strategies Science Plan Team

37 Members Representing
Office of Everglades Policy and Coordination
Water Resources Division
Operations, Maintenance and Construction Division

Wossenu Abtew
Holly Andreotta
Lucia Baldwin
Kevin Carter
Michael Chimney
Mark Cook
Carlos Coronado
Brian Garrett
Larry Gerry
Susan Gray
Nenad Iricanin
Delia Ivanoff
Megan Jacoby
Wasantha Lal
Neil Larson
Jennifer Leeds
Jonathan Madden
Jeremy McBryan
Shili Miao
Zaki Moustafa
Susan Newman
Jayantha Obeysekera
Stacey Ollis
Tracey Piccone
Kathleen Pietro
Peter Rawlik
Garth Redfield
Larry Schwartz
Sean Sculley
Trudy Morris Stein
Dave Struve
Lou Toth
Odi Villapando
Naiming Wang
Walter Wilcox
Shi Kui Xue
Hongying Zhao

Attachment: September 2013 GB recognitions (1483 : Employee Recognition - Presented by Blake C. Guillory, Executive Director)

The Restoration Strategies Science Plan Team was formed and began work to develop a Science Plan in August 2012. Two months earlier, in June, the State of Florida and the U.S. Environmental Protection Agency reached consensus on new restoration strategies for further improving water quality in the Everglades.

The permits and associated consent orders that require additional treatment and storage projects required the District to develop and implement a Science Plan to enhance the understanding of mechanisms and factors that affect phosphorus treatment performance. Results from the Science Plan may be used to inform the design and operations of water quality projects -- improving capabilities to manage for achievement of the Stormwater Treatment Areas' stringent numeric discharge limit for total phosphorus.

Developing the Science Plan has required significant effort to review existing knowledge; determine information gaps and formulate questions regarding phosphorus removal mechanisms and factors that influence these mechanisms -- including physical, chemical and biological processes.

The Science Plan Team worked collaboratively with technical representatives, experts and consultants representing the U.S. Environmental Protection Agency, Florida Department of Environmental Protection, U.S. Army Corps of Engineers, Everglades National Park and Arthur R. Marshall Loxahatchee Wildlife Refuge. This was accomplished through seven technical meetings and multiple informal workshops. Progress updates were presented to public stakeholders at Long-Term Plan Quarterly meetings and Water Resources Advisory Commission meetings.

The draft Science Plan was released for public comment in April and finalized by June. Deadline for implementation is this month; however, many of the studies have already been initiated due to the exceptional work of the Restoration Strategies Science Plan Team. Thank you for your exceptional work and congratulations to our Team of the Month!

Attachment: September 2013 GB recognitions (1483 : Employee Recognition - Presented by Blake C. Guillory, Executive Director)

40-Year Service Recognition
Wesley P. Ficht, Jr. – Field Station Crew Chief
Miami Field Station
Operations, Maintenance and Construction

Wesley was hired in September 1973 to work at the Miami Field Station as a Fieldman and reclassified to Equipment Operator in 1977. His job was cutting trees and operating heavy equipment. He also became very proficient at operating towboats for the Miami, West Palm Beach, Clewiston and Okeechobee field stations and in1989 was promoted to Craft Supervisor of Towboats.

Always a team player, Wesley's work goes beyond District borders: He cleared a debris jam on the Myakka River for the Southwest District; and cleared canal debris and removed tussocks from Lake Trafford for the St. Johns River District. Other career highlights include meeting the challenges of the long recovery from Hurricane Andrew in 1992. Wesley played a key role in developing standard operating procedures for flat and slope mowing contracts when he supervised the mowing program in 1995 and oversaw the program's outsourcing in 1996.

As Crew Chief, Wesley now leads a team of 11 employees to maintain canal conveyance capacity and conduct special projects such as tree removal. Known for his dedication and resourcefulness, he has been recognized for being on two teams of the month.

Thank you, Wesley, for commendable work and 40 years of public service!

Attachment: September 2013 GB recognitions (1483 : Employee Recognition - Presented by Blake C. Guillory, Executive Director)

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September 12, 2013
REVISED

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Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

REGULATION AGENDA ITEMS

PERMIT DENIAL: Those listed on the consent agenda are routine in nature and non-controversial. Such denials are typically due to failure of applicant to complete the application. Unique or controversial projects or those requiring a policy decision are normally listed as discussion items. Permit types include:

Environmental Resource (ERP): Permits that consider such factors as the storage of storm water to prevent flooding of a project (upstream or downstream projects); the treatment of stormwater prior to discharge from the site to remove pollutants; and the protection of wetlands on the project site.

Surface Water Management: Permits for drainage systems, which address flood protection, water quality, and environmental protection of wetlands.

Water Use: Permits for the use of ground and/or surface water from wells, canals, or lakes.

Lake Okeechobee Works of the District: Permits that set concentration limits for total phosphorus in surface discharge from individual parcels in the Lake Okeechobee Basin.

EAA Works of the District: Permits to reduce the total phosphorus load from the EAA by 25 percent in water discharged to Works of the District.

Wetland Resource: Permits for dredge and fill activities within Waters of the State and their associated wetlands.

ADMINISTRATIVE HEARING: A case in litigation conducted pursuant to the Administrative Procedures Act (Chapter 120, Florida Statutes) involving the determination of a suit upon its merits. Administrative hearings provide for a timely and cost effective dispute resolution forum for interested persons objecting to agency action.

FINAL ORDER: The Administrative Procedures Act requires the District to timely render a final order for an administrative hearing after the hearing officer submits a recommended order. The final order must be in writing and include findings of fact and conclusions of law.

CONSENT ORDER: A voluntary contractual agreement between the District and a party in dispute which legally binds the parties to the terms and conditions contained in the agreement. Normally used as a vehicle to outline the terms and conditions regarding settlement of an enforcement action.

CONSERVATION EASEMENT: A perpetual interest to the District in real property that retains land or water areas in their existing, natural, vegetative, hydrologic, scenic, open or wooded condition and retains such areas as suitable habitat for fish, plants, or wildlife in accordance with Section 704.06, F.S.

TECHNICAL DENIAL: This action normally takes place when a proposed project design does not meet water management criteria or the applicant does not supply information necessary to complete the technical review of an application.

EMERGENCY ORDER and AUTHORIZATION: An immediate final order issued without notice by the Executive Director, with the concurrence and advice of the Governing Board, pursuant to (Section 373.119(2), Florida Statutes, when a situation arises that requires timely action to protect the public health, safety or welfare and other resources enumerated by rule and statute.

MEMORANDUM OF AGREEMENT/UNDERSTANDING: A contractual arrangement between the District and a named party or parties. This instrument typically is used to define or explain parameters of a long-term relationship and may establish certain procedures or joint operating decisions.

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

PETITION: An objection in writing to the District, requesting either a formal or an informal administrative hearing, regarding an agency action or a proposed agency action. Usually a petition filed pursuant to Chapter 120, Florida Statutes, challenges agency action, a permit, or a rule. Virtually all agency action is subject to petition by substantially affected persons.

SEMINOLE TRIBE WORK PLAN: The District and the Seminole Indians signed a Water Use Compact in 1987. Under the compact, annual work plans are submitted to the District for review and approval. This plan keeps the District informed about the tribe plans for use of their land and the natural resources. Although this is not a permit, the staff has water resource related input to this plan.

SITE CERTIFICATIONS: Certain types of projects (power plants, transmission lines, etc.) are permitted by the Governor and Cabinet under special one-stop permitting processes that supercede normal District permits. The Water Management Districts, DEP, DCA, FGFWFC, and other public agencies are mandatory participants. DEP usually coordinates these processes for the Governor and Cabinet.

VARIANCES FROM, OR WAIVERS OF, PERMIT CRITERIA: The Florida Administrative Procedures Act provides that persons subject to an agency rule may petition the agency for a variance from, or waiver of, a permitting rule. The Governing Board may grant a petition for variance or waiver when the petitioner demonstrates that 1) the purpose of the underlying statute will be or has been achieved by other means and, 2) when application of the rule would create a substantial hardship or would violate principles of fairness.

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

DENIALS

MIAMI-DADE COUNTY

1. JAVIER AND AGUSTIN MEJAY'S NURSERY
   ORLANDO GARCIA
   SEC 15 TWP 56S RGE 38E

APPL. NO. 080204-11
PERMIT NO. N/A
ACREAGE: 5.00
LAND USE: NURSERY

PERMIT TYPE: WATER USE

WATER SOURCE: UNKNOWN
ALLOCATION: UNKNOWN

PRIMARY ISSUES: FINAL ORDER TO DENY DUE TO APPLICANT'S FAILURE TO COMPLETE APPLICATION

LAST DATE FOR BOARD ACTION: SEPTEMBER 12, 2013

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

CONSENT ORDERS

1. RESPONDENT: FERNANDO VERGARA
   PROJECT: COCO SOD FARMS

   SEC 28,29,31-33 TWP 37S RGE 33E HIGHLANDS COUNTY
   SETTLEMENT OF AN ENFORCEMENT ACTION REGARDING UNPERMITTED WATER DISCHARGE AND FAILURE TO MAINTAIN WETLAND PRESERVES

2. RESPONDENT: AMKBJ PARTNERS, LTD, LLLP
   PROJECT: PIONEER ROAD IWD

   PALM BEACH COUNTY
   SETTLEMENT OF AN ENFORCEMENT ACTION REGARDING UNAUTHORIZED WORKS RESULTING IN ALTERATION OF PROPERTY CONTROL ELEVATION.

3. RESPONDENT: SPACE COAST CREDIT UNION
   PROJECT: CHARLIE'S MITSUBISHI

   SEC 27 TWP 35S RGE 40E ST. LUCIE COUNTY
   SETTLEMENT OF AN ENFORCEMENT ACTION REGARDING UNPERMITTED CONSTRUCTION OF A SURFACE WATER MANAGEMENT SYSTEM

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

CONSERVATION EASEMENT AMENDMENTS AND RELEASES

1. PERMITTEE: SDG PALM CITY INC
PROJECT: SAWGRASS VILLAS

MARTIN COUNTY

APPROVE A REQUEST FOR A PARTIAL RELEASE OF A CONSERVATION EASEMENT WITHIN A RESIDENTIAL COMMUNITY KNOWN AS SAWGRASS VILLAS IN MARTIN COUNTY. THE APPLICANT IS REQUESTING THE RELEASE OF A 3,097 SQ FT AREA TO ALLOW FOR WIDENING OF CR 714/MARTIN HIGHWAY. MITIGATION TO OFFSET WETLAND IMPACTS AS A RESULT OF THE ROAD CONSTRUCTION WILL INCLUDE THE USE OF FRESHWATER HERBACEOUS CREDITS FROM BLUEFIELD MITIGATION BANK.

2. PERMITTEE: CITY OF SUNNY ISLES BEACH
PROJECT: NORTH BAY ROAD BRIDGE

MIAMI-DADE COUNTY

APPROVE A REQUEST FOR RELEASE OF A 0.11 ACRE AREA WITHIN AN EXISTING CONSERVATION EASEMENT FOR THE NORTH BAY ROAD BRIDGE PROJECT IN THE CITY OF SUNNY ISLES BEACH (CITY). ON SEPTEMBER 13, 1999, THE DISTRICT ISSUED ENVIRONMENTAL RESOURCE PERMIT 13-01266-P FOR THE APPROVAL OF A 2.566 ACRE WETLAND MITIGATION AREA ASSOCIATED WITH THE 17070 COLLINS AVENUE SHOPPING CENTER DEVELOPMENT IN MIAMI DADE COUNTY. THIS CONSERVATION EASEMENT AREA WAS SUBSEQUENTLY REDUCED TO 2.417 ACRES TO ACCOMMODATE A FIRE LANE ASSOCIATED WITH THE DEVELOPMENT OF THE AVENTURA BEACH MARINA APARTMENTS (APPLICATION NUMBER 010411-19). THE CITY HAS NOW APPLIED TO CONSTRUCT THE NORTH BAY ROAD BRIDGE TO ADDRESS ACCESS ISSUES ASSOCIATED WITH PUBLIC SAFETY CONCERNS (APPLICATION NUMBER 090408-3). THEREFORE, THE 0.11 ACRE PORTION OF THE EXISTING CONSERVATION EASEMENT OVERLAPPING THE PROPOSED BRIDGE CONSTRUCTION FOOTPRINT IS REQUESTED TO BE RELEASED.

3. PERMITTEE: DEERFIELD LAND CORPORATION
PROJECT: OSCEOLA CROSSING

OSCEOLA COUNTY

APPROVE A REQUEST FOR THE PARTIAL RELEASE OF A CONSERVATION EASEMENT IN A PROJECT AREA KNOWN AS OSCEOLA CROSSING (APPLICATION NO. 130620-12) IN OSCEOLA COUNTY. THE EXISTING EASEMENT WAS RECORDED IN 2000 AS PART OF THE OSCEOLA CORPORATE CENTER PERMIT NO. 49-00477-S. SPECIFICALLY, 2.50 ACRES OF WETLANDS, 4.90 ACRES OF UPLAND CUT SURFACE WATERS AND 2.86 ACRES OF UPLAND PRESERVATION WILL BE REMOVED FROM THE EXISTING CONSERVATION EASEMENT. AREAS REPRESENTING FORMER MITIGATION ACREAGE INCLUDE 0.08 ACRES OF WETLAND CUT BORROW POND, AND 1.31 ACRES OF UPLANDS. THE APPLICANT WILL PROVIDE 1.37 FRESHWATER FORESTED WETLAND CREDITS TO OFFSET THE AREAS REQUIRING MITIGATION.

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

CONSERVATION EASEMENT AMENDMENTS AND RELEASES

4. PERMITTEE: OSCEOLA CORPORATE CENTER
PROJECT: THE APARTMENTS AT OCC

OSCEOLA COUNTY

APPROVE A REQUEST FOR THE PARTIAL RELEASE OF A CONSERVATION EASEMENT IN A PROJECT AREA KNOWN AS THE APARTMENTS AT OCC (APPLICATION NO. 130802-5) IN OSCEOLA COUNTY. THE EXISTING EASEMENT WAS RECORDED IN 2000 AS PART OF THE OSCEOLA CORPORATE CENTER PERMIT NO. 49-00477-S. SPECIFICALLY, 3.27 ACRES OF WETLANDS WILL BE REMOVED FROM THE EXISTING CONSERVATION EASEMENT. THE APPLICANT WILL PROVIDE 1.31 FRESHWATER FORESTED WETLAND CREDITS TO OFFSET THE AREAS REQUIRING MITIGATION.

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

SEMINOLE TRIBE WORK PLANS

1. CONCUR WITH THE FIRST AMENDMENT TO THE TWENTY SEVENTH ANNUAL WORK PLAN FOR THE SEMINOLE TRIBE OF FLORIDA. WORKS IN THE BRIGHTON RESERVATION INCLUDE A PROPOSED WIDENING OF THE HARNEY POND ROAD TO PROVIDE A CENTER LANE (FROM EAST OF FLOWING WELL ROAD TO CR721, APPROXIMATELY 1.3 MILES); PROPOSED INSTALLATION OF SEVEN DRINKING WATER (4-INCH) WELLS FOR CATTLE CONSUMPTION; PROPOSED CONSTRUCTION OF SEVEN DEEP COOLING PONDS TO SUPPORT LIVESTOCK.

Attachment: ca_reg_rm_100_sd (Revised II) (1463 : Regulatory Consent Agenda)

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September 12, 2013

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III	**RIGHT OF WAY OCCUPANCY PERMIT REQUESTS FOR DENIAL:** Governing Board action is required for routine requests for permits which do not conform to applicable rules and criteria of Works and Lands of the District. Items are placed on this Consent Agenda when the staff's recommendation is for denial.	5

Attachment: ca_om_reg_101_sd (1462 : Right of Way Regulatory Consent Agenda)

RIGHT OF WAY OCCUPANCY NEW PERMITS

1. DJ TRUNK ENTERPRISES, LLC
COUNTY: PALM BEACH

Permit Number: 14216
Appl No.: 13-0514-1

AUTHORIZING:
DOCK WITH BANK STABILIZATION AND REVETMENT WITHIN THE NORTH RIGHT OF WAY OF C-15 LOCATED AT THE REAR OF 1420 CORMORANT ROAD.

Attachment: ca_om_reg_101_sd (1462 : Right of Way Regulatory Consent Agenda)

RIGHT OF WAY OCCUPANCY PERMIT REQUESTS WITH WAIVER OF DISTRICT CRITERIA

1. Consideration of a request by **CenturyLink**, (Application Number 13-0604-1M) for issuance of a Modification to Right of Way Occupancy Permit Number 13784, and waiver of the District's criteria for the installation of an aerial communication cable crossing the Henderson Creek Canal. Location: Collier County, Section 26, Township 50 South, Range 26 East.

   The applicant's request for waiver of the District's criteria, which governs the minimum vertical clearance requirement for low-voltage aerial crossings within the Works or Lands of the District's, is based on "substantial hardship." The applicant asserts and has provided written documentation from the County and FP&L that there are many buried utilities in the project area which precludes a subaqueous crossing; and increasing the height of the proposed aerial cable would cause a violation of the National Electric Safety Code due to the proximity of adjacent overhead powerlines. The existing FP&L poles to which the proposed communication cable will be attached do not accommodate the District's required minimum vertical clearance of 40'. The proposed re-tensioned crossing, however, will provide a vertical clearance ranging from approximately 33' to 38' over the east bank of the canal where the District's current land-based access exists.

   The District's Field Operations and Land Management staff of the District's Big Cypress Field Station has determined that the proposed aerial communication cable will not significantly interfere with the District's ability to perform necessary construction, alteration, operation and maintenance activities, so the purpose of the underlying statue will be achieved.

   The applicant's petition has been reviewed by the Office of Counsel for compliance with the applicable legal requirements. Pursuant to Section 120.542(6), F.S. notice of the petition was provided to the Department of State and was published in *Volume 39, Number 113* of the *Florida Administrative Register on June 11, 2013*. No public comments were received.

   Therefore, staff recommends **approval** of the issuance of Modification to Right of Way Occupancy Permit Number 13784 and **approval** of the petition for Waiver of the District's criteria which governs the minimum vertical clearance requirements of aerial crossings within Works or Lands of the District.
   (Easement)

Attachment: ca_om_reg_101_sd (1462 : Right of Way Regulatory Consent Agenda)

RIGHT OF WAY OCCUPANCY PERMIT REQUESTS WITH WAIVER OF DISTRICT CRITERIA

2. Consideration of a request by **Carl E. and Leslie A. Rasmussen** (Application Number 12-1120-2) for issuance of Right of Way Occupancy Permit Number 14215 and waiver of the District's criteria for an existing boat dock with roof within the northerly right of way of the C-38 Canal. Location: Okeechobee County, Section 30, Township 37, South, Range 34 East.

   The applicant's request for waiver of the District's criteria which governs the minimum low member elevation for pile-supported facilities located within Works or Lands of the District is based on "principles of fairness". The applicant asserts there are similar docks along this reach of C-38 that do not meet the District's low member elevation criteria. The applicant also agrees that at such time as renovation or replacement of the subject docking facility is required, the permittee shall re-construct the boat dock with roof to meet the District's minimum low member elevation criteria. The low member elevation for the existing boat dock with roof is set at 23.12'NGVD which is approximately 1' lower than the 24.0' NGVD requirement.

   The District's Field Operations and Land Management staff has determined that the existing structure will not significantly interfere with the District's ability to perform necessary construction, alteration, operation and maintenance activities, so the purpose of the underlying statute will be achieved.

   The applicant's petition has been reviewed by the Office of Counsel for compliance with the applicable legal requirements. Pursuant to section 120.542(6), F.S. notice of the petition was provided to the Department of State and was published in *Volume 39, Number 20* of the *Florida Administrative Register* on *January 30th, 2013.* No Public comments were received.

   Therefore, staff recommends **approval** of the issuance of a Right of Way Occupancy Permit Number 14215 and **approval** of the petition for Waiver of the District's criteria which governs the minimum low member elevation of pile-supported facilities within Works or Lands of the District.
   (Easement)

Attachment: ca_om_reg_101_sd (1462 : Right of Way Regulatory Consent Agenda)

RIGHT OF WAY OCCUPANCY PERMIT REQUESTS FOR DENIAL

1. Consideration of a request by **Corenthia Willis** (Application Number 13-0621-1), for issuance of a Right of Way Occupancy Permit to allow installation of a fence enclosure within the south right of way of C-9 at the rear of 351 NW 201 Street, Miami, FL. Location: Miami-Dade County, Section 36, Township 51 South, Range 41 East.

Staff recommends **denial** of the request for issuance of a permit due to the fact that the proposed fence would interfere with Miami-Dade County's Snake Creek Trail - a public recreational facility previously authorized under Right of Way Occupancy Permit Number 13901 issued on August 11, 2011. Miami-Dade County Parks, Recreation and Open Spaces Department has objected in writing to the application submitted by Corenthia Willis. As such, the proposed fence enclosure is inconsistent with District Rule 4-E-6.221(3), Florida Administrative Code, which states: "In determining whether a permit should be issued, the District shall consider whether the activity unduly burdens the District's interests. In making this decision, the District shall weigh the following critical factors:

> (j) meets the general and specific criteria in the Criteria Manual which is incorporated by reference in Rule 40E-6.091, Florida Administrative Code;
>
> (k) interferes with actual or potential public use of the District's works or lands, including public recreational or other facilities not within the District's works."

Attachment: ca_om_reg_101_sd (1462 : Right of Way Regulatory Consent Agenda)

M E M O R A N D U M

TO: Governing Board Members

FROM: Karen Estock, Division Director

DATE: September 12, 2013

SUBJECT: Approve the release of District canal, mineral and road reservations, and issuance of non-use commit

BACKGROUND INFORMATION: Canal reservations evolved from efforts to provide infrastructure, without cost to the taxpayers, to carry out drainage and reclamation projects, and provide roads. Many, but not all, conveyances of land by the State of Florida through the Trustees of the Internal Improvement Trust Fund ("TIITF") and the Everglades Drainage District (EDD), a predecessor to the South Florida Water Management District, reserved rights to construct future water control works, percentages of the mineral rights, together with the right of ingress, egress and exploration, and reservations for State and County road rights-of-way.

The District routinely receives applications for releases of these reservations from landowners, attorneys, title companies and lending institutions, who consider the reservations to be title defects; applications are processed by the Real Estate Management Section. Applications are reviewed by appropriate District personnel and applicable local governmental agencies to determine that there is no present or future need for the canal reservation. Road reservations are released upon review and approval by the affected county and the Florida Department of Transportation. Mineral reservations are released for parcels containing 1.25+/- acres or less, and non-use commitments are issued for parcels greater than 1.25+/- acres. When a non-use commitment is issued, the District agrees not to exercise its right of ingress and egress for the exploration of minerals, provided the landowner does not explore for the same. The District retains its interest in the mineral estate and is entitled to any future proceeds should exploration occur.

CONSIDERATIONS: See Exhibit "A" attached hereto and made a part hereof, which contains the details of releases to be approved and issued.

AUTHORIZATION: Pursuant to Section 373.096 of the Florida Statutes, the Governing Board of the District may release any reservation for which it has no present or apparent use under terms and conditions determined by the Board.

FISCAL IMPACT: None; reservations were acquired at no cost to the District.

RECOMMENDATION: A Resolution of the Governing Board of the South Florida Water Management District approving release of District canal, mineral and road reservations, and issuance of non-use commitment; providing an effective date.

EXHIBIT "A"

File No.:	18552
Applicant:	Vadim Brinzan and Svitlana Brinzan, husband and wife
Reserving Deeds:	E-1579 (DB 703-216, 11/20/1944) and E-2547 (DB 707-439, 2/7/1945)
Fee paid:	$250.00
Action:	Approve release of District canal, mineral and road reservations
Acres:	0.47 acres, more or less
Legal Description:	Lot 22, Block B-3, OAKS AT BOCA RATON PLAT ONE, PB 95-16, Section 31, Township 46 South, Range 42 East
Location:	9568 Grand Estates Way, Boca Raton, Palm Beach County
Reviewed by:	Lake Worth Drainage District, Palm Beach County and Florida Department of Transportation (no internal review needed due to size and land use)

File No.:	18553
Applicant:	Archdiocese of Miami, Inc., a Florida non-profit corporation
Reserving Deed:	E-2228 (DB 470-322, 1/16/1945)
Fee paid:	$250.00
Action:	Approve release of District canal, mineral and road reservations
Acres:	1.0 acre, more or less
Legal Description:	Portion of Section 18, Township 50 South, Range 41 East, NEWMAN'S SURVEY, PB 2-26(D), and the Hiatus between T50S-R40E and T50S-R41E
Location:	2350 SW 112th Avenue, Davie, Broward County
Reviewed by:	Water Supply Development Section, Right of Way Section, Environmental Resource Permitting Bureau, Survey Section and Office of Everglades Policy and Coordination, Florida Department of Transportation and Broward County

File No.:	18556
Applicant:	Fidel Suarez
Reserving Deed:	E-2653 (DB 2499-335, 3/7/1945)
Fee paid:	$250.00
Action:	Approve release of District canal, mineral and road reservations
Acres:	1.25 acres, more or less
Legal Description:	Portion of Tract 52, FLORIDA FRUIT LAND'S SUBDIVISION NO. 1, PB 2-17, Section 13, Township 52 South, Range 39 East
Location:	NW 159th Street, Miami, Miami-Dade County
Reviewed by:	Miami-Dade Water Control Section, Miami-Dade County and Florida Department of Transportation (no internal review needed due to size and land use)

File Nos.:	18557, 18558 and NUC 1631
Applicant:	Palm Tree Farms, LLC, a Florida limited liability company
Reserving Deeds:	E-5331 (DB 773-249, 7/5/1946), and T-1772 (DB 332-518, 8/15/1925)
Fee paid:	$725.00
Action:	Approve release of District canal and mineral reservations, and issuance of non-use commitment
Acres:	9.41 acres, more or less

Legal Description:	Portion of Tracts 33, 34, 47 and 48, Block 28, THE PALM BEACH FARMS CO. PLAT NO. 3, PB 2-45, Section 29, Township 44 South, Range 42 East
Location:	Hooks Road, Lake Worth, Palm Beach County
Reviewed by:	Water Supply Development Section, Right of Way Section, Environmental Resource Permitting Bureau, Survey Section, Office of Everglades Policy and Coordination, and Lake Worth Drainage District

File No.:	18559
Applicant:	G.L. Homes of Palm Beach Associates, Ltd., a Florida limited partnership
Reserving Deed:	E-271 (DB 681-169, 2/28/1944)
Fee paid:	$250.00
Action:	Approve release of District canal and road reservations
Acres:	25.50 acres, more or less
Legal Description:	Portion of Tract “A”, CANYON SPRINGS PRESERVE PLAT NO. 5, PB 107-112, Section 32, Township 45 South, Range 42 East and Section 5, Township 46 South, Range 42 East
Location:	Acme Dairy Road, Boynton Beach, Palm Beach County
Reviewed by:	Water Supply Development Section, Right of Way Section, Environmental Resource Permitting Bureau, Survey Section and Office of Everglades Policy and Coordination, Lake Worth Drainage District, Palm Beach County and Florida Department of Transportation

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0901

A Resolution of the Governing Board of the South Florida Water Management District approving release of District canal, mineral and road reservations, and issuance of non-use commitment; providing an effective date. (OMC, Kathy Massey, ext. 6835)

WHEREAS, certain underlying landowners have requested that the South Florida Water Management District ("District") release certain canal, mineral and road reservations, and issue a non-use commitment;

WHEREAS, the District is empowered to grant such releases pursuant to Section 373.096, Florida Statutes;

NOW THEREFORE, BE IT RESOLVED by the Governing Board of the South Florida Water Management District:

Section 1. The Governing Board of the South Florida Water Management District hereby approves the release of District canal, mineral and road reservations, and issuance of a non-use commitment, as described in Exhibit "A", attached hereto and made a part hereof.

Section 2. This Resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

Attachment: ca_om_200_Exhibit A (Resolution No. 2013 - 0901 : Approve the release of District canal, mineral and road reservations, and

EXHIBIT "A"

RELEASE OF DISTRICT CANAL, MINERAL AND ROAD RESERVATIONS:

File No.:	18552
Applicant:	Vadim Brinzan and Svitlana Brinzan, husband and wife
Reserving Deeds:	E-1579 (DB 703-216, 11/20/1944) and E-2547 (DB 707-439, 2/7/1945)
Acres:	0.47 acres, more or less
Legal Description:	Lot 22, Block B-3, OAKS AT BOCA RATON PLAT ONE, PB 95-16, Section 31, Township 46 South, Range 42 East
Location:	9568 Grand Estates Way, Boca Raton, Palm Beach County

File No.:	18553
Applicant:	Archdiocese of Miami, a Florida non-profit corporation
Reserving Deed:	E-2228 (DB 470-322, 1/16/1945)
Acres:	1.0 acre, more or less
Legal Description:	Portion of Section 18, Township 50 South, Range 41 East, NEWMAN'S SURVEY, PB 2-26(D), and the Hiatus between T50S-R40E and T50S-R41E
Location:	2350 SW 112th Avenue, Davie, Broward County

File No.:	18556
Applicant:	Fidel Suarez
Reserving Deed:	E-2653 (DB 2499-335, 3/7/1945)
Acres:	1.25 acres, more or less
Legal Description:	Portion of Tract 52, FLORIDA FRUIT LAND'S SUBDIVISION NO. 1, PB 2-17, Section 13, Township 52 South, Range 39 East
Location:	NW 159th Street, Miami, Miami-Dade County

File Nos.:	18557 and 18558
Applicant:	Palm Tree Farms, LLC, a Florida limited liability company
Reserving Deeds:	E-5331 (DB 773-249, 7/5/1946), and T-1772 (DB 332-518, 8/15/1925)
Acres:	9.41 acres, more or less
Legal Description:	Portion of Tracts 33, 34, 47 and 48, Block 28, THE PALM BEACH FARMS SO. PLAT NO. 3, PB 2-45, Section 29, Township 44 South, Range 42 East
Location:	Hooks Road, Lake Worth, Palm Beach County

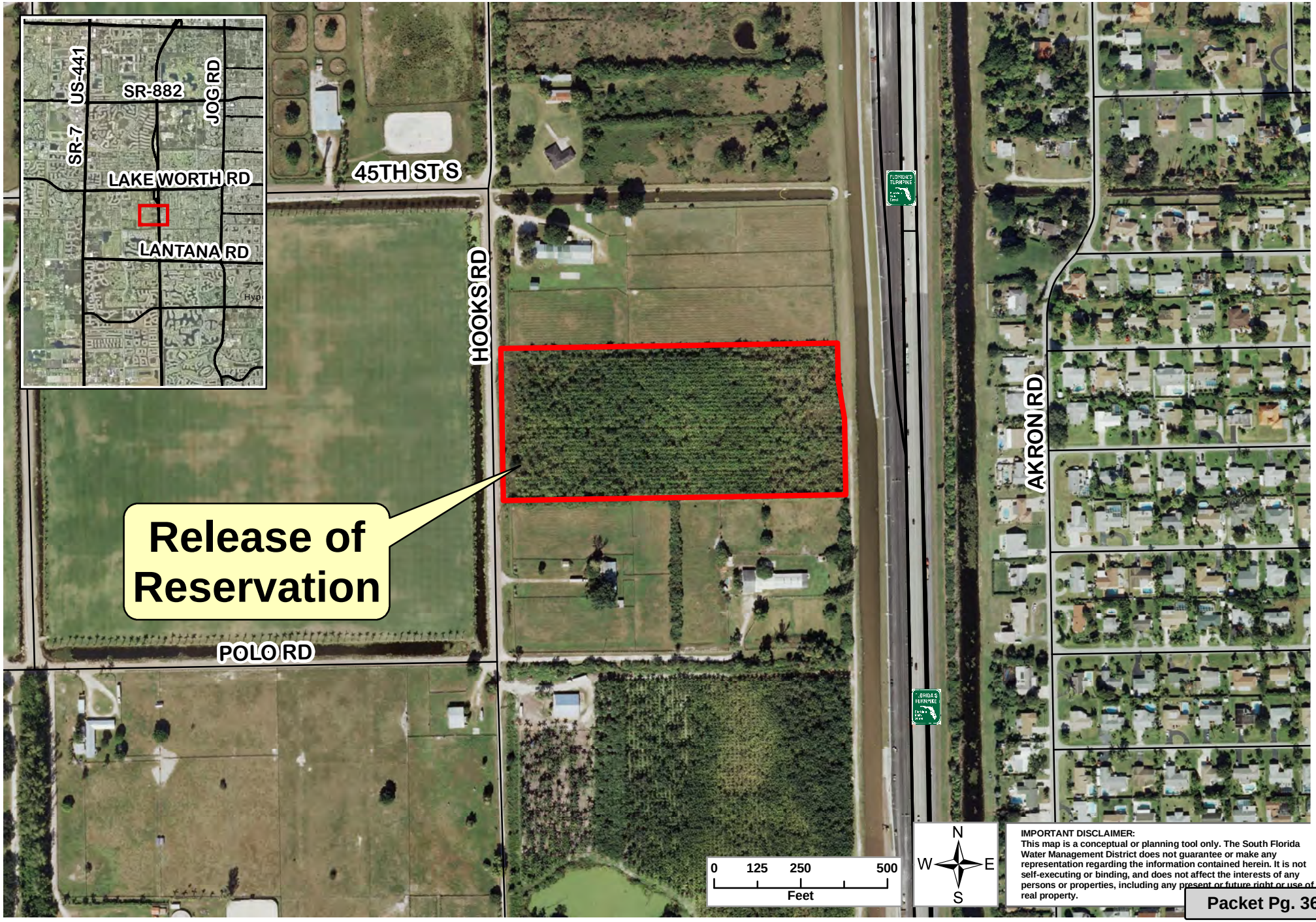
File No.:	18559
Applicant:	G.L. Homes of Palm Beach Associates, Ltd., a Florida limited partnership
Reserving Deed:	E-271 (DB 681-169, 2/28/1944)
Acres:	25.50 acres, more or less
Legal Description:	Portion of Tract "A", CANYON SPRINGS PRESERVE PLAT NO. 5, PB 107-112, Section 32, Township 45 South, Range 42 East, and Section 5, Township 46 South, Range 42 East
Location:	Acme Dairy Road, Boynton Beach, Palm Beach County

ISSUANCE OF NON-USE COMMITMENT:

File No.:	NUC 1631
Applicant:	Palm Tree Farms, LLC, a Florida limited liability company
Reserving Deed:	E-5331 (DB 773-249, 7/5/1946)
Acres:	9.41 acres, more or less
Legal Description:	Portion of Tracts 33, 34, 47 and 48, Block 28, THE PALM BEACH FARMS SO. PLAT NO. 3, PB 2-45, Section 29, Township 44 South, Range 42 East
Location:	Hooks Road, Lake Worth, Palm Beach County

Attachment: ca_om_200_Exhibit A (Resolution No. 2013 - 0901 : Approve the release of District canal, mineral and road reservations, and

18557, 18558, and NUC 1631
Palm Beach County



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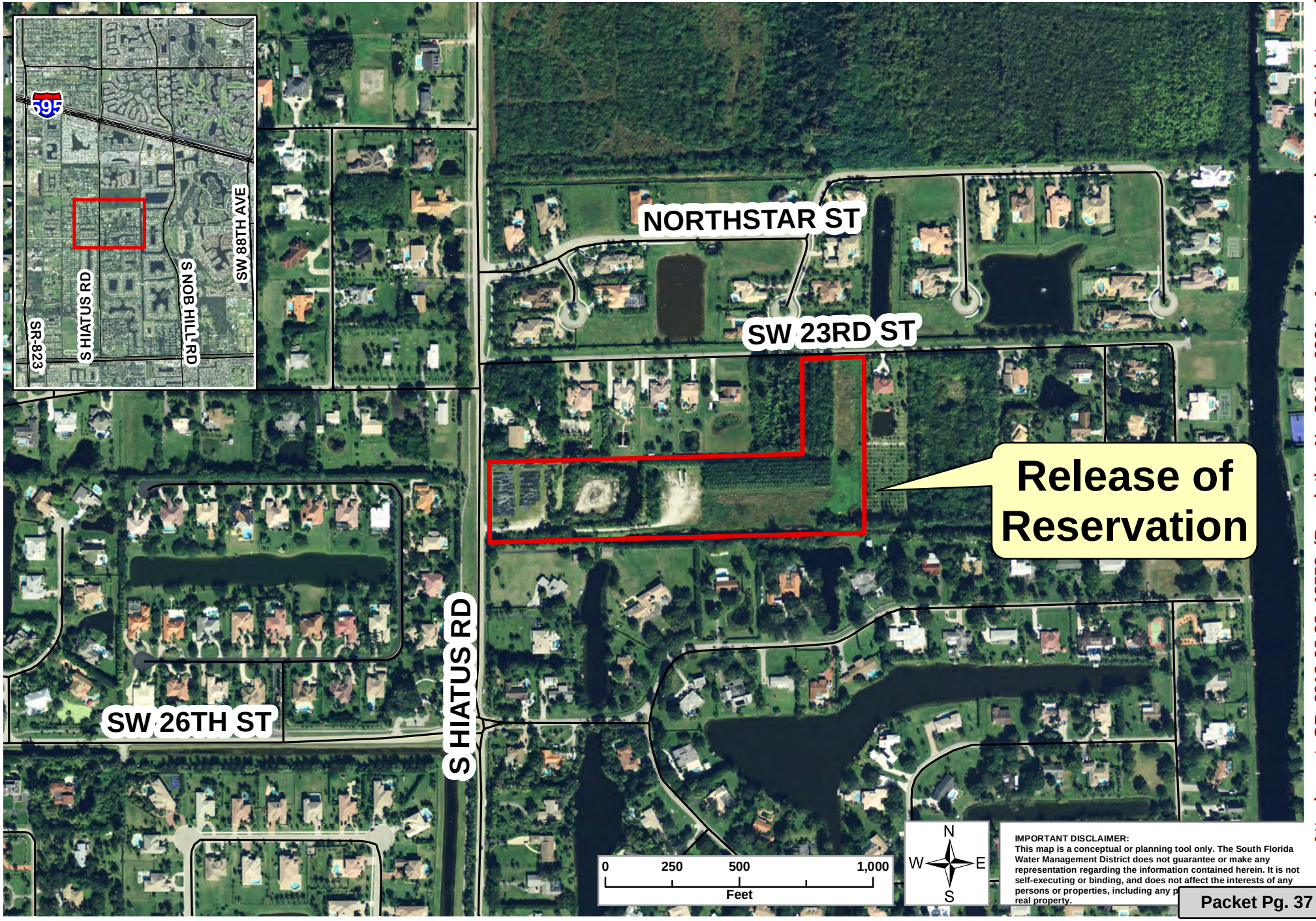
For copies of this map (\\Ad.sfwmd.gov\dfsroot\data\aa_gis\arc_data\maps\ReleaseofReservation\%FILEPATH.mxd), created on DATE by SMF. Contact the Real Estate Section.

Attachment: GB_2013-08-27_18557_18558_NUC1631 (Resolution No. 2013 - 0901 : Approve the release of

18553
Broward County



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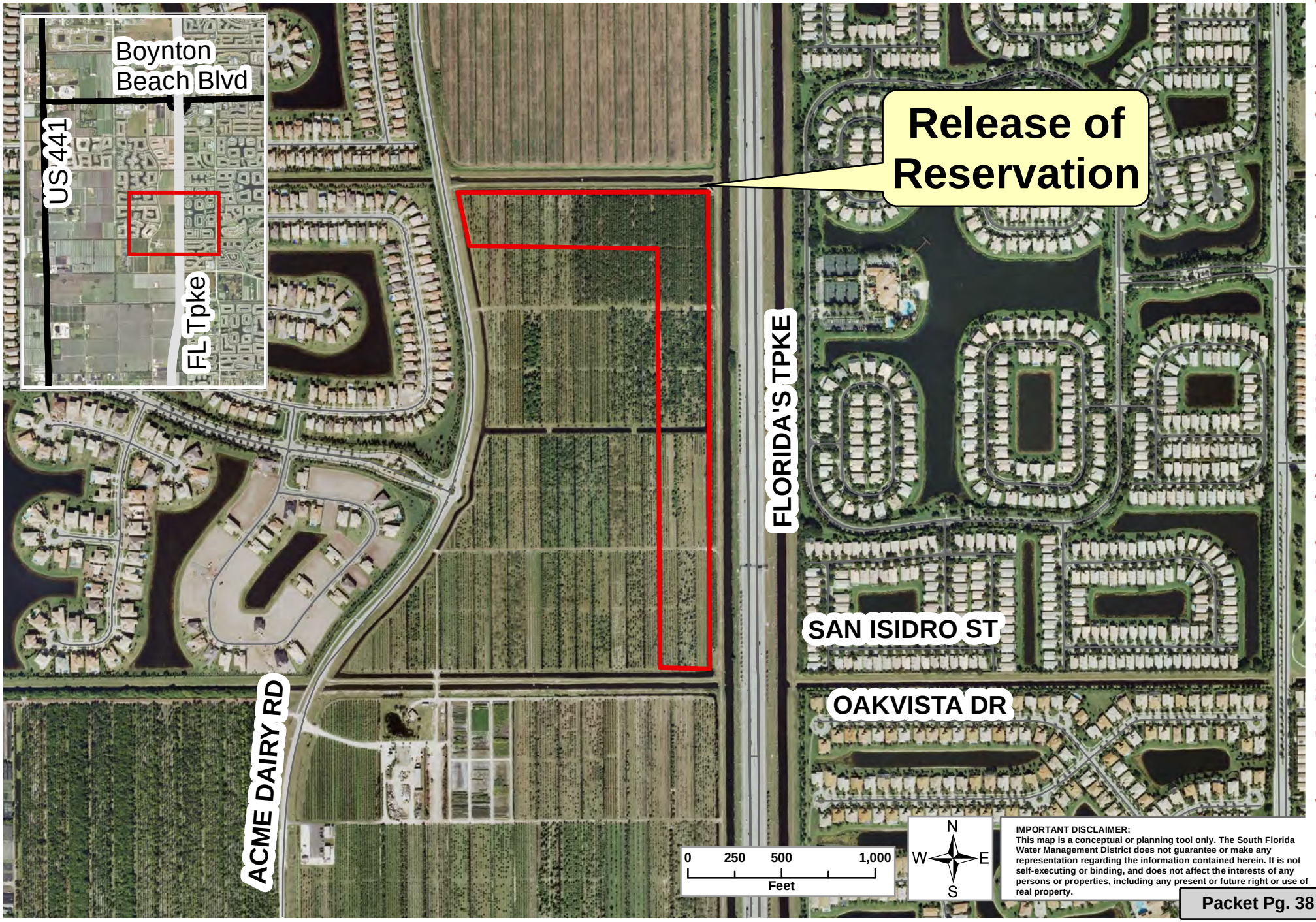
real property.

Attachment: GB_2013-08-28_18553 (Resolution No. 2013 - 0901 : Approve the release of District canal,

For copies of this map (\\Ad.sfwmd.gov\dfsroot\data\aa_gis\arc_data\maps\ReleaseofReservation\GB_2013-08-28_NUC1630_18553), created on 08-28-2013 by NRK. Contact the Real Estate Section.

18559
Palm Beach County



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Attachment: GB_2013-08-28_18559 (Resolution No. 2013 - 0901 : Approve the release of District canal,

18552
Palm Beach County

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Attachment: GB_2013-08-30_18552 (Resolution No. 2013 - 0901 : Approve the release of District canal,

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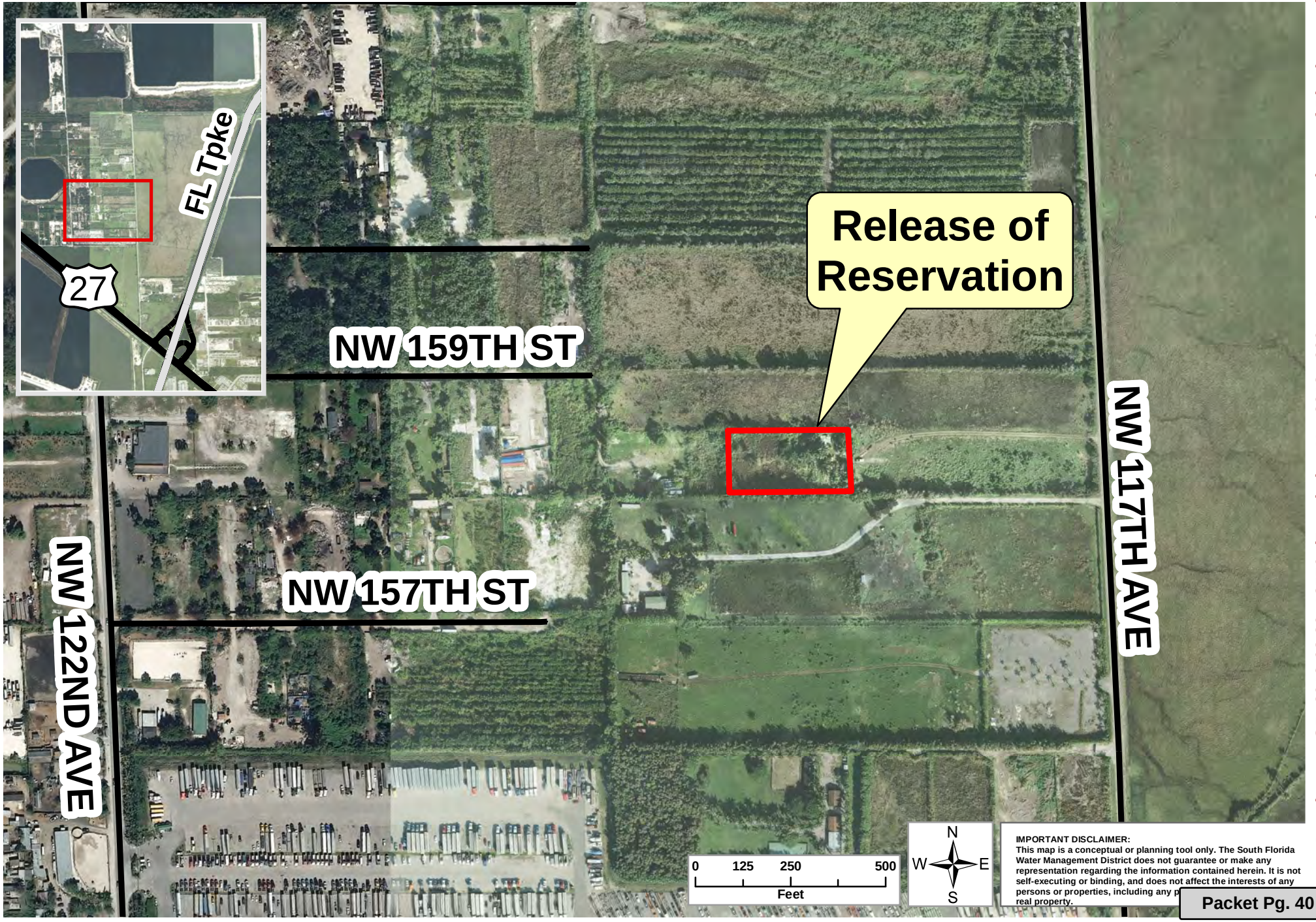
18556
Miami-Dade County



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M E M O R A N D U M

TO: Governing Board Members

FROM: Sharon M. Trost, PG, AICP, Director, Regulatory Division

DATE: September 12, 2013

SUBJECT: Approve Interagency Agreement for permitting responsibilities for Lucky L Ranch Mitigation Bank

Background

Blue Water LLC (BWLLC) proposes to construct and operate a mitigation bank known as "Lucky L Ranch Mitigation Bank" (Project) which requires environmental resource permits, as outlined in Part IV of Section 373, Florida Statutes ("Fla. Stat."). The project is located within the jurisdictional boundaries of both the South Florida Water Management District (SFWMD) and St. Johns River Water Management District (SJRWMD).

SFWMD staff is currently reviewing ERP Application Number 130808-15 for the mitigation bank.

Summary

In order to streamline the review of the Environmental Resource Permitting (ERP) elements of the project review, SFWMD staff will review and take final agency action on the mitigation bank, portions of which in Osceola County are located within the SJRWMD.

Recommendation

Staff recommends Governing Board approval of the Interagency Agreement between SFWMD and SJRWMD for designation of responsibility for permitting under Part IV of Chapter 373, F.S. for the project known as "Lucky L Mitigation Bank".

Staff Contact: **Anita R. Bain, Director, Environmental Resource Permitting Division, (561) 682-6866**

Susan Martin, Sr. Specialist Attorney, Office of Counsel (561) 682-6251

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0902

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into an Interagency Agreement between the South Florida Water Management District and St. Johns River Water Management District for designation of regulatory responsibility for permitting under Part IV of Chapter 373, Florida Statutes, for the project known as Lucky L Ranch Mitigation Bank that crosses jurisdictional boundaries of both Water Management Districts; providing an effective date. (REG, Anita Bain, ext. 6866)

WHEREAS, the Blue Water LLC proposes to construct and operate a mitigation bank known as "Lucky L Ranch Mitigation Bank " (Project) which requires environmental resource permits, as outlined in Part IV of Section 373, Florida Statutes ("Fla. Stat."); and

WHEREAS, the Project is located within the jurisdictional boundaries of both the South Florida Water Management District and St. Johns River Water Management District; and

WHEREAS, Section 373.046(6), Fla. Stat., authorizes a water management district to designate, through an interagency agreement, regulatory responsibility to another water management district over a project which crosses the jurisdictional boundaries of both districts; now therefore

BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of the Interagency Agreement with St. Johns River Water Management District, which is attached hereto and incorporated herein.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this _____ day of _____, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

Attachment: ca_reg_rm_102_sd (Revised) (Resolution No. 2013 - 0902 : Approve Interagency Agreement for permitting responsibilities for

INTERAGENCY AGREEMENT BETWEEN
SOUTH FLORIDA WATER MANAGEMENT DISTRICT AND THE
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
FOR DESIGNATION OF REGULATORY RESPONSIBILITY
FOR THE LUCKY L MITIGATION BANK PROJECT

THIS INTERAGENCY AGREEMENT ("AGREEMENT") by and between the SOUTH FLORIDA WATER MANAGEMENT DISTRICT, a special taxing district organized under Chapter 373, Florida Statutes, whose address is 3301 Gun Club Road, West Palm Beach, Florida 33406, hereinafter referred to as "SFWMD", and ST. JOHNS RIVER WATER MANAGEMENT DISTRICT, a special taxing district organized under Chapter 373, Florida Statutes, whose address is 4049 Reid Street, Palatka, Florida 32177, hereinafter referred to as "SJRWMD is entered into two originals this _____day of _____, 2013.

WITNESSETH:

WHEREAS, the applicant, Blue Water LLC, proposes to construct and operate a 1,317 acre mitigation bank known as the Lucky L Mitigation Bank located in the central region of Osceola County, east of Lake Kissimmee and north of Lake Marian (the proposed project); and

WHEREAS, in order to construct the proposed project, the applicant will need to apply for and receive certain authorizations under Part IV of Chapter 373, Florida Statutes; and

WHEREAS, the proposed project is located primarily within the jurisdictional boundaries of the SFWMD, but is partially located within the jurisdictional boundaries of the SJRWMD; and

WHEREAS, when the geographic area of a project crosses water management district boundaries, subsection 373.046(6), Florida Statutes, authorizes the affected districts to designate, via an interagency agreement, a single affected district to implement in that area, under the rules of the designated district, all or a part of the applicable regulatory responsibilities of Part IV of Chapter 373, Florida Statutes; and

WHEREAS, because the majority of the project will be located within the jurisdictional boundaries of the SFWMD, both Districts desire to designate to SFWMD all regulatory responsibilities under Part IV of Chapter 373, F.S., for the Lucky L Mitigation Bank project.

NOW THEREFORE, SJRWMD and SFWMD, under the authority of Subsection 373.046(6), F.S., hereby agree as follows:

1. In order to facilitate a more coordinated and efficient review of the application, SJRWMD hereby designates to SFWMD all regulatory responsibilities for the Lucky L Mitigation Bank project under Part IV of Chapter 373, Florida Statutes, for those portions of the proposed project that lie within the jurisdictional boundaries of the SJRWMD.

2. SFWMD will review and process any required authorizations for the entire Lucky L Mitigation Bank, including establishment of the Mitigation Bank Service Area.

3. SFWMD will keep the mitigation bank ledger.

4. Modifications of any permits issued pursuant to Part IV of Chapter 373, Florida Statutes, for the proposed project, shall also be processed by the SFWMD.

5. This Agreement will commence upon execution by all parties and will remain in effect until all parties mutually agree in writing to terminate this Agreement.

IN WITNESS WHEREOF, each party, or lawful representative, has executed this AGREEMENT on the date set forth next to their signature below.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Attest: _____

By: _____
Daniel O'Keefe, Chair
Governing Board

Date: _____

Attachment: ca_reg_rm_102_sd (Revised) (Resolution No. 2013 - 0902 : Approve Interagency Agreement for permitting responsibilities for

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

Attest: _____ By: _____

Hans G. Tanzler III
Executive Director

Date: _____

Attachment: ca_reg_rm_102_sd (Revised) (Resolution No. 2013 - 0902 : Approve Interagency Agreement for permitting responsibilities for

MEMORANDUM

TO: Governing Board Members

FROM: Sharon M. Trost, P.G., AICP, Director, Regulation Division

DATE: September 12, 2013

SUBJECT: Rule Development on Noticing Requirements

Background

Staff proposes to amend District Rules 40E-1.021 and 40E-1.6058, F.A.C., to define the term "posting", and to reduce the types of permit applications for which the District will publish a notice of receipt of permit application in a newspaper of general circulation.

The District currently publishes in newspapers "notices of receipt of permit application" for consumptive use, environmental resource, and everglades agricultural area permits. Pursuant to Florida Statutes, only "notices of receipt of permit application" for individual water use permits and permits for construction or alteration of dams, impoundments, reservoirs, and appurtenant works must be published. Subsection 373.118(3), Florida Statutes, allows the Governing Board to establish alternative notice requirements for general permits. Staff proposes to amend Rule 40E-1.6058, F.A.C., to state that "notices of receipt of permit application" for individual water use permits and permits for construction or alteration of dams, impoundments, reservoirs, and appurtenant works shall be published, but "notices of receipt of permit application" for all other applications shall be posted on the District's website. This will also be consistent with proposed new Statewide Environmental Resource Permit rules.

This recommendation will result in a cost saving to the District in terms of both dollars and employee time. In reviewing the historical averages, the average yearly savings from this rule change for all three regulatory programs would be approximately $41,486.

Recommendation

Authorize publication of a Notice of Rule Development and authorize publication of the Notice of Proposed Rules to amend Rules 40E-1.021 and 40E-1.6058, F.A.C.; and request review from the Office of Fiscal Accountability and Regulatory Reform.

Staff Contacts: **Sharon Trost**
Phone (561) 682-6814

Susan Martin, Sr. Specialist Attorney, Office of Counsel
Phone (561) 682-6251

Attachment: CA_REG_ memo_Noticing Rulemaking (1395 : Rule Development of Alternative Notice Requirements)

DRAFT 8/19/13

40E-1.021 Definitions.
When used in this Chapter, Chapters 40E-2, 40E-4, 40E-20, 40E-40, 40E-41, 40E-61, and 40E-400, F.A.C.:
(1) "through (5) No Change.
(6) "Posting" means placing notice on the District's website.
Rulemaking Authority 373.044, 373.113 FS. Law Implemented 668.003, 668.004, 668.50 FS. History–New 10-1-06, Amended 10-23-12, _____.

40E-1.6058 Posting, Publication and Requests for Notification of Permit Applications or Notices of Intent.
(2) Posting and Publication of Notice of Receipt of Permit Application or Notice of Intent.
(a) Within 45 days of receipt of an individual or general permit application, the District shall post notice thereof on the District's website and shall cause notice to be published of receipt of applications for individual water use permits, permits for construction or alteration of dams, impoundments, reservoirs, and appurtenant works, under part IV of this chapter; and permits under s. 403.812, Fla. Stat. thereof in a newspaper having general circulation as defined in Chapter 50, F.S., in the county in which the activity will occur.
Rulemaking Authority 373.113, 668.003, 668.004, 668.50, FS. Law Implemented 120.53(1), 120.60(3), 668.003, 668.004, 668.50, FS. History–New 10-3-95, Amended 7-2-98, 6-12-00, 10-1-06, 12-15-11.

Attachment: ca_reg_103_sd (1395 : Rule Development of Alternative Notice Requirements)

Public Use Rule

40E-7.511 Policy and Purpose.

(1) The purpose of Rules 40E-7.511 through 40E-7.539, F.A.C., hereinafter "this Part," ~~the rule in this part~~ is to further implement the legislative intent expressed in Sections 259.101, 373.016(3)(i)~~(2)(h)~~, 373.1391, 373.1395, and 373.59(11), F.S., ~~and Chapter 140, Article IV, South Florida Water Management District Policies and Procedures Code,~~ and therefore, to establish regulations governing public access to certain District lands and use of said lands for nature based recreation and allied purposes. It is the intent of these regulations to protect the water resources, native plant communities, fish and wildlife populations, and related natural features of these lands together with any historic and cultural improvements thereon.

(2) Pursuant to Section 373.1395, F.S., the ~~Nothing contained in these regulations shall be construed as an assurance by the~~ District provides no assurance that said District lands are safe for any purpose, that the District has a duty of care toward any person entering said lands or that the District is responsible for any injuries or damage to persons or property caused by an act or omission of any person who enters said District lands, including invitees, licensees, contractors, trespassers or other persons.

Specific Authority 279.101, 373.044, 373.113, 373.171 FS. Law Implemented 259.101, 373.016, 373.056, 373.103, 373.1391, 373.1395, 373.59 FS. History–New 5-24-94, Amended 1-5-03, 7-12-06.

40E-7.520 Scope and Applicability.

(1) The general regulations contained herein are broad in scope and applicable to all District lands.

(2) The regulations are applicable to all persons entering upon, using, or visiting said District lands.

(3) A copy of the regulations contained herein may be posted at entry points, activity areas, and recreation sites equipped with bulletin boards or otherwise made reasonably available to the public.

(4) Consistent with the environmental sensitivity of these areas and the purposes for which the lands were acquired, and all rights, privileges, and protections afforded by the provisions of Section 373.1395, F.S., all District lands are hereby deemed open and available to the public for outdoor recreational purposes and access unless otherwise limited, restricted, or prohibited by special provision in this rule. Nothing in this rule prevents ~~shall prevent~~ other federal, state, or local agencies, including but not limited to those with management contracts with the District, from requiring compliance with their own rules, permits, regulations, ordinances, or laws to the fullest extent of their lawful authority.

(5) Any signage, prohibiting access to or, use of District lands shall only apply to the property or area set forth in or delineated by such signage and a presumption shall exist that all other portions of the Management Areas, Stormwater Treatment Areas, ~~and~~ Impoundment Areas, Rights of Way, and vacant undesignated lands where public access or use is not specifically prohibited are open and available for outdoor recreational purposes unless otherwise limited, restricted or prohibited by the Governing Board. This provision shall not be construed to impede enforcement of trespass statutes including but not limited to Chapter 810, F.S.

(6) When the District authorizes another government entity to jointly manage public recreation on District lands, this Part ~~Chapter 40E-7, Part V, F.A.C.,~~ is supplemental to the laws, statutes,

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ordinances, and rules of the other government entity. When in conflict with this Part, the laws, statutes, ordinances, and rules of the other government entity supersede this Part, unless otherwise inconsistent with Chapter 373, F.S.~~ governmental entities where cooperative agreements for management of certain public uses of district lands have been approved by the Governing Board~~.

(7) The following District lands are not governed under this Part:~~exempt from the provisions of Chapter 40E-7, Part V, F.A.C:~~

(a) District office buildings, service centers, field stations, pump stations, ~~water control structures~~ and other facilities.

(b) District lands that are under a land management lease or agreement with city, county, state, federal agencies, or private entities to assume total management responsibility, including without limitations Water Conservation Areas 1, 2 and 3.

(c) District lands that are commercially leased lands will not be governed by these rules unless the lease specifically permits public access.

(d) District lands on Tribal Reservations.

(8) Public Use Activities that are authorized by this Part are not authorized on District lands where the District has less than fee interest and where the underlying fee owner has legally restricted or prohibited public access.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.056, 373.1391, 373.1395, 373.1401, 373.59 FS. History–New 5-24-94, Amended 11-12-95, 1-7-97, 11-13-97, 1-1-99, 1-5-03, 7-12-06.

40E-7.521 Definitions.

When used in this P~~p~~art:

(1) "Activity area" means a zone within a management area designated for specific recreational activities.

(2) "Access point" means a designated location or boundary for public access to ~~a~~ District lands.

(3) "Allied purposes" means other related outdoor activities including, but not limited to, frogging, photography, painting, environmental education, and nature study.

(4) "Camping" means to use a vehicle, tent or shelter, or to arrange bedding or both with the intent to stay overnight.

(5) "Designated road" means any road, path, lane, or trail officially designated by name or number for public vehicular travel.

(6) "District lands" means any real property owned, leased, managed, or controlled by ~~in which~~ the District and includes lands or water areas defined in this Part as ~~has an interest and is limited to~~ Management Areas, Stormwater Treatment Areas, Impoundment Areas, Rights of Way, and vacant undesignated lands.

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(7) "Event Authorization" means a permission to access and use District lands in a manner not otherwise provided for or authorized in this P~~p~~art.

~~(8) "Executive Director" means the person who is in the position of Executive Director for the South Florida Water Management District.~~

(8)~~(9)~~ "Facility" or "Structure" means any object placed on District lands which is intended to be permanently attached to the land for which would be considered a fixture under Florida law.

(9)~~(10)~~ "Group campsite" means a designated campsite for campers whose total is eight (8) or more people.

(10)~~(11)~~ "Horse cart" means a non-motorized two- (2) wheeled vehicle pulled by a single saddle animal.

(11)~~(12)~~ "Hunting device" means any mechanical device used to take or attempt to take wildlife or feral hogs.

(12)~~(13)~~ "Idle Speed" means the minimum speed at which a motorized V~~v~~essel is able to move and maintain adequate steerage control.

(13)~~(14)~~ "Impoundment Area" means District lands designated by the Governing Board as an Impoundment Area.

(14)~~(15)~~ "Leased" means the granting of either an exclusive or non-exclusive use of or interest in District lands for a specified period of time.

(15)~~(16)~~ "Outdoor recreational purposes" means natural resource based outdoor recreational activities including, but not limited to, fishing, hunting, horseback riding, bicycling, swimming, camping, hiking, canoeing, boating, airboating, scuba diving, birding, sailing, jogging, picnicking, nature study, water skiing, geocaching, astronomy, and visiting historical, archaeological, scenic or scientific sites.

(16)~~(17)~~ "Management Area" means District lands ~~any Save Our Rivers land, other District land, or combination thereof,~~ designated by the Governing Board as a Management Area. ~~Such lands are managed as single and distinct units for the purpose of restoring, preserving, and protecting the water and related environmental resources of said area, including regulating the public uses thereon.~~

(17)~~(18)~~ "Management Unit" means a portion of any ~~Save Our Rivers land or other~~ District lands within a management area that requires a specific public use regulation due to legal, cultural or environmental factors uniquely affecting the specific unit of land, but which is not applicable to the entire management area.

(18)~~(19)~~ "Natural Resources" mean water, soils, flora, and fauna.

(19) "This Part" means Rules 40E-7.511 through 40E-7.539, F.A.C.

(20) "Personal watercraft" means a V~~v~~essel less than ~~then~~ 16 feet in length which uses an inboard motor powering a water jet pump as its primary source of motorized power and which is designed to be operated by a person sitting, standing, or kneeling on the V~~v~~essel, rather than in the conventional

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manner of sitting or standing inside the V~~v~~essel.

(21) "Primitive Camping" means no amenities are provided.

(22) "Recreation site" means an improved or unimproved site established to facilitate public use of a designated Management Area, Stormwater Treatment Area, Impoundment Area, Right of Way or vacant undesignated land.

(23) "Recreational trail" means saddle animal riding, hiking, canoeing, bicycling, or jogging trails for use by the public.

(24) "Right of Way" or "Rights of Way," for purposes of this Rule, means those lands ~~the Right of Way~~ acquired by the District in fee, easement, or other type of grant, for the purpose of construction, operation, and maintenance of ~~the canals and levees adopted as~~ Works of the District adopted pursuant to Section 373.086, F.S., including, but not limited to, ~~These Right of Way include the~~ canals, levees, water control structures, spoil areas, and access roads, excluding Stormwater Treatment Areas (STAs). ~~maintenance berms and spoil mounds located thereon.~~

(25) "Saddle animal" means any animal used to transport a person or property.

~~(26) "Service animal" means an animal such as a guide dog, signal dog or other animal individually trained to provide assistance to an individual with a disability.~~

(26)~~(27)~~ "Special Use License" means a type of license granted by the District to allow access to and use of certain District lands and facilities as set forth in this Part.

(27)~~(28)~~ "Stormwater Treatment Area" means District lands designated by the Governing Board as a Stormwater Treatment Area.

(28)~~(29)~~ "Vacant undesignated land" means any land owned by the District that is not designated as a Management Area, Stormwater Treatment Area, Impoundment Area, or Rights of Way ~~which land is greater than ten (10) acres~~ and has legal and practical public access.

(29)~~(30)~~ "Vessel" is synonymous with a boat as referenced in s. 1(b), Art. VII of the Florida State Constitution and includes every description of watercraft, barge, and air boat, other than a seaplane on the water, used or capable of being used as a means of transportation on water.

Rulemaking Authority 373.019, 373.044, 373.113, 373.171 FS. Law Implemented 373.016, 373.056, 373.069, 373.0693, 373.073, 373.079, 373.083, 373.103, 373.1391, 373.59 FS. History–New 5-24-94, Amended 11-13-97, 1-1-99, 1-5-03, 7-12-06, 8-28-12.

40E-7.523 Access to District Lands; Closures.

(1) When designated access points are indicated, entry onto and exiting from Management Areas, Stormwater Treatment Areas, and Impoundment Areas by the general public is only authorized at those designated access points.

(2) Entry onto and exiting from Right of Way may be at any legal public access point.

(3) Under ~~District lands or areas within District lands shall be closed to public use under~~ the

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following conditions, specific activities will be prohibited or District lands will be closed:

(a) When necessary during emergency conditions such as floods, severe weather events, or wildfire for public safety and the protection of natural resources. Such closures shall require the approval of the Executive Director~~ and concurrence of the Governing Board. In no event shall such closures exceed forty-five (45) days duration absent reconsideration and approval by the Governing Board~~.

(b) When necessary~~, in the judgment of the Executive Director or the Governing Board,~~ based upon available information at the time, on a temporary, seasonal or permanent basis to protect natural, historic or archaeological resources. ~~Such closures, to the extent they exceed forty-five (45) days, shall require approval by the Governing Board.~~

(c) During certain days, hours or periods of time, when such closure is necessary to implement land management practices such as prescribed burning, vegetation spraying, construction, operations, maintenance, research studies, data collection, resource protection, or as a condition of a contract or permit.

(d) Upon the designation by the Governing Board pursuant to Section 373.6055, F.S., that certain District lands or facilities are "critical infrastructure,"~~,~~ as designated by the Regional Domestic Security Task Force pursuant to applicable law, whereupon such lands or facilities shall be immediately deemed closed for public use without further action required by the Governing Board.

~~(e) Specific uses permitted on District lands may be restricted to certain areas within those lands.~~

(4) Closures of District lands ~~Regulated closures under subsection 40E-7.523(3), F.A.C., temporary, seasonal, or permanent closures of District lands or areas within District lands~~ will be posted at authorized points of entry or at an established boundary within said areas.

(5) The use or occupancy of existing buildings, structures, and related improvements is prohibited unless designated as a public use facility.

(6) Entry into and exiting from Management Areas and Rights of Way from Vessels~~vessel~~ is allowed when these lands are open for public access.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, ~~373.119,~~ 373.1391, 373.59 FS. History–New 5-24-94, Amended 1-1-99, 1-1-01, 7-12-06.

40E-7.525 Use of Vehicles, Vessels, and Aircraft; Navigational Restrictions.

(1) The operation of licensed and unlicensed vehicles, including swamp buggies, tracked vehicles, off-road or off-highway all-terrain vehicles, motorcycles, golf carts, or any other type of unlicensed motorized vehicle, on District lands is prohibited except: ~~on District lands is prohibited with the following exception: District lands are open to licensed vehicles on designated named and numbered roads only unless otherwise authorized.~~

(a) The use of licensed vehicles is authorized on designated roads open to the public;

(b) The use of vehicles is authorized where the District has affirmatively opened a roadway or parking area for a specified public use; or

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(c) The use of vehicles is authorized where authorized by a Special Use License or Event Authorization.

(2) Any person who drives a vehicle on District lands shall drive in a careful and prudent manner, having regard for the width, grade, curves, corners, traffic and all other attendant circumstances, so as not to endanger the life, limb or property of any person.

(3) Motorized vehicle operators shall comply with posted speed limits on District lands and roads. If no speed limit is posted, the speed limit is 20 mph. Speed limits are not applicable to airboats, except when ~~the latter are~~ operated on roads on District lands.

(4) Parking ~~or operating~~ a motor vehicle, or trailer, in an unauthorized location or in a manner blocking roads, levees, maintenance berms, gates, or water control structures is prohibited ~~except where the District has affirmatively opened a roadway or a parking area for such use~~.

(5) Servicing or maintaining vehicles and equipment is prohibited except when in conjunction with authorized recreational activities and allied purposes.

~~(6) The operation of unlicensed swamp buggies, tracked vehicles, off-road or off highway all-terrain vehicles, motorcycles, off-road motorcycles or motocross motorcycles, or any other type of motorized vehicle on District lands is prohibited unless otherwise approved by an Event Authorization.~~

(6)~~(7)~~ Any restrictions to navigation established pursuant to state or federal law, applicable to District lands, are ~~shall be~~ specified in Rules 40E-7~~.538, 40E-7~~.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C., and ~~reasonably~~ identified by posted signage. ~~in the field by appropriate signs.~~

(7)~~(8)~~ No person shall enter or exit District lands from a V~~v~~essel or airboat when public access to such land is closed.

(8)~~(9)~~ No person shall launch an airboat or motorized V~~v~~essel except at designated boat launch facilities. Ramps constructed pursuant to Chapter 40E-6, F.A.C., are ~~shall be~~ deemed to be designated boat launch facilities.

(9)~~(10)~~ No person shall operate an airboat or V~~v~~essel beyond posted signage. ~~District signs.~~

(10)~~(11)~~ The takeoff ~~take-off~~ or landing of either motorized or non-motorized aircraft, including airplanes, helicopters, ultra lights, gliders and hang gliders, is prohibited except in an emergency or for official business.

(11)~~(12)~~ The takeoff ~~take-off~~ or landing of model aircraft is prohibited unless ~~otherwise specified in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C., or~~ approved by an Event Authorization.

Specific Authority 373.044, 373.113 FS. Law Implemented 316.192, 316.1925, 316.655, 373.016, 373.1391, 373.59 FS. History–New 5-24-94, Amended 1-5-03, 7-12-06.

40E-7.526 Equestrian Activities; Use of Saddle Animals.

(1) Equestrian activities are allowed ~~on vacant undesignated lands and~~ on Rights of Way on ~~existing~~ canal maintenance berms and levee tops. On all other District lands, equestrian activities are

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allowed where identified by posted signage on trails, areas, ~~on~~ designated roads, or equestrian campgrounds. ~~trails and established roads where permitted by signs.~~ District lands where ~~requiring~~ a Special Use License is required to conduct ~~for~~ equestrian activities are identified ~~in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C.~~by posted signage.

(2) Users of saddle animals on District owned land must possess proof of negative Coggins test on their person, as required by Chapter 5C-18, F.A.C.

(3) Equestrian activities are prohibited ~~not permitted~~ in wetland areas.

(4) The use of a horse cart as defined by subsection 40E-7.521(10~~12~~), F.A.C., is authorized ~~permitted~~ on Rights of Way on existing canal maintenance berms and levee tops and on~~. On all~~ other District lands as identified by posted signage on trails, areas, designated roads, or equestrian campgrounds.~~, horse carts are prohibited except as authorized in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C.~~

Specific Authority 373.044, 373.113 FS. Law Implemented 316.192, 316.1925, 316.655, 373.016, 373.1391, 373.59 FS. History–New 5-24-94, Amended 1-5-03, 7-12-06.

40E-7.527 Hunting.

(1) Consistent with applicable provisions of local, state, and federal law~~,~~ concerning hunting, ~~or the possession and use of firearms or other types of hunting devices,~~ such as the rules of the Florida Fish and Wildlife Conservation Commission and the United States Department of Interior, Fish and Wildlife Service, hunting, trapping, and the releasing of free-running hunting dogs are prohibited on District lands unless the land is opened as a public hunting area and these uses are authorized in the specific public hunting area regulations.

(2) Public hunting on District lands is regulated, administered and enforced by the Florida Fish and Wildlife Conservation Commission, in cooperation with the District. A ~~If a~~ public hunting area~~,~~ established ~~is permitted~~ on District lands will~~, it shall~~ be posted as prescribed by Chapter 810, F.S. ~~Management Areas currently established as public hunt areas are noticed in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C.~~

(3) Public hunting areas are ~~shall only be~~ established on District lands with approval of the Governing Board, except that Governing Board approval is not required to authorize public hunting on District lands less than 100 acres in size and adjacent to other District lands with established hunting areas. ~~Agreements between the District and the Florida Fish and Wildlife Conservation Commission or the United States Fish and Wildlife Service are considered to be authorizations to remove designated game species.~~

(4) Hunting is prohibited ~~No person shall hunt~~ except during regulated hunting seasons established and managed by the Florida Fish and Wildlife Conservation Commission.

(5) Erecting or maintaining tree stands on District lands more than 10 days before or more than 10 days after any authorized hunting season is prohibited.

(6) Placing, exposing or distributing any grain or other food for wildlife is prohibited.

(7) Hunting from improved roads is prohibited.

(8) Hunting in areas posted as closed to hunting ~~safety zones~~ is prohibited.

~~(9) Hunting beyond posted signs is prohibited.~~

Rulemaking Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.1401, 373.59, 790, 810.09 FS. History–New 5-24-94, Amended 1-1-01, 1-5-03, 7-12-06, 8-28-12.

40E-7.528 Bicycling.

Bicycling is allowed on ~~vacant undesignated lands and on~~ Rights of Way on existing canal maintenance berms and levee tops. On all other District lands, bicycling is allowed except as restricted by posted signage.~~on designated trails and established roads except where restricted by signs. Lands requiring a Specific Use License for bicycling are identified in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C.~~

Specific Authority 373.044, 373.133 FS. Law Implemented 373.016, 373.1391, 373.1401, 373.59, 790, 810.09 FS. History–New 7-12-06.

40E-7.529 Overnight Camping.

(1) Management Areas:

(a) Camping and the use of camping amenities are authorized only within designaged campsites as identified by posted signage.~~Overnight, primitive camping on a first-come, first-serve basis is permitted only at designated campsites and shall require a Special Use License as specified in Rule 40E-7.538, F.A.C.~~

~~(b) Designated campsites and amenities within specific Management Areas shall be reasonably identified in the field by appropriate signs or markers.~~

(b)~~(c)~~ Overnight camping or the presence of camping equipment is ~~shall be~~ limited to eight (8) ~~five (5)~~ consecutive days, or 30 total days per year on ~~per~~ District lands where camping is authorized, unless authorized by Special Use License.

(c) A Special Use License is required:

1. in certain camping areas identified by posted signage; and

2. for group campsites in Management Areas.

(d) Camping is prohibited without ~~Use of group campsites in Management Areas requires~~ a Special Use License where a Special Use License is required as posted by signage.

(2) Overnight camping within Stormwater Treatment Areas, Impoundment Areas, and Rights of Way is prohibited, except that overnight Primitive Camping, or the presence of camping equipment on the Florida National Scenic Trail is authorized for one night only per site and when in possession of a Special Use License.

~~(a) Overnight, primitive camping is permitted only along the Florida National Scenic Trail when in possession of a Special Use License.~~

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~~(b) Overnight camping or the presence of camping equipment shall be limited to one (1) night unless authorized by a Special Use License.~~

(3) Camping within vacant undesignated lands is prohibited unless authorized by an Event Authorization.

(4)~~(3)~~ No person shall install, erect, or maintain any unauthorized camp, building, structure, shelter, residence or sign.

(5) Between the hours of 11:00 p.m. and 7:00 a.m., loud music, barking dogs, or any other activities causing excessive noise are prohibited in camping areas. Generator use in camping areas is allowed except as restricted by posted signage.

(6) Pets must be leashed and under control within camping areas.

(7) Within camping areas, pet and horse waste must be disposed of properly. Horse manure must be disposed in designated manure disposal areas if provided.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 5-24-94, Amended 11-13-97, 1-1-99, 1-5-03, 7-12-06.

40E-7.530 Trapping.

Trapping is prohibited on all District lands except where authorized by an Event Authorization, permit, or agreement ~~which shall be~~ limited to scientific study or removal of nuisance species. ~~Trapping on District land is regulated, administered and enforced by the Florida Fish and Wildlife Conservation Commission.~~

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 7-12-06.

40E-7.532 Operating Hours.

District lands will ~~shall~~ be open to public use twenty-four (24) hours a day, seven (7) days a week, or during the hours and days designated for specific areas identified by posted signage, consistent with Rules 40E-7.5382, 40E-7.5383, and 40E-7.5384, F.A.C., except during authorized closures as set forth in subsection 40E-7.523(3), F.A.C.~~, above or unless otherwise specified in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C.~~

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.119, 373.1391, 373.59 FS. History–New 5-24-94, Amended 7-12-06.

40E-7.534 Special Use Licenses.

(1) In order to maximize opportunities for public recreation on District lands and provide public access where it might otherwise be prohibited, the District issues Special Use Licenses. A Special Use License~~, issued by the District's Land Stewardship Division or its authorized agents or contractors at no cost to the public, shall be~~ is required to engage in the following ~~in select~~ activities on District

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lands: ~~identified by the Governing Board, when determined necessary to protect the natural resources of said areas, prevent overuse of facilities, or to avoid conflicts between users. District lands with Special Use License requirements, including the daily quota for Special Use Licenses for each District land, if any, shall be specified in Rules 40E-7.538, 40E-7.5381, 40E-7.5382, 40E-7.5383 and 40E-7.5384, F.A.C.~~

(a) to obtain vehicular access to District lands through locked gates as identified by posted signage;

(b) to reserve campsites in certain areas with limited capacity as identified by posted signage;

(c) for equestrian use in certain areas with limited capacity as identified by posted signage; or

(d) for persons with a mobility impairment requesting to use a vehicle in areas prohibited under Rule 40E-7.525, F.A.C., or requesting other mobility-impaired accommodations.

(2) The District will issue Special Use Licenses on a first-come, first-served basis when the area and facilities can accommodate the requested use and such use is consistent with the protection of natural resources.

(3)~~(2)~~ A Special Use ~~Application and~~ License holder and all participants must comply with all conditions of the ~~shall be submitted to the District on Form #0830. Upon receipt of a properly completed~~ Special Use ~~Application and~~ License. ~~Form #0830, the District's Land Stewardship Division shall issue Special Use Licenses on a first come first served basis until the daily quota established by the District for that activity is reached.~~

~~(3)Special Use Licenses shall only be valid for the dates shown on the License and must be in the possession of the applicant while on the identified District land. If the applicant is a group, then the license must be in the possession of the designated group leader.~~

(4) Special Use License holders must retain the license in their possession at all times when using the area for which the license applies. If the Licensee is a group, the license must be in the possession of the group leader.

(5) If the Licensee is using a vehicle, the license reference number must be displayed on the driver's side of the dashboard of the Licensee's and any participant's vehicle.

(6)~~(4)~~ Persons requesting ~~wishing to obtain~~ a Special Use License, when required by the District, may apply in person, call, or write to request a copy of Special Use Application and License Form #0830 from the District at the following:

(a) Land Resources Bureau~~Stewardship Division~~
South Florida Water Management District
Post Office Box 24680 (mailing)
Building B-1 3301 Gun Club Road (in person)
West Palm Beach, FL 33416-4680
Telephone: (561)686-8800 or Florida WATS 1(800)432-2045, or

(b) The District's website: www.sfwmd.gov/recreation ~~From the applicable service center as set forth in the special provisions for the specific District land, or~~

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~~(c) From the District's website: www.sfwmd.gov/org/clm/lsd/public.html.~~

~~(5) In the event the daily quota has been reached, the District shall notify the Special Use License applicant that the District intends to deny the application, and the applicant may request further consideration by the Governing Board.~~

(7)~~(6)~~ The District may ~~Executive Director, or his designee, shall~~ revoke a Special Use License if the licensee violates any provision~~s~~ of this Part ~~rule~~ or the Special Use License.

~~(7) Special Use Licenses shall be issued in accordance with the provisions of this section, for the purpose of providing mobility impaired persons the opportunity to use motorized vehicles to access portions of the District lands not otherwise open to motorized vehicles. Licenses for this purpose will be issued upon request, including proof of mobility impairment, as long as the requested use will not adversely impact the resource, impair the safety and welfare of the user, interfere with the reasonable use by others, or result in substantial financial obligations by the District to accommodate the user. Mobility impaired hunting permits are issued by the Florida Fish and Wildlife Conservation Commission.~~

~~(8) Any person prohibited from entering onto District land by a court order shall not be eligible to apply for a Special Use License, during the prohibition period.~~

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 5-24-94, Amended 1-1-99, 1-1-01, 1-5-03, 7-12-06.

40E-7.535 Event Authorization.

(1) In order to provide opportunities for group activities on ~~A person or entity shall apply for an Event Authorization, at no cost to the applicant, to use~~ District lands in a manner not otherwise provided ~~for~~ or authorized in this Part, the District issues Event Authorizations~~part~~.

(2) To receive an Event Authorization, a person or entity ~~the applicant~~ must provide reasonable assurance that:

(a) The requested use will not involve the permanent alteration of any District lands or the permanent placement of any structure on District lands;

(b) The requested use is resource-based;

(c) The requested use is consistent with the management plan for the District lands involved;

(d) The requested use will not harm the natural ~~environmental~~resources of the District lands;

(e) The requested use will not cause unreasonable expense to the District;

(f) The requested use will not create a substantial risk of liability that is not mitigated pursuant to subsection (4)(b) ~~to the District~~;

(g) The requested use will not harm any dam, impoundment, works, water control structure, road, or District-owned facilities or equipment;

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(h) The requested use will not interfere with District water management, leased, or authorized uses of the land; and

(i) The requested use will not interfere with any other use allowed by this P~~p~~art.

(3) ~~The District shall impose upon any~~ Event Authorizations issued pursuant to this P~~p~~art will include such reasonable conditions as are necessary to assure that the use or activity authorized will meet the criteria set forth in this P~~p~~art.

~~(4) The Governing Board delegates to the Executive Director or their Designee the authority to issue or revoke Event Authorizations pursuant to this part.~~

(4)~~(5)~~ A person or entity may request ~~apply for~~ an Event Authorization according to the following procedure:

(a) Submit a written request to:

South Florida Water Management District
Land Resources Bureau~~Stewardship Division~~
P.O. Box 24680
West Palm Beach, Florida 33416-4680

(b) If the requested use will create a substantial risk of liability to the District, the person or entity ~~applicant~~ must mitigate the substantial risk of liability by:

1. Providing proof of liability and property damage insurance naming the District as an insured in an amount sufficient and determined by the District to cover the cost of the potential liability; and

2. Providing waivers or releases of liability sufficient to eliminate the potential liability.

~~(c) If the requested use satisfies all of the criteria set forth in this section and is not otherwise inconsistent with District Policy, the Executive Director shall issue the Event Authorization.~~

(5)~~(6)~~ A person or entity receiving an Event Authorization from the District must have the Event Authorization in their possession at all times while on District lands.

(6)~~(7)~~ The District may revoke ~~In the event the holder of~~ an Event Authorization if the holder violates its ~~the~~ terms or ~~of the authorization,~~ engages in an activity ~~a use~~ not authorized ~~permitted~~ by the ~~authorization, or the authorized activity is no longer consistent with District policy, the~~ Event Authorization ~~shall be subject to revocation by the Executive Director or designee~~.

(7) An Event Authorization holder and all participants must comply with all conditions of the Event Authorization.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 7-12-06.

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40E-7.537 General Prohibitions.

The following are ~~shall be~~ prohibited on all District lands unless otherwise specified:

(1) Discharging firecrackers, rockets, or any other fireworks.

(2) Destroying, defacing, or removing any natural resource or native plant, including the felling of dead trees.

(3) Destroying, injuring, defacing, vandalizing, removing, or disturbing in any manner any public building, tower, recorder, gage, walkway, platform, well, sign, gate, fence, equipment, monument, marker, or other structure or improvement.

(4) Destroying or damaging scientific study plots, photo points, transect lines, benchmarks or survey monuments, or survey markers.

(5) Trespassing on, operating, vandalizing, or interfering with the operation of any water control structures.

(6) Discharging or disposing of oil, gasoline, paint, thinner, pesticides, fertilizer, explosives or other pollutants, chemicals and wastes.

(7) Cleaning or disposing of fish, game, animals, or food at: potable watering stations, ~~in~~ rest rooms, ~~at~~ boat ramps, camping areas, levees, or trailheads;~~,~~ or washing clothing or articles, or washing, cleaning or servicing of vehicles; except where facilities for such activities have been provided by the District or other management entity.

(8) Using refuse containers or other refuse facilities to dispose ~~for disposal~~ of household or commercial garbage ~~or trash~~.

(9) Building or maintaining a fire in a place other than a grill, fireplace, or fire ring provided by the District or other authorized management agency for such purpose. This prohibition does not apply to portable camp stoves or grills provided by the user.

(10) Commercial activity by a ~~for-profit~~ person or entity without a written ~~contractual~~ agreement with the District.

(11) Conducting an activity on District lands that is prohibited, restricted, or regulated by posted signage.~~where prohibited by posted signs where such activity is regulated by the posting of signs under Chapter 40E-7, Part V, F.A.C.~~

(12) Installing or maintaining unauthorized signs.

(13) Pets that are not under physical restraint.~~with the exception of service animals and leashed animals on Management Areas.~~

(14) The abandonment of personal property.

(15) Using a horse trough for anything other than watering horses.

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Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 5-24-94, Amended 1-1-99, 1-5-03, 7-12-06.

40E-7.538 Special Provisions for Management Areas of the District Open to the Public.

~~(1) Rough Island North and South and Johnson Island Units.~~

~~(a) Seasonal public access to the Rough Island North limited access area is permitted from August 16 to February 14 only between the hours of 6:00 a.m. to 9:00 p.m., via the airboat gate. Users of this area must be in possession of a Special Use License.~~

~~(b) A quota of fifty (50) annual Special Use Licenses has been established for this area. Annual Special Use Licenses are available on June 1st of each year from the District's Upper Lakes Region land manager at the Orlando Service Center.~~

~~(c) Hunting is permitted in the Rough Island North limited access area only on those dates during seasonal public access period referenced in paragraph 40E-7.538(1)(a), F.A.C., which coincide with hunting seasons established by the Florida Fish and Wildlife Conservation Commission.~~

~~(d) Any person who has been issued an annual Special Use License for the limited use area shall have the annual Special Use License in possession while in the limited use area.~~

~~(e) Special Use License holders shall not operate any vessel not registered with the District in the limited access area without first notifying the District.~~

~~(f) The number of hunters that can accompany an annual Special Use License holder to hunt in the limited access area is limited to three.~~

~~(g) The annual Special Use License may be transferred from one registered airboat or watercraft to another airboat or watercraft after notifying the Upper Lakes Region land manager at the Orlando Service Center. The Special Use License holder may not operate that vessel in the limited access area until after such notification has been made.~~

~~(h) Any person convicted of violating a federal, District, state or local fish and wildlife law, statute, rule or ordinance within the previous 3 years shall not be eligible for a Special Use License to enter the Rough Island North limited use area.~~

~~(2) Lake Marion Creek Management Area in Polk County. Camping is permitted only at designated campsites when in possession of a Special Use License.~~

(1)~~(3)~~ Gardner-Cobb Marsh Management Unit in Osceola County: ~~.~~

(a) Persons may only enter and exit the Management Unit ~~management area~~ from Lake Cypress, Lake Hatchineha, Lake Kissimmee, and Canal 36.

~~(b) Airboating is prohibited beyond the restricted area signs, on or across improved roadways or within hammock areas, except that airboats may cross the main grade at the designated crossing points.~~

~~(c) Hunting in Ike Hammock is prohibited.~~

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~~(4) Lower Kissimmee River Management Area located in Polk, Osceola, Highlands, Glades, and Okeechobee Counties.~~

~~(a) Camping is permitted only at designated campsites when in the possession of a Special Use License.~~

~~(b) The use or possession of saddle animals is permitted when in the possession of a Special Use License.~~

~~(c) The use or possession of saddle animals and camping at designated campsites is permitted for both uses when in possession of a Special Use License permitting both uses.~~

(2)~~(5)~~ DuPuis Management Area located in Martin and Palm Beach Counties: ~~.~~

~~(a) The use or possession of saddle animals and horse carts is restricted to the equestrian center, designated equestrian trails, and named or numbered roads.~~

~~(b) The use of off road vehicles is restricted to the designated disabled hunt in accordance with Florida Fish and Wildlife Conservation Commission regulations.~~

~~(c) No dogs are allowed on DuPuis except as authorized by the Florida Fish and Wildlife Conservation Commission.~~

(a)~~(d)~~ Camping at the family campsite is limited to:

1. Only tent camping or tent popup camping; and ~~is allowed.~~

2. A maximum of 8 people and 2 vehicles ~~are allowed~~ per campsite.

~~3. Generators are not allowed.~~

~~(6) CREW Marsh Management Area located in Lee and Collier Counties.~~

~~(a) Persons may enter and exit the Management Area each day between sunrise and sunset from any established trailhead off State Road 850 (Corkscrew Road).~~

~~(b) Overnight camping is permitted at the designated primitive campsite when in the possession of a Special Use License (See Rule 40E-7.534, F.A.C.) or as authorized by Florida Fish and Wildlife Conservation Commission. A quota of twenty (20) persons per night has been established by the District for use of the designated campsites.~~

~~(7) Bird Rookery Swamp Management Area located in Collier County. Persons may enter the Management Area on foot at the west end of N.W. 43 Avenue, Collier County.~~

~~(8) Flint Pen Strand Management Area located in Lee County. Persons may enter and exit the Management Area on foot from Poormans Pass.~~

~~(9) Nicodemus Slough Management Area located in Glades County.~~

~~(a) Persons may enter the Management Area each day between sunrise and sunset; nighttime activities other than those specified in paragraph 40E-7.538(9)(c), F.A.C., below are prohibited.~~

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~~(b) Overnight camping is prohibited.~~

~~(c) Airboating and frogging are permitted on the Management Area. Airboaters operating on the Management Area must be in possession of a Special Use License. A quota of five airboats per day has been established by the District. A copy of the Special Use License must be displayed in a readily visible location within the licensee's vehicle while parked on the Management Area.~~

~~(d) The use or possession of a saddle animal is prohibited.~~

Rulemaking Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 1-1-01, Amended 1-5-03, 7-12-06, 8-28-12.

40E-7.5381 Special Provisions for Rights of Way of the District.

Unless authorized under Chapter 40E-6, F.A.C., the ~~The~~ following, in addition to the other prohibitions and restrictions in this Part, are ~~shall be~~ prohibited on all ~~Right of Way of the~~ District Rights of Way:~~;~~ ~~which include rights-of-way, canals, levees, maintenance berms, and spoil mounds:~~

(1) Hunting.

~~(2) Discharging firecrackers, rockets, or any other fireworks.~~

~~(3) Operating a motor vehicle including licensed and registered motor vehicles as well as off highway and all terrain vehicles except where the District has affirmatively opened a roadway or a parking area for public use.~~

~~(4) Operating any all terrain vehicles or off highway vehicles, or amphibious vehicles.~~

~~(5) Parking vehicles or trailers in such a manner as to block access roads, levees, maintenance berms, gates or water control structures.~~

(2)~~(6)~~ Anchoring or tying a Vessel, including personal ~~vessel or~~ watercraft, to a road, levee, maintenance berm, structure, fence, tree, post, sign, gauge, data recorder, weed barrier, or boat barrier.

(3)~~(7)~~ Vessels being occupied or used as a temporary or permanent residence or business.

(4)~~(8)~~ Operating or mooring a Vessel, including personal ~~vessel or~~ watercraft, in such a manner as to impede the District's ability to construct, operate and maintain its structures.

(5)~~(9)~~ Pets that are not under physical restraint or~~, with the exception of service animals, leashed animals and animals otherwise~~ under the effective control of the owner.

~~(10) Installing, erecting or maintaining a temporary or permanent place of residence including, but not limited to, a camp, trailer, or shelter. Overnight primitive camping along the Florida National Scenic Trail is permitted if camper possesses a Special Use License on their person.~~

~~(11) The abandonment of personal or commercial property.~~

Rulemaking Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 7-12-06, Amended 8-28-12.

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40E-7.5382 Special Provisions for Vacant Undesignated District Lands Open to the Public.

(1) In addition to the other prohibitions and restrictions in this Part, the following are prohibited:~~The following shall be prohibited on vacant undesignated lands, as that term is defined in subsection 40E-7.521(30), F.A.C.~~

~~(1) Hunting is only authorized in those vacant undesignated lands which have been opened for public hunting as provided in Rule 40E-7.525, F.A.C., if any.~~

~~(2) Camping.~~

(a)~~(3)~~ Motorized vessels.

~~(4) Pets with the exception of service animals, leashed animals, and animals otherwise under the effective control of the owner.~~

(b)~~(5)~~ Public access between 1/2 hour after sunset to 1/2 hour before sunrise.

(2) Pets must be under physical restraint at all times.

Rulemaking Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 7-12-06, Amended 8-28-12.

40E-7.5383 Special Provisions for Stormwater Treatment Areas (STAs~~STA's~~) of the District Open to the Public.

Persons may only enter and exit Stormwater Treatment Areas at designated public access points during the hours and days, and in areas as identified ~~designated~~ by posted signage ~~signs~~.

(1) In addition to the other prohibitions and restrictions in this Part, the ~~The~~ following are prohibited in all Stormwater Treatment Areas:

~~(a) Pets, with the exception of service animals.~~

~~(b) Frogging.~~

(a)~~(c)~~ Fishing or frogging in areas closed to fishing or frogging within the STAs~~STA's~~ as restricted by posted signage ~~by sign~~.

(b)~~(d)~~ Motorized and non-motorized Vessels~~vessel~~ and boat trailers in interior waters, with the exception of those areas identified by posted signage.

(c)~~(e)~~ Entering interior waters.

~~(2) Hunting is only authorized in those STA's which have been opened for public hunting in accordance with Rule 40E-7.525, F.A.C.~~

(2)~~(3)~~ Vessels and V~~v~~essel operation are authorized ~~is permitted~~ only on STA exterior canals under the following limitations:

(a) Vessel and V~~v~~essel operation limitations are ~~shall be~~ posted by signage.

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(b) Vessel and V~~v~~essel operation limitations are ~~shall be~~ made specific to each Stormwater Treatment Area exterior canal for: resource protection; protection of District structures, equipment, and levees; and operation and maintenance of the STA.

(c) Vessels are ~~shall be~~ limited as motorized or non-motorized, and by engine horsepower, engine type, and V~~v~~essel type.

(d) Vessel operation is ~~shall be~~ limited by area, water depth, by distance from District structures, equipment, or levees, and by speed.

(3)~~(4)~~ The following V~~v~~essel and V~~v~~essel operations are prohibited in Stormwater Treatment Area exterior canals:

(a) Personal watercraft.

(b) Airboats.

(c) Vessel operation greater than Idle Speed within 300 feet of any District, structure or equipment.

(d) Vessel operation which causes damage to plants, injures animals or fish, or other natural ~~environmental~~ resources.

(e) Vessel operation within an area delineated by V~~v~~essel barriers.

(f) Anchoring or tying a V~~v~~essel or watercraft to a road, levee, maintenance berm, structure, fence, tree, post, sign, gauge, data recorder, weed barrier, or V~~v~~essel barrier.

(4) Pets must be under physical restraint at all times and are only allowed in areas identified by posted signage.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.4592(4)(a), 373.59 FS. History–New 7-12-06.

40E-7.5384 Special Provisions for Impoundment Areas of the District Open to the Public.

Persons may only enter and exit Impoundment Areas at designated public access points during the hours and days, and in areas as identified ~~designated~~ by posted signage~~signs~~.

(1) The following are prohibited in all Impoundment Areas:

~~(a) Pets with the exception of service animals, leashed animals, and animals otherwise under the effective control of the owner.~~

~~(b) Frogging.~~

(a)~~(c)~~ Fishing or frogging in areas closed to fishing or frogging within the Impoundment Areas identified by ~~as~~ posted signage~~by sign~~.

(b)~~(d)~~ Swimming, surfing, snorkeling, scuba diving or use of other underwater breathing apparatus.

(c)~~(e)~~ Water skiing, tubing, wake boarding or similar in water sports.

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~~(2) Hunting is only authorized in those Impoundments Areas which have been opened for the public hunting in accordance with Rule 40E-7.525, F.A.C., if any.~~

(2)~~(3)~~ Vessels and V~~v~~essel operation is authorized ~~permitted~~ on Impoundment Areas under the following limitations:

(a) Vessel and V~~v~~essel operation limitations are ~~shall be~~ posted by signage.

(b) Vessel and V~~v~~essel operation limitations are ~~shall be~~ made specific to each Impoundment Area for: resource protection; protection of District structures, equipment, and levees; and operation and maintenance of the Impoundment Area.

(c) Vessels are ~~shall be~~ limited as motorized or non-motorized, and by engine horsepower, engine type, and V~~v~~essel type.

(d) Airboat operation is ~~shall be~~ limited to designated areas.

(e) Vessel operation is ~~shall be~~ limited by area, water depth, by distance from District structures, equipment, or levees, and by speed.

(3)~~(4)~~ The following V~~v~~essels and V~~v~~essel operations are prohibited in Impoundments:

(a) Personal watercraft.

(b) Vessel operation greater than Idle Speed within 300 feet of any District, structure or equipment.

(c) Vessel operation which causes damage to plants, injures animals or fish, or other natural ~~environmental~~ resources.

(d) Vessel operation within an area delineated by V~~v~~essel barriers.

(e) Anchoring or tying a V~~v~~essel or watercraft to a road, levee, maintenance berm, structure, fence, tree, post, sign, gauge, data recorder, weed barrier or V~~v~~essel barrier.

(4) Pets must be under physical restraint at all times and are only allowed in areas identified by posted signage.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.1391, 373.59 FS. History–New 7-12-06.

40E-7.539 Penalties.

(1) Pursuant to Section 373.609, F.S., it shall be the duty of every state and county attorney, sheriff, police officer, and the appropriate city and county official to assist the District, and their agents, in the enforcement of the provisions of this rule.

(2) Any person who violates any provision of this rule is subject to eviction from the premises and/or arrest and prosecution for a second-degree misdemeanor, punishable as provided in Section 775.082 or 775.083, F.S.

(3) The penalties identified in these rules do not supersede other remedies available to the District

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at law and/or in equity.

Specific Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.129, 373.1391, 373.59, 373.609, 373.613 FS. History–New 5-24-94, Amended 1-5-03, 7-12-06.

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M E M O R A N D U M

TO: Governing Board Members

FROM: Karen Estock, Division Director

DATE: September 12, 2013

SUBJECT: Authorize Notice of Proposed Rulemaking-Public Use Rule

Background:
On March 14, 2013, the Governing Board authorized staff to initiate rule development for the Chapter 40E-7, F.A.C., Public Use Rule as it pertains to the rules and regulations associated with public access and nature-based recreation on District lands. District staff have reviewed the Public Use Rule and identified rules in need of clarification, modification, or updating. Staff conducted a public workshop on May 13, 2013 to receive public input on the rule and to discuss rule changes proposed by staff. Public comments were also solicited and received through direct e-mail notification and the District's website. The draft rule along with received public comment was presented at the June 17, 2013 Water Resources Advisory Commission- Recreation Issues Workshop (WRAC-RIW) where additional public comment was provided. Consensus was received from WRAC-RIW participants for staff to move forward with the proposed rule changes with agreed upon modifications. A status update on the Public Use Rule development process was presented at the September 5, 2013 WRAC meeting. The proposed rule will be noticed and published in the September FAR and provided for review to the Joint Administrative Procedures Committee (JAPC) and the Office of Fiscal Accountability and Regulatory Reform (OFARR) in accordance with Executive Order 11-211.

How this helps meet the District's 10-year Strategic Plan:
Proposed Rulemaking to amend existing public use rules will provide for continued public recreation on District lands consistent with state law and the protection of natural resources.

Funding Source:
This item does not require the expenditure of additional District funds.

This Board item impacts what areas of the District, both resource areas and geography:
This item impacts the Land Resources Bureau and all District lands open to the public for recreational purposes under the Chapter 40E-7, F.A.C. Public Use Rule.

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What concerns could this Board item raise?
Notice of Proposed Rulemaking is necessary to update the current Public Use Rule which will require staff time to be reallocated from other duties to work on the requested rule development process.

Why should the Governing Board approve this item?
Publication of Notice of Proposed Rulemaking is required in order to make necessary changes to the existing Public Use Rule.

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M E M O R A N D U M

TO: Governing Board Members

FROM: Karen Estock, Division Director

DATE: September 12, 2013

SUBJECT: Cocohatchee Access Easement Boat Ramp Agreement

Agenda Item Description
In anticipation of legal cost and expenses exceeding the disputed amount in the event the District contests this claim through litigation, it is recommended that the District settle the claim for $10,000.00 upon receipt of a release of liability and permanent easement interest that would allow the existing access boat ramp to remain in use at its current location.

Background
Collier County was issued Right of Way Permit No. 10911 to construct various facilities within the right of way including a District boat ramp east of the Cypress Way E bridge. According to Collier County staff, the referenced boat ramp location was modified in the field in consultation with Field Station management at the time to the current location which is partially on property owned by the claimant (see attached map). The District's Field Station has since been using the boat ramp, currently the only available access point to this reach of the canal, to maintain the canal. The District did not obtain the claimant's consent to use the subject property, which was necessary since the subject boat ramp is located on the claimant's property. The claimant is in the process of converting the strip of land partially occupied by the boat ramp into a park and has agreed to allow the boat ramp to remain permanently as part of the settlement agreement.

Core Mission and Strategic Priorities
The District's Big Cypress Field Station needs this boat ramp, currently the only available access point to this reach of the canal, to maintain the canal.

Funding Source
The required funding ($10,000) will come from the BCB Field Station FY2014 Operating Budget, subject to Governing Board Approval of the FY 2014 Budget.

Staff Recommendation
Staff recommends the District settle the claim for $10,000.00 upon receipt of a release of liability and permanent easement interest.

If you have any questions, please call Karen Estock at ext. 6282 or Jorge Patino at ext. 6175.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0903

A Resolution of the Governing Board of the South Florida Water Management District authorizing payment of $10,000 from Big Cypress Basin Field Station FY14 operating budget for settlement of claim made by Wallace Homes of Southwest Florida, Inc., a Florida Corporation, against South Florida Water Management District regarding alleged unauthorized construction and use of an access boat ramp located west of the Cypress Way E Bridge on the Cocohatchee West Canal, Collier County and acquisition of a boat ramp easement; subject to Governing Board approval of the FY14 budget; providing an effective date. (OMC, Jorge Patino, ext. 6175)

WHEREAS, Collier County was issued Right of Way Permit No. 10911 to construct various facilities within the right of way including a District boat ramp east of the Cypress Way E bridge. According to Collier County staff, the referenced boat ramp location was modified in the field in consultation with Field Station management at the time to the current location which is partially on property owned by the claimant (see attached map). The District's Field Station has since been using the boat ramp, currently the only available access point to this reach of the canal, to maintain the canal. The District did not obtain the claimant's consent to use the subject property, which was necessary since the subject boat ramp is located on the claimant's property. The claimant is in the process of converting the strip of land partially occupied by the boat ramp into a park and has agreed to allow the boat ramp to remain permanently as part of the settlement agreement.

WHEREAS, The Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest that, in anticipation of legal cost and expenses exceeding the disputed amount in the event the District contests this claim through litigation, the District settle the claim for $10,000.00 upon receipt of a release of liability and permanent easement interest that would allow the existing access boat ramp to remain in use at its current location; now therefore

BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves settlement of the claim for $10,000.00 from the BCB Field Station Operating Budget, upon receipt of a release of liability and permanent easement interest that would allow the existing access boat ramp to remain in use at its current location.

Section 2. Approval is subject to Governing Board approval of the FY2014 budget.

Section 3. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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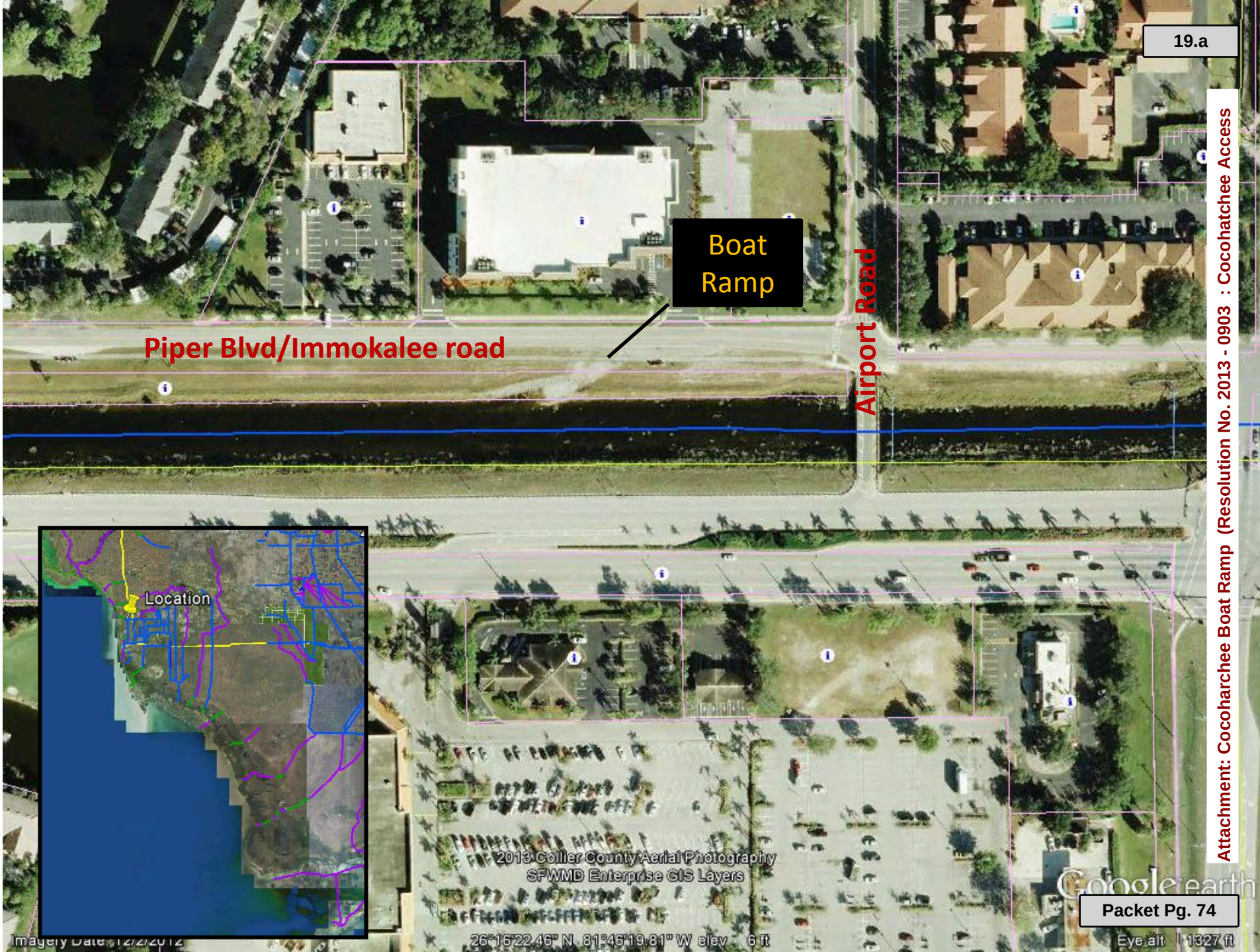

Attachment: Cocoharchee Boat Ramp (Resolution No. 2013 - 0903 : Cocohatchee Access

M E M O R A N D U M

TO: Governing Board Members

FROM: Jeff Kivett, Division Director

DATE: September 12, 2013

SUBJECT: EOC Chiller - Contract Number 4600002936

Agenda Item Description
Project includes the installation of a new Trane 156 ton chiller and its associated chilled water piping and the replacement of two existing air cooled condensing units (CAC-1 and CAC-2) and replacement of two existing computer room air conditioning units (CRAC-1 and CRAC-2) with new Liebert condensers and conditioning units. In addition, the existing chiller/condenser enclosure structure will require modifications which include steel and reinforced concrete to accommodate the new larger equipment.

Background
Project is located on District Headquarters and is adjacent to the Emergency Operations Center to the east. The District's current air conditioning system does not have sufficient capacity to support the District's Emergency Operations Center and Data Center or have a redundant source for air conditioning needs. The EOC Data Center's goal is to become a Tier 4 data center. Therefore, all components need to be fault tolerant including the Chiller. This project provides a new chiller and modifications to the existing chilled water piping which will have sufficient capacity to provide chilled water to the three existing Trane air handlers, three Liebert control room air conditioning units, two UPS room air conditioning units as well as provide additional capacity to accommodate future CRAC units needed by the District. Two of the existing condensing units (CAC-1 and CAC-2) as well as two existing computer room air conditioning units (CRAC-1 and CRAC-2) will also be replaced in this project. The existing and proposed replacement condensers will provide the required redundant source for the CRAC unit's air conditioning needs. The existing 70 ton Chiller will be left in place as a partial chilled water back-up.

Core Mission and Strategic Priorities
This Project supports the Emergency Operations Center and Data Center. The EOC is staffed and operated 24 hours a day, 365 days a year by the Operation Control Center (OCC) Staff and the District's Security Department. Additionally, during major weather events, it is operated by additional support Staff of approximately 50 people. The District's current air conditioning system does not have sufficient capacity to support the District's Emergency Operations Center (EOC) and Data Center or have a redundant source for air conditioning needs. The EOC Data Center's goal is to become a Tier 4 data center. Therefore, all components need to be fault-tolerant including the chiller.

Funding Source
The lowest responsive and responsible bidder is Overland Construction Co., Inc. with a total amount of $879,800.00 for which ad valorem funds of $75,000.25 is budgeted in FY13 and the remaining amount is subject to Governing Board approval of the FY14 budget.

Staff Recommendation
Staff recommends approval of this project. The present air conditioning system does not have enough capacity to efficiently cool the Data Center, Control Room and the Emergency Operation center. Currently the redundant cooling systems are serving as primary cooling units. With the addition of the new UPS units and the future planned growth of the Data Center, the existing cooling systems will not meet the cooling demands. The new air-cooled chiller and associated systems will efficiently provide the capacity necessary to ensure the District's Emergency Response Mission as well as provide the necessary capacity required for the Data Center. Delay of this project could impact the District's ability to provide Emergency Response.

If you have any questions, please call John Mitnik, P.E., Bureau/Office Chief at ext. 2679.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0904

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a 319 day contract with Overland Construction, Inc., the lowest responsive and responsible bidder, for the Emergency Operations and Data Center HVAC improvements, in the amount of $879,800.00, for which ad valorem funds of $75,000.25 is budgeted in FY13 and the remaining amount is subject to Governing Board approval of the FY14 Budget; providing an effective date. (Contract Number 4600002936) (Denise Palmatier, ext. 6758)

WHEREAS, This project supports the District's Mission of Emergency Response and the addition of the new chiller and replacement of the condensers is recommended for the continued operational integrity and efficiency of the Emergency Operations Center and Data Centers; and

WHEREAS, The existing condensers and computer room air conditioning units have met their useful lives. The addition of the new chiller, condensers, and conditioning units will provide enough capacity to efficiently cool the Data Center, Control Room and the Emergency Operation center;

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of Contract Number 4600002936 with Overland Construction, Inc.

Section 2. This project supports the District mission of Emergency Operations.

Section 3. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Karen Estock, Division Director

DATE: September 12, 2013

SUBJECT: Ft. Lauderdale Slope Mowing - Contract Number 4600002935

Agenda Item Description
A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a three-year contract with two (2) one-year renewal options with Toler Enterprises, Inc., the lowest responsive and responsible bidder for Slope Mowing Services in the Fort Lauderdale Field Station area, in the amount of $486,000 for three (3) years, of which $162,000 in ad valorem funds are budgeted in FY14 and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date.

Background
Maintenance of the Right of Ways is required to ensure that vegetation is controlled at a manageable height and will uphold the operational integrity of the District's flood control system. This project for the Fort Lauderdale Field Station area, will contract approximately 1,080 acres to be mowed on an annual basis. The lowest responsive and responsible bidder is Toler Enterprises, Inc., at $150 per acre. Since this is a work order contract, the amount of acres to be mowed will fluctuate, based on the weather, budget, and construction projects in these areas.

Core Mission and Strategic Priorities
Mowing the District's Right of Ways will reduce and control vegetative growth along canal banks which can impede operations, inspections and access to the District's water control facility.

Funding Source
This is a three-year contract with two (2) one-year renewal options, in the amount of $486,000 for which $162,000 in ad valorem funds are budgeted in FY14 and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets.

Staff Recommendation
Staff recommends authorizing the approval of Contract Number 4600002935, as this item supports continual operations and maintenance of the District canal system. If not mowed and maintained, these areas would become a potential hazard to the public as well as District employees.

If you have any questions, please call Karen A. Estock at ext. 6282 or Mike Gallagher at ext. 2124.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0905

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a three-year contract with two (2) one-year renewal options with Toler Enterprises, Inc., the lowest responsive and responsible bidder, for Slope Mowing Services in the Fort Lauderdale Field Station area, in the amount of $486,000 for three years, of which $162,000 in ad valorem funds are budgeted in FY14 and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date. (OMC, Karen Estock, ext. 6282)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a three-year contract with two (2) one-year renewal options with Toler Enterprises, Inc., the lowest responsive and responsible bidder, for Slope Mowing Services in the Fort Lauderdale Field Station area, in the amount of $486,000 for three years, of which $162,000 in ad valorem funds are budgeted in FY14 and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of Contract Number 4600002935 with Toler Enterprises, Inc.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

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Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Karen Estock, Division Director

DATE: September 12, 2013

SUBJECT: Approve a Resolution Authorizing Payment in Lieu of Taxes (PILT) for Okeechobee County BOCC

Background: Pursuant to Ch. 373.59(10), F.S., the District is obligated to process and provide payment in lieu of taxes (PILT) to taxing authorities located within eligible counties when property has been acquired and removed from the tax roll. In accordance to the statutes, the local taxing authority submits an application with supporting documentation which enables District staff to verify actual ad valorem property tax loss to the taxing authority, package the application and submit to the Department of Revenue for certification.

How this helps meet the District's Mission? Authorization of PILT enables the District to comply with Florida Statutes.

Funding Source: The PILT payment is budgeted in the Water Management Lands Trust Fund supported by lease revenue.

This Board item impacts what areas of the District, both organization and geography:
The Operations, Maintenance and Construction Division coordinates the PILT process for eligible counties within its jurisdiction which includes Charlotte, Glades, Hendry, Highlands, Martin, Monroe and Okeechobee. This PILT package is for Okeechobee County.

What concerns could this Board item raise? This item is required by Ch. 373.59, F.S. in order to provide financial compensation for acquisitions which remove property from the tax rolls of low population counties.

Why should the Governing Board approve this item? Approval of this item will allow the Board to make payments for PILT to Okeechobee County pursuant to their application certified by the Department of Revenue in the amount of $4,556.81.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0906

A Resolution of the Governing Board of the South Florida Water Management District authorizing the payment in lieu of taxes (PILT) to Okeechobee County Board of County Commissioners for actual ad valorem tax losses incurred as a result of land purchased by the District; providing an effective date. (OMC, Jayne Bergstrom, ext. 2672)

WHEREAS, Florida Statutes, 373.59 (10) provides that payment in lieu of taxes shall be available to all counties that have a population of 150,000 or fewer, as determined pursuant to S. 186.901; and

WHEREAS, the ability to apply for payment in lieu of taxes is available to all local governments located in eligible counties and whose lands are acquired and taken off the tax rolls after January 1, 2000; and

WHEREAS, if sufficient funds are unavailable in any year to make full payments to all qualifying counties and local governments, such counties and local governments shall receive a pro rata share of the moneys available; and

WHEREAS, the payment amount shall be based on the average amount of actual ad valorem taxes paid on the property for the 3 years preceding acquisition; and

WHEREAS, payment in lieu of taxes shall be made annually to qualifying counties and local governments after certification by the Department of Revenue that the amounts applied for are reasonably appropriate, based on the amount of actual ad valorem taxes paid on the eligible property;

NOW THEREFORE, BE IT RESOLVED by the Governing Board of the South Florida Water Management District:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the payment in lieu of taxes (PILT) to be remitted to Okeechobee County Board of County Commissioners annually until the population of Okeechobee County exceeds 150,000, or status of the properties change.

Section 2. This Resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

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Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Terremark Federal Group, Inc. Disaster Recovery Alternate Data Center

Agenda Item Description

This is continuation of the District's Disaster Recovery Alternate Data Center facility and services in the amount of $196,056. The time period is November 1, 2013 through October 31, 2014. These services will be procured from Terremark Federal Group, Inc. using the Broward College Contract #ITN-2010-001-BM.

Background

Since January 2007 the District's Disaster Recovery site has been located at the NAP of Americas, Inc. This alternate data center allows the District to deliver essential business functions despite damage, loss, or disruption of the headquarters information systems due to unexpected occurrences of a natural or man-made emergency or disaster. The Information Technology Bureau must ensure the resumption of mission critical systems and services within a reasonable period of time and with minimal loss of data.

Core Mission and Strategic Priorities

Having a disaster recovery alternate data center is part of maintaining emergency readiness. The systems housed in the NAP of the Americas are critical for communication, processing and storage of the District data used to support the District's mission.

Funding Source

The total amount for the Disaster Recovery Site is $196,056, for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

Staff Recommendation

Authorize entering into a purchase order with Terremark Federal Group, Inc. for a disaster recovery alternate data center facility and services, for the time period November 1, 2013 - October 31, 2014, using the Broward College Contract #ITN-2010-001-BM, in the amount of $196,056 for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 2638.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0907

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Terremark Federal Group, Inc, for a disaster recovery alternate data center facility and services for the time period November 1, 2013 to October 31, 2014, using Broward College Contract #ITN-2010-001-BM, in the amount of $196,056 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Terremark Federal Group, Inc. for a disaster recovery alternate data center facility and services, for the time period November 1, 2013 - October 31, 2014, using Broward College Contract #ITN-2010-001-BM in the amount of $196,056 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order to Terremark Federal Group, Inc.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Annual Renewal of Cisco Systems Hardware and Software Maintenance

Agenda Item Description

This is the annual renewal of the Cisco Systems network hardware and software maintenance in the amount of $365,855. The time period for support is November 1, 2013 through October 31, 2014 and will be procured from Presidio Corporation using the State of Florida Contract #250-000-09-1.

Background

The Cisco Systems hardware and software supports all District networks including the SCADA and internal networks, our ability to monitor and control water levels, internet connectivity, telephone system, and connection between all District offices and microwave network sites. The hardware maintenance includes phone support to trouble shoot network problems and replacement of malfunctioning equipment. The software support includes upgrades for the Cisco router operating system and technical support. This maintenance renewal also includes support for the video conferencing equipment.

Core Mission and Strategic Priorities

The hardware and software maintenance provide improved network reliability and network support for the entire District.

Funding Source

The total amount for the annual renewal is $365,855, for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

Staff Recommendation

Authorize entering into a purchase order with Presidio Corporation for the annual renewal of Cisco Systems network hardware and software maintenance, for the time period November 1, 2013 - October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $365,855 for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 2638.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0908

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Presidio Corporation for the annual renewal of Cisco Systems network hardware and software maintenance, for the time period November 1, 2013 to October 31, 2014 using State of Florida Contract #250-000-09-1, in the amount of $365,855 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Presidio Corporation for the annual renewal of Cisco Systems network hardware and software maintenance, for the time period November 1, 2013 - October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $365,855 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order to Presidio Corporation.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

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District Clerk/Secretary

Legal form approved:
By:

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Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Annual Renewal of Sun Microsystems (Oracle Corporation) Hardware Maintenance

Agenda Item Description

This is the annual renewal of the Sun Microsystems (Oracle Corporation) hardware maintenance in the amount of $318,085. The time period for support is November 1, 2013 through October 31, 2014. This support will be procured from Oracle Corporation using State of Florida Contract #250-000-09-1. Oracle Corporation purchased Sun Microsystems.

Background

The Sun Microsystems maintenance includes servers, storage, peripherals and the Sun Solaris operating system. Currently the District has 100+ Sun Solaris servers. Critical District applications such as SAP, DBHYDRO, Operations, Oracle, and other core infrastructure applications reside on the Sun Microsystems hardware. Utilizing this support provides a high availability of services and reduced systems administration cost.

Core Mission and Strategic Priorities

The Sun Microsystems hardware houses critical data supporting the District's mission and five-year strategic goals.

Funding Source

The total amount for the annual renewal is $318,085, for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

Staff Recommendation

Authorize entering into a purchase order with Oracle Corporation for the annual renewal of Sun Microsystems server, storage, and peripheral hardware maintenance, for the time period November 1, 2013 - October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $318,085 for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 2638.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0909

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Oracle Corporation for the annual renewal of Sun Microsystems server, storage, and peripheral hardware maintenance, for the time period November 1, 2013 to October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $318,085 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Oracle Corporation for the annual renewal of Sun Microsystems server, storage, and peripheral hardware maintenance, for the time period November 1, 2013 - October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $318,085 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order to Oracle Corporation.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Annual Renewal of Oracle Software Maintenance

Agenda Item Description
This is the annual renewal of the Oracle software maintenance in the amount of $886,367. The time period for support is October 25, 2013 through October 24, 2014. This support will be procured from Mythics, Inc. using the GSA Schedule #GS-35F-0153M.

Background
This maintenance includes technical support and upgrade service on all Oracle software supporting numerous (90) District and CERPZone databases and websites. The District's Oracle infrastructure is utilized by Operations, SAP and all Portal Web Applications (Portal, Employee Emergency Notification Site, Weather/Real-Time Readings, Agenda Builder, GB/WRAC Public Reporting, Key Permit Application, ePermitting, eSubmittal, Graphical Verification Analysis, and Regulation). The Operations Oracle database is part of the decision support system that is critical for water managers making real-time decisions. SAP leverages Oracle's Real Application Cluster to provide high availability of financial services for the entire District user community. The Portal infrastructure is built on Oracle Application and Cluster Server ensuring reliable web applications and service availability. This level of support for the Oracle maintenance also ensures access to Oracle's engineering team for issues and rapid escalation to problem resolution.

Core Mission and Strategic Priorities
Some of the vital District functions managed by Oracle software are budget preparation, hydrologic and meteorological data processing and storage, regulatory administration, research, planning, land management, risk management, operations and maintenance, and water quality monitoring.

Funding Source
The total amount for the annual renewal is $886,367, for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

Staff Recommendation
Authorize entering into a purchase order with Mythics, Inc. for the annual renewal of Oracle software maintenance and upgrades, for the time period October 25, 2013 - October 24, 2014, using GSA Schedule #GS-35F-0153M, in the amount of $886,367 for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 2638.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0910

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Mythics, Inc. for the annual renewal of Oracle software maintenance and upgrades, for the time period October 25, 2013 to October 24, 2014, using GSA Schedule #GS-35f-0153M, in the amount of $886,367 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Mythics, Inc. for the annual renewal of Oracle software maintenance and upgrades, for the time period October 25, 2013 - October 24, 2014, using GSA Schedule #GS-35F-0153M in the amount of $886,367 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order to Mythics, Inc.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Annual Renewal of EMC Corporation Hardware and Software Maintenance

Agenda Item Description

This is the annual renewal of the EMC Corporation infrastructure hardware and software maintenance in the amount of $198,594. The time period for support is November 1, 2013 through October 31, 2014 and will be procured from Forsythe Solutions Group using the State of Florida Contract #250-000-09-1.

Background

The Systems Engineering Section uses EMC equipment and software to maintain, store and backup the District's critical data across three tiers of storage. The storage infrastructure provides high availability and redundancy for numerous services. The third tier of storage is utilized by Documentum, file system & email archiving. The second tier provides file system storage for all employees at the District (projserv & dataserv). The final tier provides the high speed storage to critical services such as SAP, email and Operations databases. Also to protect this data from any unforeseen disaster select information across the storage platforms is replicated remotely to the District's disaster recovery site. The environment is scalable and strategically lends itself to the overall long term solution for data management at the District.

Core Mission and Strategic Priorities

Information is one of the most important and valuable assets of the District. As the amount of information that is stored electronically grows, the management of the storage systems is of critical importance. This hardware and software assist District staff in the administration and protection of the District's core mission and strategic priorities and enables the high availability of the information to the end users.

Funding Source

The total amount for the annual renewal is $198,594, for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

Staff Recommendation

Authorize entering into a purchase order with Forsythe Solutions Group for the annual renewal of EMC Corporation infrastructure hardware and software maintenance, for the time period November 1, 2013 - October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $198,594 for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 2638.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0911

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Forsythe Solutions Group for the annual renewal of infrastructure hardware and software maintenance, for the time period November 1, 2013 to October 31, 2014, using State of Florida Contract #250-000-09-1, in the amount of $198,594 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Forsythe Solutions Group for the annual renewal of infrastructure hardware and software, for the time period November 1, 2013 to October 31, 2014 using State of Florida Contract #250-000-09-1, in the amount of $198,594 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order to Forsythe Solutions Group.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Annual Renewal of Symantec Corporation (Veritas) Software Maintenance

Agenda Item Description

This is the annual renewal of the Symantec Corporation (Veritas) software maintenance in the amount of $225,820. The time period for support is December 1, 2013 through November 30, 2014. This maintenance will be procured from Dyntek Services, Inc. using the GSA Schedule #GS-35F-0119Y.

Background

This maintenance includes technical support and upgrade service, on all Symantec Corporation (Veritas) software licenses (Storage Foundation, Enterprise Vault and Netbackup). With Veritas Storage Foundation, physical disks can be grouped into logical volumes to improve disk utilization and eliminate storage-related downtime. In addition, Veritas Storage Foundation gives systems administrators the flexibility to move data between different operating systems and storage arrays, and to balance input/output (I/O) across multiple paths to improve performance. Veritas Netbackup enables the District to backup, restore, and provide data integrity. Ensuring critical data retention is a high priority and, in case of an emergency and data loss, Netbackup provides data protection for the District. Enterprise Vault is the District's email archiving tool that streamlines backup and recovery times by moving older, infrequently accessed data from production sources into a centralized archive.

Core Mission and Strategic Priorities

Information is one of the most important and valuable assets of the District. As the amount of information that is stored electronically grows, the management of the storage systems is of critical importance. This software assists staff in the administration and protection of the information supporting the District's mission and five-year strategic goals.

Funding Source

The total amount for the annual renewal is $225,820, for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

Staff Recommendation

Authorize entering into a purchase order with Dyntek Services, Inc. for the annual renewal of Symantec storage software maintenance and upgrades, for the time period

December 1, 2013 - November 30, 2014, using GSA Schedule #GS-35F-0119Y, in the amount of $225,820 for which ad valorem funds are subject to Governing Board approval of the FY14 budget.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 2638.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0912

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Dyntek Services, Inc. for the annual renewal of Symantec storage software maintenance and upgrades, for the time period December 1, 2013 to November 30, 2014, using GSA Schedule #GS-35f-0119Y, in the amount of $225,820 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Dyntek Services, Inc. for the annual renewal of Symantec storage software maintenance and upgrades, for the time period December 1, 2013 - November 30, 2014 using GSA Schedule #GS-35F-0119Y, in the amount of $225,820 for which ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order to Dyntek Services, Inc.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Enterprise License Agreement for Geographical Systems Software

Agenda Item Description
This is a three year Enterprise License Agreement in the amount of $989,000. The time period for the agreement is October 1, 2013 through September 30, 2016. This license agreement will be procured directly from the manufacturer Environmental Systems Research Institute, Inc. (Esri).

Background
The Esri software licenses include: ArcGIS Desktop and extensions, ArcGIS Server and extensions (including Portal for ArcGIS), Workflow Manager, Data Reviewer, and all existing licenses. The Esri software is used to manage District spatial data, analyze spatial and non-spatial data, develop maps and reports, and develop applications for internal and external customers. The Enterprise License Agreement provides unlimited access to software, software maintenance, ArcGIS Online Level 4 Organizational Annual Subscription, and the Enterprise Advantage Program. The Esri maintenance includes all software upgrades, patches, fixes and full technical support for all District licenses.

Core Mission and Strategic Priorities
The Esri software licenses allow the District to manage, deliver, and analyze spatial data that supports the District's programs including Operations, Maintenance & Construction, Regulation, and Water Resources. Specific applications using this software include the Integrated Real Estate Information System (IRIS), Geographic Information System (GIS), Operations Decision Support System (ODSS), Regulatory GIS Support System (RegGSS), ePermitting and the Emergency Operations Center (EOC). Most of the spatial data visible in the District's Google Earth Enterprise system is developed and maintained by District staff using the Esri software.

Funding Source
The total amount for the three year agreement is $989,000. The first year of the agreement is $389,000, for which ad valorem funds are subject to Governing Board approval of the FY14 budget. The remaining $600,000 is subject to Governing Board approval of the FY15 and FY16 budgets.

Staff Recommendation
Authorize entering into a purchase order with Environmental Systems Research Institute, Inc. for a three year Enterprise License Agreement in the total amount of $989,000 for which $389,000 is budgeted in FY14 and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets.

If you have any questions, please call Doug Bergstrom at ext. 6214 or Duane Piper at ext. 263

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0913

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a purchase order with Environmental Systems Research Institute, Inc. (Esri) as an exception to the general standards of competition for an Enterprise License Agreement for geographic information systems software, for the time period October 1, 2013 to September 30, 2016 in the amount of $989,000 for which $389,000 of ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date. (AS, Duane Piper, ext. 2638)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate, and in the public interest to authorize entering into a purchase order with Environmental Systems Research Institute, Inc. (Esri) as an exception to the general standards of competition for an Enterprise License Agreement for geographic information systems software, for the time period October 1, 2013 - September 30, 2016, in the amount of $989,000 for which $389,000 of ad valorem funds are budgeted and subject to Governing Board approval of the FY14 budget and the remainder is subject to Governing Board approval of the FY15 and FY16 budgets; providing an effective date.

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby approves issuing a purchase order as an exception to the general standards of competition to Environmental Systems Research Institute, Inc.
Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

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Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Terrie Bates, Director, Water Resources Division

DATE: September 12, 2013

SUBJECT: Aquatic Vegetation and Prey-base Fish Monitoring in Southern Everglades Agreement

Agenda Item Description
A three-year, sole source agreement, with Audubon of Florida's Tavernier Science Center to continue the monitoring of hydrology, aquatic vegetation, and prey-base fauna within the mangrove transition zones of Northern Florida Bay in an amount not to exceed $390,000 subject to Governing Board approval of the FY14-FY16 budgets.

Background
Audubon of Florida's Tavernier Science Center has been measuring aquatic vegetation and prey-base fauna (invertebrates and fishes) across the mangrove transition zones of southern Biscayne Bay, Florida Bay and the Gulf of Mexico since the mid-1990s. Audubon developed these important ecological indicators because they are critical links in the mangrove food web. The relatively short generation times of aquatic vegetation and prey-base fauna gives these indicators the ability to respond quickly to hydrologic and habitat conditions in a timeframe well suited for adaptive water management. A subset of these monitoring stations, combined with Audubon monitoring stations funded by the USACOE, in the mangrove habitats along the northern fringe of Florida Bay are poised to change as a result of a variety of water management projects including the C-111 Spreader Canal, Tamiami Trail bridging, and Frog Pond detention area projects. The proposed agreement requires an exception to the standards for competition (sole source) to maintain statistical continuity with other CERP monitoring and because it would fund the only permitted Hydro-SAV-Fish monitoring network in the mangrove transition zone. Note: Stations are not in the open waters of Florida Bay. The work proposed for this multi-year contract is intended to maintain ecological expertise, quality assurance, and build upon previously collected baseline monitoring data in order to integrate data with USACOE monitoring and discriminate between natural variability and water management effects.

Core Mission and Strategic Priorities
This item is aligned with the District mission to balance and improve water quality, flood control, and natural systems. It supports multiple objectives within northeast Florida Bay including determining impacts of water management in Taylor Slough and the C-111 area on the natural system, assessing the effectiveness of the Florida Bay Minimum Flows and Levels rule, assessing the impacts of the Frog Pond detention area project, reporting of system condition for RECOVER, and documenting a shifting base condition from which to evaluate the full C-111 Spreader Canal project when it is implemented.

Funding Source
The funding is from Alligator Alley Toll Road special revenue (228000 funds), and the request is $390,000 (distributed over three years), subject to Governing Board approval of the FY14-FY16 budgets.

Staff Recommendation
Staff recommends a sole source exception to general standards of competition to maintain spatial and temporal continuity with RECOVER monitoring by the USACOE and recommends approval of this agreement, which will allow the District to receive data and analyze information about the effect of water management and restoration within the coastal habitats of the Southern Everglades.

If you have any questions, please call me at ext. 6952 or Linda Lindstrom at ext. 6820.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0914

A Resolution of the Governing Board of the South Florida Water Management District authorizing a three-year agreement with Audubon of Florida's Tavernier Science Center for hydrology, aquatic vegetation, and prey-base fauna monitoring in the Southern Everglades Mangrove Communities and authorize a sole source as an exception to the general standards of competition in an amount not to exceed $390,000 subject to Governing Board approval of the FY14 through FY16 budgets; providing an effective date. (Contract #4600002916) (WR, Joseph Stachelek, ext. 4543)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a 3 year agreement with Audubon of Florida's Tavernier Science Center and to authorize a sole source as an exception to the general standards of competition , in the amount of $390,000 subject to Governing Board approval of the FY14-16 budgets, to measure hydrology, aquatic vegetation, and prey-base fauna in the Southern Everglades mangrove communities to determine impacts of operations and restoration projects, and;

WHEREAS, effects of water releases and altered water deliveries through operational plans or restoration projects upstream of Florida Bay, Manatee Bay, and Barnes Sound will be measured and documented by this work; **now therefore**

BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of contract number 4600002916 with Audubon of Florida's Tavernier Science Center as a sole source exception to the general standards of competition.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

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District Clerk/Secretary

Legal form approved:
By:

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Office of Counsel

Print name:

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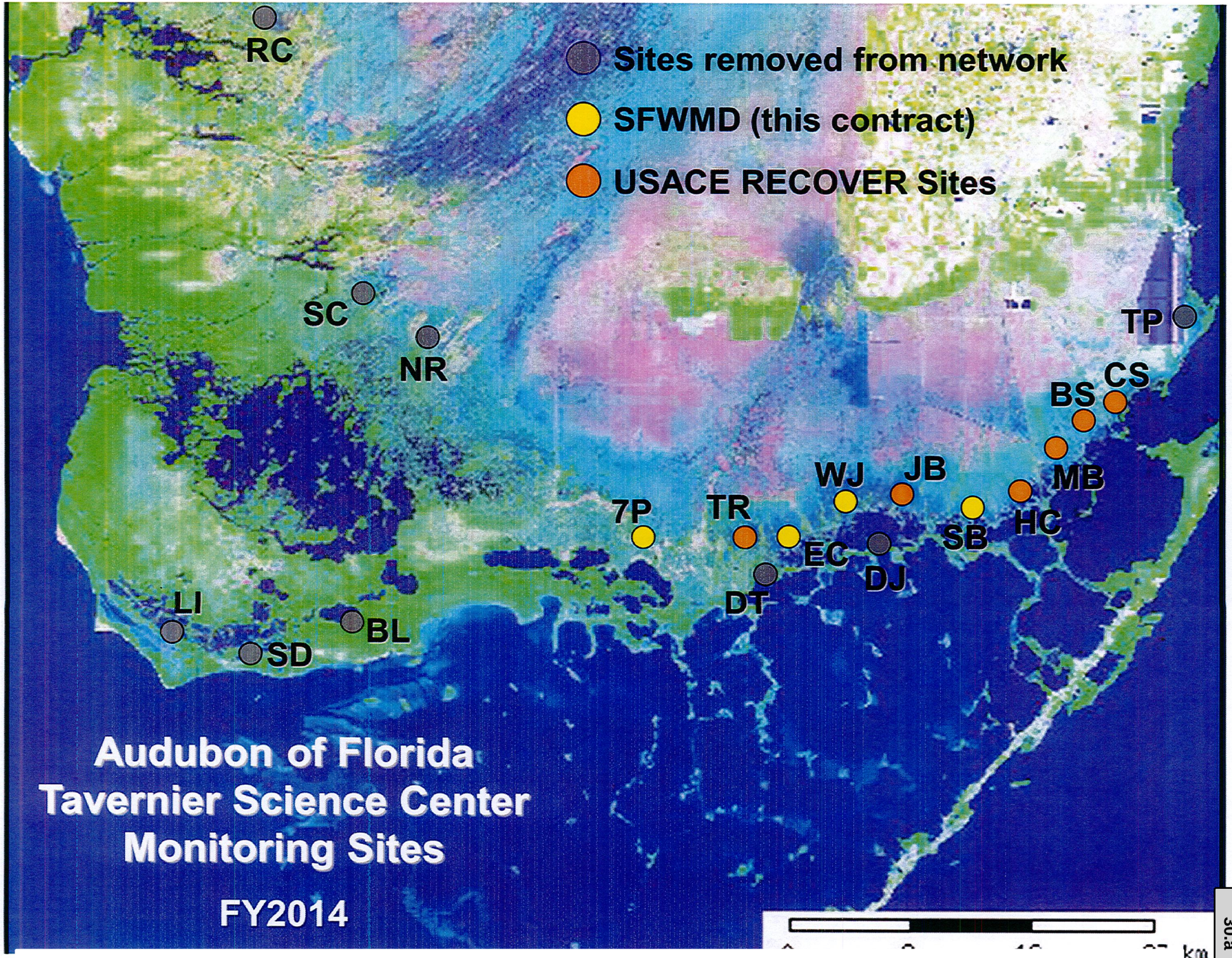
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Tavernier Science Center
Monitoring Sites
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M E M O R A N D U M

TO: Governing Board Members

FROM: Dan DeLisi, Chief of Staff

DATE: September 12, 2013

SUBJECT: Collier County – Northern Golden Gate Estates (NGGE) Flow Way Restoration

Agenda Item Description
This item is to seek District Governing Board authorization to enter into one-year cost-share agreements with Collier County, which will provide partial funding to support construction of the NGGE Flow Way Restoration project that includes the installation of 42 culvert crossings to restore historic flow ways.

Background
Collier County has recently completed a comprehensive plan funded by DEP for restoration of the historic flow ways in a 34-square mile area of Northern Golden Gate Estates (NGGE). The plan aims at restoring the remnant sloughs of Winchester Head, Horsepen Strand and other wetlands impaired by roads, canals and residential developments. It also laid out the preliminary feasibility of diverting additional Golden Gate Main Canal flows by spreader channels in Northern Belle Meade and eventual sheet flows to South Belle Meade through I-75 culverts. The funding provided with this agreement will support the first phase of this project, which includes the installation of 42 equalizing culverts north and south of Oil Well Road (CR-858) within the existing Right of Way in order to reconnect historic flow ways in the project area.

The main goal of this project is to facilitate surface water conveyance to low lying areas to reduce the burden placed on the Basin's canal system, reduce flows to Naples Bay, and provide aquifer recharge for public water supplies.

The agreement shall commence on October 1, 2013 and terminate on September 30, 2014. Individual projects were identified, scoped and budgeted to fit within the coming fiscal year and staff is confident that this project will be completed within FY14. This item was reviewed and approved by the Big Cypress Basin Board on May 16, 2013.

Core Mission and Strategic Priorities
This project supports the District's core missions of flood protection and improvement of water quality in the receiving waters as set forth in the priorities of the 10-Year Strategic Plan. The project will assist Collier County in meeting their future demands for mitigation of flooding problems and surface water quality improvement.

Funding Source
The total construction cost of the project in FY14 is estimated to be $581,000. The District's contribution is not to exceed $290,500 in dedicated Big Cypress Basin ad valorem funds, budgeted for FY14.

Staff Recommendation
Staff recommends approval for authorization to enter into a one-year cost-share agreement with Collier County for providing partial funding to support construction of this project.

If you have any questions, please call me at ext. 6232.

DD/mg

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0915

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with Collier County in the amount not to exceed $290,500, for the construction of the Northern Golden Gate Estate Flow Way Restoration project, for which dedicated Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a one (1) year agreement with Collier County for the construction of the Northern Golden Gate Estates (NGGE) Flow Way Restoration project, for the not exceed amount of $290,500, for which dedicated Big Cypress Basin funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (Agreement Number 4600002932)

NOW AND THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of the Agreement Number 4600002932 with Collier County.
Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

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Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Dan DeLisi, Chief of Staff

DATE: September 12, 2013

SUBJECT: Collier County - Livingston Road ASR Well #2

Agenda Item Description
This item is to seek District Governing Board authorization to enter into one-year cost-share agreements with Collier County, which will provide partial funding to support the construction of the Livingston Road Aquifer Storage & Recovery (ASR) Well #2 project, an alternative water supply development project.

Background
The Big Cypress Basin Board has been providing financial assistance to Collier County for several years to support construction of projects for enhancing alternative water supplies. The funding provided with this agreement will support the construction of ASR Well #2 at the Livingston Road ASR Wellfield to store freshwater and reclaimed water for use during peak demand periods in the County's Irrigation Quality (IQ) Water System. This project is part of the County's ASR program that includes the construction of five ASR Wells at the Livingston Road site. The construction of Wells #3 through #5 will follow in future years. The requested funding for FY14 is only for construction of ASR Well #2.

The benefits of this project include conservation of water supply, reduction of discharge of treated effluent, reduction of raw water withdrawal for potable water supply and extended lifetime and sustainable capacity of the potable water treatment facilities. It is expected that one MGD (million gallons per day) reclaimed water will be made available with the addition of this well.

The agreement shall commence on October 1, 2013 and terminate on September 30, 2014. Individual projects were identified, scoped and budgeted to fit within the coming fiscal year and staff is confident that this project will be completed within FY14. This item was reviewed and approved by the Big Cypress Basin Board on May 16, 2013.

Core Mission and Strategic Priorities
This program supports the District's core missions of alternative water supply development and improvement of water quality as set forth in the priorities of the 10-Year Strategic Plan. This project will assist Collier County in meeting the future demands for alternative water supply.

Funding Source
The total construction cost of the project in FY14 is estimated to be $1,500,000. The District's contribution is not to exceed $600,000 in dedicated Big Cypress Basin ad valorem funds, budgeted for FY14.

Staff Recommendation
Staff recommends approval for authorization to enter into a one-year cost-share agreement with the Collier County for providing partial funding to support construction of this project.

If you have any questions, please call me at ext. 6232.

DD/mg

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0916

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with Collier County in the amount not to exceed $600,000, for the construction of the Livingston Road Aquifer Storage and Recovery (ASR) Well #2 project, for which dedicated Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a one (1) year agreement with Collier County for the construction of the Livingston Road Aquifer Storage and Recovery (ASR) Well #2 project, for the not to exceed amount of $600,000, for which dedicated Big Cypress Basin funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (Agreement Number 4600002929)

NOW AND THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of the Agreement Number 4600002929 with Collier County.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

M E M O R A N D U M

TO: Governing Board Members

FROM: Dan DeLisi, Chief of Staff

DATE: September 12, 2013

SUBJECT: City of Marco Island – Swallow Avenue Drainage Improvements

Agenda Item Description
This item is to seek District Governing Board authorization to enter into one-year cost-share agreements with the City of Marco Island, which will provide partial funding to support construction of the City's Swallow Avenue Drainage Improvements project, a drainage and flood mitigation project.

Background
The Big Cypress Basin Board has been providing financial assistance to the City of Marco Island for several years to support construction of projects for upgrading stormwater management systems to mitigate flooding problems and to improve water quality of the receiving inland waters and estuaries.

The existing stormwater collection system of the Swallow Avenue area is not capable of handling the drainage problems that lead to road closures and stranded vehicles. The current flooding hinders the City's ability to provide fire department access during and after storm events. Two (2) new outfalls were completed as Phase 1 of the project in 2010. The funding provided with this agreement will support Phase 2, which includes the installation of large reinforced concrete pipes and drainage structures along Swallow Avenue to collect runoff and provide water quality treatment prior to discharge through the two (2) new outfalls completed in Phase 1. This project will alleviate severe flooding that impacts the public and limits access to numerous condominium developments and provide access to emergency response during and after storm events.

The agreement shall commence on October 1, 2013 and terminate on September 30, 2014. Individual projects were identified, scoped and budgeted to fit within the coming fiscal year and staff is confident that this project will be completed within FY14. This item was reviewed and approved by the Big Cypress Basin Board on May 16, 2013.

Core Mission and Strategic Priorities
This project supports the District's core missions of flood protection and improvement of water quality in the receiving waters as set forth in the priorities of the 10-Year Strategic Plan. The project will assist the City of Marco Island in meeting their future demands for mitigation of flooding problems and surface water quality improvement.

Funding Source
The total construction cost of the project in FY14 is estimated to be $590,000. The District's contribution is not to exceed $236,000 in dedicated Big Cypress Basin ad valorem funds, budgeted for FY14.

Staff Recommendation
Staff recommends approval for authorization to enter into a one-year cost-share agreement with the City of Marco Island for providing partial funding to support construction of this project.

If you have any questions, please call me at ext. 6232.

DD/mg

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0917

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with the City of Marco Island in the amount not to exceed $236,000, for the construction of the City's Swallow Avenue Drainage Improvements project, for which dedicated Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a one (1) year agreement with the City of Marco Island for the construction of the Swallow Avenue Drainage Improvements project for the not to exceed amount of $236,000, for which dedicated Big Cypress Basin funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (Agreement Number 4600002930)

NOW AND THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of the Agreement Number 4600002930 with the City of Marco Island.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

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M E M O R A N D U M

TO: Governing Board Members

FROM: Dan DeLisi, Chief of Staff

DATE: September 12, 2013

SUBJECT: Naples (ASR) Well #3

Agenda Item Description
This item is to seek District Governing Board authorization to enter into one-year cost-share agreements with the City of Naples, which will provide partial funding to support the construction of the City's Aquifer Storage and Recovery (ASR) Well #3 project, an alternative water supply development project.

Background
The Big Cypress Basin Board has been providing financial assistance to the City of Naples for several years to support construction of projects for enhancing alternative water supplies. The funding provided in this agreement is to continue the construction of an ASR wellfield at the Riverside Circle location, which includes the installation and testing of four (4) ASR wells, three (3) monitoring wells, and the evaluation of potential storage zones below the Underground Supply of Drinking Water (USDW). The scope of work for this phase includes the following: Construction ASR Well #3, Installation of Yard Piping and Construction of a Monitoring Well for ASR Well #3.

The agreement shall commence on October 1, 2013 and terminate on September 30, 2014. Individual projects were identified, scoped and budgeted to fit within the coming fiscal year and staff is confident that this project will be completed within FY14. This item was reviewed and approved by the Big Cypress Basin Board on May 16, 2013.

Core Mission and Strategic Priorities
This program supports the District's core missions of alternative water supply development and improvement of water quality as set forth in the priorities of the 10-Year Strategic Plan. This project will assist the City of Naples in meeting the future demands for alternative water supply.

Funding Source
The total construction cost of the project is estimated to be $1,914,000. The District's contribution is not to exceed $600,000 in dedicated Big Cypress Basin ad valorem funds, budgeted for FY14.

Staff Recommendation
Staff recommends approval for authorization to enter into a one-year cost-share agreement with the City of Naples for providing partial funding to support construction of ASR Well #3.

If you have any questions, please call me at ext. 6232

DD/mg

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0918

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year cooperative agreement with the City of Naples in the amount not to exceed $600,000, for the construction of the City's Aquifer Storage and Recovery (ASR) Well #3 project, for which dedicated FY 14 Big Cypress Basin ad valorem funds are budgeted, subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a one (1) year agreement with the City of Naples for the construction of the Aquifer Storage and Recovery (ASR) Well #3 project, for the not to exceed amount of $600,000, for which dedicated Big Cypress Basin funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (Agreement Number 4600002927)

NOW AND THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of the Agreement Number 4600002927 with the City of Naples.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

M E M O R A N D U M

TO: Governing Board Members

FROM: Carolyn S. Ansay, General Counsel

DATE: September 12, 2013

SUBJECT: Certification of Completion of Economic Estimates

Agenda Item Description
This item requests the Governing Board authorize its Chair to execute a certification that the District has completed the economic estimates required under paragraph 120.745(9)(b), Florida Statutes, and authorizing transmittal of the certification to the Joint Administrative Procedures Committee before October 1, 2013.

Background
Subsection 120.745(9), Florida Statutes (F.S.), provides an exemption from the enhanced rule review and compliance economic review if it meets specified criteria and certifies in writing to the Joint Administrative Procedures Committee (JAPC) an election to utilize such an exemption. The South Florida Water Management District (District) voluntarily complied with the specified criteria and, pursuant to Resolution No. 2011-903 elected to utilize the exemption.

Pursuant to paragraph 120.745(9)(b), F.S., the District is required to provide a reasonable economic estimate of regulatory cost or economic impact for District rules identified by the Office of Fiscal Accountability and Regulatory Reform (OFARR) as having such cost or impact. The agency head is required to certify in writing to JAPC, on or before October 1, 2013, that the agency has completed each economic estimate required by paragraph 120.745(9)(b), F.S., in order to be exempt from the biennial review required in subsection 120.74(2), F.S., for the year 2013. District staff will complete the economic estimates required and will input the information into OFARR's web application before October 1, 2013. The proposed certification is attached and incorporated in the associated Governing Board Resolution.

Core Mission and Strategic Priorities
The District is required to adopt rules and to comply with the provisions of sections 120.74 and 120.745, F.S.

Funding Source
District staff time will be used to prepare the economic estimates.

Staff Recommendation
Staff recommends authorization for the Governing Board Chair to execute the Certification of Completion of Economic Estimates and transmittal of same to JAPC no later than October 1, 2013.

If you have any questions, please call Carolyn Ansay at ext. 6976 or Doug MacLaughlin at ext. 2153.

CSA/jr

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0919

A Resolution of the Governing Board of the South Florida Water Management District authorizing the Governing Board chair to execute a certification that the District has completed the economic estimates required under paragraph 120.745(9)(b), Florida Statutes, and authorizing transmittal of the same to the Joint Administrative Procedures Committee; providing an effective date. (OC, Carolyn Ansay, ext. 6976)

WHEREAS, subsection 120.745(9), Florida Statutes (F.S.), provides an exemption from the enhanced rule review and compliance economic review if it meets specified criteria and certifies in writing to the Joint Administrative Procedures Committee (JAPC) an election to utilize such an exemption;

WHEREAS, the South Florida Water Management District (District) voluntarily complied with the specified criteria and, pursuant to Resolution No. 2011-903 elected to utilize the exemption;

WHEREAS, pursuant to paragraph 120.745(9)(b), F.S., the District is required to provide a reasonable economic estimate of regulatory cost or economic impact for District rules identified by the Office of Fiscal Accountability and Regulatory Reform (OFARR) as having such cost or impact;

WHEREAS, the agency head is required to certify in writing to JAPC, on or before October 1, 2013, that the agency has completed each economic estimate required by paragraph 120.745(9)(b), F.S., in order to be exempt from the biennial review required in subsection 120.74(2), F.S., for the year 2013;

WHEREAS, District will complete the economic estimates required by paragraph 120.745(9)(b), F.S., and will input the information into OFARR's web application before October 1, 2013; **now therefore**

BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the Governing Board chair to execute a Certification of Completion of Economic Estimates, attached and incorporated herein, and further authorizes transmittal of the same to JAPC.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
CERTIFICATION OF COMPLETION OF
ECONOMIC ESTIMATES PURSUANT
TO PARAGRAPH 120.745, FLORIDA STATUTES

I, Daniel O'Keefe, Chair of the South Florida Water Management District (District) Governing Board, do hereby certify that, pursuant to paragraph 120.745(9)(b), Florida Statutes, the District has completed the economic estimates of its rules identified by the Office of Fiscal Accountability and Regulatory Reform.

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT

_____
Witness

_____
Daniel O'Keefe
Governing Board Chair

_____
Date

Approved as to Legal Form
And Content

_____

Attachment: 2013-09-12 FINAL certification (Resolution No. 2013 - 0919 : Certification of Completion of Economic Estimates)

M E M O R A N D U M

TO: Governing Board Members

FROM: Carolyn S. Ansay, General Counsel

DATE: September 12, 2013

SUBJECT: Hyatt Stipulated Motion for Order to Pay Costs

Agenda Item Description:
This is an agenda item to resolve all attorney's fees and expert witness costs incurred by Kenneth G. Hyatt in the eminent domain action styled South Florida Water Management District v. Kenneth G. Hyatt, et al., Osceola County Case Number 2011CA-002798-ED- from 1993 to the present date.

Background:
History
On August, 24 2011, the District filed an eminent domain "slow-take" lawsuit to acquire flowage easement interests adjacent to Lake Kissimmee from Kenneth G. Hyatt and Arnold H. Mack in furtherance of the Kissimmee River Restoration Project. The District began negotiations to acquire property from these landowners under a threat of condemnation in November 1993. On April 11, 2013, the District dismissed its eminent domain action to allow the USACE to review the quality and quantity of the estates required for the project, along with any engineering fixes or "cures". As a result, the landowners are entitled to recover their reasonable attorney's fees and costs incurred in defense of this eminent domain action. Section 73.091 and Section 73.092, Florida Statutes (2012) requires the condemning authority to pay the landowner's reasonable attorney's fees and reasonable costs incurred in defense of condemnation. The Court ordered the District to pay for expert witness engineering fees incurred by Kenneth G. Hyatt pursuant to the condemnation efforts by the District. The District reached full settlement with Kenneth G. Hyatt to pay costs incurred by Kenneth G. Hyatt that were not determined by the Court.

Current Resolution. The order from the Court to the District to pay engineering fees and the proposed settlement reached with Kenneth G. Hyatt for the payment of the remaining attorney's fees and costs related to the condemnation action will require the District to pay attorney's fees and costs of $865,220.96 to Kenneth G. Hyatt. The parties have agreed to enter a stipulated motion for an order to pay costs which includes previous orders to pay costs entered by the Court. This order and its payment represents payment for any and all attorney's fees, expert witness costs, or other taxable costs incurred by Kenneth G. Hyatt in defense of District eminent domain efforts from November 1993 to the date of the entry of the stipulated order.

Core Mission and Strategic Priorities:
Payment of attorney's fees and costs is necessary to satisfy the District's statutory obligation to pay reasonable attorney's fees and costs incurred by the landowner in defense of District eminent domain actions. The terms of this settlement are consistent with previous settlements, within the guidelines provided by the Governing Board and cost payment guidelines.

Funding Source:
We have been advised by the Land Resource Department that settlement of costs is funded with monies from the Okeechobee Ad Valorem Fund. The proposed full settlement provides for payment of costs of $865,220.96. This settlement is a savings of $124,337.01 (approximately 14%) from the initial demand and documentation submitted by attorneys for the landowner totaling $989,557.97. The total amount required to be deposited by the District under this settlement is $865,220.96.

Staff Recommendation
Staff recommends approval of this item to resolve any and all claims for attorney's fees, expert witness fees, and taxable costs and to avoid the uncertainties associated with litigation over these costs which would require the District's expenditure of additional funds to pay both the District's and property owner's substantial legal costs associated with further litigation. The discount obtained through negotiations will most likely exceed that which the District could obtain through further judicial action.

If you have any questions, please call Carolyn Ansay at [ext. 6976] or Keith Williams at [ext. 2791].

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0920

A Resolution of the Governing Board of the South Florida Water Management District to authorize entry into a stipulated motion for order to pay costs with Kenneth G. Hyatt for payment of attorney's fees and expert witness costs of $865,220.96 which represents any and all costs incurred by Kenneth G. Hyatt in the Osceola County Kissimmee River restoration project styled South Florida Water Management District v. Kenneth G. Hyatt, et al., case no.: 2011CA-002798-ED, filed in the 9th Circuit Court in and for Osceola County, Florida; providing an effective date. (OC, Carolyn Ansay, ext. 6976)

WHEREAS, Sections 373.083(1) and 373.129, Florida Statutes, authorize the South Florida Water Management District to settle existing lawsuits; and

WHEREAS, this case was filed in Osceola County, Florida; and

WHEREAS, the Parties have been engaged in negotiations in an attempt to resolve the outstanding attorney's fees and costs without trial; and

WHEREAS, settlement of this matter avoids the additional costs of a trial and the uncertainties of a judicial order; and

WHEREAS, the Parties have been successful in presenting a proposed stipulated motion for order to pay costs to the Governing Board of the South Florida Water Management District; and

WHEREAS, the terms of the proposed stipulated motion for order to pay costs are set forth on the attached document;

BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

To authorize entry into a stipulated motion for order to pay costs with Kenneth G. Hyatt for $865,220.96, which represents payment of any and all attorney's fees, expert witness fees or other taxable costs incurred by Kenneth G. Hyatt for the eminent domain action styled South Florida Water Management District v. Kenneth G. Hyatt, et al., Case No.: 2011CA-002798-ED, filed in the Circuit Court of the 9th Judicial District in and for Osceola County, Florida; providing an effective date.

This Resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September 2013.

BUDGETED

$865,220.96	**402000**	**520**	**5214**	**FD01**	**580013**
	Fund	**Agency**	**Org**	**Activity**	**Object/Revenue**

_____
Budget Approval

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

IN THE CIRCUIT COURT IN AND FOR OSCEOLA COUNTY, FLORIDA

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT,

Petitioner,

vs. Case No. 2011 CA 002798 ED
Parcel No. 18072-003
18072-004

KENNETH G. HYATT, et al.,

Respondents.
_____/

STIPULATED MOTION FOR ORDER TO PAY COSTS

The Petitioner, SOUTH FLORIDA WATER MANAGEMENT DISTRICT, and Respondent, KENNETH G. HYATT, by and through undersigned counsel, respectfully stipulate and agree that costs shall be paid as follows:

Klusza & Goding, Inc.		$ 82,000.00
Peter Spyke		$ 1,000.00
Raffa Consulting Economists, Inc.		$ 1,000.00
Vanasse Hangen Brustlin, Inc.		$ 20,000.00
Weed Systems, Inc.		$ 28,000.00
Peterson & Myers, P.A.		$ 6,500.00
Charlie Stratton, Esq.		$ 5,250.00
Balmoral Group		$ 1,500.00
Geosyntec** (see attached Order)		$371,455.96
Peterson & Myers, P.A. - attorney fees		$350,000.00
	TOTAL	$865,220.96

The total sum of **$865,220.96** shall, within thirty (30) days from the date of the signing of the Order, be paid by the Petitioner to the Trust Account of Peterson & Myers, P.A., P. O. Box 1079, Lake Wales, FL 33859-1079 for proper disbursement. The parties further stipulate and agree that the total sum reflected herein represents payment of any and all attorney's fees, expert witness fees, and taxable costs incurred by the Respondent from January 1, 1993 to the date of entry of this Order.

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT
BY_____
Keith L. Williams, Esq.
Fla. Bar No. 0135615
3301 Gun Club Road MSC 1410
West Palm Beach, FL 33406
561/682-2791
Attorney for Petitioner

PETERSON & MYERS, P.A.

BY_____
Deborah A. Ruster, Esq.
Fla. Bar No. 0327581
P. O. Box 1079
Lake Wales, FL 33859-1079
863/676-7611
Attorneys for Respondent Hyatt

EXHIBIT A

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

IN THE CIRCUIT COURT IN AND FOR OSCEOLA COUNTY, FLORIDA

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT,

Petitioner,

vs.

Case No. 2011 CA 002798 ED
Parcel No. 18072-003
18072-004

KENNETH G. HYATT, et al.,

Respondents.
_____/

ORDER ON COSTS

THIS CAUSE having come before the Court on a Stipulated Motion for Order to Pay Costs, and all parties being represented by counsel before the Court, and the Court having considered all matters before it, and the Court being otherwise fully advised, it is

ORDERED that the Petitioner, SOUTH FLORIDA WATER MANAGEMENT DISTRICT, shall pay costs as follows:

Klusza & Goding, Inc.		$ 82,000.00
Peter Spyke		$ 1,000.00
Raffa Consulting Economists, Inc.		$ 1,000.00
Vanasse Hangen Brustlin, Inc.		$ 20,000.00
Weed Systems, Inc.		$ 28,000.00
Peterson & Myers, P.A.		$ 6,500.00
Charlie Stratton, Esq.		$ 5,250.00
Balmoral Group		$ 1,500.00
Geosyntec** (see attached Order)		$371,455.96
Peterson & Myers, P.A. - attorney fees		$350,000.00
	TOTAL	$865,220.96

That within thirty (30) days from the signing of this Order the total sum of **$865,220.96** shall be paid by the Petitioner to the Trust Account of Peterson & Myers, P.A., P. O. Box 1079, Lake Wales FL 33859-1079 for proper disbursement.

DONE AND ORDERED in Chambers at Kissimmee, Osceola County, Florida, this _____ day of September, 2013.

_____
Scott Polodna, Circuit Judge

Copies furnished to: All counsel of record

IN THE CIRCUIT COURT OF THE NINTH JUDICIAL CIRCUIT IN AND FOR OSCEOLA COUNTY, FLORIDA

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT,

Petitioner,

CASE NO.: 2011-CA-2798-ED

vs.

KENNETH HYATT, ARNOLD MACK,
et al.,

Respondents.
_____/

ORDER GRANTING RESPONDENTS MOTION TO TAX FEES AND COSTS

THIS MATTER came before the Court as a result of South Florida Water Management District ("SFWMD") having filed a Petition in Eminent Domain on 24 August 2011 and voluntarily dismissing said Petition on 11 April 2013. A hearing on Respondents' Motion to Tax Fees and Costs was held on 23 July 2013. The Court having reviewed Respondents' Motion, case law, the file, arguments of counsel, and being fully advised in the premises FINDS as follows:

Legal Authority

The Florida Constitution guarantees that "[n]o private property shall be taken except for a public purpose and will full compensation therefor paid to each owner." Art. X, Section 6(a), Fla. Const. Full compensation is the objective of this provision and includes costs of expert witnesses. *Jacksonville Expressway Authority, Dade County v. Brigham*, 47 So.2d 602 (Fla. 1950). This Court has the authority to determine and award reasonable fees and costs to the Respondents associated with the defense of the petition. Regarding the motions to tax attorney's fees and costs, section 73.091, Fla. Stat. (2013),

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

obligates the Petitioner to pay attorney's fees and all reasonable costs incurred in the defense of the proceedings. Moreover, the Petitioner's voluntary dismissal of the petition did not divest the trial court of jurisdiction to consider the motions for fees and costs. *See Golf Course Resorts v. DOT,* 816 So.2d 236 (Fla. 2nd DCA 2002) (*Citing: City of Hallandale v. Chatlos,* 236 So.2d 761, 763 (Fla.1970); *State, Dep't of Transp. v. ABS Prop. P'ship,* 693 So.2d 703, 705 (Fla. 2d DCA 1997)).

Findings of Fact

The Respondent's witness, J. Davis Connor[1], testified that SFWMD interest in their property dates back to November 24, 1993 (Respondent's Exhibit #1). The Respondents received an appraisal along with an offer letter in 2010 (Respondent's Exhibit #2). Mr. Connor testified that the appraisal was intimidating to the Respondents since the cost to cure was estimated at $1.9 million and they were under time pressure due to the accompanying offer letter. As a result of the Petitioner's actions, the Respondent Hyatt entered into a contract with Geosyntec Consultants that required special terms, including special payment terms which made Hyatt directly liable for payment to Geosyntec. Respondent Mack subsequently entered into a cost sharing contract with Hyatt regarding the services to be provided by Geosyntec. Additionally, Mack also entered into a contract with Geosyntec with similar provisions (Respondent's Exhibit #4). Mr. Connor testified both of these arrangements (Hyatt being directly liable and Hyatt/Mack cost sharing agreement) are highly unusual in Eminent Domain practice.

Respondents' Exhibits 5 and 6 reflect the Notice to Proceed contracts that contained "not to exceed" clause which was a major concession by Geosytec that put them at risk for cost overruns. In addition to both Respondents being jointly and

[1] Mr. Connor's background and experience speak for themselves and need not be reiterated in this Order.

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

severally liable for the entirety of Geosyntec's work, each Respondent had to invest $17,500 in order for Geosyntec to begin its work. Mr. Connor testified that not only was this an unusual contract with Geosyntec but this case was unusual in two other ways; the cooperative efforts between Hyatt and Mack to procure the necessary professional services and the sharing of work-product information with the Petitioner. Mr. Connor also testified that the contract for services were both necessary and reasonable under the circumstances of this Petition.

Mr. Jack Brandon testified for the Respondents and emphasized the unusual and cooperative nature of this Petition.[2] He testified that the Petition agreed to pay for groundwater data collection and surveying. Mr. Brandon contracted with Mr. David Carter initially for modeling done exclusively for Respondent Mack. He indicated that his work did not go into the same detail as Geosyntec and more work would have been necessary to determine a final cure. The Petitioner was never given any accounting of costs for Mr. Carter or Geosyntec during their employment nor did the Petitioner request to see the fees and costs of these contracts.[3] Mr. Brandon also explained how eminent domain engineering is costlier compared to development engineering.

The Respondents also presented the testimony of Chad Drummond who is employed by Geosyntec as an associate engineer and was the person who negotiated the contract with Respondents. Mr. Drummond testified how his company had never entered into a contract like the ones involved in this Petition. Geosyntec had to front most of the money of their work and performed the work within the proposed budget. The budget constraints were very important to Geosyntec since there was the "not to exceed" clause

[2] Mr. Brandon's background and experience speak for themselves and need not be reiterated in this Order.
[3] Mr. Brandon testified that in his 42 years of experience he has never asked the condemning authority to approve the costs of his engineers/experts.

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

which placed the risk of cost overruns onto Geosyntec. Mr. Drummond also explained the challenges reflected in their scope of work, including 8 different crops to consider in their surface and ground water modeling. Mr. Drummond also established that their work was accomplished in the most cost effective manner possible (Respondents' Exhibit #10 and 11)[4]. Mr. Drummond also explained the nature of the work that was necessary to defend the Petition.

The Respondents presented the expert testimony of Gregory Seidel who opined that Geosyntec's hours and rates were reasonable. He stated Geosyntec was very efficient in their fees when analyzed per acre and per node and was actually done less expensively than 5 of 6 of Mr. Seidel's own similar projects. Mr. Seidel testified that he took into account the complexity of the project and the number of acres. He also indicated "legal work" was riskier than development work and therefore the rate charged should be higher.[5]

The Petitioner presented the testimony of Alan Shirkey, an employee of SFWMD. Mr. Shirkey is an engineer and worked on the project with the Respondents' engineers. He never discussed with Respondents the scope and budget of the work for the project. Mr. Shirkey opined that the Respondents' engineering work was not reasonable in that the fee vs. cost of improvements was too high and that too many hours were worked by high level engineers and too few were done by low level engineers. Mr. Shirkey pointed out that Mr. Carter's invoices were much lower than Geosyntec and that their end-work was similar. Mr. Shirkey also testified that he failed to see the difference between a

[4] These exhibits give the breakdown of labor hour and expense distribution.
[5] This Court infers that Mr. Seidel's definition of legal work includes eminent domain projects which requires more meetings with lawyers and governmental agencies and ultimately may require court testimony.

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

litigation case and a development case. The Petitioner's also introduced several exhibits establishing rates SFWMD pays to engineers for continuing engineering services for similar work in Florida.

Mr. Shirkey conceded that the engineering work done by Geosyntec and Mr. Carter was necessary on the Respondent's property because the report obtained by SFWMD was inadequate—that a higher level of engineering needed to be done. Mr. Shirkey also agreed that ideally engineering firms are paid monthly for their work and he recognized that Geosyntec took on risk by not being paid in the usual manner. He also agreed under these circumstances it was reasonable for Geosyntec to negotiate some premium in exchange for the risk. Mr. Shirkey opinioned that a rate adjustment would have saved a considerable amount of money but he did not opine whether the number of hours was reasonable or unreasonable.[6] Mr. Shirkey did not testify to what rates he believes are reasonable for lower level and higher level engineers and staff for this project.

Conclusions of Law

The Respondents have shown this Court by clear and convincing evidence that the hiring of a professional engineer to perform the scope of work contracted with Geosyntec and David Carter was absolutely necessary to defend the Petition. In fact, Petitioner agreed the work was necessary through the testimony of its own expert/employee, Mr. Alan Shirkey. The only challenge to the fees at issue in the hearing was the hourly rates

[6] If this Court's memory and notes are correct, Mr. Shirkey was never even asked about the total number of hours; rather, his testimony focused ultimately on the rates charged (including high level vs. low level)

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

charged by Geosyntec. Petitioner's expert used the rates charged by one Respondent's original expert, David Carter, as an example of reasonableness.[7]

While the Petitioner presented conflicting evidence regarding the reasonableness of rates, this Court finds that the hourly rates charged by Geosyntec were reasonable under the unique circumstances of this Petition. The Petitioner attempted to compare rates by introducing rates SFWMD establishes for its continuing services contracts. This Court gives those rates relatively little weight in its analysis since the Respondents relative bargaining position in this case is not anything similar to the bargaining position of a governmental agency with (arguably) a lot of work to contract out to any engineer willing to accept those rates. Respondents are two land owners under strict time constraints that must hire an engineering firm willing to defer payment to undertake a large task in a litigated matter. The Petitioner's own expert witness recognized a firm was entitled to negotiate a premium under these circumstances. While the Petitioner's witness established that the engineering project could have possibly been done cheaper, they did not overcome the Respondents' proof of reasonableness.

BASED UPON the foregoing it is therefore **ORDERED and ADJUDGED**

1. Respondent Hyatt Farms is awarded:
    a. Pre-Modeling work $63,091.26
    b. Hyatt ½ of Geosyntec Modeling $134,294.79
    c. Cost to cure and litigation support $174,069.91
2. Respondent Mack Farms is awarded:
    a. Mack ½ of Geosyntec Modeling $134,294.79

[7] This Court concludes that Petitioner thus is not contesting the fees sought on behalf of Mr. Carter.

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

DONE and ORDERED in Chambers, Osceola County, Florida on August 1, 2013.

SCOTT POLODNA, Circuit Judge

Attachment: Hyatt Composite Exhibit A (Resolution No. 2013 - 0920 : Hyatt Stipulated Motion for Order to Pay Costs)

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on August 1, 2013, a true and correct copy of the foregoing has been emailed to:

Keith L. Williams, Esq. kwilliam@sfwmd.gov; acarrell@sfwmd.gov; and litigation@sfwmd.gov

Deborah A. Ruster, Esq. druster@petersonmyers.com
J. Davis Connor, Esq. jconnor@petersonmyers.com

Jack P. Brandon, Esq. jbrandon@petersonmyers.com
John B. Allen, Esq. ballen@petersonmyers.com

Judicial Assistant

M E M O R A N D U M

TO: Governing Board Members

FROM: Carolyn S. Ansay, General Counsel

DATE: September 12, 2013

SUBJECT: Mack Stipulated Motion for Order to Pay Costs

Agenda Item Description:
This is an agenda item to resolve all attorney's fees and expert witness costs incurred by Arnold H. Mack in the eminent domain action styled South Florida Water Management District v. Kenneth G. Hyatt, et al., Osceola County Case Number 2011CA-002798-ED- from 1993 to the present date.

Background:
History
On August 24, 2011, the District filed an eminent domain "slow-take" lawsuit to acquire flowage easement interests adjacent to Lake Kissimmee from Kenneth G. Hyatt and Arnold H. Mack in furtherance of the Kissimmee River Restoration Project. The District began negotiations to acquire property from these landowners under a threat of condemnation in November 1993. On April 11, 2013, the District dismissed its eminent domain action to allow the USACE to review the quality and quantity of the estates required for the project, along with any engineering fixes or "cures". As a result, the landowners are entitled to recover their reasonable attorney's fees and costs incurred in defense of this eminent domain action. Section 73.091 and Section 73.092, Florida Statutes (2012) requires the condemning authority to pay the landowner's reasonable attorney's fees and reasonable costs incurred in defense of condemnation. The Court ordered the District to pay for expert witness engineering fees incurred by Arnold H. Mack pursuant to the condemnation efforts by the District. The District reached full settlement with Arnold H. Mack to pay costs incurred by Arnold H. Mack that were not determined by the Court.

Current Resolution. The order from the Court to the District to pay engineering fees and the proposed settlement reached with Arnold H. Mack for the payment of the remaining attorney's fees and costs related to the condemnation action will require the District to pay attorney's fees and costs of $645,444.79 to Arnold H. Mack. The parties have agreed to enter a stipulated motion for an order to pay costs which includes previous orders to pay costs entered by the Court. This order and its payment represents payment for any and all attorney's fees, expert witness costs, or other taxable costs incurred by Arnold H. Mack in defense of District eminent domain efforts from November 1993 to the date of the entry of the stipulated order.

Core Mission and Strategic Priorities:
Payment of attorney's fees and costs is necessary to satisfy the District's statutory obligation to pay reasonable attorney's fees and costs incurred by the landowner in defense of District eminent domain actions. The terms of this settlement are consistent with previous settlements, within the guidelines provided by the Governing Board and cost payment guidelines.

Funding Source:
We have been advised by the Land Resource Department that settlement of costs is funded with monies from the Okeechobee Ad Valorem Fund. The proposed full settlement provides for payment of costs of $645,444.79. This settlement is a savings of $92,769.71 (approximately 14%) from the initial demand and documentation submitted by attorneys for the landowner totaling $738,214.50. The total amount required to be deposited by the District under this settlement is $645,444.79.

Staff Recommendation
Staff recommends approval of this item to resolve any and all claims for attorney's fees, expert witness fees, and taxable costs and to avoid the uncertainties associated with litigation over these costs which would require the District's expenditure of additional funds to pay both the District's and property owner's substantial legal costs associated with further litigation. The discount obtained through negotiations will most likely exceed that which the District could obtain through further judicial action.

If you have any questions, please call Carolyn Ansay at [ext. 6976] or Keith Williams at [ext. 2791].

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0921

A Resolution of the Governing Board of the South Florida Water Management District to authorize entry into a stipulated motion for order to pay costs with Arnold H. Mack for payment of attorney's fees and expert witness costs of $645,444.79 which represents any and all costs incurred by Arnold H. Mack in the Osceola County Kissimmee River restoration project styled South Florida Water Management District v. Kenneth G. Hyatt, et al., case no.: 2011CA-002798-ED, filed in the 9th circuit court in and for Osceola County, Florida; providing an effective date. (OC, Carolyn Ansay, ext. 6976)

WHEREAS, Sections 373.083(1) and 373.129, Florida Statutes, authorize the South Florida Water Management District to settle existing lawsuits; and

WHEREAS, this case was filed in Osceola County, Florida; and

WHEREAS, the Parties have been engaged in negotiations in an attempt to resolve the outstanding attorney's fees and costs without trial; and

WHEREAS, settlement of this matter avoids the additional costs of a trial and the uncertainties of a judicial order; and

WHEREAS, the Parties have been successful in presenting a proposed stipulated motion for order to pay costs to the Governing Board of the South Florida Water Management District; and

WHEREAS, the terms of the proposed stipulated motion for order to pay costs are set forth on the attached document;

BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

To authorize entry into a stipulated motion for order to pay costs with Arnold H. Mack for $645,444.79, which represents payment of any and all attorney's fees, expert witness fees or other taxable costs incurred by Arnold H. Mack for the eminent domain action styled South Florida Water Management District v. Kenneth G. Hyatt, et al., Case No.: 2011CA-002798-ED, filed in the Circuit Court of the 9th Judicial District in and for Osceola County, Florida; providing an effective date.

This Resolution shall take effect immediately upon adoption.

BUDGETED					
$645,444.79	**402000**	**520**	**5214**	**FD01**	**580013**

	Fund	Agency	Org	Activity	Object/Revenue

_____
Budget Approval

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

IN THE CIRCUIT COURT IN AND FOR OSCEOLA COUNTY, FLORIDA

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT,

Petitioner,

vs. Case No. 2011 CA 002798 ED
Parcel No. 18072-002

KENNETH G. HYATT, et al.,

Respondents.
_____/

STIPULATED MOTION FOR ORDER TO PAY COSTS

The Petitioner, SOUTH FLORIDA WATER MANAGEMENT DISTRICT, and Respondent, ARNOLD H. MACK, as Trustee off the Arnold H. Mack Revocable Trust dated December 27, 2000, by and through undersigned counsel, respectfully stipulate and agree that the costs shall be paid as follows:

American Compliance Technologies, Inc. (A-C-T)	$ 35,000.00
Calhoun, Collister & Parham, Inc.	$ 62,000.00
David C. Carter Consulting	$ 71,000.00
Dr. Sal J. Locascio	$ 8,500.00
Pickett & Associates, Inc.	$ 56,000.00
Peterson & Myers, P.A.	$ 1,900.00
Broad & Cassel, P.A.	$ 5,250.00
Balmoral Group	$ 1,500.00
Geosyntec** (see attached Order)	$134,294.79
Peterson & Myers - attorney fees	$270,000.00
TOTAL	$645,444.79

The total sum of $645,444.79 shall, within thirty (30) days from the date of the signing of the Order, be paid by the Petitioner to the Trust Account of Peterson & Myers, P.A., P.O. Box 1079, Lake Wales FL 33859-1079 for proper disbursement. The parties further stipulate and agree that the total sum reflected herein represents payment of any and all attorney's fees, expert witness fees, and taxable costs incurred by the Respondent from January 1, 1993 to the date of entry of this Order.

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT
BY_____
Keith L. Williams, Esq.
Fla. Bar No. 0135615
3301 Gun Club Road MSC 1410
West Palm Beach, FL 33406
561/682-2791
Attorney for Petitioner

PETERSON & MYERS, P.A.

BY_____
Deborah A. Ruster, Esq.
Fla. Bar No. 0327581
P. O. Box 1079
Lake Wales, FL 33859-1079
863/676-7611
Attorneys for Respondent Mack

EXHIBIT A

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

IN THE CIRCUIT COURT IN AND FOR OSCEOLA COUNTY, FLORIDA

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT,

Petitioner,

vs. Case No. 2011 CA 002798 ED
Parcel No. 18072-002

KENNETH G. HYATT, et al.,

Respondents.
_____/

ORDER ON COSTS

THIS CAUSE having come before the Court on a Stipulated Motion for Order to Pay Costs, and all parties being represented by counsel before the Court, and the Court having considered all matters before it, and the Court being otherwise fully advised, it is

ORDERED that the Petitioner, SOUTH FLORIDA WATER MANAGEMENT DISTRICT, shall pay costs as follows:

American Compliance Technologies, Inc. (A-C-T)	$ 35,000.00
Calhoun, Collister & Parham, Inc.	$ 62,000.00
David C. Carter Consulting	$ 71,000.00
Dr. Sal J. Locascio	$ 8,500.00
Pickett & Associates, Inc.	$ 56,000.00
Peterson & Myers, P.A.	$ 1,900.00
Broad & Cassel, P.A.	$ 5,250.00
Balmoral Group	$ 1,500.00
Geosyntec** (see attached Order)	$134,294.79
Peterson & Myers - attorney fees	$270,000.00
TOTAL	$645,444.79

That within thirty (30) days from the signing of this Order the total sum of **$645,444.79** shall be paid by the Petitioner to the Trust Account of Peterson & Myers, P.A., P. O. Box 1079, Lake Wales FL 33859-1079 for proper disbursement.

DONE AND ORDERED in Chambers at Kissimmee, Osceola County, Florida, this _____ day of September, 2013.

_____
Scott Polodna, Circuit Judge

Copies furnished to: All counsel of record

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

IN THE CIRCUIT COURT OF THE NINTH JUDICIAL CIRCUIT IN AND FOR OSCEOLA COUNTY, FLORIDA

SOUTH FLORIDA WATER
MANAGEMENT DISTRICT,

Petitioner,

CASE NO.: 2011-CA-2798-ED

vs.

KENNETH HYATT, ARNOLD MACK,
et al.,

Respondents.
_____/

ORDER GRANTING RESPONDENTS MOTION TO TAX FEES AND COSTS

THIS MATTER came before the Court as a result of South Florida Water Management District ("SFWMD") having filed a Petition in Eminent Domain on 24 August 2011 and voluntarily dismissing said Petition on 11 April 2013. A hearing on Respondents' Motion to Tax Fees and Costs was held on 23 July 2013. The Court having reviewed Respondents' Motion, case law, the file, arguments of counsel, and being fully advised in the premises FINDS as follows:

Legal Authority

The Florida Constitution guarantees that "[n]o private property shall be taken except for a public purpose and will full compensation therefor paid to each owner." Art. X, Section 6(a), Fla. Const. Full compensation is the objective of this provision and includes costs of expert witnesses. *Jacksonville Expressway Authority, Dade County v. Brigham*, 47 So.2d 602 (Fla. 1950). This Court has the authority to determine and award reasonable fees and costs to the Respondents associated with the defense of the petition. Regarding the motions to tax attorney's fees and costs, section 73.091, Fla. Stat. (2013),

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

obligates the Petitioner to pay attorney's fees and all reasonable costs incurred in the defense of the proceedings. Moreover, the Petitioner's voluntary dismissal of the petition did not divest the trial court of jurisdiction to consider the motions for fees and costs. *See Golf Course Resorts v. DOT,* 816 So.2d 236 (Fla. 2nd DCA 2002) (*Citing: City of Hallandale v. Chatlos,* 236 So.2d 761, 763 (Fla.1970); *State, Dep't of Transp. v. ABS Prop. P'ship,* 693 So.2d 703, 705 (Fla. 2d DCA 1997)).

Findings of Fact

The Respondent's witness, J. Davis Connor[1], testified that SFWMD interest in their property dates back to November 24, 1993 (Respondent's Exhibit #1). The Respondents received an appraisal along with an offer letter in 2010 (Respondent's Exhibit #2). Mr. Connor testified that the appraisal was intimidating to the Respondents since the cost to cure was estimated at $1.9 million and they were under time pressure due to the accompanying offer letter. As a result of the Petitioner's actions, the Respondent Hyatt entered into a contract with Geosyntec Consultants that required special terms, including special payment terms which made Hyatt directly liable for payment to Geosyntec. Respondent Mack subsequently entered into a cost sharing contract with Hyatt regarding the services to be provided by Geosyntec. Additionally, Mack also entered into a contract with Geosyntec with similar provisions (Respondent's Exhibit #4). Mr. Connor testified both of these arrangements (Hyatt being directly liable and Hyatt/Mack cost sharing agreement) are highly unusual in Eminent Domain practice.

Respondents' Exhibits 5 and 6 reflect the Notice to Proceed contracts that contained "not to exceed" clause which was a major concession by Geosytec that put them at risk for cost overruns. In addition to both Respondents being jointly and

[1] Mr. Connor's background and experience speak for themselves and need not be reiterated in this Order.

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

severally liable for the entirety of Geosyntec's work, each Respondent had to invest $17,500 in order for Geosyntec to begin its work. Mr. Connor testified that not only was this an unusual contract with Geosyntec but this case was unusual in two other ways; the cooperative efforts between Hyatt and Mack to procure the necessary professional services and the sharing of work-product information with the Petitioner. Mr. Connor also testified that the contract for services were both necessary and reasonable under the circumstances of this Petition.

Mr. Jack Brandon testified for the Respondents and emphasized the unusual and cooperative nature of this Petition.[2] He testified that the Petition agreed to pay for groundwater data collection and surveying. Mr. Brandon contracted with Mr. David Carter initially for modeling done exclusively for Respondent Mack. He indicated that his work did not go into the same detail as Geosyntec and more work would have been necessary to determine a final cure. The Petitioner was never given any accounting of costs for Mr. Carter or Geosyntec during their employment nor did the Petitioner request to see the fees and costs of these contracts.[3] Mr. Brandon also explained how eminent domain engineering is costlier compared to development engineering.

The Respondents also presented the testimony of Chad Drummond who is employed by Geosyntec as an associate engineer and was the person who negotiated the contract with Respondents. Mr. Drummond testified how his company had never entered into a contract like the ones involved in this Petition. Geosyntec had to front most of the money of their work and performed the work within the proposed budget. The budget constraints were very important to Geosyntec since there was the "not to exceed" clause

[2] Mr. Brandon's background and experience speak for themselves and need not be reiterated in this Order.
[3] Mr. Brandon testified that in his 42 years of experience he has never asked the condemning authority to approve the costs of his engineers/experts.

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

which placed the risk of cost overruns onto Geosyntec. Mr. Drummond also explained the challenges reflected in their scope of work, including 8 different crops to consider in their surface and ground water modeling. Mr. Drummond also established that their work was accomplished in the most cost effective manner possible (Respondents' Exhibit #10 and 11)[4]. Mr. Drummond also explained the nature of the work that was necessary to defend the Petition.

The Respondents presented the expert testimony of Gregory Seidel who opined that Geosyntec's hours and rates were reasonable. He stated Geosyntec was very efficient in their fees when analyzed per acre and per node and was actually done less expensively than 5 of 6 of Mr. Seidel's own similar projects. Mr. Seidel testified that he took into account the complexity of the project and the number of acres. He also indicated "legal work" was riskier than development work and therefore the rate charged should be higher.[5]

The Petitioner presented the testimony of Alan Shirkey, an employee of SFWMD. Mr. Shirkey is an engineer and worked on the project with the Respondents' engineers. He never discussed with Respondents the scope and budget of the work for the project. Mr. Shirkey opined that the Respondents' engineering work was not reasonable in that the fee vs. cost of improvements was too high and that too many hours were worked by high level engineers and too few were done by low level engineers. Mr. Shirkey pointed out that Mr. Carter's invoices were much lower than Geosyntec and that their end-work was similar. Mr. Shirkey also testified that he failed to see the difference between a

[4] These exhibits give the breakdown of labor hour and expense distribution.
[5] This Court infers that Mr. Seidel's definition of legal work includes eminent domain projects which requires more meetings with lawyers and governmental agencies and ultimately may require court testimony.

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

litigation case and a development case. The Petitioner's also introduced several exhibits establishing rates SFWMD pays to engineers for continuing engineering services for similar work in Florida.

Mr. Shirkey conceded that the engineering work done by Geosyntec and Mr. Carter was necessary on the Respondent's property because the report obtained by SFWMD was inadequate—that a higher level of engineering needed to be done. Mr. Shirkey also agreed that ideally engineering firms are paid monthly for their work and he recognized that Geosyntec took on risk by not being paid in the usual manner. He also agreed under these circumstances it was reasonable for Geosyntec to negotiate some premium in exchange for the risk. Mr. Shirkey opinioned that a rate adjustment would have saved a considerable amount of money but he did not opine whether the number of hours was reasonable or unreasonable.[6] Mr. Shirkey did not testify to what rates he believes are reasonable for lower level and higher level engineers and staff for this project.

Conclusions of Law

The Respondents have shown this Court by clear and convincing evidence that the hiring of a professional engineer to perform the scope of work contracted with Geosyntec and David Carter was absolutely necessary to defend the Petition. In fact, Petitioner agreed the work was necessary through the testimony of its own expert/employee, Mr. Alan Shirkey. The only challenge to the fees at issue in the hearing was the hourly rates

[6] If this Court's memory and notes are correct, Mr. Shirkey was never even asked about the total number of hours; rather, his testimony focused ultimately on the rates charged (including high level vs. low level)

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

charged by Geosyntec. Petitioner's expert used the rates charged by one Respondent's original expert, David Carter, as an example of reasonableness.[7]

While the Petitioner presented conflicting evidence regarding the reasonableness of rates, this Court finds that the hourly rates charged by Geosyntec were reasonable under the unique circumstances of this Petition. The Petitioner attempted to compare rates by introducing rates SFWMD establishes for its continuing services contracts. This Court gives those rates relatively little weight in its analysis since the Respondents relative bargaining position in this case is not anything similar to the bargaining position of a governmental agency with (arguably) a lot of work to contract out to any engineer willing to accept those rates. Respondents are two land owners under strict time constraints that must hire an engineering firm willing to defer payment to undertake a large task in a litigated matter. The Petitioner's own expert witness recognized a firm was entitled to negotiate a premium under these circumstances. While the Petitioner's witness established that the engineering project could have possibly been done cheaper, they did not overcome the Respondents' proof of reasonableness.

BASED UPON the foregoing it is therefore **ORDERED and ADJUDGED**

1. Respondent Hyatt Farms is awarded:
    a. Pre-Modeling work $63,091.26
    b. Hyatt ½ of Geosyntec Modeling $134,294.79
    c. Cost to cure and litigation support $174,069.91
2. Respondent Mack Farms is awarded:
    a. Mack ½ of Geosyntec Modeling $134,294.79

[7] This Court concludes that Petitioner thus is not contesting the fees sought on behalf of Mr. Carter.

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

DONE and ORDERED in Chambers, Osceola County, Florida on August 1, 2013.

SCOTT POLODNA, Circuit Judge

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on August 1, 2013, a true and correct copy of the foregoing has been emailed to:

Keith L. Williams, Esq. kwilliam@sfwmd.gov; acarrell@sfwmd.gov; and litigation@sfwmd.gov

Deborah A. Ruster, Esq. druster@petersonmyers.com
J. Davis Connor, Esq. jconnor@petersonmyers.com

Jack P. Brandon, Esq. jbrandon@petersonmyers.com
John B. Allen, Esq. ballen@petersonmyers.com

Judicial Assistant

Attachment: Mack Composite Exhibit A (Resolution No. 2013 - 0921 : Mack Stipulated Motion for Order to Pay Costs)

M E M O R A N D U M

TO: Governing Board Members

FROM: Terrie Bates, Director, Water Resources

DATE: September 12, 2013

SUBJECT: Approval of the *2013 Lower East Coast Water Supply Plan Update* (LEC Plan Update)

Agenda Item Description

Approval of the *2013 Lower East Coast Water Supply Plan Update* (LEC Plan Update).

Background

Regional water supply plans are required to be updated at least every five years pursuant Chapter 373, F.S. The first *Lower East Coast Regional Water Supply Plan* was completed in 2000 and updated in 2005-2006. The LEC Plan Update augments the knowledge and assumptions of past plans.

The LEC Plan Update provides demand projections through 2030, and identifies sources and strategies to meet these demands pursuant to Chapter 373, F.S. The plan incorporates water supply development projects proposed by public water supply utilities to meet their projected demands. It also includes updates to the LEC minimum flow and level (MFL) water bodies' prevention and recovery strategies. The LEC Plan concludes that the future water needs of the LEC Planning Area can continue to be met through the 2030 planning horizon with appropriate management, conservation, and implementation of projects identified in this plan. Meeting the future water needs is dependent on the following: completion of water supply development projects by two public water supply utilities; completion of USACE's Herbert Hoover Dike Rehabilitation Project and implementation of a new Lake Okeechobee regulation schedule could return the lake to MFL prevention status, enhance the level of certainty to existing permitted users, and support other environmental objectives; and, implementation of CERP and other projects identified in MFL prevention and recovery strategies.

The LEC Plan Update was developed in an open public forum with extensive participation by water users, water utilities, local governments, environmental organizations, agricultural interests, and other stakeholders through the District's Water Resources Advisory Commission. A series of workshops were held during the plan development process to solicit input and to provide information about planning results and progress. Approval of this LEC Plan Update will trigger actions by local governments, in coordination with utilities, to consider these recommendations for incorporation into their required 10-Year Facilities Work Plans.

Core Mission and Strategic Priorities

Water Supply is one of the District's core missions. Developing and updating regional

Attachment: ca_wr_200_sd (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

water supply plans in coordination with local governments and other stakeholders to meet the current and future demands of the water users and the environment is a strategic priority.

Funding Source
Implementation of the water resource and water supply projects identified in the LEC Plan Update would be funded through a combination of local, District, and state funds, as appropriate and available. The majority of these projects are subject to cost-sharing with the federal government.

Staff Recommendation
Staff recommends the Governing Board issue a final order approving the 2013 LEC Plan Update. Updating water supply plans is a strategic priority and would be consistent with Chapter 373 F.S. The 2013 LEC Plan Update provides demand projections through 2030, and identifies sources and strategies to meet these demands. In addition, the approval of this LEC Plan Update will allow the recommended alternative water supply projects to be eligible for funding, will support the District's responsibility under Chapter 373, F.S., and allow local governments to complete their responsibilities under Chapter 163, F.S.

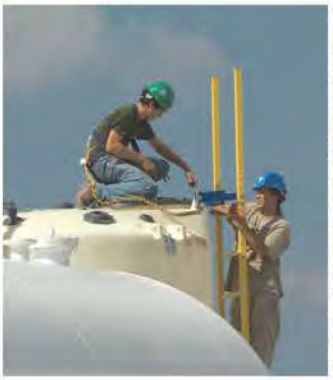
If you have any questions, please call Terrie Bates at ext. 6952 or Dean Powell at ext.6787.

TB/bjm

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

August 2013 Final Draft

Planning Document



LOWER EAST COAST
WATER SUPPLY PLAN UPDATE

2013

Attachment: LEC_Plan_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

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Acknowledgements

The South Florida Water Management District recognizes and thanks the Water Resources Advisory Commission Regional Water Supply Workshop participants for their contributions, comments, advice, information, and assistance throughout the development of this *2013 Lower East Coast Water Supply Plan Update*.

Furthermore, the South Florida Water Management District expresses appreciation to all staff who contributed to the development and production of this plan update.

For further information about this document, please contact:

Brenda Mills
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406
Telephone: (561) 682-6536
Email: bmills@sfwmd.gov

sfwmd.gov

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Attachment: LEC_Plan_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

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Attachment: LEC_Plan_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

Executive Summary

The South Florida Water Management District's (SFWMD) strategic goal for all of its water supply plans is to ensure an adequate supply of water to protect natural systems and to meet existing and future reasonable-beneficial uses, while sustaining water resources for future generations. This document is the second update to the *2000 Lower East Coast Regional Water Supply Plan* (2000 LEC Plan) (SFWMD 2000). The first update, the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update), was finalized in 2007 (SFWMD 2007). This update presents 20-year population and water demand projections, a review of water supply issues and evaluations, and water source options; examines local and regional efforts completed since the previous update; and evaluates future water resource and proposed water supply development projects for 2010–2030.

The Lower East Coast (LEC) Planning Area covers 6,100 square miles, including Palm Beach, Broward, and Miami-Dade counties, most of Monroe County, and eastern Hendry and Collier counties. The Everglades Agricultural Area, located in the LEC Planning Area, is a portion of the Lake Okeechobee Service Area. However, the entire Lake Okeechobee Service Area, which includes portions of Martin, Okeechobee, Glades, and Lee counties, is considered in the LEC water supply planning process because of its reliance on Lake Okeechobee.

A number of factors distinguish the LEC Planning Area from others regions of the state, including population, spatial extent of natural systems, availability of fresh water, and an extensive network of canals and related water works. The LEC Planning Area boundary encompasses three of the state's five most populous counties. Extensive natural systems such as Lake Okeechobee, the Everglades, Florida and Biscayne bays, the Northwest Fork of the Loxahatchee River, and Lake Worth Lagoon are found in the LEC Planning Area. It includes two national parks and four national wildlife refuges. The area typically receives abundant fresh water seasonally, with volumes exceeding human and natural system needs. Water availability also varies annually, including periodic drought. The regional water management system, the Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project), is largely located in the LEC Planning Area. The C&SF Project plays a critical role in capturing wet season storm water and moving water between natural systems as well as delivering water to agricultural areas and the urbanized coastal communities.

Total water demand is projected to increase by 12 percent to 1,933 million gallons per day (MGD) by 2030. Public Water Supply (PWS) remains the LEC Planning Area's single largest water use category in 2030, representing 52 percent of the planning area's total water demand. It is followed by agriculture at 34 percent. The remaining four categories, domestic (residential) self-supply, recreation and landscaping, industrial, and power generation, account for the remaining 14 percent.

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Attachment: LEC_Plan_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

The LEC Planning Area traditionally has relied on fresh groundwater from the surficial aquifer system and surface water from Lake Okeechobee as primary water sources for urban, agricultural, and industrial uses. The Everglades provides groundwater and surface water recharge to the urban coastal communities, contributing to the water supply throughout most of this region. In 2010, fresh groundwater accounted for 94 percent of potable water produced by PWS utilities. The surficial aquifer system, including the Biscayne aquifer, provides more than 1 billion gallons a day for utilities, as well as agricultural production, landscape irrigation, and other uses. Since the last plan update, the SFWMD placed limitations on additional allocations from the freshwater sources in the region to protect the region's natural resources. As a result, use of alternative water sources has expanded.

This plan update was developed in an open public forum with water supply utilities, local governments, environmental organizations, agricultural interests, and other stakeholders through the SFWMD's Water Resources Advisory Commission. The process to develop the population and water demand projections began in 2010. Multiple meetings and workshops were held with water users, local governments, utilities, agriculture and other industry representatives, environmental representatives, and agencies to solicit input, provide information about planning results, and receive comments on draft sections of the plan.

PUBLIC WATER SUPPLY

This plan update represents a departure from the demand projections in the 2000 LEC Plan and the 2005–2006 LEC Plan Update. Subsequent to approval of the 2005–2006 LEC Plan Update in February 2007, the nation's economy fell into a long recession that had significant impacts on regional water supply planning, lowering population and demand forecasts. The dramatic slowdown in population growth occurred at the same time that consumption of potable water declined as measured in gallons per person per day. Likely reasons for this decrease in PWS consumption include short-term water shortage restrictions in response to droughts, long-term water conservation projects including SFWMD's year-round landscape irrigation conservation measures, and increased use of reclaimed water. Local actions, such as implementation by Broward and Miami-Dade counties of ordinances limiting landscape irrigation to two days a week, the Broward County Water Conservation Partnership, and individual utility conservation programs, have been key in lowering the water use rate. An indication of the resulting trend is the LEC Planning Area's population grew by 600,000 people between 2000 and 2010, but total potable water use declined by 87 MGD (10 percent) during the same decade.

This plan's twenty-year population and PWS demand forecasts are lower than the two previous plans' projections. Projections developed for this update indicate the planning area's population will increase over 18 percent, from approximately 5.6 million residents in 2010 to slightly more than 6.6 million by 2030. In contrast, the 2005–2006 LEC Plan Update projected the planning area's population to increase over 31 percent, to 7.3 million by 2025. The projected population growth varies widely between the counties: Palm Beach County

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Attachment: LEC_Plan_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

(+25 percent), Broward County (+14 percent), Miami-Dade County (+18 percent), and Monroe County (-5 percent).

The projected gross water demand for 2030 for the region's PWS is 1,008 MGD, a 20 percent increase from the volume used in 2010. Because the 2010 PWS water use was lower than the historical demand of the previous decade, the projected growth is within the available capacities for most utilities. Also, many utilities have been planning for the higher population growth rates and have secured twenty-year water use permit allocations and built the necessary treatment capacity. The cumulative volume of water currently allocated for PWS slightly exceeds the total projected demand for 2030 and the majority of the PWS water providers appear to be able to meet their 2030 projected demand without additional allocation or infrastructure. A few utilities will likely face a potential deficit on an average daily or peak demand basis within the next 20 years and have proposed projects in this plan for the deficit.

Utilities have diversified their water supply sources with development of alternative water supplies, including treatment and storage technologies, and water conservation programs. These alternatives include constructing brackish Floridan aquifer wells and reverse osmosis treatment plants, reclaimed water treatment and distribution facilities, and aquifer storage and recovery systems. Between 2007 and 2009, 41 MGD of potable water supply capacity was added. From 2010 to 2013, nine utilities built potable water supply projects with a capacity of 49 MGD. Approximately 14 percent of the current PWS allocation is now from an alternative water source, primarily brackish groundwater.

In this plan update, 10 utilities have proposed 13 new potable water supply projects totaling 76 MGD. Based on the 2030 demand projections, two utilities each appear to need one of their proposed potable water supply projects during the planning period. The two projects total 26 MGD. Local governments, in coordination with utilities, will address the proposed projects as they revise their water supply facilities work plans, which must be submitted to the State of Florida Department of Economic Opportunity and reviewing agencies within 18 months of approval of this plan update.

In addition to the 13 potable water supply projects, this plan update incorporates 15 nonpotable water projects proposed by utilities to meet future needs. Twelve of the nonpotable water projects are reclaimed water projects, including several to comply with the 2008 Leah G. Schad Ocean Outfall Program. Implementation of this program is expected to result in 178 MGD of additional reuse by 2025. If population growth accelerates faster than forecasted, reuse and other alternative water source projects could become more urgent for some water providers.

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Attachment: LEC_Plan_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

AGRICULTURAL WATER SUPPLY

Agricultural self-supply demand is projected to remain relatively stable over the planning horizon. It will continue to be the LEC Planning Area's second largest water user in 2030, accounting for 34 percent of the total water demand. Agricultural areas are projected to need supplemental irrigation water for approximately 575,897 acres in 2030 with a gross water demand of 668 MGD. The largest concentration of agricultural activity is located in the Everglades Agricultural Area and is dominated by sugarcane. The Everglades Agricultural Area, dependent on Lake Okeechobee and its connected conveyance canals for supplemental irrigation, is a fully developed, stable agricultural area where permitted acres and cropping practices are not expected to change over the next 20 years.

While urban development has reduced farmlands east of the Everglades, a robust agricultural industry remains in portions of Palm Beach, Broward, and Miami-Dade counties, which are within the LEC Service Area. Winter vegetables dominate the crops in eastern Palm Beach and Broward counties. Miami-Dade County has extensive nurseries and tropical fruit groves, in addition to vegetable crops. A modest increase of 581 acres is anticipated by 2030 for the agricultural operations in the LEC Service Area.

LAKE OKEECHOBEE

In the Lake Okeechobee Service Area, local conditions limit the volume of available fresh water. Specifically, Lake Okeechobee and hydraulically connected water bodies are limited sources as a result of the United States Army Corps of Engineers' (USACE) implementation of the 2008 Lake Okeechobee federal regulation schedule. The schedule change is intended to operate the lake at lower levels than recent regulation schedules to reduce the risk that the lake's dike might fail, as well as impacts to the lake ecology.

Studies supporting the 2008 Lake Okeechobee Regulation Schedule change assessed impacts on water supply performance. The analysis projected a decline in the physical level of certainty of agricultural users reliant on lake water supplies, from a 1-in-10 year to a 1-in-6 year drought return frequency. The new schedule also was expected to cause Lake Okeechobee to exceed its minimum flows and levels (MFL) criteria more frequently. In response, SFWMD developed a MFL recovery strategy in 2008. As one part of that strategy, SFWMD adopted regulatory criteria to limit future additional withdrawals from Lake Okeechobee and connected water bodies to protect the lake and prevent further erosion to the level of certainty for existing legal users.

USACE has started the rehabilitation of the Herbert Hoover Dike. The initial step—construction of a 21.4-mile cutoff wall component in Reach 1—is scheduled for completion in 2013, and satisfies the majority of the risk reduction goals. As part of this risk reduction approach, the 32 water control structures (culverts) operated by USACE will be replaced, removed, or abandoned by 2018. Rehabilitation to Reaches 2 and 3 is scheduled for completion by 2022. USACE has indicated it will consider revisions to the lake regulation schedule at that time. Any increase in the lake's regulation schedule as a result of the repairs

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will likely be evaluated by USACE through a National Environmental Policy Act analysis of multiple objectives including flood protection, water supply, and the ecological health of the lake and downstream ecosystems.

NATURAL SYSTEMS INCLUDING THE EVERGLADES

The water supply needs for natural systems limit water available for allocation and are addressed through a variety of regulatory mechanisms and water resource development projects. Construction of ecosystem restoration projects is vital to the health of the region's water resources, including elements identified in MFL recovery and prevention strategies. The Comprehensive Everglades Restoration Plan (CERP), a partnership between USACE and SFWMD, has long held a critical relationship with water supply planning in the LEC Planning Area and includes capital projects needed for restoration. The 2000 LEC Plan was developed on a parallel track with CERP during the 1990s and identified CERP projects to protect and restore natural systems and provide water supply for urban and agricultural communities alike. Implementation of many CERP projects has been delayed. In response, SFWMD initiated construction of CERP projects within the LEC Planning Area including the Loxahatchee River Watershed Restoration Project, Biscayne Bay Coastal Wetlands Phase 1, and C-111 Spreader Canal Western Project.

A number of CERP components are being formulated and evaluated as part of the Central Everglades Planning Project. This effort is identifying and planning for projects on land in public ownership to allow more water to be directed south to Water Conservation Area 3, Everglades National Park, and Florida Bay, while providing for other water related needs of the region. The recommended plan will require approval by SFWMD's Governing Board and the Florida Department of Environmental Protection, as well as congressional authorization and appropriations.

CONCLUSION

This update provides an assessment of the water supply demand and available sources for the LEC Planning Area through 2030. Meeting the 1-in-10 level of service for all water users and MFLs in the LEC Planning Area is not likely within the next five years due to the interrelationship of the federal projects outlined in the plan and current operations under the 2008 Lake Okeechobee Regulation schedule. Future LEC plan updates will address the progress of the water resource development projects based on project sequencing, project funding, and implementation partnerships as applicable. Until this occurs, this plan continues to rely upon the existing programs and regulations, along with the identified PWS development projects, and their correlation with water supply demands and available sources. The future water needs of the LEC Planning Area can be met with appropriate management, conservation, and implementation of projects identified in this plan. SFWMD anticipates any additional water from Lake Okeechobee resulting from operational changes or a revised regulation schedule could return the lake to MFL prevention status, enhance

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the level of certainty to existing permitted users, and support other environmental objectives. Meeting the future water needs is dependent on the following:

- Construction of two potable water supply development projects by PWS utilities.
- Utilization of the flexibility within the 2008 Lake Okeechobee Regulation Schedule as incremental dam safety improvements are completed; and in the longer term, completion of the seepage berm construction or equivalent repairs to the Herbert Hoover Dike for reaches 1, 2 and 3 by the USACE and implementation of a new Lake Okeechobee regulation schedule.
- Implementation of CERP and other projects identified in MFL prevention and recovery strategies.

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Acronyms and Abbreviations

2000 LEC Plan	*2000 Lower East Coast Regional Water Supply Plan*
2005–2006 LEC Plan Update	*2005–2006 Lower East Coast Water Supply Plan Update*
2008 LORS	2008 Lake Okeechobee Regulation Schedule
ac-ft	acre-feet
AFSIRS	Agricultural Field Scale Irrigation Requirements Simulation
AGR Self-Supply	Agricultural Self-Supply
ASR	aquifer storage and recovery
Basis of Review	*Basis of Review for Water Use Permit Applications within the South Florida Water Management District, referred to as the Basis of Review*
BEBR	Bureau of Economic and Business Research
BBCW Project	Biscayne Bay Coastal Wetlands Project
BMP	best management practice
C&SF Project	Central and Southern Florida Project for Flood Control and Other Purposes
CEPP	Central Everglades Planning Project
CERP	Comprehensive Everglades Restoration Plan
cfs	cubic feet per second
DBHYDRO	SFWMD's corporate environmental database
Decomp	Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement project
DPM	Decompartmentalization Physical Model
DSS	Domestic Self-Supply
EAA	Everglades Agricultural Area
ERTP	Everglades Restoraton Transition Plan
ET	evapotranspiration
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FDEP	Florida Department of Environmental Protection
FEB	flow equalization basin
FKAA	Florida Keys Aqueduct Authority
FPL	Florida Power & Light

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F.S.	Florida Statutes
FY	Fiscal Year
ICI Self-Supply	Industrial/Commercial/Institutional Self-Supply
LEC	Lower East Coast
LECSA	Lower East Coast Service Area
LECsR	Lower East Coast Subregional Model
LOSA	Lake Okeechobee Service Area
MDWASD	Miami-Dade Water and Sewer Department
MFL	minimum flows and levels
MGD	million gallons per day
mg/L	milligrams per liter
ModWaters	Modified Water Deliveries to Everglades National Park
NGVD	National Geodetic Vertical Datum of 1929
PBCWUD	Palm Beach County Water Utility Department
PCUR	per capita use rate
PIR	project implementation report
PWR Self-Supply	Power Generation Self-Supply
PWS	Public Water Supply
REC Self-Supply	Recreational/Landscape Self-Supply
RO	reverse osmosis
SAS	surficial aquifer system
SFWMD	South Florida Water Management District
STA	stormwater treatment area
Support Document	*2011–2013 Water Supply Plan Support Document*
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
Water CHAMP	Water Conservation Hotel and Motel Program
WaterSIP	Water Savings Incentive Program
WCA	water conservation area
WTP	water treatment plant
WWTP	wastewater treatment plant

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1 Introduction

The South Florida Water Management District (SFWMD) updates regional water supply plans to promote the availability of water to meet current and future water needs while protecting South Florida's water resources. This is the second five-year update of the *2000 Lower East Coast Regional Water Supply Plan* (2000 LEC Plan) (SFWMD 2000). This update builds on the information and analysis contained in the 2000 LEC Plan and the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007). This current update assesses the Lower East Coast (LEC) Planning Area's existing and projected water needs and water sources to meet those needs from 2010 to 2030. The update also describes proposed water supply projects, regional water resource projects and implementation strategies for Fiscal Year (FY) 2010 through FY 2030.

TOPICS

- Current Update
- Legal Authority and Requirements
- Goals and Objectives
- Planning Process
- Planning Area Background
- History of Planning Efforts
- Progress
- Climate Change
- Planning for Next 20 Years

CURRENT UPDATE

This update reflects the influence of significant fluctuations in the economy, residential and commercial development, and agricultural commodity markets on the projected population growth and water needs of the LEC Planning Area. **Chapter 2** of this update documents the population growth and water demand by each water use category. **Chapter 3** discusses regulatory protection of water resources and changes since the last plan update to the water resources, their availability, and issues facing the region. **Chapter 4** identifies water resource development projects that are primarily the responsibility of the SFWMD. **Chapter 5** evaluates the planning area's water source options. **Chapter 6** describes proposed water supply development projects that are primarily the responsibility of water suppliers and water users. **Chapter 7** provides future guidance and direction with emphasis on actions recommended prior to the next update.

NAVIGATE

This plan update consists of this Planning Document, an Appendices volume, and the *2011–2013 Water Supply Plan Support Document* (SFWMD 2013a).

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LEGAL AUTHORITY AND REQUIREMENTS

The legal authority and requirements for water supply planning are primarily found in Chapter 373, Florida Statutes (F.S.). Chapters 163, 187, and 403, F.S. provide additional direction. In accordance with Chapters 163 and 373, F.S., regional water supply plans and local government comprehensive plans must ensure adequate potable water facilities are constructed and are concurrently available with new development. The water supply planning region identified in this plan shall be considered a Water Resource Caution Area for the purposes of section 403.064, F.S., and affected parties may challenge the designation pursuant to section 120.569, F.S.

LAW / CODE

Subsection 373.709(1), F.S.:

The governing board of each water management district shall conduct water supply planning for any water supply planning region within the district identified in the appropriate district water supply plan under Section 373.036, F.S. where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period.

GOAL AND OBJECTIVES

The goal for this water supply plan update is to identify sufficient water supply sources and future projects to meet existing and future reasonable-beneficial uses during a 1-in-10 year drought condition through 2030 while sustaining water resources and related natural systems. The following objectives provide an overall framework for this planning process:

- **Water Supply –** Identify sufficient water resource and water supply development options to meet projected 2030 water demands during a 1-in-10 year drought event.
- **Water Conservation and Alternative Source Development –** Increase levels of conservation, the efficiency of water use, and the development of alternative water sources to meet projected demand.
- **Natural Systems –** Protect and enhance the environment, including the Everglades and other federal, state, and locally identified natural resource areas.
- **Linkage with Local Governments –** Provide information to support local government comprehensive plans.
- **Compatibility and Linkage with Other Efforts –** Achieve compatibility and integration with the following:
  - Comprehensive Everglades Restoration Plan (CERP) and other environmental restoration projects

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- Modifications to operating schedules for the regional system, including Lake Okeechobee
- Water use permitting process, minimum flow and level (MFL) criteria, and water reservations
- Other regional and local water resource planning efforts

PLANNING PROCESS

The planning process for developing this update is described in **Table 1**.

Table 1. Planning process for developing this plan update.

PLANNING PROCESS			
1	2	3	4
Planning and Assessment	**Data Collection, Analyses and Issue Identification**	**Evaluation of Water Resources and Water Source Options**	**Identify Water Resource and Water Supply Development Projects**
The update process incorporated extensive public participation, including a series of public workshops, as well as coordination with local governments, the Florida Department of Environmental Protection, and other appropriate state and federal agencies. A review of previous planning efforts in the region and documentation of activities since the approval of the 2005–2006 LEC Plan Update were key starting points of this process.	Using the 2005–2006 LEC Plan Update as a foundation, updating this plan involved collecting the latest information about population, water demand, (**Chapter 2**), water resources, water conservation, and land use. Analyses, such as groundwater and surface water evaluations; a review of regulatory information; mapping; wetland studies; and other related data (**Chapter 3**) confirmed the validity of previously identified issues and helped identify new issues.	The next phase of the planning process involved reviewing existing solutions or developing new solutions to address the identified issues. In areas where projected demand exceeds available supplies, solutions included alternative water supplies and water conservation (**Chapter 5**). In most cases, the 2005–2006 LEC Plan Update had identified more projects than needed to meet the projected demand for 2025. Source options were evaluated and appropriate responsibilities were identified.	In areas where water resource conditions warranted, water resource development projects were identified (**Chapter 4**). Water supply projects intended to meet water needs for the next 20 years were identified by utilities then compiled and evaluated by SFWMD with input from stakeholders, the public, and other agencies. The projects were also screened for permitting feasibility. With lower 2030 projections, some proposed projects may be downsized, delayed, eliminated, or substituted with different projects (**Chapter 6**).

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Public Participation

SFWMD established the Water Resources Advisory Commission to serve as an advisory body to the Governing Board. The commission is the primary forum for conducting workshops, presenting information, and receiving public input on water resource issues affecting South Florida. Commission members represent interests from all four of SFWMD's water supply planning areas.

SFWMD held Water Resources Advisory Commission issue workshops on the plan update throughout the water supply planning process. Stakeholders representing a cross-section of interests in the region—agricultural, industrial, tribal, environmental, utilities, local government planning departments, and state and federal agencies—were invited to attend the workshops as well as the public. During the workshops, participants reviewed and provided comments regarding projected demand and other key plan elements compiled by SFWMD staff. In addition to issue workshops, water demand projections were also coordinated through individual meetings with local government planning departments, utilities, and agricultural industry representatives. Workshop participants also reviewed and provided input on water supply issues, the condition of regional water resources, water source options, and the draft water supply plan documents. The public's comments on draft chapters of the plan were discussed in workshops and posted on SFWMD's website. Ultimately, the plan was presented to SFWMD's Governing Board for their consideration for approval at a publicly noticed meeting.

PLANNING AREA BACKGROUND

The LEC Planning Area includes all of Palm Beach, Broward, and Miami-Dade counties, most of Monroe County, and the eastern portions of Hendry and Collier counties (**Figure 1**). The inset in **Figure 1** shows the LEC Planning Area in relation to the three other regional planning areas within SFWMD boundaries. Some Palm Beach County utilities provide water to small portions of Martin County. Martin County population demands are included with the appropriate Palm Beach County utility information.

Figure 2 shows the location of the water supply service areas within the LEC Planning Area. The plan boundary encompasses the Lower East Coast Service Area (LECSA) and part of the Lake Okeechobee Service Area (LOSA). LECSA includes major metropolitan areas from West Palm Beach to Fort Lauderdale to Miami. LOSA includes portions of Palm Beach, Martin, Okeechobee, Hendry, Glades, and Lee counties that are dependent on Lake Okeechobee and connected conveyance canals for supplemental water supply. The Everglades Agricultural Area (EAA), the largest portion of LOSA, falls within the plan boundaries. While not included in the water demand totals, the water supply needs of LOSA located in Martin, Okeechobee, Hendry, Glades, and Lee counties are considered in LEC Planning Area analyses. The documentation and discussions of the portion of LOSA outside of the EAA are found in the SFWMD's other regional water supply plans. Likewise, discussions of the Caloosahatchee and St. Lucie estuaries are found in the Lower West Coast and Upper East Coast water supply plans, respectively.

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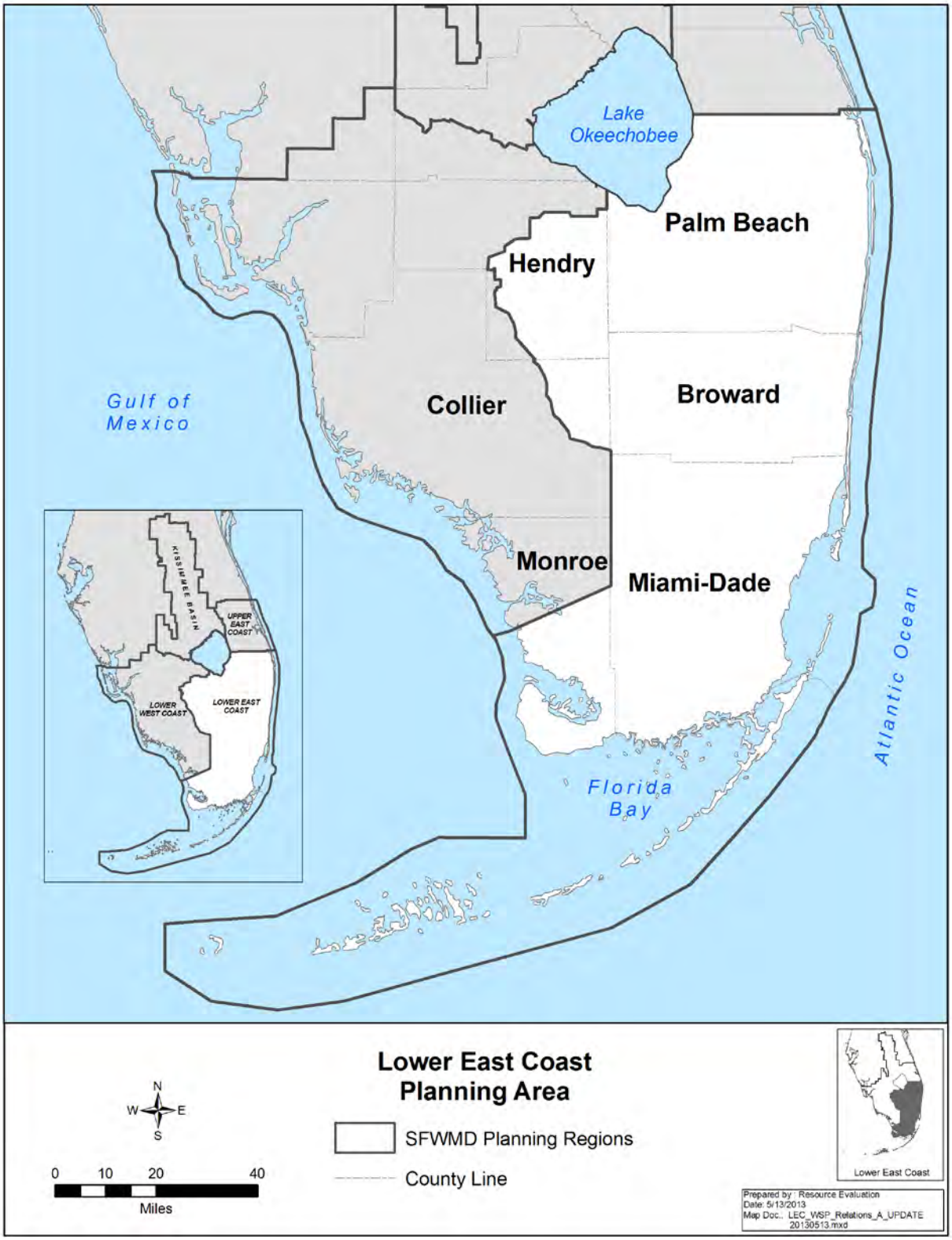

Figure 1. Map of the LEC Planning Area showing the counties within the planning area and its location relative to other planning areas within SFWMD boundaries.

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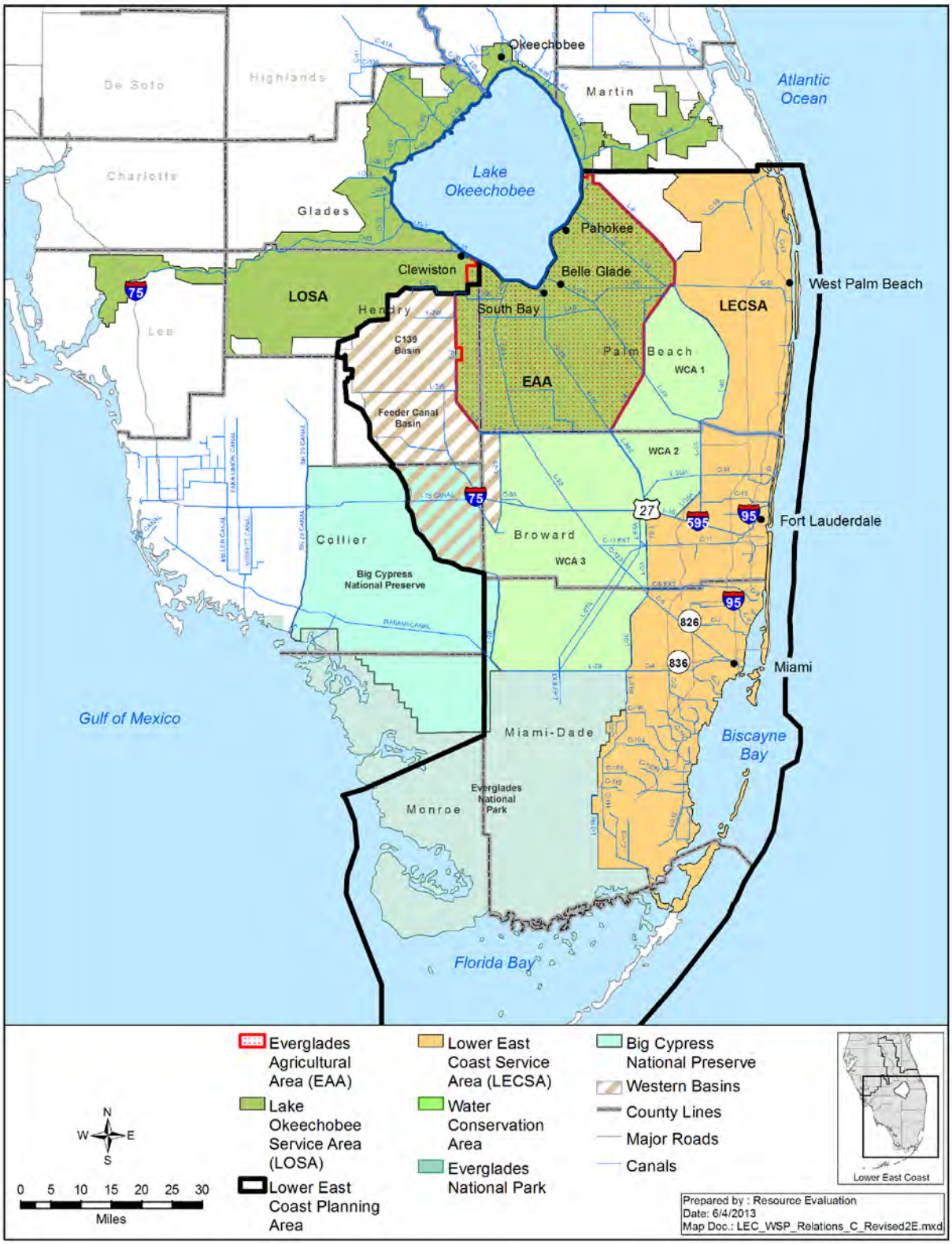

Figure 2. Location of LOSA, EAA, and LECSA in relation to the LEC Planning Area boundaries.

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Because the LEC Planning Area is dependent on water from Lake Okeechobee and the Everglades—especially the Water Conservation Areas (WCAs)—for a portion of its supply, the LEC water supply planning efforts are inexorably linked with restoration efforts and management decisions concerning those unique water resources. The majority of restoration projects are part of CERP, a joint effort of SFWMD and the United States Army Corps of Engineers (USACE). In addition to Lake Okeechobee and the Everglades, the LEC Planning Area is home to an extensive agricultural industry, large urban communities (approximately 70 percent of SFWMD's total population), and other valued ecosystems that are generally connected to Lake Okeechobee or the Everglades.

The LEC Planning Area is described in detail in the *2011–2013 Water Supply Plan Support Document* (Support Document) (SFWMD 2013a). Additional background information is highlighted here:

- World-renowned ecosystems, such as the Everglades, Lake Okeechobee, Florida Bay, Biscayne Bay, and the Northwest Fork of the Loxahatchee River are located in the LEC Planning Area. The planning area includes two national parks (Everglades and Biscayne), a federally-designated Wild and Scenic River (Northwest Fork of the Loxahatchee River), and four national wildlife refuges.

- Palm Beach, Broward, and Miami-Dade counties are among the state's five most populated counties. In 2010, the LEC Planning Area represented 30 percent of Florida's total population.

- The 2005–2006 LEC Plan Update included a large set of alternative water supply projects due to the higher population growth projections and Public Water Supply (PWS) demand—1,286 million gallons per day (MGD) in 2025—as well as the anticipated effect of proposed SFWMD rules. In 2007, water use criteria was adopted, which limited direct and indirect withdrawals from Everglades and North Palm Beach County/Loxahatchee River Watershed water bodies and their integrated conveyance systems.

- Neither the growth in population nor demand materialized. PWS demand decreased over the past 10 years. While, the reasons are mixed, conservation efforts by the utilities and SFWMD, water shortage restrictions, year-round irrigation conservation measures, and the economic downturn, played a role. As a result, per capita water use rates continued to decline over the past five years.

- The combination of reduced per capita use rates and slower than anticipated population growth reduced actual PWS demand in 2010 (842 MGD) to less than the PWS demand in 2005 (912 MGD). The combined permitted water use allocation of 1,165 MGD enables most utilities to meet most or all of their future demand without additional projects.

- Some PWS utilities deferred construction of alternative water supply projects. Some alternative water supply projects recommended in the 2005–2006 LEC Plan Update may not be necessary until after the 2030 planning horizon.

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- Within the LEC Planning Area, the portion of the EAA in Palm Beach County is ranked first in Florida and the United States in total sugarcane acres under cultivation. Palm Beach County accounted for 77 percent of the total sugarcane acreage in Florida. The county also ranked first in Florida in the value of vegetables, melons, potatoes, and sweet potatoes produced ($409 million). The county ranked first in Florida in combined vegetable acreage—79,792 acres—harvested for sale (USDA-NASS 2007).
- Although only a portion of Hendry County is within the LEC Planning Area boundary, in 2007, the entire county was ranked first in the state for orange grove acreage and the value of fruits, tree nuts, and berries produced ($407.7 million) (USDA-NASS 2007). Hendry County is second in terms of sugarcane acres under cultivation in Florida behind the Palm Beach County portion of the EAA.
- Miami-Dade County leads the state in the production of nursery and ornamental/greenhouse products. In 2007, Miami-Dade County produced $494 million in greenhouse and nursery sales.

Population Projections and Water Demand

Projections developed for this update estimate that the LEC Planning Area's population will increase by over 18 percent between 2010 and 2030, from approximately 5.6 million residents to almost 6.7 million. In contrast, the 2005–2006 LEC Plan Update estimated a population increase over 31 percent, or 7.3 million by 2025.

This update projects gross water demand for PWS in 2030 at 1,007 MGD. This demand projection is 20 percent more than the 842 MGD actually used in 2010. The change in PWS demand from 2010 to 2030 will require implementation of fewer water supply development projects by utilities than previously proposed. Most of the projected increased demand can be met with existing allocations and infrastructure.

In 2010, 52 PWS utilities were in the LEC Planning Area. By 2013, only 50 PWS utilities remained. The state closed the AG Holley Hospital in 2012, which had its own PWS facility. In 2013, the Palm Beach County Water Utilities Department took over the Glades Utility Authority, which serves the cities of South Bay, Belle Glade, and Pahokee.

Even at the lower demand projection, PWS is expected to remain the LEC Planning Area's largest water use category in 2030, representing at least 52 percent of the planning area's total water demand. The Agricultural (AGR) Self-Supply use category is projected to remain the second largest water use category in 2030. AGR Self-Supply water demand is estimated to increase from 655 MGD in 2010 to 664 MGD in 2030, representing at least 34 percent of the LEC Planning Area's total gross demand. The remaining 14 percent consists of Domestic Self-Supply (DSS), Industrial/Commercial/Institutional (ICI) Self-Supply, Recreational/Landscape (REC) Self-Supply, and Power Generation (PWR) Self-Supply demands.

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Overview of Water Resources

Water for urban and agricultural uses in the LEC Planning Area comes from groundwater and surface water. Water for the natural system comes from the same sources. Determining the condition and sustainability of water needed to meet projected urban and agricultural demands (**Chapter 2**), as well as environmental resources, requires consideration of the area's available water sources (**Chapter 3**). Also, the Support Document contains extensive information related to the LEC Planning Area and its water resources.

Groundwater Resources

The LEC Planning Area groundwater resources are the surficial aquifer system (SAS), and the Floridan aquifer system (FAS) (**Figure 3**).

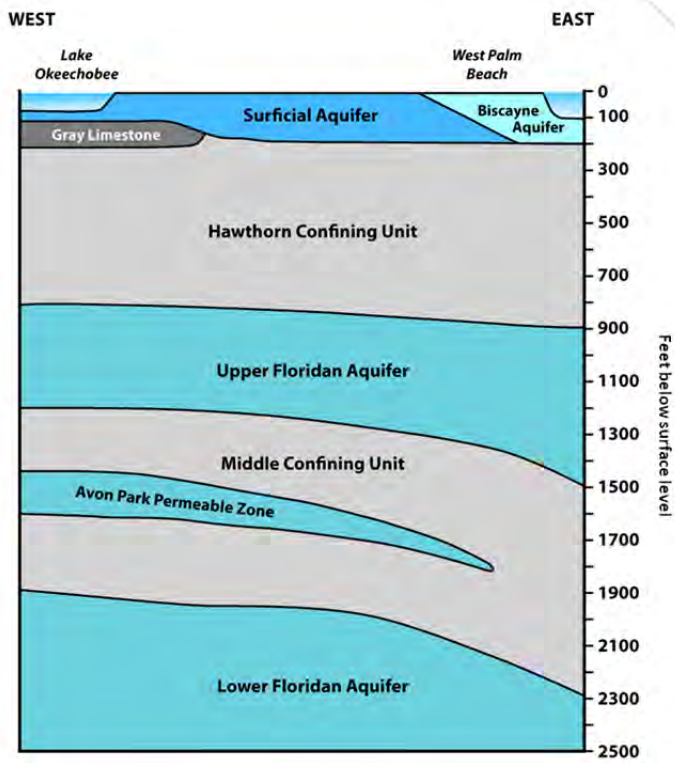

Figure 3. Generalized hydrogeologic cross-section of South Florida.

Surficial Aquifer System

The SAS, including the Biscayne aquifer, is shallow, predominately unconfined, and generally extends from land surface to 200 feet in depth. Rainfall and seepage from surface water bodies recharges the SAS. Surface water systems are canals, lakes, the Everglades, and other wetlands. The Biscayne aquifer is among the most productive in the world. It currently provides more than one billion gallons of water a day on average for potable and irrigation needs in the tri-county area. In 2010, fresh groundwater accounted for 94 percent of potable water produced by PWS utilities.

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Floridan Aquifer System

The FAS is a thick, multi-layered sequence of predominantly carbonate rocks that underlies Florida and parts of Alabama, Georgia, and South Carolina. While the FAS is the primary source of fresh water for much of northern and central Florida, it contains brackish water in the LEC, Lower West Coast, and Upper East Coast planning areas. Until recent years, the Floridan aquifer was not widely developed as a water source in the LEC Planning Area due, in part, to the extensive availability of fresh groundwater. The brackish portions of the FAS is more extensively developed in the Upper East Coast and Lower West Coast planning areas due to the lower productivity of the SAS in those planning areas.

Surface Water Resources

The LEC Planning Area's surface water resources are integrally interconnected as part of the Kissimmee–Okeechobee–Everglades ecosystem. Historically, water flowed from the Kissimmee Chain of Lakes into the Kissimmee River, which then emptied into Lake Okeechobee. Overflow from the lake would move as sheetflow across the Everglades and into Florida Bay. Today, Lake Okeechobee, the WCAs, and an extensive network of canals are the principal sources of surface water in the LEC Planning Area.

Significant Freshwater Systems

The Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project) links Lake Okeechobee and the Everglades with agricultural and urban areas and other major ecosystems. The C&SF Project divided the remaining Everglades south of Lake Okeechobee and north of U.S. 41 in Palm Beach, Broward, and Miami-Dade counties into three hydrologic units known as the WCAs. Everglades National Park lies south of U.S. 41. Descriptions of the significant freshwater systems within the LEC Planning Area are as follows:

- **Lake Okeechobee** is a key component of the South Florida hydrologic system. It serves multiple purposes, including flood protection, urban, agricultural, and environmental water supply, navigation, commercial and recreational fisheries, and fish and wildlife habitat. The lake is critical for flood control during wet seasons and water supply during dry seasons. Agriculture in LOSA is the predominate user of lake water. The Okeechobee Utility Authority (in the Kissimmee Basin Planning Area) is the only remaining PWS utility using water directly from Lake Okeechobee. Since the last plan update, Clewiston (in the Lower West Coast Planning Area), South Bay, Belle Glade, and Pahokee (**Figure 2**) discontinued the use of Lake Okeechobee as their supply source and now use FAS water treated by reverse osmosis.
- **WCAs** are the remaining portions of the northern and central Everglades that were diked as part of the C&SF Project. The WCAs are operated and maintained for flood control, while providing water supply to the LEC Planning Area and environmental habitat. Stormwater treatment areas treat runoff from the EAA and regulatory discharges from Lake Okeechobee before water is conveyed to

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the WCAs. The WCAs serve as the first source of supplemental water to the coastal canals that recharge the Biscayne aquifer. WCA 1 is contained within the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

- **Everglades National Park** is the nation's second largest national park. The park is home to a wide variety of endangered species and has several international preserve-style designations. Water from the WCAs enters Everglades National Park and flows through Taylor and Shark River sloughs to Whitewater and Florida bays and the Ten Thousand Islands area.

- **C&SF Project canals** move water from Lake Okeechobee and the WCAs to maintain coastal canal levels during dry times to augment water supplies. The canals are also a crucial component of the region's flood control system, discharging storm water to tide.

- **Wetlands** extend across approximately 2 million acres of the LEC Planning Area (USFWS 2010b). The remnant Everglades represent the majority of the region's wetlands. In addition to the WCAs and Everglades National Park, key wetlands in the LEC Planning Area include Holey Land and Rotenberger wildlife management areas, Pennsuco Area, and Grassy Waters Preserve and other wetlands in the Loxahatchee River Watershed. The region also has extensive constructed wetlands within the EAA that serve as stormwater treatment areas. Finally, isolated wetlands can be found throughout the LEC Planning Area.

Significant Coastal Ecosystems

Other important ecosystems in the region include the coastal systems of the Northwest Fork of the Loxahatchee River, Lake Worth Lagoon, Biscayne Bay, and Florida Bay. A brief description of each system is provided here:

- The **Northwest Fork of the Loxahatchee River** is a federally-designated Wild and Scenic River. The Northwest Fork of the Loxahatchee River flows from Palm Beach County north into Martin County and bends east through Jonathan Dickinson State Park. It then flows southeast back into Palm Beach County, where it enters the central embayment area of the Loxahatchee River Estuary. It is in the LEC Planning Area because the river's watershed includes a broad area of northern Palm Beach County.

- **Lake Worth Lagoon** is an estuarine system located in eastern Palm Beach County and extends for about 22 miles adjacent to heavily urbanized areas. It is connected to the Atlantic Ocean by the Lake Worth and South Lake Worth inlets.

- **Biscayne Bay** covers approximately 428 square miles located on the southeastern coast in Miami-Dade County. The bay is an aquatic preserve and an Outstanding Florida Water. The southern half of the bay is within Biscayne National Park. This is the largest marine park in the National Park system and supports diverse flora and fauna, including many endangered species.

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- **Florida Bay** lies between the Everglades and the Florida Keys. Florida Bay covers 850 square miles, of which approximately 80 percent is within Everglades National Park.

HISTORY OF PLANNING EFFORTS

The 2000 LEC Plan concluded timely implementation of CERP projects would meet most of the environmental needs and water supply demands of the region by 2020. When the LEC plan was updated five years later, delays to CERP projects had already significantly changed the basis of that conclusion. The 2000 LEC Plan also recommended protecting water needed for CERP projects from allocation. SFWMD developed restricted allocation area criteria for the Everglades and North Palm Beach/Loxahatchee River Watershed water bodies to protect water needed for restoration projects. Additional discussion of the criteria is below and in **Chapter 3**. As a result, the 2005–2006 LEC Plan Update concluded that PWS would need to depend heavily on conservation and the development of alternative water sources and treatment facilities.

During the development of the 2005–2006 LEC Plan Update, local governments and water suppliers in the LEC Planning Area worked closely with SFWMD to identify and develop water supply projects to meet projected water demands. Many of the proposed projects were incorporated into local government comprehensive plans and water use permits. Since then, the economic downturn, slower population growth, and improved conservation significantly lowered demand projections. SFWMD also allocated fresh groundwater where appropriate local hydrologic conditions were present and regulatory requirements were met. As a result, many alternative water supply projects recommended in the last update have been postponed.

PROGRESS SINCE THE 2005–2006 LEC PLAN UPDATE

The 2000 LEC Plan and 2005–2006 LEC Plan Update identified several regional issues concerning water conservation, groundwater and surface water sources, regulatory criteria, and Everglades and ecosystem restoration. The Five-Year Water Resource Development Work Program, published in Volume II of the South Florida Environmental Reports (available online at www.sfwmd.gov/sfer) annually summarizes progress. At the time this update was developed, the most recent Five-Year Water Resource Development Work Program is published in Chapter 5A of the *2013 South Florida Environmental Report – Volume II* (Martin 2013). Several of the items represent long-term efforts to advance the understanding of the region's water resources or develop improved tools for future planning efforts after this plan update. Additional activities and programs implemented since the 2005–2006 LEC Plan Update are presented below.

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Water Supply Development Projects

- SFWMD worked closely with staff from PWS utilities to modify population and demand projections and, where necessary, identify water supply development projects for this update. **Chapter 6** of this update discusses existing, ongoing, and proposed water supply development projects for the LEC Planning Area. **Appendix F** provides summary tables of key project information.
- When funding is available, the alternative water supply projects listed in this update are eligible for cost-sharing consideration through a separate annual funding process established by SFWMD's Governing Board that is consistent with the state's statutory requirements.
- Water supply development in the LEC Planning Area includes traditional (fresh surface water and groundwater) and alternative sources. Through the Alternative Water Supply Funding Program, SFWMD assisted permittees in the development of reclaimed water projects, water reclamation facilities, brackish water wellfields, reverse osmosis treatment facilities, and aquifer storage and recovery (ASR) well systems. From FY 2007 to FY 2012, SFWMD, in cooperation with the State of Florida, provided more than $123 million in alternative water supply funding for 212 projects. Ninety of these projects were within the LEC Planning Area.
- Between FY 2007 and FY 2011, projects funded by the Alternative Water Supply Funding Program created 72 MGD of new water capacity in the LEC Planning Area. The water sources include 27 MGD of brackish water, 21 MGD of reclaimed water, and 23 MGD of surface water/storm water.

Regulations and Operations

- In 2007, SFWMD adopted restricted allocation area criteria for the Everglades and North Palm Beach/Loxahatchee River Watershed water bodies. These criteria are a component of MFL recovery strategies for the Everglades and the Northwest Fork of the Loxahatchee River. The criteria limit allocations that affect the protected water bodies to levels that occurred as of April 1, 2006. Additional discussion of the restricted allocation area criteria is in **Chapter 3**.
- In 2008, USACE implemented 2008 LORS to address concerns about the integrity of the Herbert Hoover Dike surrounding Lake Okeechobee as well as high water impacts to the lake ecology. The dike provides flood control for developed areas around the lake. 2008 LORS (USACE 2007) is designed to regulate lake levels at a lower elevation, between 12.5 and 15.5 feet National Geodetic Vertical Datum of 1929, than previous regulation schedules. Analyses for the supplemental environmental impact statement for 2008 LORS indicated that existing legal users in LOSA would experience more frequent shortages than under the previous schedule. The analysis projected a decline in the physical level of certainty of agricultural users reliant on lake water supplies, from a 1-in-10 year to a 1-in-6 year drought return frequency.

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- Analyses indicated that implementation of 2008 LORS would cause MFL criteria for Lake Okeechobee to be violated. Therefore, SFWMD changed the Lake Okeechobee MFL status from prevention to recovery. In October 2008, SFWMD adopted restricted allocation area criteria for LOSA as part of the lake's MFL recovery strategy.
- Shortly after implementation of 2008 LORS, SFWMD updated its Water Shortage Management Plan (Chapter 40E-21, Florida Administrative Code [F.A.C.]) to assure equitable distribution of available water resources among all permitted water users of the lake during times of water shortage.
- Adaptive protocols for Lake Okeechobee operations were updated in 2010 (SFWMD 2010) in response to 2008 LORS implementation. The protocols provide guidance to staff and SFWMD's Governing Board when making recommendations to USACE about Lake Okeechobee water releases in the base flow and beneficial use bands. Adaptive protocols are designed to identify potential "win-win" or "win-neutral" situations in which one or more environmental resource may benefit from a lake release and where minimal or no adverse effect on meeting permitted agricultural and urban water supply needs or impacts on Seminole Tribe water rights are anticipated.
- In 2007, USACE found the Herbert Hoover Dike to be a Class I risk, the highest risk for dam failure. The implementation of the 21.4-mile cutoff wall component in Reach 1 satisfies the majority of the risk reduction goals. This component will be complete in 2013. As part of this risk reduction approach, the 32 water control structures (culverts) operated by USACE are being replaced, removed, or abandoned with a scheduled completion in 2018. Rehabilitation of Reaches 2 and 3 is planned to be completed by 2022.
- 2008 LORS will be reexamined and possibly changed by USACE in connection to the completion of Reaches 1, 2, and 3.

Water Conservation

- In September 2008, SFWMD adopted the Comprehensive Water Conservation Program to foster demand management and save water throughout SFWMD.
- The Districtwide Year-round Landscape Irrigation Conservation Measures Rule became effective in March 2010 (Chapter 40E-24, F.A.C.), consistent with the Comprehensive Water Conservation Program. This rule supports the long-term sustainability of SFWMD's water resources. The rule limits landscape irrigation to three days a week within the LEC Planning Area. Broward and Miami-Dade counties adopted two-day-a-week limits by local ordinance.
- The Water Savings Incentive Program (WaterSIP) provides up to 50-50 cost-sharing funds for noncapital cost projects, such as the purchase and installation of high efficiency indoor plumbing fixtures, outdoor irrigation retrofits, and automatic distribution system line flushing devices. Utilities, municipalities, property owner associations, and large water users may participate in the

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program. From FY 2005 to FY 2011, SFWMD allocated $2.35 million for LEC Planning Area WaterSIP projects. This represents an estimated potential savings of 3.9 MGD. For more information on water conservation, see **Chapter 5** and **Appendix D**.

Restoration Efforts by SFWMD

- The CERP Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat (formerly known as the Acme Basin B Discharge Project) was completed in 2010. The project improves Everglades water quality by diverting the direct discharge of urban runoff into a stormwater treatment area before the water enters the Arthur R. Marshall Loxahatchee National Wildlife Refuge.
- Construction of the Deering Estate Flow-way Project, a component of the CERP Biscayne Bay Coastal Wetlands Project, was completed by SFWMD in 2012. The flow-way directs freshwater runoff away from existing canal discharges and redistributes it as sheetflow prior to discharge into Biscayne Bay.
- As of January 2013, four of 10 culverts planned for the L-31 East component of the CERP Biscayne Bay Coastal Wetlands Project were installed by SFWMD. This component reestablishes, at least in part, historical sheetflow and wetland hydroperiods downstream of the project area.
- The CERP C-111 Spreader Canal Western Project involves the construction of a hydrologic ridge along the eastern border of Taylor Slough. The purpose is to retain more water within the slough and increase water flow to Florida Bay. SFWMD began construction of major features in 2010, which were completed in 2012. Operational testing commenced shortly thereafter.

Water Storage

- An L-8 Basin site was originally anticipated to provide water storage as a component of the CERP Loxahatchee River Watershed Restoration Project (formerly known as the North Palm Beach County – Part I Project). As part of the Restoration Strategies Regional Water Quality Plan approved in 2012, the L-8 Basin site is now under construction for use as a flow equalization basin. The project will store water for consistent delivery needed to optimize performance of the Everglades stormwater treatment areas. While interim operations may provide for the delivery of dry season flows to the Loxahatchee River, a permanent replacement project feature is needed in the future. In 2013, SFWMD and Palm Beach County conceptually agreed to the acquisition of the approximately 1,800-acre site owned by the county. USACE is continuing to develop the project implementation report for the Loxahatchee River Watershed Restoration Project.
- In 2010, construction commenced on the CERP Fran Reich Preserve (formerly known as the Site 1 Impoundment) – Phase I Project by USACE. This project consists of a 1,660-acre aboveground impoundment located in the southwestern

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portion of urban Palm Beach County. A federal contract for Phase I was terminated in 2012 due to difficulties encountered during construction. USACE restarted the project in May 2013 and anticipates finishing it in 2014. Phase II will require congressional authorization.

- In 2012, the testing of the CERP Hillsboro ASR Pilot Project, located in western Boca Raton, was successfully completed. Preliminary results indicate that high capacity ASR is feasible in the vicinity of the Fran Reich Preserve. However, the volume of storage and recovery has not been determined.
- Cycle testing continues at the CERP Lake Okeechobee ASR Pilot Project, located adjacent to the Kissimmee River just north of the lake. Results at that location indicate that ASR technology is feasible near Lake Okeechobee. The final report will be available by the end of 2013. The CERP ASR Regional Study is currently conducting analyses to determine the total number of ASR wells that may be constructed adjacent to the lake, which will be completed by the end of 2014.
- The City of Boynton Beach constructed a second ASR well and integrated it into the city's water treatment system. This project has successfully demonstrated that potable water ASR operation is feasible in the urban area of the LEC Planning Area.

Modeling and Monitoring Studies

- In 2005, SFWMD and the United States Geological Survey began a cooperative study to measure evapotranspiration (ET) in South Florida using the eddy covariance method. The cooperative study examined spatially extensive plant communities within Big Cypress National Preserve individually, including dwarf cypress, cypress swamps, pine uplands, wet prairies, and marsh as mapped by Duever et al. (1986). This study provided the first quantitative measurements of ET for the major natural plant communities in South Florida. The actual measured ET data from this study is being used to improve hydrologic models. As part of this same project, in 2007, the United States Geologic Survey installed five ET monitoring sites within differing vegetation communities in Big Cypress National Preserve and completed the construction of three towers. The fieldwork was completed in 2010 and the results from this study have been published in Shoemaker et al. (2011), available on the web at pubs.usgs.gov/sir/2011/5212/.
- SFWMD held an independent peer review of the Lower East Coast Subregional Model. The model simulates groundwater flow in the SAS in the LEC Planning Area. Five smaller groundwater models were used to develop the Lower East Coast Subregional Model following the adoption of the 2000 LEC Plan. Currently, the model is used to address site-specific issues pertaining to water use, permitting, and several CERP projects. Refinements to the model based on the peer review are expected to proceed in 2013.

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- A study of the development and application of water quality modeling components that could be applied to SFWMD's Regional Simulation Model was completed in FY 2009. As a result, a spatially distributed water quality model for phosphorus transport and cycling in wetlands was developed for application throughout SFWMD (Jawitz et al. 2008).
- Three new FAS well sites in Palm Beach County have been equipped with instrumentation and have been transmitting water level data to SFWMD at 15-minute intervals. PBF-14 monitors the upper Floridan aquifer. Wells BOYRO-EXP and PBF-15, are multi-zone wells monitoring the upper and middle Floridan (BOYRO-EXP), and the upper, middle, and lower Floridan (PBF-15) aquifers.
- SFWMD developed a density-dependent model of the FAS that encompasses the LEC Planning Area (HydroGeoLogic, Inc. 2006), referred to as the Phase I Model. SFWMD completed the Phase II Model, which extended the Phase I Model to include the Upper East Coast Planning Area, in October 2008 (Golder Associates 2008). The model evaluates future effects of proposed use of the FAS. An independent peer review of the model was conducted in June 2011. Implementation of peer review recommendations is presently under way. The final transient, density-dependent model—now known as the East Coast Floridan Model—is scheduled for completion by the end of 2013, followed by model documentation.

OUTLOOK ON CLIMATE CHANGE

Climate change and its effects on hydrogeologic conditions should be considered in water supply planning. Long-term data and modeling project changes to sea levels, air temperatures, weather patterns including the frequency and intensity of rain, droughts, ET rates, and other parameters that will affect water availability. Southeastern Florida is especially vulnerable to the effects of climate change and sea level rise. The area is generally flat and low, with an average elevation of 15 feet above mean sea level. The regional economy has major investments within close proximity of the coast and about 30 percent of the population of Florida lives in Palm Beach, Broward, Miami-Dade, and Monroe counties. The 2000 LEC Plan identified saltwater intrusion as an issue for several utilities at risk. SFWMD worked with coastal utilities to develop inland freshwater sources and diversify water sources to reduce the risk of saltwater intrusion.

Responses to climate change are most effective when addressed by multiple levels of government. In 2011, Florida passed the Community Planning Act, which provides for adaptation action areas to improve infrastructure resilience to flooding by extreme high tides, storm surges, and sea level rise in low lying coastal areas. At the regional level, Palm Beach, Broward, Miami-Dade, and Monroe counties signed the Southeast Florida Regional Climate Change Compact in January 2010 to coordinate climate change mitigation and adaptation activities in the region. This compact allows local and county governments to establish their agenda for climate change adaptation while providing an efficient means for

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state and federal agencies to participate with technical assistance and support. In October 2012, the compact signatories published *A Region Response to a Changing Climate* to serve as a regional climate action plan (Southeast Florida Regional Climate Change Compact 2012a). Counties and their municipalities, numerous other governmental agencies, and subject matter experts participated in the development of this plan. Broward, Miami-Dade, and Monroe counties also developed individual county climate change action plans. SFWMD is jointly working with the Southeast Florida Regional Climate Change Compact signatories to evaluate sea level rise. See **Chapter 3** for more information.

WATER SUPPLY PLANNING FOR THE NEXT 20 YEARS

The stronger statutory link between local governments' comprehensive plans and SFWMD's regional water supply plans, data sharing, and collaborative planning are credited with improving the water supply planning process. Moreover, SFWMD's Water Supply Planning staff closely coordinates with the water use permitting staff during the water supply planning process. Coordination also increased through implementation of the Florida Department of Environmental Protection 2012 guidance memo. Water supply development projects included in this plan update underwent an initial screening for permitting feasibility. Updates to local governments' water supply facilities work plans, comprehensive plans, and SFWMD's next five-year update will continue to refine twenty-year demand estimates and projections.

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Demand Estimates and Projections

This chapter discusses water demand estimates and projections for the Lower East Coast (LEC) Planning Area. The development of water demand estimates and projections is a complex process and accomplished in coordination with staff from local governments, utilities, agencies, and stakeholder groups. Data collection and analysis to support the projections began in 2010.

TOPICS

- Water Use Categories
- Population and Water Use Trends
- Projected Demands
- Demand Projections in Perspective

Previous estimates and projections for the LEC Planning Area were published in the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007). Since its publication, a national economic downturn occurred and population growth in the LEC Planning Area slowed significantly. This led to a reduced rate of increase in future urban water demand. Agriculture is considered fully developed in most areas of the LEC Planning Area. It is a very stable agricultural area where permitted acres and cropping practices are not projected to change significantly over the next twenty years.

SUMMARY OF WATER USE CATEGORIES

The water demand for the six water use categories established by the Florida Department of Environmental Protection (FDEP) is calculated for a twenty-year planning horizon starting in 2010 and extending to 2030. A base year of 2010 is used for comparison in trend analyses. The percent usage for each water use category in this base year is described in **Figure 4**. In 2010, average annual gross water demand for all categories in the LEC Planning Area totaled 1,719 million gallons per year. By 2030, the projected average annual gross water demand is estimated to total 1,933 millions of gallons per day (MGD), an increase of 12 percent.

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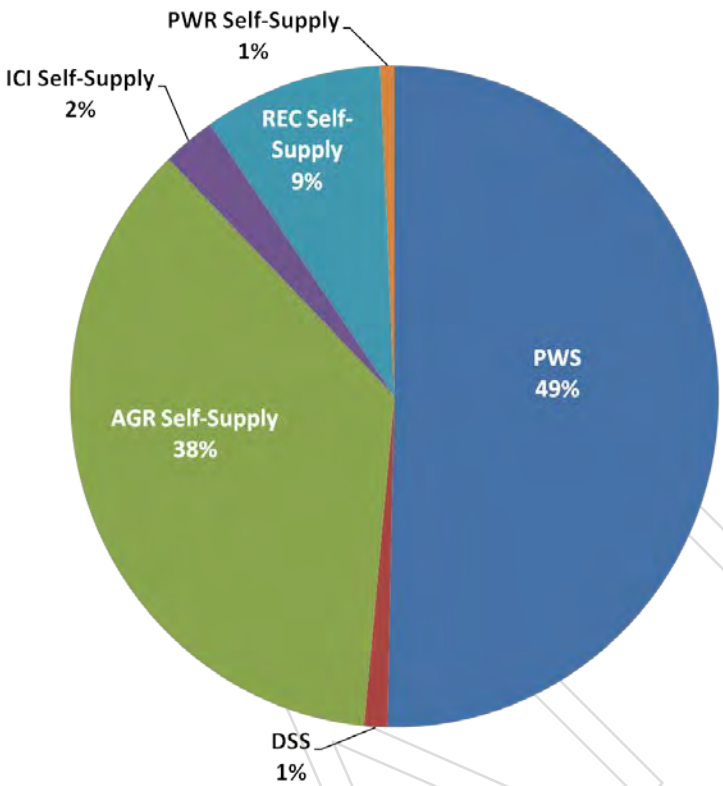

Figure 4. Percentage of estimated demand of each major water use category in 2010.

The average annual gross water demand projections for 2010 and 2030 for the water use categories are as follows:

- **Public Water Supply (PWS)** includes water supplied by water treatment facilities for potable use (drinking quality) with projected average withdrawals equal to or greater than 100,000 gallons per day or 0.1 MGD. PWS is projected to increase by 20 percent by 2030 (842 MGD in 2010 compared to 1,007 MGD in 2030).
- **Domestic Self-Supply (DSS)** includes households served by small utilities (less than 0.1 MGD) and private wells. DSS is projected to increase by 4 percent by 2030 (18 MGD in 2010 compared to 19 MGD in 2030).
- **Agricultural (AGR) Self-Supply** is water used for commercial crop irrigation, nurseries, livestock watering, and aquaculture. It is the second largest use in the LEC Planning Area. AGR Self-Supply is projected to remain stable with water demand increasing slightly by 1 percent (655 MGD in 2010 compared to 664 MGD in 2030).
- **Industrial/Commercial/Institutional (ICI) Self-Supply** includes self-supplied water consumed by business operations, such as mining and food processing, and institutions, such as schools, hospitals, and prisons, that have demand of 0.1 MGD or greater. ICI Self-Supply is projected to increase 28 percent by 2030 (44 MGD in 2010 compared to 57 MGD in 2030).

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- **Recreational/Landscape (REC) Self-Supply** is used for irrigation of golf courses, parks, cemeteries, large common areas such as homeowner associations, schools, commercial developments, and other self-supplied irrigation uses with demand of 0.1 MGD or greater. REC Self-Supply is projected to increase by 3 percent (149 MGD in 2010 compared to 153 MGD in 2030).
- **Power Generation (PWR) Self-Supply** includes water consumed by power plants for use in the production of electricity, excluding use of seawater and reclaimed water sources. PWR Self-Supply is projected to increase 185 percent by 2030 (12 MGD in 2010 compared to 33 MGD in 2030).

Projections for each water use category are based on demand under average annual rainfall conditions and anticipated growth in the LEC Planning Area through 2030. As water use is impacted by weather, particularly rainfall, demands for 1-in-10 year drought conditions are estimated and projected. **Appendix A** presents both net and gross demands under average rainfall year and 1-in-10 year drought conditions through the 2030 planning horizon. **Appendix A** also contains additional details about the methods to estimate and project water demands for each water use category. For PWS and DSS, permanent population and, for PWS, demand by each utility are provided. For AGR Self-Supply, irrigated acreage and demand for each crop type are provided. Although not quantified in this chapter, environmental demand is addressed through resource protection criteria (**Chapter 3**).

POPULATION AND WATER USE TRENDS

Population projections form the initial and key step in developing water demand projections for PWS and DSS water use categories. Population estimates for the LEC Planning Area include the resident permanent populations of Palm Beach, Broward, and Miami-Dade counties, most of Monroe County, and the eastern portion of Hendry County (**Table 2**). A portion of Collier County is in the LEC Planning Area. However, that area is part of the Big Cypress National Preserve, which does not have any permanent residents.

Between 2010 and 2030, the LEC Planning Area's population is expected to increase by 18 percent with Palm Beach, Broward, and Miami-Dade counties attracting the greatest number of new residents. The projected population growth varies widely between the counties: Palm Beach County (+25 percent), Broward County (+14 %), Miami-Dade County (+18 percent), and Monroe County (-5 percent). Monroe County may experience a small reduction in permanent residents over the next 20 years. When aggregated, the total population is projected to increase by 1,027,862 people. This is a slower rate of growth than projected in the 2005–2006 LEC Plan Update, which was a 31 percent growth rate or an estimated increase of 1,745,488 people.

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Table 2. Comparison of population projections published in the 2005–2006 LEC Plan Update and current projections presented in this plan update.

County	2010	2015	2020	2025	2030
2005–2006 LEC Plan Update Population Projections					
Palm Beach	1,415,809	1,549,635	1,679,326	1,804,188	
Broward	1,941,036	2,095,169	2,241,487	2,340,794	
Miami-Dade	2,600,263	2,769,725	2,921,389	3,066,750	
Monroe	84,100	85,800	87,200	88,600	
Hendry	1,279	1,279	1,279	1,279	
Total LEC Planning Area	**6,042,487**	**6,501,608**	**6,930,681**	**7,301,611**	
2013 LEC Plan Update Population Projections					
Palm Beach	1,320,134	1,402,101	1,484,067	1,566,034	1,648,000
Broward	1,748,066	1,809,881	1,871,696	1,933,510	1,995,325
Miami-Dade	2,496,435	2,610,526	2,724,618	2,838,709	2,952,800
Monroe	73,090	72,143	71,195	70,248	69,300
Hendry	1,279	1,320	1,360	1,401	1,441
Total LEC Planning Area	**5,639,004**	**5,895,971**	**6,152,936**	**6,409,902**	**6,666,866**

This trend is consistent with and based on the University of Florida's Bureau of Economic and Business Research (BEBR) medium range twenty-year projections completed over each of the last six years (**Figure 5**). Changes in population projections, in combination with reduced per capita water use, resulted in progressively declining PWS demand projections over the last three plans (**Figure 6**).

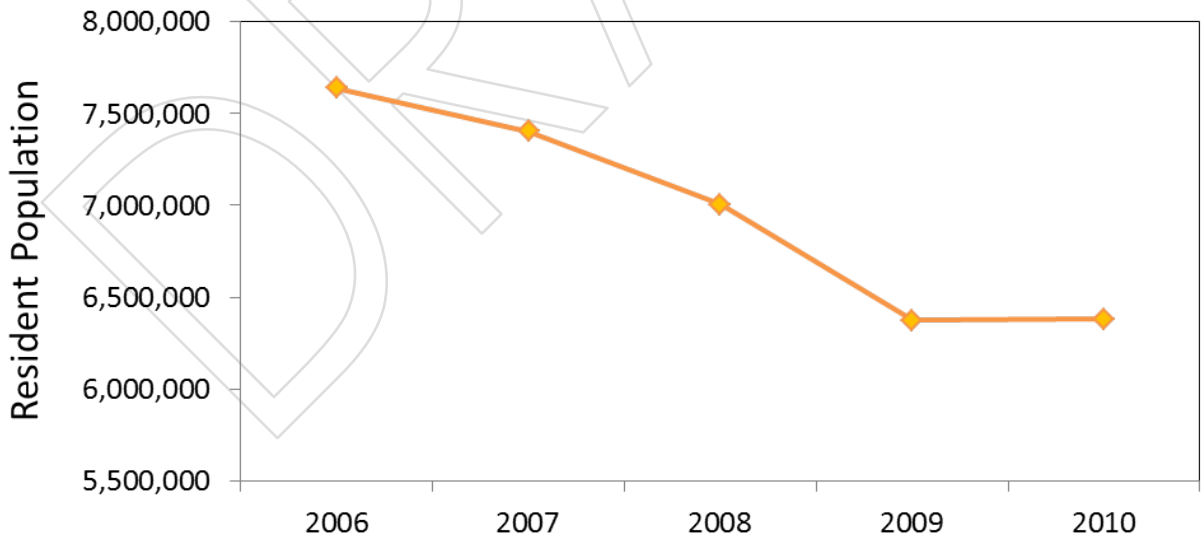

Figure 5. BEBR twenty-year population projections for 2030 over the last six years for the LEC Planning Area.

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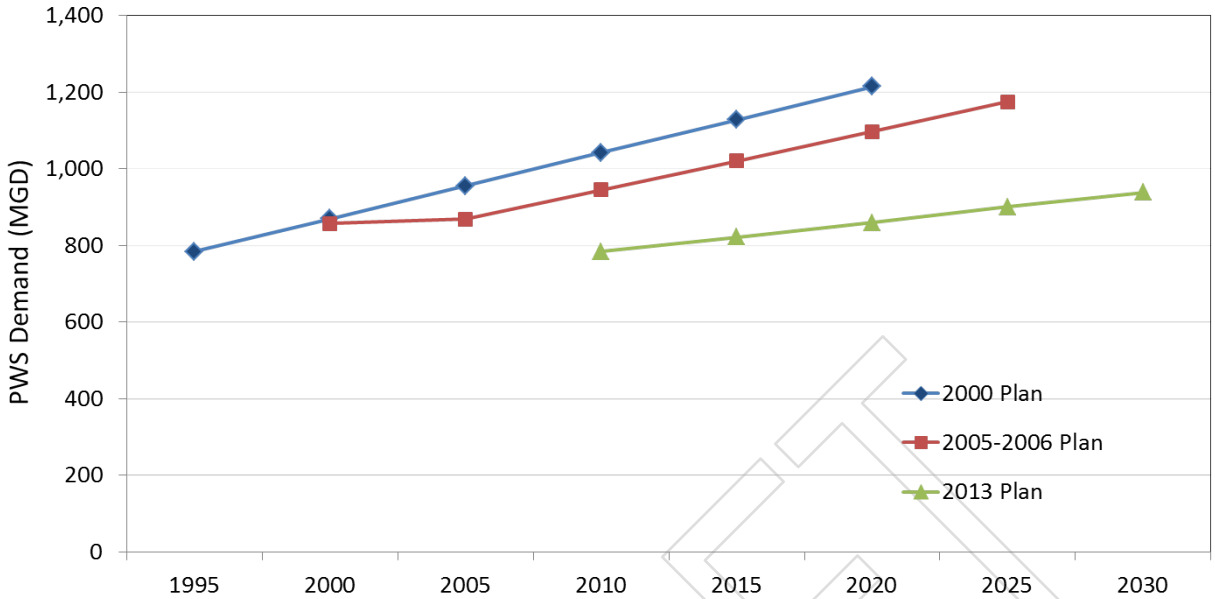

Figure 6. A comparison of PWS finished water demand projections in past plans and the current plan update.

PROJECTED DEMAND BY WATER USE CATEGORY

This section describes the gross water demand of the six water use categories. This plan update describes water demand using two methods, gross and net. Gross water demand or raw water demand, is the amount of water withdrawn from the source. Gross demand accounts for water lost during conveyance, transmission, and treatment. Gross demand is the volume of water allocated in a water use permit. Net or finished water demand is the volume of water that satisfies an end user, customer, or crop need. By definition, gross demand is greater than net demand, as most uses lose water through the treatment or transport of the water or system inefficiencies. A detailed description of both gross and net water demands is provided in **Appendix A**.

In 2010, daily gross water demand for an average rainfall year for all categories in the LEC Planning Area totaled 1,719 MGD. By 2030, the projected average annual gross water demand is projected to be 1,933 MGD, a 12 percent increase. The percent of projected demands for each water use category is provided in **Figure 7**. The percent change over the 20-year planning horizon is provided in **Table 3**.

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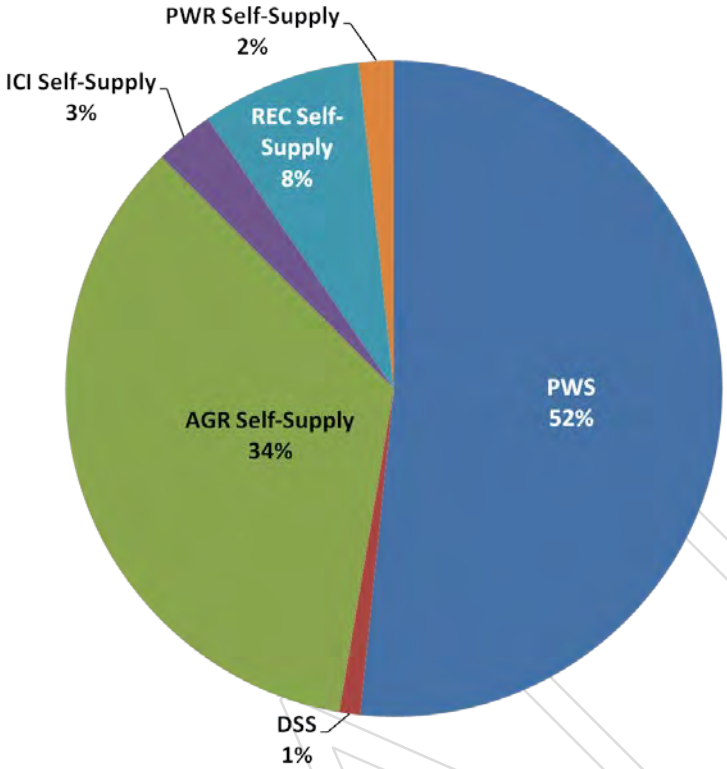

Figure 7. Percentage of projected demand of each water use category in 2030.

Table 3. Estimated gross (raw) water demand for an average rainfall year by water use category for 2010 and 2030.

Water Use Category	2010 Demand (MGD)	2030 Demand (MGD)	Change in Demand between 2010 and 2030 (MGD)	Percent Change in Demand between 2010 and 2030
Public Water Supply	841.7	1,007.5	165.8	20%
Domestic Self-Supply	18.0	18.7	0.7	4%
Agricultural Self-Supply	654.8	663.9	9.1	1%
Industrial/Commercial/Institutional Self-Supply	44.3	56.6	12.3	28%
Recreational/Landscape Self-Supply	148.9	152.8	3.9	3%
Power Generation Self-Supply	11.7	33.3	21.6	185%
LEC Planning Area Total	**1,719.4**	**1,932.8**	**213.4**	**12%**

Public Water Supply and Domestic Self-Supply

PWS is the water supplied by water treatment facilities for potable use (drinking quality) to users such as homes, offices, retail facilities, schools, and other institutions and facilities. Utilities with projected average withdrawals of 0.1 MGD or greater through 2030 comprise the PWS category. Water used by households or facilities served by small utilities (less than 0.1 MGD) or private wells are categorized as DSS.

Development of the water demand projections for the LEC Planning Area was a multistep process. The process began with development of maps showing the geographic areas

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currently served by each utility (PWS service areas). The 2010 United States Census data for population estimates (U.S. Census Bureau 2010) were then spatially distributed across PWS service areas utilizing the census block data.

The 2010 population estimates for each PWS utility were projected at the medium BEBR county growth rate to provide a preliminary 2030 population projection for each service area (BEBR 2011). It is important to note that the BEBR projections use permanent resident populations and do not include seasonal residents, tourists, and migrant workers. The 2030 service area populations were adjusted if the areas served by PWS were expected to change in the next 20 years. DSS population estimates for 2010 and 2030 were also calculated for each county. They represent the difference between the total county population and the PWS utility service area populations for the same county. A linear population growth rate was applied to distribute the initial projected population change from 2010 to 2030 in five-year intervals for each utility service area and county DSS population.

The 2010 population and net water use data, as reported to FDEP by the utilities, were then used to calculate the finished water per capita use per day. Per capita use rate (PCUR) is calculated as the total water use divided by the permanent resident population. It reflects all usage as these rates are based on finished water produced by each utility, including the water used by permanent and seasonal residents, tourists, and migrant workers. Next, the finished water PCUR was applied to the 2030 population to project future demand for each utility service area. This approach produced higher PCURs for utilities with large seasonal populations than other approaches that include a factor for seasonal residents. The initial draft of the projected demand for most PWS utility service areas assumed a constant PCUR based on 2010 for the twenty-year planning horizon. DSS demands were based on its countywide weighted average PCUR for PWS.

The draft PWS service area maps, treatment system descriptions, population, 2010 finished water use data, and projections for the PWS and DSS categories within the LEC Planning Area were provided to each utility and local government planning department. In several cases, the utilities were able to provide input on their respective maps and geographic information system coverages, system operational data, demands, and projections that resulted in adjustments to the projected population and/or demand. Many of these data exchanges took place during follow-up meetings, telephone conferences, and email correspondence. Revisions resulting from this coordination comprised the final projections for finished water published in this update.

These finished water projections were then converted to gross or raw water withdrawals to understand the total volume required to meet potable water demands. Each utility's finished water projections were multiplied by the raw to finished percent based on their treatment systems to calculate gross water demand.

During the next 20 years, the LEC Planning Area population is projected to increase from an estimated 5,639,004 in 2010 to 6,666,866 by 2030 (**Table 4**). PWS gross demand increases through the 2030 projection horizon are due to this anticipated population increase (**Table 5**). DSS demand growth rate is decreasing, as PWS systems will serve most new potable water demand.

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By 2030, the PWS and DSS water use categories will account for 53 percent of the LEC Planning Area's total gross water demand, with PWS representing the vast majority of this 2030 demand. PWS is expected to remain the LEC Planning Area's single largest use category.

Table 4. Permanent resident population projections in the LEC Planning Area for 2010 and 2030.

County	2010 Estimated Population			2030 Projected Population		
	Total [a]	PWS	DSS	Total [b]	PWS	DSS
Palm Beach	1,320,134	1,242,621	77,513	1,648,000	1,570,891	77,109
Broward	1,748,066	1,740,468	7,598	1,995,325	1,986,996	8,329
Miami-Dade	2,496,435	2,472,741	23,694	2,952,800	2,924,775	28,025
Monroe [c]	73,090	73,090	0	69,300	69,300	0
Hendry [c]	1,279	0	1,279	1,441	0	1,441
LEC Planning Area Total	**5,639,004**	**5,528,920**	**110,084**	**6,666,866**	**6,551,962**	**114,904**

a. Source: BEBR 2011
b. Sources: U.S. Census Bureau 2010 and BEBR 2011
c. Portion of county within the LEC Planning Area

Table 5. Gross water demand in the LEC Planning Area for 2010–2030.

Lower East Coast Gross Water Demand Summary (in MGD)					
Gross Water Demand	**2010**	**2015**	**2020**	**2025**	**2030**
Public Water Supply	841.5	883.1	924.0	967.6	1,007.4
Domestic Self-Supply	18.0	18.2	18.6	18.5	18.7
LEC Planning Area Total	**859.5**	**901.3**	**942.6**	**986.1**	**1,026.1**

Agricultural Self-Supply

Importance of Agriculture to LEC Planning Area and Nation

Agriculture in the LEC Planning Area holds a unique place of importance to the region, the State of Florida, and the United States economy. The LEC Planning Area hosts the regions known collectively as the "Winter Bread Basket" and "Salad Bowl" to the nation. In addition, the LEC Planning Area's nursery and ornamental industry is the largest in the state and second largest in the United States. The southern Miami-Dade County portion of the LEC Planning Area is an ideal subtropical climate that is necessary and unique for the production of numerous varieties of tropical fruits including mangos, avocados, carambola, lychees, longan, mamey sapote, passion fruit, and others grown on varietal farms to meet this specialized demand. The planning area is known for growing fruit and vegetable crops that are well suited to meeting growing consumer tastes and preferences for nutrient rich diets (including antioxidants) and exotic cuisine (DCFB 2012). AGR Self-Supply in the LEC Planning Area also includes water used for commercial crop irrigation, livestock watering, and aquaculture.

Key facts regarding agricultural production within the LEC Planning Area are as follows:

- The portion of the Everglades Agricultural Area (EAA) within Palm Beach County is ranked number one in the state and country in total sugarcane acres under cultivation.

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- Palm Beach County accounted for 77 percent of the total sugarcane acreage in Florida (USDA–NASS 2007).
- Palm Beach County ranked first in Florida in the value of vegetables, melons, potatoes, and sweet potatoes produced ($409 million) (USDA–NASS 2007).
- Palm Beach County ranked first in Florida in combined vegetable acreage harvested for sale (79,792 acres) (USDA–NASS 2007).
- Miami-Dade County leads the state in the production of nursery and ornamental/greenhouse products.
- In 2007, Miami-Dade produced $494 million in greenhouse/nursery sales and ranked number two in the United States.
- Hendry County ranked number one in 2007 in terms of oranges acreage and number one in the value of fruits, tree nuts, and berries produced ($408 million) (USDA–NASS 2007).
- Hendry County is number two in terms of sugarcane acres under cultivation in Florida behind the portion of the EAA located in Palm Beach County.

Projection Methodology and Considerations

Agricultural acreage and associated water demand are challenging to project because of various market forces, land use patterns, growth, water management projects, environmental restoration activities, macroeconomic forces, weather, and disease issues that can impact the distribution, acreage, and production/yield over a twenty-year planning horizon. The projections are not parcel specific, but are presented by county and for specific growing regions (see the **Summary** section under the **Distribution of Agriculture across the LEC Planning Area** section below), and incorporate general economic and agricultural production trend information using best professional judgment.

The first step in the process identified the baseline or current agricultural coverage by major crop types using several data sources. For 2010, land use maps were compared to SFWMD permitted acres and various data sets from the United States Department of Agriculture. The most recent agricultural census (2007) data points, as well as select survey data for some crops since 2007 (i.e., citrus and sugarcane), were compared to the current land use and permitted acres to determine where the 2010 baseline would most likely fall in terms of irrigated acres.

To develop the acreage projections, a number of sources were used including the land use projection analysis completed by the South Florida Water Management District (SFWMD). Agricultural acreage estimates from the United States Department of Agriculture and SFWMD's Water Use Regulatory Database informed and revealed key patterns. Agricultural industry experts also provided review and input. Projected acreage by crop type are provided for each county in **Appendix A**. The projection methods applied are also discussed in more detail within **Appendix A**.

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The projected agricultural acreage, aggregated across the regions and counties, results in a net rise of 581 acres by 2030. The small net rise in total acres by 2030 results in the retention of the region's agricultural base. **Table 6** shows that within the LEC Planning Area, acres under management are projected to remain stable, while some counties may show a slight decline or increase by 2030.

Table 6. Change between 2010 and 2030 in acres by area within the LEC Planning Area.

Area	2010 (acres)	2030 (acres)	Net Change
Palm Beach County – Coastal	21,647	22,820	1,173
Palm Beach County – EAA	424,152	424,152	0
Broward County	1,198	1,280	82
Miami-Dade County	47,805	46,954	(851)
Monroe County	20	20	0
Hendry County – EAA	34,058	34,058	0
Hendry County – Western Basins	46,436	46,613	177
LEC Planning Area Total	**575,316**	**575,897**	**581**

Conversion of the EAA for SFWMD Projects

The construction of stormwater treatment areas (STAs) within the EAA significantly affected the number of acres available to be farmed. Historically, the agricultural portion of the EAA has undergone periods of growth, but more recent trends indicated contraction of irrigated acres. Currently, within the EAA, approximately 458,500 acres are permitted for agriculture and this amount is expected to remain stable throughout the planning period. It is anticipated that, in the future, a portion of the remaining EAA acreage may be converted to STAs and Everglades restoration projects by SFWMD.

To fulfill the Everglades Forever Act of 1994, SFWMD constructed a series of STAs to further reduce phosphorus levels in stormwater runoff before it enters the Everglades Protection Area. In 2003, the STAs consisted of six large constructed wetlands—STA 1 East, STA 1 West, STA 2, STA 3/4, STA 5, and STA 6—totaling approximately 45,000 acres. The STAs footprint expanded by approximately 6,000 acres in 2006 with the construction of STA 2 Cell 4, STA 5 Cell 3, and STA 6 Section 2, and expanded again in 2012 by approximately 17,000 acres with the construction of Compartments B and C. The total area of treatment wetlands, including canals, distribution cells, and upland areas, is approximately 68,000 acres. Flow equalization basins and additional STAs will be constructed by 2025 as part of the Restoration Strategies Regional Water Quality Plan (**Chapter 4**), which will result in approximately 25,000 acres within the EAA being converted to water quality projects. Lastly, 14,000 acres under consideration for use as storage in the CERP planning process may be devoted to CERP projects. In total, it is anticipated that SFWMD projects may cover up to approximately 107,000 acres in the EAA by 2030. Only the 14,000 acres that may be used for a CERP project could reduce existing permitted agricultural acreage within the planning horizon.

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Distribution of Agriculture Across the LEC Planning Area

The main areas under cultivation within the LEC Planning Area are the EAA (which includes portions of Palm Beach and Hendry counties), Hendry County (the Western Basins, outside of the EAA but within the LEC Planning Area), the Palm Beach Coastal subbasin (including the Agricultural Reserve Area), and agricultural areas in South Miami-Dade County (including the Redlands) (**Figure 8**).

Everglades Agricultural Area in Palm Beach and Hendry Counties

The EAA accounts for approximately 80 percent of the agricultural acreage within the LEC Planning Area. Sugarcane and supporting rotational crops are the dominant crops grown in the EAA. The EAA is a fully developed, stable agricultural area where permitted acres and cropping practices are not projected to change significantly over the next 20 years. Consequently, projected water demands for the EAA from 2010 to 2030 do not change because EAA cultivated acres are expected to be constant throughout the twenty-year planning horizon.

Western Basins Located in Hendry County

The eastern portion of Hendry County located adjacent to the EAA is referred to as the Western Basins since it is on the western fringe of the LEC Planning Area and the Everglades. The Seminole Tribe of Florida's Big Cypress Reservation and the Miccosukee Indian Reservation are located in the Western Basins and are included in this analysis. This portion of the LEC Planning Area, known for sugarcane and citrus, also hosts crops grown for use as biofuel feedstocks. These crops are used both to sustain cogeneration power requirements for sugarcane processing (i.e., residues are combined with bagasse and wood chips to fire boilers), within integrated operations, and for ethanol production. Crops grown for use as biomass feedstocks (i.e., sweet sorghum) and for ethanol production are one of the emerging trends within this region of the planning area and the acreage falls under the "Field Crops – Other" and "Field Crops – Sugarcane" categories of the plan update.

Hendry County is the dominant citrus producer within the planning area (28,437 acres in 2010). Because of the uncertainty associated with the recovery of citrus production, a low and high projection was prepared for this crop (see **Appendix A**). By 2030, the projected high scenario for total citrus acreage in the entire LEC Planning Area is expected to total 21,157. In the low scenario, citrus acreage continues to decline and, by 2030, accounts for only 7,093 acres and the formerly cultivated citrus land is assumed to be fallow. To estimate future gross water demand, the high projected acres for citrus was incorporated. The projected citrus acreage incorporates the removal of 10,774 acres as part of the C-139 Annex Restoration Project in Hendry County by 2018. As **Table 6** shows, on balance, the Western Basins total irrigated acreage is expected to increase by 177 acres by 2030 (less than 1 percent) reflecting net gains in vegetables, sugarcane, and greenhouse/ nursery acres.

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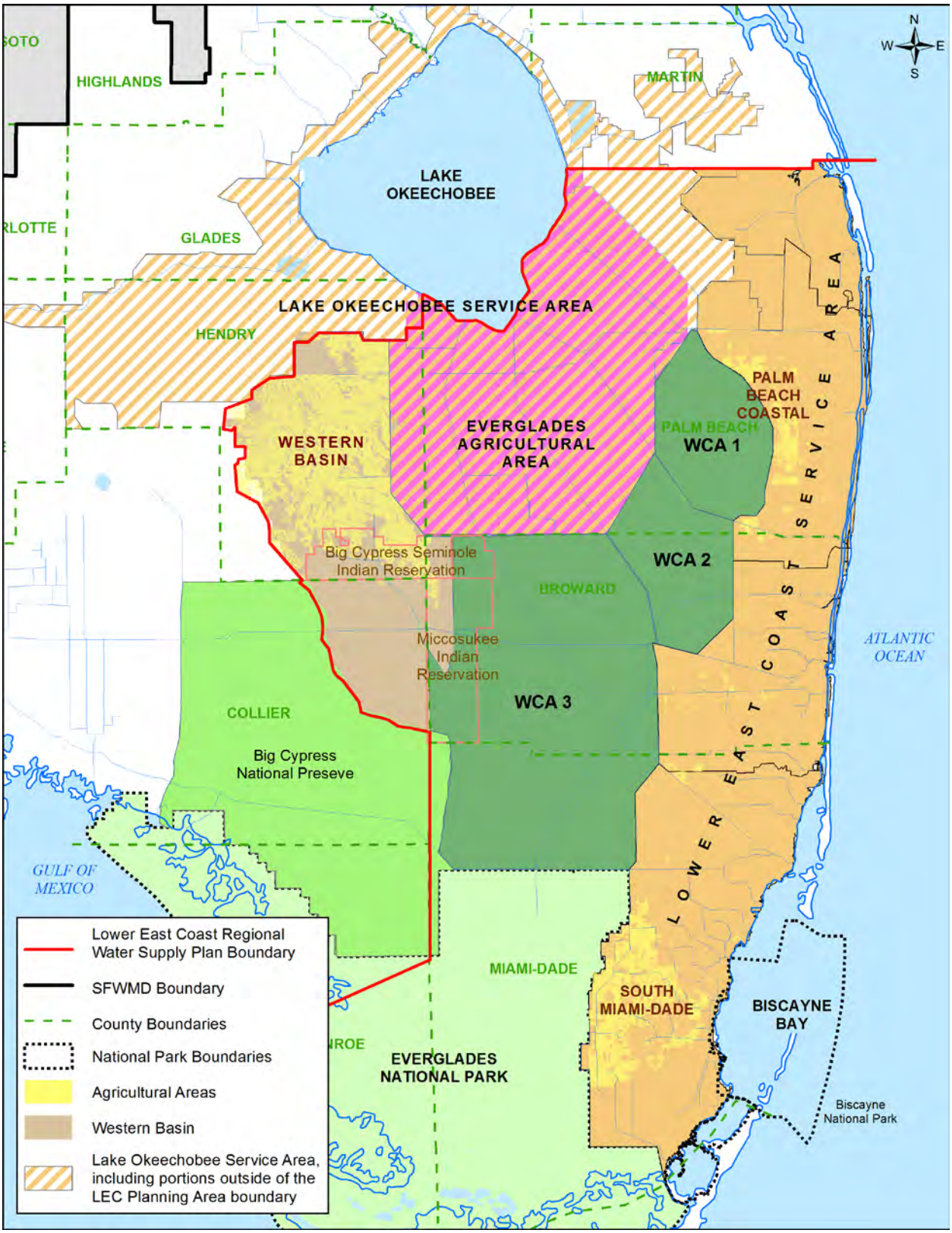

Figure 8. Main areas under cultivation within the LEC Planning Area.

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Lower East Coast Service Area

Within the coastal portion of Palm Beach County located in LECSA, citrus, other fruits/nuts, sod, and greenhouse/nursery production are projected to rise 1,173 acres by 2030. The scale of sod and greenhouse/nursery production can vary positively with a recovery in housing. This projection incorporates historic commodity-based trends, regional specialization, and stakeholder preferences for sustainable agriculture visible in plans for the Agricultural Reserve Area.

For South Miami-Dade County, the projections assume a slight decline in acreage—851 acres out of an existing 47,805 acres under management. This stable projection assumes the retention of the Redlands agricultural heritage (an area of critical importance to national, state, and regional consumer markets), favorable consumption and commodity demand trends, and a relatively weak future demand for new housing (and encroaching subdivisions) by historic standards. However, as noted above, some relatively small acreage losses due to fallout from the economic downturn and eventual urban encroachment under a stronger recovery are expected by 2030.

For Broward County, the projections expect a slight increase of 82 acres reflecting greenhouse/nursery operations coming back with economic recovery. Monroe County's greenhouse/nursery operations are not expected to change over the planning horizon.

Summary

Total irrigated agricultural acreage within the LEC Planning Area is expected to rise slightly from 575,316 acres in 2010 to 575,897 acres by 2030 (**Table 7**). The agriculture in the LEC Planning Area is dominated by the EAA, which is a fully developed, stable agricultural area where permitted acres and cropping practices are not projected to change significantly over the next twenty years. Consequently, projected water demands for the EAA remain constant from 2010 to 2030. Citrus acreage and water use is expected to decline in the Western Basins in Hendry County, reflecting implementation of the C-139 Annex Restoration project and the associated removal of acres from agricultural production. The remaining crop types in Hendry County offset the loss of citrus resulting in an increase of 177 acres. For the LEC Planning Area as a whole, sugarcane, other field crops, sod, and greenhouse/nursery are expected to increase slightly over the planning horizon, while other fruits and nuts, and vegetables, melons, and berries are expected to fall slightly.

The expected loss of additional agricultural acres due to urbanization has been deferred to much later periods over the twenty-year planning horizon. The restrained housing market and a slow economic recovery in South Florida has diminished competition for agricultural land from developers compared to the 2005–2006 LEC Plan Update evaluation environment. More generally, the rapid loss of arable land over the last 10 years throughout the United States raised the relative value of existing agricultural lands and placed a renewed emphasis on sustainable land management and food security. Some small declines expected in the Palm Beach Coastal area and the loss of citrus acreage in the Western Basins portion of Hendry County will likely be offset by gains in other crops within the planning

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area (sod and nursery/greenhouse production in Palm Beach County and sugarcane in the Western Basins in Hendry County). Palm Beach County is expected to retain its agricultural acres over the twenty-year planning horizon and to slightly increase agricultural lands within the Agricultural Reserve Areas.

Table 7. Change between 2010 and 2030 in acres by crop type within the LEC Planning Area.

Crop Type	2010 (acres)	2030 (acres)	Net Change (acres)
Citrus	31,628	21,157	(10,471)
Field Crops – Sugarcane	409,622	418,868	9,246
Field Crops – Other	19,079	19,309	230
Vegetables, Melons, and Berries	82,530	81,918	(612)
Sod	9,885	10,781	896
Greenhouse/Nursery	14,270	15,670	1,400
Other Fruits and Nuts	8,302	8,194	(108)
Total for All Crop Types	**575,316**	**575,897**	**581**

Agricultural Water Demands

Agricultural water demand reflects projected irrigated acreage, crop and soil types, growing seasons, and irrigation system types and strategies. AGR Self-Supply demand calculations for this update were completed using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model. The model calculates water demand for average rainfall and 1-in-10 year drought conditions using 30 years of daily rainfall and evapotranspiration records (Smajstrla 1990).

Gross irrigation requirements are the amount of water that must be withdrawn from the source in order to be delivered to the plant root zone. It includes the effect of losses due to inefficiencies in water application. The supplemental irrigation requirement water volumes projected reflect the soil type and irrigation system efficiency. Net demand reflects an estimate of the amount of water farmers need to place into the root zones of crops to sustain yields. **Appendix A** presents both net and gross irrigation demands by crop type under average rainfall year and 1-in-10 year drought conditions through the 2030 planning horizon.

Current agricultural water use accounts for 38 percent of the region's total gross demand Estimated agricultural irrigated acreages and gross demand for an average year by crop type for 2010 and 2030 are presented in **Table 8**. By 2030, the LEC Planning Area's total gross AGR Self-Supply demand is projected to remain essentially the same compared to 2010, increasing 1 percent from 655 MGD in 2010 to 664 MGD in 2030.

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Table 8. Estimated irrigated acreages and gross demand for an average water year by crop type for 2010 and 2030.[a]

Crop Category	2010 Acres	2010 Demand (MGD)	2030 Acres	2030 Demand (MGD)
Citrus	31,628	47.5	21,157	26.8
Field Crops – Sugarcane	409,622	385.2	418,868	407.5
Field Crops – Other	19,079	36.3	19,309	36.5
Vegetables, Melons, and Berries	82,530	125.5	81,918	126.8
Sod	9,885	12.1	10,781	13.3
Greenhouse/Nursery	14,270	38.1	15,670	43.1
Other Fruits and Nuts	8,302	10.0	8,194	9.9
LEC Planning Area Total	**575,316**	**654.8**	**575,897**	**663.9**

a. Perceived discrepancies in totals between this chapter and **Appendix A** are due to rounding.

Industrial/Commercial/Institutional Self-Supply

The water demand projections for the ICI Self-Supply sector are expected to rise to 57 MGD by 2030 from 44 MGD in 2010. These projections are slightly lower than the 61 MGD projected for 2025 in the 2005–2006 LEC Plan Update and reflect the different economic environment and sustainable resource use applications. A large component of the water use projections for ICI Self-Supply assumed that growth in self-supply for this region is proportional to the underlying economic activity that generates water demand in the area. This assumption was developed based on observed historic correlations with industrial output and water inputs in key sectors.

The ICI Self-Supply use category comprises large facilities for production processing, with the largest uses consisting of mining (i.e., aggregates industry) and food processing (dominated by the sugar industry). Because of the importance of these large users, the projection methodology was based on isolating and assessing the relationship between water use and expected future growth for these sectors.

The projections also reflect trends in process efficiencies (less water input demanded per unit of output) over the past ten years observed in large ICI Self-Supply users. ICI Self-Supply projections assume demand for average rainfall year and 1-in-10 year drought conditions are the same, and that withdrawal demand is equal to user demand so that no distinction is made between net (finished) and gross (raw) water amounts. It should be noted, with some use types within the ICI Self-Supply group, a large share of water demand is quickly returned to the system for reuse/recycling purposes (i.e., rock washing in the aggregates industry).

Many other ICI Self-Supply facilities receive their water from PWS utilities and their needs are included in PWS use. Time series data of pumpage reports obtained from SFWMD's Water Use Regulatory Database were used to evaluate and calculate ICI Self-Supply water use demand in addition to other data described in **Appendix A**.

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Recreational/Landscape Self-Supply

Gross demand for REC Self-Supply is projected to increase by 3 percent from the estimated 149 MGD in 2010 to 153 MGD in 2030 (**Table 3**). REC demand supplied by PWS utilities is included in the PWS demand. REC Self-Supply water use projections include landscape and golf course irrigation demand, as well as water needs for parks, communities, homeowner associations with common areas and consolidated irrigation systems, and areas with green spaces such as ball fields, stadiums, and cemeteries.

Estimated landscape and golf course acreage were projected separately. Projected golf course acreage was based on the total number of golf course acres identified through golf course inventories and review of the water use permits in SFWMD's Water Use Regulatory Database. Time series trends of irrigated golf course acreage within the LEC Planning Area by county were reviewed from 1985 through the present and were compared to development history, depicted by a time series of annual new privately owned residential building permits within each LEC Planning Area county. Given the recession and housing crisis, followed by a weak economic recovery restrained by a structurally troubled and weak housing market, the demand for new golf courses and existing course expansion has been, and will likely remain, stagnant. Based on the expected pace of economic recovery during the twenty-year planning horizon, golf course acreage is expected to gradually decline and then stabilize before gradually increasing. In 2010, total irrigated golf course acreage in the LEC Planning Area was estimated to be 25,253 acres. Approximately 30 percent of this total acreage was irrigated in part using reclaimed water (personal communication, Richard Nevulis, Reuse Specialist, SFWMD).

Historical patterns of growth in acreage for nongolf course landscaping and recreational water use were also evaluated since the 2005–2006 LEC Plan Update. Between 2006 and 2011, community development expanded, increasing the landscape acreage requiring irrigation. This trend was visible in homeowners' association permit applications to irrigate common areas supporting developments rising considerably since the last plan update. The last ten years also witnessed a development phase characterized by unprecedented urban development, with community expansion moving westward in the LEC Planning Area prior to the housing price bubble bursting in 2007. With the housing correction and bubble burst, the projections assume some marginal declines in the landscape irrigated acreage category followed by a slight recovery to a plateau over the remainder of the planning horizon.

The estimated 2010 and 2030 projected gross demand were calculated using 2010 estimated acreage, 2030 projected acreage, and the AFSIRS model. The AFSIRS model calculates the net irrigation requirements of a given crop type given its type of irrigation system and efficiency. Details regarding the future acreage projections for permitted landscape irrigation for each county are contained within **Appendix A**.

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Power Generation Self-Supply

The need for additional power supplies is expected to grow as the population in the LEC Planning Area and other portions of South Florida grow. The PWR Self-Supply water demand projections include input from Florida Power & Light (FPL), and consider expected load growth and power pool grid contributions within the LEC Planning Area. FPL utilizes an assessment method incorporating environmental, economical, and technical feasibility when selecting power generation and cooling technologies most appropriate for site-specific conditions, including water supply and wastewater disposal. Different technologies may require and utilize traditional and alternative water supply sources.

Currently, three power generation plants in the LEC Planning Area are permitted to withdraw fresh or brackish water: 1) the FPL West County Energy Center, which is currently the largest combined-cycle plant in the country, located in northwestern Palm Beach County; 2) the FPL Turkey Point plant located near Florida City in Miami-Dade County; and 3) the Homestead Municipal Power Plant in Miami-Dade County. The FPL West County Energy Center utilizes reclaimed water from Palm Beach County Water Utilities Department. FPL has not withdrawn water from surface or brackish water sources for this center since 2010. FPL uses water from the closed-cycle recirculation canal system and brackish Floridan aquifer water at Turkey Point Plant Unit 5. The Homestead Municipal Power Plant withdraws water from the Biscayne aquifer.

Another potential FPL plant may be sited in the LEC Planning Area, possibly in Hendry County where FPL has purchased land. The demand associated with this future plant is 22.8 MGD in 2030. Net PWR Self-Supply is projected to increase from 12 MGD in 2010 to 33 MGD by 2030 (**Table 3**) in the LEC Planning Area.

The projections do not include the Lake Worth Power Plant or other FPL facilities. The Lake Worth Power Plant uses fresh water provided by the City of Lake Worth Utilities. Therefore, PWS takes into account the Lake Worth Power Plant demand. The other FPL plants use or propose to use seawater or reclaimed waters, which do not require a SFWMD water use permit. The proposed Turkey Point Plant Units 6 and 7 expansions are expected to be added to FPL's South Florida grid system within the next 20 years. The planned source of cooling water for Units 6 and 7 is reclaimed water provided by the Miami-Dade Water and Sewer Department. Other FPL power generation plants in the LEC Planning Area use seawater, including Cutler and Lauderdale. FPL recently demolished the 1960s era Riviera and Port Everglades Plants and is replacing them with new, state-of-the-art high efficiency facilities. The new Riviera Beach plant will begin serving customers in 2014 when it returns to service as a "next generation clean energy center." The Riviera Plant will continue to use water from the Intracoastal Waterway for once-through cooling purposes, while the Port Everglades Energy Center may continue to use water from the Intracoastal Waterway for once-through cooling purposes or switch to reclaimed water.

The projections reflect process efficiencies associated with natural gas combined-cycle generation units. In the 2005–2006 LEC Plan Update, the estimated thermoelectric self-supply freshwater demand for 2005 was only 5 MGD, but expected to grow to 103 MGD by

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2025 to support proposed new power generating facilities. However, FPL's continued use of seawater, the modernization of plants, and use of reclaimed water when available contributed to the decrease in water resources permitted by SFWMD for PWR Self-Supply.

DEMAND PROJECTIONS IN PERSPECTIVE

The demand projections presented in this update are based on the best information available. These projections reflect trends, circumstances, and industry plans that change over time. For example, this update expects slower population growth than was anticipated in the 2005–2006 LEC Plan Update. The timing and strength of economic recovery will play a role in future land use patterns and the relative water demand uses across sectors. During past economic recoveries, housing led the expansion by stimulating demand. In contrast, under the current expansion, the job of leading the recovery is falling on the cumulative contributions from other sectors. As a consequence, moderate economic growth trajectory is deferred until much later in the planning horizon. This expectation is based on housing conditions that restrained development and urban growth. Industries important to the LEC Planning Area, such as construction and the supporting materials industries, have been sidelined. With housing and construction remaining depressed, other sectors such as tourism and agriculture become relatively more important in lifting the economy closer to its long-term trend growth potential. **Table 9** shows the 2025 gross demand projected in the 2005–2006 LEC Plan Update compared to the 2030 demand projected in this plan update. The tables contrast the different planning environments (and expectations for future growth) existing at the time of the projections and plan development.

Table 9. Gross demand projected in the 2005–2006 LEC Plan Update versus this plan update.

Water Use Category	Projected 2025 Demand from 2005–2006 Plan Update (MGD)	Projected 2030 Demand from This Plan Update (MGD)	Percent Difference
Public Water Supply	1,286.5	1,007.4	(22)
Domestic Self-Supply	48.9	18.7	(62)
Agricultural Self-Supply	689.1	663.9	(4)
Industrial/Commercial/Institutional Self-Supply	61.3	56.6	(8)
Recreation/Landscape Self-Supply	84.8	152.8	80
Power Generation Self-Supply	102.6	33.3	68
LEC Planning Area Gross Demand Total	**2,273.2**	**1,932.7**	**(15)**

Since completion of the 2005–2006 LEC Plan Update, less water was used in 2010 for a number of reasons, including implementation of rules restricting lawn irrigation, water shortage restrictions, conservation education, and a decline in economic activity. These changes suppressed PCUR to varying degrees over the past ten years. It is uncertain if the newly learned behaviors or water use ethics that reduced water demand at the tap or effects of the economic downturn are permanent or temporary. Water conservation measures were not explicitly factored into the demand projections used in this chapter unless requested by a utility. Rather, water conservation was considered a water source

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option. The utilities implementing significant conservation projects included them on their utility profiles (**Chapter 6**) to meet their future needs.

With urbanization pressure diminished, the projections assume an opportunity for agricultural land use retention over the twenty-year planning horizon that is supported by market forces and rising trends in net farm incomes. The agricultural projections are uncertain for a number of reasons including industry-specific factors, such as weather and disease, which may continue to affect agricultural production within the LEC Planning Area. Agriculture is highly dependent on global market conditions and, as the economy eventually recovers at a faster rate further out in the planning horizon, pressure from urban development and competition for land to support ecosystem restoration projects is likely.

REC Self-Supply gross demand is expected to increase by 3 MGD in the course of the 2010–2030 planning horizon. The majority of future landscaped areas will be associated with the continued support and maintenance of residential developments (constructed under the past housing boom) and corresponding irrigation needs will be met using reclaimed water where feasible. REC Self-Supply demand increased significantly from the 2005-2006 LEC Plan Update with the inclusion of a number of developments and commercial properties that have a single irrigation system for the entire property and were recently permitted.

For the PWR Self-Supply use category, future load growth requiring capacity expansions of the FPL plants will increase the demand for cooling process water to more than 33 MGD by 2030, which is much lower than the 2005–2006 LEC Plan Update estimate for 2025 of 103 MGD. FPL's use of seawater, modernization of plants, and the use of reclaimed water when available contributed to the decrease compared to the previous plan in projected water demand for this use.

In summary, the population growth driving the LEC Planning Area's urban needs will be the major force behind the growth in water demand reflected in this update. Most of the population growth is expected to take place in Palm Beach, Broward, and Miami-Dade counties, which will mask the small decline expected in Monroe County's population.

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3

Water Resource Analyses – Current and Future Conditions

This chapter provides an overview and status of the water resources within the Lower East Coast (LEC) Planning Area and the protections afforded water resources through regulatory criteria. Water supply to meet the demands described in **Chapter 2** is largely dependent on the availability of water resources. Understanding the relationship and effect of meeting water demands via withdrawals from water resources is critical to water supply planning.

TOPICS

- Regulatory Protection
- Water Resources by Region
- Climate Change

The current condition of the water resources is a product of a rich history of natural events and human alteration. With an annual precipitation average of 57 inches and nearly 75 percent of the rainfall occurring during the wet season of May through October (Abtew et al. 2013), the region is dependent on the Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project). This regional water management system—with nearly 2,000 miles of canals and more than 2,800 miles of levees and berms, 69 pump stations, 645 water control structures, and more than 700 culverts—helps to provide regional water supplies and flood control. Canals move water from Lake Okeechobee and the Everglades to coastal counties to recharge the surficial aquifer system (SAS) during dry times. The canals are also a crucial component of the flood control system for the region. Canals discharge water to tide through bays, lagoons, and coastal estuaries, which support biological diversity. Maintaining this diversity is a key part of maintaining the health of Florida's ecological systems and resources.

Past analyses indicated that fresh water from the surficial and Biscayne aquifers and surface water from Lake Okeechobee and canals is not adequate to meet the growing needs of the LEC Planning Area during 1-in-10 year drought conditions. Potential impacts on wetlands, potential for saltwater intrusion, and other factors limit the sources available to meet water demands. Previous water supply plans identified a variety of alternative water supply development projects to avoid water resource impacts, avoid competition between water users, and provide a sustainable supply of water (SFWMD 2000, 2007). Implementation of these recommendations is well under way and includes increased water conservation, use

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of reclaimed water, surface water storage and management, and development and use of brackish water. Concurrently, the South Florida Water Management District (SFWMD) adopted two additional restricted allocation area rules to protect significant portions of water resources found in the LEC Planning Area.

The interaction between science, policy, and legal tools, as well as water supply regulatory programs, aid to protect water supplies for the natural systems mentioned above. Water use permit applicants must provide reasonable assurances that the proposed water use 1) is reasonable-beneficial, 2) will not interfere with any existing legal use of water, and 3) is consistent with the public interest. An existing legal use of water is a water use authorized under a SFWMD water use permit or existing and exempt from permit requirements. This chapter describes water use permitting criteria, minimum flow and level (MFL) criteria, water reservations, and water shortage plans designed to protect and manage water resources. This chapter also describes the major water resources and their current condition, future trends, and the effect of changed operational protocols. Water resource development projects that provide additional water and restore or improve water quality of our water resources will be discussed in **Chapter 4**.

REGULATORY PROTECTION OF WATER RESOURCES

The intent of Chapter 373, Florida Statues (F.S.), is to manage Florida's water resources to ensure their sustainability (Section 373.016, F.S.). SFWMD developed water resource protection standards consistent with the legislative direction. The levels of harm—"harm", "significant harm", and "serious harm"—are relative resource protection terms, each playing a role in the ultimate goal of achieving a sustainable water resource. For instance, programs regulating surface water management and water use permitting must prevent harm to the water resource. The conceptual relationship among the various harm standards, associated conditions, and water shortage severity is shown in **Figure 9** while **Table 10** summarizes statutory resource protection tools and definitions.

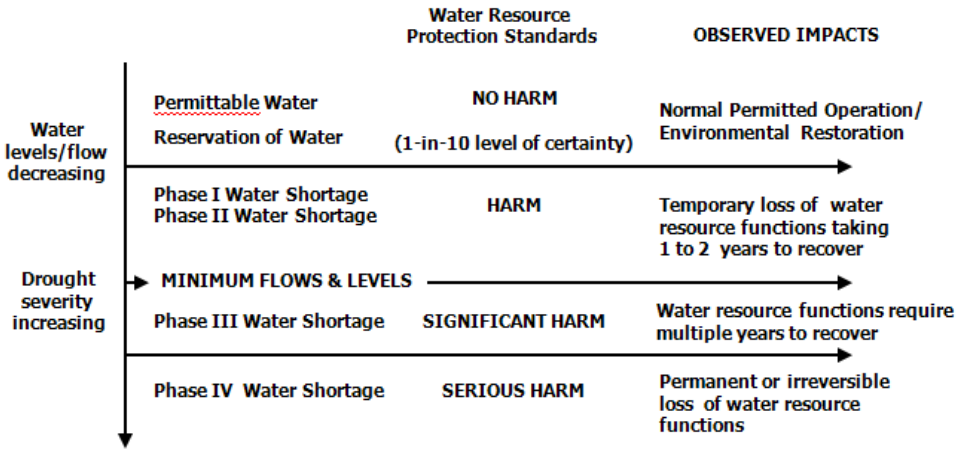

Figure 9. Conceptual relationship among the harm, significant harm, and serious harm water resource protection standards.

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Table 10. Summary of statutory resource protection tools.

Tool	Description
Water Use Permitting	The right to use water is authorized by permit. The conditions of permit issuance are more specifically enumerated in Chapters 40E-2 and 40E-20, Florida Administrative Code (F.A.C.). In order to provide reasonable assurances that the conditions of permit issuance are met, applicants must meet the technical criteria in the *Basis of Review for Water Use Permit Applications within the South Florida Water Management District* (SFWMD 2012b). The technical criteria used to evaluate the quantity and the proposed water uses' impact on the source include the following: • Saltwater intrusion • Wetland and other surface water body impacts • Pollution • Impacts to off-site land uses • Interference with existing legal users • MFLs and their regulatory components
Minimum Flows and Levels	MFL criteria are the flows or levels at which the specific water resource would experience significant harm from further withdrawals. If water flows or levels are below the MFL criteria, or projected to fall below the MFL criteria within the next 20 years, SFWMD must expeditiously implement a recovery or prevention strategy (Subsection 373.0421(2), F.S.). These strategies may include the construction of new or improved water storage facilities, development of additional water supplies, implementation of water conservation, etc. The strategy is to be developed in concert with the water supply planning process and coincide with the twenty-year planning horizon for the area.
Water Reservations	A water reservation sets aside water for the protection of fish and wildlife or the public health and safety. When a volume of water is reserved, it is not available for allocation to consumptive uses. Water reservations can be developed based on existing water availability and/or consideration of future water supplies made available by water resource projects. The Water Resources Development Act of 2000 requires SFWMD to use its reservation or allocation authority to protect water made available by Comprehensive Everglades Restoration Plan (CERP) projects as necessary for the natural system. Any volume of water not necessary for the protection of fish and wildlife or public health and safety may be certified as available and allocated to consumptive uses.
Water Shortage	Water shortages are declared by SFWMD's Governing Board when available groundwater or surface water is not sufficient to meet users' needs or when conditions require temporary reduction in total use within the area to protect water resources from serious harm. SFWMD's Water Shortage Plans are contained in Chapters 40E-21 and 40E-22, F.A.C. The purposes of the plans are to protect the water resources of SFWMD from serious harm; assure equitable distribution of available water resources among all water users during times of shortage consistent with the goals of minimizing adverse economic, social, and health related impacts; provide advance knowledge of the means by which water apportionments and reductions will be made during times of shortage; and promote greater security for water use permittees.

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To ensure the sustainability of Florida's water resources, Chapter 373, F.S., provides water management districts with several regulatory tools to protect water resources where the harm standards are applied:

- Water use permitting addresses the use of water resources to protect them from harm. Harm is defined as the temporary loss of water resource functions that results from a change in surface water or groundwater hydrology, and takes a period of one to two years of average rainfall conditions to recover (Rule 40E-8.021(9), Florida Administrative Code [F.A.C.]).
- MFL criteria define the point at which additional withdrawals will result in significant harm to the water resources or the ecology of the area (Sections 373.042 and 373.0421, F.S.). Significant harm is the temporary loss of water resource functions that results from a change in surface water or groundwater hydrology that takes more than two years to recover, but which is considered less severe than serious harm (Rule 40E-8.021(31), F.A.C.).
- Water reservations set aside water for the protection of fish and wildlife or public health and safety. Reserved water is not allocated to consumptive uses (Subsection 373.223(4), F.S.).
- Water shortage restrictions limit water use when sufficient water is temporarily unavailable to meet user needs or when conditions require temporary reduction in use to prevent serious harm to water resources (Sections 373.175 and 373.246, F.S.). Serious harm is the long-term loss of water resource functions resulting from a change in surface water or groundwater hydrology (Rule 40E-8.021(30), F.A.C.).

Changes to Water Use Permitting

The *2000 Lower East Coast Water Supply Plan* (2000 LEC Plan) (SFWMD 2000) recommended incorporation of resource protection criteria (MFLs and water reservations), level of certainty, special designations, and permit durations into the water use permitting criteria. A series of rulemaking efforts was completed in September 2003, resulting in amendments to Chapters 40E-1, 40E-2, 40E-5, 40E-8, 40E-20, and 40E-21, F.A.C. and the *Basis of Review for Water Use Permit Applications within the South Florida Water Management District*, referred to as the Basis of Review (SFWMD 2012b). Among the most significant changes were the amendments to permit duration, permit renewal, wetland protection, supplemental irrigation requirements, saltwater intrusion, aquifer storage and recovery, and model evaluation criteria.

A renewal process for irrigation class water use permits in the LEC Planning Area's urban corridor began in 2004 and was mostly complete in 2006. Most Lower East Coast Service Area (LECSA) Public Water Supply (PWS) permits were renewed between 2008–2011. Lake Okeechobee Service Area (LOSA) permit renewals began in 2009, with most permits issued by 2011. Many of the renewed permits are for twenty-year durations. The processing of permit applications, and the associated data and analysis to support and evaluate them, benefited the evaluation of current conditions for this plan update.

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Additional Protection Afforded Water Resources

The water resource protection criteria contained in the Basis of Review includes three additional mechanisms to protect water supplies for natural systems from consumptive uses: 1) MFLs, 2) water reservations, and 3) restricted allocation area rules. In recent years, the SFWMD's priorities have focused on establishing water reservation and restricted allocation area rules to facilitate construction of the Comprehensive Everglades Restoration Plan (CERP) project components. Federal law requires natural system water provided by CERP projects to be protected by water reservation or restricted allocation area rules prior to executing a cost-share agreement to construct.

The SFWMD also continues to fulfill its statutory obligation to identify key water bodies for which MFLs should be developed or updated. Section 373.042(2), F.S. requires each of the five water management districts to provide an annual MFL priority list and schedule to the Florida Department of Environmental Protection (FDEP). The statute was modified in 2013 to require identification of proposed water reservations. Future submittals to FDEP will include lists and schedules for MFL and water reservation water bodies.

The priority list is based on the importance of the waters to the state or region and the existence of, or potential for, significant harm to the water resources or ecology of the state or region, and includes those waters that are experiencing or may reasonably be expected to experience adverse impacts. In addition, the SFWMD considers the CERP project schedule and the related federal and state requirements to protect water for the natural system using its reservation or allocation authority. To this end, in 2007 the SFWMD adopted restricted allocation area rules for the Lower East Coast Service Area and North Palm Beach County/Loxahatchee River Watershed to limit allocation of water and, in part, to support construction of CERP projects. Restricted allocation area and water reservation rules function similarly and limit allocations; therefore the SFWMD has removed initial water reservations for the Everglades and Loxahatchee River water bodies from its priority lists. In addition, the United States Army Corps of Engineers (USACE) has verified that federal requirements have been met for several CERP projects by virtue of the SFWMD's adoption of water reservations and restricted allocation area rules. Taken together, these rules function to afford protection for water resources across significant portions of the planning area.

Minimum Flows and Levels

MFL criteria define the point at which further withdrawals will result in significant harm to the water resources or ecology of the area. These criteria are applied individually to affected water bodies and define flow or stage, durations, and return frequency. When setting MFL criteria, the Governing Board must consider changes and structural alterations to watersheds, surface waters, and aquifers and the effects such changes or alterations had, and the constraints such changes or alterations placed on the hydrology of an affected watershed, surface water, or aquifer (Subsection 373.0421(1), F.S.).

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Within the LEC Planning Area, between 2001 and 2006, the Governing Board adopted MFL criteria for five water bodies. These water bodies include 1) Lake Okeechobee, 2) the Everglades, which includes Water Conservation Area (WCA) 1, WCA 2, WCA 3, Everglades National Park, and Rotenberger and Holey Land wildlife management areas, 3) the Biscayne aquifer, 4) the Northwest Fork of the Loxahatchee River and Estuary, and 5) Florida Bay (Chapter 40E-8, F.A.C.). **Figure 10** shows the location of both MFL and water reservation water bodies. MFL criteria must be reviewed periodically. SFWMD is currently reviewing the Caloosahatchee and Florida Bay MFL criteria as described in the 2013 priority water body list submitted to FDEP (Medellin 2013).

When SFWMD establishes an MFL, it must determine whether the existing flow or level in the water body is below or projected to fall below, the MFL criteria within the next 20 years. If it will, SFWMD must develop and expeditiously implement a recovery or prevention strategy. The strategy, when appropriate, should include development of additional water supplies, water conservation, and other efficiency measures consistent with the provisions in Sections 373.0421 and 373.709, F.S.

SFWMD develops a recovery strategy when the water body currently exceeds the MFL criteria. The goal of a recovery strategy is to achieve the established MFL as soon as practicable. The recovery strategy must include the provision of sufficient water supplies for all existing and projected reasonable-beneficial uses, and may include the development of additional supplies, construction of new or improved storage facilities, and implementation of conservation or other efficiency measures. A prevention strategy is developed when the MFL criteria is not currently violated, but is projected to be exceeded within the next 20 years. The goal of a prevention strategy is for the water body to continue to meet the established MFL in the future. Both recovery and prevention strategies must include phasing or a timetable that allows for the provision of sufficient water supplies for all existing and projected reasonable-beneficial uses. MFL recovery and prevention strategies are implemented in phases with consideration of SFWMD's missions in managing water resources, including water supply, flood protection, environmental enhancement, and water quality protection, as required by Section 373.016, F.S.

Presently, recovery strategies exist for Lake Okeechobee, the Everglades, and the Northwest Fork of the Loxahatchee River. Prevention strategies exist for the Biscayne aquifer and Florida Bay. Both types of MFL strategies are described in **Appendix B**. Details and the status of projects and programs identified in **Appendix B** can be found later in this chapter and in **Chapter 4**. Further details on MFLs are available on SFWMD's website at www.sfwmd.gov/mfls.

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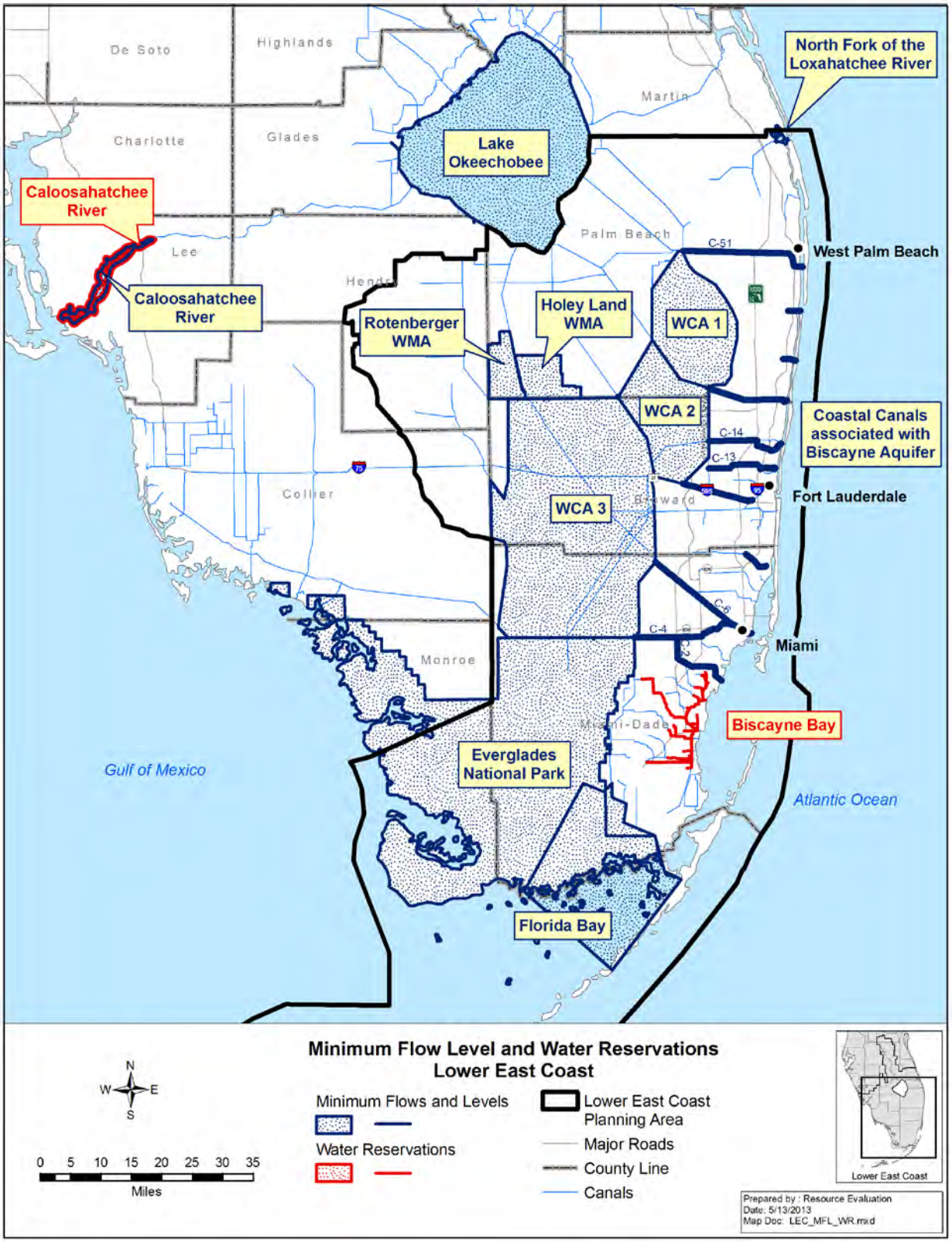

Figure 10. MFL and water reservation water bodies.
(Note: WMA – Wildlife Management Area.)

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Water Reservations

Chapter 373.709(h), F.S. requires regional water supply plans to include water reservation rules adopted for the planning area. A water reservation rule sets aside water for the protection of fish and wildlife or public health and safety. When a volume of water is reserved, it is unavailable to allocate for consumptive uses. Water reservations are developed based on existing water availability and/or consideration of future water supplies that water resource projects make available. The Water Resources Development Act of 2000 and Section 373.470, F.S. require SFWMD to reserve or allocate the increase water supplies for the natural system identified in CERP project implementation reports. Water reservations rules became effective in support of the CERP Picayune Strand Restoration, the Indian River Lagoon – South, and Biscayne Bay Coastal Wetlands (BBCW) projects in 2009, 2010 and 2013. The Governing Board is expected to consider draft water reservation rules in 2014 for the CERP Caloosahatchee River (C-43) West Basin Storage Reservoir.

Biscayne Bay Water Reservation

From 2003 to 2011, SFWMD evaluated different approaches to establish rules to protect Biscayne Bay. The approaches included evaluating whether to establish MFL criterion to establish the point at which further withdrawals would cause significant harm to the bay's resources, implementing a restricted allocation area rule or a water reservation to protect surface water flows to the bay. From 2003 to 2007, SFWMD completed a series of reports, which did not demonstrate a clear link between biological resources and salinity based on freshwater inflows, a necessary linkage for defining the MFL significant harm threshold. From 2008 to 2009, SFWMD refocused its efforts on measures needed to achieve restoration of Biscayne Bay and completed a peer reviewed report, *Adequacy of Technical Information to Support Minimum Inflow Needs for Biscayne Bay*, which concluded that additional salinity information needed to be developed (SFWMD 2009a). In 2012, SFWMD and USACE completed the project implementation report for the BBCW Phase I Project, which identified a specific quantity of surface water to be protected in order for the project to achieve its intended benefits. After considering options to protect water for the bay, which included 1) a water reservation for surface water flows identified for the portions of the bay improved by the CERP project; 2) a water reservation for surface water flows for all of Biscayne Bay; and 3) a restricted allocation area rule for surface water flows for all of Biscayne Bay, the SFWMD Governing Board directed staff to undertake rule development for a water reservation for surface water associated with the CERP project.

SFWMD adopted a rule to reserve water to protect existing surface water flows up to the target flows for Biscayne Bay identified by the CERP project implementation report for Phase 1 of the BBCW Project (USACE and SFWMD 2012). Specifically, the proposed rule prohibits the allocation of surface water within certain reaches of the C-100, C-1, C-102, C-103, and associated canals to consumptive uses. Further details on water reservations are available on SFWMD's website at www.sfwmd.gov/reservations.

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Restricted Allocation Area Rules

Restricted allocation areas limit allocations from water resources (e.g., lakes, wetlands, and canals) in defined geographic areas. Three areas have restrictions on allocations within the LEC Planning Area. The two largest areas and water users affected are the Lower East Coast and Lake Okeechobee service areas. By limiting allocation, restricted allocation area rules function similar to a water reservation that also limits allocations. To that end the SFWMD has removed initial water reservations for the Everglades and the Loxahatchee River Watershed water bodies from its priority lists. Additional areas include canals in eastern Hendry County and the North Palm Beach/Loxahatchee River Watershed. **Figure 11** shows the locations of restriction allocation areas within the LEC Planning Area.

In February 2007, SFWMD's Governing Board adopted restricted allocation area criteria for the Everglades and Loxahatchee River Watershed water bodies (Section 3.2.1.E, Basis of Review). This criteria limits allocations to conditions or withdrawals in the Lower East Coast Service Area and North Palm Beach County/Loxahatchee River Watershed, depending on the specific use class, that existed as of April 1, 2006, known as the "base condition water use." The rule only allows allocations over the "base condition water use" through alternative source development, implementation of offsets (e.g., recharge barriers and recharge trenches), or identification of terminated or reduced water uses that existed as of April 1, 2006. Wet season water can be allocated if the permit applicant demonstrates that such flows are not needed for restoration of the Everglades pursuant to CERP or for the Loxahatchee River Watershed water bodies, pursuant to the *Northern Palm Beach County Comprehensive Water Management Plan* (SFWMD 2002). This criteria is part of the MFL recovery strategies for both the Everglades and the Northwest Fork of the Loxahatchee River.

In October 2008, SFWMD's Governing Board adopted restricted allocation area criteria for LOSA (Section 3.2.1.G, Basis of Review). These criteria limit surface water withdrawals from Lake Okeechobee and all surface water hydraulically connected to the lake. The change in permit criteria was necessitated by the impacts to water supply and increased exceedances of the lake MFL criteria from implementation of the 2008 Lake Okeechobee Regulation Schedule (2008 LORS), which reduced stages in Lake Okeechobee by approximately one foot. When repairs by USACE to the Herbert Hoover Dike are complete and the lake's regulation schedule is revised through a National Environmental Policy Act analysis, the expectation is that the resulting schedule will raise lake levels. The additional water held in the lake is expected to return the lake from MFL recovery status to MFL prevention status, enhance the level of certainty to existing permitted users now receiving less than 1-in-10 level of certainty, and support environmental objectives. In the meantime, these criteria are part of the MFL recovery strategy for the lake.

The third restricted allocation area found in the LEC Planning Area is located just south of LOSA in eastern Hendry County. These basins have a limited network of surface water canals that are not connected to Lake Okeechobee. Canals in this area include the L-1, L-2, and L-3 canals, where no additional surface water can be allocated over the existing allocations (Section 3.2.1.C, Basis of Review).

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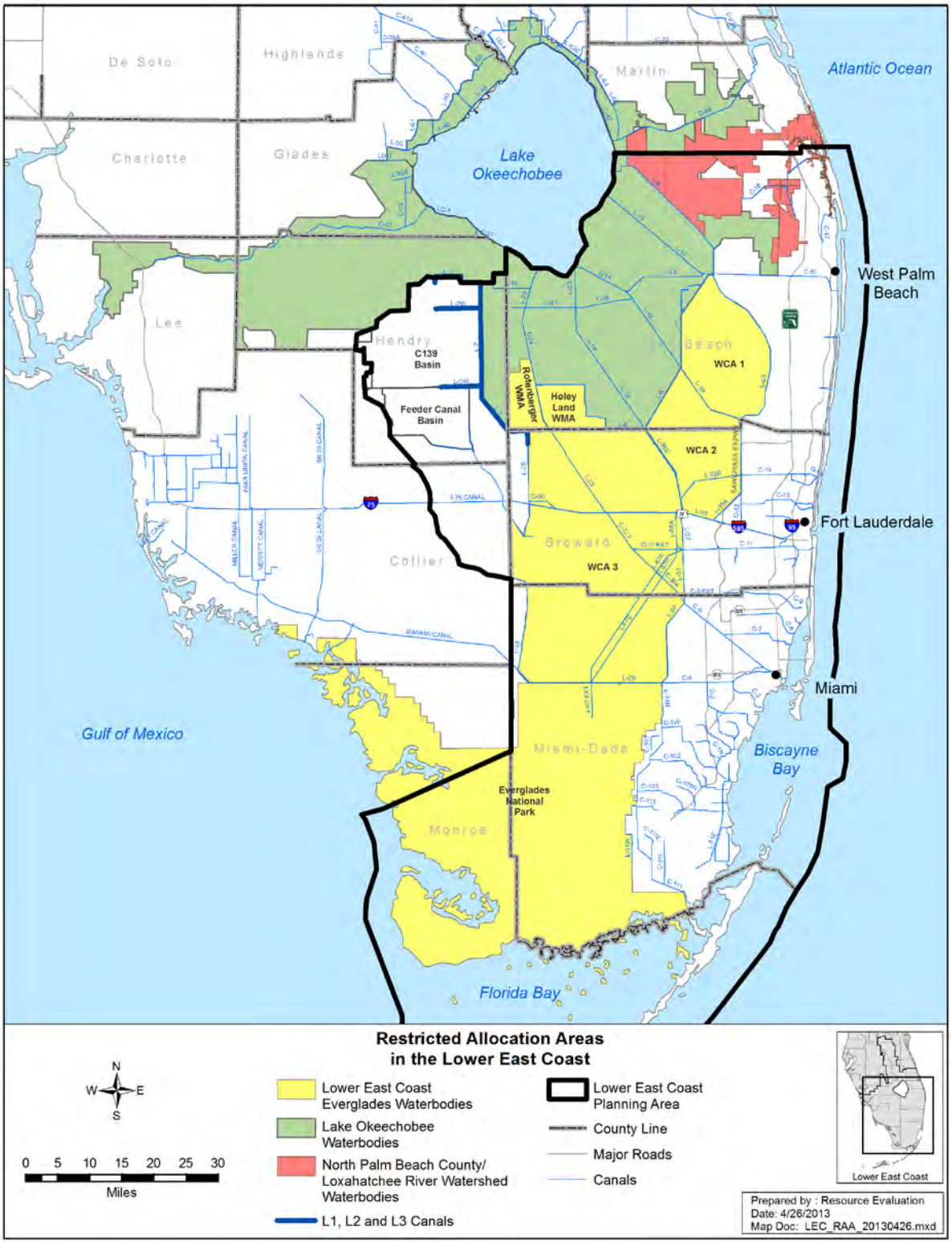

Figure 11. Restricted allocation areas in the LEC Planning Area.
(Note: WMA – Wildlife Management Area.)

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Water Shortage Criteria

In accordance with Sections 373.175 and 373.246, F.S., water shortage declarations are designed to prevent serious harm from occurring to water resources. Serious harm is defined as the long-term loss of water resource functions resulting from a change in surface water or groundwater hydrology. Observed impacts associated with serious harm can result in long-term, irreversible, or permanent loss of water resource functions (Rule 40E-8.021(30), F.A.C.).

The Water Shortage Plan laid out in Chapter 40E-21, F.A.C. is applied to manage water use when insufficient groundwater or surface water is available to meet user needs or when conditions require temporary reduction in use. The goal is to protect the remaining supply through demand management and ensure a fair distribution of this supply. Chapter 40E-22, F.A.C. is the SFWMD Regional Water Shortage Plan. It contains water shortage restrictions related to specific water bodies, including Lake Okeechobee. Further information on water shortage management is available in the *2011–2013 Water Supply Plan Support Document*, referred to as the Support Document (SFWMD 2013a).

OVERVIEW OF WATER RESOURCES BY REGION

Major regions of the LEC Planning Area include Lake Okeechobee and hydraulically connected surface water bodies; the Everglades Agricultural Area (EAA), which is located in LOSA; the Everglades, including the WCAs and Everglades National Park; Loxahatchee River and Estuary; Lake Worth Lagoon; Biscayne Bay; Florida Bay, and the Lower West Coast Service Area (**Figure 12**).

Lake Okeechobee

Lake Okeechobee serves multiple purposes, including urban, agricultural and environmental water supply, flood control, navigation, and commercial and recreational fisheries. It is also a key ecological component of the Greater Everglades ecosystem (Zhang and Sharfstein 2013). The lake has multiple inflows, including the Kissimmee River, and receives water from a watershed in excess of 4,600 square miles. However, the lake only has two major outlets for flood control purposes: one to the east coast via the St. Lucie Canal and another to the west coast via the Caloosahatchee Canal (SFWMD 2011b). The 143-mile long Herbert Hoover Dike encircles the lake to protect the surrounding communities from flooding. A technical review of the dike conducted by an expert panel in 2006 (Bromwell et al. 2006) indicated the need for a major rehabilitation.

MFL criteria and a prevention strategy were established for Lake Okeechobee in 2001. Significant harm criteria associated with the MFL criteria were based on the relationship between water levels in the lake and the abilities to 1) protect the coastal aquifer against saltwater intrusion, 2) supply water to Everglades National Park, 3) provide littoral zone habitat for fish and wildlife, and 4) ensure navigational and recreational access (SFWMD 2000).

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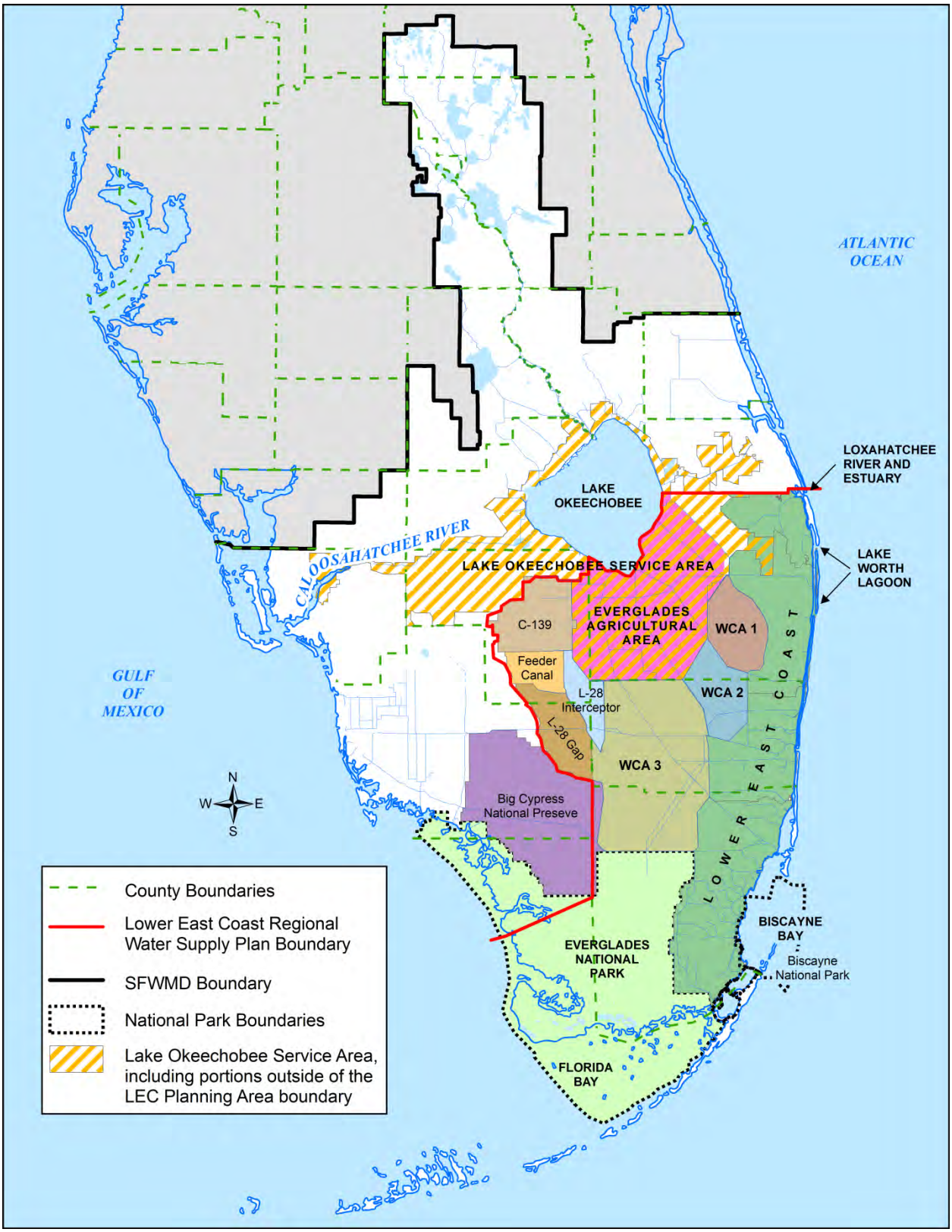

Figure 12. Major regions of the LEC Planning Area.

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2008 LORS and Adaptive Protocols

As mentioned earlier in the chapter, USACE adopted a new lake schedule, 2008 LORS, to reduce the risk of the dike failure (USACE 2007) until it is rehabilitated. The schedule includes operating guidelines designed to maintain Lake Okeechobee water levels approximately one foot lower than the previous schedule to protect the integrity of the dike and enhance lake ecology. Under 2008 LORS, water levels are primarily maintained between 12.5 and 15.5 feet National Geodetic Vertical Datum of 1929 (NGVD). Overall, the changes under 2008 LORS result in an average loss of approximately 430,000 acre-feet (ac-ft) of water storage for all uses. The new schedule increased the frequency of low lake stage exceeding the MFL criteria.

As a result of the impacts to water supply and the water resource, SFWMD changed the MFL status from prevention to recovery and developed a recovery strategy, which can be found in **Appendix B.** The strategy includes a regulatory component that limits future additional withdrawals from Lake Okeechobee and all surface water hydraulically connected to the lake (referred to in the Florida Statutes as the "Lake Okeechobee Waterbody") in order to prevent further degradation of the level of certainty for existing legal users or change in lake MFL performance.

To assist managing the lake under 2008 LORS, adaptive protocols for Lake Okeechobee operations were revised (SFWMD 2010). The key goals of the revisions are to improve water supply, flood protection, and ecosystem benefits within the constraints of 2008 LORS and the *Central and Southern Florida Project Water Control Plan for Lake Okeechobee and Everglades Agricultural Area* (USACE 2008). Adaptive protocols provide guidance to water managers for discretionary releases for ecosystem benefits or to improve conditions related to the operation of the C&SF Project when the lake stage is in the low, base flow, and beneficial use sub-bands. For further discussion of these changes, see **Appendix B**.

Lake Okeechobee's response to changing levels and stage ranges has been quite dynamic. However, a number of trends appear to be emerging. The emergent and submerged vegetation communities appear to have moved lakeward (towards previously deeper water areas); with the upper, short hydroperiod marsh becoming progressively more terrestrial in character. Additionally, many of the large shallow bays, particularly at the southern end of the lake, are shifting from being dominated by submerged vegetation towards being dominated by emergent species; while submerged plant beds extended further offshore (**Figure 13**). For the most part, faunal responses to these changes have been positive. Both sport and commercial fish species appear to be thriving (Zhang and Sharfstein 2012, 2013). The lake had more nesting activity of the endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*) in 2012 than in any year since 1992 (Kitchens et al. in press). Use of the lake by waterfowl remained high. However, wading bird foraging and nesting success (with one exception) has been relatively poor in the last several years. This may be due to low lake levels preventing adequate development of the required prey base in areas of suitable depth in the marsh (Zhang and Sharfstein 2012, 2013, Chastant and Gawlik 2011).

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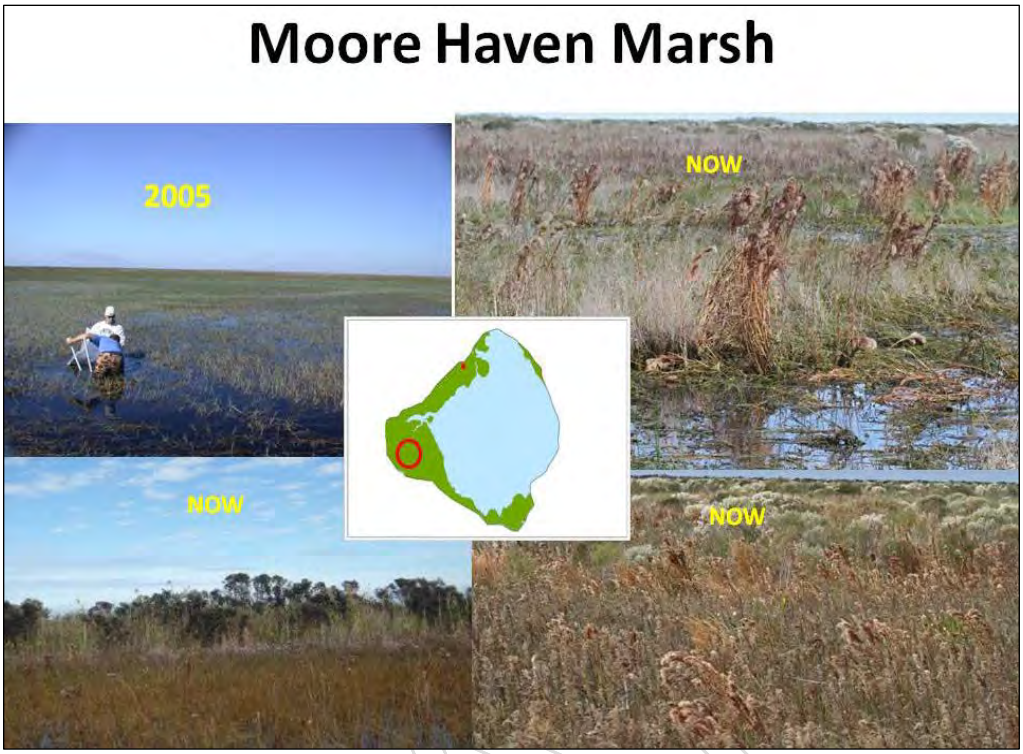

Figure 13. Major shifts in the Lake Okeechobee marsh vegetation community occurred over the past seven years in response to recent droughts and implementation of 2008 LORS, which strives to maintain the lake at least a foot lower than the previous operating schedule.

Water quality in Lake Okeechobee remains relatively unchanged and appears to be insensitive to both the change to 2008 LORS schedule and the relatively modest nutrient abatement projects that have been implemented to date. The main driver for annual phosphorus load continues to be volume and source of inflow to the lake (Zhang and Sharfstein 2013), which is directly related to annual rainfall in the watershed. Even though high nutrient levels, lower lake levels, and clearer water occurred over the past several years, cyanobacterial (blue-green algae) blooms and their associated toxins remained low since 2005 (Zhang and Sharfstein 2012, 2013).

Because of the climatic variability of South Florida, coupled with large differences between the lake's inflow and outflow potential and the lack of additional water storage features both upstream and downstream of the lake, the overarching driver for lake ecology continues to be stochastic or naturally occurring events like droughts and hurricanes (Havens et al. 2001). Their dominance was clearly demonstrated by years like 2001, 2007, and 2011 (droughts), and 2004 and 2005 (major hurricanes).

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Everglades

The Everglades, which includes the WCAs and Everglades National Park (**Figure 14**), are managed for flood control, water supply, regional groundwater control (including prevention of saltwater intrusion), recreation, and enhancement of fish and wildlife, including endangered and threatened species (Abtew et al. 2013). As a natural ecosystem, it contains the globally rare and last remnant ridge and slough patterning, tree islands that are considered important habitat for subtropical and tropical plant and animal species, marl marshes, and coastal mangrove forests and marshes. The Everglades is the focus of one of the largest ecological restoration projects in the world.

The Everglades is a peatland, a type of wetland with soils composed of organic matter that builds up by accumulating decaying vegetation. Natural peatlands stay saturated and the peat generally remains wet year-round. Within the Everglades is a patterned peatland, called ridge and slough, consisting of long, linear patterns of alternating sawgrass ridges among sloughs populated by water lilies. The entire landscape pattern is oriented parallel to water flow. These peatlands provided a wide variety of habitat for fish and other aquatic species, reptiles and amphibians, such as alligators and frogs, wading birds, and migratory birds. They were very low nutrient (especially phosphorus) wetlands.

The Everglades were initially drained to encourage use for farming. Then, as the peat was over-dried and burned, water supply became an issue for the growing coastal human population. Beginning in the 1950s and 1960s, the wetlands were compartmentalized to retain water for water supply as part of the C&SF Project (Alexander and Crook 1973), radically altering these depths. Compartmentalization required intensive water management. The WCAs are impoundments that confine water over a sloped surface (sloping generally southward from Lake Okeechobee towards Florida Bay). Therefore, water depths in the northern regions are lower than in the southern regions of each WCA.

Prior to human development, water flowed unimpeded out of Lake Okeechobee over what is now the EAA, bounded by the coastal ridge to the east and the higher lands west of what is now WCA 3A and Big Cypress National Preserve (McVoy et al. 2011). Historically, this flow wound its way to Biscayne or Florida bays. Under natural flows, water levels across the landscape were generally equally deep.

Now, the primary inflows and outflows from the WCAs are rainfall and evapotranspiration (Abtew et al. 2013), which is evaporation plus water released by vegetation. Additional inflows come from the stormwater treatment areas (STAs) and through gates that connect one WCA to another (S-10 structures from WCA 1 to WCA 2, S-11 structures from WCA 2A to WCA 3A, and S-12 structures from WCA 3A to Everglades National Park). Storm water from the EAA moves south through STAs constructed by SFWMD and into the Everglades Protection Area. The STAs include STA 1 East, STA 1 West, STA 2, STA 3/4, and STA 5/6 as of September 2012. Expansion of STA 2 (known as Compartment B) and STA 5/6 (known as Compartment C) are complete and are permitted to operate. These two STA expansion projects increase the total effective treatment area to 57,000 acres.

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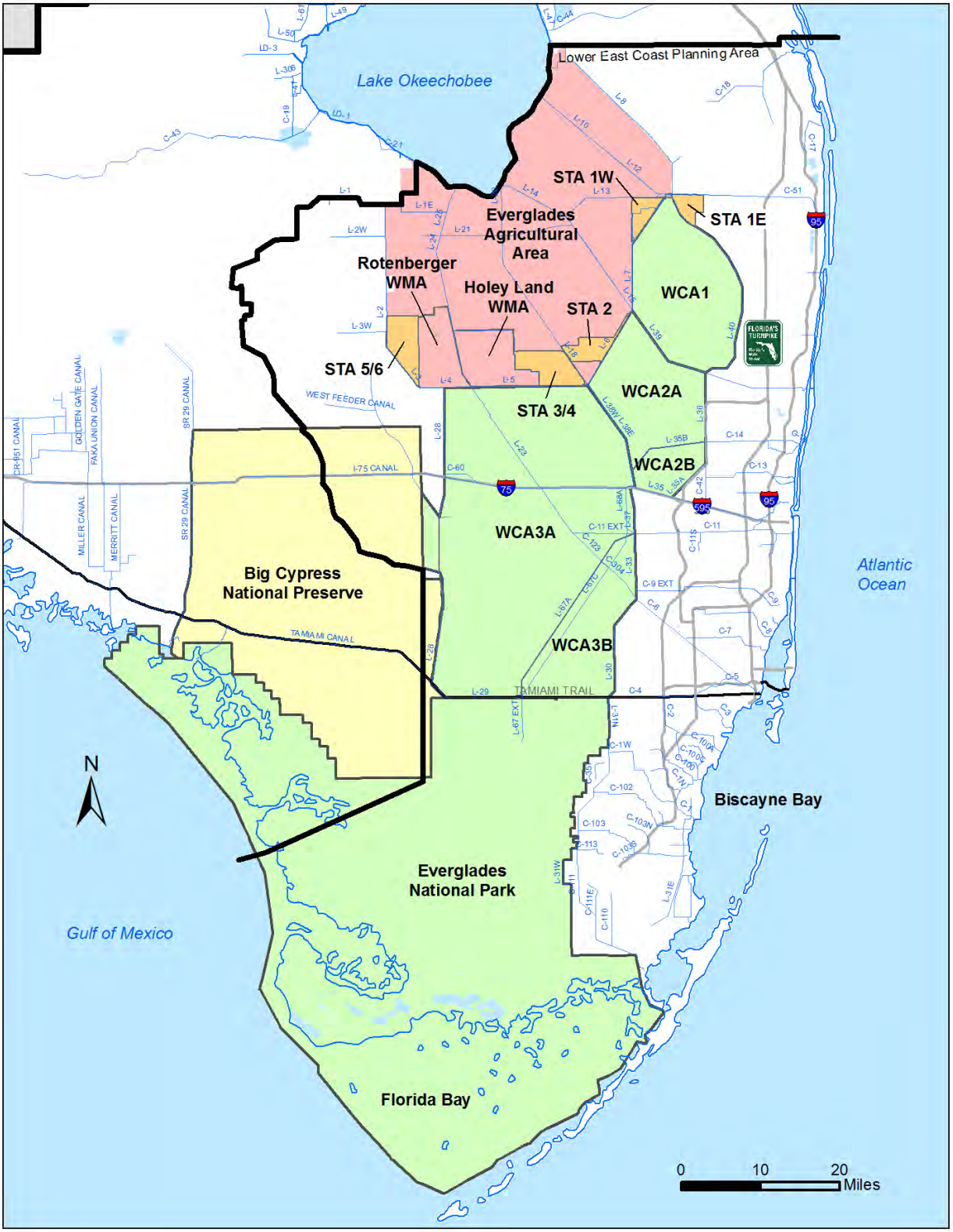

Figure 14. Map of the Greater Everglades region.
(Note: WMA – Wildlife Management Area.)

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Water levels in most of the WCAs are managed via inflow and outflow control structures using a set of regulation schedules established by USACE (USACE 1996). These schedules allow for different water levels under different conditions. These ranges can provide storage of runoff during the wet season for subsequent use during the dry season, and flood control during the wet season.

Everglades MFL criteria were established in 2001. Impacts associated with significant harm include increased peat oxidation, frequency of severe fires, soil subsidence, loss of aquatic refugia, loss of tree islands, and long-term changes in vegetation or wildlife habitat. The MFL criteria for the Everglades were based on protecting the two dominant soil types, peat-forming and marl-forming wetlands, found within the ecosystem. An MFL recovery strategy has been in place since 2001 when the criteria were adopted. This strategy can be found in **Appendix B**. In 2007, regulatory criteria limited additional withdrawals, whether direct or indirect, from Everglades water bodies to the levels permitted as of April 1, 2006.

Everglades Restoration Transition Plan

The Everglades Restoration Transition Plan (ERTP) (USACE 2011) defines water management operating criteria for the C&SF Project features and the constructed features of the Modified Water Deliveries to Everglades National Park Project and the C-111 South Dade Project until the Combined Operational Plan is implemented, which incorporates more flexible operating criteria to better manage WCA 3A. The ERTP is intended to improve conditions for the Everglades snail kite, the wood stork (*Mycteria americana*), and wading birds and their habitats while maintaining protection requirements for the Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), along with C&SF Project purposes.

The limited flexibility within the current system was evaluated by reviewing hydrological, meteorological, and ecological data from 1998 to 2009. Specifically, this time frame corresponds to several efforts: evaluation of the protection of the Cape Sable seaside sparrow (USACE 1999, 2000a, USACE and SFWMD 1999), development of the 2000 and 2001 Interim Structural and Operational Plans (USACE 2000a), and development of the 2002 and 2006 Interim Operational Plans (USACE 2002, 2006). Recommendations within the United States Fish and Wildlife Service's (USFWS) *Draft Multi-Species Transition Strategy for Water Conservation Area 3A* (USFWS 2010a) formed the basis for the ERTP performance measures and ecological targets.

Through the ERTP, the USFWS and USACE implemented a Multi-species Management Plan for WCA 3A to manage hydrology to better address the needs of multiple species. These species included the endangered wood storks, Everglades snail kites, and wading birds. Habitats included wet prairies and tree islands. During this process, concern over levee integrity led USACE to replace the flood regulation schedule for WCA 3A with the 1960 flood regulation schedule. The 1960 schedule reduces the three-gauge average wet season stages by 0.25 foot and the dry season stages by 0.5 foot relative to the existing schedule (USACE 2011).

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Following the approval of the ERTP final environmental impact statement (USACE 2011), the ERTP replaced the Interim Operating Plan when the Record of Decision Central and Southern Florida Project Everglades Restoration Transition Plan was signed on October 19, 2012 (USACE 2012). This reduced dry season schedule may significantly decrease water supply for natural ecosystems and downstream uses and has already produced stages lower than those of the previous year.

Response to Recent Droughts

An additional water supply concern is the recent droughts. The Everglades experienced two relatively severe droughts in 2009 and 2011, when water levels in the five WCAs fell below ground over 87 to 100 percent of their areas. In WCA 3A, where water levels along the L-67 and L-29 canals usually remain aboveground throughout the dry season, water levels fell belowground and exceeded MFL criteria (**Figure 15** and **Figure 16**). Peat fires can result in catastrophic loss of peat, which took decades to centuries to form. In June 2011, the Prairie Fire burned 68,300 acres of WCA 3B and was extinguished by rainfall a few days later (**Figure 17**). Of additional concern was that water depths in west central WCA 3A, the location of the best ridge and slough patterning, was up to 2 feet underground, leading potentially to significant peat loss through exposure to air, leading to high rates of decomposition.

Figure 15. Wetland conditions were similar throughout most of WCA 3A with dried and cracked peat. This photo, taken on June 6, 2011, was from an area immediately adjacent to the L-67 Canal that is nearly always inundated. (Photo by M. Nungesser, SFWMD.)

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Figure 16. Wetland conditions on June 6, 2011, in southern WCA 3A about one mile north of Tamiami Trail. Sawgrass ridges are exposed and mud is cracking. Sloughs are exposed or with a very shallow cover of water, which is unusual for southern WCA 3A. (Photo by M. Nungesser, SFWMD.)

Figure 17. Prairie Fire in WCA 3B during June 2011 which burned over 107 square miles over five days. (Photo by M. Kobza, SFWMD.)

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South Florida is facing climate change in the form of increased temperatures and effects on evapotranspiration, increased or decreased rainfall, and sea level rise. These alterations may affect water supply for the natural ecosystems of the Everglades (see the **Outlook on Climate Change** section at end of this chapter for more information).

Loxahatchee River and Estuary

The Loxahatchee River and Estuary lie in southern Martin County and northern Palm Beach County on the east coast of Florida (**Figure 18**). The Loxahatchee River is referred to as the "last free flowing river in southeastern Florida" and represents one of the last vestiges of native cypress river swamp within southeastern Florida. In 1985, 9.5 miles of the Northwest Fork was federally-designated as Florida's first National Wild and Scenic River. Large sections of the river's watershed and river corridor are within Jonathan Dickinson State Park, which includes outstanding examples of the region's natural biological communities.

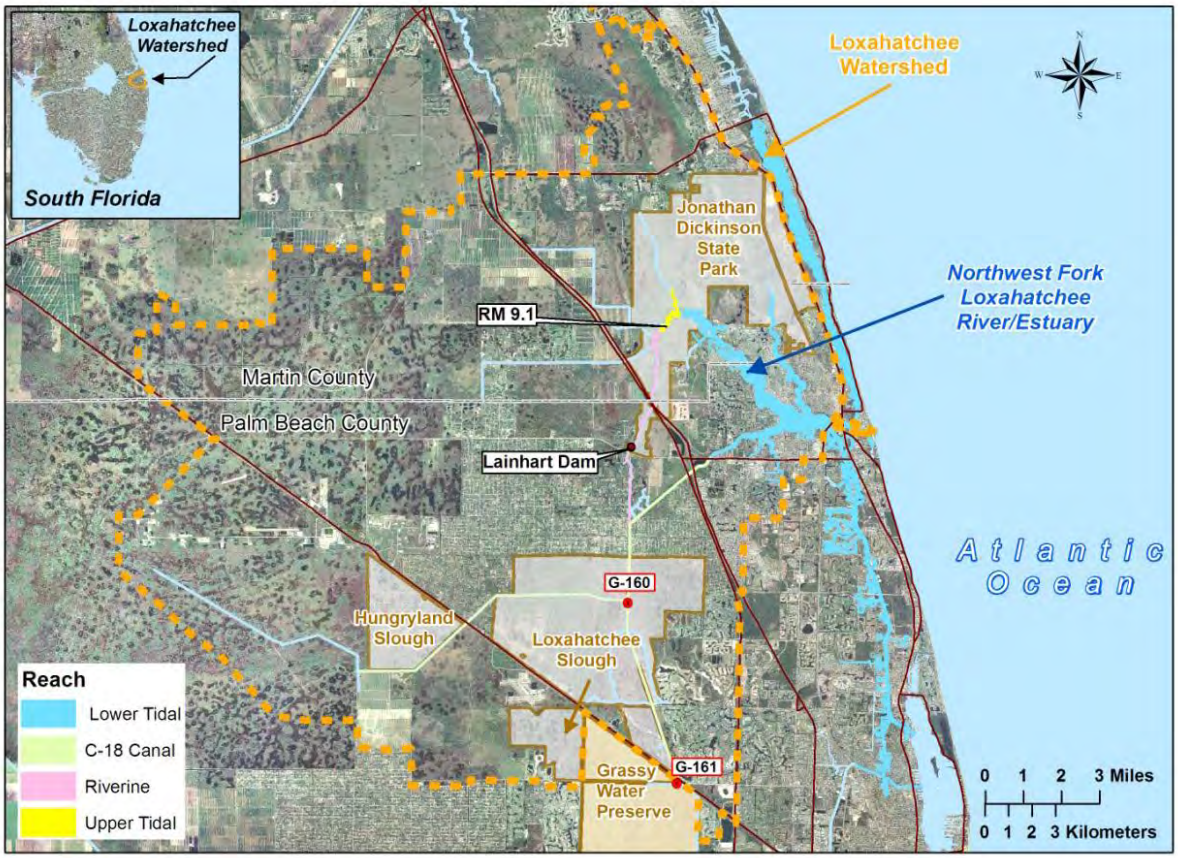

Figure 18. Major features of the Loxahatchee River and Estuary.
(Note: RM – River Mile.)

A system of inland wetlands, known as Grassy Waters Preserve and the Loxahatchee and Hungryland sloughs, form the headwaters of the watershed and drain into the Northwest Fork of the Loxahatchee River. Floodplain plant communities, soils, and salinity regimes can be used to identify and characterize three distinct reaches along the system: riverine, upper

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tidal, and lower tidal. The Northwest Fork of the Loxahatchee River contains about 790 acres of riverine, 59 acres of upper tidal floodplain, and 111 acres of lower tidal floodplain regimes (SFWMD 2006). The riverine reach is generally unaffected by salinity. The upper tidal reach experiences some saltwater intrusion during the dry season. The lower tidal reach is highly influenced by tides and salinity in the water and soils.

Despite these enduring natural resources, the Loxahatchee ecosystem was permanently altered by the opening of the Jupiter Inlet in 1947, which allows a larger tidal amplitude and saltwater intrusion. Drainage canal systems also altered the natural pattern of freshwater inflow and inundation of the floodplain. Saltwater intrusion and reduced freshwater inflows to the riverine and upper tidal reaches of the Northwest Fork have particularly been problematic. As a result, in 2003, SFWMD adopted MFL criteria for the Northwest Fork of the Loxahatchee River (Chapter 40E-8, F.A.C.). The MFL criteria is exceeded when flow over the Lainhart Dam declines below 35 cubic feet per second (cfs) for more than 20 days or the average salinity at River Mile 9.1, expressed as a twenty-day rolling average, exceeds 2.[1] An MFL recovery strategy was adopted simultaneously with the MFL criteria. Since the recovery strategy's adoption, it has been revised and can be found in **Appendix B**.

In 2006, SFWMD developed a restoration plan for the Northwest Fork (SFWMD 2006). The restoration plan includes the ecological target species, performance measures, and monitoring requirements needed to track the success of restoration goals, and provide guidance for future adaptive management and operational practices. The plan identified five valued ecosystem components for the Northwest Fork of the Loxahatchee River: 1) cypress swamp and hydric hammock in the freshwater riverine floodplain, 2) cypress swamp in the tidal floodplain, 3) fish larvae in the low salinity zone, 4) oysters in the mesohaline zone, and 5) seagrasses in the polyhaline zone downstream. Monitoring of these communities continues along the river. Salinity concentrations and freshwater flows are examined each year to better understand dry and wet season hydrologic flow patterns and how water management can best be used to ecologically benefit the freshwater portions of the river and estuary.

The restoration plan describes a preferred restoration scenario that establishes a variable dry season flow between 50 and 110 cfs over Lainhart Dam, providing an additional 30 cfs of flow from the downstream tributaries (light blue line in **Figure 19**). SFWMD monitors compliance with the MFL criterion via results from the five tidal and salinity stations and a flow meter at Lainhart Dam. During Water Year 2011 (May 1, 2010–April 30, 2011), flow over Lainhart Dam was mostly maintained above the MFL criterion of 35 cfs, except for the periods of November 27, 2010 to March 3, 2011 (66 days) and April 20 to May 1, 2010 (12 days) (**Figure 19**). The twenty-day rolling average salinity at River Mile 9.1 did not exceed 2 during Water Year 2011.

[1] Common practice no longer uses measurements of salinity, which previously used parts per thousand or practical salinity units.

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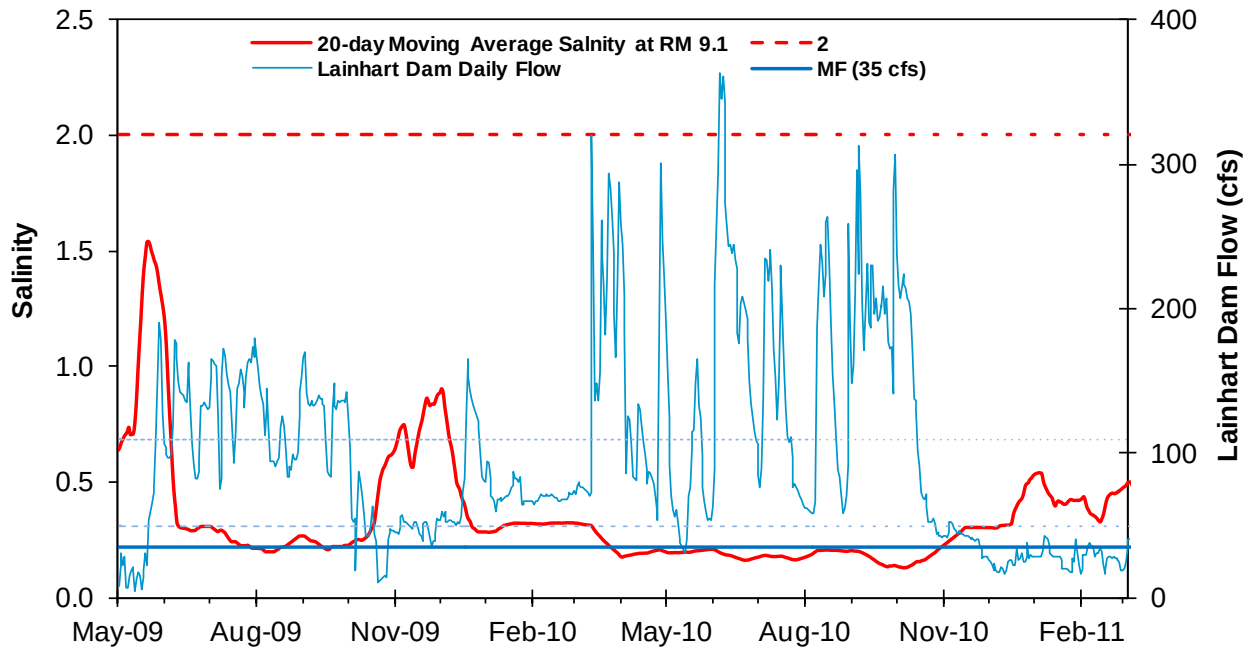

Figure 19. Flow rate and salinity related to the MFL criterion at Lainhart Dam in the Northwest Fork of the Loxahatchee River during Water Years 2010–2011. (Note: RM – River Mile, MF – Minimum Flow.)

Response to Recent Drought

During the 2011 drought, SFWMD experimented with operational options in an effort to get more water to the Loxahatchee River to meet the MFL criteria (Alleman 2012). Water from the L-8 site was pumped through a series of canals northward to the City of West Palm Beach's Grassy Waters Preserve. A portion of the water stored within Grassy Waters Preserve was then released north through the G-161, G-160, and G-92 structures to the Northwest Fork of the Loxahatchee River. These releases were a collaborative effort between SFWMD, City of West Palm Beach, Palm Beach County, and Loxahatchee River District. An estimated 10,872 ac-ft of water were delivered to the Loxahatchee River, meeting the MFL criterion for 48 days during the 2011 drought. A report on the pilot test results, *L-8 Reservoir Pilot Test Water Quality Results*, was submitted to the FDEP in June 2011 (SFWMD 2011a). The pilot test produced a broader understanding of the operational complexities involved in routing L-8 Reservoir water to the Loxahatchee River during extreme dry conditions and data on water conveyance losses associated with making these deliveries. SFWMD also gained a better understanding of changes in water quality, especially with respect to salinity and phosphorus concentrations.

Loxahatchee River Science Plan

As recommended in the *Restoration Plan for the Northwest Fork of the Loxahatchee River* (SFWMD et al. 2006), the Loxahatchee Interagency Science Team was established to collaboratively develop a science plan to address prioritization of monitoring efforts that

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support adaptive management of the system, and fill in gaps of critical knowledge regarding ecosystem restoration success. The science plan was completed in 2010 (SFWMD et al. 2010). Management and research objectives were described and linked to watershed, riverine, and estuarine resources. Several ongoing projects were identified along with new projects to address informational gaps. Results are expected to be used to evaluate the status of the system, and develop predictive tools and improved performance measures for assessing biological and hydrological effects of water management practices on the ecosystem.

Lake Worth Lagoon

Lake Worth Lagoon is a 22-mile long estuary adjacent to eastern Palm Beach County (**Figure 20**). It is bounded by land to the west and barrier islands to the east. Depths within the estuary are typically between 6 and 10 feet. Tidal exchange with the Atlantic Ocean occurs at Lake Worth (Palm Beach) and South Lake Worth (Boynton) inlets. Lake Worth Lagoon Watershed encompasses about 450 square miles of primarily urbanized land.

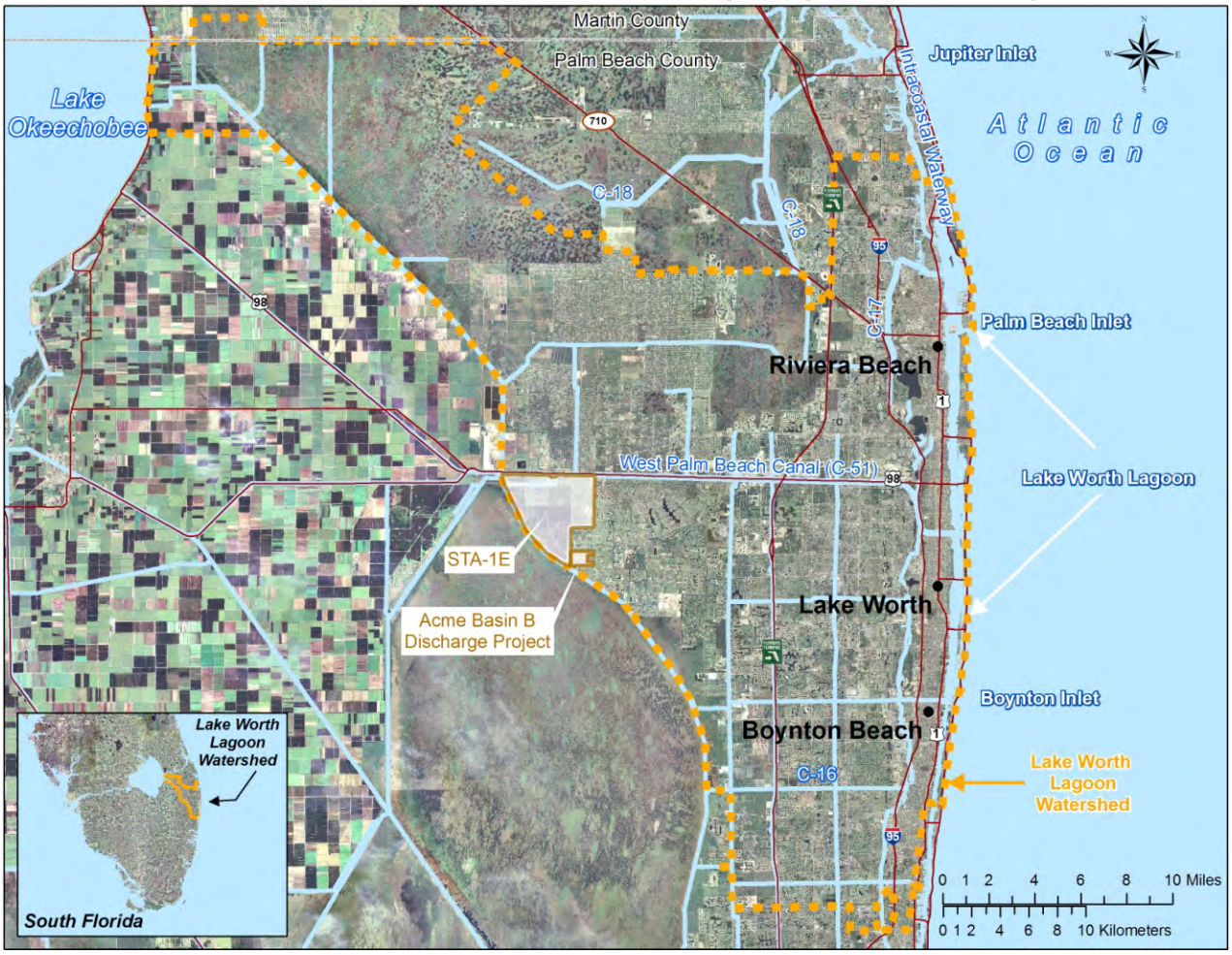

Figure 20. Major features of Lake Worth Lagoon.

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Lake Worth Lagoon is divided into three geographical segments—north, central and south. Each segment has its own water quality, circulation and physical characteristics. Freshwater runoff from the watershed is collected in primary and secondary canals. The major sources of fresh water are the C-17 Canal (Earman River), C-51 Canal (West Palm Beach Canal), and the C-16 Canal (Boynton Canal). The C-51 Canal contributes about 50 percent of the freshwater runoff to the lagoon. Studies indicate that about 75 percent of the C-51 Canal discharge turns northward in the lagoon and about 25 percent turns southward (Chiu et al. 1970).

The Lake Worth Lagoon Management Plan was first drafted in 1998 by Palm Beach County's Department of Environmental Resource Management and updated in 2008 (PBCDERM 2008). The plan reviews progress made implementing the original goals and priorities. It also provides the status of the lagoon and actions plans for future projects. Implementation of the plan relies on partnerships and cooperative agencies, including SFWMD.

Excessive fresh water is sometimes discharged into the lagoon, reducing salinity and causing excessive sedimentation and turbidity. The average daily flow is 419 cfs, but can be greater than 7,000 cfs during wet periods. Salinity can be below optional thresholds for key species, such as the eastern oyster (*Crassostrea virginica*) and Johnson's seagrass (*Halophila johnsonii*). Current performance measures are targeted at limiting the discharges from the C-51 Canal so that salinity does not stay below 15 for more than 26 days or less than 5 for more than seven days from April through July each year. To accomplish these targets, two upper limitations are recommended: 1) eliminate flow events of 1,000 cfs or greater and 2) eliminate flows greater than 500 cfs for extended periods of time (seven days or greater). To attain this salinity threshold, the targets are as follows:

- Inflows should be maintained between 0 to 500 cfs based on a seven-day moving average.
- High flow events of 1,000 cfs or greater, based upon a two-day moving average, should not occur.
- Flow greater than 500 cfs based on a seven-day moving average should be eliminated (Rudolph 1998).

The CERP Environmental Preserve at the Marjorie Stoneman Douglas Habitat (formerly known as Acme Basin B Discharge Project), which includes C-51 pump station installations and C-51 Canal improvements, was completed in spring 2010. This project diverts urban runoff in Palm Beach County to the C-51 Canal, where it is subsequently directed to STA 1E for treatment before discharge to the Arthur R. Marshall Loxahatchee National Wildlife Refuge. Along

Project construction kickoff

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with environmental and flood control benefits, this project may reduce some of the harmful discharges to Lake Worth Lagoon, reducing the frequency of low salinity events (see **Chapter 4** for more information).

In partnerships with SFWMD and the City of West Palm Beach, the Palm Beach County Department of Environmental Resources Management conducted annual hydrographic surveys of the C-51 Canal system following the C-51 Canal Sediment Management Project completion in 2006 (Alleman 2012). About 101,500 cubic yards of muck were removed from a 3,500-linear foot section of the canal where a sediment trap was constructed. Annual hydrographic surveys were conducted between 2007 and 2010 to determine the effectiveness of a newly created sediment trap, and to examine volumetric changes (i.e., erosion or accretion) over the project area. The purpose of this analysis was to 1) determine if a correlation exists between annual discharge volumes at the S-155 structure and sediment accretion within the C-51 Canal, 2) estimate the annual rate of accretion within the sediment trap, 3) propose maintenance dredging requirements for the canal system, and 4) evaluate any remaining muck deposits that might exist outside of the dredged area. About 11,394 cubic yards of material accreted within the sediment trap throughout the project area between 2007 and 2009. During the final year of the study period (2009–2010), a substantial loss of material throughout all reaches of the canal occurred. The loss was attributed to an increase in rate and volume of water discharged through the S-155 structure.

A second sediment management project was conducted in 2009 and completed in 2010 near Ibis Isle, a mangrove fringed island located about 2.5 miles south of the confluence of the C-51 Canal and Lake Worth Lagoon (Alleman 2012). In this study, 41,000 cubic yards of sand were brought into the project area to cap the muck and raise the wetland shelf elevation to intertidal levels for the planting of mangroves and cord grass (*Spartina alterniflora*). In addition, lime rock was deposited to create oyster habitat. Both of these sediment projects were a part of the CERP North Palm Beach County – Part 1 Project (USACE and SFWMD 2005), now referred to as the CERP Loxahatchee River Watershed Restoration Project.

Ibis Isle restoration in Lake Worth Lagoon

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Biscayne Bay

Biscayne Bay is a shallow, subtropical estuary located along Florida's southeastern coast (**Figure 21**). The bay covers about 428 square miles, with 270 square miles lying within Biscayne National Park. Biscayne National Park was designated in 1980 to protect, among other purposes, a combination of terrestrial and undersea life. The entire watershed area covers about 850 square miles. Most of the northern and central areas of the watershed are urban, with Miami being the largest city. Large parts of the southern watershed are dominated by agricultural land.

SFWMD manages and maintains a drainage network that includes 16 outfalls into Biscayne Bay. The water management system regulates water levels within the watershed for flood control and water supply. Drainage of the watershed altered the location and timing of freshwater inputs to the bay. On both an annual scale and during rainfall events, runoff into canals that historically flowed into the bay through small rivers, streams, and groundwater has been altered. In addition, construction of artificial inlets and channels, particularly in the northern area, contributed to the bay's transition from a freshwater estuary to a more saline environment.

From the 1900s to today, salinity increased in the southern area of the bay, especially along the western nearshore areas (Wingard et al. 2004). A primary concern has been both hypersalinity and the annual range of salinity near the western shore of south central Biscayne Bay and within Manatee Bay. The cause of increased salinity is not clear, but may be a combination of reduced average rainfall, sea level rise, and diversion or altered timing of freshwater inputs. About half of the total freshwater input to the bay consists of discharges from the primary canals, totaling an average of 1.4 million ac-ft per year on average. Additional significant sources of fresh water include rainfall, averaging about 60 inches per year, and groundwater influx, which is estimated to be roughly five percent of surface water inputs (Langevin 2001).

Water quality in Biscayne Bay has been impacted by increasing stormwater runoff from developed lands and raw sewage discharges. Raw sewage discharges ceased in the 1950s. More recently, water quality has been improving. Despite these dramatic physical and chemical changes, the bay supports extensive submerged aquatic vegetation, macroalgal, and hard ground communities. On the other hand, some fisheries that were once abundant, such as redfish or red drum (*Sciaenops ocellatus*), mullet (*Mugil* sp.) and spotted seatrout (*Cynoscion nebulosus*), declined substantially. The bay still supports a large recreational fishery and viable commercial pink shrimp (*Farfantepenaeus duorarum*) fishery. Eastern oysters were abundant prior to the changes to Biscayne Bay, and oyster bars were relatively common. Now oyster bars are rare, and individuals are mostly found on mangrove prop roots and bulkheads. Additionally, large areas of coastal wetlands have been filled, and most of the remaining coastal wetlands are in the central and southern areas of Biscayne Bay. These wetlands have been largely starved of fresh water because of diversion of storm water to canals.

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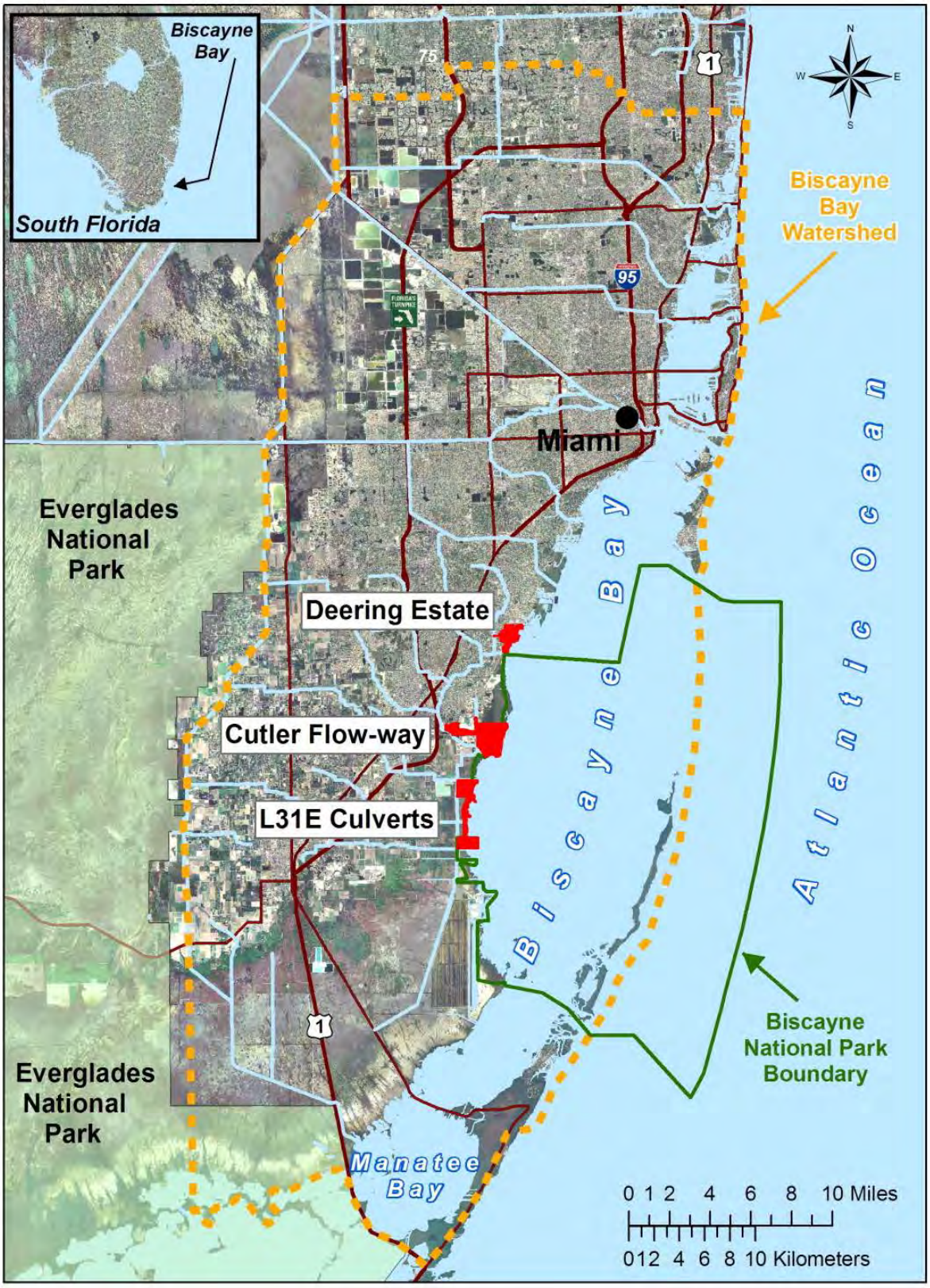

Figure 21. Major features of Biscayne Bay.

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The CERP BBCW Project will restore some overland freshwater flow to coastal wetlands in central Biscayne Bay. The project is likely to result in some incidental reduction of nutrient loads into the bay. SFWMD constructed some components of the project, including the Deering Estate Flow-way and culverts in the L-31E Canal. However, most of the project will not be completed for several years. SFWMD adopted a water reservation rule to reserve water needed for the BBCW Project in 2013. See **Chapter 4** for more information about the project.

SFWMD tracks salinity in the nearshore area of south-central Biscayne Bay to monitor how the system responds to inflows from the C-102, C-103, and Military canals. Salinity in this area tends to become hypersaline (i.e., salinity greater than 35) during the dry season (Alleman 2011). This condition is considered unhealthy for many estuarine species (Montagna et al. 2008). It is unlikely the current BBCW Project features will completely alleviate this condition.

SFWMD also tracks performance of the newly constructed components of the BBCW Project, which include culverts along the L-31E to divert canal water into coastal wetlands and a pump at the Deering Estate to divert canal water into the historic Cutler Creek and Deering Slough. The L-31E culverts are passive, flap-gated devices designed to divert available fresh water from the L-31E Canal into adjacent wetlands. During the 2011 dry season (November 2011–April 2012), SFWMD experienced below average rainfall in this region, which resulted in relatively low flows. The total quantity of water discharged through the L-31E culverts component area was approximately 4,703 ac-ft (**Figure 22**). The total fresh water diverted in 2011 and 2012 through the L-31E culverts was 4,444 and 4,927 ac-ft, respectively, which represents about 4 percent of the total flow available for diversion. The pump at Deering Estate began operation in 2012. The pump diverted about 3,350 ac-ft of water through February 2013, rehydrating wetlands. BBCW Project monitoring data and analyses are reported annually in the South Florida Environmental Reports (www.sfwmd.gov/sfer).

South Miami-Dade Area of Interest

Agriculture has been a key economic component in southeastern Miami-Dade County since the early 1900s. Crops vary year to year based on market conditions but winter vegetables and ornamental nursery stock are the primary agricultural staples in the region. Agriculture benefited from moderate temperatures during winter months. However, agriculture is also challenged by the low lying nature of the topography, which frequently results in thin unsaturated soil thicknesses and a high risk of crop loss due to flooding during moderate rainfall events.

Early farming interests worked together to develop local drainage through the construction and operations of canals, pumps, and structures. In the 1960s, USACE incorporated these local drainage features into the C&SF Project. In 1966 and 1967, operations of the S-21A structure, which provides drainage to the C-102 Basin, and the S-179 and S-20F structures, which drain the Florida City and C-103 basins, were transferred to the Central and Southern Flood Control District (predecessor to SFWMD).

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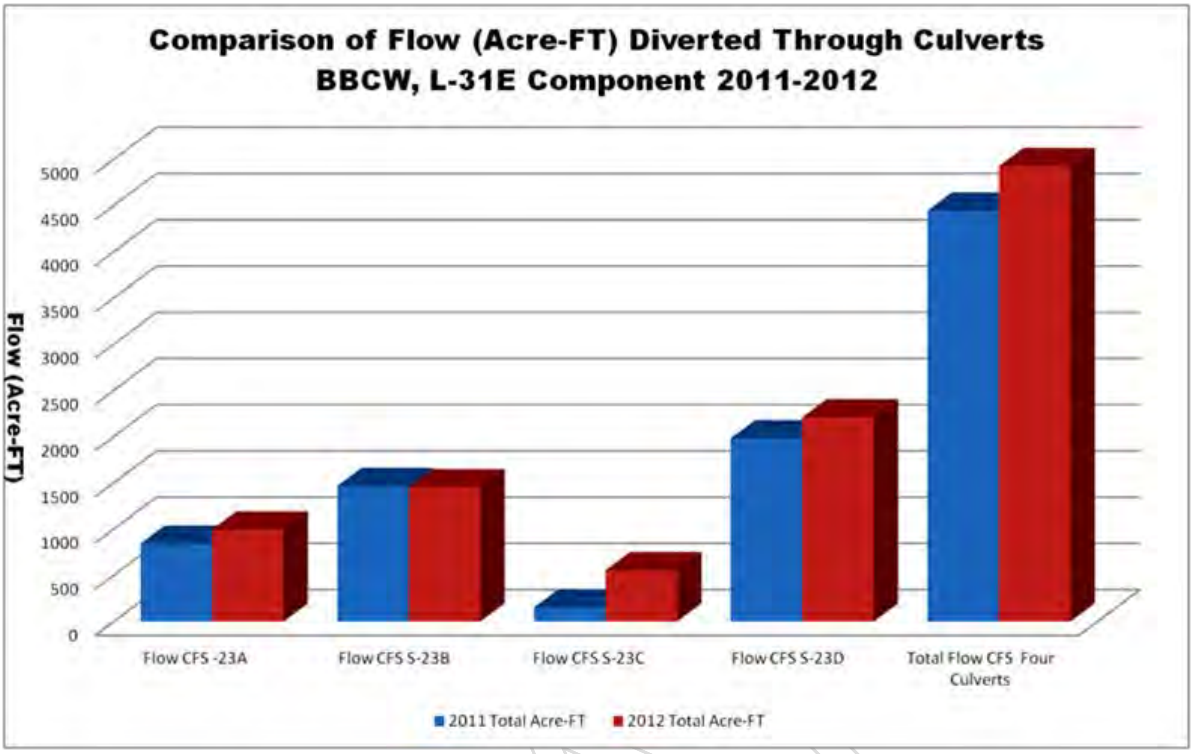

Figure 22. Flows diverted to the BBCW Project area in 2011 and 2012.
(Note: Acre-FT – acre-feet.)

SFWMD, as local sponsor of the federal C&SF Project, operates these structures under the provisions contained in the *Master Water Control Manual, East Coast Canals, Volume 5* (USACE 1995). The manual identifies high and low operational ranges for these structures and provides for flexibility in selecting the operational settings to use depending on field conditions and agricultural needs. Initially, the structures were set at the low operational levels for most of the growing season (October–April) and raised to the high operational settings during the wet season (May–September). However, during dry years, the shift from the low to high operational ranges occurred earlier in the year as additional drainage was not needed under those conditions. In response to drought conditions during the 1980s, which caused coastal irrigation wells to become salty, local farmers worked with SFWMD to incorporate an intermediate operational range for the S-20F and S-21A structures, which holds slightly higher groundwater levels in the spring to reduce inland saltwater intrusion.

Concerns over the seasonal operations were raised by area environmental interests and Biscayne National Park. In particular, concerns were expressed that shifting to the low operational range in October drained area groundwater that may otherwise be available to moderate nearshore salinity levels in Biscayne Bay during the later months of the dry season (March–May). In 2010, SFWMD initiated a series of workshops and studies—the South Miami-Dade Water Issues Coordination Initiative—geared toward evaluating the historic seasonal operations and identifying feasible opportunities to manage water to support area agriculture and improve dry season salinity conditions in the nearshore south Biscayne Bay area. The statistical analysis report, *South Miami-Dade Statistical Data Analysis* (Smith 2010), can be found on the SFWMD website at

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www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/south_miami-dade_statistical_data_analysis.pdf.

Through this process, SFWMD learned that delaying the initiation of the drawdown from October to later in the year would significantly impact winter vegetable crop marketability by delaying the timing of the crop delivery to market away from the December–January freeze window, which provided a competitive advantage to south Miami-Dade growers over other north and central Florida winter vegetable producers impacted by freeze losses and associated market valuation, and by reducing the number of crop cycles per year resulting from the shorter growing season. In addition, research conducted by the National Park Service identified that relatively small releases of fresh water from S-20F, S-21A, and/or S-12 (on the order of 76 cfs per any two of three structures) during the dry season effectively moderates the occurrence of high salinity and hypersalinity events in the productive nearshore areas of Biscayne Bay.

Efforts to redirect regional water supplies from outside of the coastal basins to make dry season deliveries to Biscayne Bay were thwarted in 2011 and 2012 due to drought conditions that affected water storage. However, in 2012, in a coordinated effort between the National Park Service, the United States Department of the Interior, and SFWMD, an operational test was conducted to move water from WCA 3A through S-21 over a two-week period at average discharge rates of 100 cfs. The test successfully reduced elevated salinity levels in nearshore monitoring stations in the bay. In addition, operation of available CERP BBCW Project components, including the L-31E culverts and the Deering Estate S-700 pump station, proved beneficial in distributing fresh water through coastal marine wetlands. During the 2012–2013 dry season, S-20F remained in the lower operational range, which provided daily low level freshwater flows to Biscayne Bay while maintaining area drainage for farming activities. These low level releases were shown to be successful in moderating nearshore bay salinities in the vicinity of the S-20F structure. SFWMD will continue to work closely with area interests to identify opportunities to optimize the management of water in southeastern Miami-Dade County based on real-time conditions consistent with the constraints of the system.

Florida Bay

Covering a triangular area of 850 square miles at the southern tip of the state, Florida Bay lies between the Everglades and the Florida Keys (**Figure 23**). About 80 percent of the estuary lies within Everglades National Park. The shallow bay has an average depth of about 3.3 feet, and most of the bottom is covered by submerged aquatic vegetation, particularly seagrass, which is beneficial habitat for many invertebrate and fish species. Since 1987, when widespread seagrass die-off began, a cascade of ecosystem changes occurred, including subsequent seagrass die-off events, algal blooms, high turbidity, widespread mortality of sponges, and decreases in some other invertebrates and fish species (Fourqurean and Robblee 1999). A major premise of Everglades restoration is that historical decreases in freshwater inflow from the Everglades and resultant increases in salinity contributed to these ecological changes (Rudnick et al. 2005).

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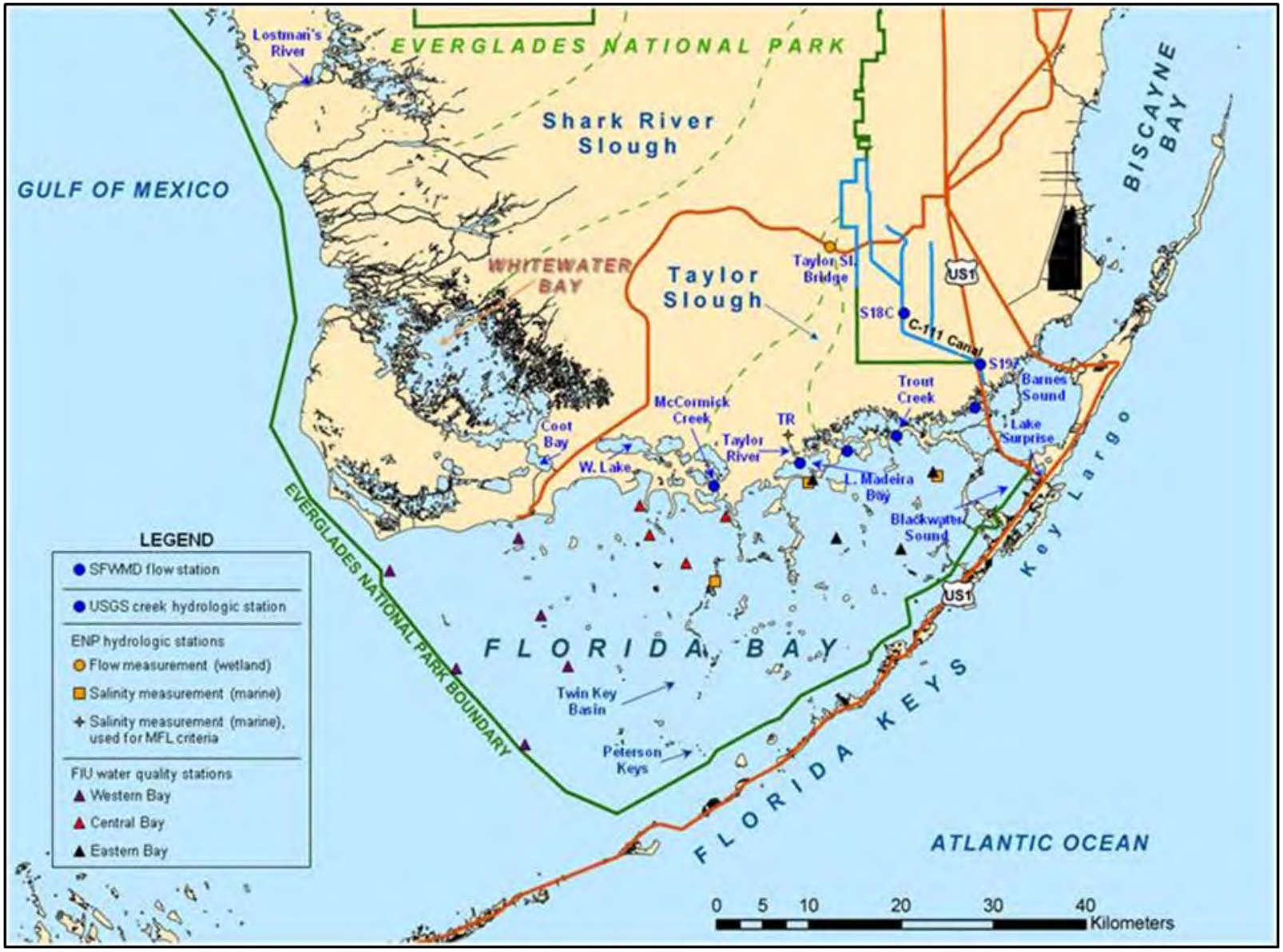

Figure 23. Major features of Florida Bay.

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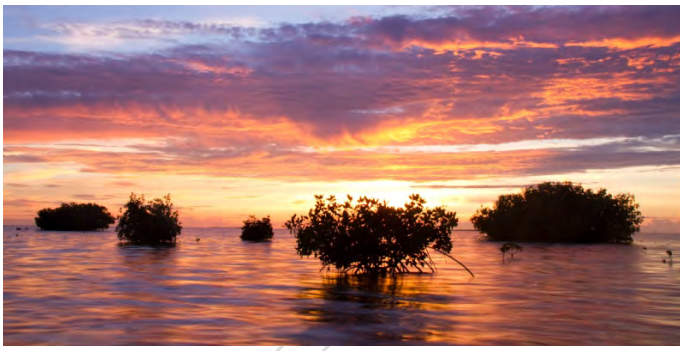
Florida Bay

Protective rules for Florida Bay include MFL criterion established in 2006. An MFL exceedance occurs in northeastern Florida Bay when the average salinity over 30 or more consecutive days exceeds 30 at the Taylor River salinity monitoring station. This criterion is based on the needs of submerged aquatic vegetation habitat within the Taylor River/Little Madeira Bay/Eagle Key gradient, which is responsive to conditions in the transition zone between the Everglades and Florida Bay. Submerged aquatic vegetation is a critical component of the Florida Bay ecosystem. An MFL prevention strategy has been in place since 2006 and is provided in **Appendix B**. Since adoption of the Florida Bay MFL in 2006, there have been three MFL exceedances, but no MFL violations.

SFWMD has a program of monitoring, research, and modeling in Florida Bay to 1) better understand the importance of water management as a driver of these and other ecological changes, 2) improve the ability to forecast the impacts of changing water management, and 3) improve management structures and operations for the protection and restoration of the Florida Bay ecosystem. Results from major monitoring projects emphasizing hydrologic and salinity conditions, water quality, seagrass habitat, and upper trophic levels including waterfowl, shrimp, and lobster can be found in Chapter 12 of Volume I of the *2010 South Florida Environmental Report* (Doering and Alleman 2010). An update on research and modeling activities and research planning is also provided, summarizing key results related to water management operations, the Florida Bay MFL, and CERP.

SFWMD is currently reevaluating the MFL criterion for Florida Bay. The technical assessment will consider the ecological and hydrologic components and include the research data collected since 2006. The MFL prevention strategy will be reevaluated as well, including whether to retain or modify the prevention strategy or develop a recovery strategy.

CERP C-111 Spreader Canal Western Project: Baseline and Post-Implementation Monitoring

The CERP C-111 Spreader Canal Western Project, which aims to reduce water losses from Taylor Slough to the eastern boundary of the Everglades, was completed in February 2012. This project creates a hydrologic ridge along the eastern border of Taylor Slough, thereby increasing the flow of water to Florida Bay via the slough. As a result of the project, important changes in the hydrology and ecology of the southern Everglades wetlands, the mangrove ecotone, and Florida Bay are expected to occur. For more information see www.evergladesplan.org/pm/projects/proj_29_c111.aspx.

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The ecological effects of the CERP C-111 Spreader Canal Western Project are being assessed by comparing baseline monitoring to post-implementation monitoring. Previous monitoring efforts assisted with the development of baseline data for operational and restoration planning, performance measures and targets, and simulation models.

Post-implementation monitoring includes the following:

- Monitoring changes in nutrient and organic matter transport and transformations in water flowing from canals and through the wetlands of the southern Everglades to Florida Bay.
- Documenting changes in wetland salinity and vegetation.
- Synthesizing the findings from this large wetland monitoring network with complementary monitoring and research efforts in the region to assess status and trends and causes of change.

Additional Monitoring

SFWMD is conducting additional long-term monitoring. The monitoring includes 1) freshwater macrophyte species composition; 2) sawgrass biomass, productivity, and tissue nutrient content; 3) soil characteristics, geochemical parameters, porewater salinity, and nutrients in several transects across the salinity gradient; 4) water levels and hydroperiod within the study area; 5) nutrient concentrations in the wetland and in creek inputs to Florida Bay; and 6) periphyton biomass and nutrient ratios at selected sites. The project will provide water quality and ecological data necessary for meeting several mandates:

- CERP C-111 Spreader Canal Western Project
- Restoration Coordination and Verification Program system status reports (RECOVER 2007a, 2007b, 2009, 2012)
- Reevaluation of the Florida Bay MFL criteria
- Assessment of this portion of the Everglades Protection Area pertaining to the Everglades Forever Act
- Assessment of ongoing operational plans and effects

Lower East Coast Service Area

Surficial Aquifer System

The SAS extends across the LEC Planning area. It provides up to 94 percent of the fresh water for PWS and other urban uses within the planning area. The vertical extent and lateral variations within the aquifer are shown on the cross-section provided in **Figure 3** within **Chapter 1**. Groundwater withdrawals from the SAS for agricultural users are common in Palm Beach, Broward, and Miami-Dade counties. The highly transmissive Biscayne aquifer is part of the SAS, primarily extending across Broward and Miami-Dade counties and a small portion of southern Palm Beach County. A map of the transmissivity

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and spatial extent of the Biscayne aquifer is presented in **Figure 24**, and indicates the aquifer becomes more transmissive (i.e., permeable) to the south. The Biscayne aquifer is designated as a "sole source aquifer" by the United States Environmental Protection Agency (USEPA) under the Safe Drinking Water Act because it is a principal source of drinking water and highly susceptible to contamination due to its high permeability and proximity to land surface.

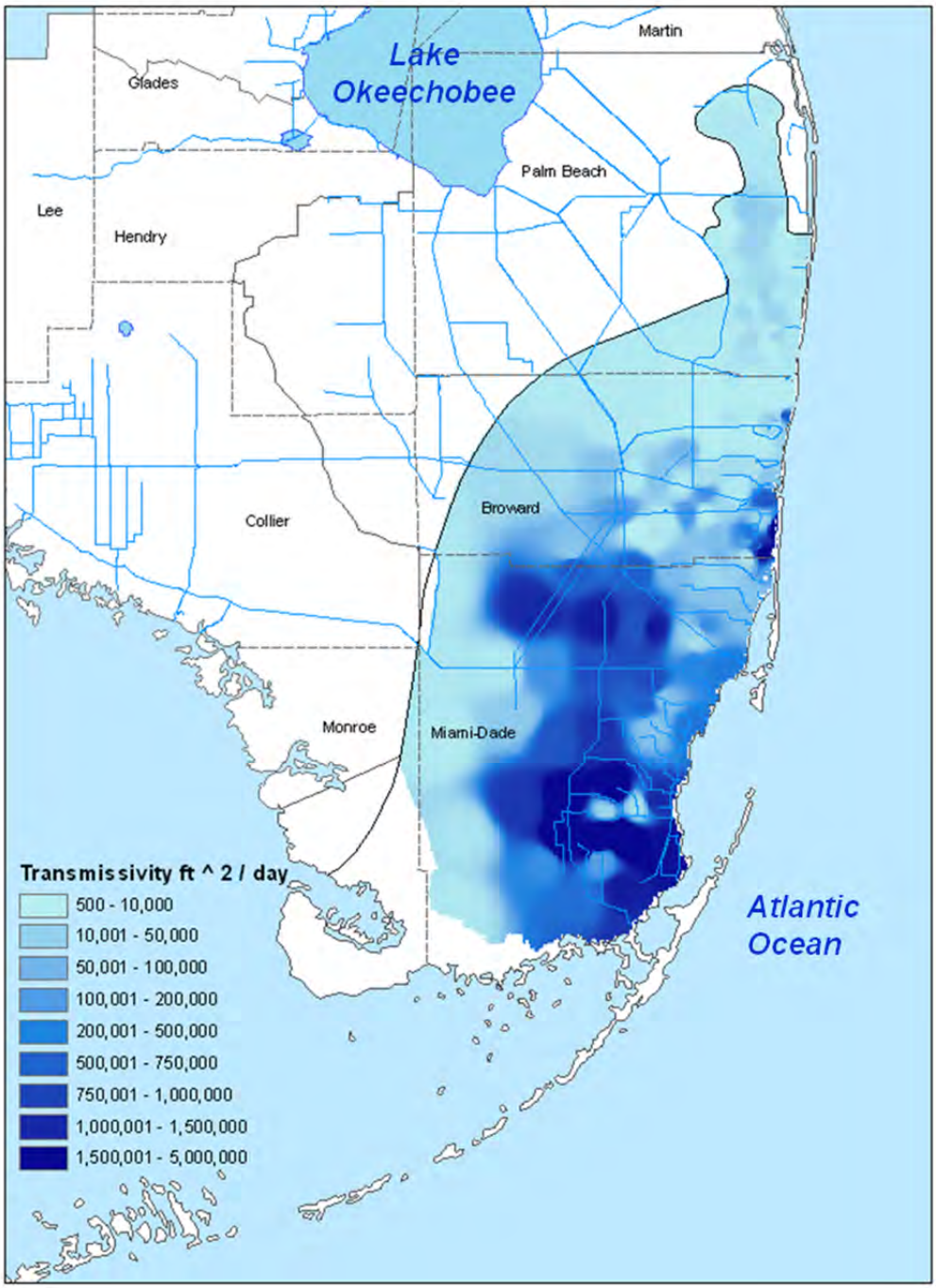

Figure 24. Map of the spatial extent and transmissivity of the Biscayne aquifer. (Note: in units of square feet per day.)

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Protective rules for the Biscayne aquifer include MFL criterion established by rule in 2001. The minimum level for the Biscayne aquifer is the water level associated with preventing movement of the saltwater interface landward to the extent that groundwater quality at the withdrawal point is insufficient to serve as a water supply source. To meet the operational criteria, the canal stages at 11 primary structures cannot fall below identified levels for more than 180 days, and the average annual stage must be sufficient to allow levels and chloride concentrations in the aquifer to recover to levels that existed before a drought or discharge event occurred. An MFL prevention strategy has also been in place since 2001.

Water Levels

The SAS is an unconfined aquifer and responds rapidly to rainfall or the lack of rainfall. The Biscayne aquifer is also hydraulically connected to the surface water management systems in the LEC Planning Area, and is readily recharged and drained by canal water levels. As an example of this rapid response, **Figure 25** displays a 35-year period of record from a SAS well in east-central Broward County showing annual variations in water levels in response to seasonal rainfall and longer-term climactic variations. In this well (G-1221), average annual variations range within about 2 feet, although variations of as much as 6 feet can occur in response to heavy rain events.

Because of the shallow, unconfined nature and high transmissivity of the Biscayne aquifer, canal stages and groundwater elevations are highly interdependent. Surface water management systems function as aquifer drains during dry periods. Rainfall intercepted by canal systems is diverted before recharging the aquifer and can lead to recharge in other areas, diversion to downstream consumptive use, loss to evapotranspiration, or discharge to tide. Urban and agricultural development and construction of the C&SF Project canal system resulted in changes to the groundwater hydrology of the area and an increased concern about the inland movement of salt water in coastal areas.

The United States Geological Survey (USGS) maintains a network of wells that records water levels within the SAS throughout South Florida. This network is useful when comparing current water levels within each well with historical ranges. **Figure 26** displays USGS maps from May 2011 and May 2012, showing differences between water levels throughout most of the area, resulting from considerably wetter conditions during 2012 as compared to 2011. SFWMD monitors these comparison maps weekly and uses them to determine areas of potential concern, particularly with regard to saltwater intrusion or when considering operational adjustments.

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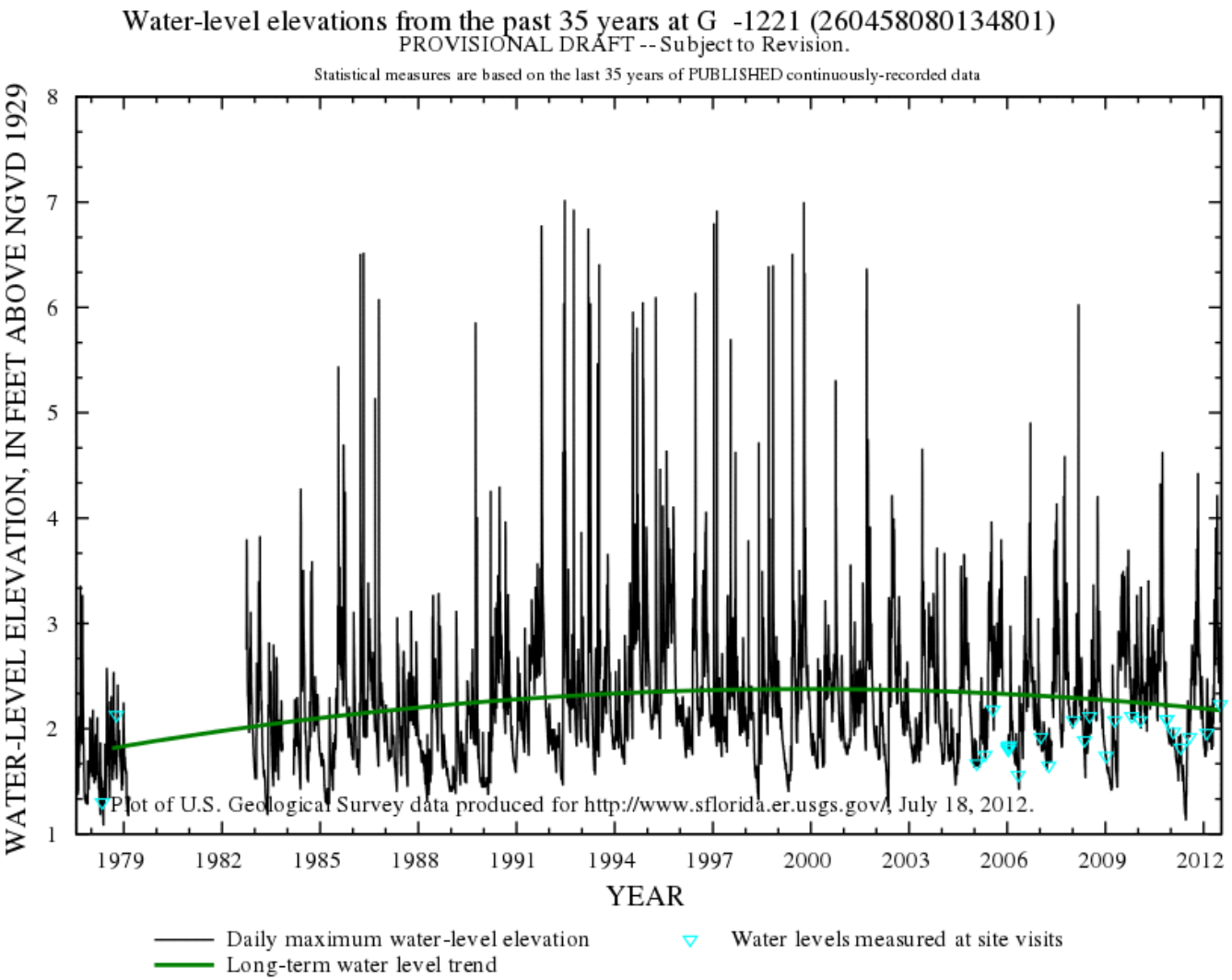

Figure 25. Long-term water levels in a Biscayne aquifer well in Broward County. (Source: USGS National Weather Information System database.)

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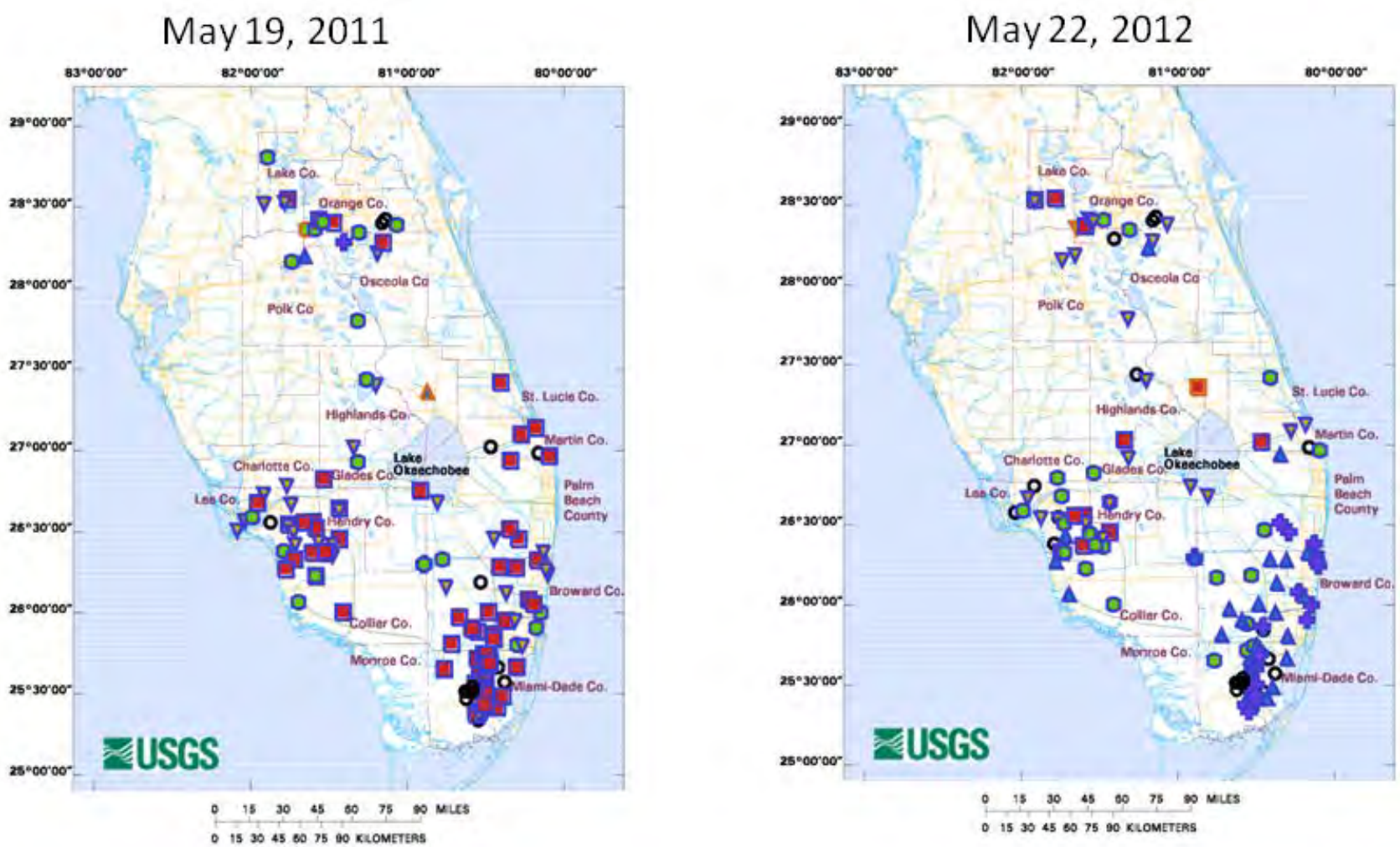

Footnote: Red boxes denote water levels within lowest 10% of historical range; green circles denote water levels with 20% of historical mean; blue triangles denote water levels between highest 10 % to 30% of historical range; purple cross denotes water levels with highest 10% of historical range.

Figure 26. Water levels recorded at USGS monitoring wells during May 2011 (left panel) and May 2012 (right panel).

Chloride Concentrations

SFWMD regulates withdrawals from the SAS to, among other items, prevent saltwater intrusion and to support ongoing environmental restoration programs among others. SFWMD implemented a rigorous program of chloride and water level monitoring to determine the extent of saltwater intrusion throughout the LEC Planning Area. Data from wells in the monitoring network in Palm Beach, Broward, and Miami-Dade counties are online at USGS' website at www.sflorida.er.usgs.gov/ddn_data/index.html.

SFWMD recently (May 2011) estimated the position of the saltwater interface for each coastal county within the SAS and documented this position on maps. **Figure 27** presents an example, showing the approximate extent of SAS saltwater intrusion for Broward County as of 2009. The maps were prepared based on periodic salinity monitoring conducted by USGS, SFWMD, and water use permit holders in select monitoring wells as of spring 2009. In general, the position of the interface remained relatively stable when compared to maps previously published by USGS. That said, the interface is certainly dynamic, and chloride concentrations increased in some areas (e.g., City of Lake Worth and southern Broward and Miami-Dade counties), while some wells in Palm Beach County exhibited freshening. SFWMD intends to periodically (i.e., every three to five years) compile chloride data from its salinity monitoring well network and prepare maps to estimate the position of the saltwater interface and allow comparison over time.

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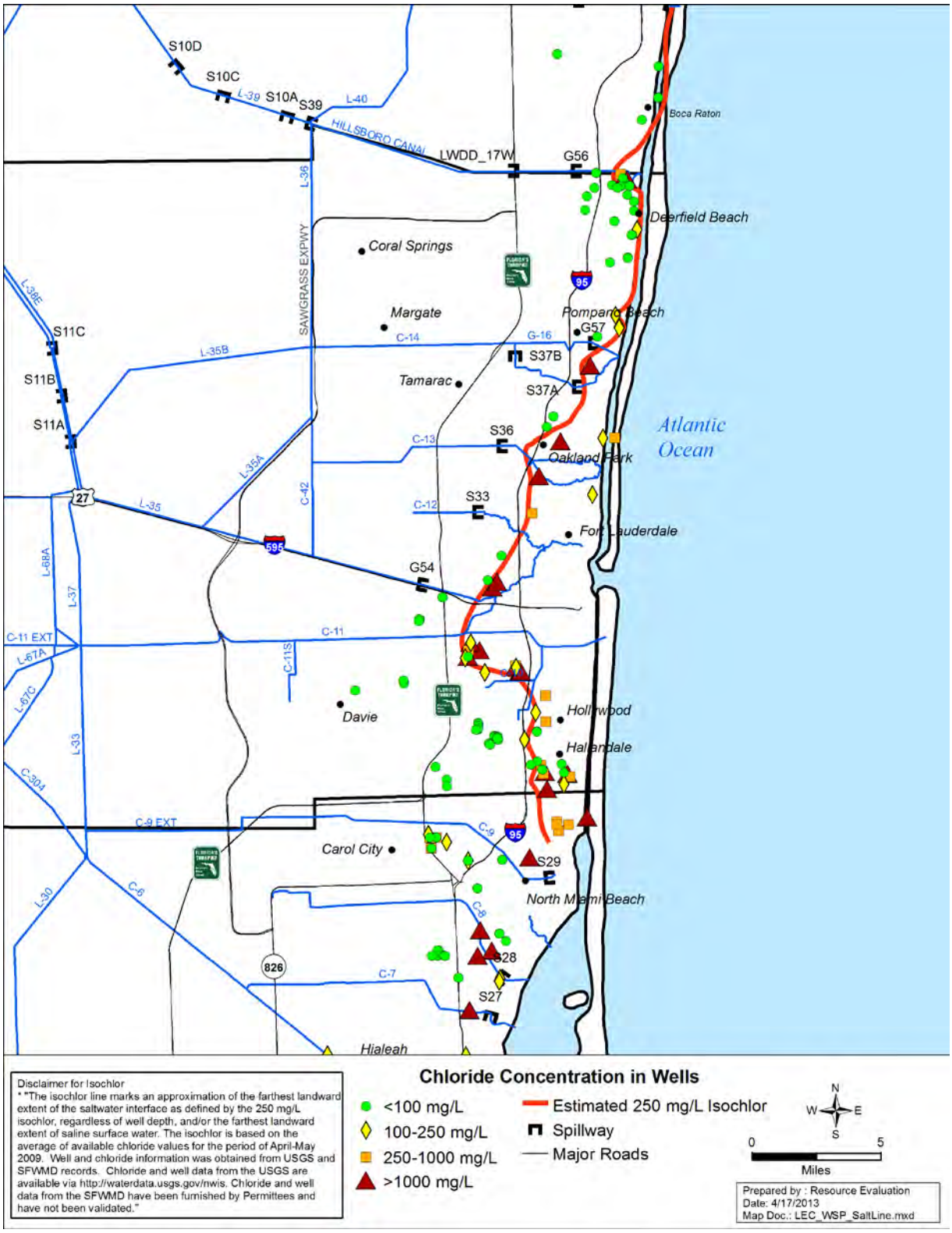

Figure 27. Estimated position of the saltwater intrusion extent in Broward County in 2009.

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Utilities Response to Saltwater Intrusion

Saltwater intrusion was identified in the 2000 LEC Plan as a major issue for 15 coastal utilities, which were asked to identify potential locations for new wellfields further inland. Following the adoption of the plan, the SFWMD planning and regulatory programs provided support to these utilities considered most at risk. Some of the utilities at risk had already begun planning either new wellfield sites or alternative source development. The *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update; SFWMD 2007) included specific alternative water supply projects for each utility.

During 2007 and extending into mid-2008, South Florida experienced an extended period of dry weather. Water levels declined throughout the region, creating concerns for accelerated saltwater intrusion, particularly in the areas of large supply withdrawals at PWS wellfields located in close proximity to the coastline. As a result, SFWMD updated its analysis of utilities facing saltwater intrusion. Utilities were classified as "at risk" if they either did not have a western wellfield, an alternative source of water, or the ability to meet their needs through interconnection with other utilities. Additionally, certain utilities were designated as "of concern" if they operated wellfields near the saltwater interface, but also operated a western wellfield, or had access to an alternative source that was not threatened by saltwater intrusion.

The utilities at risk in the LEC Planning Area identified during the 2007 drought included City of Lake Worth Utilities, Town of Lantana, City of Dania Beach, Town of Hillsboro Beach, City of Hallandale Beach, Miami-Dade Water and Sewer Department (MDWASD) south wellfields, Florida City Water and Sewer Department, City of Homestead, and the Florida Keys Aqueduct Authority (FKAA). The locations of several of the wellfields relative to the historic saltwater intrusion line are shown in **Figure 28** and **Figure 29.** As a result of prudent management of the water withdrawals, each of the utilities was able to endure the 2007 drought without detrimental effects from saltwater intrusion. Of the nine utilities at risk, seven utilities have taken steps to diversify their sources to reduce their vulnerability to saltwater intrusion. As a result, City of Lake Worth Utilities, Town of Lantana, City of Dania Beach, Town of Hillsboro Beach, City of Hallandale Beach, City of Homestead, and FKAA are classified as utilities of concern in this plan update. Two utilities remain classified as utilities at risk: MDWASD south wellfields and Florida City Water and Sewer Department. Both utilities are pursuing projects that would result in their removal from the list prior to the next five-year update of this plan. MDWASD has proposed an alternative water supply project that is captured in this plan update, while Florida City Water and Sewer Department is discussing interconnection agreements with other utilities.

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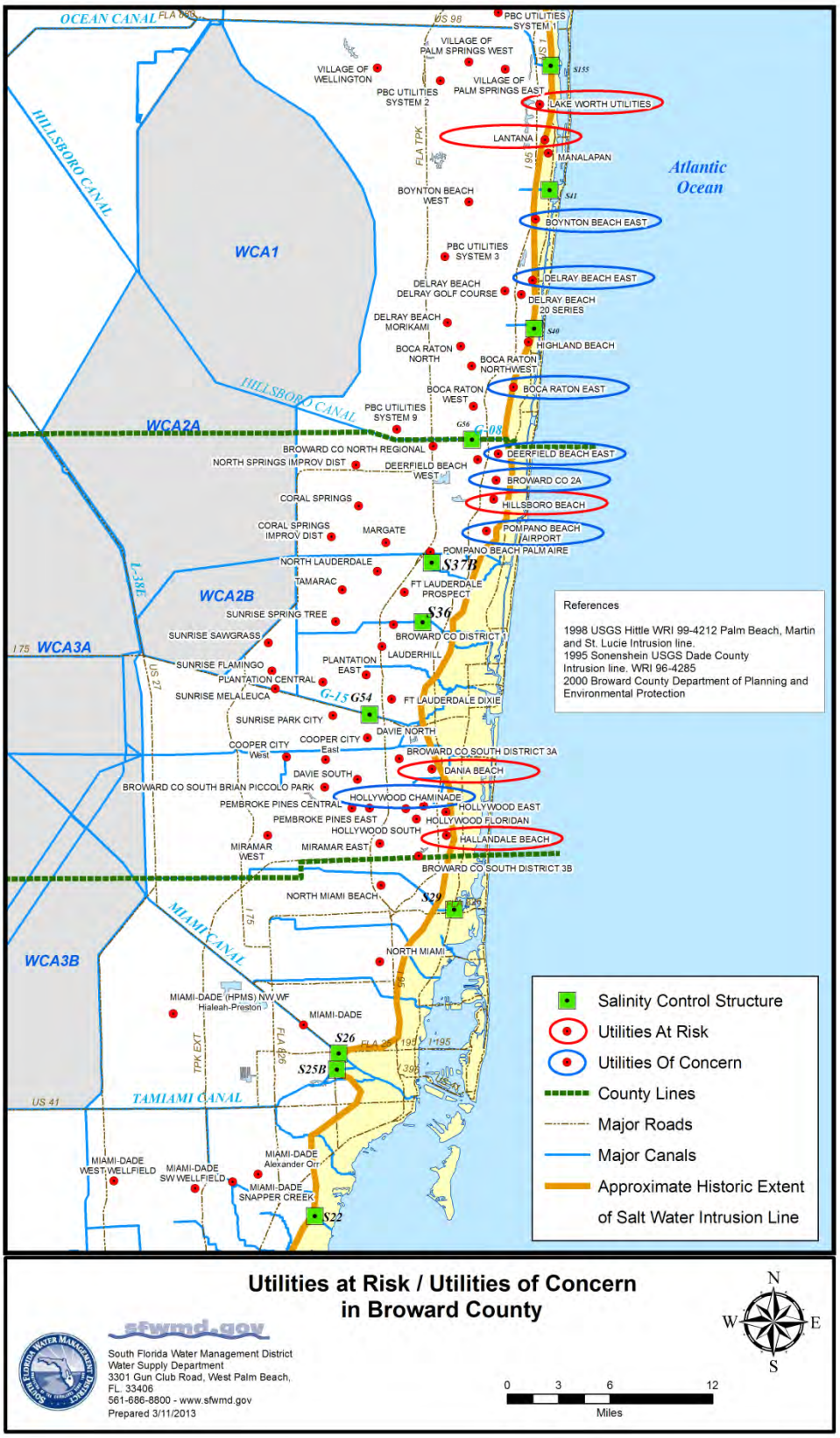

Figure 28. Utilities at risk and utilities of concern in southern Palm Beach and Broward counties in 2007 relative to the historic saltwater intrusion extent.

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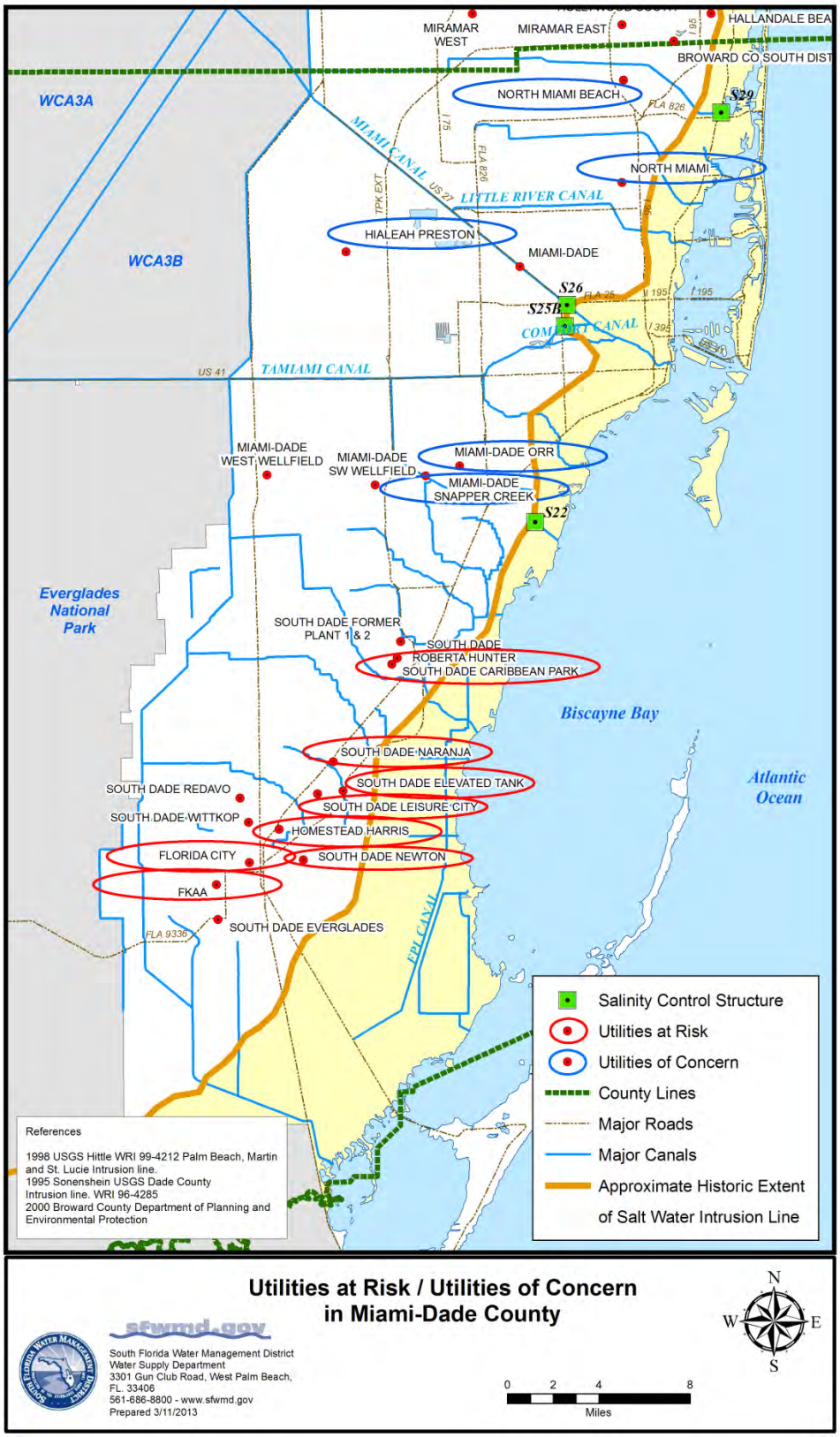

Figure 29. Utilities at risk and utilities of concern in Miami-Dade County in 2007 relative to the historic saltwater intrusion extent.

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Floridan Aquifer System

Within the LEC Planning Area, the Floridan aquifer system (FAS) represents a source of brackish groundwater for water users to meet future demand. More than 500 feet of low permeability sediments of the Hawthorn Group separate the FAS from the overlying SAS. Under such conditions, the FAS is "confined" and water within the FAS exists under artesian pressure. Although the potentiometric surface of the FAS is above land surface, the low permeability sediments of the Hawthorn Group prevent upward migration of brackish waters into the shallower aquifers. From Jupiter to southern Miami, water from the FAS is highly mineralized and requires specialized treatment, such as reverse osmosis or blending, to be converted into drinking water. As a result of the brackish quality of the water, the FAS is not a suitable source of agricultural water supply in the LEC Planning Area without blending or treatment.

The FAS is generally subdivided into upper and lower sections separated by a relatively continuous low permeability, confining unit. The top of the upper FAS is approximately 900 to 1,000 feet below land surface in southeastern Florida, and the base of the upper Floridan aquifer extends as deep as 1,500 feet below land surface. More recently, the lower permeable zone of the upper Floridan aquifer, referred to as the Avon Park Permeable Zone, has been identified. This zone can be more productive and is frequently of better quality than the upper Floridan aquifer (Reese and Richardson 2007). Below this is the uppermost zone of the lower Floridan aquifer, which is more brackish than the upper Floridan aquifer. Several hundreds of feet of low transmissivity limestone are present at this depth, which effectively confine the formations in the FAS beneath it. At the base of the lower Floridan aquifer, at a depth of approximately 2,500 feet below land surface, are cavernous zones with extremely high transmissivity, known as the Boulder Zone, which provides a zone for disposal of treated wastewater, brine by-products of reverse osmosis treatment, and other FDEP-regulated discharges in the LEC Planning Area.

Since the *2005–2006 Lower East Coast Water Supply Plan Update* (SFWMD 2007) was published, water withdrawals from the FAS increased by approximately 20 MGD. Presently, utilities produce a total of about 30 MGD of treated "finished" water from the FAS. Construction of new systems and expansion of existing FAS wellfields were undertaken by the following utilities: Seacoast Utility Authority, Glades Utility Authority, City of Lake Worth Utilities, City of Deerfield Beach, Town of Davie, City of Miramar, MDWASD (City of Hialeah), City of North Miami Beach, and FKAA. Seven golf courses also use the FAS as an irrigation supply source. **Figure 30** presents a map with the location of permitted existing and proposed FAS wells within the LEC Planning Area.

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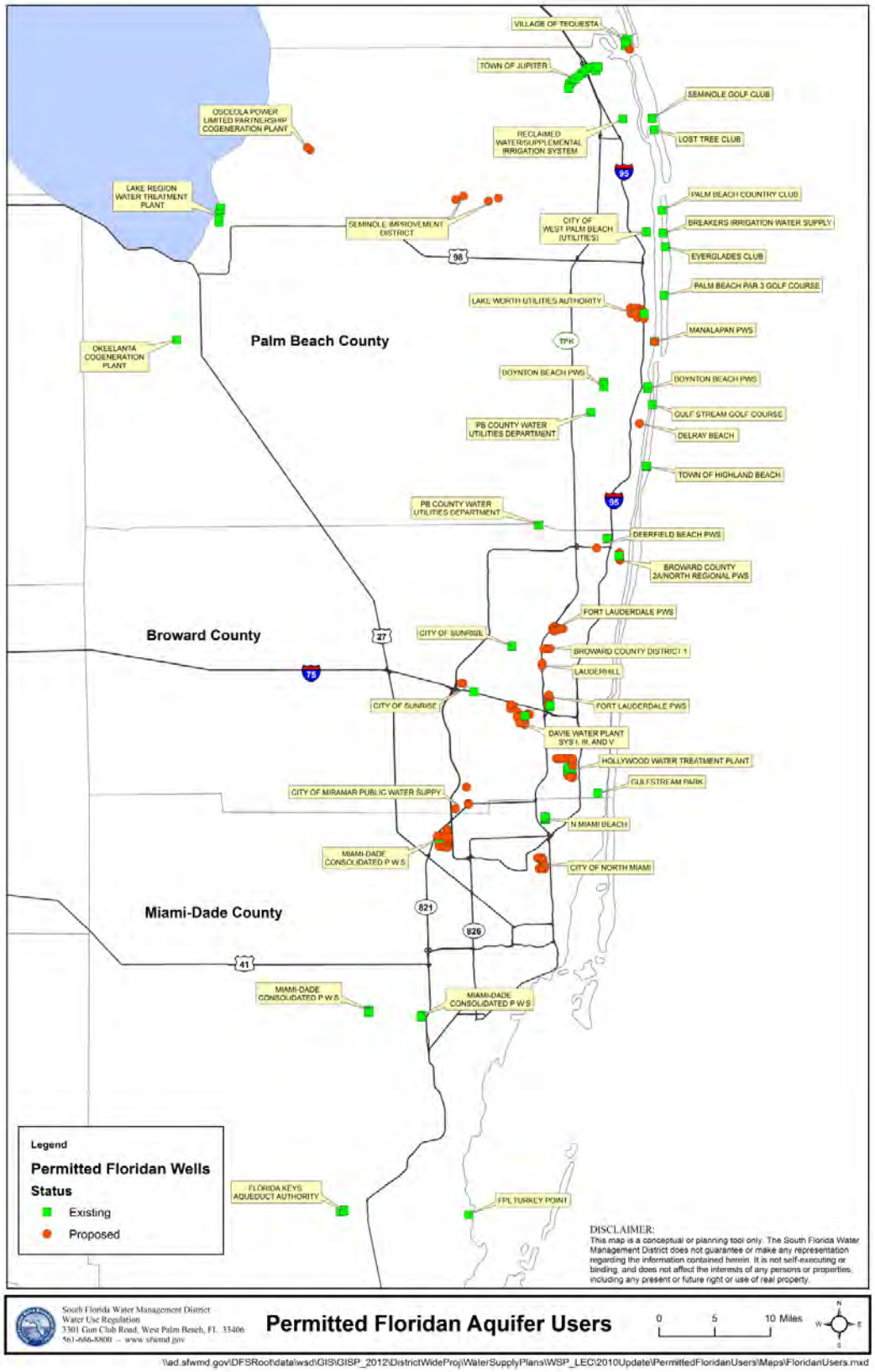

Figure 30. Locations of existing and potential FAS wells for PWS in the LEC Planning Area.

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Water Levels

SFWMD maintains a FAS water level monitoring network throughout South Florida to observe long-term trends and serve as calibration points for groundwater models. The locations of wells within this network are shown in **Figure 31**. The data from this monitoring network is important, particularly in light of the trend of increasing withdrawals from the aquifer over the past few decades. To date, available water level data from wells monitoring the ambient conditions with the FAS—away from most permitted specific withdrawal locations—indicates that water levels within the aquifer remained fairly stable over the past decade.

Chloride Concentrations

To date, most of the usage of water from the FAS comes from the upper Floridan aquifer and the Avon Park Permeable Zone because the water in deeper portions of the FAS is more saline. A map of chloride concentrations in the upper Floridan aquifer is presented in **Figure 32**. In the recent periods of increasing withdrawals, the chloride concentration of water produced from FAS wellfields generally remained fairly stable. However, chloride concentrations within the aquifer are geographically variable. Within the past few years, the Glades Utility Authority wellfield in the Belle Glade area experienced an unanticipated increase in chlorides within the produced water. This phenomenon is probably a result of upconing of saline groundwater from deeper portions of the aquifer. This illustrates that supply wellfields drawing from the FAS need to be carefully evaluated, designed, and operated to minimize the potential for water quality degradation over time.

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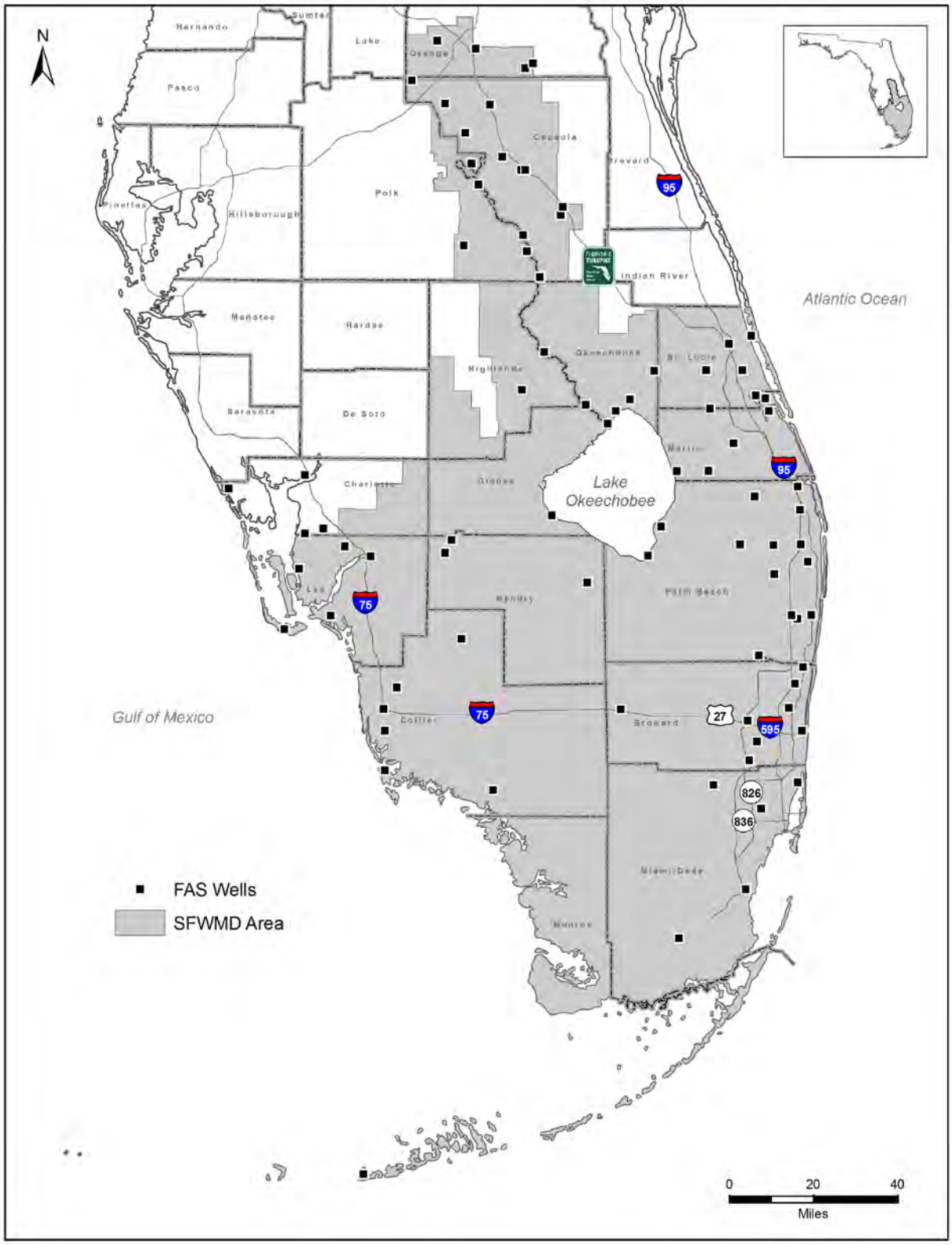

Figure 31. FAS monitoring wells.

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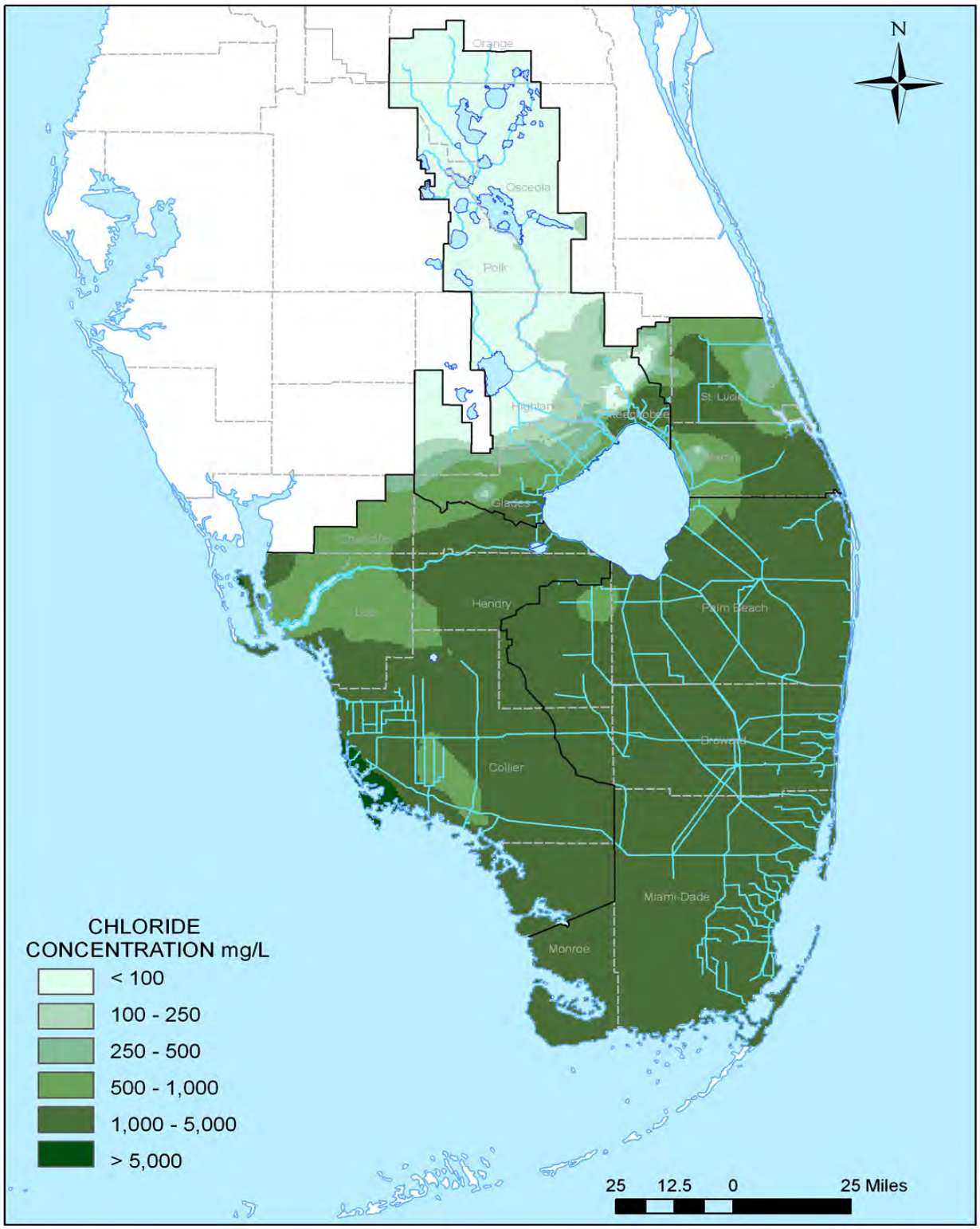

Figure 32. Estimated chloride concentrations in the upper FAS within SFWMD. (Note: mg/L – milligrams per liter.)

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OUTLOOK ON CLIMATE CHANGE

Climate change, especially sea level rise, may affect the water supply in the LEC Planning Area. While climate change is occurring across the globe, the regional impact varies and the degree and rate of change remains uncertain. Long-term data show changes in parameters such as temperature, rainfall, and sea level. Despite the uncertainties, climate change and its effects on coastal freshwater aquifers should be included as a consideration in water supply planning (see **Chapters 1** and **7**).

The potential impacts of climate change vary. Rising sea levels will cause groundwater near the coast to become more saline and groundwater levels to increase. Shallow water supply wellfields within this area will potentially become brackish. The rising sea level has the strong potential to increase the salt content of water leaking into sewer collection systems and complicate the operations of wastewater treatment plants (Bloetscher et al. 2009).

Changes to evapotranspiration and weather patterns are not predictable today but will likely affect water supply and demand. If temperatures and evapotranspiration increase as many experts expect, both PWS and Agricultural Self-Supply water demands may increase. More frequent intense rainfall events with longer interim dry periods could increase total annual rainfall, but decrease effective rainfall, as more water may be lost to runoff or tide. These changes in precipitation and runoff will further alter estuarine circulation patterns and salinity regimes (Scavia et al. 2002).

The uncertainty of climate change challenges water utilities as they plan for the future. Traditionally, water resource planning used climate data from the past and current hydrology to represent future supply conditions because it was assumed the parameters of water resources, such as temperature, precipitation, stream flow, groundwater, and evaporation, would be the same as they had been in the past. While large variations in observed weather were experienced in the past, it was assumed that climate statistics would stay the same and variability would not increase in the future. With climate change, future planning must be able to consider additional uncertainties and larger variability (Water Utility Climate Alliance 2010).

Evaluation Efforts

Efforts to understand the effects of climate change and the approaches to deal with climate change are under evaluation by many agencies. At the national level, USEPA developed the *National Water Program 2012 Strategy: Response to Climate Change* (USEPA 2012). In this document, USEPA stated the following:

> …coastal areas are likely to see multiple impacts associated with climate change (e.g., sea level rise, increased damage from floods and storms, coastal erosion, changes in drinking water supplies, increasing temperature); acidification…; and nitrogen and phosphorus pollution, which could result in more profound consequences to water resources and

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ecosystem services. These overlapping impacts make protecting water resources in coastal areas especially challenging.

USEPA states that many actions that could be taken to adapt to climate change are actions that add value absent climate change. The best management practices used by PWS utilities include water conservation and other efficiencies and have the ability to deal with climate change impacts as well as increasing demand caused by population growth. Three of the goals from this strategy relate to water supply planning:

- Efficiency in the use of energy and water should form the foundation of how we develop, distribute, recover, and use energy and water.
- Wastewater treatment facilities, which treat human and animal waste, should be viewed as renewable resource recovery facilities that produce clean water, recover energy, and generate nutrients.
- The water and energy sectors—governments, utilities, manufacturers, and consumers—should move toward integrated energy and water management from source, production, and generation to end user.

For more information on USEPA's 2012 National Water Program Strategy see water.epa.gov/scitech/climatechange/2012-National-Water-Program-Strategy.cfm.

The State of Florida passed the Community Planning Act in 2011 (Chapter 163, F.S.). This act provides for adaptation action areas to improve infrastructure resilience to flooding by extreme high tides, storm surges, and sea level rise in low lying coastal areas. Also in 2011, the Florida Department of Economic Opportunity received funding from the National Oceanic and Atmospheric Administration to fund a five-year project, Community Resiliency: Planning for Sea Level Rise. Among the goals of the project are to inventory sea level rise research and adaptation initiatives, identify technical resources for local communities, identify models to assess vulnerability, and determine the best way to incorporate sea level rise adaptation planning into state and local comprehensive plans.

To support regional and local efforts, Palm Beach, Broward, Miami-Dade, and Monroe counties established the Southeast Florida Regional Climate Change Compact to inform, improve, and advance regional planning efforts together. The SFWMD is an active but non-voting member of the compact. Compact participants recognized the need to protect and address the vulnerable water supply and infrastructure, and preserve both the natural system and agricultural resources. Participants in the process include the four counties, SFWMD, numerous local and city governments and utilities, other governmental agencies, and nonprofit organizations. In October 2012, the compact published *A Region Responds to a Changing Climate*, which serves as a regional climate action plan (Southeast Florida Regional Climate Change Compact 2012a). Because there are more than 100 local governments in the region with various government structures, management policies, land use authorities, charters, and political environments, implementation of the plan is expected to take different forms and must be flexible to address specific local conditions (Southeast Florida Regional Climate Change Compact 2012a). Additionally, Broward, Miami-Dade, and Monroe counties developed comprehensive county climate change action plans with goals, strategies, and action items.

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Both Broward and Miami-Dade counties are working cooperatively with the USGS on development of groundwater models to address water supply planning while considering sea level rise. The Broward model will help to simulate the historical pattern and rate of saltwater intrusion in the central and southern portions of the county. The Miami-Dade model will be used to evaluate operational scenarios and effects and how sea level rise will affect the freshwater/saltwater interface in the Biscayne aquifer. Additionally, Broward County has developed a comprehensive surface water and groundwater model that can be used to simulate various water management scenarios. This model can be used to quantify the benefits to natural areas like wetlands, as well as to wellfields, from proposed improvements to water management, and it can help us identify ways to prevent saltwater intrusion in vulnerable areas.

As mentioned earlier in this chapter, SFWMD estimated the position of the saltwater interface for each coastal county within the SAS and documented this position with a series of maps. The maps were based on periodic salinity monitoring conducted by USGS, SFWMD, and water use permit holders in select monitoring wells as of spring 2009. Work on the next series of saltwater interface map updates will begin in 2014. This will allow comparison of the interface over time, and potentially identify areas of concern that may require additional monitoring or action to protect wellfields. These maps will be used in water supply planning, consumptive use permitting, and other areas of SFWMD.

Response to Sea Level Rise

In the LEC Planning Area, sea level rise is a key concern. Therefore, early in their efforts, members of the Southeast Florida Regional Climate Change Compact reviewed current projections and scientific literature regarding sea level rise. Compact members recommended the sea level rise projections used by the group be based on the USACE guidance document, *Water Resource Policies and Authorities Incorporating Sea-Level Change Considerations in Civil Works Programs* (USACE 2009), until more definitive information became available. USACE anticipates a sea level rise of 3 to 7 inches by 2030 and 9 to 24 inches by 2060. Related to the sea level rise projections is the need to understand the areas potentially vulnerable because of the rise. In support of the compact's efforts, SFWMD developed digital elevation data sets for mapping inundation layers to represent areas potentially vulnerable to one-, two-, and three-feet sea level rise scenarios. The maps and inundation layers were then used by the four counties to assess their jurisdictions (Southeast Florida Regional Climate Change Compact 2012a).

In concert with the regional climate action plan, the Southeast Florida Regional Climate Change Compact developed a *Regional Climate Action Framework: Implementation Guide* (Southeast Florida Regional Climate Change Compact 2012b) that describes initiatives, planning horizon, potential partners, potential funding sources, needed policies or legislation, estimated resources needed, and performance measures. Of the 110 recommendations, 18 relate to water supply, water management, and infrastructure. SFWMD will continue to collaborate with other compact participants on the implementation process.

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The SFWMD has invested resources in developing numerical models and evaluating water management model scenarios of sea level rise and precipitation. Because of the changing weather patterns, the SFWMD will extend the climate data used in modeling more frequently than every five years, which is typical.

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4

Water Resource Development Projects

TOPICS

- Regional Projects
- Districtwide Projects
- Summary

This chapter addresses the roles of the South Florida Water Management District (SFWMD) and other parties in water resource development projects and provides a summary of projects in the Lower East Coast (LEC) Planning Area. The project summaries serve as a brief overview of the additional water supply-related activities in the LEC Planning Area and are listed by region where benefits accrue. The regions are Lake Okeechobee, the Everglades, the Loxahatchee River, Biscayne Bay, Florida Bay, and the LEC Service Area. Lastly, an update on the status of districtwide water resource development projects is provided. Annual updates on these projects can be found in Chapter 5 of Volume I of the South Florida Environmental Reports available from www.sfwmd.gov/sfer.

Florida water law identifies two types of projects to meet water needs: water resource development projects (subject of this chapter) and water supply development projects. Water resource development projects are generally the responsibility of water management districts. These projects support water supply development and are intended to ensure the availability of an adequate supply of water for all existing and future uses, including maintaining the functions of natural systems. To comply with the responsibility to provide water for the natural system, the SFWMD monitors the health of the natural system. Therefore, projects related to monitoring are included in this chapter.

Water supply development projects are generally the responsibility of water users, such as utilities, and involve the water source options described in **Chapter 5** to meet their needs. Specific water supply development projects are identified in **Chapter 6** and **Appendix F**.

Water resource planning in the LEC Planning Area is strongly influenced by the Comprehensive Everglades Restoration Plan (CERP). Authorized by the United States Congress in 2000, CERP is a conceptual plan, the implementation of which is a significant restoration program. CERP builds upon and complements other state and federal initiatives to revitalize South Florida's ecosystem. In 2000, federal and state legislation authorized the United States Army Corps of Engineers (USACE) and SFWMD to equally fund restoration, protection, and preservation of water resources in Central and South Florida, including the

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Everglades. To implement CERP, USACE and SFWMD employ the following phases: 1) project identification, 2) project planning, 3) approval and authorization, 4) project design, 5) project construction, and 6) operation and maintenance. These phases are supported by modeling, land acquisition, project controls, and technical services performed throughout the process. CERP projects are discussed by region in this chapter and are listed in **Table 11**. The CERP projects also form the capital projects element of the MFL recovery strategies found in **Appendix B**.

Table 11. Regions within the LEC Planning Area and CERP projects within each region.

Region	CERP Project
Lake Okeechobee	Lake Okeechobee Watershed Project
Everglades	Water Conservation Area 3A Decompartmentalization Physical Model
Loxahatchee River	Loxahatchee River Watershed Restoration Project
Biscayne Bay	Biscayne Bay Coastal Wetlands Project
Florida Bay	C-111 Spreader Canal Western Project
LEC Service Area	Fran Reich Preserve Reservoir
	Hillsboro Aquifer Storage and Recovery Pilot Project
	Broward County Water Preserve Areas
	Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat

REGIONAL WATER RESOURCE DEVELOPMENT PROJECTS

Lake Okeechobee

In this section, the following projects are discussed:

- CERP Lake Okeechobee Watershed Project
- Taylor Creek, Nubbin Slough, and Lakeside Ranch Stormwater Treatment Areas (STAs)
- USACE Herbert Hoover Dike Major Rehabilitation
- Lake Okeechobee Habitat Enhancements

The locations of these projects are shown in **Figure 33**.

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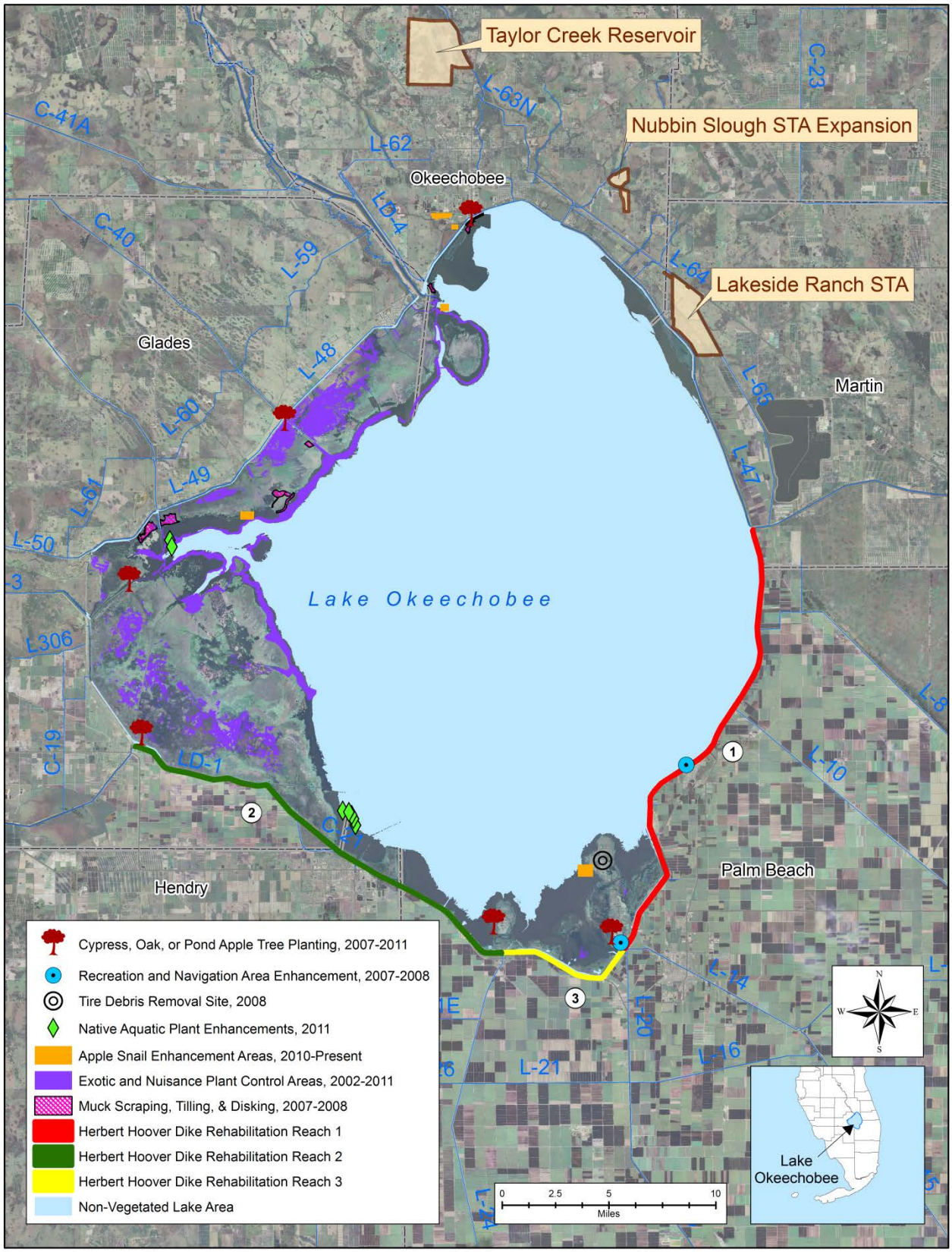

Figure 33. Projects in the Lake Okeechobee region.

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CERP Lake Okeechobee Watershed Project

The CERP Lake Okeechobee Watershed Project area covers approximately 1,800 square miles and incorporates the four major tributary systems that drain the lower portion of the watershed into Lake Okeechobee. The purpose of this project is to reduce damaging releases to the surrounding estuaries, increase aquatic and wildlife habitat, regulate extreme highs and lows in lake staging, and reduce phosphorus loading. In addition, this project will focus on rehydrating wetlands in and around the areas north of Lake Okeechobee and improving the ecological health of Lake Istokpoga. Although located outside of the LEC Planning Area, this project includes additional storage that will provide water supplies needed for Lake Okeechobee minimum flows and levels (MFL) recovery.

The key components of the CERP Lake Okeechobee Watershed Project proposed tentatively selected plan consist of a recommended Lake Istokpoga regulation schedule and the following six structural water storage and treatment features:

- **Reservoir in the Taylor Creek/Nubbin Slough Basin** – an 1,984-acre reservoir will provide a maximum capacity of 32,000 acre-feet (ac-ft). It will receive inflows from, and discharge back to, Taylor Creek.
- **STA in the Taylor Creek/Nubbin Slough Basin –** a 3,975-acre treatment area will receive inflow from the L-64 Canal and discharge back to the L-47 Canal. It is projected to provide 15.8 metric tons per year total phosphorus load reduction.
- **Reservoir in the Kissimmee River Basin –** a 10,281-acre aboveground reservoir will provide a maximum storage capacity of 161,263 ac-ft within the Kissimmee River Basin. It will receive flow from and discharge back to the Kissimmee River.
- **Reservoir in the Lake Istokpoga Basin –** a 5,416-acre reservoir to provide a maximum storage capacity of 79,560 ac-ft. It will receive inflow from and discharge back to the C-41A Canal.
- **STA in the Lake Istokpoga Basin –** an 8,044-acre treatment area will receive flow from the C-41 Canal and discharge treated water to Lake Okeechobee. It is expected to provide approximately 29.1 metric tons per year total phosphorus load reduction.
- **Restored Wetland in Paradise Run** – a 3,730-acre wetland restoration site located at the ecologically significant confluence of Paradise Run, oxbows of the Kissimmee River, and Lake Okeechobee.

Implementation of the CERP Lake Okeechobee Watershed Project has been delayed primarily due to unresolved federal-state cost-sharing issues for project water quality components. However, water resource development projects progressed in the region under the auspices of other programs and initiatives. These include the Northern Everglades and Estuaries Protection Program, the Lake Okeechobee Protection Plan, the

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Lake Okeechobee and Estuary Recovery Plan, and the Lake Okeechobee Watershed Construction Project Phases 1 and 2.

Taylor Creek, Nubbin Slough, and Lakeside Ranch STAs

Numerous efforts have been conducted under the Lake Okeechobee Watershed Project, including completion of the Lakeside Ranch STA Phase I construction and two pilot-scale STAs in Taylor Creek and Nubbin Slough.

Taylor Creek STA Pilot Project

The Taylor Creek STA pilot project was constructed in 2006 and implemented under the Lake Okeechobee Watershed Construction Project – Phase 1. The STA is located in central Okeechobee County and is approximately 142 acres in size with an effective treatment area of 118 acres. It is divided into two cells in series and is expected to treat about 10 percent of the water flow in Taylor Creek. The expected annual average total phosphorus removal performance of the Taylor Creek Pilot STA was estimated at 2.08 metric tons per year.

Initial flow-through operations at the Taylor Creek STA commenced in 2008, but were suspended due to a culvert failure at the discharge structure. After repairs were completed, the STA resumed continuous flow-through operation in September 2010. USACE and SFWMD, the project's co-sponsors, have a 50-50 cost share agreement. SFWMD is responsible for the operation, monitoring, and maintenance of the facility. Since May 2011, SFWMD has operated the facility under a Florida Department of Environmental Protection (FDEP) permit.

Nubbin Slough STA Pilot Project

The Nubbin Slough STA Pilot Project was also implemented under the Lake Okeechobee Watershed Construction Project – Phase 1. It is the larger of the two pilot STAs implemented north of the lake. USACE was responsible for the design and construction of the project. SFWMD is the local sponsor of the project and will be responsible for operation and maintenance.

Nubbin Slough STA Pilot Project

It is located about 6.5 miles southeast of the City of Okeechobee. This two-celled STA is approximately 809 acres in size with an effective treatment area of 773 acres. The projected long-term average total phosphorus reduction within the STA was estimated at 5 metric tons or about 85 percent of the total phosphorus load of Nubbin Slough at the project location.

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Construction of the Nubbin Slough STA was completed in September 2006; however, it could not be operated as designed due to a series of electrical and mechanical problems uncovered during pump tests. Aggradations of sediment in the pump basin also impaired operations. Repairs and construction modifications to the intake basin were completed and the STA became operational in June 2012. Flooding associated with Tropical Storm Isaac revealed that remnant pipes exist within the STAs footprint and need to be plugged. SFWMD and USACE developed a repair plan for the S-385 bypass weir and piping under the levee. Repairs will begin when groundwater levels are low enough to proceed with the pipeline excavation and grouting. In the meantime, pumping operations and water quality monitoring at the Nubbin Slough STA are suspended.

Lakeside Ranch STA Project

The Lakeside Ranch STA Project is a key component of the Northern Everglades and Estuaries Protection Program and is featured in the *Lake Okeechobee Watershed Construction Project Phase 2 Technical Plan* (SFWMD et al. 2008). The Lakeside Ranch STA is in the Taylor Creek/Nubbin Slough Subwatershed, a nutrient hot spot in the Lake Okeechobee Watershed. The STA is expected to reduce total phosphorus loads to the lake by up to 19 metric tons per year. The STA will also be able to recirculate water from the lake, which may provide potential for internal phosphorus removal.

The Lakeside Ranch STA Project was designed in two phases. Phase I includes a northern STA (919-acre effective treatment area), canal improvements along the L-63 and L-64 levees, and installation of the S-650 pump station. State appropriations funded construction of Phase I, which was completed in May 2012. Phase II includes a southern STA (788-acre effective treatment area), a new pump station at S-191, and a discharge canal. Final design of Phase II was completed in December 2011 and implementation is subject to future funding. This STA is anticipated to be one of the tentatively selected plan components of the CERP Lake Okeechobee Watershed Project.

USACE Herbert Hoover Dike Major Rehabilitation

USACE is rehabilitating the Herbert Hoover Dike, a 143-mile series of levees and structures surrounding Lake Okeechobee, to address structural integrity concerns with the embankment and internal culvert structures. The Herbert Hoover Dike was first authorized in 1930. It was constructed by hydraulic dredge and fill methods. In 2007, USACE designated the Herbert Hoover Dike a dam safety action classification risk of Class I, representing the highest USACE dam risk of failure rating and requiring remedial action.

Herbert Hoover Dike rehabilitation construction

The project originally included construction of structural features, cut-off walls, and landside rehabilitation. It also included design of rehabilitation features in current and

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future segments (Reaches 1–8) of the Herbert Hoover Dike. The *Herbert Hoover Dike Major Rehabilitation Evaluation Report* (USACE 2000b) divided the 143-mile dike into eight reaches with the initial focus on Reach 1. This reach-by-reach approach has been replaced with the systemwide risk reduction approach USACE utilizes for safety modifications to dams. The current approved and planned remediation measures will address the highest points of potential failure in the system based on known areas of concern.

The implementation of the 21.4-mile cutoff wall component in Reach 1 satisfies the majority of the risk reduction goals. This component is scheduled to be completed in 2013. As part of this risk reduction approach, the 32 water control structures (culverts) operated by USACE are being replaced, removed, or abandoned with a scheduled completion in 2018. Culvert 14, north of Canal Point, was removed in 2011. Replacement work began in 2012 to Culverts 11 and 16 south of Port Mayaca, at Culverts 1 and 1A east of Moore Haven, and at Culverts 3 and 4A near South Bay. Additional contracts for the replacement of other culverts are expected to be awarded by late 2013.

USACE is currently conducting the Herbert Hoover Dike Dam Safety Modification Study, which is anticipated to be complete in 2015. The study is a comprehensive, systemwide study intended to identify risks in the system, and to recommend the necessary measures that can reduce the risk of failure. USACE expects the results of the study to provide the final roadmap toward the ultimate goal of reducing failure risk at the Herbert Hoover Dike. Culvert replacement will continue as the study progresses. Once the study is complete, USACE will execute projects identified by the study. Additional planned remediation measures consist of construction of a cutoff wall and/or a seepage management system in Reaches 2 and 3. These actions are scheduled for completion by 2022 (USACE and SFWMD 2013) and should lower the dam safety action classification from Class I.

USACE committed to revision of the Lake Okeechobee operations in its *Final Environmental Impact Statement Including Appendices A through G – Lake Okeechobee Regulation Schedule* (USACE 2007). Specifically, USACE stated, the following:

> Pending completion of rehabilitation in Reaches 1, 2 or 3, as HHD[2] rehabilitation progresses, the Corps[3] will evaluate the capacity to operate the Lake in a manner to provide more water storage in conjunction with achieving other project purposes. The anticipated points at which the Corps will utilize the flexibility within the schedule consistent with protection of health safety and welfare to provide additional storage include, at a minimum, completion of filling of the toe ditch, construction of the seepage berm within the existing right of way in Reach 1, and equivalent dike improvements in Reaches 2 or 3, which are currently under design. Upon changed circumstances, the Corps will provide additional storage, consistent with technical analysis, that might result from higher lake elevations.

[2] HHD – Herbert Hoover Dike
[3] Corps – United States Army Corps of Engineers

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The USACE expects to operate under the 2008 Lake Okeechobee Regulation Schedule (2008 LORS) until the earlier of 1) implementation of a new Lake Okeechobee schedule as a component of the systemwide operating plan to accommodate CERP projects, or 2) completion of the Herbert Hoover Dike seepage management system for Reaches 1, 2, and 3 as determined necessary to lower the dam safety action classification rating from Class 1. USACE intends to implement a new schedule or any necessary schedule modifications or deviations concurrent with the completion of item 1 or item 2 above (USACE and SFWMD 2013).

A revised regulation schedule could provide the additional water supplies needed for Lake Okeechobee MFL recovery, enhance the level of certainty to existing permitted users, and support other environmental objectives. For more information see www.saj.usace.army.mil/Missions/CivilWorks/LakeOkeechobee/HerbertHooverDike.aspx.

Lake Okeechobee Habitat Enhancements

The 2007 drought lowered Lake Okeechobee water levels, allowing SFWMD to cost-effectively conduct a series of management activities. Continued low water levels in both Lakes Okeechobee and Istokpoga during 2008 prompted SFWMD to garner input from various agencies to plan low lake stage restoration projects for the coming dry seasons, as well as helping to mitigate more the frequent low lake stages anticipated under the 2008 LORS. These low lake level activities resulted in further research and aided project formulation. The activities include muck scraping and disking/plowing, native aquatic plant enhancement, exotic and nuisance plant control, recreation and navigation area enhancement, in-lake debris removal, and initiation of an apple snail (*Pomacea paludosa*) nursery. These activities were implemented during subsequent droughts.

Everglades

The following projects are discussed in this section (**Figure 34**):

- Restoration Strategies Regional Water Quality Plan
- C-139 Annex Restoration
- Modified Water Deliveries to Everglades National Park (ModWaters)
- CERP Water Conservation Area (WCA) 3A Decompartmentalization (Decomp) Physical Model (DPM)
- Ongoing CERP Planning, including the Central Everglades Planning Project (CEPP)
- Wading Bird Monitoring Report
- Historical Tree Island Mapping

Green heron in Everglades National Park

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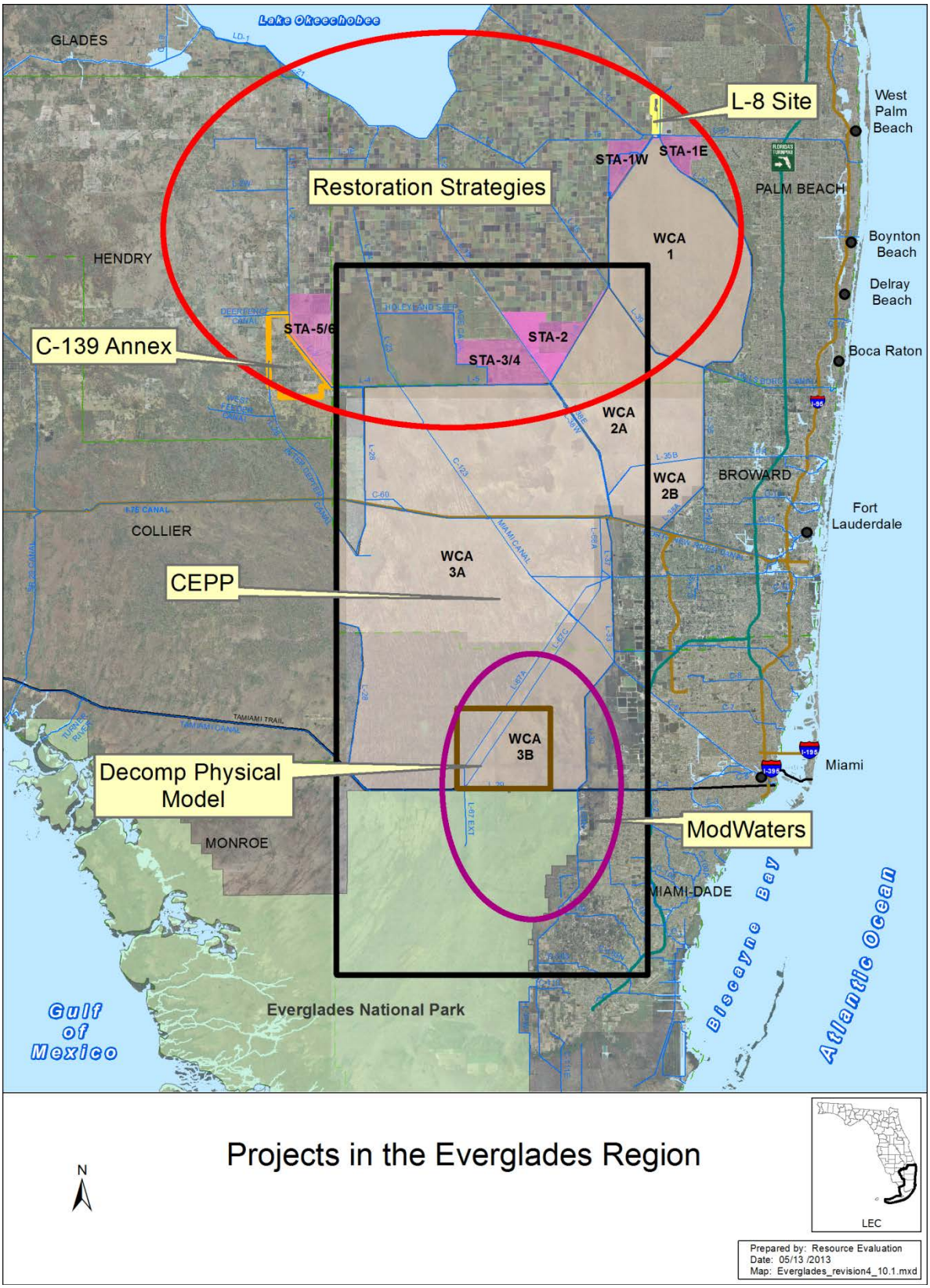

Figure 34. Projects in the Everglades region.

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Restoration Strategies Regional Water Quality Plan

The Restoration Strategies Regional Water Quality Plan is a strategy and technical plan comprised of a suite of projects designed to meet water quality objectives supporting Everglades' restoration. FDEP and SFWMD worked in coordination with the United States Environmental Protection Agency to develop projects that will work in combination with the existing STAs to achieve the Water Quality Based Effluent Limit. The technical plan includes six projects that will create more than 6,500 acres of new STAs and 110,000 ac-ft of additional water storage through construction of flow equalization basins (FEBs) (**Figure 35**). FEBs are constructed storage features used to capture and store peak stormwater flows. FEBs provide a more steady flow of water to STAs, helping to maintain desired water levels needed to achieve optimal water quality treatment performance.

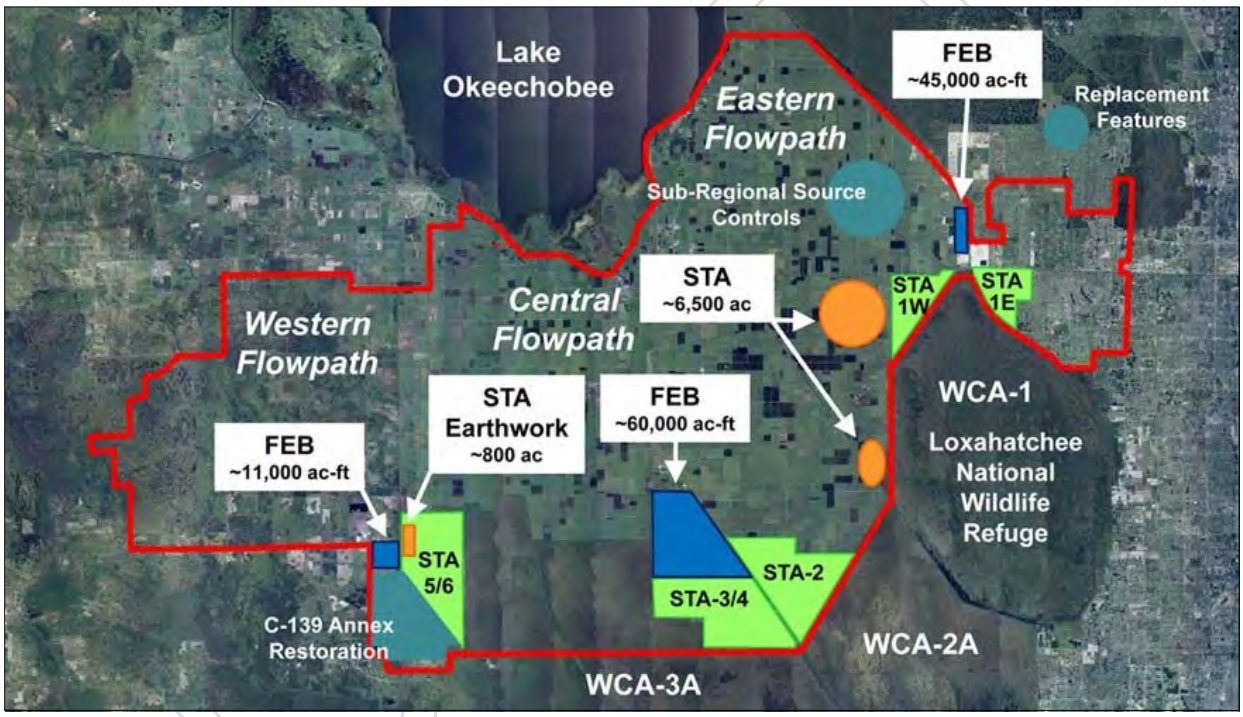

Figure 35. Key elements of the Restoration Strategies Regional Water Quality Plan.

The strategy also includes additional source controls—pollution reduction at its source—in the eastern Everglades Agricultural Area where phosphorus levels in stormwater runoff have been historically higher. In addition, a robust science plan will ensure continued research and monitoring to improve and optimize the performance of water quality treatment technologies.

In the L-8 Basin, located in central Palm Beach County, SFWMD purchased a 46,000 ac-ft belowground impoundment created by rock mining operations. The L-8 site was originally anticipated to provide water storage as a CERP component. The unique geology (low transmissivity limestone) at the L-8 site allows for deep, belowground storage, minimizing water loss through seepage. As part of the Restoration Strategies Regional Water Quality

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Plan approved in 2012, the L-8 site is now under construction for use as an FEB. The L-8 FEB will provide storage for delivery of consistent flows needed to optimize performance of the STAs. In September 2012, SFWMD awarded a $63.9 million contract for design and construction of an inflow structure, internal improvements, revetment strengthening, a pump station, and six pumps to convey water into and out of the L-8 FEB, which can pull water from 40 feet below land surface.

The A-1 FEB is an 15,000-acre shallow impoundment area located south of Lake Okeechobee. It is designed to store approximately 60,000 ac-ft of storm water. The A-1 FEB is the largest of three FEBs identified in the plan. The A-1 FEB will attenuate peak stormwater flows, temporarily storing water so it can be delivered at a steady rate to STA 2 and STA 3/4 to improve their performance. FDEP issued a permit authorizing SFWMD to build, operate, and maintain the A-1 FEB on July 2013. Construction of the A-1 FEB is scheduled to be completed by July 2016.

Design and construction of the treatment and storage projects will be completed in three phases over a twelve-year timeframe, with completion set for 2025. More information is available at www.sfwmd.gov/restorationstrategies.

C-139 Annex Restoration

The C-139 Annex Restoration property is a restoration project funded in part by the Lake Belt Mitigation Fund. The Lake Belt Mitigation Committee[4] studied the restoration potential of the site and approved its use as mitigation for wetland impacts in the Lake Belt region in December 2012.

The project will restore historic Everglades hydrologic conditions to 15,000 acres formerly used as a citrus grove. Restoration will progress as mitigation funds allow and is expected to be by complete by 2018. The project will consist of the following elements:

- Buildings and structures removal
- Exotic vegetation removal
- Citrus tree clearing and planting bed leveling
- Irrigation system removal and well abandonment
- Canal backfilling, and road and levee degradation to restore sheetflow
- Native vegetation replanting and microtopographical contouring

[4] The Lake Belt Mitigation Trust Fund is designed to fund mitigation projects offsetting limerock mining impacts within areas of the Miami-Dade County Lake Belt. The fund is supported by a per-ton mitigation fee assessed on limestone sold from the Lake Belt area. The fund is used for acquiring environmentally sensitive lands and for restoration, maintenance, and other environmental purposes. Expenditures from the fund are managed by the Miami-Dade County Lake Belt Mitigation Committee, an interagency committee consisting of representatives from the Miami-Dade County Department of Environmental Resource Management, FDEP, SFWMD, and the Fish and Wildlife Conservation Commission.

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Modified Water Deliveries to Everglades National Park

The United States Department of Interior and USACE co-sponsor ModWaters. Its purpose is to restore natural hydrologic conditions in Everglades National Park, which were altered by the construction of roads, levees, and canals. The project is a foundation project for CERP, providing the first major restoration effort for Everglades National Park. This project will provide water supplies needed for Everglades MFL recovery.

Many of the anticipated CERP projects will not be technically feasible without implementation of ModWaters. ModWaters is essential to provide the flow capacity necessary for future CERP projects.

ModWaters has five major components:

- **Tamiami Trail Modifications** – The L-29 Levee and Tamiami Trail Highway impede water flow from WCA 3B to northeastern Shark River Slough in Everglades National Park. These impediments will be overcome by completion of two new water control structures that will allow flow through the L-29 Levee, raising Tamiami Trail, and installation of a one-mile long bridge on Tamiami Trail. Construction of this project began in 2010 and the new bridge opened for use in April 2013 with additional site work continuing through the end of the year.
- **L-67A Conveyance Features –** This component involves the construction of new water control structures to allow water to flow from WCA 3A into WCA 3B. These features may not be executed as part of ModWaters due to budgetary constraints.
- **8.5-Square Mile Area Protection Features –** This component includes a protection levee, seepage collection canal, pump station, and detention area to maintain existing levels of flood protection to the 8.5-Square Mile Area under the higher stages expected with increased flow to northeastern Shark River Slough. Construction of this component was complete in 2008.
- **S-356 Pump Station –** This pump station will collect water that seeps out of WCA 3B and northeastern Shark River Slough into the L-30 and L-31 canals and pump it into the L-29 Canal, thereby returning water to northeastern Shark River Slough. This component will provide restoration benefits to Everglades National Park and avoid impacts on flood protection to the east. Construction was complete in 2002. However, FDEP has not issued an operational permit. Considerable stakeholder controversy surrounding the use of the S-356 pump station prevented it from reaching operational status. USACE submitted an application to FDEP in October 2012 requesting authorization to field test operations at the S-356 pump station and to modify G-3273 criteria. As of February 2013, action on the application is pending USACE response to FDEP's request for additional information.
- **Taylor Slough Bridge –** A replacement bridge was constructed in 2007 to increase the flow capacity under the main park road.

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CERP WCA 3A Decompartmentalization Physical Model

DPM is a field-scale test that will assess the effects of pulsed flows on hydrology, sediment transport, vegetation, and wildlife. DPM results will determine how best to design and formulate plans for future decompartmentalization of WCA 3, as visualized in CERP. DPM is designed to address scientific, hydrologic, and water management uncertainties that require clarification prior to future planning and construction of Everglades restoration projects. This project will help determine the water supplies needed for Everglades MFL recovery. This project will temporarily install the following features: ten 60-inch culverts in the L-67A Levee, and a 3,000-foot gap in the L-67C Levee with three experimental backfill methods.

Deconstruction of these features will occur at the end of the DPM testing period and the project area will be restored to pre-DPM conditions. In 2012, USACE received the final permit for DPM construction and interim operations. A contract for construction was awarded in May 2012. SFWMD anticipates testing will begin November 2013 and continue through 2014.

Ongoing CERP Planning

In October 2011, the intergovernmental South Florida Ecosystem Restoration Task Force endorsed a state-federal initiative to speed up the CERP planning process for key restoration projects in the Everglades. Now under way, CEPP combines a series of CERP components into one project implementation report. CEPP will identify and plan for projects on land already in public ownership to direct more water south to the central Everglades, WCA 3, Everglades National Park, and Florida Bay while providing water for other water-related needs. The following CEPP components for storage and treatment, distribution and conveyance, and seepage management elements are under consideration (**Figure 36**):

Storage and Treatment

- Construction of an FEB on the Talisman A-2 parcel with integrated operations with the Restoration Strategies Regional Water Quality Plan A-1 FEB operations.
- Diversion of L-6 Canal flows and L-5 Canal improvements.
- Removal of approximately 2.9 miles of the western portion of the L-4 Levee and modification of the S-8 pump station.
- Miami Canal backfill and spoil mound removal (beginning approximately 1.5 miles south of the S-8 structure and ending at I-75).

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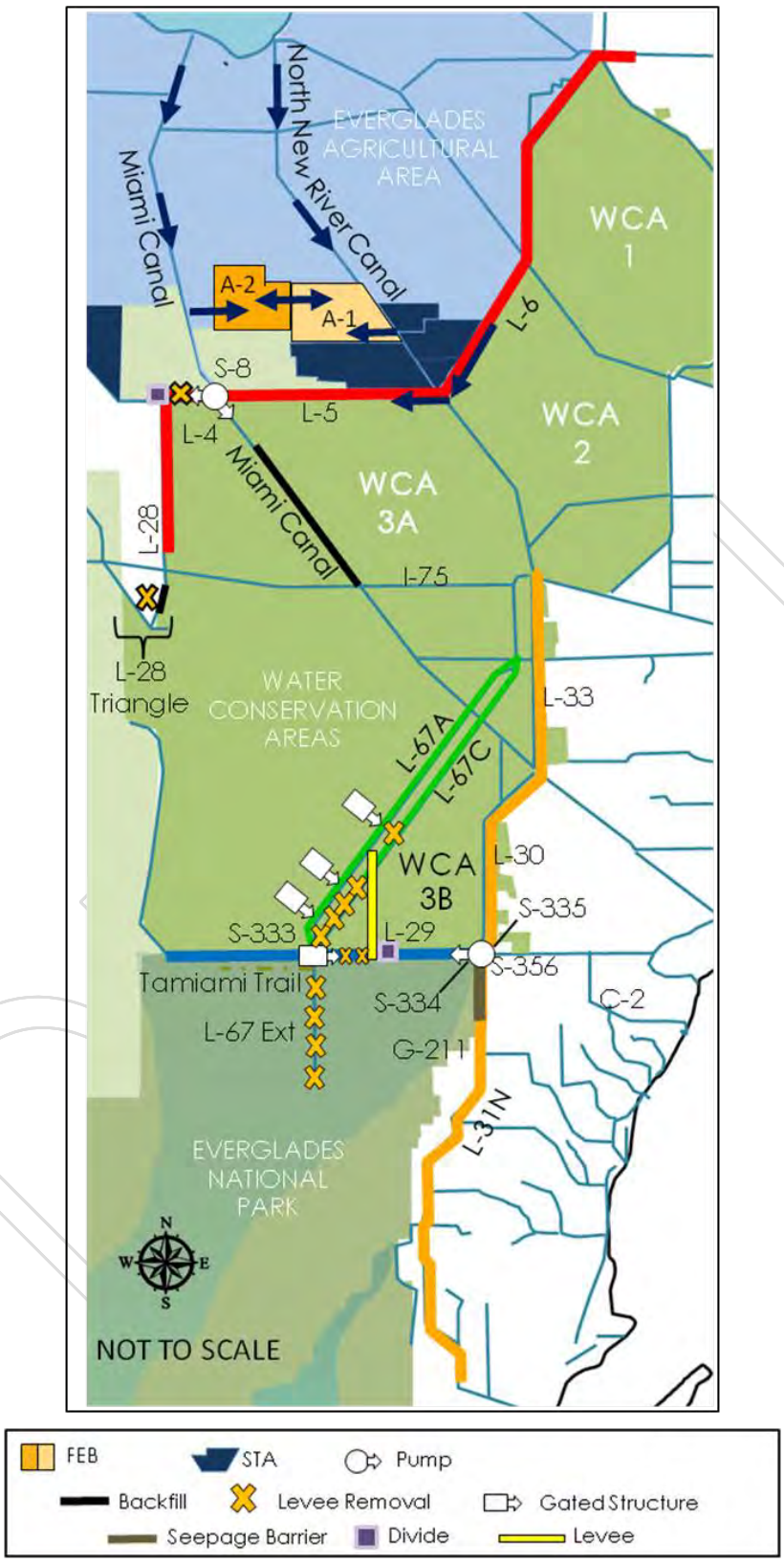

Figure 36. CEPP features under consideration.

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Distribution and Conveyance (Southern WCA 3A/B)

- Increase the S-333 structure capacity.
- Construction of three structures and spoil removal west of the L-67A Canal north and south of the structures with two of the structures at the beginning of the flow-way from WCA 3A through WCA 3B to Everglades National Park.
- Construction of a levee in WCA 3B connecting the L-67A Levee to the L-29 Levee along with removal of the L-67C (no canal backfill) and L-29 levees, creating a flow-way from WCA 3A through WCA 3B to Everglades National Park.
- Construction of a gated structure along the L-67A Levee and 6,000-foot gap in the L-67C Levee.
- Removal of the entire L-67 Extension Levee and backfill the L-67 Extension Canal.
- Removal of the Old Tamiami Trail road from the L-67 Extension Levee to Everglades National Park's Tram Road.

Seepage Management

- Increase S-356 pump station capacity.
- Construction of a partial depth seepage barrier south of Tamiami Trail (along the L-31N Levee).
- G-211 structure operations refinement and use of coastal canals to convey seepage.

Wading Bird Monitoring Report

Wading birds are useful indicators of environmental health. The collection of data and analysis of the trends is a useful tool to track changes in the environment. Each year, SFWMD prepares the Wading Bird Monitoring Report covering all wading bird breeding colonies in South Florida. The 2012 report documents continued declines in the nesting activity of many wading bird species highlighting the need for Everglades restoration and development of regional water resources projects (Cook and Kobza 2012).

Historical Tree Island Mapping

Everglades tree islands are areas of critical habitat and centers of biodiversity. In 2011, this project mapped tree islands within Everglades National Park using stereoscopic analyses of historic aerial photography from 1952 through 2004. Previous mapping efforts found tree island degradation or loss on 90 percent of WCA 2A and 60 percent of WCA 3A since the 1940s due to hydrologic alterations.

This project sought to examine relatively healthy tree islands of Shark River Slough for comparison to the degraded tree islands in the WCAs. Data gained from this and previous tree island studies gives insight into the hydrologic conditions needed to sustain healthy

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tree islands. The study highlights the need for development of regional water resources projects to restore hydrologic conditions in the WCAs to sustain tree islands. Documentation of this additional information is necessary to provide a better understanding of how and why tree islands changed over the last 50 years and what might be in store for their future.

Loxahatchee River

Loxahatchee River

In this section, the following projects are discussed:

- Restoration Plan for the Northwest Fork of the Loxahatchee River
- CERP Loxahatchee River Watershed Restoration Project (formerly known as North Palm Beach County – Part 1)
- Storage for the Loxahatchee River

Restoration Plan for the Northwest Fork of the Loxahatchee River

In April 2003, a recovery strategy was approved, which included the commitment by SFWMD to develop, in partnership with FDEP, "a practical restoration plan and goal" for the Northwest Fork of the Loxahatchee River. The objective of the *Restoration Plan for the Northwest Fork of the Loxahatchee River* is to use the best available scientific and technical information to develop a practical restoration goal and plan to provide restorative flows to the ecosystem of the Northwest Fork of the Loxahatchee River (SFWMD et al. 2006).

The staff of SFWMD, FDEP, Jonathan Dickinson State Park, and the Loxahatchee River District collected and analyzed data to develop and evaluate the restoration flow alternatives. After evaluating the ability of each variable flow scenario to achieve the restoration goal, the preferred restoration flow scenario was selected. The preferred scenario provides near optimal inundation for the freshwater riverine floodplain forest, reverses saltwater intrusion within the tidal floodplain, and has minimal impact on the downstream estuarine biota. The *Restoration Plan for the Northwest Fork of the Loxahatchee River* with its preferred restoration flow scenario is the foundation for other important plans and projects within the Loxahatchee River Watershed. Projects benefitting the Loxahatchee River constructed by SFWMD, or with SFWMD support to other agencies, include the following:

- M-Canal Widening – completed 2007
- C-18 Project Culvert Replacements – completed 2007
- Nine Gems Restoration – completed 2010
- Culpepper Hydrologic Restoration – completed 2011
- Cypress Creek Weir Installation – completed 2012

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- Cypress Creek Berm/Water Control Structures – ongoing 2013
- Loxahatchee Slough Restoration – ongoing 2013

SFWMD also acquired land in support of Loxahatchee River restoration including the following parcels: Culpepper (1,282 acres), Cypress Creek (3,398 acres), Palmar East – Nine Gems (2,895 acres), and Loxahatchee Slough (592 acres).

CERP Loxahatchee River Watershed Restoration Project

The purpose of the CERP Loxahatchee River Watershed Restoration Project, formerly known as the North Palm Beach County Project – Part 1, is to capture, store, and treat excess water currently discharged to Lake Worth Lagoon and use that water to enhance the Loxahatchee River and Slough and provide water supplies to Grassy Waters Preserve. This project provides water needed for Loxahatchee River MFL recovery.

Excess canal water would be back-pumped through existing and proposed water control structures and canals, which would provide water quality treatment prior to discharge into Grassy Waters Preserve. The CERP planning process will evaluate a suite of alternative flow-ways and components with respect to providing beneficial flows to the Loxahatchee River, achieving hydropattern restoration, and reducing flows to the Lake Worth Lagoon. Elements of Flow-way 1 that have already been constructed (i.e., G-160 and G-161 Structures, and M Canal Widening) will be included in the evaluation process.

G-160 structure

Construction of the G-161 Northlake Boulevard Water Control Structure was completed in January 2007. The structure consists of remotely operated gates and dual 60-inch steel culverts installed under Northlake Boulevard near its intersection with the Beeline Highway in northern Palm Beach County. The structure will assist with achieving the desired environmental hydroperiods in Grassy Waters Preserve as well as the Loxahatchee Slough. It also will facilitate gravity flows from these environmental areas to the C-18 Canal and the Northwest Fork of the Loxahatchee River during dry periods.

SFWMD initiated incremental operation of the G-160 structure on June 1, 2009. However, contribution of the G-161 project to the restoration of natural hydroperiod to this system, individually or together with the related G-160 project, is constrained by water availability. Full benefits of the G-160 and G-161 structures will not be realized until water is available in amounts adequate to provide restorative flows to the Northwest Fork of the Loxahatchee River.

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Storage for Loxahatchee River

The L-8 Site was originally acquired to provide water storage as a component of the CERP Loxahatchee River Watershed Restoration Project and was an element of the MFL recovery strategy for the Loxahatchee River. Recently, the Restoration Strategies Regional Water Quality Plan incorporated the L-8 Site as one of its features. It is now under construction for use as an FEB for the eastern flow-way, and will provide storage to allow for the delivery of consistent flows that are needed to optimize performance of STAs.

While interim operations for the L-8 FEB may provide for the delivery of dry season flows to the Loxahatchee River, a permanent replacement storage feature for the Loxahatchee River is needed. In 2013, SFWMD and Palm Beach County conceptually agreed to the acquisition of approximately 1,800 acres owned by the county that could be used to store and deliver water to the Loxahatchee River. The Restoration Strategies Regional Water Quality Plan includes the cost to acquire property and to construct a storage facility on an alternative site. Acquisition of the site is expected to be complete in 2014, and design of the storage facility is expected to proceed in 2018.

Biscayne Bay

In this section, the following projects are discussed and locations of some are shown in **Figure 37**:

- CERP Biscayne Bay Coastal Wetlands (BBCW) Project (Phase 1)
- Developing Technical Information for Biscayne Bay
- Biscayne Bay Seepage Study
- Biscayne Bay and Watershed Water Quality Data Analysis
- Storm Event Sampling in the Biscayne Bay Watershed
- Characterization of Nearshore Epifauna Study

Development of surface drainage systems and groundwater extraction altered the quantity, quality, timing, and distribution of freshwater flows to Biscayne Bay. The links between development, freshwater inflows, and the bay's ecology are complex. The Biscayne Bay Seepage Study and Characterization of Nearshore Epifauna Study are part of the effort to clarify these relationships. The CERP BBCW Project seeks to restore areas impacted by channelization by restoring the quantity and distribution of fresh surface water discharging to the bay. Water quality in the bay also suffered as a result of rapid runoff entering the bay from surface drainage systems. The Storm Event Sampling in the Biscayne Bay Watershed Project seeks to understand these impacts more clearly. The overall mass balance of freshwater inflows to Biscayne Bay shifted as a result of development and altered the salinity of the bay. The project, Developing Technical Information for Biscayne Bay, seeks to build a technical basis for policies to protect the bay as a whole.

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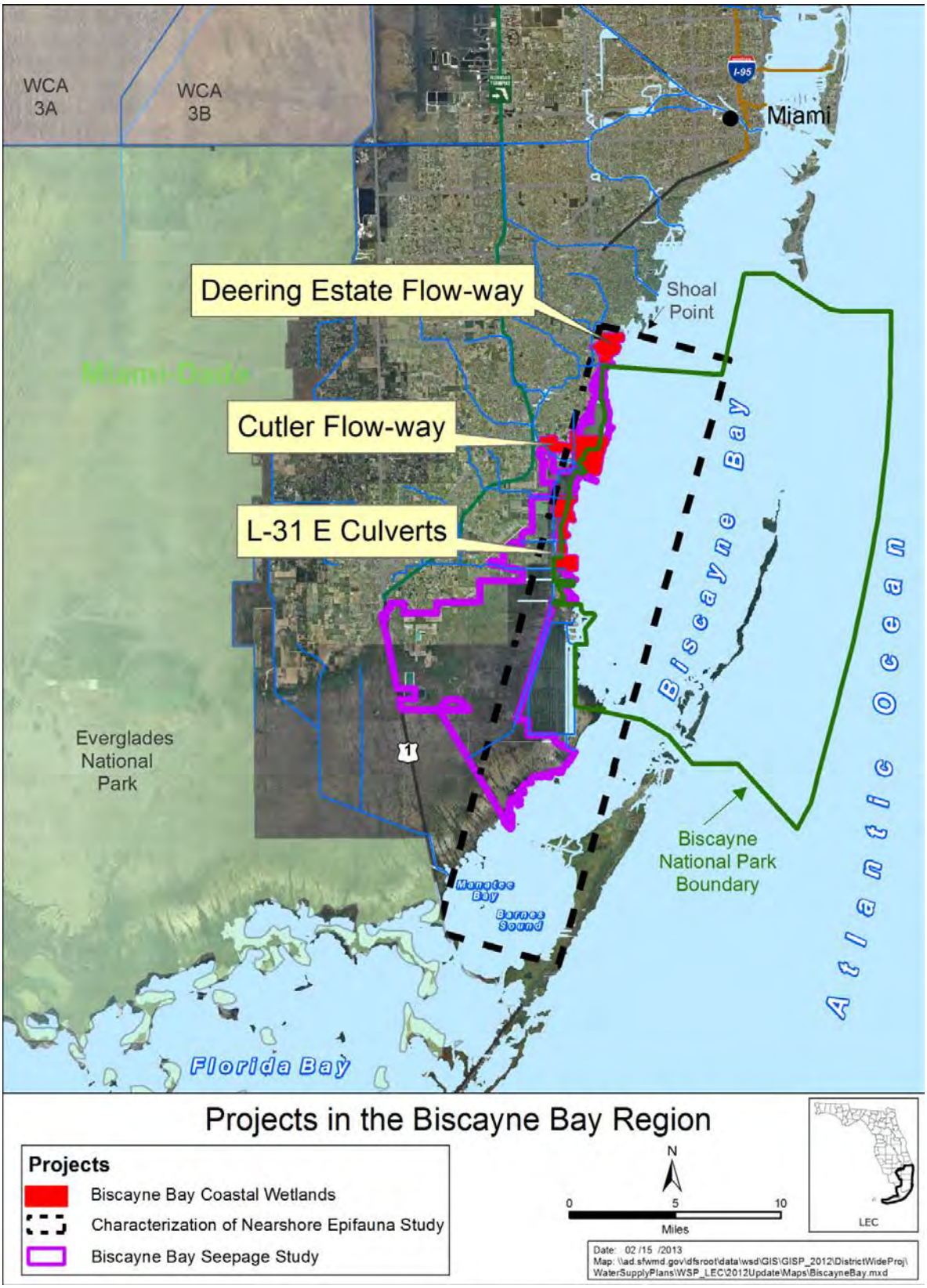

Figure 37. Projects in the Biscayne Bay region.

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CERP Biscayne Bay Coastal Wetlands Project (Phase 1)

The CERP BBCW Project is essential to achieving restoration of tidal wetlands and nearshore habitats within Biscayne Bay, including Biscayne National Park. The project will divert runoff that currently discharges through regional canals and redistribute the fresh water through a spreader canal system into the coastal wetlands adjoining Biscayne Bay to provide a more natural and historic overland flow. The slower, more natural delivery of fresh water over a broad area is expected to provide more stable salinity conditions and reestablish appropriate estuarine salinities that are important for fish and shellfish nursery habitat in tidal wetlands and the nearshore bay. SFWMD expects this project will create conditions conducive to the reestablishment of oysters and other components typical of a healthy estuarine ecosystem.

The CERP BBCW Project is composed of three components: Cutler Wetlands Flow-way, Deering Estate Flow-way, and L-31 East Flow-way. In advance of congressional authorization and appropriations, SFWMD constructed the Deering Estates Flow-way and a portion of the L-31E Flow-way:

- **Cutler Wetlands Flow-way –** The infrastructure includes a pump station on the C-1 Canal, construction of a lined conveyance canal, construction of a spreader canal system, box culverts under roadways, and plugging of mosquito control ditches. The pump station will deliver water to the spreader canal located in the saltwater wetlands via a lined conveyance canal. The Cutler Wetlands Flow-way construction was completed in February 2013.
- **Deering Estate Flow-way –** This flow-way redistributes excess freshwater runoff, directing it away from existing canal discharges and spreading it out as sheetflow prior to discharging into Biscayne Bay. SFWMD completed construction in April 2012. The project became operational in November 2012 and is currently in the implementation stage.

Deering Estate Flow-Way pump station (S-700)

- **L-31 East Flow-way –** This flow-way is designed to reestablish, at least in part, historical sheetflow and wetland hydroperiods downstream of the project area. This component may also provide the additional benefit of mitigating impacts of discharging fresh water via the existing canals. SFWMD expects this component will achieve its objectives by redirecting flow through a series of new culverts. As of January 2013, SFWMD constructed four of the ten culverts planned for the L-31 East Flow-way.

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USACE and its co-sponsor, SFWMD, completed the *Biscayne Bay Coastal Wetlands Phase I Final Project Implementation Report and Environmental Impact Statement* in January 2012 (USACE and SFWMD 2012). The final report describes the project purpose and need, location, evaluation of alternatives, and recommended plan. The chief of engineers report was signed in May 2012 and submitted to the Assistant Secretary of the Army for Civil Works for review. The signed record of decision was transmitted to the United States Congress for authorization.

Developing Technical Information for Biscayne Bay

In 2008, SFWMD compiled the report, *Adequacy of Technical Information to Support Minimum Inflow Needs for Biscayne Bay* (SFWMD 2009a) as part of continuing work undertaken to assess potential technical criteria for Biscayne Bay. SFWMD conducted a peer review of this report in advance of the development of criteria or a technical approach for water management strategies to protect inflows needed for Biscayne Bay (Montagna et al. 2008). The peer review independently evaluated the adequacy of available information to support a technical approach to manage minimum freshwater inflow needs of natural resources in Biscayne Bay.

As part of this effort, a mass balance analysis of freshwater inflows and salinity in Biscayne Bay was completed to describe how general salinity patterns relate to inflows in different areas of Biscayne Bay (Marshall et al. 2008). Also evaluated within the technical report were differing approaches of structuring estuarine criteria that have been used or proposed in South Florida and elsewhere (SFWMD 2009a).

Biscayne Bay Seepage Study

SFWMD needs a better understanding of the hydrogeologic framework of the surficial aquifer system (SAS) in the bay's coastal wetlands for the CERP BBCW Project to support modeling efforts and ongoing water resource management initiatives. To investigate aquifer salinity in the CERP BBCW Project area, 22 groundwater monitoring wells were installed at 13 sites along the western edge of Biscayne National Park. SFWMD will use this data to delineate the saltwater interface and study the hydrogeologic characteristics and groundwater quality within the upper portion of the Biscayne aquifer around the CERP BBCW Project. The initial findings of this study are in *Biscayne Bay Coastal Wetlands, Aquifer Salinity Investigation* (Janzen et al. 2008).

Seagrass in Biscayne Bay

Biscayne Bay and Watershed Water Quality Data Analysis

This project collected, organized, and analyzed water quality data for Biscayne Bay. The project's results are in *Biscayne Bay and Watershed Water Quality Data Analysis, Task 5:*

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Final Report (Migliaccio 2008). The report includes 1) a summary of water quality in Biscayne Bay, 2) an analysis of time series results describing canal nutrient water quality entering the bay and within the bay, 3) comparisons of land uses from 1972 to the present, as available over time, and 4) examination of the relationships between land use changes and water quality.

Storm Event Sampling in the Biscayne Bay Watershed

Existing monthly grab sample monitoring of pollutants discharging into Biscayne Bay may not be sufficient to fully characterize loading that occurs during storm events. The primary purposes of this project were to 1) assess existing event mean concentration results for the Biscayne Bay Watershed to determine if the existing data were adequate to characterize nutrient loads into Biscayne Bay and 2) provide recommendations for the development of a monitoring plan to collect such data if it does not currently exist. The investigators concluded that, in some cases, existing data was inadequate for accurate characterization of nutrient loads into Biscayne Bay. Technical recommendations for improvement of sampling procedures and associated analysis are documented in the project's final report, *Storm Event Sampling in the Biscayne Bay Watershed: Final Project Report* (Migliaccio 2009).

Characterization of Nearshore Epifauna Study

Historical descriptions of the fisheries of Biscayne Bay suggest that a greater diversity and abundance of fishery species associated with mesohaline habitat once occurred in the bay. In southern Biscayne Bay, the Characterization of Nearshore Epifauna Study is designed to help assess CERP effectiveness, once implemented, in meeting this objective. The purpose of this project is to create a baseline characterization of the present day alongshore epifauna from Shoal Point to Manatee Bay, determine species relationships with salinity, classify species on the basis of these salinity relationships, identify indicators, and formulate performance measures and targets for assessing CERP implementation effects. Preliminary analytical results suggest that relationships between faunal distributions and salinity can be found in data acquired from shallow water, nearshore epifaunal sampling. Expanding sampling may increase understanding of relationships among mangrove and seagrass fauna, seagrass habitat, and salinity. This final report for this project—*Epifaunal Communities of Mainland Nearshore South Biscayne Bay* (Browder et al. 2011)—was completed in May 2011.

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Florida Bay

The following projects are discussed in this section:

- USACE C-111 South Dade Project
- S-197 Structure Replacement Project
- CERP C-111 Spreader Canal Western Project
- Florida Bay MFL Prevention Strategy Monitoring and Research

Florida Bay

Locations of most these projects or their components are shown in **Figure 38**.

USACE C-111 South Dade Project

In 1994, USACE completed a study of potential alterations to the C-111 Canal to reduce impacts to Everglades National Park (USACE 1994). This report outlined new water control facilities and modifications to the existing Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project). The ongoing C-111 South Dade Project implements the report's recommendations in phases. This project provides water supplies identified in the Florida Bay MFL prevention strategy.

The C-111 South Dade Project is composed of twelve contracts or phases. Work began in 1994. At present, seven of the twelve contracts have been executed. Work completed since 2006 includes the following:

- Two interim pump stations and one permanent pump station were constructed.
- A retention/detention zone was constructed.
- Taylor Slough Bridge was replaced.
- 4.75 miles of spoil mounds along the lower C-111 Canal were removed.
- S-331 Command and Control Center was constructed.
- A full retention/detention area linking previously separated pump station detention areas was constructed.

In April 2012, SFWMD issued a solicitation to identify qualified firms for the eighth contract. This contract includes construction to extend the S-332B North detention area and contain discharges from the 8.5-Square Mile Area STA component of ModWaters.

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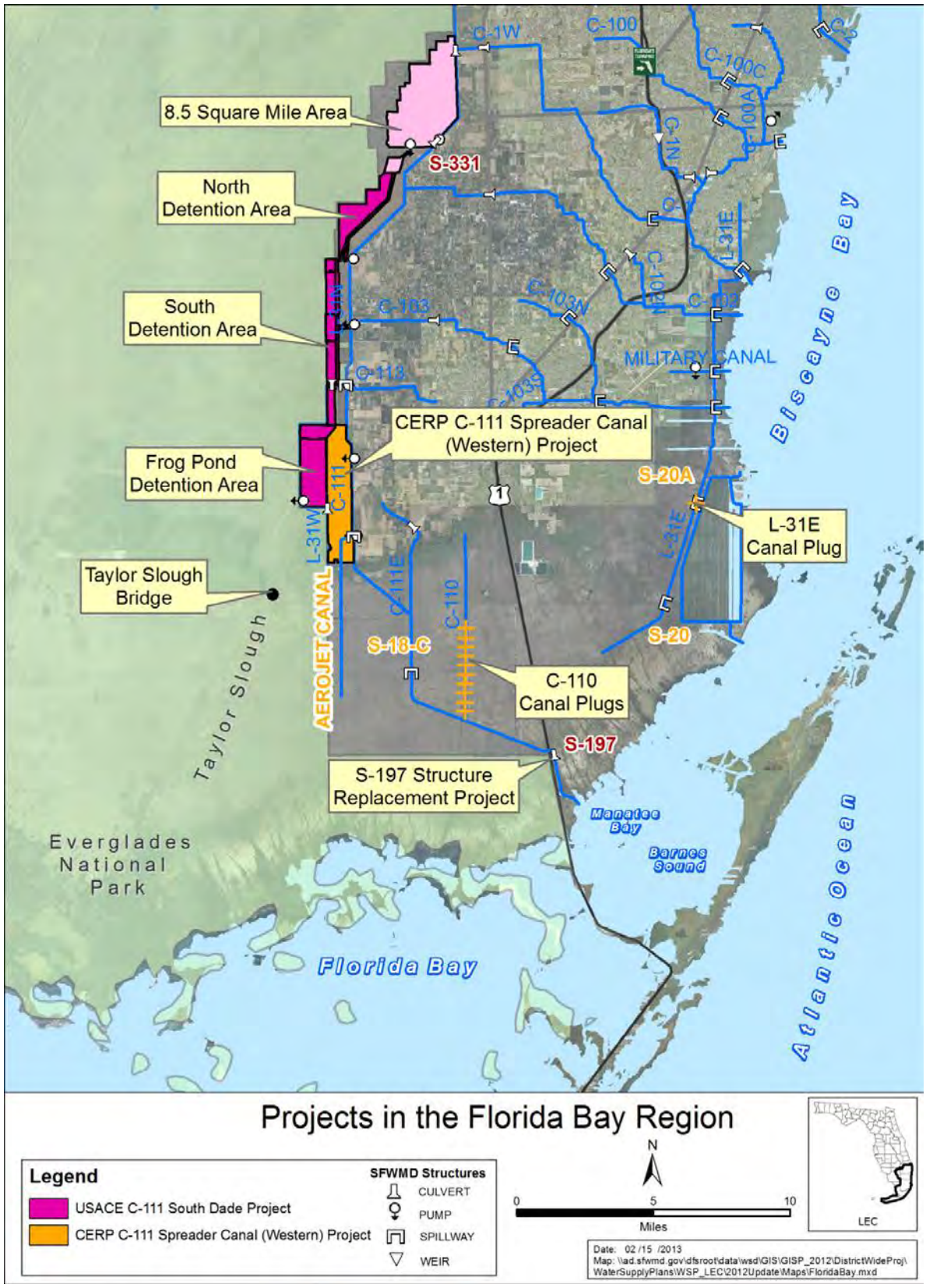

Figure 38. Projects in the Florida Bay region.

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S-197 Structure Replacement Project

The S-197 structure is located in southern Miami-Dade County near Manatee Bay. SFWMD is replacing this structure to ensure it continues to be an effective component of flood control operations in the C-111 Canal until the CERP C-111 Spreader Canal Western Project is complete. The structure also provides important environmental benefits and water resource protection by preventing saltwater intrusion to coastal fresh waters, particularly during high tides. The new S-197 Structure will use the same operation criteria, is at the same location, and will have the same discharge capacity as the previous structure. SFWMD expects the S-197 Structure Replacement Project will be complete and operational before the end of 2013. The new S-197 design took into account a maximum (worst case) differential head on the gates, considering the C-111 Canal full of water on one side and empty on the other side.

CERP C-111 Spreader Canal Western Project

This project includes structural and operational changes to improve the quantity, timing, and distribution of water delivered to Florida Bay via Taylor Slough to improve hydroperiods within the wetlands of the Southern Glades and Model Lands. The project provides more natural sheetflow to Florida Bay and decreases damaging discharges through the C-111 Canal to Manatee Bay and Barnes Sound, without adversely impacting existing levels of flood protection provided to adjacent agricultural and urban lands. This project provides water supplies identified in the Florida Bay MFL prevention strategy (Subsection 40E-8.421(8), Florida Administrative Code).

The C-111 Spreader Canal Western Project created a nine-mile hydraulic ridge adjacent to Everglades National Park, which keeps more of the natural rainfall and water flows within Taylor Slough. The hydraulic ridge was created by the following:

- Construction of a 590-acre aboveground detention area in the Frog Pond area
- Installation of two 225-cubic feet per second pump stations
- Integration of other project features.

Project elements intended to provide ecosystem restoration benefits in the Southern Glades and Model Lands include the following:

- An operable structure in the lower C-111 Canal
- Incremental operational changes at the S-18C structure
- A plug at the S-20A structure
- Operational changes at the S-20 structure
- Construction of earthen plugs in the C-110 Canal

The Assistant Secretary of the Army for Civil Works signed the project's record of decision in 2012 and transmitted it to the United States Congress for authorization. In February 2012, SFWMD completed construction of key components of the CERP C-111 Spreader

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Canal Western Project as part of its state-expedited program. Construction included the Frog Pond Detention Area, Aerojet Canal features, plugs in the C-110 Canal, a plug at the S-20A structure and operational changes at S-18C and S-20. A new structure in the lower C-111 Canal is still scheduled for construction in the future.

Florida Bay MFL Prevention Strategy Monitoring and Research

In 2006, SFWMD adopted MFL criterion for northeastern Florida Bay (see **Chapter 3**). A scientific peer review panel reviewed the 2006 technical documentation supporting MFL development—*Draft Technical Documentation to Support Development of Minimum Flows and Levels for Florida Bay* (SFWMD 2006)—and made recommendations for additional research, monitoring, and modeling. Many of the recommendations, including monitoring and modeling, have been initiated and are ongoing.

A review of information collected from Florida Bay is under way and expected to be complete at the end of 2013. Ecological and hydrological data are being considered for use in evaluating the condition of the protected resource and the performance of the MFL criteria. The ecological information includes distribution of various seagrasses and their response to variable salinity conditions. The hydrologic information will analyze existing flow, stage, rainfall, and modeling data. The ecological and hydrologic evaluations will be integrated into a single technical report to evaluate the effectiveness of the existing MFL criterion.

Lower East Coast Service Area

In this section, the following projects are discussed and locations of many are in **Figure 39**:

- CERP Fran Reich Preserve Reservoir (formerly Site 1 Reservoir)
- CERP Hillsboro Aquifer Storage and Recovery (ASR) Pilot Project
- CERP Broward County Water Preserve Areas
- CERP Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat (formerly Acme Basin B Discharge Project)
- L-31N Seepage Management Project
- Lower East Coast Subregional Model (LECsR) Update
- Saltwater Interface Mapping
- East Coast Floridan Model
- Gun Club Road Satellite Reuse Facility Feasibility Study and Pilot Project
- Groundwater Replenishment via Canal Recharge Augmentation Study
- Alternative Water Sources Subregional Feasibility Study: Fort Lauderdale, Sunrise, and Miami-Dade County
- S-155A Divide Structure
- Florida City Canal Water Control Structure

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CERP Fran Reich Preserve Reservoir

This project provides water supplies needed for Everglades MFL recovery. This facility will capture and store the excess surface water runoff from the Hillsboro Basin and releases from the Arthur R. Marshall Loxahatchee National Wildlife Refuge. The project is located in Palm Beach County near the East Coast Protective Levee and Hillsboro Canal. The project will complete a 1,660-acre, 8-foot deep, aboveground impoundment to capture excess surface water in the Hillsboro Canal. With the reservoir in place, dry season water withdrawals from the refuge to meet water demands will be reduced, allowing more natural and consistent water levels within the refuge. Benefits to the downstream estuaries and reduced groundwater seepage from the refuge are also expected.

USACE and SFWMD executed the project partnership agreement for Phase I (L-40 improvements) construction in June 2010 and USACE initiated construction. The original construction strategy for the project involved a single contract. However, in order to utilize funding from the American Recovery and Reinvestment Act of 2009, a standalone and usable portion of the project was identified for construction. The standalone features are the embankment (L-40 modifications) and the S-530 spillway. These Phase 1 features will reduce the amount of seepage loss from the adjacent refuge. Reducing seepage will help increase the amount of water that remains in that natural system, especially during dry periods. Maintaining the additional water will allow for ecological habitat improvements in the refuge.

USACE terminated the Phase 1 contract in July 2012 with approximately 20 percent of the work completed. In January 2013, USACE awarded a contract to construct the remaining features. Work on the project began in April 2013 with expected completion by December 2014.

The Phase II of this project requires congressional authorization due to increased project cost. Phase II, if approved, will include additional site preparation, earthwork, construction of pump stations, canal improvements, embankment, placement of geocells on the embankment exterior, and placement of soil cement on embankment interior.

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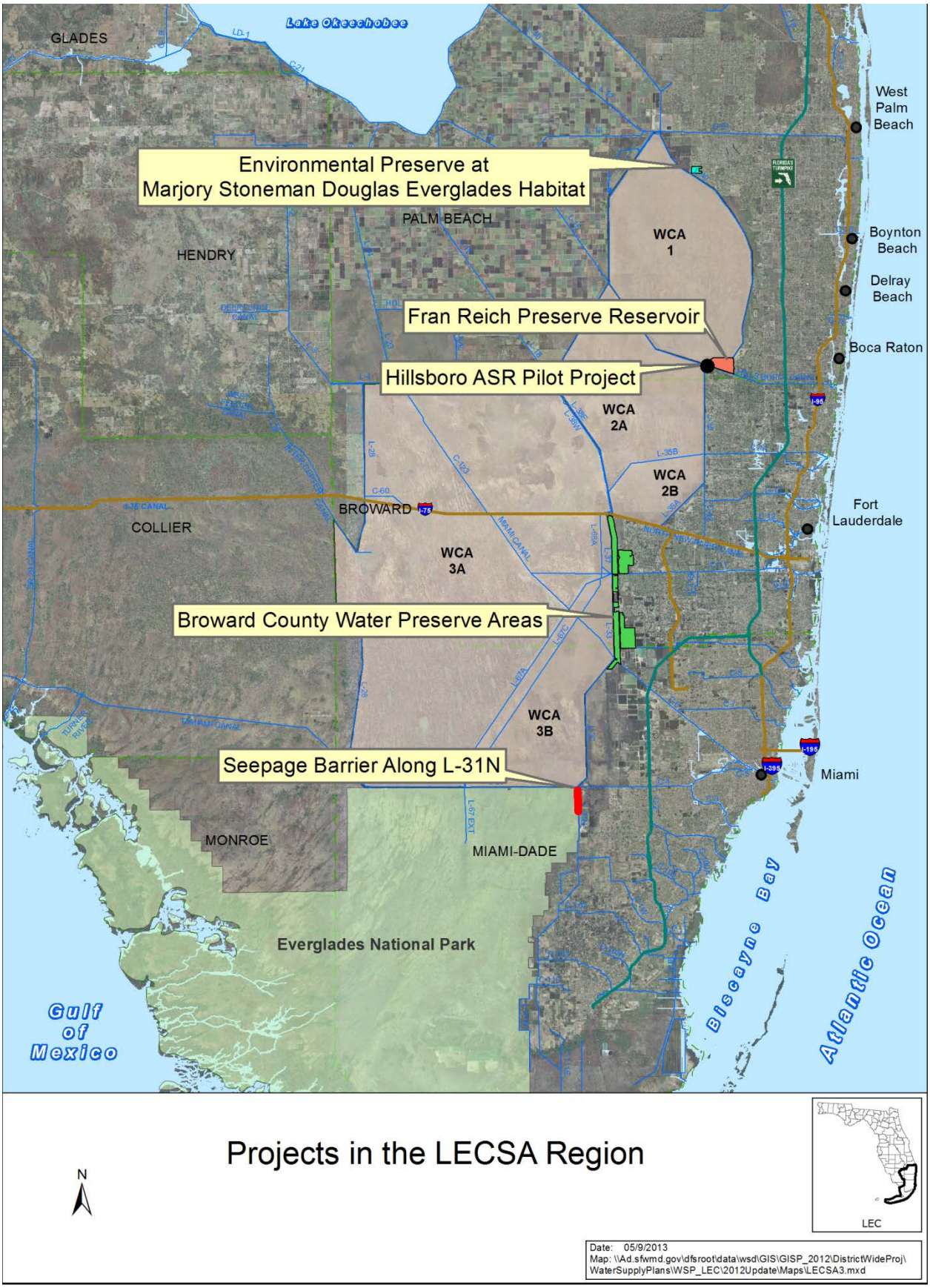

Figure 39. Projects in the Lower East Coast Service Area (LECSA).

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CERP Hillsboro ASR Pilot Project

This project is located just south of the Arthur R. Marshall Loxahatchee National Wildlife Refuge and north of the Hillsboro Canal on a 1,660-acre tract of SFWMD-owned land in south-central Palm Beach County. The project includes the construction of a 5-million gallons per day (MGD) ASR well and several monitoring wells. The project's purpose is to evaluate and reduce the technical and regulatory uncertainties of implementing the full-scale Hillsboro ASR project as planned for CERP.

As the lead agency, SFWMD prepared the plans and specifications for the 5-MGD ASR system that was installed in fall 2008. Cycle testing began in January 2010 and finished in 2012. The system operated successfully. Although some arsenic was observed in water recovered during the first cycle, concentrations declined to below regulatory concern during subsequent cycles. Recovery efficiencies increased from approximately 21 percent during the first cycle to above 40 percent by third cycle. Continued improvement is anticipated as the system is operated in the future. Cycle testing indicates that ASR technology can be implemented near the Fran Reich Preserve Reservoir. The SFWMD and USACE are preparing the final project technical data report with finalization set for 2013. The future use of the project for non-CERP purposes is under evaluation.

CERP Broward County Water Preserve Areas

This project is designed to perform three primary functions:

- Reduce seepage loss from WCA 3A and WCA 3B to the C-11 and C-9 basins.
- Capture, store, and distribute surface water runoff from the western C-11 Basin.
- Wetland restoration

The project will construct the following major infrastructure features:

- An 1,168-acre impoundment to capture and store runoff from the C-11 Basin, reduce pumping of surface water into WCAs, and provide releases for other regional uses
- A 4,353-acre seepage management area that would establish a buffer, reducing seepage to and from WCAs, and maintain flood protection
- An 1,641-acre impoundment that would capture and store surface runoff from the C-9 Basin, store C-11 Impoundment overflow, manage seepage, and provide releases for regional benefit

Additional project functions include maintaining existing level of service flood protection, groundwater recharge, increasing spatial extent of wetlands, and improving hydroperiods and hydropatterns in WCA 3A and WCA 3B. The preserve areas will benefit federally-listed threatened and endangered species and many wading birds. This project provides water supplies needed for Everglades (including WCAs and Everglades National Park) MFL recovery. The chief's report was completed in May 2012 and the record of decision for the project implementation report was submitted in October 2012 to the United States Congress for authorization.

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CERP Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat

The Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat (formerly called the Acme Basin B Discharge Project) is the first CERP project completed in Palm Beach County. The project's primary purpose is to provide water quality and flood mitigation benefits. It improves water quality by diverting the direct discharge of urban runoff away from the Arthur R. Marshall Loxahatchee National Wildlife Refuge. The project directs runoff north to STA 1 East, before it enters the refuge.

Marjory Stoneman Douglas Everglades Habitat adjacent to the Village of Wellington

Two pump stations and a 365-acre water storage area were constructed to impound flood waters and provide a buffer between natural and developed areas. SFWMD and the Village of Wellington invested approximately $35 million in the project. Construction began in 2007 and finished in 2010. This project provides water supplies needed for Everglades (including WCAs and Everglades National Park) MFL recovery.

The project also has recreational and educational aspects. Visitors can access the site. Over two miles of paved pedestrian paths and a six-story observation tower are contained within the 365-acre site. The paths connect seven learning areas that explain native vegetation and wildlife.

L-31N Seepage Management Project

The Miami-Dade Limestone Products Association constructed the L-31N Seepage Management Project using funds collected through a state imposed fee on limestone products sold by the mining companies operating in the Lake Belt region of Miami-Dade County. The barrier's purpose is to reduce the seepage from Everglades National Park. In November 2011, the Lake Belt Mitigation Committee approved Phase 1 of the L-31N Seepage Management Project. Under Phase 1 and the L-31N Seepage Management Field Test, a 35-foot deep seepage barrier was constructed extending two miles south from Tamiami Trail along the berm of the L-31N Canal. Construction of the barrier was complete in July 2012.

A monitoring program is now under way to measure changes in water level and L-31N Canal flow using a network of hydrologic data gathering sites. The monitoring program, designed to last two years, will provide the necessary information to evaluate performance of the barrier. This project helps conserve water supplies needed for Everglades MFL recovery.

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Lower East Coast Subregional Model Update

SFWMD developed the LECsR Model based on the United States Geological Survey's (USGS) Modular Three-dimensional Finite-difference Groundwater Flow Model code, referred to as MODFLOW. This model simulates groundwater flow in the LEC Planning Area (**Figure 40**). It is used for planning and regulatory purposes. SFWMD conducted a peer review of the LECsR Model. The peer review panel prepared a report in June 2006. SFWMD updated the model to reflect the majority of the primary peer review comments. The tool, and variations of the tool, were used to address a number of site-specific issues relating to water use permitting, the CERP Loxahatchee River Watershed Restoration Project, C-4 Impoundment Project, and C-51 Reservoir Feasibility Study.

Figure 40. Domain of the LECsR Model.

Saltwater Interface Mapping

In August 2011, SFWMD published maps displaying the estimated position of the freshwater-saltwater interface in the coastal SAS of St. Lucie, Martin, Palm Beach, Broward, Lee, and Collier counties. SFWMD used data from April and May 2009 (i.e., the end of the dry season) to document the current inland extent of the saltwater front within the aquifer for future comparison. The maps are based on measured or estimated chloride concentrations in water samples from three primary sources: 1) wells of water use permittees 2) USGS wells, and 3) SFWMD wells. In a separate effort, Miami-Dade County worked with USGS to develop saltwater intrusion maps of their county.

Maps for each county are at the following web locations:

- Palm Beach County: www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/palm_beach_isochlor_apr-may_2009opt.pdf
- Broward County: www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/broward_isochlor_apr-may_2009opt.pdf
- Miami-Dade County: An interactive saltwater intrusion map viewer is at www.envirobase.usgs.gov/FLIMS/SaltFront/viewer.htm

A review of previous freshwater-saltwater interface maps of South Florida indicate that the interface is dynamic but has not moved appreciably over time. This is due, in large part, to coastal salinity control structures maintaining adequate freshwater heads. Maps prepared at five years intervals document any progression of the saltwater front within the aquifers.

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Gun Club Road Satellite Reuse Facility Feasibility Study and Pilot Project

From 2005 to 2006, SFWMD and Palm Beach County conducted the Gun Club Road Satellite Reuse Facility Feasibility Study and Pilot Project. The project evaluated the feasibility of providing reclaimed water for irrigation at SFWMD's headquarters and the immediate vicinity in West Palm Beach. Two types of membrane bioreactor treatments were tested to produce reclaimed water that meets applicable requirements. The study evaluated construction and operational costs, potential end users, the distribution system, and overall cost. Potential users included SFWMD headquarters, Trump International Golf Course, United States Army Reserve facilities, Lake Lytal Park, and Palm Beach International Airport.

Reuse system

The results of the study indicated limited benefits to the county's water supply because of the project's distance from supply wells. Based on these findings, as well as financial limitations and other priorities, Palm Beach County and SFWMD decided not to move forward with the project.

Groundwater Replenishment via Canal Recharge Augmentation Study

Canal recharge or indirect aquifer recharge refers to the replacement of existing fresh surface water regional water supply deliveries with highly treated reclaimed water. Canal recharge would reduce dependency on regional resources and reuse effluent that is currently disposed of by deep well injection or discharge to the ocean. A legislatively directed study was completed by FDEP in 2006 evaluating canal recharge. In addition, SFWMD sponsored, in coordination with two local utilities, two advanced wastewater treatment pilot studies to evaluate reusing highly treated reclaimed water for canal and groundwater discharge, which were completed in 2008.

2007 FDEP Report to the Legislature on Canal Recharge

In 2004, the Florida Legislature directed (Chapter 2004-381, Laws of Florida) FDEP, in coordination with SFWMD, to conduct a study to investigate the feasibility of discharging reclaimed water into canals and the aquifer system as an environmentally acceptable means of augmenting groundwater supplies and enhancing natural systems in the LEC Planning Area. The legislature recognized direct or indirect discharge of reclaimed water into canals and the aquifer system for transport and subsequent reuse may provide an environmentally acceptable means to augment water supplies and enhance natural systems, but also that there are water quantity and water quality challenges that must be better understood and resolved. The study process, including workshops, presentations, and findings can be found at www.dep.state.fl.us/water/wqssp/canals.htm.

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FDEP published a preliminary final draft document, *Canal Recharge: A Report to the Governor and Legislature*, reflecting the outcome of this investigation (FDEP 2006). The report was never finalized. Three fundamental considerations guided FDEP's evaluation of canal recharge feasibility: 1) whether canal recharge could be considered beneficial reuse under Florida law; 2) whether those benefits could be achieved without compromising water quality; and 3) whether canal recharge, when compared with alternative types of reuse and water supply, would be cost effective. Modeling for the study indicates that reclaimed water could potentially reduce regional system releases by an average of 27 percent.

Water quality was another consideration. Under Florida's water quality standards, canal recharge likely could be authorized only if the highest available wastewater treatment technology were employed—generally speaking, reverse osmosis with advanced nutrient removal and high-level disinfection. Project-specific analyses would have to be undertaken to account for these costs and the revenue sources to underwrite them, as well as the potential value of the natural system or water supply benefits to be achieved.

Based on this study, FDEP concluded that individual canal recharge projects may prove worthwhile and recommends evaluating any proposed canal recharge project on its individual merits. However, the report also stated there is no basis to conclude at the time that canal recharge should be implemented on a regional scale.

The report contained the following specific recommendations:

- Canal recharge is one of many options that may help achieve water supply goals in southeastern Florida. These options should be evaluated and compared directly in terms of water supply and natural systems benefits, water quality implications, relative costs and economic value, and implementation demands.
- Canal recharge should be factored into local and regional water supply planning and development in the proper context, combined with other reuse and alternative water supply options to be judged based on relative environmental merit, cost-effectiveness, and public interest.
- It would be appropriate for entities interested in exploring specific canal recharge projects to work with FDEP and SFWMD to submit permit applications. A detailed review of a specific project, with this study as context, would yield much more information as to the value of canal recharge. Any such project would have to include a more refined accounting of the relationship between the amount of water released to the canals and the volume of groundwater recharge thereby achieved.

Local Pilot Studies

To further investigate treatment associated with direct and indirect canal recharge, SFWMD entered into interagency agreements with the cities of Plantation and Sunrise to perform advanced wastewater treatment pilot studies to evaluate reusing highly treated reclaimed water for canal and groundwater discharge. These pilot studies investigated the

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performance of different physical, chemical, and biological advanced wastewater treatment technologies. The studies also evaluated the removal of micro-constituents (pharmaceuticals or personal care products) from the wastewater; modeled the fate, transport, and impact of discharged reclaimed water; and evaluated the toxicity of reclaimed water discharge into natural water bodies. For more information see www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/reuse_pilot_swwwtf.pdf for the City of Sunrise (MWH Global, Inc. 2008) and www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/reuse_pilot_awt.pdf) for the City of Plantation (Hazen and Sawyer 2008).

Alternative Water Sources Subregional Feasibility Study

During the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007), it was recognized that some of the assumptions of the *2000 Lower East Coast Regional Water Supply Plan* (2000 LEC Plan) (SFWMD 2000) were no longer valid, including the completion of certain CERP projects and the associated water that was assumed to be available. Moreover, establishment of the Everglades MFL and the associated recovery strategy limited the ability of Public Water Supply utilities to meet future water demands from traditional sources. Analyses conducted indicated that certain subregions of the LEC Planning Area—Fort Lauderdale, Sunrise, and Miami-Dade County—were likely to face greater challenges in meeting water demands. Towards that end, SFWMD initiated a feasibility study to evaluate the potential for subregional alternative water supply sources to meet these demands. The study, *Alternative Water Sources Sub-Regional Feasibility Study: Fort Lauderdale, Sunrise, and Miami-Dade County* (CDM 2006), included development of evaluation criteria and cost estimates for identified technologies as well as first and second tier screening of alternatives. Four projects were selected for more detailed analysis including preparation of conceptual designs. Given the subregional nature of the projects, a 20-MGD capacity was selected as the minimum amount to be provided that might be beneficial.

The study developed conceptual designs for a potential canal augmentation project coupled with a large user reclaimed water irrigation project for the City of Sunrise, and a combination of brackish reverse osmosis water treatment with a satellite wastewater treatment facility to provide indirect potable water recharge in Fort Lauderdale. Planning level data developed in the study, and subsequent conceptual designs, provided information helpful to LEC Planning Area water users during consideration of alternative water supply project options. Cost estimates developed for each treatment technology utilized in the conceptual designs provided a resource for alternative water supply feasibility assessment in the LEC Planning Area. The final report for this project was published in 2006.

S-155A Divide Structure

The 2000 LEC Plan contained recommendations for CERP planners to conduct additional analysis in the planning and placement of the proposed S-155A divide structure. USACE constructed S-155A and transferred it to SFWMD in 2004. The S-155A divide structure, along with S-319 and STA-1 East, were constructed by the USACE as part of the C-51

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Western Basin Flood Control Project; which is considered part of the base condition of CERP. However, S-155A's intended use was substantially modified from the previous conceptual plan. Initially, the structure was to be integrated into the CERP North Palm Beach County Project. It was to be part of a system designed to benefit Lake Worth Lagoon by improving water quality and reducing discharges from the C-51 Canal using a backpumping and treatment concept. However, the CERP North Palm Beach County Project has since been reconfigured and renamed the Loxahatchee River Watershed Restoration Project. The C-51 backpumping and treatment elements were eliminated from the project. At present, the S-155A divide structure divides the C-51 Basin into the Western C-51 and Eastern C-51 basins. It passes flood discharges from the Western C-51 and S-5A basins to the east via the C-51 Canal when STA 1 East reaches maximum operational depths and no longer has the capacity for additional inflows. The S-155A also passes flood discharges from the L-8 Basin to the east via the C-51 Canal at times.

Florida City Canal Water Control Structure

The Florida City Canal located in southern Miami-Dade County is a tributary to the L-31E and C-103 canals, which discharge through the SFWMD's S-20F structure into Biscayne Bay. Miami-Dade County wishes to improve water management and wetland resources on environmentally endangered lands in the vicinity of the Florida City Canal. The county proposes to construct a water control structure in the Florida City Canal at the intersection with Southwest 107th Avenue, and to retrofit existing culverts to improve wetlands hydrology of Miami-Dade County owned environmentally endangered lands adjacent to the canal. Construction is anticipated to begin in early 2014 and take less than one year to construct; however, it is contingent upon funding.

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DISTRICTWIDE WATER RESOURCE DEVELOPMENT PROJECTS

Water resource development projects encompassing more than one planning area are considered districtwide projects. **Table 12** at the end of this section summarizes the estimated costs and timeframes of the described districtwide projects. Aspects specifically pertaining to or having relevance to the LEC Planning Area are identified within the context of these districtwide projects. **Table 12** does not include other programs with water resources development components, such as CERP, which are primarily budgeted as ecosystem restoration projects; however these were discussed earlier in the chapter.

SFWMD undertakes districtwide water resource development projects consistent with sections 373.05 and 373.019, Florida Statutes (F.S.). Specifically, Section 373.019(24), F.S. states the following:

> "Water resource development" means the formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation, and maintenance of major public works facilities to provide for flood control, surface and underground water storage, and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities.

Most water resource development projects described in this section support and enhance water supply development projects but do not themselves yield specific quantities of water. For example, groundwater monitoring groundwater assessment and modeling provide important information about aquifer characteristics (e.g., hydraulic properties and water quality) but do not provide details on water quantities. Information derived from these water resource development projects supports water supply development projects (i.e., developing appropriate facility design identifying safe aquifer yields, and evaluating the economic viability of projects). SFWMD is the implementing agency of the projects described in this section.

The following projects have been completed since the last plan update and are discussed in this section:

- Evapotranspiration Measurement Project
- Water Supply Cost Estimation Study
- Water Desalination Concentrate Management and Piloting Study

The following ongoing and future projects are also discussed in this section:

- MFL, Water Reservation Activities and Restricted Allocation Areas

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- Comprehensive Water Conservation Program
- Alternative Water Supply
- Drilling and Testing
- Groundwater Assessment
- Groundwater, Surface Water, and Wetland Monitoring
- Groundwater Modeling

Completed Districtwide Projects

Evapotranspiration Measurement Project

Evapotranspiration (ET) is a large part of the hydrologic budget in Florida, ranging from 30 to over 100 percent of average precipitation. In the past, the accuracy of hydrologic models, basin-scale studies, water budgets, and other hydrologic analyses throughout the state was limited because of the lack of accurate estimates for this large water loss. Scientists and water managers in Florida benefit from having a network of consistently operated high quality ET stations from representative land use areas using state-of-the-science methods.

The ET Measurement Project collected information to improve methods for computing the potential ET and reference ET. Potential ET is a necessary data input for most hydrologic simulation models. Reference ET is a necessary input for SFWMD permit applications.

Over the years, USGS, in cooperation with SFWMD, completed a number of specialized hydrogeologic studies to address specific SFWMD needs. The information provided from these studies was necessary to enhance the understanding of ET rates in various wetland and upland plant communities, and similar issues. USGS completed a series of ET studies between October 2000 and September 2011.

The objectives of the studies were as follows:

- Measure actual ET from representative land covers in Florida
- Develop models to estimate projected ET from environmental variables such as depth to water, season, and net radiation
- Provide 2-kilometer gridded satellite-based estimates of potential and reference ET on a daily timescale for the entire state.

The data products for this series of studies include the following:

- Daily values of ET, archived in USGS National Weather Information System database, which are accessible at fl.water.usgs.gov/et/etdata.html.
- The daily potential and reference ET data sets, by year and county from 1995 through 2010, which are accessible at fl.water.usgs.gov/et/.

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- Big Cypress field investigations are published in *Evapotranspiration over Spatially Extensive Plant Communities in the Big Cypress National Preserve, Southern Florida, 2007–2010* (Shoemaker et al. 2011), which is available at pubs.usgs.gov/sir/2011/5212/.

Water Supply Cost Estimation Study

The objective of this project was to develop engineering cost estimation relationships for evaluating water supply alternatives for SFWMD's regional planning areas. The study evaluated options using groundwater, surface water, seawater, ASR, and reclaimed water. The final cost study was published in two reports: *Water Supply Cost Estimation Study* (CDM 2007a) and *Water Supply Cost Estimation Study – Phase II Addendum* (CDM 2007b). Descriptions of these studies are as follows:

- ***Water Supply Cost Estimation Study*** **–** This study developed opinions of probable costs for various water treatment and disinfection technologies, water treatment plant and distribution components, and various wastewater treatment technologies for capacities of 5, 10, 15, and 20 MGD based on project records. The report provides estimates of costs for wells, well treatment methods, wastewater treatment methods, deep injection well disposal, ASR, and surface water storage projects. This report is available at www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/water%20supply%20cost%20estimation%20study%202-2007_cdm.pdf.
- ***Water Supply Cost Estimation Study – Phase II Addendum*** **–** This addendum complements the previous study providing cost estimates for additional capacities of 1 and 3 MGD, as well as estimates for wastewater granular filters and chlorine disinfection using onsite generation of hypochlorite. See www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/wtrsupply_costeststudy_phaseii_add_21-2007.pdf for this report.

Water Desalination Concentrate Management and Piloting Study

SFWMD undertook this study to evaluate alternatives for concentrate minimization in South Florida and provide technological recommendations. The study included two phases. Phase 1 constituted several desktop evaluations of four concentrate minimization methods and several representative reverse osmosis treatment plants in the SFWMD region. Phase 2 further evaluated, through pilot testing, a concentrate minimization method at a representative brackish water reverse osmosis plant site, which was selected based on Phase 1 evaluations.

The purpose of the pilot test was to demonstrate the feasibility of the selected concentrate minimization methodology and evaluate its performance. The pilot study was performed at the City of North Miami Beach Norwood–Oeffler Water Treatment Plant. The testing began in August 2009 and finished in November 2009. The pilot study demonstrated stable performance, effectively increasing the overall system recovery from 75 to 88 percent under conservative operating conditions for secondary reverse osmosis, implying an

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increase of 13 percent in production efficiency. The study showed the process is viable for representative South Florida brackish water.

The study recommended further optimization of the process and operational parameters in a subsequent study. This subsequent study would be conducted on a larger demonstration scale and operated over a longer duration to capture any size-related scale-up effects and seasonal variability. The report (Carollo Engineers 2009) can be found at www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/waterdesalinationconcentratemgmtpiloting-dec09-carollo.pdf.

Ongoing and Future Districtwide Projects

MFL, Water Reservation Activities and Restricted Allocation Areas

MFLs, water reservations, and restricted allocation area rules are water resource protection measures that have been developed to help ensure the sustainability of water resources within the SFWMD. The costs included in **Table 12** are for contracts (such as ecological monitoring) and staff time.

For information on MFLs, water reservations, and restricted allocation areas, see **Chapter 3** of this report. **Chapter 3** summarizes current rules in effect as of 2013. Additional information can also be found in **Appendix B**, which includes a table (Table B-3) that lists the status of water resource development projects that provide water supplies associated with MFL recovery and prevention strategies.

Comprehensive Water Conservation Program

The long-standing conservation goal of SFWMD is to prevent and reduce wasteful, uneconomical, impractical or unreasonable uses of water resources. This is addressed through planning, regulation, the use of alternative sources including reclaimed water, public education, and demand reduction through conservation technology, best management practices and water-saving funding programs. The costs included in **Table 12** are for contracts (such as WaterSIP) and staff time.

The Comprehensive Water Conservation Program is a series of implementation strategies designed to create an enduring conservation ethic and permanent reduction in water use. It was approved in 2008 and developed in conjunction with stakeholders through the SFWMD's Water Resources Advisory Commission. The program is organized into regulatory, voluntary and incentive-based, and educational and marketing initiatives. More detailed information about the Comprehensive Water Conservation Program, is found in Chapter 5: Evaluation of Water Source Options. Additional supporting information can be found in **Appendix D** and Chapter 5 of the *2011–2013 Water Supply Plan Support Document* (SFWMD 2013a).

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Alternative Water Supply

The ability to meet the need for additional water supply hinges on efforts to develop region-specific sources that offer an alternative to traditional groundwater and surface water. The costs included in **Table 12** are for contracts and staff time. Through the Alternative Water Supply Funding Program, SFWMD assisted permittees in the development of reclaimed water projects, water reclamation facilities, brackish water wellfields, reverse osmosis treatment facilities, and ASR well systems. From fiscal year (FY) 2007 to FY 2012, SFWMD, in cooperation with the State of Florida, provided more than $123 million in alternative water supply funding for 212 projects. Ninety of these projects are within the LEC Planning Area. Between FY 2007 and FY 2011, projects funded by the Alternative Water Supply Funding Program created 72 MGD of new water capacity in the LEC Planning Area. The water sources include 27 MGD of brackish water, 21 MGD of reclaimed water, and 23 MGD of surface water/storm water.

Additional information can be found in **Chapter 6** of this update. A full description of Alternative Water Supply-related projects and associated funding is contained in the SFWMD's Alternative Water Supply Annual Reports, prepared pursuant to Section 373.707(7), F.S., and published in Volume II of the annual South Florida Environmental Reports (www.sfwmd.gov/sfer).

Drilling and Testing

Drilling and testing includes the installation of wells for aquifer investigations of short to long-term monitoring of aquifer water levels. This work includes contract and staff time for items such as drilling and well construction, geophysical logging, pump tests, sediment analysis, and lithological descriptions. The costs included in **Table 12** are for contracts (such as drilling) and staff time.

The SFWMD's knowledge of South Florida hydrogeology is enhanced whenever exploratory/test wells are constructed. Such increased understanding has improved the accuracy of groundwater modeling and decision making regarding the approval of consumptive use permits.

Groundwater Assessment

Groundwater assessment includes items such as the development of hydrostratigraphic maps and saltwater interface maps. The costs included in **Table 12** are for staff time.

Saltwater Interface Mapping

SFWMD publishes maps displaying the estimated position of the freshwater-saltwater interface in the coastal SAS of St. Lucie, Martin, Palm Beach, Broward, Lee, and Collier counties to document the current inland extent of the saltwater front within the aquifer for future comparison. The SFWMD publishes saltwater interface maps in five-year intervals

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based on ongoing collection and analysis of groundwater monitoring data. Maps for Miami-Dade and Monroe counties are prepared by the USGS.

Groundwater, Surface Water, and Wetland Monitoring

Information regarding the groundwater and surface water levels is essential to managing and protecting South Florida's water resources. Real-time data combined with historical information about water levels, weather, rainfall, and water quality changes help managers make water resource decisions. The costs included in **Table 12** are for contracts (such as USGS contracts) and staff time.

Water level and water quality monitoring at existing wells provide critical information to aid SFWMD in the development of groundwater models, assessing groundwater conditions, and management of these resources. SFWMD maintains extensive groundwater monitoring networks. SFWMD partners with USGS, providing additional support for ongoing monitoring. Data are archived in DBHYDRO—SFWMD's corporate environmental database—which stores hydrological, meteorological, hydrogeological, and water quality data. USGS monitors, archives, and publishes data annually.

Districtwide groundwater monitoring activities related to the LEC Planning Area include the following:

- **USGS Water Level Monitoring –** An ongoing effort to collect data from groundwater level monitoring in the SAS. The project includes well and recorder maintenance as well as archiving data in the USGS database. In FY 2011, the groundwater monitoring network was reduced due to budgetary constraints, loss of sites, well destruction, and equipment damage.
- **Groundwater Monitoring –** An ongoing effort of monitoring groundwater levels in all water supply planning areas of the SFWMD. Monitoring includes 760 groundwater stations districtwide as of 2012. Monitoring is done for the SAS, intermediate aquifer system, and Floridan aquifer system (FAS), and recorders are maintained. Data are collected, analyzed, validated, and archived in DBHYDRO. Data are available through www.sfwmd.gov/dbhydro.
- **Regional FAS Exploration and Well Maintenance –** Water level and water quality monitoring is ongoing at select FAS well sites districtwide. SFWMD monitors water levels at 61 sites in its FAS well network. SFWMD has installed one FAS well in the LEC Planning Area since the 2005–2006 LEC Plan was published—a tri-zone monitor well on the L-8 Canal in Palm Beach County. Well maintenance is conducted at FAS well sites as needed. Data are collected, analyzed, validated, and archived in SFWMD's DBHYDRO database.
- **Hydrogeologic Database Improvements –** This effort involves uploading of backlogged data and conducting miscellaneous database corrections.
- **Monthly Groundwater Level Measurements** – Continued water level monitoring at select sites, including data collection, data analysis, and validation.

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Groundwater Modeling

Regional groundwater flow models simulate the rate and direction of movement through the subsurface. The models include the major hydrologic components of the hydrologic cycle. They are used in water supply planning to understand the effects of current and future water supply usage. The costs included in **Table 12** are for contracts (such as peer review) and staff time.

Floridan Aquifer System Model and Database Development

SFWMD recognized the need to develop a FAS groundwater model in the LEC Planning Area to improve management of this water resource given projected limits on traditional sources (e.g., Biscayne aquifer) to meet future water demands. SFWMD developed Phase I of the Lower East Coast Floridan Model (HydroGeologic, Inc. 2006), using USGS' computer code SEAWAT 2000—a fully coupled or uncoupled density-dependent flow and transport model—to allow simulation of density-dependent flow given the brackish water quality of the FAS. The availability of additional hydrogeologic and validated water use data, as well as a desire to expand the model domain to include the Upper East Coast Planning Area, led to the initiation of a Phase II modeling project. Development of this combined LEC and Upper East Coast model, referred to as the East Coast Floridan Aquifer System Model, began in 2007 and was completed in October 2008 (Golder Associates 2008).

An independent peer review of this model was completed in June 2011. Peer review comments suggested development of a predevelopment steady-state model, changes in boundary conditions, incorporation of more recent hydrogeologic and time series data, and recalibration. SFWMD incorporated these comments using data available up until December 2011. The predevelopment model, including revised boundary conditions and updated hydrogeologic and historical water use data, was recently calibrated. The final transient, density-dependent model—now known as the East Coast Floridan Model—is scheduled for completion by the end of 2013. Model documentation will then follow. Once complete, the model will be available to address regional resource questions, including those that will arise during the next LEC water supply plan update. **Figure 41** shows the model boundary.

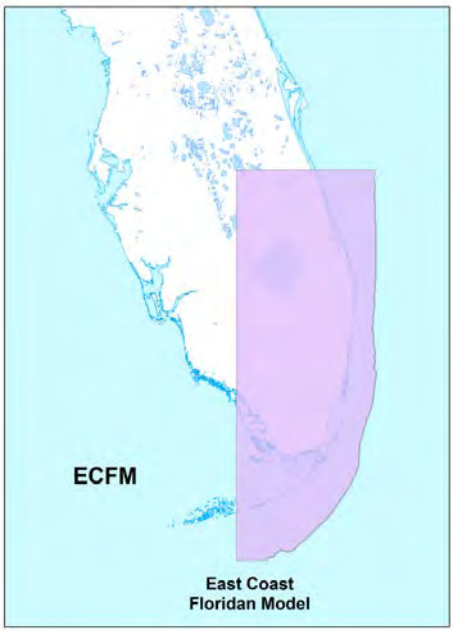

Figure 41. East Coast Floridan Model boundary.

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Lower West Coast Floridan Aquifer Model, Incorporation of Peer Review Comments

The Lower West Coast Floridan Aquifer Model extends into the western portion of the LEC Planning Area (**Figure 42**). It includes Hendry County and fragments of western Broward and Miami-Dade counties. In 2008, SFWMD retained three independent groundwater modeling experts to conduct a technical peer review of its draft Lower West Coast Floridan Aquifer Model, which uses USGS's SEAWAT 2005 code. The peer review panel completed its report in August 2008.

Table 12 provides for estimated costs and timeframes for completion of water resource development projects described in this chapter or in **Chapter 5**.

Figure 42. Lower West Coast Floridan Aquifer Model boundary.

Table 12. Implementation schedule and costs for ongoing districtwide water resource development projects. Source: Table 5A-1 in Martin (2012).

Districtwide Water Resource Development Projects	Plan Implementation Costs ($ in thousands)					
	FY2013	FY2014	FY2015	FY2016	FY2017	Total
MFL, Water Reservation Activities and Restricted Allocation Areas [a] Est. start date: 1995 Est. finish date: ongoing	658	667	660	660	660	3,305
Comprehensive Water Conservation Program [a] Est. start date: 1977 Est. finish date: ongoing	903	867	850	850	850	4,320
Alternative Water Supply [a] Est. start date: 1997 Est. finish date: ongoing	2,900	1,590	1,840	1,840	1,840	10,010
Drilling and Testing [a] Est. start date: 1990 Est. finish date: ongoing	1,409	1,157	1,140	1,140	1,140	5,986
Groundwater Assessment [b] Est. start date: 2002 Est. finish date: ongoing	40	40	40	40	40	200
Groundwater, Surface Water, and Wetland Monitoring [a] Est. start date: 2002 Est. finish date: ongoing	1,517	1,380	1,380	1,380	1,380	7,037
Groundwater Modeling [a] Est. start date: 1997 Est. finish date: ongoing	402	406	406	406	406	2,026
Sub-Total	**7,829**	**6,107**	**6,316**	**6,316**	**6,316**	**32,884**

a. Includes staff time and contract dollars

b. Includes staff time only

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SUMMARY

Water resource development projects serve various purposes in support of water supply development. Benefits of the water resource development projects discussed in this chapter include the following:

- Improved understanding of the hydrogeologic system that is the source of both traditional and alternative water supplies for the LEC Planning Area
- Prevention of the loss of natural resources
- Preservation of existing supplies through better resource understanding and management and continued implementation of regional resource monitoring
- Water conservation to protect water sources and provide an efficient way to expand current water supplies
- Increased future supply availability

Table 13 provides that status of all of the projects discussed in this chapter.

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Table 13. Project status table.

Project	Completed Elements	Status of Uncompleted Elements
Lake Okeechobee Region		
CERP Lake Okeechobee Watershed Project		• Waiting for decisions on federal/state cost sharing.
Taylor Creek, Nubbin Slough, and Lakeside Ranch STA pilot projects	• Taylor Creek STA Pilot Project became operational in 2011. • Lakeside Ranch STA Pilot Project Phase 1 became operational in 2012.	• Lakeside Ranch STA Pilot Project Phase 2 waiting for construction funding. • Nubbin Slough STA Project is complete, but nonoperational until repaired.
USACE Herbert Hoover Dike Major Rehabilitation	• USACE completed assessment of Hebert Hoover Dike and classified it a damn safety action classification of Class 1. • Culvert 14 removed and replaced with fill in 2011.	• Reach 1 cutoff wall to be complete in 2013. • Replacement work began on culverts in 2012. • Replacement of other culverts to be awarded by late 2013. • Replacement of all 32 culverts to be completed by 2018. • Cutoff wall and/or seepage management systems to be implemented in Reaches 2 and 3 by 2022. • Remaining rehabilitation projects will be developed based on the findings of the Herbert Hoover Dike Dam Safety Modification Study, which is underway, and expected to be complete in 2015.
Lake Okeechobee Habitat Enhancements	• Most activities completed by 2011.	• Apple snail enhancement continues in 2013.
Everglades Region		
Restoration Strategies Regional Water Quality Plan	• In 2012, $63.9 million contract awarded to design/build the L-8 FEB including an inflow structure, internal improvements, revetment strengthening, a pump station, and six pumps. • Final design of A-1 FEB completed in 2013. • In 2013, FDEP issued a permit authorizing SFWMD to build, operate, and maintain the A-1 FEB. • L-8 Divide Structure (G-541) preliminary design completed in 2013.	• L-8 FEB design and construction initiated and expected to be complete December 2016. • A-1 FEB construction expected to be complete July 2016. • S-5AS Divide Structure modification initiated and expected to be complete September 2016. • S-375 structure expansion initiated and expected to be complete December 2018. • STA 1 West expansion planned and expected to be complete December 2018. • L-8 Divide Structure (G-541) construction expected to be complete March 2016. • Completion of all elements estimated by 2025.
C-139 Annex Restoration	• The Lake Belt Mitigation Committee approved the C-139 Annex for wetlands mitigation in 2012.	• Restoration will progress as mitigation funds allow and is expected to be complete in 2018.

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Table 13. Continued.

Project	Completed Elements	Status of Uncompleted Elements
Everglades Region (continued)		
Modified Water Deliveries to Everglades National Park	• 8.5-Square Mile Area protection features completed in 2008. • Taylor Slough Bridge completed in 2007. • 1-mile bridge on Tamiami Trail completed in 2013. • L-67 extension canal and levee has 4 of 9 miles degraded.	• S-356 pump station construction is complete and awaiting permit to operate.
Decomp Physical Model	• Final permit for DPM construction and interim operations received in 2012. • Construction contract was awarded in May 2012.	• Testing is anticipated to begin in November 2013 and continue through 2014.
Ongoing CERP Planning including CEPP	• Draft project implementation report (PIR) complete and available for public comment in September 2013.	• When the PIR is finalized, the SFWMD Governing Board will consider approval. • USACE to complete PIR and chief of engineer's report to transmit project to United States Congress for authorization. • CERP planning on other projects is ongoing.
Wading Bird Monitoring Report	• Most recent report has been published.	• Reports completed annually to identify breeding colonies.
Historical Tree Island Mapping	• Completed in 2011	
Loxahatchee River		
Restoration Plan for the Northwest Fork of the Loxahatchee River	• SFWMD acquired land in support of Loxahatchee River restoration. • M-Canal widening completed in 2007. • C-18 Project culvert replacements completed in 2007. • Nine Gems restoration completed in 2010. • Culpepper hydrologic restoration completed in 2011. • Cypress Creek weir installation completed in 2012.	• Cypress Creek berm/water control structures is ongoing in 2013. • Loxahatchee Slough restoration is ongoing in 2013. • Planning is ongoing in 2013.
CERP Loxahatchee River Watershed Restoration Project	• SFWMD acquired land in support of Loxahatchee River restoration. • M-Canal widening completed in 2007. • G-160 completed in 2004 and currently operational. • G-161 completed in 2007 and currently operational. • Operational testing of L-8 and flow-way was conducted by SFWMD in 2011.	• Planning is ongoing in 2013.
Storage for Loxahatchee River	• In 2013, SFWMD and Palm Beach County conceptually agreed to the acquisition of approximately 1,800 acres. Design is expected to proceed in 2018.	

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Table 13. Continued.

Project	Completed Elements	Status of Uncompleted Elements
Biscayne Bay		
CERP BBCW Project Phase 1	• PIR and chief of engineer's report completed in 2012. • Cutler Wetlands Flow-way completed in 2013. • Deering Estate Flow-way construction completed and operational in 2012. • L-31 East Flow-way has 4 of 10 culverts completed.	• Signed record of decision transmitted to congress for authorization.
Developing Technical Information for Biscayne Bay	• Completed in 2008.	
Biscayne Bay Seepage Study	• Completed in 2008.	
Biscayne Bay and Watershed Water Quality Data Analysis	• Completed in 2008.	
Storm Event Sampling in the Biscayne Bay Watershed	• Completed in 2009.	
Characterization of Nearshore Epifauna Study	• Completed in 2011.	
Florida Bay		
USACE C-111 South Dade Project	• Seven of the twelve contracts for this project executed since work began in 1994.	• Execution of construction contracts is ongoing. In April 2012, SFWMD issued a solicitation to identify qualified firms for the eighth contract.
S-197 Structure Replacement Project		• Construction is ongoing with completion expected in 2013.
CERP C-111 Spreader Canal Western Project	• PIR completed in 2011 and chief of engineer's report completed in 2012. • SFWMD construction of major elements completed in 2012.	• Signed record of decision transmitted to congress for authorization.
Florida Bay MFL Prevention Strategy Monitoring and Research	• Monitoring data collection completed in 2012.	• Review of data collected from Florida Bay is under way and expected to be complete by 2013.
Lower East Coast Service Area		
CERP Fran Reich Preserve Reservoir	• PIR completed in 2006 and congress authorized construction for Phase 1 in 2007.	• Phase 1 under construction and expected to be complete by December 2014. • Additional authorization from congress needed for Phase 2.
CERP Hillsboro ASR Pilot Project	• Cycle testing completed in 2012.	• Final technical data report expected to be complete in 2013.
CERP Broward County Water Preserve Areas	• PIR and chief of engineer's report completed in 2012.	• Signed record of decision transmitted to congress for authorization.
CERP Environmental Preserve at the Marjory Stoneman Douglas Everglades Habitat	• Completed and operational in 2010.	
L-31N Seepage Management Project	• Construction of the underground barrier completed in July 2012.	• A performance monitoring program is under way until 2014.

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Table 13. Continued.

Project	Completed Elements	Status of Uncompleted Elements
Lower East Coast Service Area (continued)		
LECsR Model Update	• Completed in 2006.	• Updates ongoing in 2013.
Saltwater Interface Mapping	• Updated maps for LEC Planning Area completed in 2011.	• Monitoring is ongoing. • Preparation of saltwater interface maps will be complete in 2014.
Gun Club Road Satellite Reuse Facility Feasibility Study and Pilot Project	• Completed in 2006.	
Groundwater Replenishment via Canal Recharge Augmentation Study	• Completed in 2008.	
Alternative Water Sources Subregional Feasibility Study: Fort Lauderdale, Sunrise, and Miami-Dade County	• Completed in 2006.	
S-155A Divide Structure	• Completed in 2004 and operational.	
Florida City Canal		• If funded, construction is anticipated to begin in 2014 and be completed in 2015.
Districtwide Water Resource Development Projects		
ET Measurement Project	• Completed in 2011.	
Water Desalination Concentrate Management and Piloting Study	• Completed in 2009.	
Water Supply Cost Estimation Study	• Completed in 2007.	
MFL, Water Reservation Activities and Restricted Allocation Areas	• Three water reservation rules and two restricted allocation area rules adopted since 2007.	• Continued implementation of MFL recovery and prevention strategies. Development of new water reservation rules.
Comprehensive Water Conservation Program	• Program completed in 2008. • Adopted year-round irrigation rule in 2010.	• Continued operation of recognition and certification programs, regulatory initiatives, education, and outreach with funding support through WaterSIP.
Alternative Water Supply	• Funds distributed on an annual basis.	• Continued support through Alternative Water Supply Funding Program
Drilling and Testing		• Installation of monitoring wells and subsurface testing as needed.
Groundwater Assessment		• Preparation of saltwater interface maps for six counties will be complete in 2014.
Groundwater, Surface Water, and Wetland Monitoring		• Ongoing monitoring of 760 groundwater stations districtwide.
Groundwater Modeling	• East Coast Floridan Model completed in 2008 and peer review completed in 2011. • Peer review for the Lower West Coast Floridan Aquifer Model completed in 2008.	• East Coast Floridan Model completion, including response to peer review, expected in 2013.

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5

Evaluation of Water Source Options

The Lower East Coast (LEC) Planning Area historically relied on fresh water from aquifers and surface water sources to meet water supply needs. As population and water demand increased, the development of other water source options also increased. This chapter presents an evaluation of water source options available within the LEC Planning Area through 2030 to accommodate future urban and agricultural growth while meeting the needs of the ecosystem.

TOPICS

- Groundwater
- Surface Water
- Reclaimed Water
- Storage: Surface Water & Groundwater
- Seawater
- Water Conservation
- Summary

In the LEC Planning Area, traditional freshwater source options include groundwater from the surficial aquifer system (SAS) and surface water from Lake Okeechobee, the Water Conservation Areas (WCAs), and connected water bodies. Alternative water source options include brackish groundwater from the Floridan aquifer, reclaimed water, seawater, storage capacity by using reservoirs or aquifer storage and recovery (ASR) systems, and water conservation.

To evaluate the water source options, consideration must be given to several key factors, such as future water needs, source availability, water quality requirements for the intended uses, and cost. **Chapter 2** provides summaries of gross water demand for all water use categories: Public Water Supply (PWS), Domestic Self-Supply (DSS), Agricultural (AGR) Self-Supply, Industrial/Commercial/Institutional (ICI) Self-Supply, Recreational/Landscape (REC) Self-Supply, and Power Generation (PWR) Self-Supply. The LEC Planning Area population is expected to increase by 18 percent, from approximately 5.6 million people in 2010 to more than 6.6 million by 2030. Gross water demand for all water use categories is projected to increase by 214 million gallons per day (MGD) (12 percent) by 2030.

The PWS and AGR Self-Supply categories account for more than 88 percent of all water use in the LEC Planning Area. Currently, all but two PWS utilities in the LEC Planning Area utilize fresh groundwater from the SAS to supply the majority of potable water demand. Agricultural operations in the Everglades Agricultural Area (EAA) rely on surface water, while growers in the eastern portion of the planning area use a combination of groundwater

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and surface water. Water use permits have been issued and infrastructure exists to meet a significant portion of the 2030 water needs for PWS and AGR Self-Supply. This is important because restricted allocation area criteria limit new allocations from traditional groundwater and surface water sources, which are described in **Chapter 3** and discussed briefly later in this chapter.

Each water source option presented in this chapter briefly describes current and future uses. Additional information about water source options and their related costs is provided in Chapter 5 of the *2011–2013 Water Supply Plan Support Document* (Support Document) (SFWMD 2013a). Water treatment technologies and associated costs are presented in Chapter 6 of the Support Document.

GROUNDWATER

Groundwater sources in the LEC Planning Area include fresh groundwater from the SAS, including the Biscayne aquifer, and brackish groundwater from the Floridan aquifer. More information about these aquifers, including yields and characteristics specific to the LEC Planning Area, is provided in **Chapter 3** of this update and Chapter 10 of the Support Document.

Fresh Groundwater

Fresh groundwater is the primary source of supply for potable water consumption, landscape irrigation, and industrial and commercial uses in the LEC Planning Area. In the urban areas of the LEC Planning Area, PWS relies heavily on the SAS, including the Biscayne aquifer. The SAS produces good quality fresh water from relatively shallow wells. In some cases, the ambient water quality meets most primary and secondary drinking water quality standards. Local rainfall, canals, groundwater seepage from WCAs and Everglades National Park, and surface water deliveries from WCAs recharge these aquifers. When sufficient water is available, surface water from Lake Okeechobee can also be routed to WCAs, then to regional canals to maintain water levels and recharge the aquifer. During droughts, lower regional groundwater levels may cause inland movement of salt water at the interface of the aquifer with seawater. In this case, water shortage restrictions may be declared by the Governing Board of the South Florida Water Management District (SFWMD) to conserve freshwater supplies.

Figure 43 shows the distribution of SFWMD-permitted SAS wells for PWS utilities producing over 0.1 MGD. The map reveals that well capacities generally increase from Palm Beach County to the south towards Miami-Dade County as a result of the presence of the Biscayne aquifer. The transmissivity of the Biscayne aquifer generally increases from north to south. In 2010, PWS utilities utilized fresh groundwater to supply 94 percent of their total potable water demand. Existing allocations of fresh groundwater exceed projected 2030 demand for more than half of the PWS utilities (see **Chapter 6** for specifics). Most of the 2030 demand will continue to be met by fresh groundwater from the SAS. More details about actual and permitted withdrawals from each source can be found in **Appendix C**.

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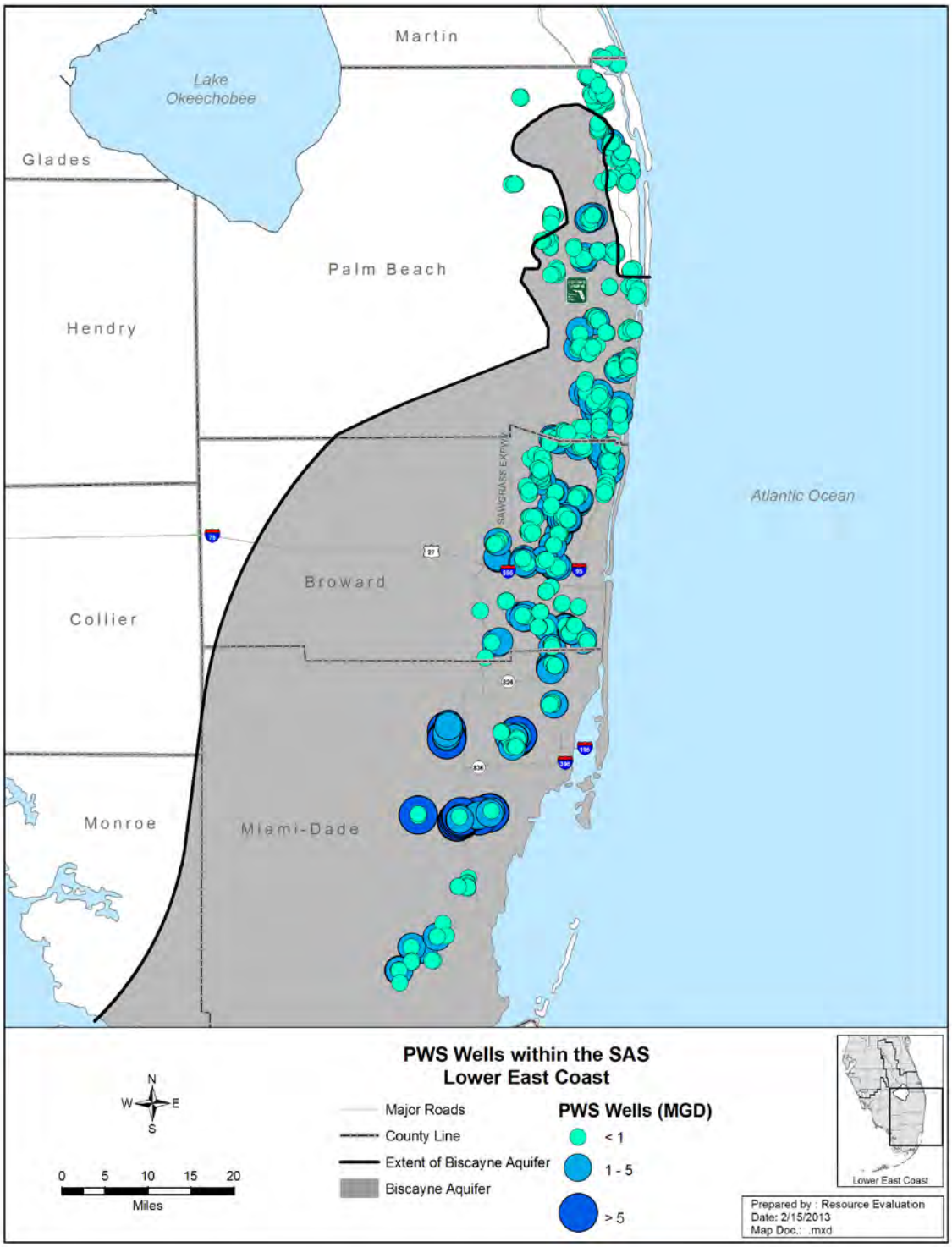

Figure 43. Location and approximate yield of SAS PWS production wells in the LEC Planning Area.

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Fresh groundwater supplied all of the estimated 18 MGD of DSS in 2010. By 2030, DSS demand throughout the LEC Planning Area is expected to increase slightly to 19 MGD. Domestic wells are exempt from SFWMD water use permitting requirements. Fresh groundwater from the SAS will continue to supply DSS.

Agriculture in Broward and Miami-Dade counties, comprising approximately 8 percent of irrigated agricultural acres in the LEC Planning Area, is primarily dependent upon withdrawals from the Biscayne aquifer to supply supplemental irrigation for crops, livestock, and other purposes. Fresh groundwater supplied approximately 10 percent of the total AGR Self-Supply water demand in the LEC Planning Area. In 2010, the AGR Self-Supply demand met by fresh groundwater was approximately 68 MGD. AGR Self-Supply demand is expected to remain somewhat constant for the next 20 years. **Figure 44** shows the location and relative magnitude of agricultural allocations. The remainder of agriculture acreage and demand is supplied by fresh surface water and discussed below.

The primary use for water in the REC Self-Supply category is for irrigation of parks, athletic fields, golf courses, medians, and large landscaped areas. The largest water users in the ICI Self-Supply category are the aggregates mining and food processing industries, such as sugar mills. Fresh groundwater accounted for 40 percent of the total REC Self-Supply demand and 60 percent of the total ICI Self-Supply demand in 2010. The remainder of the water for these two categories is from diverse sources including surface water, brackish groundwater, and reclaimed water. Growth in the REC Self-Supply category is expected to be small, about 3 percent. The increased demand will likely be met by the same three sources, depending on availability at specific locations. By 2030, ICI Self-Supply demand is expected to increase by 28 percent. The increase will largely be met by groundwater where available.

Fresh groundwater provided less than 10 percent of the total water demand for PWR Self-Supply in the LEC Planning Area in 2010. It is anticipated that a similar volume of fresh groundwater will be used for PWR Self-Supply in 2030, while reliance on other sources, such as seawater, will expand. Reclaimed water use for cooling recently expanded and is anticipated to continue to grow to meet PWR Self-Supply needs through 2030.

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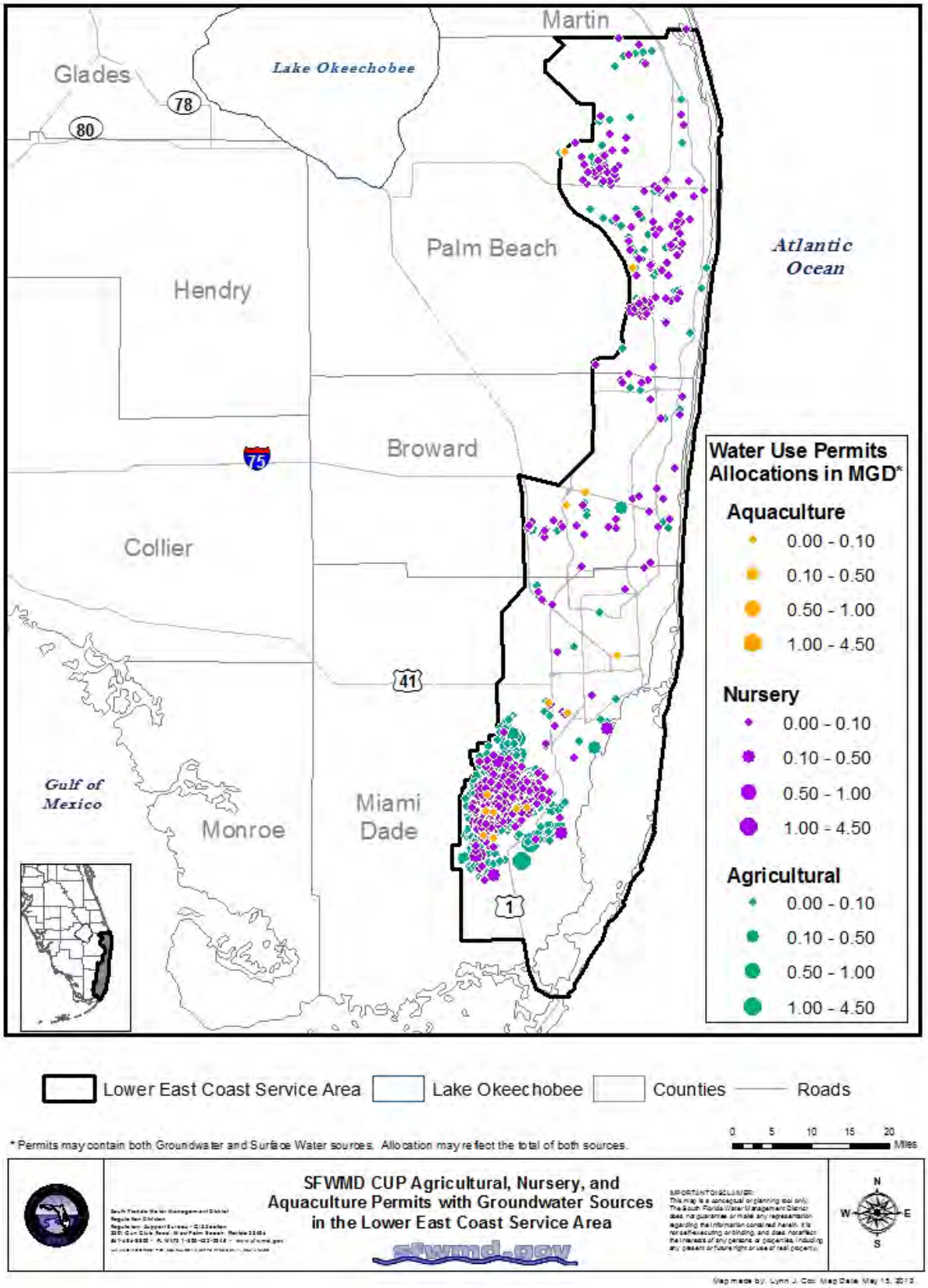

Figure 44. Location and relative magnitude of agricultural allocations from the SAS.

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Western Basins

The Everglades Protection Area's tributary basins include the C-139, Feeder Canal, L-28 Interceptor, and L-28 Gap (located within the Big Cypress National Preserve) basins, which encompasses approximately 440,000 acres located primarily in eastern Hendry County (**Figure 45**). These basins are collectively called the Western Basins because they are along the western edge of the Everglades. Generally, land within these basins have three classifications: 1) agricultural (vegetable, sugarcane, and citrus), 2) cow-calf operations, and 3) wetlands and native areas. Agricultural land dominates the C-139 and Feeder Canal basins. While the L-28 interceptor basin land use is split between wetlands and agricultural. The L-28 Gap Basin consists almost entirely (98 percent) of wetlands. Urban land classifications occupy 4 percent of the C-139 Basin. Overall, agricultural land uses and urban lands are projected to remain stable. The Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida both have reservations in the Western Basins (**Figure 46**) with water supply needs for its residents, agriculture and wetlands. Both water supply and water quality of stormwater runoff are challenges facing the development of the Western Basins.

Florida's 1994 Everglades Forever Act, Section 373.4592, Florida Statutes (F.S.), mandated 1) the construction of stormwater treatment areas (STAs), 2) landowners within the C-139 Basin should implement best management practices (BMPs), and 3) landowners not collectively exceed average annual historic total phosphorus load adjusted for rainfall. In 2002, SFWMD adopted the C-139 Basin BMPs Regulatory Program, Chapter 40E-63, Florida Administrative Code (F.A.C.), to ensure the total phosphorous load requirements would be met. After four years with source control mandatory BMP permits, the C-139 Basin was not meeting the historic total phosphorus load required by rule. SFWMD amended Chapter 40E-63, F.A.C. to address future compliance. The amendments became effective in November 2010. The performance measure to meet historic total phosphorous loading adjusted by rainfall were met in water years 2008, 2010, 2011, and 2012 (a water year begins on May 1 and ends on April 30 of the following year).

Water management in general (water supply and discharges) is thought to be a critical factor affecting phosphorus loads from the basin. Water management, water availability, and the effects of allocation of water supply for the Western Basins require further study. Studies and data of the surface and groundwater in the Western Basins will assist with restoration of wetland hydroperiods on the Seminole Tribe of Florida's Big Cypress Reservation and in the Big Cypress National Preserve. The Seminole Tribe's long standing concerns in the Western Basins include adequate water supply for the environment and the lack of attention by federal and state resource agencies on its condition. To address this deficiency, a subset of South Florida Ecosystem Restoration Task Force member agencies, which includes federal and state agencies, has convened to discuss this issue and other specific concerns raised by the Seminole Tribe.

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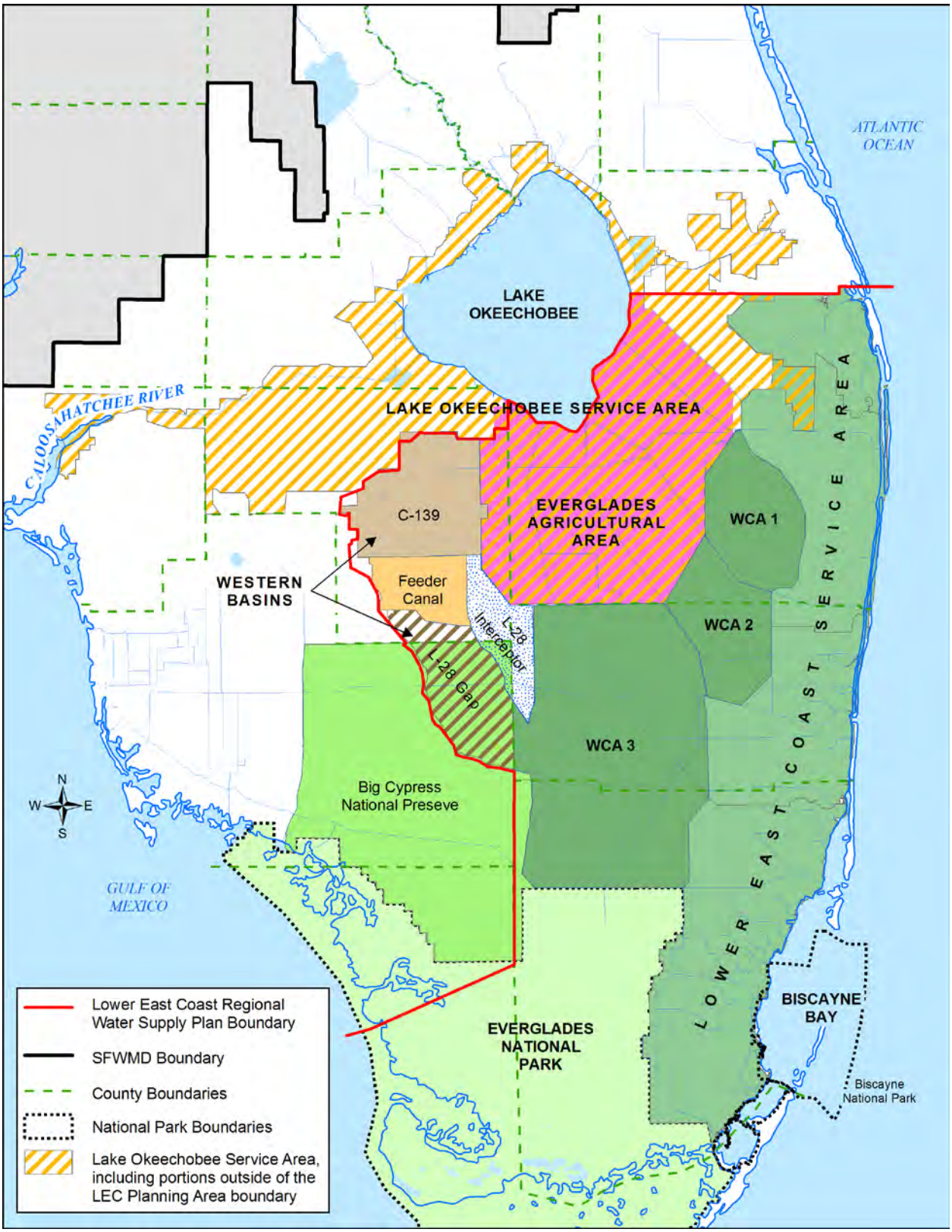

Figure 45. EAA, Western Basins, and surrounding areas.

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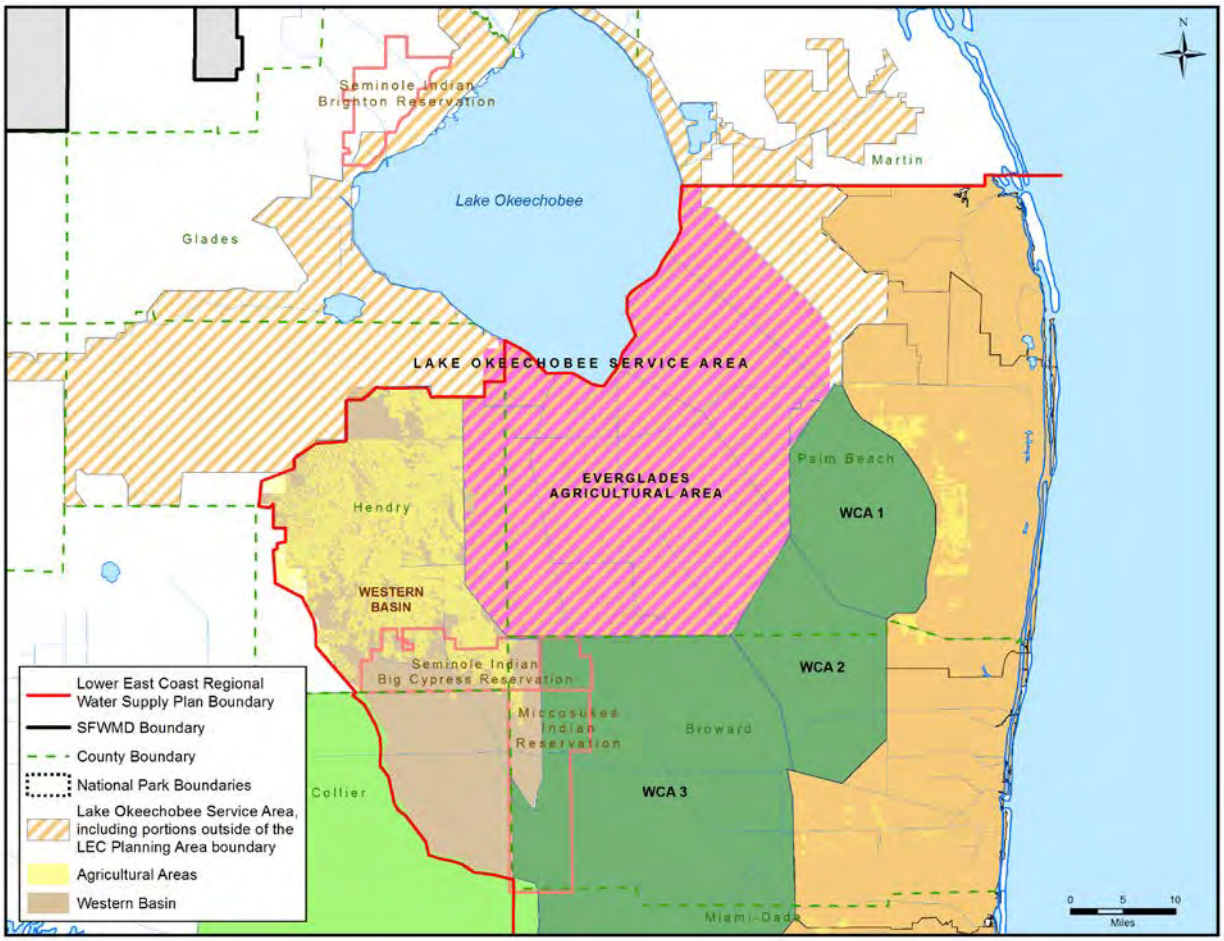

Figure 46. Western Basins map showing the Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida reservations.

Available water supplies for allocation for the basin from the SAS are constrained by the presence of isolated wetlands. Water supply demands fluctuate seasonally, with emphasis on the fall-to-winter and winter-to-spring growing seasons, which require optimal water table levels. However, some additional groundwater supplies may be available consistent with the wetland criteria and maximum developable limits applicable to this area. Maximum developable limits are discussed in Section 3.2.4 of the *Basis of Review for Water Use Permit Applications within the South Florida Water Management District*, commonly referred as the Basis of Review (SFWMD 2012b). Applicants must provide reasonable assurances that the proposed use shall not cause harmful drawdowns so as to deplete semi-confined freshwater aquifers within the Lower West Coast Planning Area, which is adjacent. The potentiometric head within the lower Tamiami aquifer shall not be allowed to drop to less than 20 feet above the top of the uppermost geologic strata that comprises the aquifer at any point during a 1-in-10 year drought condition.

Alternatives to increase the availability of water supply sources, permanently or seasonally, involve studying ways to develop water supply storage capacity for periods of need, and further supporting a means to optimize and reuse irrigation water in identified areas.

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Coordinated long-term plans are needed that consider alternative water supplies or matching demand to availability. To that end, SFWMD is updating the Lower West Coast Surficial Aquifer and Intermediate System Model, a groundwater flow model, to include the intermediate aquifer system. Once peer reviewed, which is tentatively scheduled for completion during Fiscal Year 2014, it will be applied to examine the potential impacts of existing and future groundwater withdrawals from the SAS and intermediate aquifer system.

In 2010, SFWMD purchased land from the United States Sugar Corporation, providing 26,800 acres (42 square miles) of strategically located property south of Lake Okeechobee for the construction of water storage and water quality improvement projects and wetland restoration that will bring meaningful environmental benefits to the Everglades. Currently, the land is leased back to agricultural producers for farming until plans can be developed and implemented for restoration projects. The purchase included 17,900 citrus acres in Hendry County to improve water quality in the Western Basins where phosphorus loads have historically been high. Approximately 14,400 acres of the C-139 Annex (see **Figure 34** in **Chapter 4**), located just west of thousands of acres of existing STAs that treat agricultural runoff, will be restored to a more natural condition. Removal of the citrus trees from production will begin in 2014 and finish by 2018. Removal of the citrus trees will reduce the demand for groundwater currently used for irrigation. Restoration will improve the quality, timing, and distribution of water flowing into the Everglades. See the C-139 Annex Restoration project description in **Chapter 4** for more information.

Limits on Availability

The SAS, including the Biscayne aquifer, is a source of limited availability to the extent that withdrawals result in induced seepage from the Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project), except when stormwater or wet season discharge occurs, as defined by Section 1.7.2.2.B of the Basis of Review. In 2007, SFWMD adopted the LECSA and North Palm Beach County/Loxahatchee River Watershed water bodies restricted allocation area criteria (Section 3.2.1.E, Basis of Review). Within these areas, the SAS is generally limited due to potential impacts on the regional system, wetlands, existing legal water users including DSS, and the potential for saltwater intrusion. SFWMD will evaluate new or increased allocations on an application-by-application basis to determine if the project meets water use permitting criteria.

Brackish Groundwater

Brackish groundwater is defined as water with a chloride concentration greater than 250 milligrams per liter (mg/L) and less than 19,000 mg/L. In the LEC Planning Area, water produced from the Floridan aquifer system (FAS), the upper Floridan aquifer specifically, typically contains chlorides in excess of 500 mg/L. Appropriate desalination treatment technologies must be used before this type of water supply can be suitable for most uses, including human consumption. Brackish groundwater is generally not suitable for agricultural water supply.

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In the LEC Planning Area, the upper Floridan aquifer provides brackish groundwater to supplement PWS and PWR Self-Supply demands. Water use from the FAS began in the late 1970s, and increased in the 1990s, with more significant use after 2000. By 2010, approximately 30 MGD was produced for PWS from brackish water sources in the LEC Planning Area and as of 2012, 11 PWS treatment plant facilities utilize a brackish water source (**Figure 47**). Combined, these facilities have an installed treatment capacity of 86 MGD. Overall, 23 utilities in the planning area obtained upper Floridan aquifer allocations totaling 190 MGD. Most of this volume has not been needed to date, and likely will not be needed prior to 2030, based on current demand projections.

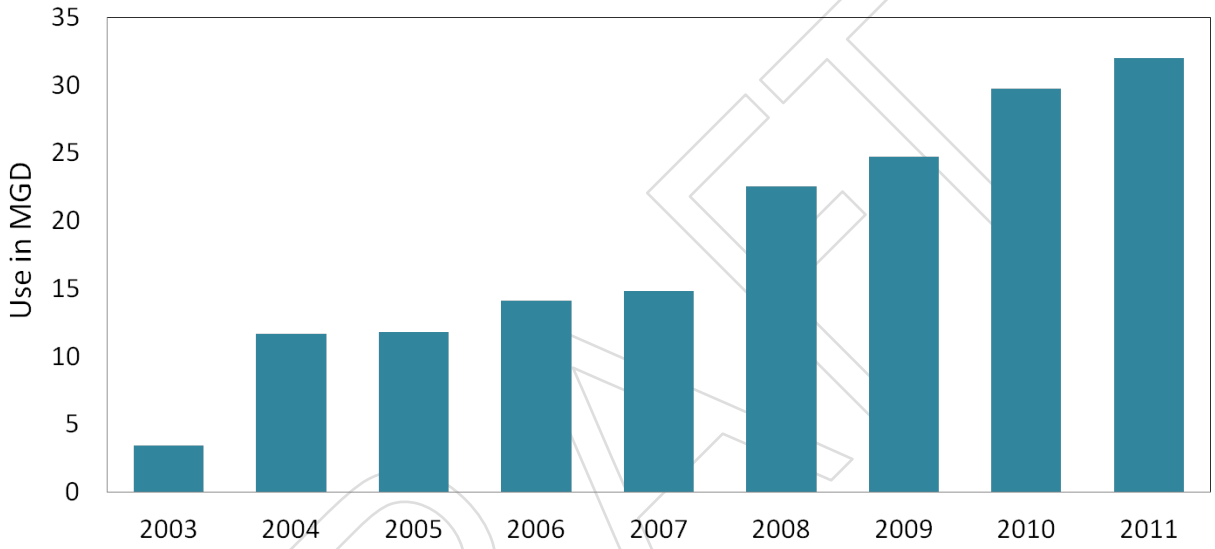

Figure 47. PWS withdrawals from brackish water sources in the LEC Planning Area for 2003–2011.

PWS utilities typically use the reverse osmosis (RO) process to remove excess salinity. The approximate production efficiency or recovery for brackish water RO facilities districtwide is between 75 and 85 percent, depending upon the membrane technology employed and the salinity of the water from the aquifer (Carollo Engineers, Inc. 2009). Some utilities blend brackish upper Floridan aquifer water with fresh groundwater and treat the blended product with lime softening or nanofiltration technology to meet drinking water standards. Blending can reduce treatment costs and increase production efficiency in order to meet drinking water standards.

Additional users of Floridan aquifer water in the LEC Planning Area include four golf courses—Seminole, Breakers, and Everglades Club golf courses in Palm Beach County, and Card Sound Golf Club in Monroe County. Only one power generating facility—the Florida Power & Light (FPL) Turkey Point Plant Unit 5—uses groundwater drawn from the Floridan aquifer for cooling.

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SURFACE WATER

Lake Okeechobee and Water Conservation Areas

Surface water has been a major source of water in the LEC Planning Area and will continue to be in the future. An overview of water resources including Lake Okeechobee and WCAs is provided in **Chapter 3.**

Lake Okeechobee, its connected conveyance system, and the WCAs are the most significant surface water sources for the LEC Planning Area. Surface water from these sources supply water to the regional system via canals and recharges the SAS. Lake Okeechobee has multiple purposes and is critical for flood control during wet seasons as well as water supply during dry seasons. Agriculture in the Lake Okeechobee Service Area covered approximately 255,500 acres outside of the EAA and the 458,500 acres within the EAA (see **Figure 2** in **Chapter 1**) in 2010. It is the predominate user of lake water. Lake Okeechobee serves as a supplemental water supply source for agriculture when rainfall is insufficient and can be used as a backup source for urban users in the coastal basins of the LEC Planning Area during droughts and dry times, and depending upon availability, may provide 'pass through' water to the WCAs in accordance with their regulation schedules. The implementation of the 2008 Lake Okeechobee Regulation Schedule, referred to as 2008 LORS, resulted in an average loss of approximately 430,000 acre-feet of storage for all uses. Canals connected to the lake will continue to provide fresh surface water for supplemental irrigation in the future consistent with water use permits.

Subsequent to the implementation of 2008 LORS, South Florida experienced several years of below average rainfall. This resulted in lake levels substantially lower than those that characterized the Water Supply and Environment and predecessor schedules. To fulfill its water supply function when at lower lake levels, SFWMD is permitted to deploy portable pumps at S-351, S-352, and S-354 at extreme low lake stages (less than 10.5 feet in relation to the National Geodetic Vertical Datum of 1929). This enables SFWMD to meet water supply needs in the EAA and the Seminole Tribe of Florida's Big Cypress Reservation.

The Okeechobee Utility Authority in the Kissimmee Basin Planning Area is the only remaining PWS utility using water directly from Lake Okeechobee. Since the last plan update, Clewiston, South Bay, Belle Glade, and Pahokee discontinued their use of Lake Okeechobee and now use FAS water treated by RO for their PWS demand (SFWMD 2012a).

The City of West Palm Beach is the only PWS utility in the LEC Planning Area to rely on surface water as its primary source. The city draws its water from Clear Lake, which is indirectly connected to Lake Okeechobee via a series of tie-back canals. The city also supplies water to the towns of Palm Beach and South Palm Beach.

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In 2010, AGR Self-Supply accounted for approximately 90 percent of surface water allocations in the LEC Planning Area (**Figure 48**). The majority of AGR Self-Supply acreage in Palm Beach and Hendry counties is located within the EAA (see **Figure 2** in **Chapter 1**) and supplemental irrigation supplied by surface water withdrawals from canals connected to Lake Okeechobee. Agriculture in eastern Palm Beach County also relies primarily on surface water in the regional canal network and WCA 1, as well as deliveries from Lake Okeechobee, for supplemental irrigation. Combined, they are the largest users of surface water in the LEC Planning Area. Some smaller agricultural uses, including nurseries and aquaculture utilizing surface water, occur in Broward and Miami-Dade counties.

The EAA accounts for approximately 80 percent of the agricultural acreage within the LEC Planning Area. It is a fully developed, very stable agricultural area where permitted acres and cropping practices are not projected to change significantly over the next twenty years. Projected water demands for the EAA from 2010 to 2030 do not increase because EAA cultivated acres are consistent throughout the planning horizon. Agricultural demand in eastern Palm Beach County is projected to increase slightly.

Water Supplies to Seminole Tribe of Florida

The Seminole Tribe of Florida has three reservations in the LEC Planning Area—Brighton, Hollywood, and Big Cypress. Two reservations rely on Lake Okeechobee as a secondary supplemental irrigation supply source, with specific volumes of water identified for the Big Cypress Reservation and drought-water shortage operations for the Brighton Reservation. The Seminole Tribe also owns other facilities and land within the LEC Planning Area. Demands, if any, associated with these other properties and the Hollywood Reservation are included within the PWS water use category.

The Seminole Tribe of Florida has surface water entitlement rights pursuant to the 1987 Water Rights Compact between the Seminole Tribe of Florida, State of Florida, and SFWMD (Public Law 100-228, 101 Statute 1566, and Chapter 87-292, Laws of Florida, as codified in Section 285.165, F.S.). The parties executed subsequent additional documents addressing the compact entitlement provisions. These documents include agreements between the Seminole Tribe and SFWMD and a SFWMD final order. Of particular interest in this regard is the 1996 agreement that addresses SFWMD mitigation responsibilities regarding impacts to the Seminole Tribe's ability to obtain surface water supplies at both the Brighton and Big Cypress reservations, which may be diminished as a result of various activities.

For the Big Cypress Reservation, SFWMD can install four portable forward pumps, capable of delivering up to 400 cubic feet per second from Lake Okeechobee to the Miami Canal to maintain stages in the canal. The SFWMD acquired an interim permit to operate the pumps from the United States Army Corps of Engineers (USACE), who in turn, is consulting with the United States Fish and Wildlife Service as part of the permitting process. This option remains a part of drought management alternatives and was completed in coordination with water restriction plans. Real-time operational decisions made during a declared drought event are made while fully cognizant of the Seminole Tribe's water rights. These

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decisions remain a part of the drought management operations. In addition, SFWMD built a weir at G-404 to facilitate delivery of water from the Miami Canal.

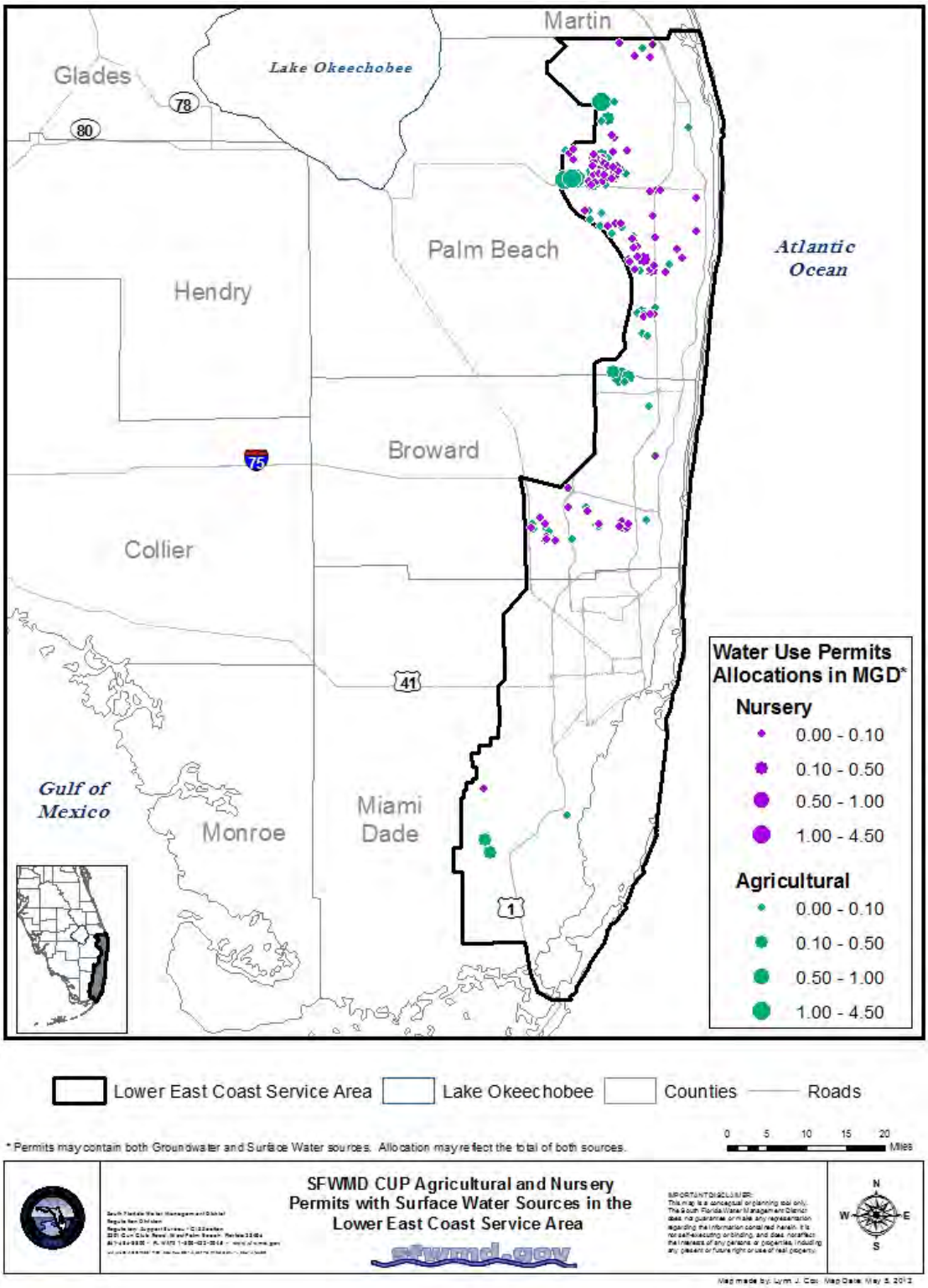

Figure 48. Location and relative magnitude of agricultural allocations utilizing surface water.

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Limits on Availability

As discussed in **Chapter 3**, in October 2008, SFWMD developed restricted allocation area criteria for the Lake Okeechobee Service Area as part of the minimum flow and level recovery strategy for Lake Okeechobee. A recovery strategy was needed due to the USACE's adoption of 2008 LORS, which generally lowered the water levels in Lake Okeechobee by approximately one foot. These criteria limit allocations from Lake Okeechobee and connected surface waters, including the C-43 and C-44 canals, to base condition water uses that occurred from April 1, 2001 to January 1, 2008.

Implementation of the restricted allocation area criteria in the Lake Okeechobee Service Area began in fall 2008. During this time, irrigation water use permits for surface water were renewed or issued for twenty-year durations. The permits covered approximately 714,000 acres in the service area, of which approximately 458,500 acres were in the EAA. As part of the permit renewal process for agricultural permits in the EAA, SFWMD reviewed historical operations of actual water supply deliveries during a 1-in-10 year drought. This evaluation observed that crop management, water quality BMPs, and unique water management activities within the EAA result in a more efficient use of water when compared to other agricultural areas using similar seepage systems. As a result of this analysis, and in consultation with the industry, an efficiency of 75 percent rather than the typical 50 percent was applied to water use permit renewals for agricultural projects within the EAA Basin employing a flood irrigation system. This change in methodology resulted in a 33 percent decrease in allocation for the basin.

Another restricted allocation area found in the LEC Planning Area is located just south of the Lake Okeechobee Service Area in eastern Hendry County. The limited network of surface water canals within these basins are not connected to Lake Okeechobee. SFWMD will not allocate additional surface water from the L-1, L-2, and L-3 canals over the existing allocations (Section 3.2.1.C, Basis of Review).

RECLAIMED WATER

Reclaimed water receives at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility. In the LEC Planning Area, reclaimed water is used for landscape irrigation (e.g., medians, residential lots, and golf courses), groundwater recharge, cooling water, and environmental enhancement.

The State of Florida encourages and promotes the use of reclaimed water. The Water Resource Implementation Rule (Chapter 62-40, F.A.C.) requires the Florida Department of Environmental Protection (FDEP) and water management districts to advocate and direct the use of reclaimed water as an integral part of water management programs, rules, and plans. SFWMD requires all applicants for water use permits proposing to irrigate with more than 0.1 MGD of water and those applicants within a mandatory reuse zone to use reclaimed water if it is feasible. Mandatory reuse zones are geographic areas designated by local governments through ordinance where reclaimed water use is required if it is

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environmentally and technically feasible. Reclaimed water can be used for many purposes, including green space irrigation, industrial cooling and process water, groundwater recharge, saltwater intrusion barriers, and other nonpotable use activities.

The use of reclaimed water in the LEC Planning Area helps to reduce potential resource impacts by decreasing the reliance on traditional fresh sources, such as groundwater and surface water. Wastewater reuse reduces use of the traditional wastewater disposal methods, such as ocean outfalls and deep well injection. Wastewater reuse provides an environmentally sound alternative. Reclaimed water also provides additional supply for uses not requiring potable water, such as irrigation, although utilities require backup disposal methods during wet periods when irrigation demand is low.

Reclaimed water generally contains relatively high concentrations of nutrients that could justify decreased use of fertilizer when used for irrigation. The increased level of nutrients may also be a concern for numeric nutrient criteria in the region.

Existing Reuse in the LEC Planning Area

Wastewater management generally evolved from smaller subregional facilities to a partially integrated system of larger regional facilities and a limited, but growing network of pipelines to carry reclaimed water to end users. Maps showing the current extent of reclaimed water pipelines are shown in **Appendix C**. The volume of reclaimed water used for a beneficial purpose, such as landscape irrigation and cooling water, increased eight-fold from 1994 to 2011 as shown in **Figure 49**. Most of this growth occurred in Palm Beach County. Over this period, the volume of reclaimed water use varied from year to year, depending on the addition of new users and rainfall. This information was collected by SFWMD and supplemented by the *2011 Reuse Inventory* (FDEP 2012).

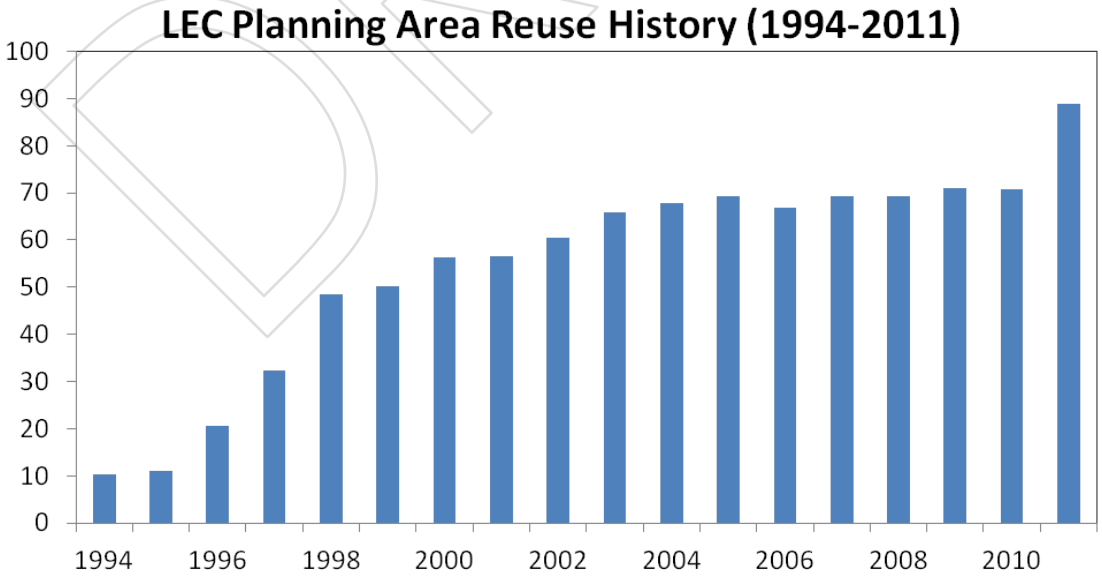

Figure 49. Annual average reclaimed water reuse in MGD in the LEC Planning Area from 1994 to 2011.

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In 2010, 44 wastewater treatment facilities in the LEC Planning Area had a permitted treatment capacity of 0.1 MGD or greater. These facilities had a total wastewater treatment capacity of 860 MGD to meet peak daily flows and treated an average of 636 MGD of wastewater in 2010. The Miami-Dade Central District Wastewater Treatment Plant, operated by the Miami-Dade County Water and Sewer Department (MDWASD), remains the area's largest wastewater treatment facility, with a capacity of 143 MGD.

In 2010, approximately 93 percent, or 594 MGD of the LEC Planning Area's treated wastewater supply, was disposed through deep well injection (353 MGD) and ocean outfalls (240 MGD). Only 71 MGD was beneficially reused. About 1 MGD was disposed through shallow injection wells in the Florida Keys area of Monroe County.

Of the 44 wastewater treatment facilities, 25 facilities reused at least a portion of their wastewater in 2010 (71 MGD). Nearly 41 MGD was used to irrigate almost 20,000 residences, 55 golf courses, 47 parks, and 12 schools, mostly within Palm Beach County (FDEP 2011). Over 6 MGD of the reclaimed water supply was reused for groundwater recharge, mainly by the City of Homestead in Miami-Dade County, through rapid infiltration basins and percolation ponds. The remaining 24 MGD of reclaimed water was reused for various purposes, including hydration of two created wetlands in Palm Beach County and use at wastewater treatment facilities. Summaries of wastewater and reclaimed water facilities, including their capacities and locations, are provided in **Appendix C**.

The total amount of water reused in the LEC Planning Area in 2010 (71 MGD) exceeds the difference between wastewater treated (636 MGD) and wastewater disposed (594 MGD). Total wastewater treated and disposed cannot be simply subtracted to quantify the volume reused. Reclaimed water reused at the wastewater treatment facility may be double-counted by adding both to the treated wastewater flow and water reuse flow totals. This occurs, for example, when the utility reuses water at the treatment plant for process water, then returns it to the disposal system. In addition, several utilities have permits to blend either groundwater or surface water with their reclaimed water. This supplemental water is added into the total water reuse without being treated at the facility.

Reclaimed water is one of three primary sources of cooling water for PWR Self-Supply, along with tidal water and seawater. These sources do not require a permit from SFWMD. As a result, they are not included in the demand numbers provided in **Chapter 2** and **Appendix A**. Starting in late 2010, the use of reclaimed water for power generation increased when Palm Beach County began providing the FPL West County Energy Center with reclaimed water from the East Central Regional Wastewater Treatment Facility. The average flow of reclaimed water in 2010 to the West County Energy Center was 12 MGD (FDEP 2011) (see difference in reclaimed water use between 2010 and 2011 in **Figure 49**). This flow is expected to approach 20 MGD with the reuse utility's first full year of reporting, and up to 27 MGD in the future. It should be noted that the addition of the FPL West County Energy Center as a reclaimed water customer followed the reporting period for the *2010 Reuse Inventory* (FDEP 2011), which is used as the baseline year for this document. As a result, this reuse is not reflected in the totals provided above and in **Appendix C**.

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Future Reuse in the LEC Planning Area

By 2030, wastewater flows are projected to increase from 636 MGD in 2010 to an estimated 832 MGD. In addition, 42 of the 44 utilities operating wastewater facilities indicated they will be reusing some portion of their treated wastewater flow. MDWASD is proposing to provide up to 90 MGD of reclaimed water to FPL for cooling water at a planned expansion of nuclear powered generation at Turkey Point (Units 6 and 7).

In the future, several other reuse options are worth noting. Reclaimed water for irrigation will continue to be an important and expanding part of future reuse in the LEC Planning Area. In addition to the traditional reuse methods, a few other methods might be available to help meet water demands or offset potential impacts associated with future withdrawals. Reclaimed water could be used by water suppliers to recharge and replenish the network of canals found in many areas of Palm Beach, Broward, and Miami-Dade counties and reduce water deliveries from the regional water management system, especially during the dry season. These canals could act as a distribution network for the reclaimed water. Reclaimed water could also be used as a saltwater intrusion barrier preventing or delaying saltwater intrusion along the coast. Under this scenario, reclaimed water would be injected into the aquifer between the saltwater source and the supply wells. Another potential use of reclaimed water is for the benefit of the environment. This application of water reuse for environmental benefit could be accomplished in a number of ways, including the hydration of natural or created wetlands. Elsewhere, inroads to utilizing reclaimed water for direct potable supply are taking place. Singapore's NEWater facilities have been producing potable water for over a decade. In the United States, locations in California and other areas in the southwest are turning to direct potable reuse for water supply.

Several local wastewater utilities have successfully implemented some of these reuse options. Irrigation using reclaimed water is prevalent in Palm Beach County, with substantially less in Broward and Miami-Dade counties. Irrigation with reclaimed water could result in a decrease in per capita demand to the local utility if replacing the use of potable water. If groundwater or surface water use is replaced, the utility has the potential to receive a substitution credit as part of their consumptive use permit. A couple of LEC PWS utilities have substitution credits, or similar, incorporated into their current consumptive use permit. Hydration of wetlands has been successfully implemented at two projects in the LEC Planning Area, which benefits the utility by providing an environmentally friendly means wastewater disposal in addition to indirectly recharging the aquifer.

Canal recharge and saltwater intrusion barriers reuse options have not been implemented by wastewater utilities in the LEC Planning Area. Studies discussed in Chapter 4 have evaluated canal recharge and advanced wastewater treatment. The concept remains viable. Saltwater intrusion barriers have been, and continue to be, viable reuse options for coastal utilities. State and local regulatory constraints would need to be addressed for any significant progress. One benefit to the utility for using reclaimed water as a saltwater intrusion barrier might be potential impact offsets that would allow the utility to pump more water from an inland wellfield.

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The most significant increase in the projected reuse is expected by the utilities impacted by the 2008 amendment to the Florida Statutes concerning use of ocean outfall for disposal. Those facilities and the state requirements are discussed in the next section.

Leah Schad Memorial Ocean Outfall Program

In 2008, the Florida Legislature enacted an ocean outfall statute (Subsection 403.086(9), F.S.) requiring the elimination of the use of six ocean outfalls in southeastern Florida as the primary means for disposal of treated domestic wastewater. In addition, the affected wastewater utilities have to reuse at least 60 percent of the outfall flows by 2025. The objectives of this statute were to reduce nutrient loadings to the environment and to achieve the more efficient use of water for water supply needs. This statute became effective on July 1, 2008.

The 2008 Leah Schad Memorial Ocean Outfall Program applies to each of the facilities/utilities that have permits to discharge through an ocean outfall. All of the wastewater/reuse facilities utilizing ocean outfalls are located in the LEC Planning Area. The facilities are as follows:

- South Central Regional Water Reclamation Facility (Delray Beach and Boynton Beach)
- Boca Raton Water Reclamation Facility
- Broward County North Regional Water Reclamation Facility
- Hollywood Southern Regional Water Reclamation Facility
- Miami-Dade North District Wastewater Treatment Plant (MDWASD)
- Miami-Dade Central District Wastewater Treatment Plant (MDWASD)

Additionally, Cooper City and the Town of Davie are permitted to discharge effluent through the outfall operated by the City of Hollywood at the Southern Regional Water Reclamation Facility. Therefore, these two local governments also have obligations to meet the outfall requirements.

Requirements of the outfall program include the following:

- Discharge through ocean outfalls must meet either advanced wastewater treatment and management by December 31, 2018, or an equivalent reduction in outfall nutrient loading.
- A functioning reuse system that reuses a minimum of 60 percent of the facility's actual flow on an annual basis installed no later than December 31, 2025.
- Timely submission of certain progress and planning summary documents.
- Inclusion of projects that promote the elimination of wastewater ocean outfalls in SFMWD's regional water supply plans.

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- State or SFWMD funding assistance must give first consideration to water supply development projects that replace existing sources or implement reuse projects to eliminate ocean outfalls.

By 2025, 60 percent of wastewater discharged through ocean outfalls must be beneficially reused as defined in Chapter 62-610, F.A.C. This percentage is computed from a baseline discharge flow of the ocean outfalls from 2003 through 2007. The baseline flows and the 60 percent reuse requirement for each utility are presented in **Table 14**. The reuse requirements for Miami-Dade County facilities may be met countywide since the North District, Central District, and South District facilities are owned and operated by the MDWASD and are interconnected.

Table 14. Baseline flows and 60 percent reuse requirement for the utilities affected by the 2008 Ocean Outfall statute.

Utility	Baseline Flow (MGD)	60 Percent Reuse Requirement (MGD)
South Central Regional Water Reclamation Facility (Delray & Boynton)	12.9	7.7
Boca Raton Water Reclamation Facility	10.3	6.2
Broward County North Regional Water Reclamation Facility	37.4	22.4
Hollywood Southern Regional Water Reclamation Facility	36.7	22.0[a]
Cooper City Wastewater Treatment Facility	1.5	0.9
Davie Wastewater Treatment Plant	1.9	1.1
Miami-Dade North District Wastewater Treatment Plant (MDWASD)	81.0	117.5
Miami-Dade Central District Wastewater Treatment Plant (MDWASD)	114.8	
Totals	**296.5**	**177.8**

a. Includes 1.6 MGD for the City of Miramar Water Reclamation Facility.

Each of the utilities using ocean outfalls submitted an annual report on July 1, 2013 to FDEP on the implementation of the ocean outfall statute. The utilities continue to implement and plan for these changes. The status of those changes for each of the ocean outfall utilities is as follows:

- **South Central Regional Water Reclamation Facility** – A deep injection well was installed to handle disposal. The ocean outfall will now only be used as a backup for emergencies. Sixty percent water reuse requirement is expected to be met by primarily increasing public access irrigation in the cities of Boynton Beach and Delray Beach.
- **Boca Raton Water Reclamation Facility** – The city is planning to increase capacity of its facility to provide 100 percent reuse. Reclaimed water will be provided for public access irrigation at additional locations in, or near, the city.

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- **Broward County North Regional Water Reclamation Facility** – Broward County is planning to meet the 60 percent reuse requirement by expanding its public access irrigation in northern Broward and southern Palm Beach counties, including expanding reuse systems in the cities of Pompano Beach and Coconut Creek.
- **Hollywood Southern Regional Water Reclamation Facility** – Hollywood is planning to inject the upper Floridan aquifer with reclaimed water to meet the 60 percent reuse requirement.
- **Cooper City Wastewater Treatment Facility** – It is anticipated that Cooper City will be working together with one of its neighboring utilities to meet the ocean outfall requirements.
- **Davie Wastewater Treatment Plant** – Davie is in the process of constructing a city-owned water reclamation facility, thereby reducing the amount of wastewater effluent it sends to the Hollywood Southern Regional Water Reclamation Facility. Reclaimed water from the new facility will be reused for public access irrigation in the city, and to meet the ocean outfall requirements.
- **Miami-Dade North, Central, and South District Wastewater Treatment Plants** – The MDSAWD is planning a combination of alternatives to meet the 60 percent reuse requirement. These alternatives include providing up to 90 MGD of reclaimed water to the FPL Turkey Point Plant for cooling water, and injecting the upper Floridan aquifer.

Reclaimed Water Legislation

In 2012, the Florida Legislature amended Section 373.250, F.S. The amendments required FDEP to initiate rulemaking to incorporate criteria for the use of "substitution credits" and "impact offsets" when a water management district is reviewing a water use permit application. Impact offsets are derived from the use of reclaimed water to reduce or eliminate a harmful impact that has or would otherwise occur as a result of a surface or groundwater withdrawal. A substitution credit means the use of reclaimed water to replace all, or a portion of, an existing permitted use of a resource-limited surface water or groundwater, allowing a different user or use to initiate a withdrawal or increase its withdrawal from the same resource-limited water resource. Legislation in 2013 amended the 2008 Ocean Outfall statute and included that the LEC Plan must evaluate reuse demand in the context of future water supply demands, and recommend adjustments, as necessary to, the reuse requirements in the act. Prior to this legislation, SFWMD has considered the utilization of reclaimed water and its benefits in assessing proposed withdrawals during the water use permitting application process, and will continue to do so. Water management districts are in the process of modifying their rules, as needed, to be consistent with the amendments to Section 373.250, F.S., and amendments to FDEP's Chapter 62-40, F.A.C.

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Supplemental Sources to Meet Reuse Demand

In some service areas, the demand for reuse exceeds the volume of wastewater treated by the utility. Meeting demands with reclaimed water may require the use of supplemental water supplies such as surface water, groundwater, or potable water, which enable a utility to maximize use of reclaimed water. However, during times of drought, other water sources, such as surface water, groundwater, or potable water, may not be available to supplement reclaimed water supplies. Use of supplemental water supplies is subject to water use permitting by SFWMD. The availability of these supplies to supplement reclaimed water will be evaluated on an application-by-application basis.

Two LEC Planning Area utilities used supplemental water in their water reuse systems in 2010. Usage (flow) is expressed in terms of annual average MGD, but tends to be greater during the dry season and less during the wet season. The Seacoast Utility Authority used a combination of surface water (0.7 MGD), drinking water (0.2 MGD), and groundwater (0.2 MGD) for supplementation. The City of Boca Raton used 0.6 MGD of supplemental groundwater in their water reuse system.

STORAGE: SURFACE WATER AND GROUNDWATER

Storage is an essential component of any supply system experiencing fluctuation in supply and demand. Capturing surface water and groundwater during wet conditions for use during dry conditions increases the use of available water. Two-thirds of South Florida's annual rainfall occurs in the wet season. Without sufficient storage capacity, much of this water discharges to tide through surface water management systems and natural drainage. In the LEC Planning Area, potential types of water storage include ASR wells, reservoirs, and surface water impoundments and ponds.

Aquifer Storage and Recovery

ASR is the underground storage of injected water into an aquifer. Water is collected during times when it is plentiful, typically during the wet season in South Florida, and pumped into an aquifer through a well that is also used for subsequent recovery of the water. In South Florida, most ASR systems store treated water in the FAS, which contains brackish water. When recharged into the aquifer, the stored water displaces the brackish water. The aquifer acts as an underground reservoir for the injected water. ASR provides for storage of large quantities of water for long-term storage and ultimate recovery that would otherwise be unavailable due to land limitations, lost to tide, or evaporation.

Potable water, surface water, groundwater, or reclaimed water can be stored using ASR technology. The quantity and quality of water recovered depends on subsurface conditions, such as the transmissivity of the aquifer or the ambient water quality within the aquifer. The level of treatment required after storage and recovery depends on whether the water is for public consumption, irrigation, surface water augmentation, or wetlands enhancement.

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The volume of water made available through ASR wells depends on factors such as well yield, water availability, variability in water supply and demand, background water quality in the ASR well's storage zone, and use type. Uncertainty of storage and yield capabilities and water quality characteristics present associated risks for success.

To date, thirteen ASR systems have been constructed by ten different utilities and by the USACE and SFWMD within the LEC Planning Are (**Figure 50**). Many of these ASR wells store treated drinking water, although other source waters stored include raw groundwater, and raw or partially-treated surface water.

The 2010 revision of the arsenic standard from 50 to 10 parts per billion added uncertainty to obtaining an operation permit from FDEP for ASR systems. As a result of this uncertainty, some utilities opted to convert the ASR wells to raw water supply wells, used solely for withdrawing water from the Floridan aquifer for blending with other water sources in the treatment system.

Since the publication of the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007), the City of Boynton Beach, MDWASD, and Florida Keys Aqueduct Authority (FKAA) constructed new ASR test and monitoring wells. The new Boynton Beach ASR well is now in service and represents the utility's second operating ASR well. The MDWASD has five ASR wells and associated monitoring wells at their West and Southwest wellfields. Most recently, MDWASD installed ultraviolet disinfection systems on their ASR wells and anticipate cycle testing during 2013. The results from the FKAA well indicated that subsurface conditions at the water treatment plant site were not conducive to ASR implementation. As a result, FKAA converted this well to a supply well for their RO facility.

Aquifer Storage and Recovery Investigations

To further the understanding of storing injected water into an aquifer, several investigations were conducted.

CERP ASR Pilot Projects

SFWMD and the USACE are conducting pilot tests on two ASR systems within SFWMD boundaries to evaluate the feasibility of ASR for the large-scale storage of surface water as part of the Comprehensive Everglades Restoration Plan (CERP). The Hillsboro ASR Pilot Project, located in western Boca Raton, recently completed three test cycles. The pilot facility recharged treated surface water into the FAS, at a depth of approximately 1,000 feet below sea level. Prior to recharge, the surface water passed through a coarse screen filter and was disinfected via ultraviolet radiation. The test cycles consisted of recharge periods between 30 to 90 days (at a daily rate of 5 MGD), storage periods from 0 to 80 days, and recovery set to limits defined by a National Pollutant Discharge Elimination System permit for the Hillsboro Canal.

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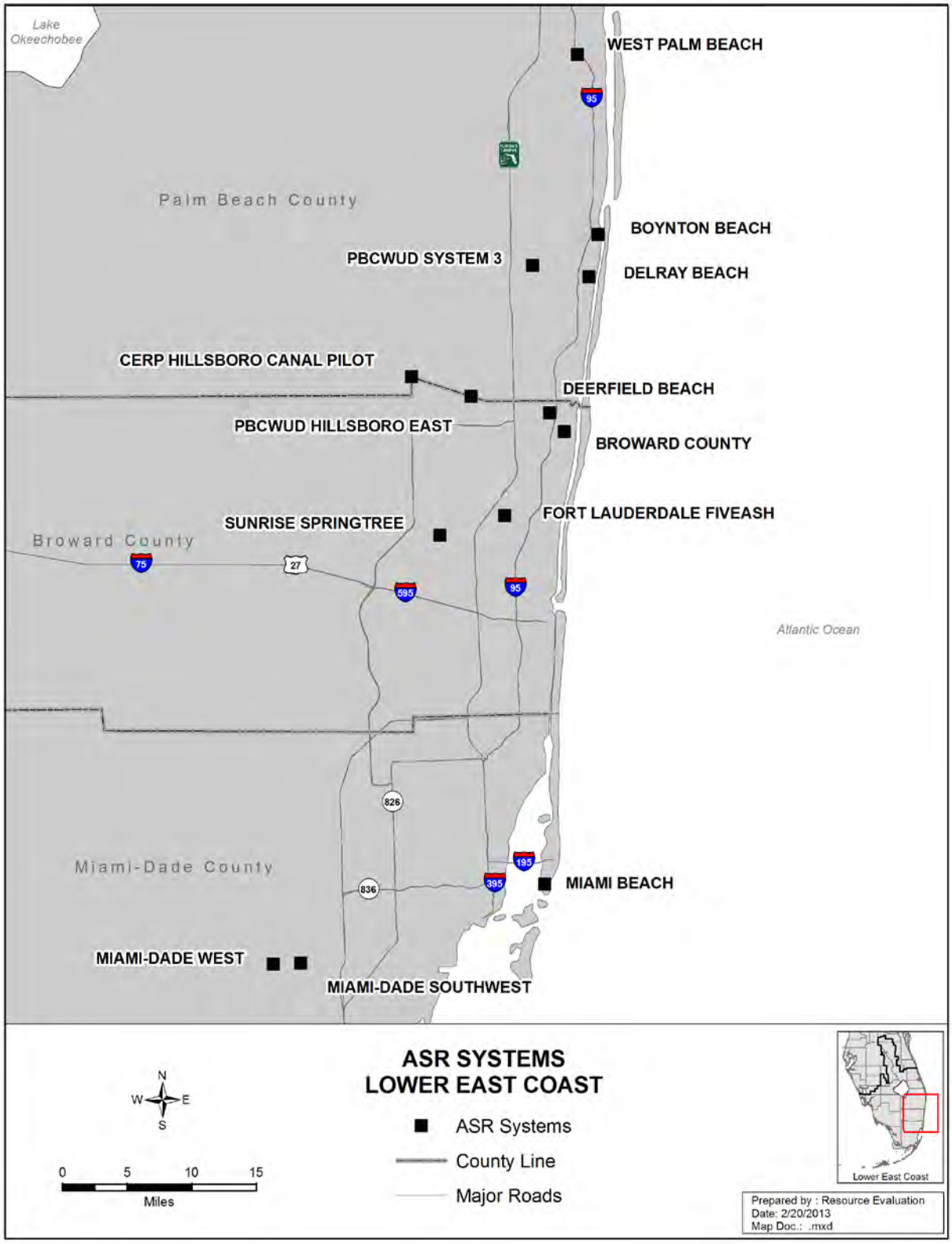

Figure 50. Location of ASR systems within the LEC Planning Area.

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The results of the Hillsboro ASR Pilot Project indicate that high capacity ASR wells, on the order of 5 MGD per well, can be successfully installed and operated in this vicinity. Recovery efficiencies ranged from approximately 20 to 40 percent, which is not uncommon for the initial test cycles at ASR systems in the LEC Planning Area. Further improvement in the recovery efficiencies would be anticipated with continued cycling testing and investment in a freshwater "target storage volume" near the ASR well. A technical report on the CERP Hillsboro ASR Pilot Project is expected in 2013.

The second CERP ASR project is located in Okeechobee County at the confluence of the Kissimmee River and Lake Okeechobee. The pilot operation of this 5 MGD facility is scheduled to be completed in mid-2013. Recent test cycles produced 100 percent recovery and resulted in reduced phosphorus concentrations.

CERP ASR Regional Study

The results of the individual CERP ASR pilot projects will be integrated into the CERP ASR Regional Study, which is designed to address regional technical issues associated with the CERP ASR program beyond the scope and budget of the ASR pilot projects. Of the 68 project components recommended in CERP, seven recommended inclusion of up to 333 ASR wells. These include the Lake Okeechobee ASR (200 wells), Caloosahatchee (C-43) Reservoir ASR (44 wells), L-8 Basin ASR (10 wells), C-51 Canal ASR (34 wells), Central Palm Beach County (Agricultural Reserve) Reservoir ASR (15 wells), and Site 1/Hillsboro ASR (30 wells). Additional ASR wells are under consideration for inclusion in conjunction with other CERP projects.

The exact number of wells has not been finalized. In addition, the final number and disposition of all proposed ASR wells will be determined through scientific investigations conducted under the ASR Regional Study, the associated ASR pilot projects, and required project implementation report studies for each CERP ASR component. This project's major elements are a technology inventory, field data collection, geotechnical and geophysical evaluations, laboratory analysis, groundwater modeling, surface water modeling, water quality monitoring, and ecological assessments. The ASR Regional Study should be complete approximately one year after the completion of the ASR pilot projects, which is anticipated to be by 2014. The report will include conclusions regarding the actual quantity of ASR wells that may be feasible and recommendations on implementation of future components of the CERP ASR program.

ASR Pretreatment Investigation

This project investigated methods to suppress the mobilization of arsenic from the aquifer-rock matrix that is associated with ASR activities. The City of Bradenton, the Southwest Florida Water Management District, the St. Johns River Water Management District, and SFWMD (through CERP) cooperatively funded this project. The pilot project began in 2008 and ended in 2012. The project consisted of 1) evaluation of arsenic mobilization processes occurring during ASR activities, 2) bench-scale studies on storage zone cores, and 3) development of a degasification "pretreatment" system to remove dissolved oxygen from

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source water prior to recharge into an ASR well. The results of the investigation indicated the removal of dissolved oxygen from the recharge water successfully resulted in the elimination of arsenic mobilization within the aquifer. These findings are significant in that they represent a technical solution to the arsenic mobilization issue associated with some ASR systems.

CERP ASR Program Interim Report

In 2008, the *Aquifer Storage and Recovery Program Interim Report 2008* was published (SFWMD and USACE 2008). The report presented findings from the first seven years of technical studies conducted by the CERP ASR Program. Among the data presented were the progress of the ASR pilot projects, exploratory well drilling, water quality monitoring, geotechnical investigations, and geophysical surveys. The report also presented the development of ASR groundwater models, geochemical analyses, and ecological evaluations. At the time the report was published, no "fatal flaws" were uncovered that might hinder the implementation of ASR in South Florida, and that additional studies were warranted to fully evaluate the full-scale implementation of ASR technology as originally envisioned in CERP. The document is available at www.evergladesplan.org/pm/projects/pdp_32_33_34_44_asr_combined.aspx.

Local and Regional Reservoirs

Surface water reservoirs provide storage of water, primarily captured during wet weather conditions, for use in the dry season. Water is typically captured and pumped from rivers or canals and stored in aboveground or inground reservoirs. For example, individual farms use small-scale (local) reservoirs for storage of recycled irrigation water or the collection of local stormwater runoff. These reservoirs may also provide water quality treatment before off-site discharge. Large-scale (regional) reservoirs are used for stormwater attenuation, water quality treatment in conjunction with STAs, and storage of seasonally available supplies.

New surface reservoirs constructed near canals or surface water bodies are referred to as off-stream reservoirs. The concept of storing excess surface water runoff in regional reservoirs generated significant interest in the northern portion of the LEC Planning Area. The proposed C-51 Reservoir is an example of an off-stream, regional reservoir. Water resource development projects designed to capture, treat, and store water are discussed in **Chapter 4**.

C-51 Reservoir Project

A mining operation is under way that may provide an additional 75,000 acre-feet of storage, if converted to the C-51 Reservoir. SFWMD, Lake Worth Drainage District, Palm Beach Aggregates, and PWS utilities jointly investigated the feasibility of using these facilities to capture and store excess surface water runoff from the C-51 Basin for beneficial uses. Structures, pumps, and canals would be constructed to deliver water to and from the reservoir. The amount of water available to the reservoir would be supplemented by

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pumping water from eastern C-51 Basin at the S-155A structure into the western basins. Capturing this water would reduce discharges to the Lake Worth Lagoon. The water would then be pumped into the reservoir during wet periods and released into the C-51 Canal during dry periods to meet future demands for water users. This operation is based on modeling conducted for the *C-51 Reservoir – Preliminary Design and Cost Estimate Final Report* (Lake Worth Drainage District et al. 2013). At full construction, the reservoir could be capable of producing 185 MGD of water during the dry season in a 1-in-10 year drought.

LEC Planning Area utilities are currently evaluating a variety of potential implementation and funding options for the project. SFWMD continues to explore a potential operational role. Over time, SFWMD's role may evolve, depending on Governing Board direction. Recently, a memorandum of understanding between SFWMD and Palm Beach Aggregates was executed to identify the responsibilities of each in moving the project forward. The memorandum of understanding describes the responsibilities for design, finance, construction, conveyance, assistance in permitting and, eventually, operation of the project. As part of this process, the Broward County Board of County Commissioners approved creation of the C-51 Governance and Finance Workgroup. If permitted and constructed, the C-51 Reservoir could be available to LEC Planning Area utilities as a water supply option. To utilize this as a water source, utilities would have to revise their water use permits and address applicable regulatory criteria.

SEAWATER

The use of desalinated seawater from the Atlantic Ocean is an additional water source option for the LEC Planning Area. SFWMD does not require a user to obtain a water use permit for the use of seawater. The ocean is an essentially unlimited source of water; however, desalination is required before use of seawater for water supply purposes. Desalination treatment technologies include distillation, RO, or electrodialysis reversal. RO is currently the most utilized desalination technology in the LEC Planning Area. To date, two RO seawater desalination treatment plants are located within the LEC Planning Area. Both plants are located in Monroe County and operated by FKAA, and have a combined supply capacity of 3 MGD to the lower Florida Keys. One is located on Stock Island—the first desalination plant built in Florida—and the other is located in Marathon. However, the largest seawater desalination facility in Florida is the Tampa Bay Seawater Desalination System, which provides up to 25 MGD of drinking water to southwestern Florida.

Significant advances in treatment and efficiencies in seawater desalination occurred over the past decade. As a result, seawater treatment costs are declining. The cost of stand-alone seawater desalination facilities remain moderately higher than brackish water desalination. The cost of seawater desalination facilities co-located with coastal power plants result in additional cost savings, further decreasing the cost difference compared to other alternative water supply sources. In December 2006, SFWMD completed a feasibility study, *Technical and Economic Feasibility of Co-located Desalination Facilities*, for co-locating seawater treatment facilities with power plants in South Florida (Metcalf & Eddy 2006). The study concluded that the most feasible three sites are co-located with FPL facilities in Fort Myers,

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Fort Lauderdale, and Port Everglades. For additional information about desalination costs, see the Support Document.

WATER CONSERVATION

Water conservation is an integral part of water supply planning and water resource management. For planning purposes, water conservation is considered a water source option because it can reduce, defer, or eliminate the need for expansion of the water supply infrastructure. This section describes water conservation opportunities, programs, and tools available to users in the LEC Planning Area. Additional supporting information can be found in **Appendix D** and Chapter 5 of the Support Document.

Comprehensive Water Conservation Program

In 2008, SFWMD's Governing Board approved the Comprehensive Water Conservation Program. This program is organized into three initiatives: 1) regulatory, 2) voluntary and incentive-based, and 3) education and marketing (SFWMD 2008). Each of these initiatives has corresponding goals and specific yet adaptable implementation strategies. The overarching vision of the program is to achieve a measurable reduction in water use, inspire governments, citizens, and businesses to value and embrace a conservation ethic, and serve as a model for water conservation. Though the SFWMD is fully committed to implementing the action steps identified in the Comprehensive Water Conservation Program, it is independent from the consumptive use permitting process and is nonbinding. The scope and implementation schedule of the action steps outlined in the Comprehensive Water Conservation Program are subject to funding levels and voluntary participation by public water suppliers and other participating groups.

Public Water Supply

For PWS, one key indicator of long-term water conservation effectiveness is decreasing daily per capita use rates over time. A per capita use rate is calculated as PWS finished water demand in gallons per day divided by the number of permanent residents. While the per capita use rate is an effective measure of conservation effectiveness for a single community or utility over time, it is less effective when comparing communities or utilities to each other. Significant differences between communities, such as the quantity of industrial use, seasonal populations, and other demographic differences can affect the total amount of water used by a community. **Table 15** presents weighted average utility per capita use rates by county for 2000, 2005, and 2010. **Table 15** shows a downward trend in the per capita use rates. This reduction in water use reflects, in part, an emerging water conservation ethic. Utility-driven plumbing retrofit programs, building code standards, public education, and the effects of SFWMD and local government year-round irrigation rules all contributed to the reduction in finished water use. In addition, there are external factors that can affect measured per capita rates and trends. These include the passive replacement of inefficient water using devices for efficient ones, recent declines in the

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economy, fluctuating population demographics of an area (e.g., persons per household and vacancy rates) the local climate, and regional droughts. SFWMD's objective is to continue this downward trend by working with water users and PWS providers to achieve significant long-term water savings.

These external factors mentioned above make calculating the per capita reduction due to conservation highly complex. Modeling tools, such as those mentioned below and in the Support Document, are capable of accounting for many of these factors, but are predictive in design. Using those tools to retroactively examine past per capita trends for the purpose of isolated effects of conservation apart from any external factors may be possible, but would require significant modification of the tools.

For an expanded discussion about estimating the effects of water conservation, see the Support Document. **Appendix D** provides the status for PWS water conservation programs for municipalities and water utilities in the LEC Planning Area.

Table 15. Per capita use rates in gallons in the LEC Planning Area for PWS finished water.

County	Per Capita Use Rates (gallons)		
	2000	2005	2010
Palm Beach	219	203	166
Broward	153	139	123
Miami-Dade	168	157	140
Monroe	216	211	109
LEC Planning Area Weighted Average	**176**	**163**	**142**[a]

a. Reflects variations in demand by permanent and seasonal populations.

Comparing per capita use rates from utility to utility or county to county is challenging. Along with the conservation, economic conditions, and landscape rules mentioned earlier, additional factors that affect these use rates include the following:

- Changing demographics of a community (such as ages and persons per household)
- Location of community—is the quality of the surface water or shallow aquifer sufficient to be used for landscape irrigation?
- Availability of reclaimed water
- Age of home—newer homes generally have landscape irrigation systems
- Local ordinances that promote or restrict the use of potable water for landscape irrigation
- Number of seasonal visitors/residents

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Water Conservation versus Alternative Water Supply Options

Meeting future water demand may require a blend of developing new alternative water supplies and increased water conservation. While most water supply development options require significant upfront investments and ongoing maintenance costs to expand water supply capacity, conservation can be the least costly means to reduce demand met by existing water supply capacity. **Table 16** compares the costs of developing 1,000 gallons of water supply through new facility construction or the expansion of an existing facility, and the costs of saving 1,000 gallons through water conservation.

Table 16. Comparison of alternative water supply development costs and water conservation costs for 1,000 gallons.

Water Conservation	New Facility Construction				Expansion of Existing Facility			
Typical Retrofit/ Replacement Programs	Nanofiltration Capacity		Low Pressure RO Capacity		Nanofiltration Process Train Capacity		Low Pressure RO Train Capacity	
	1 MGD	5 MGD	1 MGD	5 MGD	1 MGD	5 MGD	1 MGD	5 MGD
$0.40 – $3.00	$9.46	$3.42	$11.33	$4.41	$9.07	$3.13	$10.38	$3.69

Water conservation projects exceeding $3.00 per 1,000 gallons of water saved are typically not implemented by utilities because that is the point where developing alternative water supplies can become price competitive. Therefore, projects with costs above this threshold were not included in this comparison.

PWS-Sponsored Conservation Programs and Tools

Typical PWS-sponsored water conservation programs support the purchase and installation of high efficiency plumbing and irrigation fixtures, the production of educational campaigns, and the adoption of conservation-related ordinances and codes. Additionally, many of the options prescribed for PWS users are also applicable for DSS users. SFWMD supports PWS water conservation efforts through the implementation of programs mentioned below. PWS utilities are encouraged to operate treatment facilities in a highly efficient manner including ongoing leak detection and repair campaigns.

Efficient Water Using Technology & Hardware

Many PWS-sponsored programs have incentives for the replacement of older, less efficient indoor plumbing fixtures, such as toilets, faucet aerators, showerheads, and restaurant pre-rinse spray valves. These programs are often implemented through rebates, trade-ins or give aways, depending on the technology and the target audience. Similar programs focus on reducing outdoor water use through the dissemination of efficient irrigation spray heads, rain and soil moisture sensors, and computerized irrigation controllers. These related hardware and technology-related programs are often accompanied by an end user educational component to "lock in" savings and reinforce a conservation ethic.

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The United States Environmental Protection Agency developed a program called WaterSense designed to protect the future of our nation's water supply by promoting water efficiency and enhancing the market for water efficient products, programs, and practices. When designing and planning a retrofit program, SFWMD recommends utilities and municipalities refer to the WaterSense program for standards, criteria, and information. More information about this program is available from the WaterSense website, www.epa.gov/WaterSense/.

Upon request, SFWMD can provide technical assistance on water efficient technology and hardware. In addition, SFWMD administers a cost-sharing program accessible to local governments and utilities, homeowner associations, and commercial entities for technology and hardware-based conservation programs through the Water Savings Incentive Program (WaterSIP). Additional information on WaterSIP can be found in **Chapter 6**, **Appendix D**, and the Support Document.

Certification and Recognition Programs

Many public water suppliers support programs that recognize end user water conservation efforts. Some of these programs, which are referred to as certification programs, are driven by specific criteria that aim to improve efficiency in certain areas of water use. SFWMD implements and supports several recognition and certification programs. These programs include the following: 1) Water Conservation Hotel and Motel Program (Water CHAMP), which recognizes water efficiency efforts made by the lodging industry; 2) Florida Water Star program, which certifies existing buildings have been built or retrofit to high water efficiency standards; and 3) Florida-Friendly Yard program, which is administered by the University of Florida's Institute of Food and Agricultural Sciences extension office. Additional information on these programs can be found in the Support Document.

Regulatory Initiatives

Ordinances and other regulatory measures can be a low cost means to significantly advance water use efficiency. Section 373.62(1), F.S requires the installation, operation, and maintenance of a rain sensor device that overrides the cycle of an irrigation system when adequate rainfall has occurred. Conservation-related ordinances that local governments can adopt include those requiring greater water use efficiency in construction, such as the International Green Construction Code and standards derived from the Florida Water Star program and the Florida Green Building Coalition, and landscaping and irrigation, such as the Florida-Friendly Landscape Ordinance and SFWMD's Year-Round Landscape Irrigation Rule. One advantage of ordinance and code adoption is that they can be adopted wholesale or piece meal depending on pre-existing conditions in the locality. It is the responsibility of local governments to enforce compliance with landscape irrigation rules and ordinances.

In March 2010, the Mandatory Year-Round Landscape Irrigation Conservation Measures Rule (Chapter 40E-24, F.A.C.) became effective. Broadly, this rule limits irrigation of existing landscapes to two days per week with a three-day-per-week provision for counties wholly located within SFWMD's jurisdictional boundaries, including Palm Beach, Broward, Miami-

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Dade, and Monroe counties. The rule also provides local governments across the region the flexibility to adopt alternative landscape irrigation ordinances that are at least as stringent as SFWMD's rule. The Mandatory Year-Round Landscape Irrigation Conservation Measures does not supplant the SFWMD Regional Water Shortage Plan (Chapter 40E-22, F.A.C.). It contains water shortage restrictions related to specific water bodies, including Lake Okeechobee. Further information on water shortage management is available in the Support Document.

In accordance with Section 373.185, F.S, the SFWMD encourages all local governments to adopt an ordinance or amend a current ordinance to require Florida-Friendly Landscaping™ for all future development. SFWMD provides a model ordinance and technical support for local governments seeking to adopt a Florida-Friendly Landscaping™ ordinance or an irrigation ordinance consistent with Chapter 40E-24, F.A.C.

The state of Florida has undertaken an initiative, under the direction of FDEP, to bring more consistency to the consumptive use permitting programs implemented by the water management districts. Part of that initiative currently being contemplated entails making changes to the rules affecting conservation requirements for the PWS use class. It is not known at the time of this writing what changes in the permitting criteria will ultimately be made. Regardless of the required permitting criteria for water conservation, SFWMD will continue working with utilities utilizing voluntary conservation initiatives and providing assistance with goal-based planning, the use of analyses tools, and matching funding for conservation projects under SFWMD's WaterSIP program.

Water Conservation Rate Structures

Water pricing is one of the most effective means to promote water conservation. A water conservation-based rate structure provides a financial incentive to reduce use. In the LEC Planning Area, the majority of PWS providers have a block rate structure (also referred to as a "tiered" rate structure) in place. The block rate structure is generally expected to have the largest impact on heavy irrigation users. If properly structured, a tiered rate system can have a minimal impact on utility revenue. The customer's responsiveness to water conservation rate structures depends on the existing price structure, incentives of the new price structure, the customer base, and their water uses. For more information on rate structures please refer to **Appendix D**.

Education, Outreach, and Marketing

Education, outreach, and marketing are essential to accomplish a measurable change in water conservation and instill a lasting conservation ethic in South Florida businesses and communities. PWS are encouraged to have a robust and comprehensive conservation educational program. SFWMD continues to implement and support a wide variety of programs designed to build a conservation ethic and permanently reduce individual and commercial water use. Information on these programs is provided in the Support Document. **Appendix D** contains the implementation status of public education programs for PWS utilities in the LEC Planning Area.

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Goal-based Water Conservation Plans

A goal-based water conservation program is a longer-term water use reduction program that has a specified numerical water use target. The target is expressed in per capita use or quantifiable volume of water saved. Because a well-designed goal-based conservation program can lower peak demands in addition to reducing overall per capita water use, they can help a utility meet future water supply demands without building new facilities or wells. In addition to being cost-effective, when properly planned and monitored, conservation can be as reliable as an alternative water supply source in many cases. A well designed program identifies a variety of methods and practices along with anticipated costs, savings, and estimates of revenue impacts that decrease water demand to meet numeric goals. The practices selected should reflect, among other parameters, the service area's population projections, existing per capita use, participation rates, existing housing stock, and the current and anticipated service area's water use profile. SFWMD recommends regular review and analysis of plan results, which allow for program adjustments as needed to meet water conservation goals. A good example of a goal-based water conservation plan is the *Miami-Dade County Water Use Efficiency 20-Year Plan* (Miami-Dade County 2007), which is described in greater detail in **Appendix D**.

Water Conservation Program Planning Tools for Public Water Supply Utilities

PWS utilities are strongly encouraged to use a water conservation planning tool when creating a goal-based water conservation program. In general, water conservation planning tools can help a utility develop a service area water use profile, evaluate and compare the costs and benefits of various conservation measures, show projected water savings, and create a mid- to long-range conservation (or demand management) plan. Some of these tools match actual billing data to property appraiser parcel data while others use proxy data.

The tools being developed today are highly comprehensive, accounting for many factors that affect per capita water use and conservation such as the (passive) replacement of old fixtures with new ones outside of utility-driven conservation programs. In addition, some tools identify specific points of capacity deferment and present value benefits, and calculate utility revenue and rate impacts.

Upon request, SFWMD provides support and assistance to utilities to access and apply these types of tools and creating service area demand management plans. Detailed descriptions and explanations on where to find two such tools—the Conserve Florida Water Clearinghouse's EZ Guide (EZ Guide) and the Alliance for Water Efficiency's Conservation Tracking Tool—can be found in the Support Document. The St Johns River Water Management District recently developed the Florida Automated Water Conservation Estimation Tool. This tool uses linear programming to process account-level billing data, county property appraiser information, and Florida Department of Revenue land use codes to develop customer water use profiles within utility service areas. Proxy data can be used to estimate consumption by individual accounts in the absence of actual billing data. The tool generates an optimized list of water conservation BMPs, as well as a geographic

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information system map of all customers in each consumption block. SFWMD will be using this and other similar tools in the future to conduct regional analysis of conservation. Conservation staff from SFWMD can assist public water suppliers to access and apply these tools to conduct similar analyses of their service areas.

Regional Approach to Water Conservation (Broward Water Partnership)

Smaller utilities may find it advantageous to create partnerships with other utilities in implementing water conservation projects or programs. This type of consortium may be able to capitalize on bulk buying and other economy of scale benefits by pooling and sharing resources. One such consortium is the Broward Water Partnership. This is a government service currently consisting of 18 municipalities and water utilities. The goal of the partnership is to achieve at least a 10 percent reduction in countywide water demand. The partnership was initiated in 2011 with the intent to provide regional programming, including rebates and other incentives, for high efficiency plumbing fixtures and messaging to residential and commercial water users. It is estimated that up to 30 MGD may be saved by this program by 2030. More information on the partnership can be found at www.conservationpays.com and the participating utilities' summaries in **Chapter 6**.

Agricultural Use

Agriculture is the second largest water user in the LEC Planning Area. As such, the AGR Self-Supply water use category offers significant water conservation potential. The water use permitting process bases water allocations for agriculture on a number of factors, including the crop type, growing and irrigation methods, and site-specific parameters such as soil type and anticipated rainfall. Because a number of these factors are fixed, demand reduction must be based on aspects that can be changed, such as irrigation and growing methods. Generally, these types of changes are expensive and require extensive planning and consideration. Because of the costs associated with moving water, which affects the profitability of the overall crop, it is assumed that most farmers are as efficient as practicable with their water use.

SFWMD requires new citrus and container nursery projects to use microirrigation systems or other systems of equivalent efficiency. Flood/seepage irrigation type systems are typically used for tomato, corn, rice, and sugarcane production. While flood/seepage irrigation systems are not as efficient as microirrigation, tailwater recovery can be applied. It is considered a water use efficiency measure that may be used on individual projects, depending on applicability, and does provide some recharge to the SAS. Most projects located within the EAA utilizing flood/seepage irrigation have unique conditions that allow for a more efficient use of water as the water is passed from farm to farm. For permitting purposes, a higher than normal efficiency value was applied for most of the flood/seepage projects located within the EAA. Projects in the EAA may not benefit as greatly, from a water conservation perspective, from the installation of a tailwater recovery systems when compared to other projects outside the EAA.

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Agricultural Best Management Practices

Agricultural BMPs are actions agricultural businesses can take to protect or improve water quality or quantity while maintaining or even enhancing agricultural production. The Florida Department of Agriculture and Consumer Services and FDEP develop and adopt BMPs by rule for different types of agricultural operations, specific regions, or statewide. Most BMPs in the region are established to improve water quality; however, some contain an implicit water conservation component.

BMPs identified as having implicit water conservation benefits include tailwater recovery, land leveling, observation wells, regular system maintenance and evaluation, irrigation scheduling, irrigation system design, and irrigation efficiency. Tailwater recovery is a planned system to capture and recycle irrigation and storm water that runs off the field. Land leveling allows for a more uniform and efficient application of irrigation water. Observation wells provide a visual indication of surficial groundwater levels for sub-irrigation systems and can be used to optimize soil moisture while minimizing water use. Irrigation efficiency can be improved by either replacing an outdated or inefficient irrigation system or by optimizing the operations and maintenance of an existing irrigation system. The selection of a new system depends on the type of crop, soil, water source, and water availability. A review of irrigation scheduling—time between irrigation events and amount of water applied—might result in an increase of irrigation efficiency. Farmers can also use soil moisture sensors and weather-based irrigation controllers to customize irrigation based on site-specific soil and weather conditions. The volume of water that can be conserved on any individual project as a result of implementation of any of these voluntary BMPs is difficult to estimate.

Agricultural Mobile Irrigation Labs

Agricultural mobile irrigation labs evaluate the performance of irrigation systems and encourage the adoption of efficient irrigation management practices that conserve water. Three agricultural mobile irrigation labs service the LEC Planning Area and are managed and administered by the Soil Water Conservation Districts in Palm Beach, Broward, Miami-Dade, and Hendry counties. From 2006 to the third quarter of 2012, evaluations were conducted on 8,893 agricultural acres in the LEC Planning Area. Total water savings of 2.95 MGD has been estimated based on follow-up evaluations to a small number of farms.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program, implemented through the United States Department of Agriculture – Natural Resources Conservation Service, was reauthorized in the Farm Security and Rural Investment Act of 2002 to provide a voluntary conservation program for farmers and ranchers. The program promotes agricultural production and environmental quality as compatible national goals. Financial and technical assistance is offered to eligible participants to install or implement structural and management practices that address impaired water quality and conservation of water resources on eligible agricultural land. For example, reduction of soil erosion and sedimentation can have a

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positive impact on water quality and improve irrigation efficiency. During Fiscal Years 2009 and 2010, 28 farms encompassing approximately 12,000 acres participated in the program in the LEC Planning Area.

Recreational/Landscape Use

Recreational/Landscape water use includes water used to irrigate parks, athletic fields, golf courses, landscaped areas (e.g., homeowner association common areas and the areas around malls and office buildings), roadway medians, and cemeteries. The demand for water used for this purpose generally increases at a rate similar to population growth. While many recreational landscapes in the LEC Planning Area are self-supplied and irrigated drawing from either an on-site well, retention pond, canal, or even reclaimed water, many others are irrigated using potable utility-supplied water. In any case, some of the tools and programs mentioned throughout this chapter can be employed to increase efficiency and reduce wasteful use by self-supplied and PWS-supplied water users alike.

Demand reduction is possible through the use of increasing efficacy of landscape irrigation, which includes Florida-Friendly Landscaping™ principles, rain sensors, advanced irrigation technology, proper irrigation system design and scheduling, and maintenance of automatic irrigation systems. Other on-site options include capture of gray water or storm water in rain barrels or cisterns. The deployment of mobile irrigation labs can help residents and commercial water users identify areas where and how the aforementioned and other system efficiencies can be greatly improved. Information on smart irrigation technologies and mobile irrigation labs can be found in the Support Document.

Golf Courses

One of the largest subclass of users in the Recreational/Landscape water use category are made up of golf courses (37 percent of the region's total recreational water demand). As of 2010, 184 permitted golf courses (totaling 27,500 acres) were located within the LEC Planning Area. Estimated annual gross irrigation demand is 80 MGD.

Many golf courses currently employ best management and design practices and new irrigation technologies, including rain sensors or soil moisture sensors and weather-based irrigation system controllers, to maintain a high degree of water use efficiency. Golf courses using antiquated equipment should consider upgrading to the latest irrigation control technology and the use of Florida-Friendly Landscaping™ principles wherever feasible. For some projects, funding assistance through WaterSIP may be available to golf courses.

Industrial, Commercial, and Institutional Use

For many PWS, industrial, commercial, and institutional water users typically make up a relatively small number of accounts, yet make up a large proportion of a utility service area's water use profile. Working with this sector, therefore, presents an opportunity to have a significant impact on decreasing finished water demands by working with a lower

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number of users relative to other use categories. While many industrial, commercial and institutional users in the LEC Planning Area are self-supplied (i.e., draw water from either an on-site well, retention pond, canal, or even reclaimed water), some use potable utility-supplied water. The tools and programs mentioned throughout this chapter can be employed to increase efficiency and reduce wasteful use.

To assist industrial, commercial, and institutional users to improve water use efficiency, SFWMD published the *Water Efficiency and Self-Conducted Water Audits at Commercial and Institutional Facilities, A Guide for Facility Managers* (SFWMD 2013b). This guide assists facility managers through detailed self-conducted water use assessment procedures and evaluation of water usage and potential for conservation for the most common points of water use at commercial or institutional facilities. Utilities are encouraged to incorporate this guide into their outreach efforts toward commercial and institutional water users. The guidebook and its companion water use and savings calculators are available free for download from SFWMD's conservation webpage (www.savewaterfl.com) under Businesses.

Water Conservation Summary

Cooperative water conservation efforts among water users, utilities, local governments, and SFWMD are necessary to accomplish water savings. SFWMD also encourages long-term reductions in water consumption across all water use categories by promoting and implementing many of the water conservation measures and the Comprehensive Water Conservation Program initiatives presented in this chapter.

Appendix D of this update includes the status of water conservation implementation, water conservation rate structures, water conservation versus development of additional water supplies, goal-based water conservation plans, and the WaterSIP projects.

SUMMARY OF WATER SOURCE OPTIONS

The LEC Planning Area traditionally has relied on fresh groundwater from the SAS and fresh surface water as the primary water source for urban, agricultural, and industrial uses. In many areas of the LEC Planning Area, development of these sources has been maximized due to potential impacts on the regional system, wetlands, existing water users, and the potential for saltwater intrusion. Therefore, new or increased allocations from these freshwater sources will be reviewed on an application-by-application basis to determine if a project meets the consumptive use permitting criteria. As a result, diversification of water supply sources, such as use of the upper Floridan aquifer, increased storage, reclaimed water, and appropriate water conservation has been occurring in the LEC Planning Area and is expected to continue to occur in the future. The source options are dependent on location, use type, demand, regulatory requirements, and cost.

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6

Water Supply Development Status and Projects

This chapter provides a summary of the water supply development projects anticipated to meet the water demands of the Lower East Coast (LEC) Planning Area for the 2010 to 2030 planning horizon. Information is provided for each water use category presented in **Chapter 2**. Additional details about demand projections, local government responsibilities, and water supply development projects can be found in **Appendices A**, **E**, and **F**, respectively.

TOPICS

- Regional and Local Planning Linkages
- Projects Identified
- Funding
- Summary
- Public Water Supply Utility Summary Sheets

A growing population in the LEC Planning Area is driving the demand increases and need to develop water supplies. The region's population is expected to increase by 18 percent, from approximately 5.6 million in 2010 to more than 6.6 million in 2030. The gross demand for Public Water Supply (PWS), the largest water use type in the LEC Planning Area, is expected to increase 20 percent to a projected demand of 1,007 million gallons per day (MGD). Water users, such as utilities, local governments, and self-suppliers, including agriculture, industrial/commercial/ institutional, and power generation, are primarily responsible for water supply development projects. PWS relies almost exclusively on fresh groundwater from the surficial aquifer system (SAS), which includes the Biscayne aquifer. However, as discussed in previous chapters, most utilities have allocations and infrastructure in place to meet their 2030 demands. The availability of fresh groundwater to meet the needs of future growth in the LEC Planning Area could be limited by local conditions if needed. The additional water to meet future PWS demand is generally expected to be developed from other sources, primarily through development of brackish groundwater, reclaimed water, and stormwater/surface water capture. The implementation of water conservation programs offers potential water use savings to reduce future water demand.

A utility summary is included at the end of this chapter for each PWS utility supplying 100,000 gallons per day (0.1 MGD) or greater to its service area. Each summary includes the water supply projects proposed by utilities. For other water use categories, specific projects

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are identified as provided to the South Florida Water Management District (SFWMD) for this plan update.

REGIONAL AND LOCAL PLANNING LINKAGE

SFWMD's water supply planning process is closely coordinated and linked to the water supply planning of local governments and utilities. Significant coordination and collaboration throughout the water supply plan development and approval process is needed among all water supply planning entities. In the LEC Planning Area, 52 PWS utilities had a capacity of 0.1 MGD or greater in 2010. In 2013, the number of utilities is 50 as a result of closure or reorganization. The Glades Utility Authority was incorporated into the Palm Beach County Water Utilities Department (PBCWUD) system in 2013. In future plan updates, this facility will be included as part of the PBCWUD. The State of Florida closed the AG Holley State Hospital in Palm Beach County in 2012. Of these, 40 are local government owned utilities and four are privately owned utilities serving 112 local governments and the Seminole Tribe of Florida. Five water control or special districts (Chapter 298) are also located within the LEC Planning Area and operate PWS utilities serving portions of local governments. **Appendix C** provides lists of utilities and local governments served as well as statutory requirements relevant to local government comprehensive plans.

For consistency in the water supply planning process, SFWMD, local governments, and utilities worked closely to project demand and identify water supply projects for the future. Projects proposed in local governments' water supply facilities work plans are listed in the annual utility progress reports provided to SFWMD each fall. The regional and local water supply planning process is illustrated in **Figure 51** and described in the Process box on the next page.

Comprehensive plans, water supply facilities work plans, and water use permit applications are prepared at different times, each using the latest and best data available at that time. Projections and estimates could differ between local governments' work plans (and comprehensive plans) and the applicable regional water supply plan. Local economic conditions and population growth rates may affect when water is needed and projects initiated. Local governments' future water supply development projects should generally be consistent among plans and permits and meet projected water demands.

Many of the projects identified in this plan update were listed in the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007). Some of these projects are still proposed with future expansion phases (multiple phase projects), or were delayed and/or modified due to slower than projected population and demand growth.

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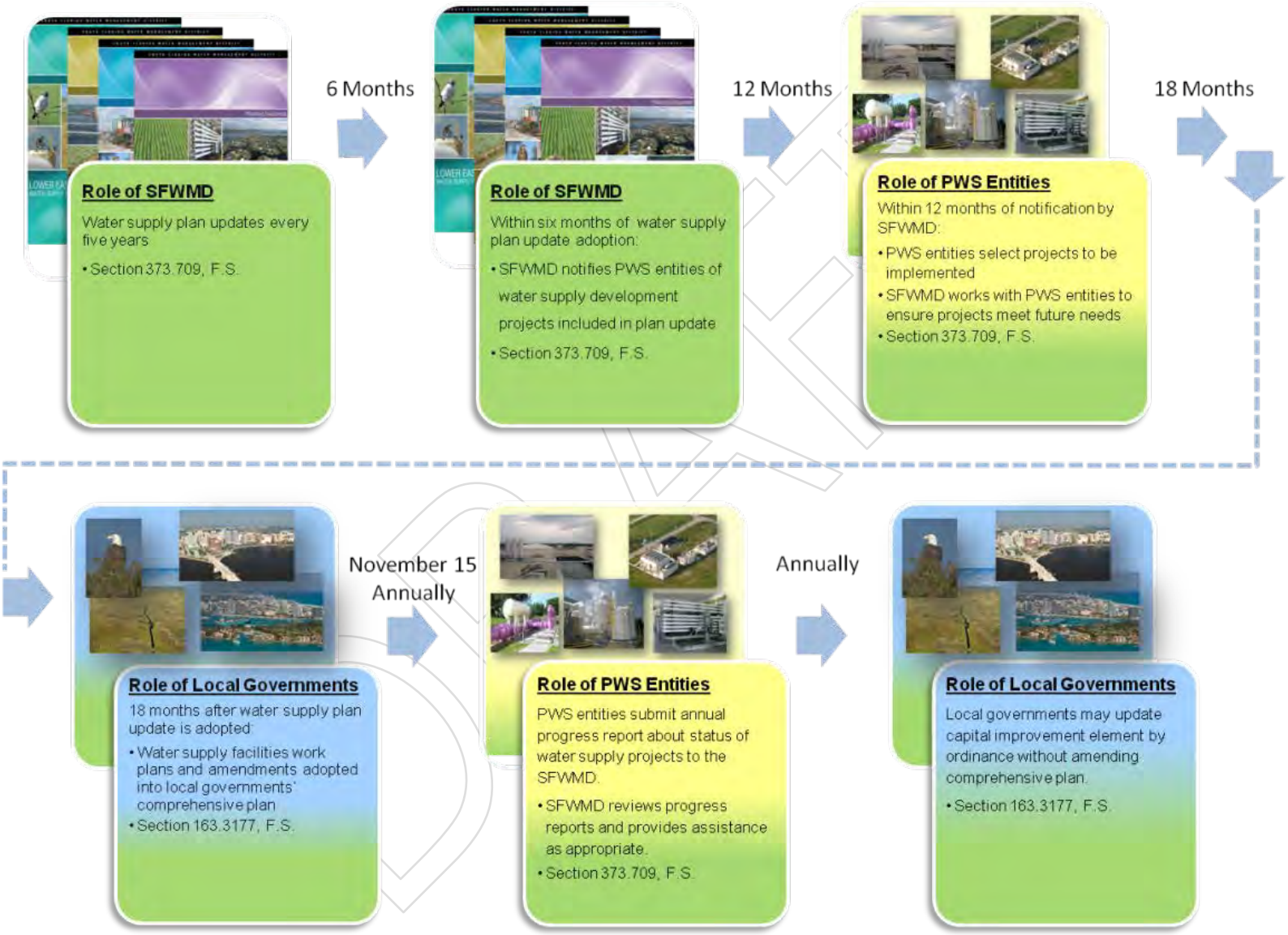

Figure 51. Linking regional water supply planning with local government comprehensive planning. (Note: F.S. – Florida Statutes.)

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PROCESS

Regional and Local Water Supply Planning Process

SFWMD is required to notify each PWS utility of the projects identified in this plan update for that utility to consider and incorporate into its corresponding government's required water supply facilities work plan in order to meet future water demand. This notification must occur within six months following approval of the water supply plan update. Once the notice is received, PWS utilities then must respond to SFWMD within 12 months about their intentions to develop and implement the projects identified by the plan or provide a list of other projects or methods to meet these needs (Section 373.709, Florida Statutes [F.S.]).

Additionally, local governments are required to adopt water supply facilities work plans and related amendments into their comprehensive plans within 18 months following approval of the regional water supply plan. The work plans contain information to update the comprehensive plan's capital improvements element, which outlines specifics about the need for, and the location of, public facilities, principles for construction, cost estimates, and a schedule of capital improvements.

Local governments are required by Subsection 163.3177(6)(c)3, F.S. to modify the potable water sub-element of their comprehensive plan to include the following:

- Incorporate the water supply project or projects selected by the local government from those projects identified in the updated regional water supply plan or proposed by the local government.
- Identify water supply projects to meet the water needs identified in the updated regional water supply plan within the local government's jurisdiction.
- Include a work plan, covering at least a ten-year planning period, for building public, private, and regional water supply facilities, including the development of alternative water supplies, which are identified in the potable water element to meet the needs of existing and new development.

By November 15 of each year, all utilities are required to submit a progress report about the status of their water supply projects (completed, underway, or planned for implementation). Local governments are required to perform an annual review of the capital improvements element to update the five-year capital improvements schedule. The local governments are encouraged to send updates to the Florida Department of Economic Opportunity and SFWMD.

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Link to Water Use Permitting

Although comprehensive plans, water supply facilities work plans, and water use permit applications are prepared at different times, each uses the latest and best data available at that time. Local governments' future water supply development projects should generally be consistent among plans and permits and meet projected water demands. However, local economic conditions and population growth rates may affect when water is needed and when water use permits should be modified to accommodate demands. When this takes place, projects may need to be proposed that may not be consistent with earlier dated documents.

A Florida Department of Environmental Protection (FDEP) guidance memo addresses coordination between SFWMD's water use permitting and water supply planning staff on projects included in water supply plans. By increasing coordination during the water supply planning process, water use permit applicants planning one of the identified water supply projects will be assured that SFWMD staff is familiar with the projects, have supporting data, and will be able to facilitate the permitting process. The proposed projects considered for this plan update were reviewed at a cursory level by SFWMD staff working in water use permitting and water supply planning using the following set of questions:

- Does the proposed project use a source of limited availability?
- Is the project located in a restricted allocation area?
- Is the proposed source from a minimum flows and levels (MFL) water body or is it connected, directly or indirectly, to an MFL water body? If yes, is the proposed use consistent with MFL recovery or prevention strategies?
- What other environmental water needs (i.e., Comprehensive Everglades Restoration Plan [CERP] targets, water reservations, etc.) may be impacted?
- What resource issues have been identified in recent permit applications in the general area for the same source (i.e., wetlands, saltwater intrusion, MFLs, etc.)?
- Have existing legal users of the same source had resource-related compliance issues?
- Have any new technical studies been completed related to source availability?

However, each proposed use of water must meet the conditions for permit issuance found in Section 373.223, Florida Statutes (F.S.), and the implementing criteria found in Chapters 40E-2 and 40E-20, Florida Administrative Code (F.A.C.). Section 373.223, F.S. requires applicants to establish that the proposed use of water 1) is a reasonable-beneficial use as defined in Section 373.019, F.S., 2) will not interfere with any presently existing legal use of water, and 3) is consistent with the public interest. Water use permits are required for all water supply development projects, except for those using 100 percent seawater or reclaimed water under direct pressure or from a lined pond.

The availability of new freshwater supplies in the LEC Planning Area is limited due to existing permitted users and source limitations, including environmental protection criteria such as saltwater intrusion (see **Chapter 3**). This is reflected in existing permitted

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allocations. The availability and permittability of freshwater supplies to meet projected water demands through 2030 will be determined on an application-by-application basis. Some freshwater supply development may be feasible depending on local conditions.

PROJECTS IDENTIFIED FOR THIS PLAN UPDATE

A discussion of the demand and supply conditions for each of the six major water use categories follows. Because most of the growth in demand during the next 20 years will occur in the urban sector, more specifically PWS uses, all of the proposed potable and nonpotable water and conservation projects will be implemented by PWS utilities.

The demand for PWS in the LEC Planning Area is projected to increase through 2030. A combination of existing and additional capacity developed by new water supply development projects will be used to meet the demand. The utility summaries indicate all LEC Planning Area utilities can meet their projected 2030 demand with existing treatment capacity or by supplementing that capacity by developing one or more identified projects. In addition to meeting demands, utilities may propose water supply development projects due to their own unique situations. These can include accommodating a change in treatment processes or sources; or optimizing distribution systems to match future demand locations. Each utility's proposed projects are displayed in their summary found at the end of this chapter and in **Appendix F**.

To manage the water resources in the region, this update promotes the diversification of sources for the water supply projects needed to meet future demands. Projects proposed for inclusion in this update were evaluated based on factors discussed in the previous section, level of detail provided (i.e., project scope, cost, and schedule), and whether the project is expected to contribute to new water supply, resulting in a potentially permittable increase in their allocations or a treatment system's rated capacity.

The majority of the PWS water providers appear to be able to meet their 2030 projected demand without additional allocation or infrastructure. Utilities have been expanding and upgrading their water treatment infrastructure since the last plan update. Between 2007 and 2009, utilities added 41 MGD of potable water supply capacity. Between 2010 and 2013, ten utilities built potable water supply projects with a capacity of 49 MGD.

In this plan update, nine utilities have proposed 11 new potable water supply projects totaling 50 MGD to implement planned system expansions, source diversification, or changes in treatment technology between 2014 and 2030 (**Figure 52**). Several of the 11 proposed projects are in response to utilities anticipating future growth at a faster rate than projected in this plan update.

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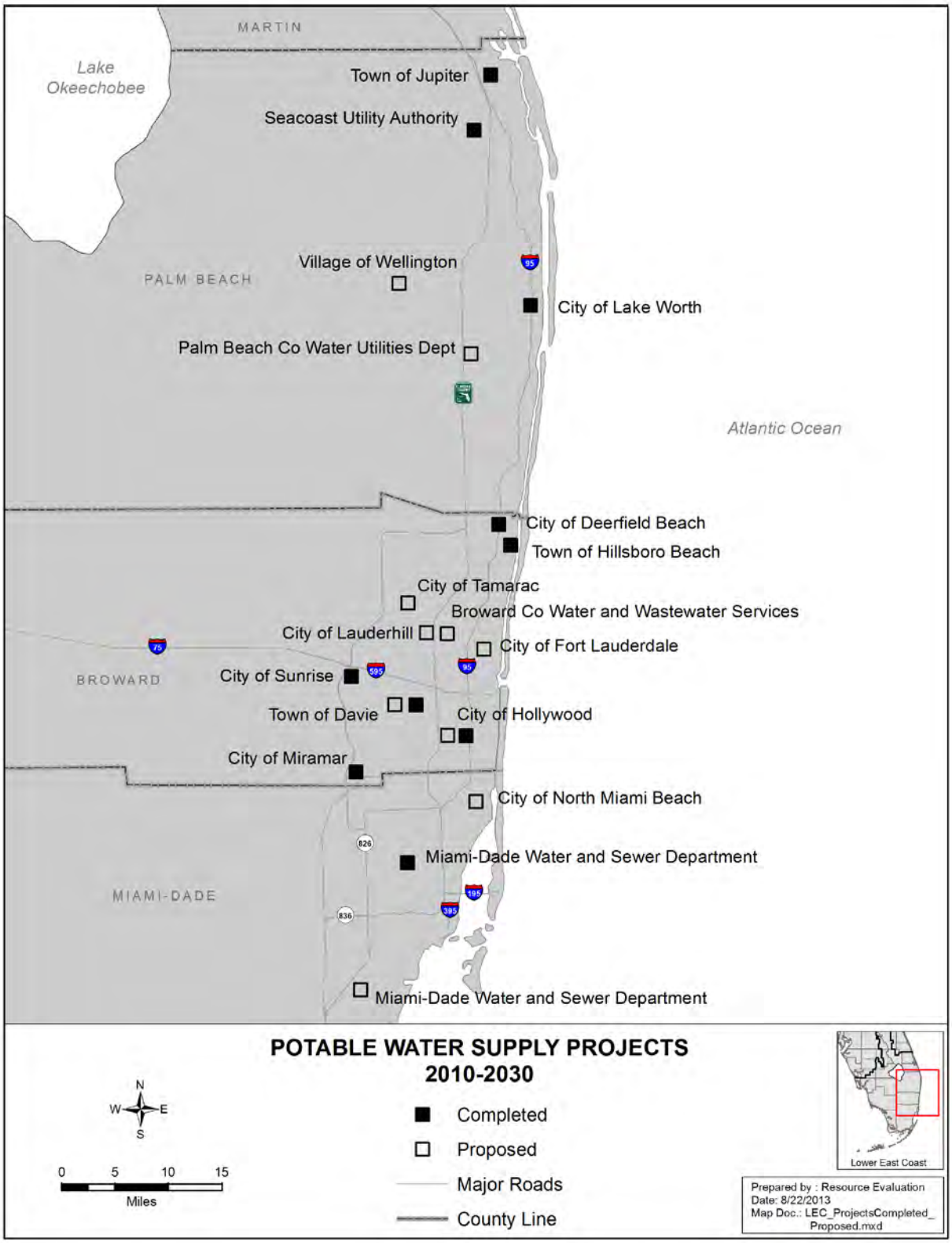

Figure 52. Completed and proposed potable water supply projects for 2010–2030.

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Based on the 2030 demand projections, two utilities appear to need their proposed potable water supply projects during the planning period. The Town of Davie has proposed a 6 MGD expansion project. Miami-Dade Water and Sewer Department (MDWASD) has proposed to build a new 20 MGD water treatment plant to meet the projected growth within the southern portion of its service area. The timing and sizing of each proposed project in this plan may depend on several factors (e.g., economic recovery, conservation programs, and constraints within treatment and distribution systems) that affect the actual demand increases over the next 20 years.

Utilities with Completed Potable Projects 2010–2013

- Seacoast Utility Authority
- Town of Jupiter
- City of Lake Worth Utilities
- Town of Hillsboro Beach
- City of Deerfield Beach
- City of Sunrise
- Town of Davie
- City of Hollywood
- City of Miramar
- MDWASD

Utilities with Proposed Potable Projects 2014–2030

- PBCWUD
- Wellington Public Utilities Department
- Broward County Water and Wastewater Services (District 1)
- City of Tamarac
- City of Lauderhill
- City of Fort Lauderdale
- Town of Davie
- City of Hollywood
- City of North Miami Beach
- MDWASD

Furthermore, a project identified for inclusion in this plan update may not necessarily be selected for development by the utility. In accordance with Section 373.709(6), F.S. nothing contained in the water supply component of a regional water supply plan should be construed to require local governments, public or privately owned utilities, special districts, self-suppliers, multijurisdictional entities, and other water suppliers to select the identified project. If the projects identified in this plan update are not selected by a utility, the utility must identify another method to meet its needs and advise SFWMD of the alternative projects(s). The local government then needs to include the project information in its water supply facilities work plan.

One reason a project may not be selected for implementation is need, or lack thereof. Several utilities proposed projects that exceed the projected demands for 2030. As happened with the 2005–2006 LEC Plan Update, utilities may replace or delete projects

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that are not needed or defer projects beyond the twenty-year planning horizon of this update.

Public Water Supply

PWS demand includes all potable uses served by public and private utilities with a production capacity equal to or greater than 0.1 MGD. The PWS finished (net) demand is projected to increase by 154 MGD from 784 MGD in 2010 to 938 MGD in 2030, while gross (raw) water demand is projected to grow by 166 MGD from 842 MGD to 1,007 MGD in 2030. In aggregate, the utilities of the LEC Planning Area have both adequate permitted water use allocation and adequate permitted potable water treatment capacity to meet the LEC Planning Area's 2030 demands. This is due in part to proactive water supply planning by utilities in coordination with SFWMD's regional planning, slower than anticipated growth rates over the past five years, and the issuance (including renewals and modifications) of water use permits with twenty-year durations.

As of 2010, PWS demand was met by fresh groundwater from the SAS (94 percent), brackish groundwater from the upper Floridan aquifer system (FAS) (3 percent), and surface water (3 percent). Although reclaimed water and conservation of potable water do not produce potable water per se, it is a means to meet nonpotable demand or extend the existing potable supplies to meet future demand.

All PWS water use permits contain provisions limiting the volume of water withdrawn from each source. If permitted allocations cannot meet 2030 demand, water supply development projects, increased allocation, or other options may be necessary. Some utilities, such as the cities of Dania Beach and Homestead expect to meet future supplemental demands by purchasing bulk or finished water through interconnections with nearby utilities that have sufficient water capacity. Other utilities, such as Seacoast Utility Authority, City of Deerfield Beach, City of Sunrise, Town of Davie, and MDWASD, have developed alternative water supplies using brackish groundwater from the FAS. Brackish water projects in the LEC Planning Area include construction of reverse osmosis (RO) water treatment plants, expansion of existing plants, and construction of new production wells.

In total, the proposed potable water supply development projects will potentially create new treatment capacity yielding 76 MGD of finished water by 10 utilities (**Table 17**). Together with existing capacity, this will exceed the projected 2030 PWS total finished demand of 938 MGD. Of the 76 MGD of new potable treatment capacity, 67 MGD would be produced by 11 brackish water source projects. An additional 10 MGD would be produced by two freshwater source projects.

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Table 17. Proposed potable water supply development projects and capacity for 2010–2030.

Water Source	Number of Projects [a]	Capacity (MGD)
Fresh groundwater (SAS)	2	9.90
Brackish groundwater (FAS)	11	66.50
Total	**13**	**76.40**

a. Some projects consist of more than one construction component and will be implemented in multiple phases.

PWS utilities identified 11 new reclaimed water projects with 151 MGD of new treatment capacity (**Table 18**). The reclaimed water projects will meet multiple types of demand, including 1) landscape irrigation, including golf courses and parks, 2) groundwater recharge, and 3) power generation. Some reclaimed water projects will produce new treatment capacity by construction or expansion of reclaimed water production facilities. Other projects involve increasing reuse distribution lines and storage facilities. PWS utilities also identified 12 reclaimed distribution projects with total capacity of 104 MGD. The capacities for reclaimed distribution and treatment projected are not summed to avoid double counting. The largest proposed reclaimed water project is located in Miami-Dade County and will supply 90 MGD to the Florida Power & Light (FPL) Turkey Point plant expansion. The City of West Palm Beach is reactivating their existing ASR system. The city is also increasing pumping capacity to move a higher volume of water to Grassy Waters Preserve. Florida City is proposing two stormwater capture projects.

Table 18. Proposed nonpotable water supply projects and capacity for 2010–2030.

Project Type	Number of Projects [a]	Capacity (MGD)
Reclaimed water (new treatment capacity)	11	151.10
Stored surface water/storm water/ASR	4	17.00
Total	**15**	**168.10**

a. Some projects consist of more than one construction component and will be implemented in multiple phases.

Conservation is an important component of utilities' plans for meeting future demands. Four specific conservation projects were proposed. Additionally, seventeen water utilities in the LEC Planning Area are participating in the Broward Water Partnership, a multiple year program that provides rebates and other water conservation tools and tips to businesses and homeowners (see **Chapter 5**). The program was recently expanded to include multiple family units, commercial buildings, and not-for-profit agencies, as well as single family homes. It is estimated that up to 30 MGD can be saved throughout Broward County by 2030 through this program. Three utilities are also planning on implementing discrete water conservation programs that will result in a combined total of savings of 45.4 MGD by 2030.

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Domestic Self-Supply

Domestic Self-Supply (DSS) includes potable water from a private domestic well serving a private residence, and utilities that produce less than 0.1 MGD on an annual basis. DSS finished (net) demands in the LEC Planning Area are only projected to increase by less than 1 MGD from 17 MGD in 2010 to 18 MGD in 2030 (gross [raw] demands are projected to increase by less than 1 MGD from 18 MGD in 2010 to 19 MGD in 2030). DSS needs are met almost exclusively with fresh groundwater from the SAS, and will continue to do so in the future. As such, no water supply development projects are proposed for this use class.

Agricultural Self-Supply

Agricultural (AGR) Self-Supply is expected to remain the second largest water use category within the planning area after PWS. Irrigated agricultural acreage in the LEC Planning Area collectively is very stable and not projected to change significantly over the next twenty years. This is especially true in the Everglades Agricultural Area where permitted acres (458,210) and cropping practices are not projected to change. The Western Basins, which are in Hendry County but outside of the Everglades Agricultural Area and Lake Okeechobee Service Area, are projected to have a slight increase in irrigated acres. Using an estimate of irrigated acres in 2010 (575,316) as a starting point, the total irrigated acres is projected to be 575,897 acres in 2030. Consequently, estimated AGR Self-Supply irrigation needs (gross demand) is projected to be 664 MGD in 2030, the vast majority of which is already permitted. AGR Self-Supply water use accounts for 34 percent of the region's total gross demand.

The primary water sources used for agricultural irrigation in the LEC Planning Area are fresh surface water in Palm Beach County, the portions of Hendry County in the LEC Planning Area, and the portions of Okeechobee, Glades, and St. Lucie counties within the Lake Okeechobee Service Area, and fresh groundwater in Hendry, Broward, and Miami-Dade counties. However, agricultural operations use both sources in the LEC Service Area (Palm Beach, Broward and Miami-Dade counties). Monroe County relies upon potable water and/or cisterns for the limited amount of supplemental irrigation needed by nurseries.

The Everglades Agricultural Area within Lake Okeechobee Service Area will continue to rely on fresh surface water from Lake Okeechobee and connected conveyance canals consistent with the existing water use permits. For the remaining portion of the Lake Okeechobee Service Area, which encompasses basins in the other three planning areas plus the C-21 and S-236 basins in the LEC Planning Area, up to 156,171 acres will be provided supplemental irrigation by fresh surface water from the lake consistent with their existing water use permits. In addition, the portion of irrigated acres in Hendry County that fall outside of the Lake Okeechobee Service Area is supplied by fresh surface and groundwater.

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The projected increase in irrigated acreage (581 acres) is minimal in comparison to the estimated 2010 actual irrigated acreage. No specific water supply development projects for agriculture were provided or have been identified in this plan update. The continued use of and increased voluntary use of the Florida Department of Agriculture and Consumer Services' best management practices, including water conservation, could reduce the amount of water needed to meet crop demands. These efforts are discussed in **Chapter 5**.

Industrial/Commercial/Institutional Self-Supply

The Industrial/Commercial/Institutional (ICI) Self-Supply water use category is comprised of large facilities for production processing with the largest uses being mining (i.e., aggregates industry) and food processing (dominated by the sugar industry). In the LEC Planning Area, the water use projection for ICI Self-Supply assumes that growth for this region is proportional to the underlying economic activity that generates PWS demand in the area. The projected demand for this category is expected to be 57 MGD by 2030, 28 percent greater than the 2010 demand.

Currently, the ICI Self-Supply water use category has sufficient supply to meet future needs. Any increase in water demands must meet the requirements of water use permitting criteria, however, existing water use permits cover the majority of the projected growth. Although fresh groundwater supplies are generally considered adequate to meet the relatively small new demands projected for this use category, alternative water supply options should be considered based on local conditions. If reclaimed water is available to meet existing and new ICI Self-Supply water demands, the feasibility of such opportunities will be evaluated through SFWMD's Water Use Permitting Program. No specific projects for ICI Self-Supply were provided or identified in this plan update.

Recreational/Landscape Self-Supply

Recreational/Landscape (REC) Self-Supply includes the use of water for irrigation of common areas, golf courses, parks, cemeteries, schools, commercial developments, and other self-supplied irrigation uses with demand of 0.1 MGD or greater. REC Self-Supply gross demand is projected to increase by 3 percent (149 MGD in 2010 compared to 153 MGD in 2030). Historically, irrigation supplies for this category include local fresh groundwater and surface water captured from canals or stormwater management systems. In recent years, irrigation for new golf courses often includes reclaimed water and on-site blending of brackish groundwater with surface water. Four golf courses use brackish groundwater treated by RO.

The small demand increase for REC Self-Supply should be met, for the most part, by currently proposed reclaimed water projects or by locally derived groundwater, which may be included in existing water use permits if applicable. Projects submitted by utilities and wastewater treatment facilities indicate that use of reclaimed water will increase significantly in the future. Expansion of water reuse systems for REC Self-Supply may reduce withdrawal demands on the water resources. Where reclaimed water is not

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available, users may qualify for limited freshwater withdrawals on an application-by-application basis.

Implementation of the Mandatory Year-Round Landscape Irrigation Conservation Measures Rule (Rule 40E-24.201, F.A.C.), water conservation methods using more efficient irrigation systems, and Florida-Friendly Landscaping™ offer potential cost savings and may reduce future demand. However, no specific projects for REC Self-Supply were provided or identified in this plan update.

Power Generation Self-Supply

The Power Generation (PWR) Self-Supply water use category is expected to grow by approximately 21 MGD (gross demand) during the next 20 years from 12 to 33 MGD as FPL plans to build a new facility in the LEC Planning Area in order to meet electrical power demand. FPL utilizes an assessment method incorporating environmental, economic, and technical feasibility when selecting power generation and cooling technologies most appropriate for site-specific conditions, including water supply and wastewater disposal. Different technologies may require and utilize both traditional and alternative water supply sources.

Currently, three power generation plants in the LEC Planning Area are permitted to withdraw groundwater: 1) West County Energy Center, 2) FPL Turkey Point Plant, and 3) Homestead Municipal Power Plant. The West Energy facility's back-up source is the SAS. FPL increased its power resources at the existing Turkey Point plant by adding combined-cycle generating technology (Unit 5). This facility uses FAS water and water from a closed-loop cooling canal system. The Homestead Municipal plant is a peaking plant that only supplies electricity when needed utilizing water from the Biscayne aquifer.

A potential plant may be sited in the LEC Planning Area, possibly in Hendry County where FPL has purchased land. The demand associated with this future plant is 22.8 MGD in 2030.

In addition, other FPL plants also use alternative water sources. Several power generation plants use seawater: Cutler, Lauderdale, Port Everglades, and Riviera Beach. The FPL West County Energy Center, located in northwestern Palm Beach County, utilizes reclaimed water (approximately 22 to 27 MGD contracted) supplied by PBCWUD since late 2010. In the future, MDWASD will provide up to 90 MGD of reclaimed water to meet FPL cooling needs at Turkey Point for the planned nuclear generating expansion units (Units 6 and 7). These plants are not addressed in the water supply plan because SFWMD does not regulate the use of seawater and reclaimed water.

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FUNDING

Funding of water supply development and water conservation projects at the local level is the shared responsibility of water suppliers and users. The State of Florida and the water management districts provided funding assistance to local water users developing alternative water supplies and measurable water conservation programs. One criterion for funding consideration is that the project has to be included in, or be consistent with, a regional water supply plan update. Some projects not included in this update, but are consistent with the plan's goals, may also be funded.

When SFWMD deems it appropriate, a plan update may specifically identify the need for multijurisdictional approaches to project options based on analysis, the ability to permit and finance, and technical feasibility. SFWMD provides funding for alternative water supply and measurable water conservation through its Alternative Water Supply and Water Savings Incentive (WaterSIP) funding programs. Funds for these programs are allocated annually through the Governing Boards approval of SFWMD's budget. An alternative water supply or water conservation project identified in this update makes that project eligible for future funding, although funding is not guaranteed. An application must be submitted during the program solicitation period and processed for the determination of whether funding will be granted for the project.

Alternative Water Supply Program

Alternative water supply sources in the LEC Planning Area include brackish water from the Upper Floridan aquifer, reclaimed water, seawater, capture of surface or storm water, new storage capacity, and conservation. Although declining per capita use rates help to reduce or defer development of new water production capacity, in some cases, new water supplies will also be needed to accommodate the region's future growth. SFWMD's Alternative Water Supply Program funds up to 40 percent of an alternative water supply project's construction cost to qualified applicants seeking cost-sharing assistance.

Since 1997, SFWMD, in cooperation with the State of Florida through the Florida Water Protection and Sustainability Program, approved over $204 million in cost-share funding for the construction of 474 alternative water supply projects throughout SFWMD boundaries. Funds provided by the state are matched dollar for dollar with SFWMD funds. While the legislature has not provided funding to the program since 2009, SFWMD continued appropriating ad valorem revenues to the program at significantly reduced levels since Fiscal Year (FY) 2011. In FY 2012 and FY 2013, budgeted Alternative Water Supply Program funding was $1.25 million and $1.6 million, respectively, including reallocated funds from prior fiscal years. In the LEC Planning Area, $53.8 million was allocated to 121 projects from FY 2006 to FY 2012. The projects created 112 MGD of new water capacity within the LEC Planning Area.

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Water Savings Incentive Program

WaterSIP is SFWMD's conservation funding assistance program. Through WaterSIP, SFWMD provides matching funds (50-50 cost share) up to $50,000 to water providers and users (e.g., cities, utilities, industrial groups, schools, hospitals, and homeowners associations) for noncapital water efficiency improvement projects that reduce urban water use utilizing water saving technologies. These technologies include low flow plumbing fixtures, rain sensors, fire hydrant flushing devices, cisterns, and other hardware. Examples of projects are toilet and bathroom fixture retrofit programs, irrigation system retrofits involving the use of micro-irrigation or the latest irrigation scheduling technologies, automatic hydrant flushing devices that eliminate the need for manual line flushing, and low flow prerinse spray valve retrofits to improve water efficiency in commercial kitchens. Program funds are budgeted annually. From FY 2005 to FY 2012, SFWMD allocated $2.4 million for projects in the LEC Planning Area. The funded projects represented an estimated potential savings of 1.5 billion gallons per year (4.1 MGD). Please refer to the Support Document for additional information. **Appendix D** provides WaterSIP projects funded in the LEC Planning Area through 2012.

SUMMARY

As discussed in **Chapter 2**, economic trends in South Florida over the past five years resulted in a lowering of population and demand projections for the next twenty years when compared to the projections in the 2005–2006 LEC Plan Update. During the twenty-year planning horizon period, the PWS category projects only a 20 percent increase in finished demand. This, combined with PWS utilities water treatment facilities expansions over that same period, resulted in most PWS utilities possessing sufficient treatment capacity and permitted allocations to meet their estimated 2030 demands. Ten utilities proposed 22 potable water projects. Of the 10, only two utilities appear to need the projects before 2030 based on LEC Planning Area projections or their respective treatment system requirements. Some utilities will meet future demand by purchasing water from other suppliers.

Amongst the DSS, AGR Self-Supply, ICI Self-Supply, REC Self-Supply, and PWR Self-Supply sectors, no new projects have been proposed, and future needs can be met under existing permit allocations; by use of existing and alternative sources, and conservation. However, future increases in withdrawals from Lake Okeechobee; the L-1, L-2, and L-3 canal system; the Everglades; and North Palm Beach/Loxahatchee Watershed water bodies must comply with the restricted allocation area criteria for the Lake Okeechobee and LEC Service Area.

A total of 17 utilities proposed water supply development projects.[5] SFWMD staff evaluated all proposed water resource development projects and incorporated 28 new projects for this update, which includes projects that develop fresh and brackish groundwater sources, provide reclaimed water treatment or storage of surface and storm water. Of these, 10

[5] Does not include the three utilities that have proposed reclaimed distribution projects.

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utilities proposed 13 potable water projects, and eight of the 10 utilities may be able to defer some or all of their potable water projects until after 2030. Four water conservation projects proposed in this plan may also assist utilities to defer capital expenses for potable water projects. As a result, potential new PWS supply capacity is significantly greater than the projected increase in demand for the planning horizon of this update. The proposed design capacity may have several purposes including meeting peak demands or operational flexibility. Most water supply development options require significant upfront investments and ongoing maintenance costs. Individual utilities may find that a portion of future water needs can be met in a more immediate and cost-effective way through a demand management program, purchasing water from neighboring utilities, or by implementing a reclaimed water project.

PUBLIC WATER SUPPLY UTILITY SUMMARIES

In this section, a utility summary is provided for each PWS utility in the LEC Planning Area. The summaries are organized by county and alphabetically within each county. A sample utility summary explains the descriptions provided.

No PWS utilities are located within the portion of Hendry County within the LEC Planning Area. However, a small portion of Clewiston Utilities' service area extends into Palm Beach County and the LEC Planning Area. Given that the majority of the Clewiston Utilities service area and population served are located within the Lower West Coast Planning Area, Clewiston Utilities is included in the *2012 Lower West Coast Water Supply Plan Update* (SFWMD 2012a).

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Descriptions of each numbered item are provided on the next two pages.

SAMPLE CITY

County: Broward County

Service Area: Sample city and portions of unincorporated county.

Description: This description includes the number and type of water treatment plants (WTPs), water sources, areas served, bulk sales or purchases, and other issues of concern to the utility. If the utility produces reclaimed water, information regarding the quantity and customers may also be be included. Utilities that participate in the Broward Water Partnership conservation program are identified here.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	100,000	110,000	120,000
Per Capita (gallons per day finished water)	100	100	100
Potable Water Demands (daily average annual finished water in MGD)	**10.0**	**11.0**	**12.0**

SFWMD WATER USE PERMITTED (00-00000-W) ALLOCATION (MGD)			
Potable Water Source	Existing	Projected	
	2010	2020	2030
Fresh Water	14.00	14.00	14.00
Brackish Water	0.00	2.00	4.00
Total Allocation	**14.00**	**16.00**	**18.00**

POTABLE WATER TREATMENT CAPACITY			
FDEP Permitted Capacity	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
	2012	2020	2030
Fresh Water	18.00	18.00	18.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	2.00	3.00
Total Capacity	**18.00**	**20.00**	**21.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	1.00	1.00	1.00

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD)**	
				2020	**2030**
Potable Water					
New Floridan RO WTP (2MGD)	Brackish Water	2017	$4.00	2.00	2.00
Additional RO Train (+1 MGD)	Brackish Water	2025	$2.00	0.00	1.00
Total			**$6.00**	**2.00**	**3.00**
Conservation and Irrigation Restrictions	Conservation	2025	$0.00	0.10	0.10

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Descriptions of numbered items on the sample utility summary provided on the previous page.

1. **Population:** The 2010 population was determined using the map of the area served by the utility in 2010 and the census block data from the 2010 United States Census (U.S. Census Bureau 2010). Projections are generally based on the Bureau of Economic and Business Research population projections report published in *Florida Population Studies* in July 2011 (BEBR 2011). For some utilities, the growth rate to project the 2020 and 2030 populations were based on additional data provided by the utility (see **Appendix A** for more information).

2. **Per Capita Water Use:** This number was calculated by dividing the 2010 total finished water produced by the utility (from monthly operating reports submitted by each utility to FDEP) by the 2010 population. It is expected that this number will differ from the per capita rate used during the water use permitting process.

3. **Potable Water Demands:** The 2010 amount is the daily average finished water produced by the utility in 2010 (from monthly operating reports submitted by each utility to FDEP). The 2020 and 2030 projected demands are the respective populations multiplied by the 2010 per capita water use for that utility (see **Appendix A** for more information).

4. **Allocation from the Current Water Use Permit:** The allocation is composed of fresh and brackish gross water allocations as described in the permit.

5. **Projected Allocation 2020/2030:** If the current water use permit specifies a change in the allocation, the 2020 or 2030 allocation is listed. Otherwise, the current allocation is assumed to continue through 2030.

6. **Total Allocation:** The total gross water allocation found in the water use permit. The total allocation may be less than the sum of the freshwater and brackish water allocations providing the utility with some operational flexibility.

7. **FDEP Permitted Capacity:** The total capacity of the WTPs used by the utility as listed on FDEP website as of May 2012. The capacity is split into the capacity available to process fresh water or brackish water.

8. **Planned Project Capacity:** The volumes of water created by projects listed in the Project Summary as proposed by the utilities. Project capacity to be completed by 2020 are shown in the 2020 column and project capacity to be completed between 2021 and 2030 are shown in the 2030 column.

9. **Total Capacity:** The existing capacity of the WTPs owned/operated by this utility plus the volumes of water produced by future planned projects.

10. **Reclaimed Water:** The capacity of the wastewater treatment plant(s) (WWTP) to produce reclaimed water. The 2010 capacity is from the *2010 Reuse Inventory* (FDEP 2011). Additional capacity is from projects planned by the utility. These projects are listed under item 11.

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11. **Project Summary:** A description of the projects the utility is proposing to construct. Only projects that produce additional water (i.e., wells, water treatments plants, etc.) or distribute water are included. Maintenance or replacement projects are not included. Each project has an anticipated completion date, water source, estimated capital cost, and volume of water produced or planned treatment capacity. Water volumes associated with distribution projects are not included in the volume summaries. The project information was provided by the utility. Not all utilities reported a project; however, all utilities that have a need for additional water did plan a project or projects.

12. **Total Projected Cumulative Design Capacity for 2020:** The total volume of projects expected to be completed between 2012 and 2020. These totals are added to the existing total in items 8 or 10, as appropriate.

13. **Total Projected Cumulative Design Capacity for 2030:** The total volume of projects expected to be completed between 2021 and 2030. These totals are added to the existing total in 8 or 10, as appropriate.

14. **Conservation:** Conservation projects projected to save at least 0.1 MGD were included by some utilities. Because these save water, rather than producing additional water, they are not included in the projected cumulative design capacity total.

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Palm Beach County Utilities

AG HOLLEY STATE HOSPITAL

County: Palm Beach County

Service Area: AG Holley State Hospital

Description: This utility is located at a State of Florida hospital in the Town of Lantana. Withdrawals were from the SAS (two wells), with an annual allocation of 0.09 MGD. The hospital was closed in July 2012; therefore, future use of the existing water treatment facility is unknown at this time.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	32	0	0
Per Capita (gallons per day finished water)	0	0	0
Potable Water Demands (daily average annual finished water in MGD)	**0.07**	**0.00**	**0.00**
SFWMD WATER USE PERMITTED (50-01092-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	0.09	0.09	0.09
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.09**	**0.09**	**0.09**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	0.36	0.36	0.36
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**0.36**	**0.36**	**0.36**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF BOCA RATON

County: Palm Beach County

Service Area: City of Boca Raton and unincorporated areas of Palm Beach County

Description: Water supply for the City of Boca Raton is from the SAS. The city owns and operates two water treatment facilities that blend a 1:2 ratio of lime softened and membrane softened water. The water use permit was renewed in 2008 and provides for the completion of reclaimed water projects in 2013 that authorize the city to withdraw additional water based on the termination of identified base condition water use through the provision of reclaimed water to meet the projected increased demands in 2020. The city implemented a fully operational reclaimed water system that has the capacity to utilize 100 percent of its annual average daily flow for reuse as authorized by FDEP. The city's water reclamation facility has met the requirements of a 100 percent reuse facility to meet the requirements of the Ocean Outfall statute (Subsection 403.086(9), F.S.). In 2011, the city provided customers with an average of 7.0 MGD and a maximum of 10.09 MGD of reclaimed water for irrigation demands that would otherwise come from the Biscayne aquifer. The city is planning a membrane concentrate and reclaimed water blending project that will increase the availability of reclaimed water.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	107,224	120,539	133,854
Per Capita (gallons per day finished water)	320	320	320
Potable Water Demands (daily average annual finished water in MGD)	**34.31**	**38.57**	**42.83**
SFWMD WATER USE PERMITTED (50-00367-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	51.53	51.53	51.53
Brackish Water	0.00	0.00	0.00
Total Allocation	**51.53**	**51.53**	**51.53**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	70.00	70.00	70.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**70.00**	**70.00**	**70.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	17.50	17.50	17.50

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Nonpotable Water					
Recycling of Membrane Concentrate for Reuse Water	Reclaimed Water	2013	$2.00	4.25 [a]	4.25 [a]
Total			**$2.00**	**4.25**	**4.25**

a. This project adds capacity to the reclaimed water distribution system but does not increase the actual treatment capacity of the reclaimed water plant.

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CITY OF BOYNTON BEACH

County: Palm Beach County

Service Area: City of Boynton Beach; towns of Briny Breezes, Hypoluxo, and Ocean Ridge; and unincorporated areas of Palm Beach County

Description: Water supply for the City of Boynton Beach is from the SAS. The city owns and operates two WTPs that use lime softening and nanofiltration processes. The water supply system is also augmented by the use of two ASR wells. The city's recent water supply plan includes a water conservation program and expanded use of reclaimed water to help with the reuse requirement of the Ocean Outfall statute (Subsection 403.086(9), F.S.) at the South Central Regional WWTP. The city shares the South Central Regional WWTP with the City of Delray Beach. This plant produces reclaimed water, which is used by both cities. The city currently purchases 2 MGD of potable water from the PBCWUD. This purchased amount will be reduced to 1 MGD after 2013. The city is planning a membrane concentrate blending project to decrease treatment losses.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	102,512	115,242	127,972
Per Capita (gallons per day finished water)	131	131	131
Potable Water Demands (daily average annual finished water in MGD)	**13.43**	**15.10**	**16.76**
SFWMD WATER USE PERMITTED (50-00499-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	14.00	13.44	13.44
Brackish Water	6.42	6.42	6.42
Bulk Water Purchase (from Palm Beach County)	2.00	1.00	1.00
Total Allocation (including bulk water purchase)	**22.42**	**20.86**	**20.86**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	19.24	19.24	19.24
Brackish Water	10.40	10.40	10.40
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**29.64**	**29.64**	**29.64**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	10.00	10.00	10.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Nonpotable Water					
Reclaimed Water Transmission Phase 2 (US 1 Corridor & Cypress Creek)	Reclaimed Water	2014	$2.00	1.00[a]	1.00[a]
Leisureville Golf Course	Reclaimed Water	2014	$2.00	0.65[a]	0.65[a]
Seacrest Boulevard Water Line	Reclaimed Water	2013	$0.26	0.10[a]	0.10[a]
Total			**$4.26**	**1.75[a]**	**1.75[a]**

a. This project adds capacity to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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CITY OF DELRAY BEACH WATER AND SEWER DEPARTMENT

County: Palm Beach County

Service Area: City of Delray Beach, Town of Gulf Stream, and unincorporated areas of Palm Beach County

Description: Water supply for the City of Delray Beach Public Utilities Department is from the SAS and FAS. Delray Beach owns and operates one lime softening treatment system located in the vicinity of their Eastern Wellfield. The water use permit provides for operation of the Eastern, Morikami, 20-series, and Golf Course wellfields, in addition to operation of an ASR well for backup supply. Delray Beach is committed to replacing permitted SAS irrigation withdrawals within its service area with reclaimed water. The projects listed below will help meet the reuse requirements of the Ocean Outfall statute (Subsection 403.086(9), F.S.) at the South-Central Regional WWTP.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	63,341	71,207	79,072
Per Capita (gallons per day finished water)	232	232	232
Potable Water Demands (daily average annual finished water in MGD)	**14.70**	**16.52**	**18.34**
SFWMD WATER USE PERMITTED (50-00177-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	17.60	17.60	17.60
Brackish Water	1.50	1.50	1.50
Total Allocation	**19.10**	**19.10**	**19.10**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	26.00	26.00	26.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**26.00**	**26.00**	**26.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	5.00	5.00	5.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Nonpotable Water					
Reclaimed Water (Area 12A Phase 1 – Barrier Island South, Atlantic Avenue to Casuarina Road and Gleason Street Trunk Line)	Reclaimed Water	2013	$1.70	0.25[a]	0.25[a]
Reclaimed Water (Area 12A Phase 2 and Area 12B Barrier Island South)	Reclaimed Water	2014	$1.20	0.25[a]	0.25[a]
Total			**2.90**	**0.50**[a]	**0.50**[a]

a. This project adds capacity to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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GLADES UTILITY AUTHORITY
PALM BEACH COUNTY WATER UTILITIES DEPARTMENT

County: Palm Beach County

Service Area: Cities of Belle Glade, Pahokee, and South Bay

Description: Water supply for the Glades Utility Authority comes from the FAS, which is treated at an RO WTP. The water use permit was renewed in 2010 and later modified to address an increase in the chloride concentrations in water produced from the wells. The three cities within the service area have been designated as Rural Areas of Critical Economic Concern. Glades Utility Authority is being absorbed into the PBCWUD effective April 2013, and will be described as such in the next update. The water distribution systems, which PBCWUD acquired from municipal governments have historically high rates of losses. PBCWUD has agreed to distribution system improvements to reduce losses in future years.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	25,051	28,164	31,276
Per Capita (gallons per day finished water)	195	195	195
Potable Water Demands (daily average annual finished water in MGD)	**4.88**	**5.49**	**6.10**
SFWMD WATER USE PERMITTED (50-06857-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.00	0.00	0.00
Brackish Water	9.43	9.43	9.43
Total Allocation	**9.43**	**9.43**	**9.43**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	0.00	0.00	0.00
Brackish Water	10.00	10.00	10.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**10.00**	**10.00**	**10.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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VILLAGE OF GOLF

County: Palm Beach County

Service Area: Village of Golf and unincorporated areas of Palm Beach County

Description: The water supply for the Village of Golf is from the SAS. The water is treated by lime softening and ultrafiltration processes. Wastewater from the service area is treated at the South Central Reclamation Wastewater Treatment Facility with more than 1.62 MGD contracted irrigation reuse at golf courses and for groundwater recharge.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	2,755	3,097	3,439
Per Capita (gallons per day finished water)	145	145	145
Potable Water Demands (daily average annual finished water in MGD)	**0.40**	**0.45**	**0.50**
SFWMD WATER USE PERMITTED (50-00612-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.60	0.69	0.69
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.60**	**0.69**	**0.69**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	0.86	0.86	0.86
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**0.86**	**0.86**	**0.86**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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TOWN OF HIGHLAND BEACH

County: Palm Beach County

Service Area: Town of Highland Beach

Description: The Town of Highland Beach is a residential community located on a barrier island east of the Intracoastal Waterway. The water supply for the town comes from the FAS, treated by RO.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	3,631	4,082	4,533
Per Capita (gallons per day finished water)	372	372	372
Potable Water Demands (daily average annual finished water in MGD)	**1.35**	**1.52**	**1.69**
SFWMD WATER USE PERMITTED (50-00346-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	0.00	0.00	0.00
Brackish Water	3.15	3.15	3.15
Total Allocation	**3.15**	**3.15**	**3.15**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	0.00	0.00	0.00
Brackish Water	3.00	3.00	3.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**3.00**	**3.00**	**3.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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TOWN OF JUPITER

County: Palm Beach County

Service Area: Towns of Jupiter and Juno Beach, and unincorporated areas of Martin and Palm Beach counties

Description: The water supply for the Town of Jupiter is from the SAS and FAS. The town owns and operates an RO plant for the FAS source and a nanofiltration process for the SAS source. Wastewater is treated at the Loxahatchee River District facility, with 5 MGD of reclaimed water returned to the town for irrigation purposes. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility on a seasonal basis but has a maximum allocation from the two sources combined.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	70,840	86,224	101,608
Per Capita (gallons per day finished water)	188	188	188
Potable Water Demands (daily average annual finished water in MGD)	**13.32**	**16.21**	**19.10**
SFWMD WATER USE PERMITTED (50-00010-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	18.80	18.80	18.80
Brackish Water	5.60	11.70	11.70
Total Allocation	**24.40**	**30.50**	**30.50**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	16.30	16.30	16.30
Brackish Water	13.70	13.70	13.70
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**30.00**	**30.00**	**30.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF LAKE WORTH UTILITIES

County: Palm Beach County

Service Area: City of Lake Worth, Town of Lake Clarke Shores, and unincorporated areas of Palm Beach County

Description: The water supply for the City of Lake Worth Utilities is from the SAS and FAS. Lake Worth was designated a "utility of concern" due to the vulnerability of its Eastern Wellfield to saltwater intrusion. In 2011, the utility brought online a wellfield that utilizes the FAS. Additionally, the utility is implementing a program of plugging and abandoning SAS wells in its Eastern Wellfield and constructing replacement wells further inland.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	45,137	50,742	56,347
Per Capita (gallons per day finished water)	98	98	98
Potable Water Demands (daily average annual finished water in MGD)	**4.42**	**4.97**	**5.52**
SFWMD WATER USE PERMITTED (50-00234-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	6.30	5.50	5.50
Brackish Water	0.00	9.00	9.00
Bulk Water Purchase (from Palm Beach County)	1.00	0.00	0.00
Total Allocation (including bulk water purchase)	**7.30**	**14.50**	**14.50**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	12.90	12.90	12.90
Brackish Water	4.50	4.50	4.50
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**17.40**	**17.40**	**17.40**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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TOWN OF LANTANA

County: Palm Beach County

Service Area: Town of Lantana

Description: The water supply for the Town of Lantana is from the SAS. The water supply is considered vulnerable to saltwater intrusion; hence, the town recently constructed two additional wells farther from the coast to provide for additional wellfield operational flexibility and reduce the potential for saltwater intrusion.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	10,348	11,633	12,918
Per Capita (gallons per day finished water)	171	171	171
Potable Water Demands (daily average annual finished water in MGD)	**1.77**	**1.99**	**2.21**
SFWMD WATER USE PERMITTED (50-00575-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	2.48	2.48	2.48
Brackish Water	0.00	0.00	0.00
Total Allocation	**2.48**	**2.48**	**2.48**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	3.84	3.84	3.84
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**3.84**	**3.84**	**3.84**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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TOWN OF MANALAPAN

County: Palm Beach County

Service Area: Towns of Manalapan and Hypoluxo

Description: The water supply for the Town of Manalapan comes from the SAS and FAS. The town operates an RO WTP that has the capability of blending the fresh and brackish water sources.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	2,421	2,722	3,022
Per Capita (gallons per day finished water)	440	440	440
Potable Water Demands (daily average annual finished water in MGD)	**1.07**	**1.20**	**1.33**
SFWMD WATER USE PERMITTED (50-00506-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.58	0.58	0.58
Brackish Water	1.33	1.33	1.33
Total Allocation	**1.91**	**1.91**	**1.91**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	0.65	0.65	0.65
Brackish Water	1.70	1.70	1.70
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**2.35**	**2.35**	**2.35**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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TOWN OF MANGONIA PARK

County: Palm Beach County

Service Area: Town of Mangonia Park

Description: The water supply for the Town of Mangonia Park is from the SAS.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	1,888	2,122	2,357
Per Capita (gallons per day finished water)	168	168	168
Potable Water Demands (daily average annual finished water in MGD)	**0.32**	**0.36**	**0.40**
SFWMD WATER USE PERMITTED (50-00030-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.58	0.58	0.58
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.58**	**0.58**	**0.58**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	1.08	1.08	1.08
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**1.08**	**1.08**	**1.08**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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MARALAGO CAY

County: Palm Beach County

Service Area: Unincorporated area of Palm Beach County

Description: Maralago Cay is a manufactured home community. It is not expected to exceed its allocation in future years.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	1,008	1,133	1,258
Per Capita (gallons per day finished water)	182	182	182
Potable Water Demands (daily average annual finished water in MGD)	**0.18**	**0.21**	**0.23**
SFWMD WATER USE PERMITTED (50-01283-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	0.27	0.27	0.27
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.27**	**0.27**	**0.27**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	0.42	0.42	0.42
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**0.42**	**0.42**	**0.42**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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PALM BEACH COUNTY WATER UTILITIES DEPARTMENT

County: Palm Beach County

Service Area: Cities of Atlantis, Boynton Beach, Greenacres, Lake Worth, and West Palm Beach; towns of Cloud Lake, Glen Ridge, Haverhill, Lake Clarke Shores, and Loxahatchee Groves; villages of Palm Springs, Royal Palm Beach, and Wellington; and unincorporated areas of Palm Beach County.

Description: PBCWUD has two lime softening and two nanofiltration WTPs. The source of water is the SAS with brackish water from FAS ASR wells to be used for blending. ASR wells are still planned as part of the alternative water supply plans in addition to expansion of reclaimed water facilities. PBCWUD's current bulk sales are 9.63 MGD, which are distributed to FPL, the cities of Boynton Beach, Atlantis, and Lake Worth, and the Town of Lake Clark Shores. The 2003 water use permit requires Palm Beach County to provide 33 MGD of alternative water supplies to avoid increased seepage from canals resulting from increased withdrawals at nearby wellfields. PBCWUD is currently supplying reclaimed water to Century Village, Emerald Dunes, and between 22 and 27 MGD to the FPL West County Energy Center. Current projections indicate that the WTP 2 expansion project may not be needed during the twenty-year planning horizon. In 2013, PBCWUD acquired the Glades Utility Authority. Hence, in future plan updates, the Glades Utility System will be included within the PBCWUD utility profile. PBCWUD is also considering a reclaimed water partnership project with Broward County to expand the distribution of reclaimed water in southern Palm Beach County.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	458,839	515,412[a]	572,795[a]
Per Capita (gallons per day finished water)	115	115	115
Potable Water Demands (daily average annual finished water in MGD)	**52.77**	**59.30**	**65.90**
SFWMD WATER USE PERMITTED (50-00135-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	79.99	79.99	79.99
Brackish Water	7.00	7.00	7.00
Total Allocation	**86.99**	**86.99**	**86.99**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	101.38	101.38	101.38
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	8.50
Total Capacity	**101.38**	**101.38**	**109.88**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	17.50	42.00[b]	51.00[c]

a. The Palm Beach County Planning Division has recently projected that the 2020 and 2030 populations served by the utility could be as high as 558,249 and 626,388, respectively. The difference between the Palm Beach County Planning Division and the estimate used in this plan, which is from the PBCWUD, is largely due to assumptions about the rate at which existing self-supplied users will be provided centralized water services.

b. Based upon information contained in the 2008 Palm Beach County 20-Year Water Supply Work Plan.

c. Based upon SFWMD staff estimation of anticipated flow quantities provided by the PBCWUD.

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PROJECT SUMMARY					
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ Million)	Projected Cumulative Design Capacity (MGD) 2020	2030
Potable Water					
WTP 2 Expansion	Fresh Water	2025	$15.00	0.00	8.50
Total			**$15.00**	**0.00**	**8.50**
Nonpotable Water					
Morikami Reclaimed Pump Station	Reclaimed Water	2013	$0.05	2.00[a]	2.00[a]
Total			**$0.05**	**2.00**	**2.00**

a. This project adds capacity to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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VILLAGE OF PALM SPRINGS

County: Palm Beach Couty

Service Area: Village of Palm Springs, Town of Lake Clarke Shores, and unincorporated areas of Palm Beach County

Description: The SAS is the source of water for the Village of Palm Springs. The two water treatment facilities are interconnected and utilize ion exchange, followed by lime softerning, filtration, and disinfection. The Town of Lake Clarke Shores purchases water from the Village of Palm Springs to serve 3,126 people. The village's water use permit does not contain an allocation sufficient to meet anticipated demands through 2030. The village previously recognized the potential shortfall. The utility indicates it will purchase water from Palm Beach County. The village will need to execute a bulk purchase agreement or implement other projects to increase its water supply by 2030.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	45,204	50,817	56,431
Per Capita (gallons per day finished water)	84	84	84
Potable Water Demands (daily average annual finished water in MGD)	**3.80**	**4.27**	**4.74**
SFWMD WATER USE PERMITTED (50-00036-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	4.74	4.62	4.62
Brackish Water	0.00	0.00	0.00
Total Allocation	**4.74**	**4.62**	**4.62**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	10.00	10.00	10.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**10.00**	**10.00**	**10.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF RIVIERA BEACH

County: Palm Beach County

Service Area: City of Riviera Beach and Town of Palm Beach Shores

Description: The SAS is the source of water for the City of Riviera Beach. It is treated by lime softening.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	37,757	42,446	47,134
Per Capita (gallons per day finished water)	173	173	173
Potable Water Demands (daily average annual finished water in MGD)	**6.53**	**7.34**	**8.15**
SFWMD WATER USE PERMITTED (50-00460-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	9.08	9.08	9.08
Brackish Water	0.00	0.00	0.00
Total Allocation	**9.08**	**9.08**	**9.08**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	17.50	17.50	17.50
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**17.50**	**17.50**	**17.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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SEACOAST UTILITY AUTHORITY

County: Palm Beach County

Service Area: Towns of Juno Beach and Lake Park, Village of North Palm Beach, City of Palm Beach Gardens, and unincorporated areas of Palm Beach County

Description: Seacoast Utility Authority withdraws from the SAS and FAS. The authority is replacing its lime softening plant with a nanofiltration treatment plant by the end of 2012. In addition, a new RO plant is anticipated to come online in 2013. The Seacoast Utility Authority also provided 7.9 MGD of reclaimed water in 2011.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	87,686	98,575	109,464
Per Capita (gallons per day finished water)	201	189	189
Potable Water Demands (daily average annual finished water in MGD)	**17.62**	**18.63**	**20.69**
SFWMD WATER USE PERMITTED (50-00365-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	19.31	22.30	22.30
Brackish Water	0.00	4.33	4.33
Total Allocation	**19.31**	**26.63**	**26.63**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	30.50	26.00	26.00
Brackish Water	0.00	3.00 [a]	3.00 [a]
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**30.50**	**29.00**	**29.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	12.00	15.00	15.00

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD) 2020**	**2030**
Nonpotable Water					
Nanofiltration Concentrate Blending for Reuse Water	Reclaimed Water	2013	$4.50	3.00	3.00
Total			**$4.50**	**3.00**	**3.00**

a. Project will be online by 2013.

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VILLAGE OF TEQUESTA

County: Palm Beach County

Service Area: Village of Tequesta and Town of Jupiter Inlet Colony

Description: The Village of Tequesta obtains water from the SAS and FAS. The SAS water supply is treated with sand filtration. The FAS supply is treated by RO.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	11,581	13,345	15,108
Per Capita (gallons per day finished water)	235	235	235
Potable Water Demands (daily average annual finished water in MGD)	**2.72**	**3.14**	**3.55**
SFWMD WATER USE PERMITTED (50-00046-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	2.70	1.10	1.10
Brackish Water	1.67	3.43	3.43
Total Allocation	**4.37**	**4.53**	**4.53**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	2.73	2.73	2.73
Brackish Water	3.60	3.60	3.60
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**6.33**	**6.33**	**6.33**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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WELLINGTON PUBLIC UTILITIES DEPARTMENT

County: Palm Beach County

Service Area: Villages of Wellington and Royal Palm Beach, and unincorporated areas of Palm Beach County

Description: The Wellington Public Utilities Department currently obtains water from the SAS. The village's northern wellfields are slightly brackish and are treated using membrane softening. Water from the southern and eastern wellfields is fresher and treated via lime softening.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	55,408	62,289	69,169
Per Capita (gallons per day finished water)	105	105	105
Potable Water Demands (daily average annual finished water in MGD)	**5.82**	**6.54**	**7.26**
SFWMD WATER USE PERMITTED (50-00464-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	8.02	8.02	8.02
Brackish Water	0.00	0.00	0.00
Total Allocation	**8.02**	**8.02**	**8.02**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	6.50	6.50	6.50
Brackish Water	6.30	6.30	6.30
Planned Project Capacity	0.00	0.50	1.40
Total Capacity	**12.80**	**13.30**	**14.20**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	1.00	1.00	1.00

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD)**	
				2020	**2030**
Potable Water					
WTP Low Pressure RO Expansion Phase 1 and 2 (efficiency improvements)	Fresh Water	2025	$0.80	0.50	1.40
Total			**$0.01**	**0.50**	**1.40**
Nonpotable Water					
Phased Reclaimed System Expansions	Reclaimed Water	2011 -2030	$0.01	1.30[a]	2.90[a]
Total			**$0.01**	**1.30**	**2.90**

a. This project adds capacity to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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CITY OF WEST PALM BEACH PUBLIC UTILITIES

County: Palm Beach County

Service Area: City of West Palm Beach, and towns of Palm Beach and South Palm Beach

Description: The source of water for the City of West Palm Beach Public Utilities is surface water and a SAS wellfield. The city is currently constructing a forward pump and gate structure at Clear Lake to enable the city's intake system to remain operational during drought conditions when unusually low surface water levels persist. The city faced challenges during recent water shortages and developed plans to address water shortages and long-term growth. Alternative water supply and drought management projects include urban stormwater treatment, advanced wastewater treatment at the East Central Regional Wastewater Reclamation Facility, wetland rehydration, and aquifer recharge. Future plans include ASR, capture water otherwise lost to tide from the C-17 and C-51 canals (via replacement of Control Structure 2 with a 300-cubic feet per scond pumping system and additional wells along the M Canal).

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	109,958	123,853	143,134
Per Capita (gallons per day finished water)	253	253	253
Potable Water Demands (daily average annual finished water in MGD)	**27.87**	**31.33**	**36.21**
SFWMD WATER USE PERMITTED (50-00615-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	39.30	41.20	41.20
Brackish Water	0.00	0.00	0.00
Total Allocation	**39.30**	**41.20**	**41.20**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	47.00	47.00	47.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**47.00**	**47.00**	**47.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	6.00	6.00	6.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Potable Water					
ASR Well Reactivation at Clear Lake	Surface Water	2013	$10.00	8.00[a]	8.00[a]
C-17 Pump Station	Storm Water	2020	$2.50	8.00[a]	8.00[a]
Total			**$12.50**	**16.00**	**16.00**

a. This project adds flexibility to the water distribution system, but does not increase the actual treatment capacity of the potable water treatment plant.

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Broward County Utilities

BROWARD COUNTY WATER AND WASTEWATER SERVICES DISTRICT 1

County: Broward County

Service Area: All or portions of the cities of Fort Lauderdale, Lauderdale Lakes, Lauderhill, North Lauderdale, Oakland Park, Plantation, Pompano Beach, and Tamarac, and unincorporated areas of Broward County

Description: The SAS provides the majority of the water supply; however the permit includes allocation from the FAS. The county is currently in the process of requesting a modification in the permit allocation from the SAS. The county is expected to start drilling the FAS wells in 2013. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	71,395	75,892	80,388
Per Capita (gallons per day finished water)	99	99	99
Potable Water Demands (daily average annual finished water in MGD)	**7.05**	**7.49**	**7.93**
SFWMD WATER USE PERMITTED (06-00146-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	10.67	9.20	9.20
Brackish Water	3.23	4.70	4.70
Total Allocation	**13.90**	**13.90**	**13.90**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	16.00	16.00	16.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	1.50	2.50
Total Capacity	**16.00**	**17.50**	**18.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Potable Water					
District 1A Treatment Plant Expansion (RO WTP, Floridan wells, and a disposal well)	Brackish Water	2017	$41.10	1.50	2.50
Total			**$41.10**	**1.50**	**2.50**

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BROWARD COUNTY WATER AND WASTEWATER SERVICES DISTRICT 2A/NORTH REGIONAL WELLFIELD

Service Area: All or portions of the cities of Coconut Creek, Deerfield Beach, Lighthouse Point, Parkland, and Pompano Beach, and unincorporated areas of Broward County

Description: The SAS is the primary source of water supply for the District 2A system. The 2A wellfield includes SAS wells and a proposed FAS wellfield to provide water to a proposed RO treatment plant. The demand projections developed for this plan update suggest the proposed FAS project may not be needed until after the 2030 planning horizon so, at this time, the county has indefinitely postponed the project. The North Regional Wellfield is one of two wellfields the county developed to provide raw water to Deerfield Beach and the District 2A WTP. The Broward County North Regional WWTP provides 4.4 MGD of reuse water. The 2008 Ocean Outfall statute requires the county to achieve 25 MGD of reuse by 2025. The county is considering a project wherein it will provide reclaimed water to PBCWUD to comply with the statute. The City of Coconut Creek is currently developing a program to provide reclaimed water from North Regional WWTP throughout Coconut Creek.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	110,939	116,274	121,609
Per Capita (gallons per day finished water)	110	110	110
Potable Water Demands (daily average annual finished water in MGD)	**12.20**	**12.79**	**13.38**
SFWMD WATER USE PERMITTED (06-01634-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	19.95	17.50	17.50
Brackish Water	4.60	4.60	4.60
Total Allocation	**22.06**	**22.06**	**22.06**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	40.00	40.00	40.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**40.00**	**40.00**	**40.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	10.00	10.00	10.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Nonpotable Water					
Reclaimed Water Highlands Pompano Beach	Reclaimed Water	2013	$6.50	0.30[a]	0.30[a]
Total			**$6.50**	**0.30[a]**	**0.30[a]**

a. This project adds capacity to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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BROWARD COUNTY WATER AND WASTEWATER SERVICES SOUTH REGIONAL WELLFIELD

Service Area: The Broward County Water and Wastewater Services South Regional Wellfield, also known as the Brian Piccolo Wellfield, suppiles raw water to FPL and the cities of Hollywood, Hallandale Beach, and Dania Beach. Since this system provides raw water to other facilities, no population is assigned.

The county contracts with the City of Hollywood to treat water for the county's service area formerly known as System 3. The county distributes finished water to the Town of Pembroke Park, the City of West Park, the western portion of the City of Dania Beach, and unincorporated areas of Broward County. The System 3 WTPs have been dismantled, and the county proposed to abandon the remaining System 3 water wells and transfer that allocation to the South Regional Wellfield.

Description: Modifications to the South Regional Wellfield have not been permitted as of the end of 2012. The existing proposal calls for the City of Hallandale to develop its own wellfield, using its share of the South Regional Wellfield allocation. In addition to the System 3 allocation, a portion of water previously allocated to the City of Dania Beach would be moved to the South Regional Wellfield. See related discussions on the utility summaries for the cities of Hallandale Beach and Dania Beach.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	0	0	0
Per Capita (gallons per day finished water)	0	0	0
Potable Water Demands (daily average annual finished water in MGD)	**0.00**[a]	**0.00**[a]	**0.00**[a]
SFWMD WATER USE PERMITTED (06-01474-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	14.20	14.20	14.20
Brackish Water	0.00	0.00	0.00
Total Allocation	**14.20**	**14.20**	**14.20**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	0.00	0.00	0.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**0.00**	**0.00**	**0.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

a. Since this system provides raw water to other facilities, no population is assigned.

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CITY OF COOPER CITY UTILITY DEPARTMENT

County: Broward County

Service Area: City of Cooper City

Description: The water supply for the City of Cooper City is obtained from the SAS and treated via membrane softening. The city is projected to have minimal growth beyond 2020. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	28,543	33,335	33,585
Per Capita (gallons per day finished water)	95	95	95
Potable Water Demands (daily average annual finished water in MGD)	**2.71**	**3.17**	**3.19**
SFWMD WATER USE PERMITTED (06-00365-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	4.55	4.55	4.55
Brackish Water	0.00	0.00	0.00
Total Allocation	**4.55**	**4.55**	**4.55**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	7.00	7.00	7.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**7.00**	**7.00**	**7.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF CORAL SPRINGS

County: Broward County

Service Area: A portion of the City of Coral Springs

Description: The water supply for the City of Coral Springs is obtained from the SAS. Portions of the city are served by other utilities: Coral Springs Improvement District, North Springs Improvement District, and Royal Utilities Corporation. The information on this page addresses only the city's service area. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	58,029	60,820	63,610
Per Capita (gallons per day finished water)	114	114	114
Potable Water Demands (daily average annual finished water in MGD)	**6.62**	**6.93**	**7.25**
SFWMD WATER USE PERMITTED (06-00102-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	9.44	9.44	9.44
Brackish Water	0.00	0.00	0.00
Total Allocation	**9.44**	**9.44**	**9.44**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	16.00	16.00	16.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**16.00**	**16.00**	**16.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CORAL SPRINGS IMPROVEMENT DISTRICT

County: Broward County

Service Area: A portion of the City of Coral Springs

Description: The water supply for the Coral Springs Improvement District is obtained from the SAS. The water is treated using a lime softening process.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	36,969	38,747	40,525
Per Capita (gallons per day finished water)	103	103	103
Potable Water Demands (daily average annual finished water in MGD)	**3.81**	**3.99**	**4.17**
SFWMD WATER USE PERMITTED (06-00100-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	5.42	5.42	5.42
Brackish Water	0.00	0.00	0.00
Total Allocation	**5.42**	**5.42**	**5.42**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	7.20	7.20	7.20
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**7.20**	**7.20**	**7.20**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF DANIA BEACH

County: Broward County

Service Area: A portion of the City of Dania Beach

Description: The water supply for the City of Dania Beach comes from the SAS. Its service area covers the eastern portion of the city. The city's wellfield is limited to 1.1 MGD due to concerns about saltwater intrusion. To meet its current and future demand above its allocation, the city purchases and treats raw water from Broward County's South Regional Wellfield at Brian Piccolo Park. The city does not have a WWTP. The city's wastewater is treated by Hollywood's Southern Regional Water Reclamation Facility. This city is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	14,840	15,554	16,267
Per Capita (gallons per day finished water)	154	154	154
Potable Water Demands (daily average annual finished water in MGD)	**2.29**	**2.40**	**2.51**
SFWMD WATER USE PERMITTED (06-00187-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	1.80[a]	1.10	1.10
Brackish Water	0.00	0.00	0.00
Bulk Water Purchase (from Broward County Water and Wastewater Services South Regional Wellfield)	1.30	2.20	2.50
Total Allocation (including bulk water purchase)	**3.10**	**3.30**	**3.60**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	5.02	5.02	5.02
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**5.02**	**5.02**	**5.02**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

a. In 2013, the City of Dania Beach allocation of 1.80 MGD was reduced to 1.10 MGD to reduce the risk of saltwater intrusion into the wellfield.

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TOWN OF DAVIE

County: Broward County

Service Area: A portion of the Town of Davie and the Seminole Tribe of Florida's Hollywood Reservation

Description: The water supply of the Town of Davie is currently obtained from the SAS. The town has constructed a 6-MGD RO plant to treat water from the FAS, which will be operational by 2013. An expansion of the new RO facility is proposed for later in the planning period and currently is listed at 6.0 MGD, although the demand projections developed for this plan suggest the full project may not be needed. The town is also developing a reclaimed water system. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide. The combination of continued conservation and the implementation of reuse will also benefit Davie in meeting its 2030 demand.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	27,548	59,320	91,091
Per Capita (gallons per day finished water)	146	146	146
Potable Water Demands (daily average annual finished water in MGD)	**4.02**	**8.66**	**13.30**
SFWMD WATER USE PERMITTED (06-00134-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	6.18	5.02	5.02
Brackish Water	14.83	14.83	14.83
Total Allocation	**21.01**	**19.85**	**19.85**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	7.40	7.40	7.40
Brackish Water	0.00	6.00 [a]	6.00 [a]
Planned Project Capacity	0.00	0.00	6.00
Total Capacity	**7.40**	**13.40**	**19.40**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	3.50	3.50

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Potable Water					
RO Addition to WTP	Brackish Water	2030	$16.00 [b]	0.00	6.00
Total			**$16.00**	**0.00**	**6.00**
Nonpotable Water					
Reclaimed Water Facility	Reclaimed Water	2014	$7.50	3.50	3.50
Total			**$7.50**	**3.50**	**3.50**

a. Project will be online in 2013.

b. The annual operation and maintenance cost (including power, chemicals, parts, materials, labor, administration, and compliance) for operating a 6-MGD brackish water RO water treatment plant was estimated to be approximately $2,580,000 per year, as estimated from the *2007 Water Supply Cost Estimation Study* by CDM (2007a).

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CITY OF DEERFIELD BEACH

County: Broward County

Service Area: City of Deerfield Beach

Description: Until recently, the City of Deerfield Beach operated two interconnected WTPs: East WTP and West WTP. The city decomissioned the East WTP in 2012 and continues operation of the West WTP. The West WTP has three separate treatment systems: lime softening (7.5 MGD), nanofiltration (10.5 MGD), and RO treatment (3.0 MGD) systems. The 3.0-MGD RO unit was completed in 2013 to treat brackish water from the city's FAS wellfield. Future demands will be met 75 percent from the SAS and 25 percent from the FAS. The city's water use permit capped the East Wellfield at 3.35 MGD due to saltwater intrusion concerns. The city also purchases 0.59 MGD of raw water from Broward County's District 2A/North Regional Wellfield. This city is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	51,842	54,335	56,828
Per Capita (gallons per day finished water)	191	191	191
Potable Water Demands (daily average annual finished water in MGD)	**9.90**	**10.38**	**10.85**
SFWMD WATER USE PERMITTED (06-00082-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	11.90	11.90	11.90
Brackish Water	4.00	4.00	4.00
Bulk Water Purchase (from Broward County)	0.59	0.59	0.59
Total Allocation (including bulk water purchase)	**16.49**	**16.49**	**16.49**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	34.80	18.00	18.00
Brackish Water	0.00	3.00[a]	3.00[a]
Total Capacity	**34.80**	**21.00**	**21.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

a. Project will be online by 2013.

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CITY OF FORT LAUDERDALE

County: Broward County

Service Area: Cities of Fort Lauderdale, Oakland Park, Wilton Manors, and Hollywood; portions of the City of Tamarac; towns of Lauderdale-By-The-Sea and Davie; and villages of Lazy Lake and Sea Ranch Lakes.

Description: The SAS currently provides the water supply for the City of Fort Lauderdale. The city has two water treatment facilities. The Fiveash WTP has a 70-MGD design capacity and uses lime softening. The city's membrane plant (Peele-Dixie) was completed in 2008 and has a design capacity of 12 MGD. Before growth slowed in 2008, the city planned to construct a 6.0-MGD RO plant. Current projections indicate the RO plant may not be needed during the twenty-year planning horizon. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	212,945	223,045	233,145
Per Capita (gallons per day finished water)	190	190	190
Potable Water Demands (daily average annual finished water in MGD)	**40.46**	**42.38**	**44.30**
SFWMD WATER USE PERMITTED (06-00123-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	52.55	52.55	52.55
Brackish Water	8.64	8.64	8.64
Total Allocation	**61.19**	**61.19**	**61.19**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	82.00	82.00	82.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	6.00
Total Capacity	**82.00**	**82.00**	**88.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Potable Water					
Dixie Floridan Water Supply/WTP	Brackish Water	2030	$22.90	0.00	6.00
Total			**$22.90**	**0.00**	**6.00**

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CITY OF HALLANDALE BEACH

County: Broward County

Service Area: City of Hallandale Beach

Description: The water supply for the City of Hallandale Beach comes from the SAS. The city's existing wellfield allocation is capped at 3.5 MGD due to the risk of saltwater intrusion. The city also purchases up to 6.2 MGD of raw water from Broward County's South Regional Wellfield. Hallandale Beach proposed to develop a new wellfield located west of the city and abdandon its existing wellfield. The city was unable to find a viable western wellfield site. In 2013, Hallandale Beach decided to develop infrastructure to reduce the risk of saltwater intrusion at its existing wellfield. The city will remain a customer of the South Regional Wellfield. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	37,113	38,898	40,683
Per Capita (gallons per day finished water)	**146**	**146**	**146**
Potable Water Demands (daily average annual finished water in MGD)	**5.42**	**5.68**	**5.94**
SFWMD WATER USE PERMITTED (06-00138-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	3.50	3.50	3.50
Brackish Water	0.00	0.00	0.00
Bulk Water Purchase (from Broward County)	6.20[a]	6.20[a]	6.20[a]
Total Allocation (including bulk water purchase)	**9.70**	**9.70**	**9.70**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	16.00	16.00	16.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**16.00**	**16.00**	**16.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

a. The City of Hallandale has an agreement to purchase up to 6.20 MGD of raw water from the Broward County Water and Wastewater Services' South Regional (Brian Piccolo) Wellfield.

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TOWN OF HILLSBORO BEACH

County: Broward County

Service Area: Town of Hillsboro Beach

Description: The water supply for the Town of Hillsboro Beach comes from the SAS and is treated using a lime softening process. The town is currently replacing its existing plant with new lime softening treatment equipment. This utility is a contributing member to the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	1,875	1,965	2,055
Per Capita (gallons per day finished water)	351	351	351
Potable Water Demands (daily average annual finished water in MGD)	**0.66**	**0.69**	**0.72**
SFWMD WATER USE PERMITTED (06-00101-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.88	0.88	0.88
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.88**	**0.88**	**0.88**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	2.25	2.25	2.25
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**2.25**	**2.25**	**2.25**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF HOLLYWOOD

County: Broward County
Service Area: Cities of Hollywood and West Park, portions of the City of Dania Beach, Town of Davie, Seminole Tribe Hard Rock Casino, and portions of unincorporated Broward County
Description: The majority of the City of Hollywood's water supply comes from the SAS. The city operates three distinct WTPs, utilizing lime softening, membrane, and RO treatment technologies. It is anticipated that the FAS will provide about 25 percent of future demands. The city also purchases bulk water from the Broward County's South Regional Wellfield. The city provides treated water to Broward County for distribution to Pembroke Park, West Park, and the western portions of Dania Beach. The city operates a regional WWTP that is subject to the requirements of the 2008 Ocean Outfall statute. Additionally, the city has proposed a reuse program to recharge the FAS as its primary project to meet the resuse requirements of the Ocean Outfall statute for the South Regional WWTP. More than 23 MGD of reclaimed water projects are expected to be developed by 2025. This city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide. Current projections indicate that the RO expansion project may not be needed during the twenty-year planning horizon.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	186,798	198,559	210,320
Per Capita (gallons per day finished water)	111	111	111
Potable Water Demands (daily average annual finished water in MGD)	**20.73**	**22.04**	**23.35**
SFWMD WATER USE PERMITTED (06-00038-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	24.80	24.80	24.80
Brackish Water	8.67	8.67	8.67
Bulk Water Purchase (from Broward County Water and Wastewater Services' South Regional Wellfield)	5.90	5.90	5.90
Total Allocation (including bulk water purchase)	**39.37**	**39.37**	**39.37**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	55.50	55.50	55.50
Brackish Water	4.00	4.00	4.00
Planned Project Capacity	0.00	0.00	2.00
Total Capacity	**59.50**	**59.50**	**61.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	3.00	4.00[a]	23.40[a]

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Potable Water					
RO Expansion (one train and two Floridan wells)	Brackish Water	2027	$7.10	0.00	2.00
Total			**$7.10**	**0.00**	**2.00**

a. Projection conveyed by city staff regarding anticipated compliance with the 2008 Ocean Outfall statute.

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CITY OF LAUDERHILL

County: Broward County

Service Area: City of Lauderhill

Description: The water supply for the City of Lauderhill is obtained from the SAS and treated using a lime softening process. The city anticipates construction of FAS wells and an RO plant to meet future demands. Current projections indicate the FAS wells and RO plant may not be needed during the twenty-year planning horizon. The city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	58,114	60,909	63,704
Per Capita (gallons per day finished water)	95	95	95
Potable Water Demands (daily average annual finished water in MGD)	**5.52**	**5.79**	**6.05**
SFWMD WATER USE PERMITTED (06-00129-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	7.70	7.70	7.70
Brackish Water	1.02	1.02	1.02
Total Allocation	**8.72**	**8.72**	**8.72**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	16.00	16.00	16.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	1.00	3.00
Total Capacity	**16.00**	**17.00**	**19.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD) 2020**	**2030**
Potable Water					
Floridan Well and RO WTP Phase 1 (disposal well and RO WTP)	Brackish Water	2017	$27.50	1.00	1.00
Floridan Well and RO WTP Phase 2 (expansion of RO WTP)	Brackish Water	2018	$5.50	0.00	2.00
Total			**$33.00**	**1.00**	**3.00**

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CITY OF MARGATE

County: Broward County

Service Area: City of Margate and a portion of the City of Coconut Creek

Description: The water supply for the City of Margate is obtained from the SAS and treated through a lime softening process. The city intends to utilize reclaimed water to irrigate three golf courses and two residential communities. In the future, the city intends to modify its water use permit to account for reclaimed water usage. This city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide .

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	58,314	61,118	63,923
Per Capita (gallons per day finished water)	98	98	98
Potable Water Demands (daily average annual finished water in MGD)	**5.71**	**5.99**	**6.26**
SFWMD WATER USE PERMITTED (06-00121-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	9.30	8.51	8.51
Brackish Water	0.00	0.00	0.00
Total Allocation	**9.30**	**8.51**	**8.51**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	18.00	18.00	18.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**18.00**	**18.00**	**18.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	1.50	1.50

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD) 2020**	**2030**
Nonpotable Water					
WWTP Effluent Reuse System	Reclaimed Water	2015	$9.50	1.50	1.50
Total			**$9.50**	**1.50**	**1.50**

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CITY OF MIRAMAR

County: Broward County

Service Area: City of Miramar

Description: The water supply for the City of Miramar is obtained from the SAS and FAS. The city obtained an SAS allocation above its 11.68-MGD base condition water use by providing reclaimed water to golf courses that were using groundwater for irrigation. As a result, the city has a SAS allocation of 13.33 MGD. The city also constructed an RO treatment plant and FAS wells. All future demands will come from the FAS and the expansion of the RO plant. This city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide .

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	116,715	125,225	133,734
Per Capita (gallons per day finished water)	97	97	97
Potable Water Demands (daily average annual finished water in MGD)	**11.32**	**12.15**	**12.97**
SFWMD WATER USE PERMITTED (06-00054-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	13.89[a]	11.56[b]	13.33[c]
Brackish Water	2.67	2.67	2.67
Total Allocation	**16.00**	**14.23[b]**	**16.00[c]**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	15.25	15.25	15.25
Brackish Water	2.50	2.50	2.50
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**17.75**	**17.75**	**17.75**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	2.00	4.00[d]	4.00[d]

a. The 2008 consumptive use permit included a temporary allocation of 2.33 MGD to provide adequate supply while the city developed a FAS wellfield and an RO treatment plant.

b. The city's SAS allocation dropped to 11.56 MGD when the temporary allocation expired in 2013. However, the consumptive use permit provided opportunity for the City of Miramar to obtain an additional 1.78 MGD by providing reuse to approximately 65 businesses and getting those users to retire their irrigation class consumptive use permits for the SAS.

c. 13.33 MGD assumes the 65 or so consumptive use permits have been retired and the city has its full allocation.

d. As described in the city's water supply work plan in 2008.

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CITY OF NORTH LAUDERDALE

County: Broward County

Service Area: City of North Lauderdale

Description: The water supply for the City of North Lauderdale is obtained from the SAS and is treated using a lime softening process. The city's water use permit was modified in 2005 and does not anticipate a substantial increase in demand in the future. This is consistent with the demand projections provided in this plan.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	32,994	34,581	36,167
Per Capita (gallons per day finished water)	76	76	76
Potable Water Demands (daily average annual finished water in MGD)	**2.51**	**2.63**	**2.75**
SFWMD WATER USE PERMITTED (06-00004-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	3.64	3.24	3.24
Brackish Water	0.00	0.00	0.00
Total Allocation	**3.64**	**3.24**	**3.24**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	7.50	7.50	7.50
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**7.50**	**7.50**	**7.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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NORTH SPRINGS IMPROVEMENT DISTRICT

County: Broward County

Service Area: A portion of the City of Coral Springs and the City of Parkland

Description: The water supply for the North Springs Improvement District is obtained from the SAS. The utility incorporated the "wedge" land parcel recently annexed from Palm Beach County into their service area. If zoning in the wedge changes from agricultural to residential, the district plans to modify its water use permit to add FAS wells and an RO plant to meet future water demands. Wastewater is currently treated at the Broward County's North Regional WWTP. However, the district is planning to develop a reuse facility by 2020.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	34,895	36,573	38,251
Per Capita (gallons per day finished water)	124	124	124
Potable Water Demands (daily average annual finished water in MGD)	**4.33**	**4.54**	**4.74**
SFWMD WATER USE PERMITTED (06-00274-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	5.18	5.18	5.18
Brackish Water	0.00	0.00	0.00
Total Allocation	**5.18**	**5.18**	**5.18**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	6.80	6.80	6.80
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**6.80**	**6.80**	**6.80**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	4.00	4.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Nonpotable Water					
Water Reuse Plant	Reclaimed Water	2017	information not available	4.00	4.00
Total				**4.00**	**4.00**

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PARKLAND UTILITIES, INC.

County: Broward County

Service Area: City of Parkland

Description: Parkland Utilities, Inc. is a private utility that obtains its water supply from the SAS and treats it using a lime softening process.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	2,161	2,265	2,369
Per Capita (gallons per day finished water)	113	113	113
Potable Water Demands (daily average annual finished water in MGD)	**0.24**	**0.26**	**0.27**
SFWMD WATER USE PERMITTED (06-00242-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	0.35	0.35	0.35
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.35**	**0.35**	**0.35**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	0.58	0.58	0.58
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**0.58**	**0.58**	**0.58**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF PEMBROKE PINES

County: Broward County

Service Area: City of Pembroke Pines and Town of Southwest Ranches (five homes)

Description: The water supply for the City of Pembroke Pines is obtained from the SAS and treated using a lime softening process. The city has two wellfields: East and Central. The city owns and operates a WWTP and investigated the feasibility of producing reclaimed water for aquifer recharge in the future. At this time, the city indicated it will not proceed with the reuse project. This city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	152,002	159,312	166,622
Per Capita (gallons per day finished water)	78	78	78
Potable Water Demands (daily average annual finished water in MGD)	**11.86**	**12.43**	**13.00**
SFWMD WATER USE PERMITTED (06-00135-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	15.60	15.60	15.60
Brackish Water	0.00	0.00	0.00
Total Allocation	**15.60**	**15.60**	**15.60**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	18.00	18.00	18.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**18.00**	**18.00**	**18.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF PLANTATION

County: Broward County

Service Area: City of Plantation

Description: The water supply for the City of Plantation is obtained from the SAS and treated at two treatment facilities that use membrane filtration. Each plant has a 12-MGD capacity. The city operates a WWTP and treats a portion of the wastewater for irrigation, process water, and equipment washdown at the plant. This city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	91,812	97,595	103,377
Per Capita (gallons per day finished water)	127	127	127
Potable Water Demands (daily average annual finished water in MGD)	**11.66**	**12.39**	**13.13**
SFWMD WATER USE PERMITTED (06-00103-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	17.24	17.24	17.24
Brackish Water	0.00	0.00	0.00
Total Allocation	**17.24**	**17.24**	**17.24**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	24.00	24.00	24.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**24.00**	**24.00**	**24.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.77	0.77	0.77

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CITY OF POMPANO BEACH

County: Broward County

Service Area: Cities of Pompano Beach and Lighthouse Point, and the Town of Lauderdale-By-The-Sea

Description: The water supply for the City of Pompano Beach is obtained from the SAS from eastern and western wellfields (Airport and Palm Aire, respectively). The eastern wellfield has seasonal pumpage limits due to saltwater intrusion. The city operates one WTP that utilizes lime softening and membrane processes. The city also operates a reclaimed water facility that serves residential neighborhoods, golf courses, parks, and road medians. The expansion of the city's reclaimed water system is ongoing. The city does not have a wastewater treatment facility. The source of water for reuse is the ocean outfall line from Broward County's North Regional Water Reclamation Facility.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	79,917	83,765	87,613
Per Capita (gallons per day finished water)	170	170	162
Potable Water Demands (daily average annual finished water in MGD)	**13.59**	**14.24**	**14.19**
SFWMD WATER USE PERMITTED (06-00070-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	17.75	17.75	17.75
Brackish Water	0.00	0.00	0.00
Total Allocation	**17.75**	**17.75**	**17.75**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	50.00	50.00	50.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**50.00**	**50.00**	**50.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	7.50	7.50	7.50

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD) 2020**	**2030**
Nonpotable Water					
Reuse Distribution Expansion Program through Fiscal Year 2025	Reclaimed Water	underway	$5.70	1.40[a]	2.20[a]
Broward County Reuse Distribution	Reclaimed Water	underway	information not available	0.10[a]	0.10[a]
Total			**$5.70**	**1.50**	**2.30**
Conservation Projects					
Conservation and Irrigation Restrictions	Conservation	2025	$0.00	0.10	0.10
Total			**$0.00**	**0.10**	**0.10**

a. This project adds to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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ROYAL UTILITY CORPORATION

County: Broward County

Service Area: A portion of the City of Coral Springs

Description: The water supply for the Royal Utility Corporation is obtained from the SAS. The utility operates a lime softening WTP with a capacity of 1 MGD.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	3,234	3,390	3,545
Per Capita (gallons per day finished water)	98	98	98
Potable Water Demands (daily average annual finished water in MGD)	**0.32**	**0.33**	**0.35**
SFWMD WATER USE PERMITTED (06-00003-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.48	0.48	0.48
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.48**	**0.48**	**0.48**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	1.00	1.00	1.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**1.00**	**1.00**	**1.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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SEMINOLE TRIBE OF FLORIDA

County: Broward County

Service Area: Seminole Tribe of Florida's Hollywood Reservation

Description: Water supply for the Seminole Tribe of Florida's Hollywood Reservation is obtained from the SAS. SFWMD does not issue a water use permit to the Seminole Tribe of Florida for this location. Rather, the Water Rights Compact Among the Seminole Tribe of Florida, the State of Florida and the South Florida Water Management District provides information about water supply planning through an annual work plan. The information recently submitted by the Seminole Tribe of Florida is contained in the Fourth Amendment to the Seventeenth Annual Work Plan.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	1,368	1,434	1,500
Per Capita (gallons per day finished water)	810	810	810
Potable Water Demands (daily average annual finished water in MGD)	**1.11**	**1.16**	**1.21**
SFWMD WATER USE RIGHTS (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	2.40	2.40	2.40
Brackish Water	0.00	0.00	0.00
Total Allocation	**2.40**	**2.40**	**2.40**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	2.00	2.00	2.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**2.00**	**2.00**	**2.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF SUNRISE

County: Broward County

Service Area: Cities of Sunrise and Weston, Town of Southwest Ranches, a portion of the Town of Davie, and unincorporated Broward County

Description: The City of Sunrise obtains its water supply from the SAS and FAS. The city operates four wellfields and three WTPs primarily utilizing lime softening and membrane processes. In 2013, the city added a 1.5-MGD RO treatment system at its Springtree Plant. The city previously planned to develop 9 MGD of RO treatment capacity and acquired a FAS allocation of 10.98 MGD to accommodate expected demand. Slower growth and successful conservation efforts should allow the city to postpone development of additional capacity from the FAS aquifer beyond 2030. The city is upgrading the treatment system at its Southwest WWTP to provide 1 MGD of reclaimed water capacity and is in the design phase to develop reuse facilities at its Sawgrass WWTP. The city is a contributing member of the Broward Water Partnership conservation program, which has the goal of saving a total of 30 MGD countywide.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected [a]	
	2010	2020	2030
Population	211,403	221,570	231,736
Per Capita (gallons per day finished water)	116	116	116
Potable Water Demands (daily average annual finished water in MGD)	**24.52**	**25.70**	**26.88**

SFWMD WATER USE PERMITTED (06-00120-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	31.39	29.09	29.09
Brackish Water	4.76	10.98	10.98
Total Allocation	**36.15**	**40.70**	**40.07**

POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	50.00	50.00	50.00
Brackish Water	0.00	1.50[b]	1.50[b]
Planned Project Capacity (Brackish)	0.00	0.00	0.00
Total Capacity	**50.00**	**51.50**	**51.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.80	2.80	4.80

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ Million)	2020	2030
Nonpotable Water					
Irrigation Reuse at the Sawgrass WWTP	Reclaimed Water	2018	information not available	2.00	4.00
Total			**$0.00**	**2.00**	**4.00**

a. The city estimates 10,000 housing units are currently vacant. If these units become occupied at a rate than is higher than medium Bureau of Economic and Business Research growth rates, then demands could increase above projections.

b. Project will be online by 2013.

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CITY OF TAMARAC

County: Broward County

Service Area: City of Tamarac

Description: The water supply for the City of Tamarac is obtained from the SAS and treated using a lime softening process. City officials indicated that the city is experiencing a change in demographics that could result in more rapid growth in population and water demand than those anticipated by the analysis presented in this plan. The 2005-2006 LEC Plan Update recommended the city consider the construction of FAS wells and a 2-MGD RO treatment system to meet future demands. Current projections, however, indicate that the project may not be needed during the twenty-year planning horizon.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	56,064	58,760	61,456
Per Capita (gallons per day finished water)	105	105	105
Potable Water Demands (daily average annual finished water in MGD)	**5.89**	**6.17**	**6.45**
SFWMD WATER USE PERMITTED (06-00071-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	7.19	7.19	7.19
Brackish Water	0.00	0.00	0.00
Total Allocation	**7.19**	**7.19**	**7.19**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	16.00	16.00	16.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	2.00
Total Capacity	**16.00**	**16.00**	**18.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

PROJECT SUMMARY					
				Projected Cumulative Design Capacity (MGD)	
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**2020**	**2030**
Potable Water					
RO WTP	Brackish Water	2022	$19.00	0.00	2.00
Total			**$19.00**	**0.00**	**2.00**

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TINDALL HAMMOCK IRRIGATION AND SOIL CONSERVATION DISTRICT

County: Broward County

Service Area: Town of Davie

Description: The water supply for the Tindall Hammock Irrigation and Soil Conservation District (formerly known as Ferncrest Utilities) is obtained from the SAS. The district reuses the wastewater generated by the service area for aquifer recharge.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	2,639	2,766	2,893
Per Capita (gallons per day finished water)	158	158	158
Potable Water Demands (daily average annual finished water in MGD)	**0.42**	**0.44**	**0.46**
SFWMD WATER USE PERMITTED (06-00170-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	0.74	0.74	0.74
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.74**	**0.74**	**0.74**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	1.00	1.00	1.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**1.00**	**1.00**	**1.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.60	0.60	0.60

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Miami-Dade County

AMERICANA VILLAGE

County: Miami-Dade County

Service Area: Unincorporated areas of Miami-Dade County

Description: The water supply for this mobile home community is obtained from the SAS. The demand for this community is not expected to exceed its allocation in future years.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	1,582	1,727	1,871
Per Capita (gallons per day finished water)	138	138	138
Potable Water Demands (daily average annual finished water in MGD)	**0.22**	**0.24**	**0.26**
SFWMD WATER USE PERMITTED (13-02004-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	0.26	0.26	0.26
Brackish Water	0.00	0.00	0.00
Total Allocation	**0.26**	**0.26**	**0.26**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	0.50	0.50	0.50
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**0.50**	**0.50**	**0.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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FLORIDA CITY WATER AND SEWER DEPARTMENT

County: Miami-Dade County

Service Area: City of Florida City

Description: The water supply for the Florida City Water and Sewer Department is obtained from the SAS and treated using a lime softening process. Florida City has reduced its historically high rate of unaccounted for water losses, but its rate still exceeds SFWMD guidelines. Continued reductions should result in a lower per capita use rate, which should decrease the 2030 demand below 2.07 MGD.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	11,230	12,256	13,283
Per Capita (gallons per day finished water)	156	156	156
Potable Water Demands (daily average annual finished water in MGD)	**1.75**	**1.91**	**2.07**
SFWMD WATER USE PERMITTED (13-00029-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	2.44	2.44	2.44
Brackish Water	0.00	0.00	0.00
Total Allocation	**2.44**	**2.44**	**2.44**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	4.00	4.00	4.00
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**4.00**	**4.00**	**4.00**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	1.00	1.00

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion Date**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD) 2020**	**2030**
Nonpotable Water					
Stormwater Reuse Program	Stormwater	planned	$13.50	0.35	0.35
Friedland Manor Storm Water for Indirect Potable Use	Stormwater	planned	$30.30	0.65	0.65
Total			**$43.80**	**1.00**	**1.00**

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CITY OF HOMESTEAD

County: Miami-Dade County

Service Area: Cities of Homestead and Florida City, and unincorporated areas of Miami-Dade County

Description: The water supply for the City of Homestead is obtained from the SAS and treated using a lime softening process. Unmet needs above the existing allocation are purchased from MDWASD, which agreed by contract to provide the city with up to 3 MGD of finished water.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	65,679	71,682	77,686
Per Capita (gallons per day finished water)	157	157	157
Potable Water Demands (daily average annual finished water in MGD)	**10.31**	**11.25**	**12.20**
SFWMD WATER USE PERMITTED (13-00046-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	2010	2020	2030
Fresh Water	10.55	10.55	10.55
Brackish Water	0.00	0.00	0.00
Bulk Water Purchase (from MDWASD)	0.40	1.00	2.00
Total Allocation (including bulk water purchase)	**10.95**	**11.55**	**12.55**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	2012	2020	2030
Fresh Water	16.90	16.90	16.90
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**16.90**	**16.90**	**16.90**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	6.00	6.00	6.00

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MIAMI-DADE WATER AND SEWER DEPARTMENT

County: Miami-Dade County

Service Area: Cities of Aventura, Coral Gables, Doral, Hialeah*, Hialeah Gardens*, Homestead*, Miami, Miami Beach*, Miami Gardens, Miami Springs, North Bay Village*, North Miami*, Opa-Locka*, South Miami, Sweetwater, and West Miami*; towns of Bay Harbor Islands*, Cutler Bay, Key Biscayne, Medley*, Miami Lakes, and Surfside*; villages of Bal Harbour*, El Portal, Indian Creek*, Miami Shores, Palmetto Bay, Pinecrest, and Virginia Gardens*; and unincorporated areas of Miami-Dade County. Those cities marked by an asterick are wholesale customers of MDWASD. MDWASD handles distribution and billing for the other municipalities.

Description: The water supply for MDWASD is obtained from the SAS, the FAS, and operation of ASR wells. MDWASD is the largest water and sewer utility in Florida. It operates three large regional and five small WTPs. Two of the county's three regional WWTPs are subject to the requirements of the 2008 Ocean Outfall statute. The county is required to achieve 117.5 MGD of reuse by 2025. The county has proposed a reuse project to recharge the FAS as a key element of its program to meet the reuse requirements of the Ocean Outfall statute for its combined flow from its regional WWTPs. Current projections indicate that some of the planned RO WTP expansion projects may not be needed during the twenty-year planning horizon.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	2,141,885	2,337,660	2,533,436
Per Capita (gallons per day finished water)	141	141	141
Potable Water Demands (daily average annual finished water in MGD)	**302.01**	**329.61**	**357.21**
SFWMD WATER USE PERMITTED (13-00017-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	388.56	386.50	386.50
Brackish Water	19.95	46.60	46.60
Total Allocation	**408.51**	**433.10**	**433.10**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	453.93	447.18	447.18
Brackish Water	0.00	10.00[a]	10.00[a]
Planned Project Capacity	0.00	20.00	27.50
Total Capacity	**453.93**	**477.18**	**484.68**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	16.49	16.49	149.49

a. Project will be online by 2013.

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PROJECT SUMMARY					
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ Million)	Projected Cumulative Design Capacity (MGD)	
				2020	2030
Potable Water					
South Miami Heights RO WTP [a]	Brackish Water and 3 MGD Fresh Water	2015	$194.70	20.00	20.00
Hialeah Floridan Aquifer RO WTP Phase 2 and 3 (including concentrate disposal)	Brackish Water	2026	$37.80	0.00	7.50
Total			**$344.80**	**20.00**	**27.75**
Nonpotable Water					
North District WWTP Reuse	Reclaimed Water	2025	$13.50	0.00	7.00
Central District WWTP Reuse – Floridan Aquifer Recharge	Reclaimed Water	2025	information not available	0.00	27.10 [b]
West District Canal Water Reclamation Plant Recharge Phase 2	Reclaimed Water	2021	$665.00	0.00	21.00
West District Canal Water Reclamation Plant Recharge Phase 3	Reclaimed Water	2021	$593.00	0.00	16.00
Biscayne Coastal Wetlands Rehydration [c]	Reclaimed Water	2022	$1,120.00	0.00	89.00
South District WWTP – FPL Distribution (72-inch pipeline)	Reclaimed Water	2021	$95.00	0.00	90.00 [d]
Total			**$2,486.50**	**0.00**	**250.10**
Conservation					
Conservation Program	Conservation	2030	$20.00	12.01	15.19
Total			**$20.00**	**12.01**	**15.19**

a. The annual operation and maintenance cost (including power, chemicals, parts, materials, labor, administration, and compliance) for operating a 20-MGD brackish water RO water treatment plant was estimated to be approximately $6,990,000 per year, as estimated from the Water Supply Cost Estimation Study by CDM (2007a)

b. The Central District WWTP Reuse – Floridan Aquifer Recharge 27.10 MGD does not increase the actual treatment capacity to the reclaimed water plant and was not included in capacity totals.

c. Feasibility of this project will be determined in the future.

d. This project adds capacity to the reclaimed water distribution system, but does not increase the actual treatment capacity of the reclaimed water plant.

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CITY OF NORTH MIAMI

County: Miami-Dade County

Service Area: City of North Miami, Village of Biscayne Park, and unincorporated areas of Miami-Dade County

Description: The water supply for the City of North Miami is obtained from the Biscayne aquifer, treated using a lime softening process, and augmented with the purchase of bulk water from MDWASD. The City of North Miami has a twenty-year contract to purchase water from MDWASD. Future demands are expected to be met by development of water supply from the FAS by 2018. However, the city deferred the project. Without the RO plant, the city will need to continue purchases from MDWASD to meet 2020 and 2030 demands.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	90,397	98,660	106,922
Per Capita (gallons per day finished water)	117	117	117
Potable Water Demands (daily average annual finished water in MGD)	**10.58**	**11.54**	**12.51**
SFWMD WATER USE PERMITTED (13-00059-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	9.30	9.30	9.30
Brackish Water	7.97	7.97	7.97
Bulk Water Purchase (from MDWASD)	3.20	3.00*	4.00*
Total Allocation (including bulk water purchase)	**20.47**	**20.27**	**21.27**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	9.30	9.30	9.30
Brackish Water	0.00	0.00	0.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**9.30**	**9.30**	**9.30**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

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CITY OF NORTH MIAMI BEACH

County: Miami-Dade County

Service Area: Cities of North Miami Beach, Aventura, Miami Gardens, North Miami, and Sunny Isles Beach; Town of Golden Beach; and unincorporated areas of Miami-Dade County

Description: The water supply for the City of North Miami Beach is obtained from the SAS and FAS, and treated using a lime softening process and RO, respectively. Current projections indicate that the RO WTP expansion projects may not be needed during the twenty-year planning horizon.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population	161,968	176,772	191,577
Per Capita (gallons per day finished water)	125	129	129
Potable Water Demands (daily average annual finished water in MGD)	**20.25**	**22.80**	**24.72**
SFWMD WATER USE PERMITTED (13-00060-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	26.30	26.30	26.30
Brackish Water	12.07	12.07	12.07
Total Allocation	**38.37**	**38.37**	**38.37**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	25.50	25.50	25.50
Brackish Water	6.50	6.50	6.50
Planned Project Capacity	0.00	12.50	17.50
Total Capacity	**32.00**	**44.50**	**49.50**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.00	0.00	0.00

PROJECT SUMMARY					
Water Supply Projects	**Source**	**Completion**	**Total Capital Cost ($ Million)**	**Projected Cumulative Design Capacity (MGD)**	
				2020	**2030**
Potable Water					
Floridan Wells, Lines, Mains, and RO WTP Phases 2 and 3	Brackish Water	planned	$8.21	12.50	12.50
Floridan Wells, Lines, Mains, and RO WTP Phase 4	Brackish Water	planned	$37.50	0.00	5.00
Total			**$45.71**	**12.50**	**17.50**

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Monroe County

FLORIDA KEYS AQUEDUCT AUTHORITY

County: Monroe County

Service Area: Cities of Key Colony Beach, Key West, Layton, and Marathon; Village of Islamorada; and unincorporated areas of Monroe County. The FKAA also has a contract to provide up to 2.4 MGD to the United States Navy.

Description: The water supply for FKAA comes from the SAS and the FAS, and is treated using a lime softening process and RO, respectively. FKAA also has two desalination plants that can produce up to 3.0 MGD of finished water from seawater. These plants are used for emergencies and extreme peaks in demand. The FKAA profile recognizes the seasonal population in Monroe County now exceeds the permanent population on an annual basis. Current forecasts project a continued decline in permanent population and an increase in seasonal population (according to analyses developed by Monroe County). Data from Monroe County and FKAA indicates that the growing seasonal population appears to be driving per capita use rates upward.

POPULATION AND FINISHED WATER DEMAND			
	Existing	Projected	
	2010	2020	2030
Population (permanent)	73,090	71,195	69,300
Population (seasonal)	78,401	82,151	86,855
Per Capita (gallons per day finished water)	109	124	139
Potable Water Demands (daily average annual finished water in MGD)	**16.45**	**19.00**	**21.70**
SFWMD WATER USE PERMITTED (13-00005-W) ALLOCATION (MGD)			
	Existing	Projected	
Potable Water Source	**2010**	**2020**	**2030**
Fresh Water	17.79	17.79	17.79
Brackish Water	6.18	6.18	6.18
Total Allocation	**23.97**	**23.97**	**23.97**
POTABLE WATER TREATMENT CAPACITY			
	Cumulative Facility & Project Capacity (MGD)		
	Existing	Projected	
FDEP Permitted Capacity	**2012**	**2020**	**2030**
Fresh Water	23.80	23.80	23.80
Brackish Water	6.00	6.00	6.00
Planned Project Capacity	0.00	0.00	0.00
Total Capacity	**29.80**	**29.80**	**29.80**
NONPOTABLE WATER TREATMENT CAPACITY			
Reclaimed Water	0.62	1.62	2.72

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PROJECT SUMMARY					
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ Million)	Projected Cumulative Design Capacity (MGD) 2020	2030
Nonpotable Water					
Reclaimed Water Systems in Unincorporated Monroe County	Reclaimed Water	2015	$12.00	1.00	2.10
Total			**$12.00**	**1.00**	**2.10**
Conservation					
Low Flow Fixture Distribution	Conservation	underway	$0.25	0.10	0.15
Total			**$0.25**	**0.10**	**0.15**

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7

Future Direction

This chapter summarizes the future direction for water supply in the Lower East Coast (LEC) Planning Area. Public Water Supply (PWS) demands projected to increase in the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007) did not materialize. PWS demand actually decreased over the past five years. The reasons for the decrease are likely due to the economic downturn, water shortage restrictions during droughts, conservation efforts by the utilities, and the South Florida Water Management District's (SFWMD's) and local governments' year-round landscape irrigation conservation measures.

TOPICS

- Water Sources
- Environmental Restoration
- Future Analysis
- Coordination
- Climate Change
- Conclusion

Herbert Hoover Dike

Analyses conducted during this plan indicate that almost all PWS utilities have sufficient treatment capacity and permit allocation to meet projected 2030 demands. Rehabilitation of the Herbert Hoover Dike by the United States Army Corps of Engineers (USACE) is important for protection of the citizens living the vicinity of the lake. Additionally, completion of this project in part or wholly may enable revision of the lake operating schedule.

Meeting the 1-in-10 level of service for all water users in the LEC Planning Area is not possible within the next five years due to the interrelationship of the federal projects outlined in the plan. Future LEC water supply plans will address the progress of these water resource development projects based on project sequencing, project funding, and implementation partnerships as applicable. Until this occurs, this plan update continues to rely upon the existing programs and regulations, along with the identified potable water

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supply development projects, and their correlation with water supply demands and available sources.

This plan update also concludes that future water needs of the region can be met through the 2030 planning horizon with appropriate management, conservation, and implementation of projects identified in this plan. SFWMD anticipates any additional water from Lake Okeechobee resulting from revision of the lake operating schedule could return the lake to minimum flow and level (MFL) prevention status, enhance the level of certainty to existing permitted users, and support other environmental objectives. Meeting the future water needs is dependent on the following:

- Construction of two potable water supply development projects by PWS utilities.
- Utilization of the flexibility within the 2008 Lake Okeechobee Regulation Schedule (2008 LORS) as incremental dam safety improvements are completed; and in the longer term, completion of the seepage berm construction or equivalent repairs to the Herbert Hoover Dike for Reaches 1, 2 and 3 by USACE and implementation of a new Lake Okeechobee regulation schedule.
- Implementation of Comprehensive Everglades Restoration Plan (CERP) and other projects identified in MFL prevention and recovery strategies.

The guidance offered in this plan update should be considered in developing water supply options to meet future needs. Statutory requirements, existing conditions, resource constraints (including protection tools and criteria), and the needs of all water users are addressed, with emphasis placed on alternative water supply development, conservation, and projects for environmental needs. SFWMD's future direction for water supply planning in the LEC Planning Area requires continued coordination with utilities and other water users, natural resource protection, and continued monitoring to develop responses to saltwater intrusion and the potential of sea level rise.

WATER SOURCES

Groundwater remains the primary source of PWS drinking water throughout the LEC Planning Area. Withdrawals from the surficial aquifer system (SAS) are limited due to potential impacts on wetlands, MFL criteria, the potential for saltwater intrusion, pollution, interference with existing legal users, and off-site land uses. In addition, the Floridan aquifer system (FAS) is a source planned to augment some of the future PWS water demands in the LEC Planning Area. PWS utilities have proactively diversified supply sources, including use of the FAS. The use of reclaimed water has also increased significantly since the 2005–2006 LEC Plan Update, partially offsetting the use of fresh groundwater.

Primary surface water sources in the LEC Planning Area include Lake Okeechobee, the Water Conservation Areas (WCAs), and regional canals, such as the L-8, Hillsboro, North New River, and Miami canals. Agricultural (AGR) Self-Supply is the largest surface water user in the planning area. Based on current and projected water demands, this traditional

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source will continue to be available to meet irrigation requirements. However, regulatory criteria limits withdrawals. Fresh groundwater in the Lower East Coast Service Area may be available, but quantities will depend on local conditions, including other uses in the area.

Reclaimed water can be used to meet new uses or replace traditional freshwater sources currently used for irrigation, industrial purposes, or offsetting of regional water deliveries through canal recharge or other potable reuse options. Water storage features, such as reservoirs, aquifer storage and recovery (ASR) and impoundments, can be used to capture storm water, groundwater and surface water during wet weather periods, and provide supplemental supply for PWS and natural systems. Seawater is a potential alternative water supply. The technology costs for this source continue to decline, making it a more feasible option. Water conservation is an important component in integrated water resource management. Water conservation projects are often easier to implement than supply projects due to lower costs, extending the life of existing supplies, and acceptance by the public.

SFWMD offers recommendations and guidance in the following sections for consideration by local governments, utilities, other water users, and SFWMD water supply managers and staff as a basis for the future direction of water supply planning in the LEC Planning Area.

Groundwater

Additional allocation of fresh groundwater sources to meet future PWS demand in the LEC Planning Area is highly dependent on location, source limitations, reclaimed water availability, and water conservation measures. Approximately 94 percent of the PWS demand in 2010 was met using fresh groundwater. Fresh groundwater is also one of the primary sources of supply for agricultural and urban irrigation in the LEC Service Area.

Surficial Aquifer System

The potential use of the SAS for new or increased allocations will be evaluated on an application-by-application basis to determine if the project meets water use permitting criteria. When appropriate, water users are encouraged to continue diversifying water sources to meet future water demands.

Opportunities may exist for limited development of fresh groundwater sources through the following:

- Careful design of wellfield locations, configurations, and pumping regimes to maximize withdrawals while avoiding saltwater intrusion, pollution sources, harm to natural systems or increased dependence on the regional system as demonstrated through modeling that meets water use permitting criteria.
- Expansion of reclaimed water systems to provide “substitution credits” and/or impact offsets after demonstration of water demand.

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- Continued coordination of saltwater intrusion monitoring between SFWMD, the United States Geological Survey (USGS), and the counties is essential to ensure resource protection of the SAS. Maps delineating the extent of the saltwater interface should be published periodically to allow comparison with previous maps and identify areas of concern and/or future supply development.
- Utilities at risk and utilities of concern should continue to reduce the uncertainties and potential impacts from saltwater intrusion such as options for interconnections, alternative water supply supplementation, and wellfield reconfiguration.

Floridan Aquifer System

Some utilities are proposing modest increases in FAS water source development in conjunction with reverse osmosis treatment facilities over the next 20 years in addition to the 86 million gallons per day (MGD) of existing capacity.

Floridan aquifer monitor well

Recommendation for the FAS include the following:

- Local water users and utilities developing FAS well drilling programs are encouraged to collaborate with SFWMD. Water quality, water level, and hydrologic data from these wells can increase the understanding of the FAS and be utilized in SFWMD models.
- Brackish water from the FAS may be blended with fresh groundwater and surface water to produce acceptable quality water for PWS. Blended water supplies are dependent on water sources, volume of stored water, and natural system requirements, and require monitoring to ensure acceptable finished water quality.
- An incremental wellfield assessment and development approach should be used by utilities to design, test, and monitor production wells to minimize changes in water quality due to heterogeneities within the FAS and overstressing production zones.
- SFWMD anticipates finalizing the East Coast Floridan Model by the end of 2013. Once completed, the model will be available for simulations to address regional resource questions.

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Surface Water

Surface water sources, including Lake Okeechobee, are integrally connected as part of the Kissimmee-Okeechobee-Everglades ecosystem and regional water supply system. Recommendations and opportunities regarding surface water include the following:

- USACE should complete seepage berm construction or equivalent repairs to the Herbert Hoover Dike for Reaches 1, 2, and 3 no later than 2022 and revise the Lake Okeechobee regulation schedule, as recognized in the *Final Environmental Impact Statement including Appendices A through G – Lake Okeechobee Regulation Schedule* (USACE 2007) and the *Draft Integrated Project Implementation Report and Environmental Impact Statement – Central Everglades Planning Project* (USACE and SFWMD 2013).
- SFWMD will continue to implement MFL recovery and prevention strategies and review and update these, when appropriate, in conjunction with future plan updates. Within the LEC Planning Area, MFL criteria have been adopted for Lake Okeechobee, six areas within the Everglades (WCA 1, WCA 2, WCA 3, Everglades National Park, and Rotenberger and Holey Land wildlife management areas), the Biscayne aquifer, the Northwest Fork of the Loxahatchee River and Estuary, and Florida Bay.
- Local governments and utilities are encouraged to create additional storage capacity for excess surface water for water supply purposes, when feasible.
- Consideration must be given to the availability of the lowest quality source of water to meet any particular demand. Blending multiple alternative water sources to achieve acceptable water quality is a prudent approach to water supply.

Reclaimed Water

In the LEC Planning Area, reclaimed water is used for landscape irrigation, groundwater recharge, cooling water, and environmental enhancement. Opportunities to expand reclaimed water use are as follows:

- Local governments should consider requiring construction of reclaimed water infrastructure in new developments and establishing mandatory reuse zones. SFWMD will provide technical assistance to local governments to establish mandatory reuse zones.
- Support the development of additional reclaimed water lines for green space irrigation, such as residential lots, medians, common areas, and golf courses.

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- As part of the Leah Schad Memorial Ocean Outfall Program, six PWS utilities are required to comply with the statutory requirements. SFWMD encourages the development of creative solutions to beneficially reuse reclaimed water such as saltwater intrusion barriers, recharge of the SAS, canal recharge, environmental water supply, potable reuse, and for impact offsets and substitution credits.

Ocean outfall

- To promote efficient use, utilities should consider, where appropriate, strategies to support the expansion of reclaimed water supply, such as metering for residential customers, tiered rate structures, limiting days of the week for landscape irrigation, and facilitating interconnects with other reclaimed water utilities.
- Providers may consider the use of supplemental water supplies to meet peak reclaimed system demands. Supplemental water may enable a utility to extend its supply of reclaimed water system over a larger area. However, during times of drought, availability of supplemental water sources, such as surface water, groundwater or storm water, to supplement reclaimed water supplies may be limited in some areas.
- The Florida Department of Environmental Protection (FDEP) completed rulemaking on Chapter 62-40, Florida Administrative Code, to incorporate amendments to Section 373.250, Florida Statues (F.S.), which recognized the use of "substitution credits" and "impact offsets" to promote increased availability and distribution of reclaimed water. Where appropriate, SFWMD is amending its criteria to reflect statutory and FDEP amendments.

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New Storage Capacity for Surface Water or Groundwater

In the LEC Planning Area, potential types of water storage include reservoirs, ASR wells, and surface water impoundments. Proposed projects that develop new storage and create additional water supply may be considered alternative water sources. Opportunities for new storage capacity include the following:

- Construction of new or retrofitted surface water storage systems for agricultural operations could provide additional supply for irrigation.
- Utilities and other entities should continue to evaluate the feasibility of the C-51 Reservoir Project, including a variety of potential implementation and funding options. SFWMD will continue to explore a potential operational role associated with this feature. If permitted and constructed, the reservoir could be available to LEC Planning Area utilities as a water supply option.

L-8 Site in Palm Beach County

- Utilities should continue use of ASR and other storage options to capture wet weather flows when available and use at a later time. ASR extends water supplies for use during peak demand periods.

Hillsboro ASR Pilot Project

- SFWMD and USACE should continue studies to address local and regional implementation of ASR associated with CERP and related issues, such as arsenic mobilization.

Seawater

The ocean is an essentially unlimited source of water. The desalination process is required before use of seawater for water supply purposes. Where appropriate, utilities should consider the feasibility of desalinated seawater from the Atlantic Ocean as an additional water source option for the LEC Planning Area.

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Water Conservation

The decline in per capita water consumption rate shows in part the importance of conservation programs since the last plan update. The implementation of robust water conservation programs throughout the LEC Planning Area offers the potential to reduce future water demand. All water suppliers are urged to implement water conservation measures to reduce water supply demands and defer the construction of capital-intensive projects. Recommendations for water conservation include the following:

- SFWMD should continue to implement the 2008 Comprehensive Water Conservation Program and support programs, such as the Water Savings Incentive Program (WaterSIP), Water Conservation Hotel and Motel Program (Water CHAMP), and Florida Water Star.
- PWS utilities are encouraged to develop goal-based conservation plans to implement water conservation measures with numerical goals for achievable water savings.
- Local governments should develop or enhance existing ordinances to be consistent with Florida-Friendly Landscaping™ provisions (Section 373.185, F.S.).
- Water users should implement advanced irrigation technology, improved landscape design and management practices, and participate in recognition programs to further increase landscape water use efficiency.
- Water conservation public education programs help instill a year-round conservation ethic. Local governments and utilities are encouraged to continue providing water conservation-related educational programs in cooperation with SFWMD.
- Local governments are encouraged to implement two-day-per-week landscape irrigation ordinances, as successfully adopted in Broward and Miami-Dade counties.
- Local municipalities are encouraged to partner with adjoining municipalities to leverage resources in public outreach and education, such as the Broward Water Partnership.
- Installation of higher efficiency irrigation systems by agricultural water users is encouraged where applicable and appropriate for specific crop types.

High efficiency toilet

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- Industrial, commercial, and institutional entities are encouraged to utilize the *Draft Water Efficiency and Self-Conducted Water Audits at Commercial and Institutional Facilities, A Guide for Facility Managers* (SFWMD 2013b) to improve water use efficiency and reduce operating costs.

ENVIRONMENTAL RESTORATION

Comprehensive Everglades Restoration Plan

Water resources, including natural systems, their needs, and regulatory criteria, are discussed in **Chapter 3** and **Appendix B** and are a limitation on water available for allocation. These water supply needs are addressed by water resource development projects such as CERP as detailed in **Chapter 4**. CERP is an ongoing joint effort between USACE and SFWMD that was approved in the Water Resources Development Act of 2000. This plan includes region-specific projects to improve the quality, timing, volume, distribution, and delivery of water to the natural system. CERP and related projects will provide improved water quality, timing, and distribution of flows for the enhancement of the Everglades ecosystem and benefit other water related needs.

Restoration Strategies Regional Water Quality Plan

STA 1 West, Cell 3

In 2012, the State of Florida and the United States Environmental Protection Agency reached consensus on a new strategy for improving water quality in the Everglades. This strategy will expand water quality improvement projects to achieve the ultra-low phosphorus water quality standard established for the Everglades. SFWMD is implementing a technical plan to complete six projects that will create more than 6,500 acres of new stormwater treatment areas and 110,000 acre-feet of additional water storage. A robust science plan will ensure continued research and monitoring to improve and optimize the performance of water quality treatment technologies. Design and construction of the projects will be completed in three phases over a twelve-year time frame, with completion set for 2025.

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FUTURE ANALYSIS

A wide range of activities outside of the LEC Planning Area water supply planning process can affect future water supply within the planning area. These include the finalization of the configuration of Central Everglades Planning Project components; changes by USACE to regulation schedules for the Everglades, Lake Okeechobee, and other water bodies of the Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project); and local or subregional water supply or stormwater projects. In addition, new or modified analytical tools, such as the East Coast Floridan Aquifer Groundwater Model, are expected to become available for regional-scale water resource planning. SFWMD, in coordination with stakeholders, should determine whether available tools could be applied to better understand specific water supply issues in the LEC Planning Area.

COORDINATION

Coordination and collaboration throughout the water supply planning process is essential among regional and local governments and utilities. Coordination guidance includes the following:

- Local entities are encouraged to work together to develop consistent PWS demand projection methodologies.
- An emerging trend within the past five years has been the development of multi-jurisdictional partnerships to implement a program or project to benefit a greater number of people than one entity might benefit by itself. Examples of these partnerships include the Broward Water Conservation Partnership and the C-51 Reservoir Project utility participants.
- Water supply facilities work plans are due within 18 months of the adoption of this plan update. Local governments and utilities must provide linkage to and coordination with this plan update and the local government water supply-related components of comprehensive plans.
- Agricultural stakeholders and agencies need to work together to develop methodologies and data sources for future crop projections.
- In 2013, Chapter 373.709, F.S. was amended to provide that for future water supply plans, the Florida Department of Agriculture and Consumer Services provide data indicative of future AGR Self-Supply water demands. Any adjustments of or deviation from the data provided by Florida Department of Agriculture and Consumer Services must be described and presented with the original data.

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CLIMATE CHANGE

Long-term data show increasing worldwide temperatures and a corresponding sea level rise. For planning purposes, SFWMD is estimating a sea level rise of 5 to 20 inches in South Florida by 2060 (SFWMD 2009b). The anticipated rise in sea level may change the hydrodynamics of the coastal estuaries, change the location and shape of the freshwater-seawater interface, and increase the intrusion of salt water into coastal aquifers. Analysis is needed to identify the potential impact of sea level rise on utility wellfields and other users at risk of saltwater intrusion within SFWMD. In addition, comprehensive monitoring is needed to accurately characterize and measure aquifer conditions and saltwater movement.

The following direction and guidance is provided for climate change and sea level rise:

- Saltwater intrusion monitoring networks should be periodically reviewed for adequacy by utilities, counties, USGS, and SFWMD. Recommendations may be needed for additional or revised monitoring regimes.
- SFWMD, USACE, and potentially affected utilities and municipalities should evaluate the consequences of sea level rise, changing rainfall and storm patterns, temperature effects, and cumulative impacts to existing structures and existing legal users.
- SFWMD should update climate data used in the models more frequently than every five years, which is the norm.
- Local governments and water providers are encouraged to participate in the Southeast Florida Regional Climate Change Compact to support regional planning efforts and initiatives to adapt to rising sea level in the LEC Planning Area. More information can be found at southeastfloridaclimatecompact.org/.

Southeast Florida Regional Climate Change logo

- Analyze the sea level rise and saltwater intrusion data to identify the utility wellfields and other users at potential risk of saltwater intrusion within the LEC Planning Area. If problematic areas are identified, SFWMD should work collaboratively with county and utility staff in these areas to identify existing numerical models and modify/update them as necessary. These can be used to develop a plan to meet future water needs.

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CONCLUSION

This update concludes that the future water demands of the LEC Planning Area can continue to be met through the 2030 planning horizon with appropriate management, conservation, and implementation of projects identified in this plan. Future challenges in water resource development and natural resource protection require concerted efforts to monitor, characterize current hydrologic conditions, and project future conditions. Successful implementation of this plan update requires close coordination with other regional and local governments, utilities, and water users. Collaboration among stakeholders is also essential for directing implementation of the preceding guidance. Public and private partnering can ensure that water resources in the LEC Planning Area are prudently managed and available to meet future demands.

Miami Skyline from Biscayne Bay

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Glossary

1-in-10 year drought A drought of such intensity that it is expected to have a return frequency of once in 10 years. A drought in which below normal rainfall occurs and has a 90 percent probability of being exceeded over a twelve-month period. A drought event that results in an increase in water demand to a magnitude that would have a 10 percent probability of being exceeded during any given year.

Acre-foot, acre-feet (ac-ft) The volume of water that covers 1 acre to a depth of 1 foot. The equivalent of 43,560 cubic feet, 1,233.5 cubic meters, or 325,872 gallons, which is approximately the amount of water it takes to serve two typical families for one year.

Agricultural best management practice (BMP) A practice or combination of agricultural practices, based on research, field testing, and expert review, determined to be the most effective and practicable means of improving water quality or quantity while maintaining or even enhancing agricultural production.

Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) A simple water budget model for estimating irrigation demands that estimates demand based on basin-specific data. The AFSIRS model calculates both net and gross irrigation requirements for average and 1-in-10 year drought irrigation requirements. A crop's net irrigation requirement is the amount of water delivered to the root zone of the crop, while the gross irrigation requirement includes both the net irrigation requirement and the losses incurred in the process of delivering irrigation to the crop's root zone.

Agricultural (AGR) Self-Supply The water used to irrigate crops, water livestock, and for aquaculture (e.g., fish production) that is not supplied by a Public Water Supply utility.

Alternative water supply "Salt water; brackish surface water and groundwater; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity for surface water or groundwater, water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses; the downstream augmentation of water bodies with reclaimed water; storm water; and, any other water supply source that is designated as nontraditional for a water supply planning region in the applicable regional water supply plan" (Section 373.019, Florida Statutes).

Aquatic preserve Water body set aside by the state to be maintained in essentially natural or existing condition for protection of fish and wildlife and public recreation so the aesthetic, biological, and scientific values may endure for the enjoyment of future generations.

Aquifer A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

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Aquifer storage and recovery (ASR) The underground storage of storm water, surface water, fresh groundwater or reclaimed water, which is appropriately treated to potable standards and injected into an aquifer through wells during wet periods. The aquifer (typically the Floridan aquifer system in South Florida) acts as an underground reservoir for the injected water, reducing water loss to evaporation. The water is stored with the intent to recover it for use during future dry periods.

Aquifer system A heterogeneous body of (interbedded or intercalated) permeable and less permeable material that functions regionally as a water yielding hydraulic unit and may be composed of more than one aquifer separated at least locally by confining units that impede groundwater movement, but do not greatly affect the hydraulic continuity of the system.

Artesian A commonly used expression, generally synonymous with "confined," referring to subsurface (ground) bodies of water, which, due to underground drainage from higher elevations and confining layers of soil material above and below the water body (referred to as an Artesian aquifer), result in groundwater at pressures greater than atmospheric pressures.

Available supply The maximum amount of reliable water supply including surface water, groundwater, and purchases under secure contracts.

Base flow Sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced stream flows. Natural base flow is sustained largely by groundwater discharges.

Baseline condition A specified period of time during which collected data are used for comparison with subsequent data.

Basin (groundwater) A hydrologic unit containing one large aquifer or several connecting and interconnecting aquifers.

Basin (surface water) A tract of land drained by a surface water body or its tributaries.

Basis of Review *Basis of Review for Water Use Permit Applications within the South Florida Water Management District* (SFWMD 2012b). Read in conjunction with Chapters 40E-2 and 40E-20, Florida Administrative Code, the Basis of Review further specifies the general procedures and information used by SFWMD staff for review of water use permit applications with the primary goal of meeting SFWMD water resource objectives.

Below land surface Depth below land surface regardless of land surface elevation.

Benthos/benthic Macroscopic organisms that live on or in the bottom substrate, such as clams and worms (contrast to plankton and nekton).

Biota The plant and animal life of a region or ecosystem, as in a stream or other body of water.

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Biscayne aquifer A portion of the surficial aquifer system, which provides most of the fresh water for Public Water Supply and agriculture within Miami-Dade, Broward, and southeastern Palm Beach counties. It is highly susceptible to contamination due to its high permeability and proximity to the land surface in many locations.

Boulder Zone A highly transmissive, cavernous zone of limestone within the Lower Floridan aquifer used to dispose of secondary-treated effluent from wastewater treatment plants and concentrate from membrane water treatment plants via deep injection wells.

Brackish water Water with a chloride level greater than 250 milligrams per liter (mg/L) and less than 19,000 mg/L (Basis of Review, SFWMD 2012b).

Capacity Capacity represents the ability to treat, move, or reuse water. Typically, capacity is expressed in millions of gallons per day (MGD).

Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project) A complete system of canals, storage areas, and water control structures spanning the area from Lake Okeechobee to the east and west coasts and from Orlando south to the Everglades. It was designed and constructed during the 1950s by the United States Army Corps of Engineers to provide flood control and improve navigation and recreation.

Central Everglades Planning Project (CEPP) CEPP is a planning process for key restoration projects in the Everglades. Now under way, CEPP combines a series of Comprehensive Everglades Restoration Plan (CERP) components into one project implementation report. Through this effort, projects will be identified and planned on land already in public ownership to allow more water to be directed south to the central Everglades, Everglades National Park, and Florida Bay while protecting coastal estuaries.

Comprehensive Everglades Restoration Plan (CERP) The federal-state partnership framework and guide for the restoration, protection, and preservation of the South Florida ecosystem. CERP also provides for water-related needs of the region, such as water supply and flood protection.

Confined aquifer (1) Water-bearing stratum of permeable rock, sand, or gravel overlaid by a thick, impermeable stratum. An aquifer that contains groundwater that is confined under pressure and bounded between significantly less permeable materials such that water will rise in a fully penetrating well above the top of the aquifer. In cases where the hydraulic head is greater than the elevation of the overlying land surface, a fully penetrating well will naturally flow at the land surface without means of pumping or lifting. (2) Also known as artesian or pressure aquifer, the confined aquifer exists where the groundwater system is between layers of clay, dense rock, or other materials with very low permeability. Water is under more pressure in a confined aquifer than in an unconfined aquifer. Thus, when tapped by a well, water is forced up, sometimes above the soil surface. This is how a flowing artesian well is formed.

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Confining unit A body of significantly less permeable material than the aquifer, or aquifers, that it stratigraphically separates. The hydraulic conductivity may range from nearly zero to some value significantly lower than that of the adjoining aquifers, and impedes the vertical movement of water.

Consumptive use Any use of water that reduces the supply from which it is withdrawn or diverted.

Control structure An artificial structure designed to regulate the level/flow of water in a canal or other water body (e.g., weirs, dams).

Cubic feet per second (cfs) A rate of flow (e.g., in streams and rivers) equal to a volume of water 1 foot high and 1 foot wide flowing a distance of 1 foot in 1 second. One cfs is equal to 7.48 gallons of water flowing each second. For example, if a car's gas tank was 2 feet by 1 foot by 1 foot (2 cubic feet), then gas flowing at a rate of 1 cfs would fill the tank in two seconds.

DBHYDRO The South Florida Water Management District's corporate environmental database, storing hydrological, meteorological, hydrogeological, and water quality data.

Demand The quantity of water needed to fulfill a requirement.

Demand management Also known as water conservation, demand management involves reducing the demand for water through activities that alter water use practices, improve efficiency in water use, reduce losses of water, reduce waste of water, alter land management practices, and/or alter land uses.

Desalination A process that treats saltwater water to remove or reduce chlorides and dissolved solids, resulting in the production of fresh water.

Discharge The rate of water movement past a reference point, measured as volume per unit of time (usually expressed as cubic feet per second or meters per second).

Disinfection The process of inactivating microorganisms that cause disease. All potable water requires disinfection as part of the treatment process prior to distribution. Disinfection methods include chlorination, ultraviolet radiation, and ozonation.

Disposal Effluent disposal involves the wasteful practice of releasing treated effluent back to the environment using ocean outfalls, surface water discharges, or deep injection wells.

Dissolved oxygen The concentration of oxygen dissolved in water, sometimes expressed as percent saturation, where saturation is the maximum amount of oxygen that theoretically can be dissolved in water at a given altitude and temperature.

Domestic Self-Supply (DSS) The water used by households whose primary source of water is water treatment facilities and/or private wells with pumpages of less than 100,000 gallons per day.

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Drainage basin Land area where precipitation runs off into streams, rivers, lakes, and reservoirs. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. The drainage basin is a part of the earth's surface that is occupied by a drainage system, which consists of a surface stream with all its tributaries and impounded bodies of water. It is also known as a watershed, a catchment area, or a drainage area.

Drawdown (1) The vertical distance between the static water level and the surface of the cone of depression. (2) A lowering of the groundwater surface caused by pumping.

Drought A long period of abnormally low rainfall, especially one that adversely affects growing or living conditions.

Ecology The study of the inter-relationships of plants and animals to one another and to their physical and biological environment.

Ecosystem Biological communities together with their environment, functioning as a unit.

Ecosystem restoration The process of reestablishing to as near its natural condition as possible, the structure, function, and composition of an ecosystem.

Effective rainfall The portion of rainfall that infiltrates the soil and is stored for plant use in the crop root zone.

Effluent Treated water that is not reused after flowing out of any plant or other works used for treating, stabilizing, or holding wastes. Effluent is "disposed" of.

Electrodialysis Dialysis that is conducted with the aid of an electromotive force applied to electrodes adjacent to both sides of the membrane.

Elevation The height in feet above mean sea level according to the National Geodetic Vertical Datum of 1929. May also be expressed in feet above mean sea level as reference datum.

Environmental impact statement Required under United States environmental law by the National Environmental Policy Act for federal government agency actions "significantly affecting the quality of the human environment." It evaluates the positive and negative environmental effects of a proposed agency action.

Estuary The part of the wide lower course of a river where the current is met by ocean tides or an arm of the sea at the lower end of a river where fresh water and salt water meet.

Evapotranspiration (ET) The total loss of water to the atmosphere by evaporation from land and water surfaces and by transpiration from plants.

Exceedance The violation of the pollutant levels permitted by environmental protection standards.

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Existing legal use of water A water use authorized under a SFWMD water use permit or existing and exempt from permit requirements.

Fallow Land left unseeded during a growing season. The act of plowing land and leaving it unseeded. The condition or period of being unseeded.

Finished water Water that completed a purification or treatment process; water that passed through all the processes in a water treatment plant and is ready to be delivered to consumers.

Finished water demand (see *Net water demand*)

Fiscal Year (FY) SFWMD's fiscal year begins on October 1 and ends on September 30 the following year.

Florida Administrative Code (F.A.C.) The Florida Administrative Code is the official compilation of the administrative rules and regulations of state agencies.

Florida-Friendly Landscaping™ Quality landscapes that conserve water, protect the environment, are adaptable to local conditions, and are drought tolerant. The principles of such landscaping include planting the right plant in the right place, efficient watering, appropriate fertilization, mulching, attraction of wildlife, responsible management of yard pests, recycling yard waste, reduction of stormwater runoff, and waterfront protection. Additional components include practices such as landscape planning and design, soil analysis, the appropriate use of solid waste compost, minimizing the use of irrigation, and proper maintenance.

Florida Statutes (F.S.) The Florida Statutes are a permanent collection of state laws organized by subject area into a code made up of titles, chapters, parts, and sections. The Florida Statutes are updated annually by laws that create, amend, or repeal statutory material.

Floridan aquifer system (FAS) A highly used aquifer system composed of the upper Floridan and lower Floridan aquifers. It is the principal source of water supply north of Lake Okeechobee. The upper Floridan aquifer is used for drinking water supply in parts of Martin and St. Lucie counties. From Jupiter to southern Miami, water from the FAS is mineralized (total dissolved solids are greater than 1,000 milligrams per liter) along coastal areas.

Flow The actual amount of water flowing by a particular point over some specified time. In the context of water supply, flow represents the amount of water being treated, moved, or reused. Flow is frequently expressed in millions of gallons per day.

Flow equalization basin (FEB) A constructed storage feature used to capture and store peak stormwater flows. They provide a more steady flow of water to stormwater treatment areas, helping to maintain desired water levels needed to achieve optimal water quality treatment performance.

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Fresh water An aqueous solution with a chloride concentration less than or equal to 250 milligrams per liter (Basis of Review, SFWMD 2012b).

Geophysical log A record of the structure and composition of the earth with depth encountered when drilling a well or similar type of test or boring hole.

Gross irrigation demand or **gross irrigation requirement** (AFSIRS model) The amount of water that must be withdrawn from the source in order to be delivered to the plant's root zone. Gross irrigation demand includes both the net irrigation requirement and the losses incurred irrigating the plant's root zone.

Gross water demand (or raw water demand) is the amount of water withdrawn from the water resource to meet a particular need of a water user or customer. Gross demand is the amount of water allocated in a water use permit. Gross or raw water demands are nearly always higher than net or user/customer water demands.

Groundwater Water beneath the surface of the ground, whether or not flowing through known and definite channels. Specifically, that part of the subsurface water in the saturated zone, where the water is under pressure greater than the atmosphere.

Harm As defined in Chapter 40E-8, Florida Administrative Code, the temporary loss of water resource functions that result from a change in surface or groundwater hydrology and takes a period of one to two years of average rainfall conditions to recover.

Headwaters (1) Water that is typically of higher elevation (with respect to tailwater) or on the controlled side of a structure. (2) The waters at the highest upstream point of a natural system that are considered the major source waters of the system.

Hydrogeology The geology of groundwater, with particular emphasis on the chemistry and movement of water.

Hydrologic condition The state of an area pertaining to the amount and form of water present.

Hydrology The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

Hypersaline Salinity conditions that are above what is typical of open marine conditions. Salinity conditions in excess of typical marine conditions.

Impoundment Any lake, reservoir, or other containment of surface water occupying a depression or bed in the earth's surface and having a discernible shoreline.

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Industrial/Commercial/Institutional (ICI) Self-Supply Water used by industrial, commercial, or institutional operations withdrawing a water quantity of 100,000 gallons per day or greater from individual, on-site wells.

Infiltration The movement of water through the soil surface into the soil under the forces of gravity and capillarity.

Inflow (1) The act or process of flowing in or into. (2) The measured quantity of water that moved into a specific location.

Injection well Refers to a well constructed to inject treated wastewater directly into the ground. Wastewater is generally forced (pumped) into the well for dispersal or storage in a designated aquifer. Injection wells are generally drilled below freshwater levels, or into unused aquifers or aquifers that do not deliver drinking water.

Intermediate aquifer system This aquifer system consists of five zones of alternating confining and producing units. The producing zones include the Sandstone and Mid-Hawthorn aquifers.

Irrigation efficiency (AFSIRS model) (1) A measure of the effectiveness of an irrigation system in delivering water to a plant for irrigation and freeze protection purposes. It is expressed as the ratio of the volume of water used for supplemental plant evapotranspiration to the volume pumped or delivered for use. (2) The average percent of total water pumped for use that is delivered to the root zone of a plant. (3) As a modeled factor, irrigation efficiency refers to the average percent of total delivered water applied to the plant's root zone.

Irrigation water use Uses of water for supplemental irrigation purposes, including agricultural lands, as well as golf courses, nurseries, recreational areas, and landscapes.

Landscape irrigation The outside watering of shrubbery, trees, lawns, grass, ground covers, vines, gardens, and other such flora, not intended for resale, which are planted and are situated in such diverse locations as residential and recreational areas, cemeteries, public, commercial and industrial establishments, and public medians and rights-of-way.

Leak detection Systematic method to survey the distribution system and pinpoint the exact locations of hidden underground leaks.

Level of certainty A water supply planning goal to assure at least a 90 percent probability during any given year that all the needs of reasonable-beneficial water uses will be met, while sustaining water resources and related natural systems during a 1-in-10 year drought event.

Marsh A frequently or continually inundated unforested wetland characterized by emergent herbaceous vegetation adapted to saturated soil conditions.

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Maximum developable limit Maximum developable limit water use permitting criteria provide reasonable assurances that the proposed water use does not cause harmful drawdowns to semi-confined freshwater aquifers in the Lower West Coast Planning Area. The potentiometric head within the Lower Tamiami aquifer, Sandstone aquifer, and Mid-Hawthorn aquifer shall not be allowed to drop to less than 20 feet above the top of the uppermost geologic strata that comprises the aquifer at any point during a 1-in-10 year drought condition.

Micro irrigation The application of small quantities of water on or below the soil surface as drops or tiny streams of spray through emitters or applicators placed along a water delivery line. Micro irrigation includes a number of methods or concepts, such as bubbler, drip, trickle, mist or micro spray, and subsurface irrigation.

Million gallons per day (MGD) A rate of flow of water equal to 133,680.56 cubic feet per day, or 1.5472 cubic feet per second, or 3.0689 acre-feet per day. A flow of one million gallons per day for one year equals 1,120 acre-feet (365 million gallons). To hold one million gallons of water, a swimming pool approximately 267 feet long (almost as long as a football field), 50 feet wide, and 10 feet deep would be needed.

Minimum flows and levels (MFL) The point at which further withdrawals would cause significant harm to the water resources or natural systems. An MFL is established by water management districts pursuant to Sections 373.042 and 373.0421, Florida Statues, for a given water body and set forth in Parts II and III of Chapter 373.

Mobile irrigation laboratory A vehicle furnished with irrigation evaluation equipment that is used to carry out on-site evaluations of irrigation systems and to provide recommendations on improving irrigation efficiency.

Model A computer model is a representation of a system and its operations, and provides a cost-effective way to evaluate future system changes, summarize data, and help understand interactions in complex systems. Hydrologic models are used for evaluating, planning, and simulating the implementation of operations within SFWMD's water management system under different climatic and hydrologic conditions. Water quality and ecological models are also used to evaluate other processes vital to the health of ecosystems.

MODFLOW A modular, three-dimensional, finite-difference groundwater modeling code created by the United States Geological Survey, which is used to simulate the flow of groundwater through aquifers. SFWMD uses it for subregional groundwater modeling.

Monitor well Any human-made excavation by any method to monitor fluctuations in groundwater levels, quality of underground waters, or the concentration of contaminants in underground waters.

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National Geodetic Vertical Datum of 1929 (NGVD) A geodetic datum derived from a network of information collected in the United States and Canada. It was formerly called the "Sea Level Datum of 1929" or "mean sea level." Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific coasts, it does not necessarily represent local mean sea level at any particular place.

Natural system A self-sustaining living system that supports an interdependent network of aquatic, wetland-dependent, and upland living resources.

Net irrigation demand or **net irrigation requirement** (AFSIRS Model) The amount of water the plant needs in addition to anticipated rainfall. This is an estimate of the amount of water (expressed in inches per year) that should be delivered to the plant's root zone.

Net water demand (or user/customer water demand) is the water demand of the end user after accounting for treatment and process losses, and inefficiencies. When discussing Public Water Supply, the term "finished water demand" is commonly used to denote net demand.

Nutrient loading Discharging of nutrients from the watershed (basin) into a receiving water body, such as a lake, stream, or wetland. Expressed usually as mass per unit area per unit time kilograms per hectare per year or pounds per acre per year.

Outflow (1) The act or process of flowing out of. (2) The measured quantity of water that left an area or water body during a certain period of time.

Outlet An opening through which water can be freely discharged from a reservoir.

Overland flow The flow of rainfall or snowmelt over the land surface toward stream channels. After overland flow enters a watercourse it becomes runoff.

Per capita use (1) The average amount of water used per person during a standard time period, generally per day. (2) Total use divided by the total population served.

Performance measure A scientifically measurable indicator or condition that can be used as a target for meeting water resource management goals. Performance measures quantify how well or how poorly an alternative meets a specific objective. Good performance measures are quantifiable, have a specific target, indicate when a target has been reached, and measure the degree to which the goal has been met.

Permeability The capacity of a porous rock, sediment, or soil for transmitting a fluid.

Planning Area The South Florida Water Management District is divided into four areas within which planning activities are focused: Kissimmee Basin, Upper East Coast, Lower West Coast, and Lower East Coast.

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Potable water Water that is safe for human consumption.

Potentiometric surface A surface that represents the hydraulic head in an aquifer and is defined by the level to which water will rise above a datum plane in wells that penetrate the aquifer.

Power Generation (PWR) Self-Supply The difference in the amount of water withdrawn by electric power generating facilities for cooling purposes and the water returned to the hydrologic system near the point of withdrawal.

Process water Water used for nonpotable industrial usage, e.g., mixing cement.

Public Water Supply (PWS) Water supplied by water treatment facilities for potable use (drinking quality) with projected average pumpages greater than 0.1 million gallons per day.

Public Water Supply (PWS) demand All potable (drinking quality) water supplied by water treatment facilities with projected average pumpages of 0.1 million gallons per day or greater to all types of customers, not just residential.

Rapid infiltration basin A wastewater treatment method by which wastewater is applied in deep and permeable deposits of highly porous soils for percolation through deep and highly porous soil.

Ratoon A shoot sprouting from a plant base, as in banana, pineapple, or sugarcane.

Raw water (1) Water that is direct from the source—groundwater or surface water—without any treatment. (2) Untreated water, usually that entering the first unit of a water treatment plant.

Raw water demand (see *Gross water demand*)

Reasonable-beneficial use Use of water in such quantity as is needed for economic and efficient use for a purpose, which is both reasonable and consistent with the public interest.

Recharge (groundwater) The natural or intentional infiltration of surface water into the ground to raise groundwater levels.

Recharge (hydrologic) The downward movement of water through soil to groundwater; the process by which water is added to the zone of saturation; or the introduction of surface water or groundwater to groundwater storage, such as an aquifer. Recharge or replenishment of groundwater supplies consists of three types: 1) natural recharge, which consists of precipitation or other natural surface flows making their way into groundwater supplies; 2) artificial or induced recharge, which includes actions specifically designed to increase supplies in groundwater reservoirs through various methods, such as water spreading (flooding), ditches, and pumping techniques; 3) incidental recharge, which consists of actions, such as irrigation and water diversion, which add to groundwater supplies, but are intended for other purposes. Recharge may also refer to the amount of water so added.

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Reclaimed water Water that received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility (Rule 62-610.200, Florida Administrative Code)

Recreational/Landscape (REC) Self-Supply Water used for landscape and golf course irrigation. The landscape subcategory includes water used for parks, cemeteries, and other irrigation applications of 0.1 million gallons per day or greater. The golf course subcategory includes those operations not supplied by a Public Water Supply or regional reuse facility.

Regional Simulation Model A regional hydrologic model developed principally for application in South Florida. It is developed on a sound conceptual and mathematical framework that allows it to be applied generically to a wide range of hydrologic situations. It simulates the coupled movement and distribution of groundwater and surface water throughout the model domain using a hydrologic simulation engine to simulate the natural hydrology and a management simulation engine to provide a wide range of operational capability.

Water supply plan Detailed water supply plan developed by the South Florida Water Management District under Section 373.709, Florida Statues, providing an evaluation of available water supply and projected demands at the regional scale. The planning process projects future demand for 20 years and recommends projects to meet identified needs.

Restricted allocation areas Areas designated within the South Florida Water Management District boundaries for which allocation restrictions are applied with regard to the use of specific sources of water. The water resources in these areas are managed in response to specific sources of water in the area for which there is a lack of water availability to meet the projected needs of the region from that specific source of water (Basis of Review, SFWMD 2012b).

Retention The prevention of stormwater runoff from direct discharge into receiving waters; included as examples are systems that discharge through percolation, exfiltration, filtered bleed-down, and evaporation processes.

Retrofit (1) Indoor: the replacement of existing water fixtures, appliances, and devices with more efficient fixtures, appliances, and devices for the purpose of water conservation. (2) Outdoor: **t**he replacement or changing out of an existing irrigation system with a different irrigation system, such as a conversion from an overhead sprinkler system to a micro irrigation system (Basis of Review, SFWMD 2012b).

Reuse The deliberate application of reclaimed water for a beneficial purpose. Criteria used to classify projects as "reuse" or "effluent disposal" are contained in Rule 62-610.810, Florida Administrative Code. The term "reuse" is synonymous with "water reuse."

Reverse osmosis (RO) A membrane process for desalting water using applied pressure to drive the feed water (source water) through a semipermeable membrane.

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Runoff That component of rainfall, which is not absorbed by soil, intercepted and stored by surface water bodies, evaporated to the atmosphere, transpired and stored by plants, or infiltrated to groundwater, but which flows to a watercourse as surface water flow.

Saline water (1) An aqueous solution with a chloride concentration greater than 250 mg/L and less than that of seawater (Basis of Review). (2) Water containing significant amounts or concentrations of dissolved salts or total dissolved solids. The concentration is the amount (by weight) of salt in water, expressed in parts per million or milligrams per liter (mg/L) (~1 mg/L total dissolved solids = 0.5 mg/L of chlorides). The terms fresh, brackish, saline, and brine are used to describe the quality of the water. Any water that contains more than 500 mg/L of total dissolved solids is considered saline water. This may be brackish water (500 to 15,000 mg/L of total dissolved solids), seawater (15,000 to 40,000 mg/L of total dissolved solids), or brine (more than 40,000 mg/L of total dissolved solids). It is common in the literature to define coastal water that is very brackish simply as saline water.

Salinity Of or relating to chemical salts usually measured in parts per thousand, milligrams per liter, or practical salinity units.

Salt water (see *Seawater or salt water*)

Saltwater interface The hypothetical surface of chloride concentration between fresh water and seawater where the chloride concentration is 250 milligrams per liter at each point on the surface.

Saltwater intrusion The invasion of a body of fresh water by a body of salt water due to its greater density. It can occur either in surface water or groundwater bodies. The term is applied to the flooding of freshwater marshes by seawater, the upward migration of seawater into rivers and navigation channels, and the movement of seawater into freshwater aquifers along coastal regions.

SEAWAT A program developed to simulate three-dimensional, variable-density, transient groundwater flow in porous media. The source code for SEAWAT was developed by combining MODFLOW and MT3DMS into a single program that solves the coupled flow and solute-transport equations.

Seawater or **salt water** Water with a chloride concentration at or above 19,000 milligrams per liter (Basis of Review, SFWMD 2012b).

Sedimentation The action or process of forming or depositing sediment.

Seepage irrigation Irrigation that conveys water through open ditches. Water is either applied to the soil surface (possibly in furrows) and held for a period of time to allow infiltration, or is applied to the soil subsurface by raising the water table to wet the root zone.

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Seepage irrigation system A means to artificially supply water for plant growth that relies primarily on gravity to move the water over and through the soil, and does not rely on emitters, sprinklers, or any other type of device to deliver water to the vicinity of expected plant use.

Self-supplied The water used to satisfy a water need, not supplied by a Public Water Supply utility.

Semi-confined aquifer A completely saturated aquifer that is bounded above by a semi-pervious layer, which has a low, though measurable permeability, and below by a layer that is either impervious or semi-pervious.

Serious harm As defined in Chapter 40E-8, Florida Administrative Code, the long-term, irreversible, or permanent loss of water resource functions resulting from a change in surface water or groundwater hydrology.

Service area The geographical region in which a water supplier has the ability and the legal right to distribute water for use.

Significant harm As defined in Chapter 40E-8, Florida Administrative Code, the temporary loss of water resource functions that result from a change in surface water or groundwater hydrology and takes more than two years to recover, but which is considered less severe than serious harm.

Storm water Water that does not infiltrate, but accumulates on land as a result of storm runoff, snowmelt runoff, irrigation runoff, or drainage from areas, such as roads and roofs.

Stormwater discharge Precipitation and snowmelt runoff from roadways, parking lots, and roof drains. A major source of nonpoint source pollution to water bodies and a challenge to sewage treatment plants in municipalities where the storm water is combined with the flow of domestic wastewater (sewage) before entering the wastewater treatment plant.

Stormwater treatment area (STA) A system of constructed water quality treatment wetlands that use natural biological processes to reduce levels of nutrients and pollutants from surface water runoff.

Submersed aquatic vegetation Aquatic plants that exist completely below the water surface.

Substrate The physical surface upon which an organism lives. The natural or artificial surface upon which an organism grows or to which it is attached.

Surface water Water above the soil or substrate surface, whether contained in bounds, created naturally or artificially, or diffused. Water from natural springs is classified as surface water when it exits from the spring onto the earth's surface.

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Surficial aquifer system (SAS) Often the principal source of water for urban uses within certain areas of South Florida. This aquifer is unconfined, consisting of varying amounts of limestone and sediments that extend from the land surface to the top of an intermediate confining unit.

Tailwater Water that is typically of lower elevation or on the discharge side of the structure.

Time series A statistical process analogous to the taking of data at intervals of time.

Treatment facility Any facility or other works used for the purpose of treating, stabilizing, or holding water or wastewater.

Turbidity The measure of water clarity caused by suspended material in a liquid.

Unconfined aquifer (1) A permeable geologic unit or units only partly filled with water and overlying a relatively impervious layer. Its upper boundary is formed by a free water table or phreatic surface under atmospheric pressure. Also referred to as water table aquifer. (2) An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

Upconing Process by which saline water underlying fresh water in an aquifer rises upward into the freshwater zone as a result of pumping water from the freshwater zone.

Uplands Nonwetlands**.** An area with a hydrologic regime that is not sufficiently wet to support vegetation typically adapted to life in saturated soil conditions. Upland soils are nonhydric soils.

Utility Any legal entity responsible for supplying potable water for a defined service area.

Wastewater The combination of liquid and water carried pollutants from residences, commercial buildings, industrial plants, and institutions together with any groundwater, surface runoff, or leachate that may be present.

Water budget An accounting of total water use or projected water use for a given location or activity.

Water conservation The permanent, long-term reduction of daily water use. Permanent water use reduction requires the implementation of water saving technologies and measures that reduce water use while satisfying consumer needs. Water conservation is considered a water source option because it reduces the need for future expansion of the water supply infrastructure (see *Demand management*).

Water Conservation Areas (WCAs) Part of the original Everglades ecosystem that is now diked and hydrologically controlled for flood control and water supply purposes. These are located in the western portions of Miami-Dade, Broward, and Palm Beach counties, and preserve over 1,350 square miles, or about 50 percent of the original Everglades.

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Water conservation rate structure A water rate structure designed to conserve water. Examples of conservation rate structures include, but are not limited to, increasing block rates, seasonal rates, and quantity-based surcharges.

Water quality (1) A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose. (2) The physical, chemical, and biological condition of water as applied to a specific use. Federal and state guidelines set water quality standards based on the water's intended use, whether it is for recreation, fishing, drinking, navigation, shellfish harvesting, or agriculture.

Water reservation A legal mechanism to set aside water for the protection of fish and wildlife or the public health and safety from consumptive water use. The reservation is composed of a quantification of the water to be protected, which includes a seasonal and a location component.

Water Resources Advisory Commission A commission of the South Florida Water Management District that serves as an advisory body to the Governing Board. The WRAC is the primary forum for conducting workshops, presenting information, and receiving public input on water resource issues affecting Central and South Florida.

Water resource development The formulation and implementation of regional water resource management strategies, including collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage the water resources; development of regional water resource implementation programs; construction, operation and maintenance of major public works facilities to provide for flood control, surface and groundwater storage, and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities (Section 373.019, Florida Statutes).

Watershed A region or area bounded peripherally by a water parting and draining ultimately to a particular watercourse or body of water. Watersheds conform to federal hydrologic unit code standards and can be divided into subwatersheds and further divided into catchments, the smallest water management unit recognized by South Florida Water Management District operations. Unlike drainage basins, which are defined by rule, watersheds are continuously evolving as the drainage network evolves.

Water Shortage Plan This effort includes provisions in Chapters 40E-21 and 40E-22, Florida Administrative Code, and identifies how water supplies are allocated to users during declared water shortages. The plan allows for supply allotments and cutbacks to be identified on a weekly basis based on the water level within Lake Okeechobee, demands, time of year, and rainfall forecasts.

Water supply development The planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use. (Section 373.019, Florida Statues)

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Water table The surface of a body of unconfined groundwater at which the pressure is equal to that of the atmosphere; defined by the level where water within an unconfined aquifer stands in a well.

Water use Any use of water that reduces the supply from which it is withdrawn or diverted.

Water use permitting The issuance of permits by the South Florida Water Management District, under the authority of Chapter 40E-2, Florida Administrative Code, allowing withdrawal of water for consumptive use.

Wellfield One or more wells producing water from a subsurface source. A tract of land that contains a number of wells for supplying a large municipality or irrigation district.

Wetland An area that is inundated or saturated by surface water or groundwater with vegetation adapted for life under those soil conditions (e.g., swamps, bogs, and marshes).

Wild and Scenic River A river as designated under the authority of the of Public Law 90-542, the *Wild and Scenic Rivers Act,* as amended, is a means to preserve selected free-flowing rivers in their natural condition and protect the water quality of such rivers. A portion of the North Fork of the Loxahatchee River was federally designated as the first Wild and Scenic River in Florida on May 17, 1985.

Withdrawal Water removed from a groundwater or surface water source for use.

Yield The quantity of water (expressed as rate of flow or total quantity per year) that can be collected for a given use from surface or groundwater sources.

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Meeting South Florida's water supply needs while safeguarding its natural systems requires innovative solutions, cohesive planning, and a shared vision.

South Florida Water Management District

Committed to managing and protecting our region's water resources

South Florida Water Management District
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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

August 2013 Final Draft

Appendices

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Acronyms and Abbreviations

$M	millions of dollars
2000 LEC Plan	*2000 Lower East Coast Regional Water Supply Plan*
2005–2006 LEC Plan Update	*2005–2006 Lower East Coast Water Supply Plan Update*
2008 LORS	2008 Lake Okeechobee Regulation Schedule
AFSIRS	Agricultural Field Scale Irrigation Requirements Simulation
AGR Self-Supply	Agricultural Self-Supply
ASR	aquifer storage and recovery
Basis of Review	*Basis of Review for Water Use Permit Applications within the South Florida Water Management District*
BEBR	University of Florida's Bureau of Economic and Business Research
CEPP	Central Everglades Planning Project
CERP	Comprehensive Everglades Restoration Plan
cfs	cubic feet per second
DSS	Domestic Self-Supply
EAA	Everglades Agricultural Area
ET	evapotranspiration
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FDEP	Florida Department of Environmental Protection
FKAA	Florida Keys Aqueduct Authority
FPL	Florida Power & Light
F.S.	Florida Statutes
FY	Fiscal Year
GIS	geographic information system
HET	high efficiency toilet
ICI Self-Supply	Industrial/Commercial/Institutional Self-Supply
LEC	Lower East Coast
MDWASD	Miami-Dade Water and Sewer Department
MFL	minimum flows and levels
MGD	million gallons per day
MGY	million gallons per year

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NA	information not available or not applicable
NGVD	National Geodetic Vertical Datum of 1929
NIR	net irrigation requirement
PCUR	per capita use rate
PIR	project implementation report
PWR Self-Supply	Power Generation Self-Supply
PWS	Public Water Supply
REC Self-Supply	Recreational/Landscape Self-Supply
RO	reverse osmosis
SAS	surficial aquifer system
SAV	submerged aquatic vegetation
SFWMD	South Florida Water Management District
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
Water CHAMP	Water Conservation Hotel and Motel Program
WaterSIP	Water Savings Incentive Program
WCA	water conservation area
WRAC	Water Resources Advisory Commission
WRDA	Water Resources Development Act
WRF	water reclamation facility
WTP	water treatment plant
WWTF	wastewater treatment facility
WWTP	wastewater treatment plant

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A

Demand Projections

NOTE

Perceived discrepancies in table totals are due to rounding.

The South Florida Water Management District (SFWMD) completes the complex process of water demand estimates and projection in coordination with staff from local governments, utilities, other agencies, and stakeholder groups. This appendix provides the methods and detailed water demand projections developed for this plan update.

This appendix presents water demand estimates and projections for the following six water use categories:

- Public Water Supply (PWS)
- Domestic Self-Supply (DSS)
- Agricultural (AGR) Self-Supply
- Industrial/Commercial/Institutional (ICI) Self-Supply
- Recreational/Landscape (REC) Self-Supply
- Power Generation (PWR) Self-Supply

The PWS category encompasses potable water supplied by water treatment facilities with average production rates greater than 0.1 million gallons per day (MGD). The PWS systems, both public and private, supply potable water to all types of customers for all types of land uses. Within the PWS category, net demand refers to finished water demand and is measured by the amount of water leaving a treatment facility.

In 2010, there were 52 PWS utilities in the Lower East Coast (LEC) Planning Area. By 2013, the number of PWS utilities declined to 50. In 2012, the state closed the AG Holley Hospital, which had its own PWS facility. In 2013, the Palm Beach County Water Utilities Department took over the Glades Utility Authority[1], which served the cities of South Bay, Belle Glade, and Pahokee.

[1] The Glades Utility Authority is listed as a separate utility for estimates and projections in this appendix.

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The remaining five water use categories are self-supplied. DSS includes utilities whose average flow is less than 0.1 MGD and households whose source of potable water is a single private well. AGR Self-Supply includes water demand for supplemental crop irrigation. ICI Self-Supply refers to self-supplied business operations and institutional operations such as schools and hospitals. REC Self-Supply includes irrigation demand for landscaped areas such as community and homeowner association common grounds, ball fields, parks, cemeteries, and golf courses. The PWR Self-Supply category refers to water used at power plants, primarily for cooling purposes.

Demand for each water use category in this update is calculated in two ways: gross and net demand. Gross water demand, also known as raw water demand, is the volume of water withdrawn from the natural system that has been allocated in a water use permit. Gross demand includes the water needed for all water uses as well as the water lost to treatment transmission and system inefficiencies. Net water demand, commonly referred to as finished water demand, is the volume of water needed to meet the actual water demand of end users.

DATA SOURCES AND METHODS

In general, preparing water demand estimates and projections is highly dependent on population and land use activities information. For example, estimates of irrigated acreages are fundamental to projecting water supply demand for the AGR Self-Supply category, while information about existing and future projections of population are key to estimating and projecting reasonable PWS demand.

To meet the planning goal, the water supply needs of existing and future reasonable-beneficial uses are based on meeting those needs in a 1-in-10 year drought event (Paragraph 373.709(2)(a)1, Florida Statutes [F.S.]). Water demand estimates for 2010 and projections through 2030 in five-year increments for average rainfall conditions and 1-in-10 year drought conditions are provided in this appendix. Data sources for each category may include the *Florida 2010 Census of Population and Housing* (U.S. Census Bureau 2010), municipal planning documents, PWS utility information, water use permitting files, and federal and state agency reports. Specific data set sources, analysis methods, and applications for projections are provided within this appendix by use category.

PUBLIC WATER SUPPLY AND DOMESTIC SELF-SUPPLY

This section describes the methodology used to estimate and project population and PWS and DSS water use categories' raw and finished water demands for Palm Beach, Broward, Miami-Dade, Monroe, and Hendry counties. Monroe County's water supply needs are met solely by PWS, while the water needs of the portion of Hendry County within the LEC Planning Area are met solely by DSS.

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Population Projection Methodology

Population projections form the initial, and key, step in developing demand projections, especially for the PWS and DSS water use categories.

2010 Population Estimates

The base year for this update is 2010. The 2010 census of total population as reported by the United States Census Bureau is the basis for the 2010 population estimates as reported by the University of Florida's Bureau of Economic and Business Research (BEBR). The 2010 BEBR estimates for permanent resident population (BEBR 2011) are the basis for estimating 2030 populations for each county in the LEC Planning Area. The 2010 population estimates for each of the LEC Planning Area counties are as follows:

- Palm Beach County: 1,320,134 residents
- Broward County: 1,748,066 residents
- Miami-Dade County: 2,496,435 residents
- Monroe County: 73,090 residents

Only a portion of Hendry County is included in the LEC Planning Area. Therefore, the BEBR projections for the entire county are not applicable. The 2010 population for Hendry County relies upon the estimate in the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007), which was 1,279 people.

2010 Public Water Supply Utility Service Areas

After county populations were established, maps of areas served by each PWS utility were developed using data from SFWMD's Water Use Regulatory Database, water supply facility work plans, the 2005–2006 LEC Plan Update, and maps from the counties and PWS utilities. These maps show the areas currently served by the utilities. Service area maps were then verified by the PWS utilities during follow-up meetings and correspondence with planning, operations, and geographic information system (GIS) staff. Information supplied by the PWS utilities was especially important to identify current and future areas served. In many instances, differences existed between areas actually served and franchised or legislated service areas. The focus on areas served by PWS utilities improves the accuracy of distributing county base populations into PWS and DSS populations. Maps of these service areas are provided in **Appendix E**. Expansion of service areas in the future were addressed in the population projections.

The populations residing outside of areas served by PWS utilities were included in DSS population estimates, because United States Census Bureau data no longer include the sources of water for households including those using individual wells. For this plan update, it was assumed that all populations outside PWS service areas had self-supplied potable water.

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A few utilities, most notably the Town of Jupiter and Village of Tequesta in Palm Beach County, serve a small portion of Martin County's population, which is in the Upper East Coast Planning Area. To provide the best population served estimates, these populations are included in the populations served by utilities in Palm Beach County in this plan update. In addition, some residents in far western Palm Beach County and the portion of Hendry County within the LEC Planning Area are served by Clewiston Public Utilities (formerly served by U.S. Sugar) and are included in the *2012 Lower West Coast Water Supply Plan Update* (SFWMD 2012). Lastly, the remaining population in eastern Hendry County in the LEC Planning Area not served by the Clewiston Public Utility is self-supplied, therefore no demand for PWS will be reported for Hendry County in this plan.

Distribution of Census Block Data across 2010 PWS Utility Service Areas

The 2010 population reported by the United States Census Bureau (2010) was distributed into each PWS utility service area (**Table A-1**) by using census block data, which captures population in relatively small geographic areas (bounded by streets and prominent physical features) as the basic unit for analysis. Seasonal residents, prison inmates, migrant workers, and tourists were not included in permanent population estimates provided by the 2010 Census count.

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Table A-1. 2010 LEC Planning Area permanent resident population estimates.

County	PWS Utility or DSS	2010 Population
Palm Beach	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	32
	Boca Raton, City of	107,224
	Boynton Beach, City of	102,512
	Delray Beach Water and Sewer Department, City of	63,341
	Glades Utility Authority	25,051
	Golf, Village of	2,755
	Highland Beach, Town of	3,631
	Jupiter, Town of	70,840
	Lake Worth Utilities, City of	45,137
	Lantana, Town of	10,348
	Manalapan, Town of	2,421
	Mangonia Park, Town of	1,888
	Maralago Cay	1,008
	Palm Beach County Water Utilities Department	458,839
	Palm Springs, Village of	45,204
	Riviera Beach, City of	37,757
	Seacoast Utility Authority	87,686
	Tequesta, Village of	11,581
	Wellington Public Utilities Department	55,408
	West Palm Beach Public Utilities, City of	109,958
	Palm Beach County PWS Total	**1,242,621**
	Palm Beach County DSS Total	**77,513**
	Palm Beach County Total	**1,320,134**
Broward	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services (District 1)	71,395
	Broward County Water & Wastewater Services (District 2A)	110,939
	Cooper City Utility Department, City of	28,543
	Coral Springs, City of	58,029
	Coral Springs Improvement District	36,969
	Dania Beach, City of	14,840
	Davie, Town of	27,548
	Deerfield Beach, City of	51,842
	Fort Lauderdale, City of	212,945
	Hallandale Beach, City of	37,113
	Hillsboro Beach, Town of	1,875
	Hollywood, City of	186,798
	Lauderhill, City of	58,114

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Table A-1. Continued.

County	PWS Utility or DSS	2010 Population
Broward (continued)	Margate, City of	58,314
	Miramar, City of	116,715
	North Lauderdale, City of	32,994
	North Springs Improvement District	34,895
	Parkland Utilities, Inc.	2,161
	Pembroke Pines, City of	152,002
	Plantation, City of	91,812
	Pompano Beach, City of	79,917
	Royal Utility Corporation	3,234
	Seminole Tribe of Florida Utility	1,368
	Sunrise, City of	211,403
	Tamarac, City of	56,064
	Tindall Hammock Irrigation and Soil Conservation District	2,639
	Broward County PWS Total	**1,740,468**
	Broward County DSS	**7,598**
	Broward County Total	**1,748,066**
Miami-Dade	**Miami-Dade County PWS Utilities**	
	Americana Village	1,582
	Florida City Water and Sewer Department	11,230
	Homestead, City of	65,679
	Miami-Dade Water & Sewer Department	2,141,885
	North Miami, City of	90,397
	North Miami Beach, City of	161,968
	Miami-Dade County PWS Total	**2,472,741**
	Miami-Dade County DSS Total	**23,694**
	Miami-Dade County Total	**2,496,435**
Monroe	**Monroe County PWS Utility**	
	Florida Keys Aqueduct Authority	73,090
	Monroe County PWS Total	**73,090**
	Monroe County DSS Total	**N/A**
	Monroe County Total	**73,090**
Hendry	**Hendry County PWS**	**N/A**
	Hendry County DSS	**1,279**
	Hendry County Total	**1,279**
LEC Planning Area Total		**5,639,004**

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To determine the census blocks within the area served by each PWS utility, the geographic areas represented by census blocks and PWS utility service areas were input as polygon layers into SFWMD's GIS and overlaid. The imagery or latest available one-foot natural color aerial photography was used as a background and assisted the geographer in allocating census blocks to appropriate PWS service areas. The latest photography available was from 2009 for Palm Beach, Broward, and Miami-Dade counties. Imagery from 2011 was available for portions of rural Palm Beach County. When more current photography was not available, the one-meter natural color aerial photography from the United States Geological Survey (USGS) 2004–2005 digital ortho quarter quads was used. After allocating census blocks, population was then calculated for each PWS area served and for DSS users.

2030 County Populations

An important element of water supply planning is to use the best available data to estimate future populations. The projections used in this plan update are believed to represent a reasonable balance of long- and short-term factors affecting the development of the LEC Planning Area. However, there is always uncertainty in twenty-year population projections as growth patterns within the area could change significantly. Factors such as global and local economic trends, housing demand, migration and immigration patterns, and cultural shifts all have an effect on populations within a county and state.

To prepare population projections, 2030 populations needed to be developed for each county within the LEC Planning Area. Paragraph 373.709(2)(a)1, F.S., prescribes the use of population projections in determining needs in regional water supply plans:

> Population projections used for determining public water supply needs must be based upon the best available data. In determining best available data, the district shall consider the University of Florida's Bureau of Economic and Business Research (BEBR) medium population projections and any population projection data and analysis submitted by a local government pursuant to the public workshop described in subsection (1) if the data and analysis support the local government's comprehensive plan. Any adjustment of or deviation from the BEBR projections must be fully described, and the original BEBR data must be presented along with the adjusted data.

Table A-2 provides BEBR population projections for the low, medium, and high ranges for 2015–2040 for the LEC Planning Area. To project population for 2030, the BEBR population medium growth forecasts reported for 2010 (BEBR 2011) for each county were used. Additional sources of population information from LEC county governments or PWS utilities not accounted for in the BEBR medium projections were identified. Where population projection data captured higher population counts for 2030 than medium BEBR, projections were adjusted upwards, if appropriate and consistent with local water supply planning programs.

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Table A-2. 2010 United States census results and 2015–2040 BEBR population projections for the LEC Planning Area.

	2010 Census	Projections					
		2015	2020	2025	2030	2035	2040
	1,320,134	**Palm Beach County**					
Low		1,342,600	1,367,700	1,383,900	1,389,700	1,384,900	1,370,900
Medium		1,394,300	1,482,900	1,568,500	1,648,000	1,720,000	1,786,000
High		1,454,500	1,605,600	1,761,400	1,919,200	2,077,300	2,236,700
	1,748,066	**Broward County**					
Low		1,736,800	1,726,300	1,710,600	1,689,000	1,661,600	1,632,900
Medium		1,788,200	1,834,500	1,877,700	1,916,200	1,949,700	1,982,500
High		1,844,200	1,946,700	2,048,900	2,149,600	2,248,100	2,349,700
	2,496,435	**Miami-Dade County**					
Low		2,528,700	2,564,400	2,590,900	2,606,400	2,610,300	2,604,100
Medium		2,600,900	2,722,900	2,841,400	2,952,800	3,055,100	3,150,200
High		2,685,100	2,891,800	3,103,400	3,317,200	3,531,500	3,747,400
	73,090	**Monroe County**					
Medium		72,200	71,200	70,200	69,300	68,500	67,700

2030 PWS Utility Service Areas

The 2010 PWS utility service areas were updated to include proposed changes from 2010 to 2030. Sources of information included water use permits and discussions and correspondence with PWS utility staff. Very few utility service area boundaries are expected to change over the next 20 years.

Distribution of Census Block Data across 2030 PWS Utility Service Areas

To determine the 2030 permanent resident population estimates, the PWS utility service area portion (percentage) of the total county 2010 census population estimate (U.S. Census Bureau 2010) was multiplied by the 2030 medium population projection. Planned changes to utility service areas were compared to census blocks and adjusted as needed.

Five-Year Incremental Projections

For the required five-year incremental projections within the twenty-year planning horizon of this plan update, census block data from the 2010 Census count (U.S. Census Bureau 2010) were used as the principal means of distributing 2030 county control populations to the PWS future service areas within the LEC Planning Area counties. Five-year incremental population projections for each PWS utility are based upon a linear interpolation of the change in population from the 2010 estimates to 2030 adjusted projections.

For example, a PWS service area with a 2010 population estimate of 10,000 people and a projected growth rate of 25 percent would have a 2030 population projection of 12,500 people (**Table A-3**). The change in population is then linearly interpolated for the interim five-year increments. For the five-year incremental population numbers, see **Table A-7** later in this appendix.

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Table A-3. Example of five-year incremental projections applied to a PWS service area.

Year	2010	2015	2020	2025	2030
Population	10,000	10,625	11,250	11,875	12,500

Water Demand Projection Methodology

Historical PWS Utility Raw Water Withdrawal and Finished Treated Water Data

Both raw water withdrawn for PWS and finished treated water produced for PWS are calculated. This approach captures situations when gross and net demands differ and independently verifies efficiency. For example, urban demand for finished treated water may be met with brackish water sources found in the Floridan aquifer. Because of losses incurred during treatment processes, raw water withdrawals from brackish water sources are typically 20–25 percent greater compared to the same volume of finished water from freshwater sources. To determine historical withdrawals by all PWS utilities in the LEC Planning Area, raw water withdrawal data were obtained from SFWMD's Water Use Regulatory Database for 2010. To gather the finished treated water produced by PWS, data were extracted from the 2010 Florida Department of Environmental Protection monthly operating reports (http://www.dep.state.fl.us/water/drinkingwater/flow.htm). Five years of data were analyzed to understand trends in water use. Factors reflected in this data include the economic downturn, water shortages, empty housing stock, and implementation of year-round irrigation rules. Analysis concluded that 2010 represents the historical use trend that is expected to continue into the future.

Finished and Raw Water Demand Projections

For each PWS utility, 2010 raw water withdrawals were compared to the 2010 Florida Department of Environmental Protection data for finished water production to calculate the raw to finished water ratio for each LEC Planning Area PWS utility (**Table A-4**). These factors give a basis to compare and contrast PWS utilities and can be applied for other types of analyses to convert from finished water production to raw water withdrawals. However, a more useful statistic is finished to raw, which describes the efficiency of the various treatment trains employed by the PWS (**Table A-5**). For DSS, the finished to raw ratio is assumed to be 0.96.

Per Capita Use Rate

The planning per capita use rate (PCUR) expresses the total annual finished water used in 2010 divided by the permanent population in 2010 for each PWS utility. This method incorporates the finished water supplied by the PWS utility and consumed by seasonal residents and tourists, PWS utility supplied for industrial, commercial, and institutional use, and the losses incurred in water delivery. Irrigation demand for PWS-served households that do not use PWS for irrigation was not assessed due to the lack of available data. The planning PCURs for DSS within each county were assumed to be the same as for the

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countywide PWS weighted average, which are also shown. For Hendry County, the DSS PCUR is derived from the DSS demand and populations in the Lower West Coast Water Supply Plan Update (SFWMD 2012). **Table A-6** provides PCURs for 2010.

Each utility may have specific demographics, seasonality, and distribution characteristics that may be analyzed in detail to better quantify PCURs of specific user categories. A more localized, in-depth analysis of use may be used to focus water conservation efforts and assist in determining water use permit allocations. Therefore, the PCURs were part of the information provided to utilities for review.

Table A-4. Raw to finished water ratio for each PWS utility.

County	PWS Utility/DSS	Raw:Finished
Palm Beach County	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	1.17
	Boca Raton, City of	1.23
	Boynton Beach, City of	1.06
	Delray Beach Water and Sewer Department, City of	1.04
	Glades Utility Authority	1.35
	Golf, Village of	1.28
	Highland Beach, Town of	1.37
	Jupiter, Town of	1.25
	Lake Worth Utilities, City of	1.07
	Lantana, Town of	1.04
	Manalapan, Town of	1.25
	Mangonia Park, Town of	1.04
	Maralago Cay	1.04
	Palm Beach County Water Utilities Department	1.14
	Palm Springs, Village of	1.05
	Riviera Beach, City of	1.02
	Seacoast Utility Authority	1.03
	Tequesta, Village of	1.23
	Wellington Public Utilities Department	1.16
	West Palm Beach Public Utilities, City of	1.04
	Palm Beach County DSS	1.04
Broward County	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services (District 1)	1.08
	Broward County Water & Wastewater Services (District 2A)	1.04
	Cooper City Utility Department, City of	1.27
	Coral Springs, City of	1.05
	Coral Springs Improvement District	1.04
	Dania Beach, City of	1.06
	Davie, Town of	1.02
	Deerfield Beach, City of	1.02

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Table A-4. Continued.

County	PWS Utility	Raw:Finished
Broward County (continued)	Fort Lauderdale, City of	1.11
	Hallandale Beach, City of	1.02
	Hillsboro Beach, Town of	1.04
	Hollywood, City of	1.16
	Lauderhill, City of	1.04
	Margate, City of	1.04
	Miramar, City of	1.10
	North Lauderdale, City of	1.04
	North Springs Improvement District	1.04
	Parkland Utilities, Inc.	1.02
	Pembroke Pines, City of	1.02
	Plantation, City of	1.21
	Pompano Beach, City of	1.07
	Royal Utility Corporation	1.04
	Seminole Tribe of Florida	1.02
	Sunrise, City of	1.16
	Tamarac, City of	1.05
	Tindall Hammock Irrigation and Soil Conservation District	1.04
	Broward County DSS	1.04
Miami-Dade County	**Miami-Dade County PWS Utilities**	
	Americana Village	1.04
	Florida City Water and Sewer Department	1.01
	Homestead, City of	1.04
	Miami-Dade Water & Sewer Department	1.02
	North Miami, City of	1.04
	North Miami Beach, City of	1.12
	Miami-Dade DSS	1.04
Monroe County	**Monroe County PWS Utilities**	
	Florida Keys Aqueduct Authority	1.07
Hendry County	**Hendry County DSS**	1.04

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Table A-5. Finished to raw water ratio for each PWS utility.

County	PWS Utility	Finished:Raw
Palm Beach County	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	0.85
	Boca Raton, City of	0.81
	Boynton Beach, City of	0.94
	Delray Beach Water and Sewer Department, City of	0.96
	Glades Utility Authority	0.74
	Golf, Village of	0.78
	Highland Beach, Town of	0.73
	Jupiter, Town of	0.80
	Lake Worth Utilities, City of	0.93
	Lantana, Town of	0.96
	Manalapan, Town of	0.80
	Mangonia Park, Town of	0.96
	Maralago Cay	0.97
	Palm Beach County Water Utilities Department	0.88
	Palm Springs, Village of	0.95
	Riviera Beach, City of	0.98
	Seacoast Utility Authority	0.97
	Tequesta, Village of	0.81
	Wellington Public Utilities Department	0.86
	West Palm Beach Public Utilities, City of	0.96
	Palm Beach County DSS	0.96
Broward County	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services (District 1)	0.92
	Broward County Water & Wastewater Services (District 2A)	0.96
	Cooper City Utility Department, City of	0.78
	Coral Springs, City of	0.95
	Coral Springs Improvement District	0.96
	Dania Beach, City of	0.95
	Davie, Town of	0.98
	Deerfield Beach, City of	0.98
	Fort Lauderdale, City of	0.90
	Hallandale Beach, City of	0.98
	Hillsboro Beach, Town of	0.96
	Hollywood, City of	0.86
	Lauderhill, City of	0.96

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Table A-5. Continued.

County	PWS Utility	Finished:Raw
Broward County (continued)	Margate, City of	0.96
	Miramar, City of	0.91
	North Lauderdale, City of	0.96
	North Springs Improvement District	0.96
	Parkland Utilities, Inc.	0.98
	Pembroke Pines, City of	0.98
	Plantation, City of	0.82
	Pompano Beach, City of	0.93
	Royal Utility Corporation	0.96
	Seminole Tribe of Florida	0.98
	Sunrise, City of	0.86
	Tamarac, City of	0.95
	Tindall Hammock Irrigation and Soil Conservation District	0.96
	Broward County DSS	0.96
Miami-Dade County	**Miami-Dade County PWS Utilities**	
	Americana Village	0.96
	Florida City Water and Sewer Department	0.99
	Homestead, City of	0.96
	Miami-Dade Water & Sewer Department	0.98
	North Miami, City of	0.96
	North Miami Beach, City of	0.90
	Miami-Dade DSS	0.96
Monroe County	**Monroe County PWS Utilities**	
	Florida Keys Aqueduct Authority	0.93
Hendry County	**Hendry County DSS**	0.96

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Table A-6. PCURs for 2010.

County	PWS Utility	2010 PCUR
Palm Beach County	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	
	Boca Raton, City of	320
	Boynton Beach, City of	131
	Delray Beach Water and Sewer Department, City of	232
	Glades Utility Authority	195
	Golf, Village of	145
	Highland Beach, Town of	372
	Jupiter, Town of	188
	Lake Worth Utilities, City of	98
	Lantana, Town of	171
	Manalapan, Town of	440
	Mangonia Park, Town of	168
	Maralago Cay	182
	Palm Beach County Water Utilities Department	115
	Palm Springs, Village of	84
	Riviera Beach, City of	173
	Seacoast Utility Authority	201
	Tequesta, Village of	235
	Wellington Public Utilities Department	105
	West Palm Beach Public Utilities, City of	253
	Palm Beach County PWS Weighted-Average	**166**
	Palm Beach County DSS	**166**
	Palm Beach County Average	**166**
Broward County	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services (District 1)	99
	Broward County Water & Wastewater Services (District 2A)	110
	Cooper City Utility Department, City of	95
	Coral Springs, City of	114
	Coral Springs Improvement District	103
	Dania Beach, City of	154
	Davie, Town of	146
	Deerfield Beach, City of	191
	Fort Lauderdale, City of	190
	Hallandale Beach, City of	146
	Hillsboro Beach, Town of	351
	Hollywood, City of	111
	Lauderhill, City of	95

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Table A-6. Continued.

County	PWS Utility	2010 PCUR
Broward County (continued)	Margate, City of	98
	Miramar, City of	97
	North Lauderdale, City of	76
	North Springs Improvement District	124
	Parkland Utilities, Inc.	113
	Pembroke Pines, City of	78
	Plantation, City of	127
	Pompano Beach, City of	170
	Royal Utility Corporation	98
	Seminole Tribe of Florida	810
	Sunrise, City of	116
	Tamarac, City of	105
	Tindall Hammock Irrigation and Soil Conservation District	158
	Broward County PWS Weighted-Average	**123**
	Broward County DSS	**123**
	Broward County Average	**123**
Miami-Dade County	**Miami-Dade County PWS Utilities**	
	Americana Village	138
	Florida City Water and Sewer Department	156
	Homestead, City of	157
	Miami-Dade Water & Sewer Department	141
	North Miami, City of	117
	North Miami Beach, City of	125
	Miami-Dade PWS Weighted-Average	**140**
	Miami-Dade DSS	**140**
	Miami-Dade County Average	**140**
Monroe County	**Monroe County PWS Utilities**	
	Florida Keys Aqueduct Authority	**109**
	PWS Weighted-Average	**109**
	Monroe County Average	**109**
Hendry County	**Hendry County DSS**	**143**
	Hendry County Average	**143**
LEC Planning Area PWS Average		**142**

2030 Projected Raw and Finished Demand

For each PWS utility, 2030 finished (net) water demand was calculated by multiplying the 2030 permanent population for each PWS utility by the PCUR for 2010. This conservative assumption reflects the expectation that PCURs will remain constant over the next 20 years. Several utilities do expect declines in PCURs based on implementation of conservation and reuse projects replacing demand for treated finished water and requested lower future PCURs. To determine raw water demand for average conditions for each PWS utility, finished water projections were multiplied by the raw to finished percent in **Table A-4** to calculate raw (gross) water demand. This methodology assumes no changes in treatment

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efficiency from plant changes (e.g., lime softening to membrane) or source shifting (e.g., fresh surficial aquifer system water to lower quality Floridan aquifer system water).

As with the PWS service area maps and populations, each utility and local government within the LEC Planning Area was provided with the 2010 estimates and 2030 projections for the PWS and DSS categories produced by the methods described. In several cases, the utilities were able to provide input on their respective demands and projections that resulted in adjustments to the estimated demand. Many of these data exchanges took place during follow-up meetings, telephone conferences, and email correspondence. Revisions resulting from this coordination comprise the 2010 estimates and 2030 projections published in this update.

Average Rainfall and 1–and–10 Year Drought Conditions

Finally, net and gross water projections for average rainfall conditions were modified to calculate 1-in-10 year drought condition demand. A 1-in-10 year drought is defined by diminished rain and increased evapotranspiration (ET) relative to the historical record for a particular location from Tables V-2-1, V-2-3, V-2-5, and V-2-7 in the *Districtwide Water Supply Assessment* (SFWMD 1998). The effect of 1-in-10 year drought conditions is expected to increase demand in each county as follows:

- Palm Beach County: 1.109
- Broward County: 1.101
- Miami-Dade County: 1.087
- Monroe County: 1.031
- Hendry County: 1.049

It should be noted that the potential effect of the Mandatory Year-Round Landscape Irrigation Conservation Measures Rule has not been explicitly incorporated.

Projection Results

Table A-7 provides PWS utility and DSS five-year incremental population projections for the LEC Planning Area. **Table A-8** presents finished (net) water demand under average rainfall conditions, while **Table A-9** provides the finished water needs under 1-in-10 year drought conditions. In the same manner, **Table A-10** presents estimated gross (raw) water demands under average rainfall conditions, while **Table A-11** provides estimated gross water demands under 1-in-10 year drought conditions.

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Table A-7. PWS and DSS population projections for the LEC Planning Area.

County	PWS Utility or DSS	Population Projections				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	32	0	0	0	0
	Boca Raton, City of	107,224	113,882	120,539	127,197	133,854
	Boynton Beach, City of	102,512	108,877	115,242	121,607	127,972
	Delray Beach Water and Sewer Department, City of	63,341	67,274	71,207	75,139	79,072
	Glades Utility Authority	25,051	26,607	28,164	29,720	31,276
	Golf, Village of	2,755	2,926	3,097	3,268	3,439
	Highland Beach, Town of	3,631	3,857	4,082	4,308	4,533
	Jupiter, Town of	70,840	78,532	86,224	93,916	101,608
	Lake Worth Utilities, City of	45,137	47,940	50,742	53,545	56,347
	Lantana, Town of	10,348	10,991	11,633	12,276	12,918
	Manalapan, Town of	2,421	2,571	2,722	2,872	3,022
	Mangonia Park, Town of	1,888	2,005	2,122	2,240	2,357
	Maralago Cay	1,008	1,071	1,133	1,196	1,258
	Palm Beach County Water Utilities Department	458,839	487,328	515,412	544,306	572,795
	Palm Springs, Village of	45,204	48,011	50,817	53,624	56,431
	Riviera Beach, City of	37,757	40,101	42,446	44,790	47,134
	Seacoast Utility Authority	87,686	93,131	98,575	104,020	109,464
	Tequesta, Village of	11,581	12,463	13,345	14,226	15,108
	Wellington Public Utilities Department	55,408	58,848	62,289	65,729	69,169
	West Palm Beach Public Utilities, City of	109,958	118,252	123,853	134,840	143,134
	Palm Beach County PWS Total	**1,242,621**	**1,324,667**	**1,403,644**	**1,488,819**	**1,570,891**
	Palm Beach County DSS Total	**77,513**	**77,434**	**80,423**	**77,215**	**77,109**
	Palm Beach County Total	**1,320,134**	**1,402,101**	**1,484,067**	**1,566,034**	**1,648,000**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services (District 1)	71,395	73,643	75,892	78,140	80,388
	Broward County Water & Wastewater Services (District 2A)	110,939	113,607	116,274	118,942	121,609
	Cooper City Utility Department, City of	28,543	29,804	33,335	32,325	33,585
	Coral Springs, City of	58,029	59,424	60,820	62,215	63,610
	Coral Springs Improvement District	36,969	37,858	38,747	39,636	40,525
	Dania Beach, City of	14,840	15,197	15,554	15,910	16,267
	Davie, Town of	27,548	43,434	59,320	75,205	91,091
	Deerfield Beach, City of	51,842	53,089	54,335	55,582	56,828
	Fort Lauderdale, City of	212,945	217,995	223,045	228,095	233,145
	Hallandale Beach, City of	37,113	38,006	38,898	39,791	40,683
	Hillsboro Beach, Town of	1,875	1,920	1,965	2,010	2,055
	Hollywood, City of	186,798	192,679	198,559	204,440	210,320
	Lauderhill, City of	58,114	59,512	60,909	62,307	63,704

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Table A-7. Continued.

County	PWS Utility or DSS	Population Projections				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	58,314	59,716	61,118	62,521	63,923
	Miramar, City of	116,715	120,970	125,225	129,479	133,734
	North Lauderdale, City of	32,994	33,787	34,581	35,374	36,167
	North Springs Improvement District	34,895	35,734	36,573	37,412	38,251
	Parkland Utilities, Inc.	2,161	2,213	2,265	2,317	2,369
	Pembroke Pines, City of	152,002	155,657	159,312	162,967	166,622
	Plantation, City of	91,812	94,703	97,595	100,486	103,377
	Pompano Beach, City of	79,917	81,841	83,765	85,689	87,613
	Royal Utility Corporation	3,234	3,312	3,390	3,467	3,545
	Seminole Tribe of Florida Utility	1,368	1,401	1,434	1,467	1,500
	Sunrise, City of	211,403	216,486	221,570	226,653	231,736
	Tamarac, City of	56,064	57,412	58,760	60,108	61,456
	Tindall Hammock Irrigation and Soil Conservation District	2,639	2,703	2,766	2,830	2,893
	Broward County PWS Total	**1,740,468**	**1,802,103**	**1,866,007**	**1,925,368**	**1,986,996**
	Broward County DSS Total	**7,598**	**7,778**	**5,689**	**8,142**	**8,329**
	Broward County Total	**1,748,066**	**1,809,881**	**1,871,696**	**1,933,510**	**1,995,325**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	1,582	1,654	1,727	1,799	1,871
	Florida City Water and Sewer Department	11,230	11,743	12,256	12,770	13,283
	Homestead, City of	65,679	68,681	71,682	74,684	77,686
	Miami-Dade Water & Sewer Department	2,141,885	2,239,773	2,337,660	2,435,548	2,533,436
	North Miami, City of	90,397	94,528	98,660	102,791	106,922
	North Miami Beach, City of	161,968	169,370	176,772	184,175	191,577
	Miami-Dade County PWS Total	**2,472,741**	**2,585,749**	**2,698,757**	**2,811,767**	**2,924,775**
	Miami-Dade County DSS Total	**23,694**	**24,777**	**25,861**	**26,942**	**28,025**
	Miami-Dade County Total	**2,496,435**	**2,610,526**	**2,724,618**	**2,838,709**	**2,952,800**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	73,090	72,143	71,195	70,248	69,300
	Monroe County PWS Total	**73,090**	**72,143**	**71,195**	**70,248**	**69,300**
	Monroe County DSS Total	**0**	**0**	**0**	**0**	**0**
	Monroe County Total	**73,090**	**72,143**	**71,195**	**70,248**	**69,300**
Hendry	**Hendry County PWS Total**	**0**	**0**	**0**	**0**	**0**
	Hendry County DSS Total	**1,279**	**1,320**	**1,360**	**1,401**	**1,441**
	Hendry County Total	**1,279**	**1,320**	**1,360**	**1,401**	**1,441**
LEC Planning Area PWS Total		**5,528,920**	**5,784,662**	**6,039,603**	**6,296,202**	**6,551,962**
LEC Planning Area DSS Total		**110,084**	**111,309**	**113,333**	**113,700**	**114,904**
LEC Planning Area Total		**5,639,004**	**5,895,971**	**6,152,936**	**6,409,902**	**6,666,866**

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Table A-8. Finished water demand projections for PWS and DSS under average rainfall conditions in the LEC Planning Area.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.07	0.00	0.00	0.00	0.00
	Boca Raton, City of	34.31	36.44	38.57	40.70	42.83
	Boynton Beach, City of	13.43	14.26	15.10	15.93	16.76
	Delray Beach Water and Sewer Department, City of	14.70	15.61	16.52	17.43	18.34
	Glades Utility Authority	4.88	5.19	5.49	5.80	6.10
	Golf, Village of	0.40	0.42	0.45	0.47	0.50
	Highland Beach, Town of	1.35	1.43	1.52	1.60	1.69
	Jupiter, Town of	13.32	14.76	16.21	17.66	19.10
	Lake Worth Utilities, City of	4.42	4.70	4.97	5.25	5.52
	Lantana, Town of	1.77	1.88	1.99	2.10	2.21
	Manalapan, Town of	1.07	1.13	1.20	1.26	1.33
	Mangonia Park, Town of	0.32	0.34	0.36	0.38	0.40
	Maralago Cay	0.18	0.19	0.21	0.22	0.23
	Palm Beach County Water Utilities Department	52.77	56.04	59.27	62.60	65.87
	Palm Springs, Village of	3.80	4.03	4.27	4.50	4.74
	Riviera Beach, City of	6.53	6.94	7.34	7.75	8.15
	Seacoast Utility Authority	17.62	18.72	18.63	20.91	20.69
	Tequesta, Village of	2.72	2.93	3.14	3.34	3.55
	Wellington Public Utilities Department	5.82	6.18	6.54	6.90	7.26
	West Palm Beach Public Utilities, City of	27.87	29.92	31.33	34.11	36.21
	Palm Beach County PWS Total	**207.35**	**221.11**	**233.11**	**248.91**	**261.48**
	Palm Beach County DSS Total	**12.87**	**12.85**	**13.35**	**12.82**	**12.80**
	Palm Beach County Total	**220.22**	**233.96**	**246.46**	**261.73**	**274.28**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services (District 1)	7.05	7.29	7.49	7.74	7.93
	Broward County Water & Wastewater Services (District 2A)	12.20	12.50	12.79	13.08	13.38
	Cooper City Utility Department, City of	2.71	2.83	3.17	3.07	3.19
	Coral Springs, City of	6.62	6.77	6.93	7.09	7.25
	Coral Springs Improvement District	3.81	3.90	3.99	4.08	4.17
	Dania Beach, City of	2.29	2.34	2.40	2.45	2.51
	Davie, Town of	4.02	6.34	8.66	10.98	13.30
	Deerfield Beach, City of	9.90	10.14	10.38	10.62	10.85
	Fort Lauderdale, City of	40.46	41.42	42.38	43.34	44.30
	Hallandale Beach, City of	5.42	5.55	5.68	5.81	5.94
	Hillsboro Beach, Town of	0.66	0.67	0.69	0.71	0.72
	Hollywood, City of	20.73	21.39	22.04	22.69	23.35
	Lauderhill, City of	5.52	5.65	5.79	5.92	6.05

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Table A-8. Continued.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	5.71	5.85	5.99	6.13	6.26
	Miramar, City of	11.32	11.73	12.15	12.56	12.97
	North Lauderdale, City of	2.51	2.57	2.63	2.69	2.75
	North Springs Improvement District	4.33	4.43	4.54	4.64	4.74
	Parkland Utilities, Inc.	0.24	0.25	0.26	0.26	0.27
	Pembroke Pines, City of	11.86	12.14	12.43	12.71	13.00
	Plantation, City of	11.66	12.03	12.39	12.76	13.13
	Pompano Beach, City of	13.59	13.91	14.24	14.57	14.19
	Royal Utility Corporation	0.32	0.32	0.33	0.34	0.35
	Seminole Tribe of Florida Utility	1.11	1.13	1.16	1.19	1.22
	Sunrise, City of	24.52	25.11	25.70	26.29	26.88
	Tamarac, City of	5.89	6.03	6.17	6.31	6.45
	Tindall Hammock Irrigation and Soil Conservation District	0.42	0.43	0.44	0.45	0.46
	Broward County PWS Total	**214.87**	**222.72**	**230.82**	**238.48**	**245.61**
	Broward County DSS Total	**0.93**	**0.96**	**0.70**	**1.00**	**1.02**
	Broward County Total	**215.80**	**223.68**	**231.52**	**239.48**	**246.63**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.22	0.23	0.24	0.25	0.26
	Florida City Water and Sewer Department	1.75	1.83	1.91	1.99	2.07
	Homestead, City of	10.31	10.78	11.25	11.73	12.20
	Miami-Dade Water & Sewer Department	302.01	315.81	329.61	343.41	357.21
	North Miami, City of	10.58	11.06	11.54	12.03	12.51
	North Miami Beach, City of	20.25	21.17	22.80	23.76	24.71
	Miami-Dade County PWS Total	**345.12**	**360.88**	**377.35**	**393.17**	**408.96**
	Miami-Dade County DSS Total	**3.32**	**3.47**	**3.62**	**3.77**	**3.92**
	Miami-Dade County Total	**348.44**	**364.35**	**380.97**	**396.94**	**412.88**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	16.45	17.72	19.00	20.35	21.70
	Monroe County PWS Total	**16.45**	**17.72**	**19.00**	**20.35**	**21.70**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**16.45**	**17.72**	**19.00**	**20.35**	**21.70**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**0.18**	**0.19**	**0.19**	**0.20**	**0.21**
	Hendry County Total	**0.18**	**0.19**	**0.19**	**0.20**	**0.21**
LEC Planning Area PWS Total		**783.79**	**822.43**	**860.28**	**900.91**	**937.75**
LEC Planning Area DSS Total		**17.30**	**17.47**	**17.86**	**17.79**	**17.95**
LEC Planning Area Total		**801.09**	**839.90**	**878.14**	**918.70**	**955.70**

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Table A-9. Finished water demand projections for PWS and DSS under 1-in-10 year drought conditions in the LEC Planning Area.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.08	0.00	0.00	0.00	0.00
	Boca Raton, City of	38.05	40.41	42.77	45.14	47.50
	Boynton Beach, City of	14.89	15.81	16.75	17.67	18.59
	Delray Beach Water and Sewer Department, City of	16.30	17.31	18.32	19.33	20.34
	Glades Utility Authority	5.41	5.76	6.09	6.43	6.76
	Golf, Village of	0.44	0.47	0.50	0.52	0.55
	Highland Beach, Town of	1.50	1.59	1.69	1.77	1.87
	Jupiter, Town of	14.77	16.37	17.98	19.58	21.18
	Lake Worth Utilities, City of	4.90	5.21	5.51	5.82	6.12
	Lantana, Town of	1.96	2.08	2.21	2.33	2.45
	Manalapan, Town of	1.19	1.25	1.33	1.40	1.47
	Mangonia Park, Town of	0.35	0.38	0.40	0.42	0.44
	Maralago Cay	0.20	0.21	0.23	0.24	0.26
	Palm Beach County Water Utilities Department	58.52	62.15	65.73	69.42	73.05
	Palm Springs, Village of	4.21	4.47	4.74	4.99	5.26
	Riviera Beach, City of	7.24	7.70	8.14	8.59	9.04
	Seacoast Utility Authority	19.54	20.76	20.66	23.19	22.95
	Tequesta, Village of	3.02	3.25	3.48	3.70	3.94
	Wellington Public Utilities Department	6.45	6.85	7.25	7.65	8.05
	West Palm Beach Public Utilities, City of	30.91	33.18	34.74	37.83	40.16
	Palm Beach County PWS Total	**229.93**	**245.21**	**258.52**	**276.02**	**289.98**
	Palm Beach County DSS Total	**14.27**	**14.25**	**14.81**	**14.22**	**14.20**
	Palm Beach County Total	**244.20**	**259.46**	**273.33**	**290.24**	**304.18**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services (District 1)	7.76	8.03	8.25	8.52	8.73
	Broward County Water & Wastewater Services (District 2A)	13.43	13.76	14.08	14.40	14.73
	Cooper City Utility Department, City of	2.98	3.12	3.49	3.38	3.51
	Coral Springs, City of	7.29	7.45	7.63	7.81	7.98
	Coral Springs Improvement District	4.19	4.29	4.39	4.49	4.59
	Dania Beach, City of	2.52	2.58	2.64	2.70	2.76
	Davie, Town of	4.43	6.98	9.53	12.09	14.64
	Deerfield Beach, City of	10.90	11.16	11.43	11.69	11.95
	Fort Lauderdale, City of	44.55	45.60	46.66	47.72	48.77
	Hallandale Beach, City of	5.97	6.11	6.25	6.40	6.54
	Hillsboro Beach, Town of	0.73	0.74	0.76	0.78	0.79
	Hollywood, City of	22.82	23.55	24.27	24.98	25.71
	Lauderhill, City of	6.08	6.22	6.37	6.52	6.66

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Table A-9. Continued.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	6.29	6.44	6.59	6.75	6.89
	Miramar, City of	12.46	12.91	13.38	13.83	14.28
	North Lauderdale, City of	2.76	2.83	2.90	2.96	3.03
	North Springs Improvement District	4.77	4.88	5.00	5.11	5.22
	Parkland Utilities, Inc.	0.26	0.28	0.29	0.29	0.30
	Pembroke Pines, City of	13.06	13.37	13.69	13.99	14.31
	Plantation, City of	12.84	13.25	13.64	14.05	14.46
	Pompano Beach, City of	14.96	15.31	15.68	16.04	15.62
	Royal Utility Corporation	0.35	0.35	0.36	0.37	0.39
	Seminole Tribe of Florida Utility	1.11	1.14	1.16	1.19	1.21
	Sunrise, City of	27.00	27.65	28.30	28.95	29.59
	Tamarac, City of	6.48	6.64	6.79	6.95	7.10
	Tindall Hammock Irrigation and Soil Conservation District	0.46	0.47	0.48	0.50	0.51
	Broward County PWS Total	**236.45**	**245.21**	**245.01**	**262.58**	**270.27**
	Broward County DSS Total	**1.02**	**1.06**	**0.77**	**1.10**	**1.12**
	Broward County Total	**237.47**	**246.27**	**254.78**	**263.68**	**271.39**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.24	0.25	0.26	0.27	0.28
	Florida City Water and Sewer Department	1.90	1.99	2.08	2.16	2.25
	Homestead, City of	11.21	11.72	12.23	12.75	13.26
	Miami-Dade Water & Sewer Department	328.28	343.29	358.29	373.29	388.29
	North Miami, City of	11.50	12.02	12.54	13.08	13.60
	North Miami Beach, City of	22.01	23.01	24.78	25.83	26.86
	Miami-Dade County PWS Total	**375.14**	**392.28**	**410.18**	**427.38**	**444.54**
	Miami-Dade County DSS Total	**3.61**	**3.77**	**3.93**	**4.10**	**4.26**
	Miami-Dade County Total	**378.75**	**396.05**	**414.11**	**431.48**	**448.80**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	16.96	18.27	19.59	20.98	22.37
	Monroe County PWS Total	**16.96**	**18.27**	**19.59**	**20.98**	**22.37**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**16.96**	**18.27**	**19.59**	**20.98**	**22.37**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**0.19**	**0.20**	**0.20**	**0.21**	**0.22**
	Hendry County Total	**0.19**	**0.20**	**0.20**	**0.21**	**0.22**
LEC Planning Area PWS Total		**858.48**	**900.97**	**942.30**	**986.96**	**1027.16**
LEC Planning Area DSS Total		**19.09**	**19.28**	**19.71**	**19.63**	**19.80**
LEC Planning Area Total		**877.57**	**920.25**	**962.01**	**1,006.59**	**1,046.96**

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Table A-10. Gross water demand projections for PWS and DSS under average rainfall conditions in the LEC Planning Area.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.08	0.00	0.00	0.00	0.00
	Boca Raton, City of	42.19	44.81	47.43	50.05	52.67
	Boynton Beach, City of	14.23	15.11	16.00	16.88	17.76
	Delray Beach Water and Sewer Department, City of	15.27	16.22	17.16	18.11	19.05
	Glades Utility Authority	6.61	7.03	7.43	7.85	8.26
	Golf, Village of	0.51	0.54	0.57	0.60	0.64
	Highland Beach, Town of	1.85	1.96	2.08	2.19	2.32
	Jupiter, Town of	16.61	18.40	20.21	22.02	23.81
	Lake Worth Utilities, City of	4.74	5.05	5.34	5.64	5.93
	Lantana, Town of	1.84	1.96	2.07	2.18	2.30
	Manalapan, Town of	1.34	1.42	1.51	1.58	1.67
	Mangonia Park, Town of	0.33	0.35	0.37	0.40	0.42
	Maralago Cay	0.19	0.20	0.22	0.23	0.24
	Palm Beach County Water Utilities Department	59.91	63.63	67.29	71.07	74.79
	Palm Springs, Village of	4.00	4.25	4.50	4.74	4.99
	Riviera Beach, City of	6.66	7.08	7.49	7.91	8.31
	Seacoast Utility Authority	18.09	19.22	19.13	21.47	21.25
	Tequesta, Village of	3.34	3.60	3.85	4.10	4.36
	Wellington Public Utilities Department	6.74	7.15	7.57	7.99	8.40
	West Palm Beach Public Utilities, City of	28.98	31.12	32.58	35.47	37.66
	Palm Beach County PWS Total	233.51	249.10	262.80	280.48	294.83
	Palm Beach County DSS Total	**13.41**	**13.39**	**13.91**	**13.35**	**13.33**
	Palm Beach County Total	246.92	262.49	276.71	293.83	308.16
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services (District 1)	7.63	7.89	8.11	8.38	8.58
	Broward County Water & Wastewater Services (District 2A)	12.69	13.00	13.30	13.60	13.92
	Cooper City Utility Department, City of	3.45	3.61	4.04	3.91	4.07
	Coral Springs, City of	6.96	7.12	7.29	7.46	7.63
	Coral Springs Improvement District	3.96	4.06	4.15	4.24	4.34
	Dania Beach, City of	2.42	2.48	2.54	2.59	2.66
	Davie, Town of	4.10	6.46	8.83	11.19	13.56
	Deerfield Beach, City of	10.10	10.34	10.59	10.83	11.07
	Fort Lauderdale, City of	44.95	46.02	47.08	48.15	49.22
	Hallandale Beach, City of	5.55	5.68	5.81	5.95	6.08
	Hillsboro Beach, Town of	0.69	0.70	0.72	0.74	0.75
	Hollywood, City of	23.99	24.76	25.51	26.26	27.02
	Lauderhill, City of	5.76	5.89	6.04	6.17	6.31

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Table A-10. Continued.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	5.94	6.08	6.23	6.38	6.51
	Miramar, City of	12.46	12.91	13.38	13.83	14.28
	North Lauderdale, City of	2.60	2.66	2.73	2.79	2.85
	North Springs Improvement District	4.50	4.61	4.72	4.83	4.93
	Parkland Utilities, Inc.	0.25	0.26	0.27	0.27	0.28
	Pembroke Pines, City of	12.14	12.42	12.72	13.01	13.30
	Plantation, City of	14.14	14.59	15.03	15.48	15.93
	Pompano Beach, City of	14.55	14.89	15.25	15.60	15.19
	Royal Utility Corporation	0.33	0.33	0.34	0.35	0.36
	Seminole Tribe of Florida Utility	1.13	1.15	1.18	1.21	1.24
	Sunrise, City of	28.39	29.07	29.75	30.44	31.12
	Tamarac, City of	6.21	6.36	6.50	6.65	6.80
	Tindall Hammock Irrigation and Soil Conservation District	0.44	0.45	0.46	0.47	0.48
	Broward County PWS Total	**235.33**	**243.79**	**252.57**	**260.78**	**268.48**
	Broward County DSS Total	**0.97**	**1.00**	**0.73**	**1.04**	**1.06**
	Broward County Total	**236.32**	**244.79**	**253.32**	**261.82**	**269.54**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.23	0.24	0.25	0.26	0.27
	Florida City Water and Sewer Department	1.78	1.86	1.94	2.02	2.10
	Homestead, City of	10.72	11.21	11.70	12.20	12.69
	Miami-Dade Water & Sewer Department	308.67	322.77	336.87	350.98	365.08
	North Miami, City of	11.00	11.50	12.00	12.51	13.01
	North Miami Beach, City of	22.60	23.63	25.45	26.52	27.58
	Miami-Dade County PWS Total	**355.00**	**371.21**	**388.21**	**404.49**	**420.73**
	Miami-Dade County DSS Total	**3.46**	**3.61**	**3.77**	**3.93**	**4.08**
	Miami-Dade County Total	**358.46**	**374.82**	**391.98**	**408.42**	**424.81**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	17.68	19.04	20.42	21.87	23.32
	Monroe County PWS Total	**17.68**	**19.04**	**20.42**	**21.87**	**23.32**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**17.68**	**19.04**	**20.42**	**21.87**	**23.32**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**0.19**	**0.20**	**0.20**	**0.21**	**0.22**
	Hendry County Total	**0.19**	**0.20**	**0.20**	**0.21**	**0.22**
LEC Planning Area PWS Total		841.52	883.14	924.00	967.62	1,007.36
LEC Planning Area DSS Total		**18.03**	**18.20**	**18.61**	**18.53**	**18.69**
LEC Planning Area Total		859.55	901.34	942.61	986.15	1,026.05

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Table A-11. Gross water demand projections for PWS and DSS under 1-in-10 year drought conditions in the LEC Planning Area.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.09	0.00	0.00	0.00	0.00
	Boca Raton, City of	46.79	49.69	52.60	55.51	58.41
	Boynton Beach, City of	15.78	16.76	17.74	18.72	19.70
	Delray Beach Water and Sewer Department, City of	16.93	17.99	19.03	20.08	21.13
	Glades Utility Authority	7.33	7.80	8.24	8.71	9.16
	Golf, Village of	0.57	0.60	0.63	0.67	0.71
	Highland Beach, Town of	2.05	2.17	2.31	2.43	2.57
	Jupiter, Town of	18.42	20.41	22.41	24.42	26.41
	Lake Worth Utilities, City of	5.26	5.60	5.92	6.25	6.58
	Lantana, Town of	2.04	2.17	2.30	2.42	2.55
	Manalapan, Town of	1.49	1.57	1.67	1.75	1.85
	Mangonia Park, Town of	0.37	0.39	0.41	0.44	0.47
	Maralago Cay	0.21	0.22	0.24	0.26	0.27
	Palm Beach County Water Utilities Department	66.44	70.57	74.62	78.82	82.94
	Palm Springs, Village of	4.44	4.71	4.99	5.26	5.53
	Riviera Beach, City of	7.39	7.85	8.31	8.77	9.22
	Seacoast Utility Authority	20.06	21.31	21.22	23.81	23.57
	Tequesta, Village of	3.70	3.99	4.27	4.55	4.84
	Wellington Public Utilities Department	7.47	7.93	8.40	8.86	9.32
	West Palm Beach Public Utilities, City of	32.34	34.51	36.13	39.34	41.76
	Palm Beach County PWS Total	258.97	276.24	291.44	311.07	326.99
	Palm Beach County DSS Total	**14.87**	**14.85**	**15.43**	**14.81**	**14.78**
	Palm Beach County Total	273.84	291.09	306.87	325.88	341.77
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services (District 1)	8.42	8.69	8.93	9.23	9.45
	Broward County Water & Wastewater Services (District 2A)	13.97	14.31	14.64	14.97	15.33
	Cooper City Utility Department, City of	3.80	3.97	4.45	4.30	4.48
	Coral Springs, City of	7.66	7.84	8.03	8.21	8.40
	Coral Springs Improvement District	4.36	4.47	4.57	4.67	4.78
	Dania Beach, City of	2.66	2.73	2.80	2.85	2.93
	Davie, Town of	4.51	7.11	9.72	12.32	14.93
	Deerfield Beach, City of	11.12	11.38	11.66	11.92	12.19
	Fort Lauderdale, City of	49.49	50.67	51.84	53.01	54.19
	Hallandale Beach, City of	6.11	6.25	6.40	6.55	6.69
	Hillsboro Beach, Town of	0.76	0.77	0.79	0.81	0.83
	Hollywood, City of	26.41	27.26	28.09	28.91	29.75
	Lauderhill, City of	6.34	6.48	6.65	6.79	6.95

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Table A-11. Continued.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	6.54	6.69	6.86	7.02	7.17
	Miramar, City of	13.72	14.21	14.73	15.23	15.72
	North Lauderdale, City of	2.86	2.93	3.01	3.07	3.14
	North Springs Improvement District	4.95	5.08	5.20	5.32	5.43
	Parkland Utilities, Inc.	0.28	0.29	0.30	0.30	0.31
	Pembroke Pines, City of	13.37	13.67	14.00	14.32	14.64
	Plantation, City of	15.57	16.06	16.55	17.04	17.54
	Pompano Beach, City of	16.02	16.39	16.79	17.18	16.72
	Royal Utility Corporation	0.36	0.36	0.37	0.39	0.40
	Seminole Tribe of Florida Utility	1.24	1.27	1.30	1.33	1.37
	Sunrise, City of	31.26	32.01	32.75	33.51	34.26
	Tamarac, City of	6.84	7.00	7.16	7.32	7.49
	Tindall Hammock Irrigation and Soil Conservation District	0.48	0.50	0.51	0.52	0.53
	Broward County PWS Total	**259.08**	**268.39**	**278.12**	**287.09**	**295.62**
	Broward County DSS Total	**1.07**	**1.10**	**0.80**	**1.15**	**1.17**
	Broward County Total	**260.15**	**269.49**	**278.92**	**288.24**	**296.79**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.25	0.26	0.27	0.28	0.29
	Florida City Water and Sewer Department	1.93	2.02	2.11	2.20	2.28
	Homestead, City of	11.65	12.19	12.72	13.26	13.79
	Miami-Dade Water & Sewer Department	335.52	350.85	366.18	381.52	396.84
	North Miami, City of	11.96	12.50	13.04	13.60	14.14
	North Miami Beach, City of	24.57	25.69	27.66	28.83	29.98
	Miami-Dade County PWS Total	**385.88**	**403.51**	**421.98**	**439.69**	**457.32**
	Miami-Dade County DSS Total	**3.76**	**3.92**	**4.10**	**4.27**	**4.43**
	Miami-Dade County Total	**389.64**	**407.43**	**426.08**	**443.96**	**461.75**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	18.23	19.63	21.05	22.55	24.04
	Monroe County PWS Total	**18.23**	**19.63**	**21.05**	**22.55**	**24.04**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**18.23**	**19.63**	**21.05**	**22.55**	**24.04**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**0.20**	**0.21**	**0.21**	**0.22**	**0.23**
	Hendry County Total	**0.20**	**0.21**	**0.21**	**0.22**	**0.23**
LEC Planning Area PWS Total		922.16	967.77	1,012.57	1,060.40	1,103.97
LEC Planning Area DSS Total		**19.90**	**20.08**	**20.54**	**20.45**	**20.61**
LEC Planning Area Total		942.06	987.85	1,033.11	1,080.85	1,124.58

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AGRICULTURAL SELF-SUPPLY

Agriculture holds a unique place of importance in the LEC Planning Area's, the state of Florida's, and the United States' economy. The LEC Planning Area hosts the regions collectively known as the nation's "Winter Bread Basket" and "Salad Bowl." In addition, the region's nursery/ornamental industry is the largest in the state and second largest in the country. The southern Miami-Dade County portion of the LEC Planning Area has an ideal subtropical climate that is necessary for the production of numerous varieties of tropical fruits, some of which do not grow elsewhere in the country. These fruits include mangos, avocados, carambola, lychees, longan, mamey sapote, passion fruit, and other varietal farms that meet this specialized demand (DCFB 2012).

Background

The following facts from the *2007 Census of Agriculture for Florida* (USDA-NASS 2007) demonstrate the importance of agriculture to the LEC Planning Area:

- Palm Beach County ranked first in the United States in total sugarcane acres under cultivation and accounted for 77 percent of the total sugarcane acreage in Florida.
- Palm Beach County ranked first in Florida in the value of vegetables, melons, potatoes, and sweet potatoes produced ($409 million).
- Palm Beach County ranked first in Florida in combined vegetable acreage harvested for sale (79,792 acres).
- Miami-Dade County led the state and ranked second in the United States in the production of nursery and greenhouse/nursery products, producing $494 million in sales.
- Hendry County ranked first in terms of acres devoted to orange production and the value of fruits, tree nuts, and berries produced ($407.7 million).
- Hendry County ranked second in sugarcane acres under cultivation in Florida (note that only the eastern part of Hendry County falls within the LEC Planning Area).

Projection Methodology

The land use information used to develop the demand estimates includes irrigated agricultural acreage by crop type and by county or portions of a county. The projections assume option lands originally purchased and contemplated for Everglades restoration projects will, where applicable, continue to be used for agricultural purposes in the absence of detailed project restoration plans and schedules.

Agricultural water use includes water for irrigated, commercially grown crop categories including 1) citrus, 2) field crops – sugarcane, 3) field crops – other, 4) vegetables, melons,

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and berries, 5) sod production, 6) greenhouse/nursery, 7) other fruits and nuts, and 8) improved pasture. **Figure A-1** shows these categories with some examples of the major crop types. Due to the complexity of developing agricultural projections and uncertainty as to the future demands on current citrus lands, two scenario ranges of acreage and water demand were used to estimate the agricultural projections for this update. However, under conservative water management planning principles, the acres and demands associated with the high range of the scenario are reported in this update.

Agricultural projections were based on best available data at the time this update was developed and the estimates of existing and projected irrigated acres. AGR Self-Supply projections were developed in coordination with staff from government agencies and agricultural stakeholders.

The AGR Self-Supply demand assessment uses acreage estimates developed as part of the overall GIS land use analysis. To estimate the demand associated with the acreage for each crop, information from SFWMD's water supply assessments and previous hydrologic modeling efforts were used to identify soil types, growing seasons, and irrigation system types and efficiencies. For areas partially within the LEC Planning Area, land use maps and acreage tallies in specific regions were used to apportion total county crop acreages to areas within the Everglades Agricultural Area (EAA) and Western Basins. Where appropriate, this was accomplished by assuming changes in acreage proportional to the most recently reported acreage ratios. Acreage ratios were developed with the use of SFWMD's land use maps.

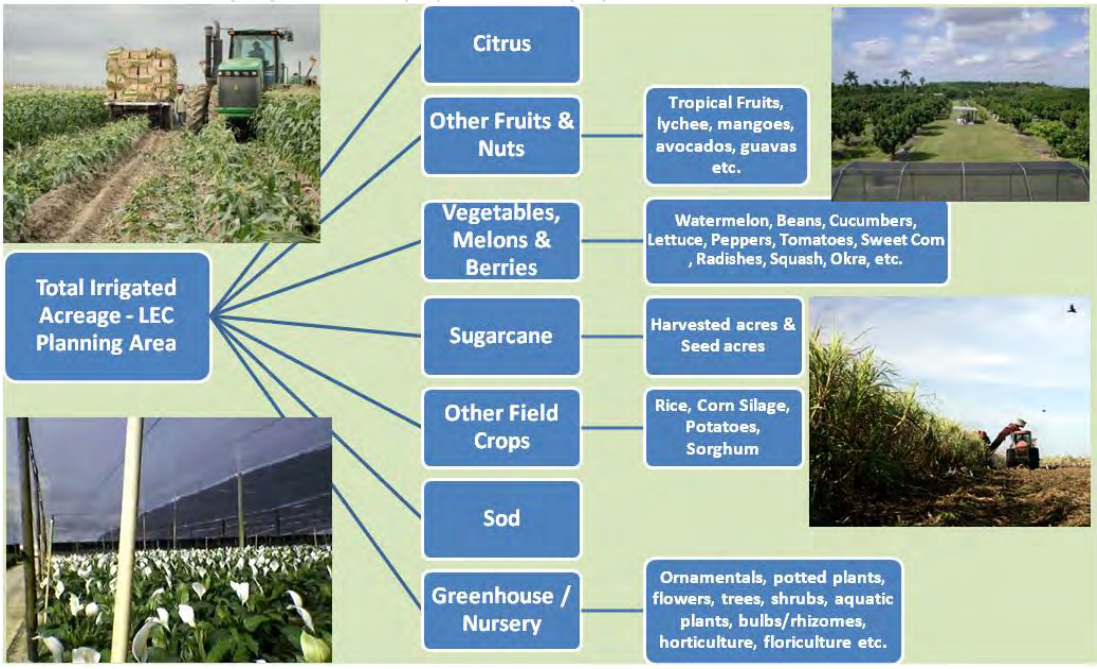

Figure A-1. Commercially grown crops in the LEC Planning Area.

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The projection method involved systematically examining trends in land use and crop type distributions since the 2005–2006 LEC Plan Update was developed. The projections are first based on compiling historic agricultural census acres at five-year intervals (by county and crop type) and comparing these figures to longer-term irrigated acreage patterns compiled by USGS. For large crops such as sugarcane, the United States Department of Agriculture (USDA) also conducts annual surveys of irrigated acres by county. These surveys were combined with census data to create long-term time series and showed important trends revealing how irrigated acres have been affected over time by major noneconomic events such as hurricanes, droughts, and restoration and water management projects. Current acreage from regulatory permitting databases and property tax parcel databases are then compared to fill in recent years and reveal trends since the 2007 agricultural census (USDA–NASS 2007). Numerous factors and variables were considered that could potentially affect the future acreage projections. Among these factors were the following:

- County land use plans and future land use targets including comprehensive master development plans, official maps, stakeholder plans, and special area plans
- Regional specialization (i.e., subtropical climate and long-established fruit orchards)
- Macro- and microeconomic conditions
- Supply, demand, and commodity price trends
- Consumption trends (tastes and preferences), pounds consumed per person over time, and production patterns (yields per acre and imports)
- Crop special studies and future scenario outlooks from the University of Florida's Institute of Food and Agricultural Sciences including their Citrus Research and Education Center, USDA, Florida Department of Agriculture and Consumer Services, etc.
- Inputs on market conditions and trends from growers, cooperatives and participants
- SFWMD land management and permitting including acquisitions and projects completed since the last plan update, areas targeted for land acquisition, current leasing arrangements, permitted acreage, and permit expirations
- Comparisons of comprehensive development plan acreage to projected acres

The agricultural demand assessment developed acreage estimates from the following data sets, information, and sources:

- USGS time series of irrigated acres by county by crop type
- USDA five-year census and annual surveys for select crops
- County-level data and yearly commercial citrus inventories completed since the *2007 Census of Agriculture for Florida* (USDA-NASS 2007) were used or considered when available

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- 2005–2006 LEC Plan Update (SFWMD 2007)
- SFWMD's Water Use Regulatory Database and permit expiration dates
- County land use appraiser/assessment files
- USDA Economic Research Service information, including market outlooks for select crops, agricultural projections to 2020, select yearbooks with historic information (i.e., vegetables and melons yearbook to assess consumption trends), and inputs and feedback from agricultural economists
- Local agricultural extension offices
- University of Florida's Institute of Food and Agricultural Sciences
- Florida Department of Agriculture and Consumer Services' *Florida Agriculture by the Numbers* annual publications
- County agricultural economic development coordinators
- Florida Farm Bureau and other agricultural stakeholders
- Other special reports produced by research groups (i.e., Florida Citrus Commission and Florida Department of Citrus) and topical reports on agricultural land use and market trends.
- Commodity price reports and trends (i.e., World Bank pink sheets)
- SFWMD's acreage estimates developed as part of GIS agricultural land use/crop type analysis (1999 and 2004)

A hierarchy of data preference was used for developing agricultural water use projections, starting with the *2007 Census of Agriculture for Florida* county-level data (USDA-NASS 2007). Census data at five-year intervals going back to 1997 reveal important trends by crop type for each county. Where available for select crops, census data were supplemented by annual surveys also prepared by USDA by county. In addition, longer-term irrigated acreage data compiled by the USGS, going back to 1985, was also referenced. Where census data was not consistently available for each crop in each county for every year, the 2007 census data was supplemented by other above named sources to fill in and provide informative links to post-census years and more recent trends. Comparisons to SFWMD's permitted acreage and permit dates of expiration were also useful to compare acreage distributions for more recent years leading up to 2010. Recent permit renewals by crop type were also useful to signal market preferences and growers' future expectations. Land use acreage data obtained from county appraiser and assessment files was also referenced for post-census years. The data and reports were also supplemented by field research where possible. For example, the LEC Planning Area agricultural projections subteam toured the Redlands area of southern Miami-Dade County and noted operations that did not survive the 2008–2009 recession, but would have been included in the 2007 census. When data from the listed sources were insufficient for indicating trends and no empirical knowledge of likely future changes in a crop's acreage was available, the acreage for that crop category was projected to remain at its most recently reported level.

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AGR Self-Supply demand calculations for this update applied results from the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model, which uses climatic data from 1965–2000. These same model data were also used in the 2005–2006 LEC Plan Update. The AFSIRS model calculates the net irrigation requirements for each crop category and irrigation system. As described in the **Recreational/Landscape Self-Supply** section of this appendix, the net irrigation requirement reflects an estimate of the amount of water, expressed in inches per year, that should be delivered to a plant's root zone to sustain yield. The gross irrigation requirement is the amount of water that must be withdrawn from the source in order to be delivered to the plant's root zone. It includes both the net irrigation requirement and the losses incurred irrigating the plant's root zone. Irrigation application efficiency, as a modeled factor, refers to the average percent of total water applied that is delivered to the plant's root zone.

This relationship is expressed as follows:

Gross Irrigation Requirement = Net Irrigation Requirement/Irrigation Efficiency

AFSIRS calculates irrigation requirements for an average rainfall year and a year with 1-in-10 year drought conditions. Historical weather data from rainfall stations that most accurately represent the average rainfall and 1-in-10 year drought conditions for each crop and county combination are used to calculate the irrigation requirements.

Projections of gross irrigation demand are based on an assumed or estimated irrigation system types obtained from SFWMD's Regulatory Permitting Database. The effect of the corresponding irrigation efficiency is based on the interpretation of current ratios and trends. There are three basic types of irrigation systems used in South Florida crop production: 1) seepage (generally described as gravity flow systems), 2) sprinklers, and 3) low volume micro irrigation systems. A weighted irrigation efficiency factor was calculated for each crop type category based on the percent use by acres for the three different irrigation systems, as reported in SFWMD's Water Use Permit Regulatory Database (**Table A-12**). The weighted irrigation efficiency factors reflect current land/crop management practices and new systems put in place for acres under management within the permitting database. The values shown in **Table A-12** are default average values from the AFSIRS system. For example, recycling water within the EAA results in higher irrigation efficiencies: with water reuse, the irrigation efficiency within the EAA is effectively 75 percent (for the applicable acres compared to the default value shown below) based on regulatory information and renewals. The final "weighted average" irrigation efficiency factor (weighted by acres that recover/recycle water) reflect the combined acres and irrigation efficiencies identified for all acres within the regions based on data within the regulatory permitting database.

Table A-12. Estimated irrigation efficiency for each type of irrigation system. [a]

Irrigation Category	Irrigation Efficiency
Low volume micro irrigation	0.85
Seepage (gravity flow)	0.50
Sprinkler	0.75

a. Reflects AFSIRS default values before weighting by crop acres per irrigation type.

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Water use in the LEC Planning Area could also decline with expected gains in irrigation efficiency. Researchers noticed trends in application efficiencies over time generally creeping upward reflecting new technologies, practices, and equipment. It is anticipated that some efficiency gains will be made for select crops within the region as older equipment is retired and replaced since the projection covers a twenty-year planning horizon. Researchers working within the LEC Planning Area continue to experiment with practices, equipment, and techniques to improve irrigation efficiency (Migliaccio 2011, Schaible and Aillery 2012).

Available water capacity and depth of soil directly affect the effectiveness of rainfall infiltration, which is considered by the AFSIRS model. The default AFSIRS soil database includes a generic sandy soil. However, the user can modify input files to include the soil type existing within the region or area where the crop is grown. While the soils can vary considerably across a particular region, the main or predominant soil group type is chosen to reflect the type within that particular region.

Example of Water Demand Calculations

A detailed example of water demand calculation procedures is presented in this section. First, the acreage of each crop in each county within the LEC Planning Area was determined. Next, the area-weighted irrigation efficiency (**Table A-12**) for the crop type in a particular county was calculated from irrigation system information contained in SFWMD's Water Use Regulatory Database.

Water use permit data categorized as citrus for a given county show that 23 percent of permittees use low volume irrigation systems, 67 percent use sprinkler systems, and 9 percent use seepage systems. Using the permit data, the area-weighted irrigation efficiency is as follows:

IRR_EFF = (0.23 x 0.85) + (0.67 x 0.75) + (0.09 x 0.50) / (0.23 + 0.67 + 0.09) = 75 percent

Of the water withdrawn (gross demand) for citrus irrigation in the given county, 75 percent is available to the crop. Losses occur due to evaporation, drainage, and line system leakage.

Assuming 90 percent use low volume irrigation systems and 10 percent use seepage (gravity flow) systems, the area-weighted irrigation efficiency based on this data is as follows:

IRR_EFF = (0.9 x 0.85) + (0.1 x 0.5) = 81.5 percent

Based on this data, 81.5 percent of the water withdrawn (gross demand) from a surface water or groundwater source is available to the crop.

The AFSIRS runs were completed for both the 2005–2006 LEC Plan Update and this plan update. The AFSIRS output is given as the net irrigation requirement in inches per year, which is the amount of water the crop needs in addition to rainfall. The input to the model is daily rainfall and ET rates in inches. The model results for the 2005–2006 LEC Plan Update

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used climatic input data for 1965 through 2000. Based on the rainfall and ET data and calculated irrigation requirements, the AFSIRS outputs include irrigation requirements for an average rainfall and 1-in-10 year drought conditions.

Continuing with the county citrus crop example, the average rainfall and 1-in-10 year drought conditions net irrigation requirements calculated by the AFSIRS model are 10.82 inches per year and 16.01 inches per year, respectively. The AFSIRS average irrigation requirement and 40,000 acres are used to estimate the gross irrigation demand for an average rainfall year for citrus in the county as follows:

Gross Irrigation Requirement (MGD) = Net Irrigation Requirement (MGD)/ Irrigation Efficiency

$$\textbf{Gross Irrigation Requirement (MGD)} = \frac{10.82\ in/_{yr} \times 40{,}000\ acres \times \left[{}^{1\ yr}/_{365\ days}\right] \times \left[{}^{1ft}/_{12\ in}\right] \times \left[{}^{43{,}560ft^2}/_{acre}\right] \times \left[{}^{7.4805\ gal}/_{ft^3}\right]}{0.815} \times 10^{-6} \approx 40 \text{ MGD}$$ [2]

Projection Results by Crop Type

Citrus

In the LEC Planning Area, most of the citrus acreage is located in Palm Beach County's Coastal Subbasin and the Western Basins located in Hendry County. Citrus acreage data were gathered from the *2007 Census of Agriculture for Florida* (USDA-NASS 2007). These data focus on citrus production and not on young groves not yet in production, inactive groves, or abandoned groves. The projections take into account the forthcoming C-139 Annex Restoration project. Accordingly, the acreage projections reduce 10,774 acres of cultivated citrus within the Western Basins by 2018 to accommodate this project. Because of the uncertainty of citrus recovery from greening and canker, two acreage projection scenarios (high and low growth rates) were developed (**Figure A-2**).

The scenarios were based on research communicated at a citrus industry research symposium[3]. The high acreage scenario growth rates applied in the projections assume that over the short term, the trend in productive acreage losses will continue. However, restoration of active bearing and nonbearing productive acreage is assumed to occur between 2015 and 2020 and rise throughout the projection period. Acreage in Palm Beach County's Coastal Subbasin is expected to rise by 240 acres over the twenty-year planning horizon. The Agricultural Reserve Area has been identified as a region that could accommodate more production in line with stakeholder preferences. With the exception of the C-139 Annex Restoration project, no significant increase or decrease in acreage is projected for the other subbasins.

[2] Key for equation: in – inch; yr – year; ft – foot; gal – gallon
[3] Future of the Global Orange Juice Industry – Citrus Research and Education Center, Lake Afred, Florida, April 8, 2010.

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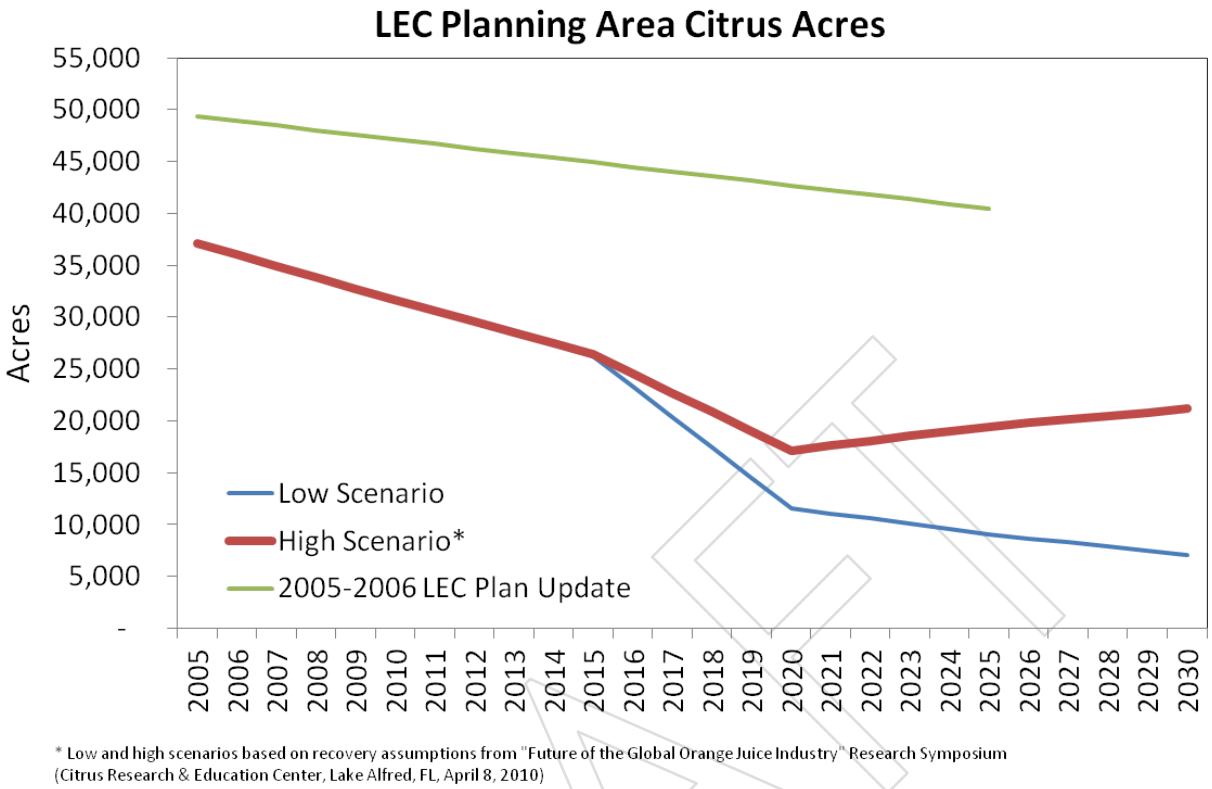

Figure A-2. Citrus acreage within the LEC Planning Area using low and high projection scenarios as well as citrus acreage projected in the 2005–2006 LEC Plan Update.

Table A-13 presents the acreage projections for the high growth scenario, the projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

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Table A-13. Gross irrigation requirements for citrus crop acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	2,463 acres	2,055 acres	2,191 acres	2,484 acres	2,704 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	9.9 inches [a]	3.0	2.1	1.9	1.8	2.0
1-in-10 year drought	15.4 inches [a]	4.5	3.3	3.0	3.0	3.3
Palm Beach County – EAA						
	Irrigated Acreage	11 acres	11 acres	11 acres	11 acres	11 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	8.9 inches	0.01	0.01	0.01	0.01	0.01
1-in-10 year drought	16.3 inches	0.03	0.03	0.03	0.03	0.03
Miami-Dade County						
	Irrigated Acreage	717 acres	599 acres	639 acres	724 acres	788 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	11.7 inches	0.8	0.6	0.7	0.7	0.8
1-in-10 year drought	17.9 inches	1.2	1.0	1.0	1.1	1.2
Hendry County – Western Basins						
	Irrigated Acreage	28,437 acres	23,745 acres	14,321 acres	16,226 acres	17,654 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	15.5 inches	43.7	35.1	20.1	22.0	24.0
1-in-10 year drought	20.8 inches	64.6	53.9	32.5	36.9	40.1
LEC Planning Area Totals						
	Total Irrigated Acreage	31,628 acres	26,410 acres	17,162 acres	19,445 acres	21,157 acres
		Gross Demand (MGD)				
Total average rainfall year		**47.5**	**37.9**	**22.7**	**24.5**	**26.8**
Total 1-in-10 year drought		**70.3**	**58.2**	**36.6**	**41.1**	**44.6**

a. Efficiency improvements to the irrigation systems are the reason for the decrease in citrus projected gross demand while the acres in citrus production increased.

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Field Crops – Sugarcane

Sugarcane is the principal field crop grown within the LEC Planning Area. Because of its dominance in terms of acreage, sugarcane is discussed separately from "other field crops." For background perspective, **Figure A-3** shows the percentage distribution of agricultural acres by crop type category within the LEC Planning Area.

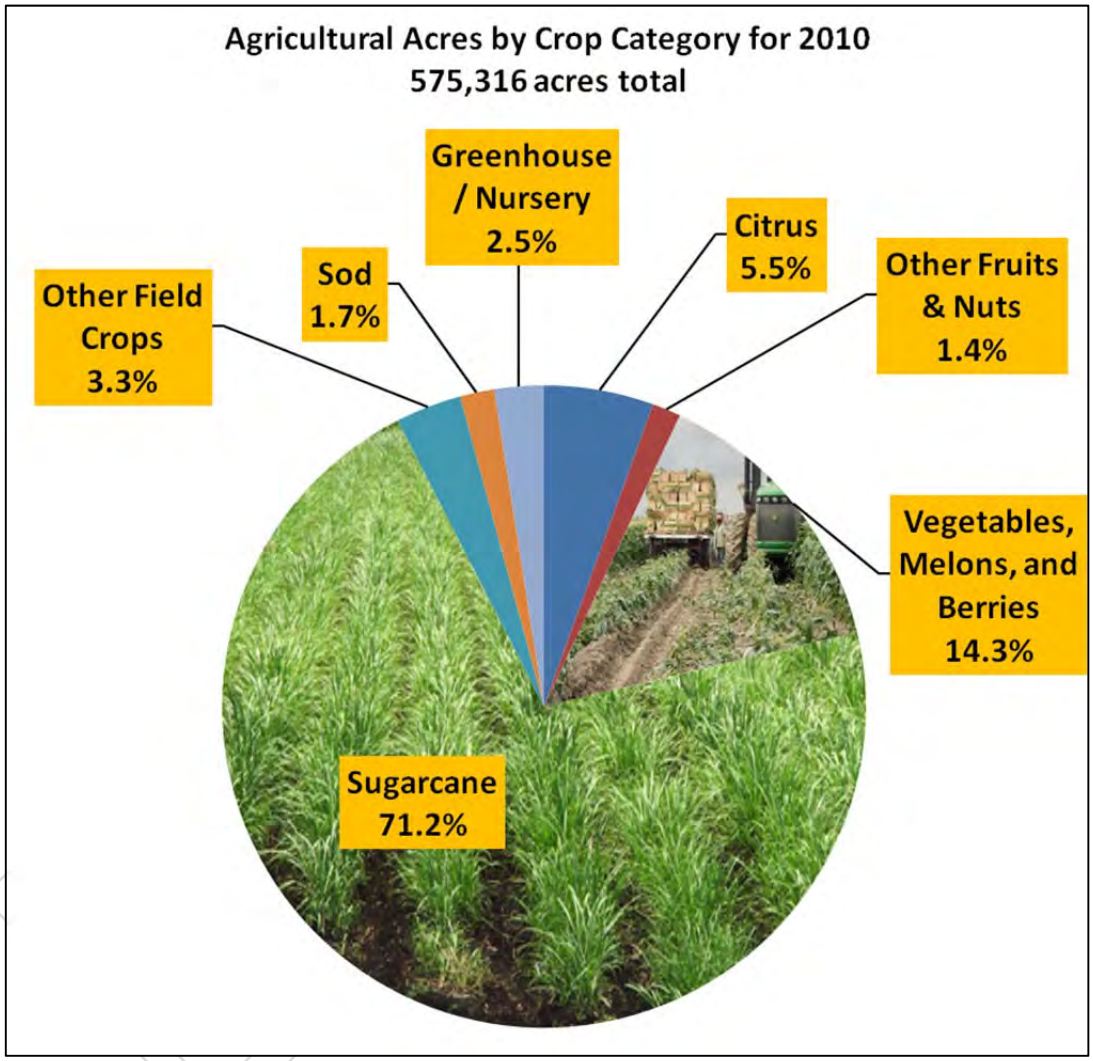

Figure A-3. Percentage distribution of agricultural acres by crop type within the LEC Planning Area.

In the 2005–2006 LEC Plan Update, historical sugarcane acreage data were gathered from annual volumes of the Florida Agricultural Statistics Service's *Field Crops Summary*. For this update, a historical time series of irrigated sugarcane acreage by county was obtained from USGS from 1985 to 2005. This time series was then compared to a time series of USDA – National Agriculture Statistic Service's sugarcane harvested acres from 1985 to 2009. These two data sources were then cross-referenced to 2011 acres obtained from SFWMD's Water Use Regulatory Database and acreage coverage from current county land use maps. The projections assume that SFWMD option lands will continue to be leased for cultivation over the twenty-year planning horizon in the absence of more defined project implementation

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plans and schedules. Historically, productive agricultural acreage within the LEC Planning Area fluctuated based on commodity demands, growth, urban development, environmental and water management requirements for land, and variations in weather events (climate). The EAA accounts for the majority of the agricultural acreage within the LEC Planning Area. The EAA has been characterized by relatively more stable fluctuations in acres, within a narrower range compared to peripheral acres in the LEC Planning Area that, in past years, have been absorbed by urban development. For example, in Palm Beach County, sugarcane is the dominant crop within the EAA—USDA's agricultural census recorded irrigated acres fluctuating between 300,000 and 375,000 from 1985 to 2009 (**Figure A-4**). The 75,000-acre band defining the range boundaries equates to be a fluctuation of 3,125 acres per year on average over this twenty-four-year period.

The band also reflects implementation of an adaptive and more strategic cultivation practice to maintain and maximize crop yields over time. In the past, the practice was to keep all acres in cultivation. However, yields declined. As a result, many farmers took some fields out of production and kept them fallow over one to two growing seasons to increase yields. This evolved into the current practice of crop rotation in addition to fallowing, where varying crops are rotated from year to year and include sugarcane, rice, corn, and other vegetables over 10 to 15 percent of the land. This practice also minimizes soil subsidence and cost-effectively uses nutrients retained in the soil.

The current plan update expects that irrigated acres in the EAA will remain stable. Accordingly, the acre projections within the EAA are based on the currently permitted acres for 2030, approximately 458,210 acres.

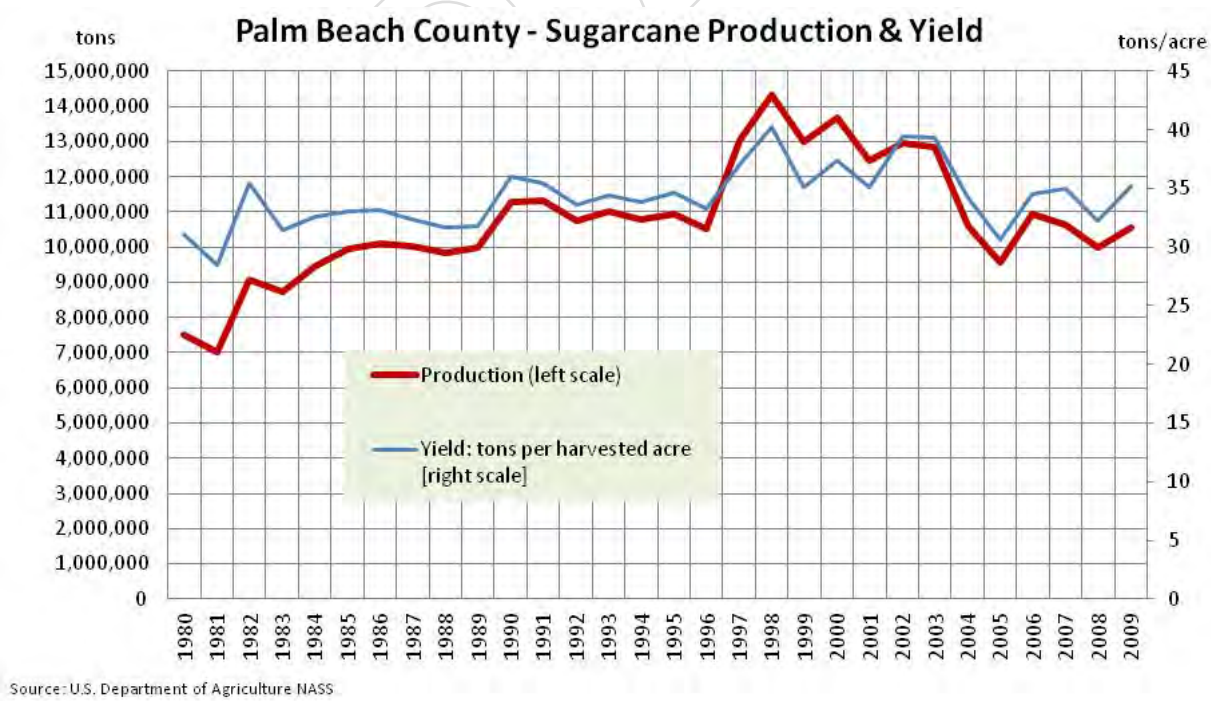

Figure A-4. Sugarcane production and yield history for Palm Beach County.

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Sugarcane is initially propagated by planting stalk cuttings and four harvests can be obtained from a planting. The first harvest takes place approximately 13 months after planting and then three ratoons (shoots from the root of the plant after it has been cropped) provide the harvest during the next three years. Sugar production per unit of land surface declines gradually with each harvest. In approximately four years, the increased yields associated with replanting outweigh the lower costs of obtaining the crop from ratoons. Because land may lie fallow for several months between crop rotation cycles, approximately 20 percent of the land associated with sugarcane production will not be harvested in any given year. Additionally, about 1 in 10 acres of sugarcane is grown for seed production. USDA's surveys report acres allotted to "seed" production, which means acreage devoted to the replanting of stalk cuttings for plant propagation.

The largest percentage of sugarcane acreage in South Florida is grown in the muck soils of the EAA within Palm Beach and Hendry counties. In addition, significant acreage occurs on the "sand lands" in Hendry and Glades counties, primarily in the LEC Planning Area.

Flood and seepage irrigation is the predominant irrigation system for sugarcane. As a result of special water management and best management practices observed within the EAA, and in consultation with the industry, an effective irrigation efficiency greater than the typical 50 percent AFSIRS model default was applied. A weighted-average efficiency factor (weighted by acres with recycling/reuse irrigation practices obtained from permit files; with water reuse, the irrigation efficiency within the EAA is effectively 75 percent) was applied in the water demand projections. This adjustment was consistent with water use permit renewals for agricultural users within the EAA employing a flood irrigation system. Water use per acre within each basin also remains the same through the twenty-year planning horizon; therefore, water use parallels the change in acreage.

Irrigation requirements are based on the unique variables and properties of the EAA compared to other areas that are modeled by the AFSIRS model. Soil types and ET are the most sensitive variables within the AFSIRS model. The EAA muck soils result in a relatively smaller average annual net irrigation requirement (NIR) compared to sandier soils in other parts of the LEC Planning Area, because the muck retains more moisture and has less runoff than other more porous soil types. Consequently, if the average annual NIRs are compared between the EAA in Palm Beach County and the Hendry County Western Basins area (that was modeled with sandy soils) to the 1-in-10 NIR, the difference between these two values for Hendry will be smaller. Hendry starts from a higher NIR average because of the sandier soil compared to the EAA located in Palm Beach County (**Table A-14**).

Table A-14. Comparison of sugarcane NIR for average and 1-in-10 years.

County and Area	Average NIR (inches)	1-in-10 NIR (inches)	1-in-10 NIR/ Average NIR
Hendry County Western Basins	16.1	21.9	1.36
Palm Beach County EAA	6.0	15.4	2.57

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Table A-15 presents the acreage projections, projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Biofuels

The portion of Hendry County within the LEC Planning Area, which is known for sugarcane, also hosts crops grown for use as biofuel feedstocks. These crops are used both to sustain cogeneration power requirements for sugarcane processing (i.e., residues are combined with bagasse and wood chips to fire boilers) and within integrated operations for ethanol production. Crops grown for use as biomass feedstocks (i.e., sweet sorghum) and for ethanol production are one of the emerging trends within this region of the planning area and the acreage falls under the "Field Crops – Sugarcane" and "Field Crops – Other" categories within this plan.

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Table A-15. Gross irrigation requirements for sugarcane acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	1,900 acres	1,900 acres	1,900 acres	1,900 acres	1,900 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	6.0 inches	0.8	0.8	0.8	0.8	0.8
1-in-10 year drought	15.4 inches	2.2	2.2	2.2	2.2	2.2
Palm Beach County – EAA						
	Irrigated Acreage	368,622 acres	368,622 acres	368,622 acres	368,622 acres	368,622 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	6.0 inches	329.0	329.0	329.0	329.0	329.0
1-in-10 year drought	15.4 inches	844.5	844.5	844.5	844.5	844.5
Hendry County – EAA						
	Irrigated Acreage	25,611 acres	25,611 acres	25,611 acres	25,611 acres	25,611 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	6.0 inches	22.9	22.9	22.9	22.9	22.9
1-in-10 year drought	15.4 inches	58.7	58.7	58.7	58.7	58.7
Hendry County – Western Basins						
	Irrigated Acreage	13,489 acres	15,801 acres	18,112 acres	20,424 acres	22,735 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	16.2 inches	32.5	38.1	43.7	49.2	54.8
1-in-10 year drought	21.9 inches	43.9	51.5	59.0	66.5	74.1
LEC Planning Area Totals						
	Total Irrigated Acreage	409,622 acres	411,934 acres	414,245 acres	416,557 acres	418,868 acres
		Gross Demand (MGD)				
Total average rainfall year		**385.2**	**390.8**	**396.4**	**401.9**	**407.5**
Total 1-in-10 year drought		**949.3**	**956.9**	**964.4**	**971.9**	**979.5**

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Field Crops – Other

Other field crops in the LEC Planning Area primarily include rice, potatoes, and tropical field crops. Acreage and water use are projected to rise slightly through 2030. **Table A-16** presents the acreage projections, the projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-16. Gross irrigation requirements for other field crop acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – EAA						
	Irrigated Acreage	17,000 acres	17,000 acres	17,000 acres	17,000 acres	17,000 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	13.6 inches	34.4	34.4	34.4	34.4	34.4
1-in-10 year drought	19.5 inches	49.3	49.3	49.3	49.3	49.3
Broward County						
	Irrigated Acreage	40 acres	40 acres	40 acres	40 acres	40 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	7.0 inches	0.0	0.0	0.0	0.0	0.0
1-in-10 year drought	12.4 inches	0.0	0.0	0.0	0.0	0.0
Miami-Dade County						
	Irrigated Acreage	1,974 acres	2,142 acres	2,196 acres	2,196 acres	2,196 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	8.8 inches	1.7	1.9	1.9	1.9	1.9
1-in-10 year drought	14.0 inches	2.7	3.0	3.0	3.0	3.0
Hendry County – Western Basins						
	Irrigated Acreage	65 acres	71 acres	73 acres	73 acres	73 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	18.4 inches	0.2	0.2	0.2	0.2	0.2
1-in-10 year drought	23.3 inches	0.2	0.2	0.3	0.2	0.3
LEC Planning Area Totals						
	Total Irrigated Acreage	19,079 acres	19,253 acres	19,309 acres	19,309 acres	19,309 acres
		Gross Demand (MGD)				
Total average rainfall year		**36.3**	**36.5**	**36.5**	**36.5**	**36.5**
Total 1-in-10 year drought		**52.2**	**52.5**	**52.6**	**52.5**	**52.6**

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Vegetables, Melons, and Berries

The agricultural regions comprising the LEC Planning Area are some of the most important winter producers of vegetables in the country. The favorable microclimate allows for multiple and varied crop rotational harvests on prime lands in close proximity to urban markets enabling producers to supply consumers throughout the year. It is estimated that over 90 percent of Miami-Dade County's vegetables are exported out of Florida. In addition, South Florida hospitality and restaurant industries are heavily dependent on vegetable crops produced in the LEC Planning Area.

The chief crops in this category include snap beans, tomatoes, cucumbers, lettuce, peppers, squash, radishes, sweet corn, and tropical vegetables. Vegetable acreage in the LEC Planning Area is concentrated in Palm Beach County, southern Miami-Dade County, and the Western Basins in Hendry County. Given favorable market conditions and future market outlooks, vegetable acreage throughout the projection period is expected to be sustained at near current levels in Palm Beach and Miami-Dade counties and to increase in Hendry County. Despite the competitive pressure from imports, the lack of urbanization pressure over the near term is favorable to producers seeking to increase production and take advantage of market windows of opportunity. In southern Miami-Dade County, SFWMD's operational management of the water table facilitates the ability of producers to sow fields at key times to get crops planted, enabling harvests to meet seasonal demands for two crops. Changes in water use parallel the changes in acreage.

Vegetable acreage projections were requested from agricultural stakeholders and agencies, including University of Florida's Institute for Food and Agricultural Sciences, the Florida Department of Agriculture and Consumer Services, and the Florida Farm Bureau. Some vegetable crops face continued pressure from imports from countries such as Mexico. But given the diversity of the crops and demand for unique and specialty exotic vegetables, these risks to potential loss of arable acres are low.

In Palm Beach County, flood irrigation is the primary irrigation type used for small vegetables. Based on the estimated usage of each type of irrigation system shown in water use permits, the irrigation efficiency was assumed to be 50 percent for these kinds of crops. In Miami-Dade County, vegetables are often irrigated with volume or traveling/overhead guns and sprinklers, and drip systems are also used. These systems have higher application efficiencies compared to flood or seepage methods and were represented by a weighted-average efficiency factor of 73 percent in the demand projections.

Table A-17 presents the acreage projections, the projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

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Table A-17. Gross irrigation requirements for vegetables, melons, and berries acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	11,660 acres	11,410 acres	11,160 acres	10,910 acres	10,660 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	8.9 inches	10.3	10.1	9.9	9.6	9.4
1-in-10 year drought	13.1 inches	15.1	14.8	14.5	14.2	13.8
Palm Beach County – EAA						
	Irrigated Acreage	30,340 acres	30,340 acres	30,340 acres	30,340 acres	30,340 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	12.0 inches	54.2	54.2	54.2	54.2	54.2
1-in-10 year drought	16.9 inches	76.3	76.3	76.3	76.3	76.3
Broward County						
	Irrigated Acreage	819 acres	811 acres	801 acres	801 acres	801 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	9.3 inches	0.8	0.7	0.7	0.7	0.7
1-in-10 year drought	13.6 inches	1.1	1.1	1.1	1.1	1.1
Miami-Dade County						
	Irrigated Acreage	28,000 acres	27,750 acres	27,500 acres	27,250 acres	27,000 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	11.3 inches	32.2	32.0	31.7	31.4	31.1
1-in-10 year drought	15.2 inches	43.4	43.0	42.6	42.2	41.8
Hendry County – EAA						
	Irrigated Acreage	8,447 acres	8,447 acres	8,447 acres	8,447 acres	8,447 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	16.1 inches	20.2	20.2	20.2	20.2	20.2
1-in-10 year drought	20.3 inches	25.5	25.5	25.5	25.5	25.5
Hendry County – Western Basins						
	Irrigated Acreage	3,264 acres	3,615 acres	3,967 acres	4,318 acres	4,670 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	16.1 inches	7.8	8.7	9.5	10.3	11.2
1-in-10 year drought	20.3 inches	9.9	10.9	12.0	13.1	14.1
LEC Planning Area Totals						
	Total Irrigated Acreage	82,530 acres	82,373 acres	82,215 acres	82,066 acres	81,918 acres
		Gross Demand (MGD)				
Total average rainfall year		**125.5**	**125.9**	**126.2**	**126.4**	**126.8**
Total 1-in-10 year drought		**171.3**	**171.6**	**172.0**	**172.3**	**172.6**

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Sod Production

Sod production projections presented in this appendix refer to irrigated sod. Some sod may be harvested from pastureland, which is not irrigated. Pasture supporting cow-calf operations is typically not irrigated because it is not economical. Some pasture in the coastal areas may include horse farms, ranchettes, etc., which may be irrigated and may have been included with sod production.

For this update, 2005 and 2010 sod production acreages were estimated based on data contained in SFWMD's Water Use Regulatory Database. Historic acreage trends obtained from USGS were also compared to building permit time series. Reports from growers indicate that sod production was hit hard by the 2008–2009 recession. Current acreage is down considerably from prerecession levels, and the demand from golf courses and urban landscaping remains depressed. Lead times necessary to prepare land for sod production in response to customer demand increased. The projections assume that sod acreage will continue to fall over the near-term planning period (through 2015), but eventually recover as the economy grows and urban development resumes a more rapid pace (between 2015 and 2020).

Because the population in the LEC Planning Area is expected to grow, sod demand is expected to rebound from low levels as community development resumes at a faster pace. Sod irrigation is provided by several methods, including low volume, sprinkler, and flood irrigation. Based on the irrigation systems indicated in water use permits, the average irrigation efficiency for sod was calculated to be 75 percent in the EAA within Palm Beach County, 75 percent in Broward County, and 50 percent in the Western Basins in Hendry County.

Sod production and associated water use is expected to remain constant in the EAA and Western Basins in Hendry County and increases in the Palm Beach Coastal Subbasin, which are the only basins with significant sod production. Irrigation requirements are similar to those for REC Self-Supply uses and, on a per acre basis, do not change over the projection period. **Table A-18** presents the acreage projections, the projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

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Table A-18. Gross irrigation requirements for sod acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	1,900 acres	1,500 acres	2,000 acres	2,300 acres	2,790 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	17.2 inches	2.4	1.9	2.6	2.9	3.6
1-in-10 year drought	21.8 inches	3.1	2.4	3.2	3.7	4.5
Palm Beach County – EAA						
	Irrigated Acreage	7,210 acres	7,210 acres	7,210 acres	7,210 acres	7,210 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	10.5 inches	7.5	7.5	7.5	7.5	7.5
1-in-10 year drought	18.1 inches	12.9	12.9	12.9	12.9	12.9
Broward County						
	Irrigated Acreage	9 acres	9 acres	9 acres	9 acres	9 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	17.7 inches	0.02	0.02	0.02	0.02	0.02
1-in-10 year drought	23.1 inches	0.02	0.02	0.02	0.02	0.02
Miami-Dade County						
	Irrigated Acreage	114 acres	91 acres	110 acres	115 acres	120 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	20.2 inches	0.2	0.1	0.2	0.2	0.2
1-in-10 year drought	24.5 inches	0.2	0.2	0.2	0.2	0.2
Hendry County – Western Basins						
	Irrigated Acreage	652 acres	652 acres	652 acres	652 acres	652 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	20.5 inches	2.0	2.0	2.0	2.0	2.0
1-in-10 year drought	26.4 inches	2.6	2.6	2.6	2.6	2.6
LEC Planning Area Totals						
	Total Irrigated Acreage	9,885 acres	9,462 acres	9,981 acres	10,286 acres	10,781 acres
		Gross Demand (MGD)				
Total average rainfall year		**12.1**	**11.5**	**12.3**	**12.6**	**13.3**
Total 1-in-10 year drought		**18.8**	**18.1**	**18.9**	**19.4**	**20.2**

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Greenhouse / Nursery

This category includes a wide variety of nursery, ornamental, and horticulture/floriculture operations. Crops in this category include palm trees and shrubs grown in the ground, container nurseries producing woody and herbaceous ornamentals in open fields, and greenhouse and shade house nurseries producing foliage plants, orchids, bromeliads, and woody ornamentals for interior spaces. Crops grown in greenhouses may also include vegetables, herbs, fruits, berries, garden plants for sale, cut flowers, and caladium bulbs/rhizomes. The same crops may be grown in the open in a nursery setting where the plants are the product for sale. Sales of these products fluctuate with economic cycles and conditions tied to the housing market (community development) and urban landscapes, both within and outside of South Florida.

For this update, information from SFWMD's Water Use Regulatory Database, the *2007 Census of Agriculture for Florida* county data (USDA–NASS 2007), USGS' historic acreage, and county assessor's office's land use data were used to estimate 2010 greenhouse/nursery acreage and project future acreage. The historic data were also compared to economic indicators to assess how the recession impacted greenhouse/nursery acres. The recession took a severe toll on this market segment. Producers in the LEC Planning Area region adapted to market conditions by carefully controlling costs and offering value added products and amenities to consumers.

Over the near-term, the projections are based on assuming a bottoming out in irrigated acres followed by a stabilization phase, and then an expansion as the economy recovers over the medium-term horizon. The so-called "U" pattern of projected acres described above is based on assuming an eventual recovery in the housing market and community developments boosting demand for landscaping and greenhouse/nursery products. Based on the data received, the projected 2010 acreage was assumed to fluctuate with economic cycles throughout the twenty-year planning horizon. The average irrigation efficiency for this crop category was calculated to be 72 percent in Miami-Dade County, 50 percent in Palm Beach County, 40 percent in Broward County, and 34 percent in the Western Basins in Hendry County.

Estimated greenhouse/nursery acreage and irrigation requirements in the LEC Planning Area are expected to initially decline until the economic expansion gains more momentum, and then to recover to higher levels later in the projection period (between 2015 and 2020), especially in Palm Beach and Broward counties, and remain fairly constant in Miami-Dade County. **Table A-19** presents the acreage projections, the projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

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Table A-19. Gross irrigation requirements for greenhouse/nursery acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	3,642 acres	3,342 acres	3,776 acres	4,209 acres	4,642 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	21.2 inches	11.5	10.5	11.9	13.3	14.6
1-in-10 year drought	25.1 inches	13.6	12.5	14.1	15.7	14.6
Palm Beach County – EAA						
	Irrigated Acreage	858 acres	858 acres	858 acres	858 acres	858 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	10.5 inches	1.3	1.3	1.3	1.3	1.3
1-in-10 year drought	18.1 inches	2.3	2.3	2.3	2.3	2.3
Broward County						
	Irrigated Acreage	250 acres	172 acres	231 acres	291 acres	350 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	22.7 inches	1.1	0.7	1.0	1.2	1.5
1-in-10 year drought	26.4 inches	1.2	0.8	1.1	1.4	1.7
Miami-Dade County						
	Irrigated Acreage	9,000 acres	8,063 acres	8,375 acres	8,688 acres	9,000 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	23.3 inches	21.6	19.4	20.1	20.9	21.6
1-in-10 year drought	26.4 inches	24.5	22.0	22.8	23.7	24.5
Hendry County – Western Basins						
	Irrigated Acreage	500 acres	400 acres	600 acres	700 acres	800 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	22.7 inches	2.5	2.0	3.0	3.5	4.0
1-in-10 year drought	27.3 inches	3.0	2.4	3.6	4.2	4.8
Monroe County						
	Irrigated Acreage	20 acres	20 acres	20 acres	20 acres	20 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	23.3 inches	0.1	0.1	0.1	0.1	0.1
1-in-10 year drought	26.4 inches	0.1	0.1	0.1	0.1	0.1
LEC Planning Area Totals						
	Total Irrigated Acreage	14,270 acres	12,855 acres	13,860 acres	14,766 acres	15,670 acres
		Gross Demand (MGD)				
Total average rainfall year		**38.1**	**34.0**	**37.4**	**40.3**	**43.1**
Total 1-in-10 year drought		**44.7**	**40.1**	**44.0**	**47.4**	**48.0**

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Other Fruits and Nuts

The major crops in this category are avocados, guavas, mangos, and lychees. Total acreage of other fruits and nuts in the LEC Planning Area is concentrated in Miami-Dade County. Various tropical and exotic fruits, such as such as mangos, carambola, longans, mamey sapote, sapodilla, jackfruit, and passion fruit, are grown in the Redlands area of southern Miami-Dade County. Miami-Dade County leads the state in the production of avocados.

Over the entire planning horizon, these crops are expected to be sustained near current levels given strong consumer demand and favorable farm economics and relative prices. Assessment of current acres supporting these crop types showed the recession resulted in only a slight loss of acres. Over the entire planning horizon, only a slight decline in acreage is expected (108 acres between 2010 and 2030), and this will most likely be attributable to urbanization pressures over the medium term. The projections assume that acreage devoted to the Other Fruits and Nuts category will be resilient over the planning horizon. Given the popularity of these crops, particularly among South Florida's diverse residents and tourists, and favorable trends in unit consumption demand, the projections assume that total acreage will only decline marginally from 2010 levels by 2030. Consumer demand continues to be strong for avocados and imports are rising to meet national demand. Water use is also expected to decline only slightly from 2010 levels given the importance of these unique crops to consumers and the economy over the planning horizon. **Table A-20** presents the acreage projections, the projected net irrigation requirement under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

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Table A-20. Gross irrigation requirements for other fruits and nuts acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal Subbasin						
	Irrigated Acreage	82 acres	136 acres	132 acres	129 acres	124 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	9.4 inches	0.08	0.13	0.12	0.12	0.11
1-in-10 year drought	15.0 inches	0.12	0.20	0.19	0.19	0.18
Palm Beach County – EAA						
	Irrigated Acreage	111 acres	111 acres	111 acres	111 acres	111 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	8.9 inches	0.15	0.15	0.15	0.15	0.15
1-in-10 year drought	16.3 inches	0.27	0.27	0.27	0.27	0.27
Broward County						
	Irrigated Acreage	80 acres	80 acres	80 acres	80 acres	80 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	9.8 inches	0.06	0.06	0.06	0.06	0.06
1-in-10 year drought	16.6 inches	0.10	0.10	0.10	0.10	0.10
Miami-Dade County						
	Irrigated Acreage	8,000 acres	7,965 acres	7,930 acres	7,895 acres	7,850 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	12.2 inches	9.7	9.7	9.7	9.6	9.5
1-in-10 year drought	18.3 inches	14.5	14.5	14.4	14.3	14.3
Hendry County – Western Basins						
	Irrigated Acreage	29 acres	29 acres	29 acres	29 acres	29 acres
	Net Irrigation Requirement	**Gross Demand (MGD)**				
Average	15.5 inches	0.04	0.04	0.04	0.04	0.04
1-in-10 year drought	20.8 inches	0.06	0.06	0.05	0.05	0.05
LEC Planning Area Totals						
	Total Irrigated Acreage	8,302 acres	8,321 acres	8,282 acres	8,244 acres	8,194 acres
		Gross Demand (MGD)				
Total average rainfall year		**10.0**	**10.0**	**10.0**	**9.9**	**9.9**
Total 1-in-10 year drought		**15.1**	**15.1**	**15.0**	**15.0**	**14.9**

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Improved Pasture

The SFWMD's definition of improved pasture is any pasture with existing or proposed facilities to deliver supplemental irrigation. Information from agricultural stakeholders indicates irrigation of improved pasture usually occurs during dry periods to keep grass alive for the nourishment of cattle because the economic returns associated with cattle production generally do not justify the expense of year-round pasture irrigation.

The 2005–2006 LEC Plan Update stated that irrigation demand was not estimated for improved pasture within the LEC Planning Area because they would only relate to some of the acres some of the time (SFWMD 2007). The SFWMD does not project water demand for improved pasture because of the intermittent demand and the lack of data and information required to properly project this demand. However, interagency and agricultural stakeholders are currently addressing methods for determining intensity of water use in this category, as well as procedures for evaluating potential conversion of pasture lands to other agricultural crop categories.

Other Agricultural Uses

Cattle numbers were obtained from the most current Florida Agricultural Statistics Service *Livestock Summary* (USDA 2011). The land and water requirements were assessed for cattle and calves on ranchlands falling within the LEC Planning Area. This update does not present estimates for cattle watering because the volume is insignificant. However, the SFWMD continues to recognize these water volumes as reasonable and beneficial needs for existing legal water uses. Aquaculture demand is also not presented because most of the use represents localized flow-through in which the water returns to the source from which it was taken.

Summary of Agricultural Results

Although estimates and projections for the agricultural subsections have been discussed in terms of crop use categories, it is also important to summarize the results in terms of total acreage and use by basin. On balance, agricultural acreage is expected to increase by 581 acres from 575,310 acres in 2010 to 575,897 acres in 2030. The EAA, the largest concentration of cropland in the LEC Planning Area, is a fully developed, stable agricultural area where cropping practices are not projected to change significantly. Consequently, the cultivated acres are expected to remain constant at their current permitted levels over the next 20 years.

The expectation for the loss of additional agricultural acres due to urbanization has been deferred to much later periods over the twenty-year planning horizon. The restrained housing market and a slow economic recovery in South Florida has diminished competition for agricultural land from developers compared to the 2005–2006 LEC Plan Update evaluation environment. More generally, the rapid loss of arable land over the last 10 years throughout the United States raised the relative value of existing agricultural lands and placed a renewed emphasis on sustainable land management and food security. Some small

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declines expected in the Palm Beach County Coastal Subbasin and the loss of citrus acreage in the Western Basins portion of Hendry County will likely be offset by gains in other crops within the planning area (sod and nursery/greenhouse production in Palm Beach County and sugarcane in the Western Basins in Hendry County). Palm Beach County is expected to retain its agricultural acres over the twenty-year planning horizon and to slightly increase agricultural lands within Agricultural Reserve Areas. Little change in agricultural acreage and water use is expected in Broward and Miami-Dade counties. Agricultural acreage in the Western Basins in Hendry County is expected to rise slightly even though the C-139 Annex Restoration Project will reduce the cultivated acreage.

Total irrigated agricultural crop categories and acreage are listed in **Table A-21**. Acreage and gross irrigation demand (water withdrawal demand) by subbasin are presented in **Table A-22**. The acreages presented in the tables for this update do not include acreages that are historically part of the Lake Okeechobee Service Area that lies in the Lower West Coast, Upper East Coast, and Kissimmee Basin planning areas.

Table A-21. Crop category and irrigated acreage in the LEC Planning Area.

Crop Category	2010	2015	2020	2025	2030
Citrus	31,628	26,410	17,162	19,455	21,157
Field Crops – Sugarcane	409,622	411,934	414,245	416,557	418,868
Field Crops – Other	19,079	19,253	19,309	19,309	19,309
Vegetables, Melons, and Berries	82,530	82,373	82,215	82,066	81,918
Sod	9,885	9,462	9,981	10,286	10,781
Greenhouse/Nursery	14,270	12,855	13,860	14,766	15,670
Other Fruits & Nuts	8,302	8,321	8,282	8,244	8,194
LEC Planning Area Total Irrigated Acres	**575,316**	**570,608**	**565,054**	**570,673**	**575,897**

Table A-22. Gross irrigation requirements for all agricultural acreage in the LEC Planning Area.

Rainfall Year	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal					
Irrigated Acreage	21,647 acres	20,343 acres	21,159 acres	21,932 acres	22,820 acres
	Gross Demand (MGD)				
Average	28.1	25.5	27.2	28.5	30.5
1-in-10 year drought	38.6	35.4	37.2	39.0	38.6
Palm Beach County – EAA					
Irrigated Acreage	424,152 acres	424,152 acres	424,152 acres	424,152 acres	424,152 acres
	Gross Demand (MGD)				
Average	426.6	426.6	426.6	426.6	426.6
1-in-10 year drought	985.6	985.6	985.6	985.6	985.6

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Table A-22. Continued.

Rainfall Year	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
	2010	2015	2020	2025	2030
Broward County					
Irrigated Acreage	1,198 acres	1,112 acres	1,161 acres	1,221 acres	1,280 acres
	Gross Demand (MGD)				
Average	2.0	1.5	1.8	2.0	2.3
1-in-10 year drought	2.4	2.0	2.3	2.6	2.9
Miami-Dade County					
Irrigated Acreage	47,805 acres	46,610 acres	46,750 acres	46,868 acres	46,954 acres
	Gross Demand (MGD)				
Average	66.2	63.7	64.2	64.7	65.1
1-in-10 year drought	86.5	83.6	84.0	84.6	85.0
Hendry County – EAA					
Irrigated Acreage	34,058 acres	34,058 acres	34,058 acres	34,058 acres	34,058 acres
	Gross Demand (MGD)				
Average	43.1	43.1	43.1	43.1	43.1
1-in-10 year drought	84.2	84.2	84.2	84.2	84.2
Hendry County – Western Basins					
Irrigated Acreage	46,436 acres	44,313 acres	37,754 acres	42,422 acres	46,613 acres
	Gross Demand (MGD)				
Average	88.7	86.1	78.5	87.2	96.2
1-in-10 year drought	124.3	121.6	110.1	123.5	136.1
Monroe County					
Irrigated Acreage	20 acres	20 acres	20 acres	20 acres	20 acres
	Gross Demand (MGD)				
Average	0.05	0.05	0.05	0.05	0.05
1-in-10 year drought	0.10	0.10	0.10	0.10	0.10
EAA					
Irrigated Acreage	458,210 acres	458,210 acres	458,210 acres	458,210 acres	458,210 acres
	Gross Demand (MGD)				
Average	469.7	469.7	469.7	469.7	469.7
1-in-10 year drought	1,070.0	1,070.0	1,070.0	1,070.0	1,070.0
LEC Service Area (Coastal Areas)					
Irrigated Acreage	70,670 acres	68,085 acres	69,090 acres	70,041 acres	71,074 acres
	Gross Demand (MGD)				
Average	96.4	90.8	93.3	95.3	98.0
1-in-10 year drought	127.6	121.1	123.6	126.3	126.6
LEC Planning Area Totals					
Total Irrigated Acreage	575,316 acres	570,608 acres	565,054 acres	570,673 acres	575,897 acres
	Gross Demand (MGD)				
Total average rainfall year	**654.8**	**646.6**	**641.5**	**652.2**	**663.9**
Total 1-in-10 year drought	**1,321.7**	**1,312.5**	**1,303.5**	**1,319.6**	**1,332.5**

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INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SELF-SUPPLY

This category includes industrial, commercial, and institutional demands not supported by a public utility. Water used for industrial, commercial, and institutional purposes supplied by utilities is included with PWS demand.

Projection Methodology

In the LEC Planning Area, the water use projection for ICI Self-Supply assumes that growth in self-supply for this region is proportional to the underlying economic activity that generates water demand in population in the area. This ICI Self-Supply use category consists of large facilities for production processing with the largest uses being mining (i.e., aggregates industry) and food processing (dominated by the sugar industry). Because of the importance of these large users within the LEC Planning Area, the projection methodology is based on isolating and assessing the relationship between water use and expected future growth for these sectors.

Permitted water use in this category determined the current ICI Self-Supply demand. The SFWMD's historic pumpage data were assessed for each county within the LEC Planning Area. For Palm Beach County, the analysis was based on separating historic pumpage between the sugar industry and "other" ICI Self-Supply users since the sugar industry accounts for a large share of total ICI Self-Supply water use (approximately 50 percent of the county total in 2010). The pumpage reports related to the Palm Beach County sugar industry permittees were isolated and summed. Water use was then plotted against trends in annual sugar production (in tons) and evaluated. The trend showed that the sugar industry's unit water use fell per ton of sugar produced since 2000 because of improved process efficiencies.

Over the projected forecast horizon, the trend in more efficient water use was extrapolated forward such that ICI Self-Supply for Palm Beach County is expected to fall from 5.4 MGD to 3.5 MGD by 2020 and remain at that rate. Nonsugar ICI Self-Supply users are also expected to use less water per unit of output given the adoption of more sustainable practices. The amount of the use was assumed to continue until the permit expiration date for each ICI Self-Supply permit in SFWMD's Water Use Regulatory Database. After that time, the growth in this sector is projected to increase at the rate of population growth.

For Miami-Dade County, the ICI Self-Supply demand analysis was based on first segregating the historic water pumpage for the aggregates industry (i.e., mining, quarrying, and rock washing) and "other" uses. The aggregates industry dominates ICI Self-Supply water use, which accounted for 94 percent of the county total in 2011. The projection method compared the aggregates industry production to the aggregates industry historic water pumpage inputs. The *Federal Reserve Index of Industrial Production-Nonmetallic Mineral Mining and Quarrying* was used for this purpose (FRS 2012). **Figure A-5** shows the historic relationship between these two measures.

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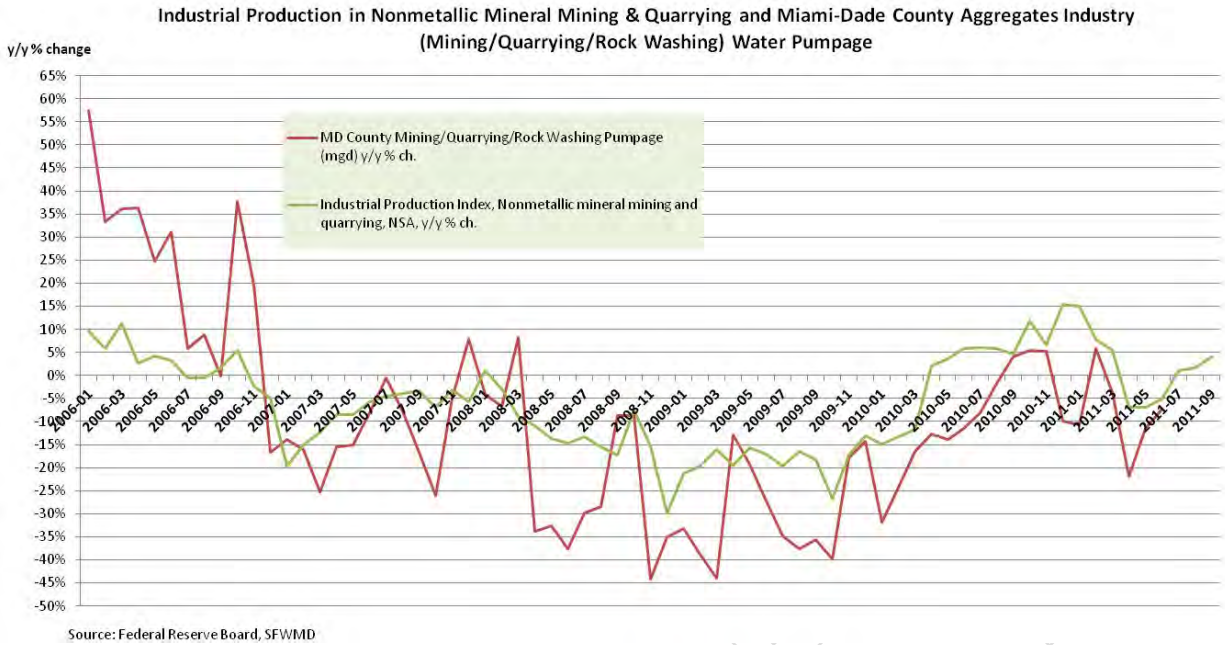

Figure A-5. Industrial production and water pumpage in nonmetallic mineral mining and quarrying for the Miami-Dade (MD) County aggregates industry.

Figure A-5 shows that water pumpage for the aggregates ICI Self-Supply segment was correlated with industrial production and the business cycle. To project the future water demand for the ICI Self-Supply segment, an annual water demand equation, based on a fitted statistical function relating water demand to industrial production was applied. Future annual industrial production for the aggregates industry was projected using official forecasts of United States economic growth (gross domestic product) and evaluating the growth rate relationship between mineral mining industrial production and the gross domestic product. The projections assume that projected water demand will follow the recurring boom and bust patterns of economic growth to 2030. For Broward County, the projections assume continued stable water demand for ICI Self-Supply over the twenty-year planning horizon.

Current and future demand calculations include information from SFWMD's Water Use Regulatory Database along with population growth rates for each county. All population numbers are based on the projections for each individual county shown earlier in this appendix. ICI Self-Supply projections assume demand under average rainfall and 1-in-10 year drought conditions remains the same, and that withdrawals are equal to user demand so no distinction is made between net (finished) and gross (raw) water amounts. It should be noted that, depending on the type of ICI Self-Supply user, a large share of water demanded is quickly returned to the system for reuse (i.e., rock washing in the aggregates industry) within the ICI Self-Supply group.

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Projection Results

Table A-23 summarizes the ICI Self-Supply demand estimates and projections in the LEC Planning Area in five-year increments during the twenty-year planning horizon. The estimates and projections are the same for average and 1-in-10 year drought conditions. Since no distinction is needed between net and gross water, only one set of demands is shown.

Table A-23. ICI Self-Supply demand projections for 2010–2030.

County	Demand Projections (MGD)				
	2010	2015	2020	2025	2030
Palm Beach	5.4	4.8	3.5	3.5	3.5
Broward	1.6	1.1	1.2	1.3	1.3
Miami-Dade	37.3	34.6	54.0	51.8	51.8
Hendry	0.0	0.0	0.0	0.0	0.0
Monroe	0.0	0.0	0.0	0.0	0.0
LEC Planning Area Total	**44.3**	**40.5**	**58.7**	**56.6**	**56.6**

RECREATIONAL/LANDSCAPE SELF-SUPPLY

The REC Self-Supply category includes self-supplied irrigation demand for landscaped recreational areas and golf courses. Landscape irrigation includes water demand for all parks (small and large), communities and homeowner associations with common areas or a master irrigation system, and areas with green space such as ball fields, stadiums, and cemeteries. These REC Self-Supply uses are identified through water use permits. With the exception of private home landscape irrigation conducted by homeowner associations, private home landscape irrigation demand is not included in this water use category.

A significant portion (approximately 30 percent) of REC Self-Supply water demand will be met by the use of reclaimed water throughout the planning horizon, which will reduce withdrawals from the water resources.

Projection Methodology

Landscape and golf course acres were identified using SFWMD's Water Use Regulatory Database. Time series trends of irrigated golf course acreage within the LEC Planning Area by county were reviewed from 1985 through the present and compared to macroeconomic historic indicators for the region. Macro or development history was depicted by a time series of annual, new, privately-owned residential building permits within each LEC Planning Area county. For example, Palm Beach County's building permit activity showed a steady increase from 1990 to 2003, when they peaked. Permits fell rapidly after this period and bottomed out during the 2008–2009 recession at 10 percent of their peak 2003 level and 18 percent of the 1990 level. Given the recession and housing crisis, followed by a weak economic recovery that has been restrained by a structurally troubled and weak

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housing market, the demand for new golf courses and existing course expansion has been stagnant. These recent trends are confirmed by reductions in golf rounds played within the service area (**Figure A-6**). In light of the slowdown in community development that could sustain new courses or course expansions, and the pace of economic recovery over the near- to medium-term period, golf course acreage projection is based on a U-shaped economic recovery pattern that anticipates continued weakness or lack of development capable of supporting golf patronage followed by a slow recovery.

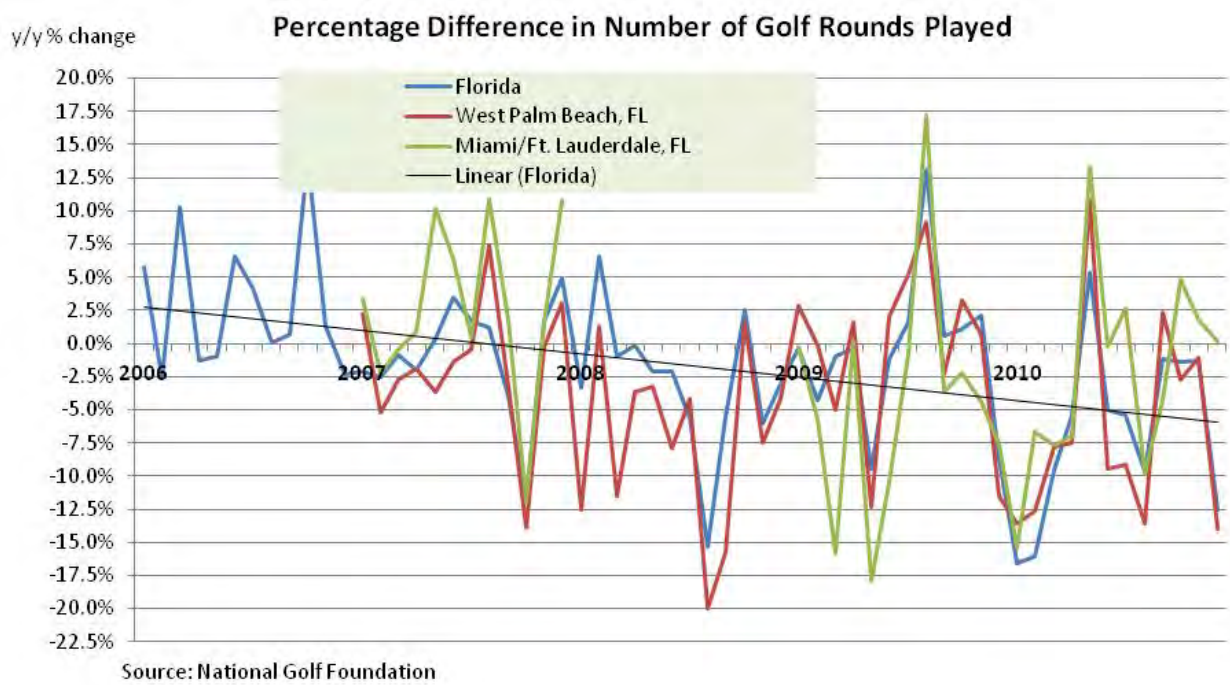

Figure A-6. Percentage difference in number of golf rounds played.

Future demand projections also considered county population growth rates, information provided by local planning officials, and golf course publications. Golf course demand by county are projected separately and added to the other landscape and recreation demands. A slower growth rate was assumed for golf courses than the population growth rate based on industry and local planning estimates of new courses during the twenty-year planning horizon.

Historic patterns of growth in acreage for non-golf course landscaping and recreational water use were also evaluated since the 2005–2006 LEC Plan Update. Between 2000 and 2011, these intervening years witnessed a rapid community development expansion that increased the landscape acreage requiring irrigation. This trend was visible in homeowners' association permit applications to irrigate common areas. This period also corresponded to the housing asset price bubble and a development phase characterized by unprecedented urban sprawl with community expansion moving westward within the LEC Planning Area. As a consequence, SFWMD's Water Use Regulatory Database expanded significantly for the REC Self-Supply water use category. Once this acreage was committed to communities, it requires future irrigation and this explains the large increase in water demand since the last plan update for the landscape component of the REC Self-Supply water use category. With

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changes to the housing market, the projections assume some marginal declines in the landscape irrigated acreage category followed by a slight recovery to a plateau over the remainder of the planning horizon. Non-golf course landscaping and recreational water use was assumed to increase at the same rate as the county population, with 2010 used as the base year estimate for the projections, and the 2005 projection from the previous plan update included for comparison.

REC Self-Supply gross and net irrigation demand calculations for this update applied results from the AFSIRS model, which uses data from 1965–2000 (Smajstrla 1990). These model results were used in the 2005–2006 LEC Plan Update and are used to calculate AGR Self-Supply irrigation demand. The AFSIRS model calculates both gross and net irrigation requirements according to the following relationship:

Gross Irrigation Requirement = Net Irrigation Requirement / Irrigation Efficiency

Demand was calculated using 36 years of rainfall and potential ET climatic data from appropriate meteorological stations. The analyses also consider soil types, irrigation methods, and strategies. The irrigation system assumed for REC Self-Supply is sprinkler irrigation with 75 percent efficiency, and rainfall and potential ET data for the respective region. The model uses assumed crop coefficients of sod to represent turf and landscape plants, and calculates demand for average rainfall and 1-in-10 year drought conditions for each county.

Projection Results

REC Self-Supply acreage projections are shown in **Table A-24**. The projected net irrigation (user) demand for each area under average rainfall conditions are shown in **Table A-25**, while **Table A-26** shows net irrigation demand under 1-in-10 year drought conditions. Gross irrigation demand (withdrawal demand) under average rainfall conditions is shown in **Table A-27**, while **Table A-28** presents gross demand under 1-in-10 year drought conditions. During the twenty-year planning horizon, REC Self-Supply demand will increasingly be met by use of reclaimed water. This will reduce withdrawal demand on the water resources and provide additional recharge of the surficial aquifer system. It is estimated that for 2010, total golf course acreage consists of 25,253 acres in the LEC Planning Area, approximately 30 percent of this total acreage was irrigated in part using reclaimed water (personal communication with R. Nevulis, Reuse Specialist, SFWMD).

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Table A-24. Acreage for REC Self-Supply in the LEC Planning Area.

Area	Acreage (acres)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	45,924	44,924	45,731	46,616	47,500
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	27,700	28,100	28,100	28,100	28,100
Miami-Dade County	8,325	8,375	8,418	8,471	8,525
Hendry County – EAA	0.0	0.0	0.0	0.0	0.0
Hendry County – Western Basins	0.0	0.0	0.0	0.0	0.0
Monroe County	428	428	428	428	428
LEC Planning Area Total	**82,377**	**81,827**	**82,677**	**83,615**	**84,553**

Table A-25. Net irrigation demand under average rainfall conditions for REC Self-Supply in the LEC Planning Area.

Area	Net Irrigation Demand – Average Rainfall Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	60.5	59.1	60.2	61.4	62.5
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	37.7	38.3	38.3	38.3	38.3
Miami-Dade County	12.8	12.9	13.0	13.0	13.1
Hendry County – EAA	0.0	0.0	0.0	0.0	0.0
Hendry County – Western Basins	0.0	0.0	0.0	0.0	0.0
Monroe County	0.7	0.7	0.7	0.7	0.7
LEC Planning Area Total	**111.7**	**111.0**	**112.2**	**113.4**	**114.6**

Table A-26. Net irrigation demand under 1-in-10 year drought conditions for REC Self-Supply in the LEC Planning Area.

Area	Net Irrigation Demand – 1-in-10 Year Drought Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	74.8	73.2	74.5	75.9	77.4
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	47.2	47.9	47.9	47.9	47.9
Miami-Dade County	15.3	15.4	15.5	15.6	15.7
Hendry County – EAA	0.0	0.0	0.0	0.0	0.0
Hendry County – Western Basins	0.0	0.0	0.0	0.0	0.0
Monroe County	0.8	0.8	0.8	0.8	0.8
LEC Planning Area Total	**138.1**	**137.3**	**138.7**	**140.2**	**141.8**

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Table A-27. Gross irrigation demand under average rainfall conditions for REC Self-Supply in the LEC Planning Area.

Area	Gross Irrigation Demand – Average Rainfall Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	80.6	78.9	80.3	81.8	83.4
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	50.3	51.0	51.0	51.0	51.0
Miami-Dade County	17.1	17.2	17.3	17.4	17.5
Hendry County – EAA	0.0	0.0	0.0	0.0	0.0
Hendry County – Western Basins	0.0	0.0	0.0	0.0	0.0
Monroe County	0.9	0.9	0.9	0.9	0.9
LEC Planning Area Total	**148.9**	**148.0**	**149.5**	**151.1**	**152.8**

Table A-28. Gross irrigation demand under 1-in-10 year drought conditions for REC Self-Supply in the LEC Planning Area.

Area	Gross Irrigation Demand – 1-in-10 Year Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	99.7	97.6	99.3	101.2	103.2
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	62.9	63.8	63.8	63.8	63.8
Miami-Dade County	20.4	20.5	20.6	20.8	20.9
Hendry County – EAA	0.0	0.0	0.0	0.0	0.0
Hendry County – Western Basins	0.0	0.0	0.0	0.0	0.0
Monroe County	1.0	1.0	1.0	1.0	1.0
LEC Planning Area Total	**184.0**	**182.9**	**184.7**	**186.8**	**188.9**

POWER GENERATION SELF-SUPPLY

The primary use of water at thermoelectric power plants is for cooling purposes. Additional water uses at power plants include boiler make-up water and ancillary uses, such as domestic-type use by employees.

In the LEC Planning Area, and in most of South Florida, PWR Self-Supply demand has been met by flow-through cooling using tidal water—not fresh water or brackish groundwater. However, this pattern is changing as new generation or expansion of existing facilities is being evaluated. These plants may utilize different cooling technologies based on environmental, economical, and technically feasible components most appropriate to site-specific conditions. The different process and cooling technologies may require and utilize traditional and alternative water supply sources.

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Florida Power & Light (FPL) is a major electrical power supplier serving South Florida. FPL uses a diverse mix of fuels at their power plants to generate electricity. FPL currently generates most of its electricity from natural gas. In 2010, three power generation facilities were located within the LEC Planning Area and permitted to withdraw water: FPL West County Energy Center in Palm Beach County, FPL Turkey Point Plant in Miami-Dade County, and Homestead Municipal Power Plant in Miami-Dade County. The Homestead Municipal Power Plant is owned by the City of Homestead.

In the West County Energy Center and Turkey Point Plant, FPL uses natural gas combined cycle technology, which produces electricity from two sources of energy instead of one. In a combined cycle power plant, a gas turbine generator produces electricity, and heat in the exhaust is also used to make steam, which in turn drives a turbine to generate additional electricity. This technology is about 30 percent more efficient than a traditional steam plant. The FPL West County Energy Center started serving customers in 2009. After the initial startup period, brackish water and surface water were utilized for the cooling system. However, in 2010, Palm Beach County began providing reclaimed water (approximately 22 to 27 MGD contracted) to this facility for cooling purposes.

FPL increased its power generation capacity at the existing Turkey Point plant by adding combined cycle generating technology to respond to significant population growth in South Florida. Unit 5 is a natural gas-fired combined-cycle unit that uses groundwater drawn from the Floridan aquifer while the other four units, Units 1–4, use water from the closed cycle recirculation canal system. FPL proposed to use up to 90 MGD of reclaimed water from Miami-Dade Water and Sewer Department to cool a planned expansion of nuclear generation at Turkey Point (Units 6 and 7) as well.

The Homestead Municipal Power Plant is a municipally owned peaking plant. A peaking plant generally runs only when there is a high demand for electricity. The plant utilizes a once-through cooling system and water is withdrawn from the Biscayne aquifer via 10 existing facilities as needed depending on which generating unit is online. The cooling water discharge point is approximately three miles upstream of SFWMD's salinity control structure S-179 and therefore, the effluent is generally returned to the aquifer locally and not discharged to tide.

The Cutler and Lauderdale FPL plants use seawater, which is not addressed in water supply plans. FPL removed the 1960s era units at the Riviera Plant in 2012 and will replace them with new, state-of-the-art high efficiency units. The plant will begin serving customers again in 2014 when it will return to service as a "next generation clean energy center." The Riviera Plant will use water from the Intracoastal Waterway for once-through cooling water. FPL removed the Port Everglades Plant in 2013 and plans to repower it. Once complete, the rebuilt facility will be known as the Port Everglades Energy Center. The Port Everglades Plant may also use water from the Intracoastal Waterway for once-through cooling purposes as it does currently; however, reclaimed water is also an option.

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Projection Methodology

Water demand projections were made in conjunction with FPL to reflect expectations for power demand growth; strategies for obtaining the electricity to meet demand, which leads to estimation of power plant construction; capacity, types, and locations of power plants; types of cooling facilities; and ability to achieve efficiencies in water use. Most of these factors are subject to considerable uncertainty. The efficacy of meeting demand from freshwater and saltwater sources needs further consideration, as does the cost-effectiveness of design and operational strategies that could significantly reduce water use.

Projection Results

Projected PWR Self-Supply water demand is presented in **Table A-29**. These projections are based on current usage and are assumed to remain the same between average rainfall and 1-in-10 year drought conditions. Because no distinction is needed between net and gross water in this use category, demand is the same. The estimates presented in **Table A-29** include only the generating capacity expected to be located in the LEC Planning Area. Additional capacity has been proposed for areas within the Lake Okeechobee Service Area. This demand was included in the *2011 Upper East Coast Water Supply Plan Update* (SFWMD 2011), *2012 Lower West Coast Water Supply Plan Update* (SFWMD 2012), and upcoming Lower Kissimmee Basin Water Supply Plan Update.

Table A-29. PWR Self-Supply water demand projections.

County	Facility Name	Water Demand Projections (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	FPL West County Energy Center (existing) [a]	5.2	0.0	0.0	0.0	0.0
Miami-Dade	FPL Turkey Point – Unit 5 (existing)	5.0	6.0	7.0	8.0	9.0
	Homestead Municipal (existing)	1.5	1.5	1.5	1.5	1.5
	Miami-Dade Total	**6.5**	**7.5**	**8.5**	**9.5**	**10.5**
LEC [b]	FPL Proposed	0.0	0.0	7.6	15.2	22.8
LEC Planning Area Total		**11.7**	**7.5**	**16.1**	**24.7**	**33.3**

a. This plant started receiving reclaimed water from Palm Beach County in 2010.
b. Location to be determined.

Another potential plant may be sited in the LEC Planning Area, possibly in Hendry County where FPL has purchased land. The demand associated with this future plant is 22.8 MGD in 2030. Net PWR Self-Supply is projected to increase from 12 MGD in 2010 to 33 MGD by 2030 (**Table A-29**) in the LEC Planning Area. The projections also account for potential power generation growth and proposed expansion, which may utilize different cooling technologies. The different process and cooling technologies may require and utilize traditional and alternative water supply sources including captured excess storm water, groundwater from the Floridan aquifer, and reclaimed water when feasible. However. the

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projections do not include saltwater withdrawals or demand met by reclaimed water at the FPL power plants because saltwater and reclaimed sources do not require a SFWMD permit.

In the 2005–2006 LEC Plan Update, the estimated PWR Self-Supply freshwater demand for 2005 was only 4.5 MGD, but was expected to grow to 102.9 MGD by 2025 to support proposed new power generating facilities (SFWMD 2007). However, FPL's use of seawater, modernization of plants, and use of reclaimed water when available, contributed to the decrease in PWR Self-Supply water demand.

TOTAL PLANNING AREA DEMAND AND PLAN COMPARISONS

Total Planning Area Demand

This section summarizes both the total net (finished) demand and total gross (raw) demand for each county as well as the entire LEC Planning Area for both average rainfall and 1-in-10 year drought conditions. Net water demands by county are provided in **Table A-30** for average rainfall conditions and **Table A-31** for 1-in-10 drought conditions. Gross water demands by county are provided in **Table A-32** for average rainfall conditions and **Table A-33** for 1-in-10 year drought conditions. **Table A-34** shows net demand and **Table A-35** presents estimated gross water demand from 2010 to 2030 for the entire LEC Planning Area under average rainfall and 1-in-10 year drought conditions.

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Table A-30. Summary of finished water demand for average rainfall conditions by county for each five-year increment.

Water Use Category	Net Water Demand – Average Rainfall Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County					
Public Water Supply	207.4	221.1	233.1	248.9	261.5
Domestic Self-Supply	12.9	12.9	13.4	12.8	12.8
Agricultural Self-Supply	233.9	232.5	233.6	234.4	235.8
Industrial/Commercial/Institutional Self-Supply	5.4	4.8	3.5	3.5	3.5
Recreational/Landscape Self-Supply	60.5	59.1	60.2	61.4	62.5
Power Generation Self-Supply	5.2	0.0	0.0	0.0	0.0
Palm Beach County Total	**525.3**	**530.4**	**543.8**	**561.0**	**576.1**
Broward County					
Public Water Supply	214.9	222.7	230.8	238.5	245.6
Domestic Self-Supply	0.9	1.0	0.7	1.0	1.0
Agricultural Self-Supply	1.1	1.0	1.1	1.2	1.3
Industrial/Commercial/Institutional Self-Supply	1.6	1.1	1.2	1.3	1.3
Recreational/Landscape Self-Supply	37.7	38.3	38.3	38.3	38.3
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Broward County Total	**256.2**	**264.1**	**272.1**	**280.3**	**287.5**
Miami-Dade County					
Public Water Supply	345.1	360.9	377.4	393.2	409.0
Domestic Self-Supply	3.3	3.5	3.6	3.8	3.9
Agricultural Self-Supply	48.5	46.5	47.0	47.3	47.7
Industrial/Commercial/Institutional Self-Supply	37.3	34.6	54.0	51.8	51.8
Recreational/Landscape Self-Supply	12.8	12.9	13.0	13.0	13.1
Power Generation Self-Supply	6.5	7.5	8.5	9.5	10.5
Miami-Dade County Total	**453.5**	**465.9**	**503.5**	**518.6**	**536.0**
Monroe County					
Public Water Supply	16.5	17.7	19.0	20.4	21.7
Domestic Self-Supply	0.0	0.0	0.0	0.0	0.0
Agricultural Self-Supply	0.03	0.03	0.03	0.03	0.03
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.7	0.7	0.7	0.7	0.7
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Monroe County Total	**17.2**	**18.4**	**19.7**	**21.1**	**22.4**
Hendry County					
Public Water Supply	0.0	0.0	0.0	0.0	0.0
Domestic Self-Supply	0.2	0.2	0.2	0.2	0.2
Agricultural Self-Supply	76.5	74.0	66.7	72.3	77.4
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.0	0.0	0.0	0.0	0.0
Power Generation Self-Supply	0.0	0.0	7.6	15.2	22.8
Hendry County Total	**76.7**	**74.2**	**74.5**	**87.7**	**100.4**
LEC Planning Area Total					
Public Water Supply	783.8	822.4	860.3	900.9	937.8
Domestic Self-Supply	17.3	17.5	17.9	17.8	17.9
Agricultural Self-Supply	360.0	354.0	348.4	355.2	362.2
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	111.7	111.0	112.2	113.4	114.6
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,328.8**	**1,352.9**	**1,413.6**	**1,468.6**	**1,522.4**

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Table A-31. Summary of finished water demand for 1-in-10 year drought conditions by county for each five-year increment.

Water Use Category	Net Water Demand – 1-in-10 Year Drought Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County					
Public Water Supply	233.5	249.1	262.8	280.5	294.8
Domestic Self-Supply	14.3	14.3	14.8	14.2	14.2
Agricultural Self-Supply	522.8	520.6	522.1	523.2	524.8
Industrial/Commercial/Institutional Self-Supply	5.4	4.8	3.5	3.5	3.5
Recreational/Landscape Self-Supply	74.8	73.2	74.5	75.9	77.4
Power Generation Self-Supply	5.2	0.0	0.0	0.0	0.0
Palm Beach County Total	792.8	798.3	814.3	834.3	852.1
Broward County					
Public Water Supply	236.5	245.2	254.0	262.6	270.3
Domestic Self-Supply	1.0	1.1	0.8	1.1	1.1
Agricultural Self-Supply	1.4	1.2	1.4	1.5	1.6
Industrial/Commercial/Institutional Self-Supply	1.6	1.1	1.2	1.3	1.3
Recreational/Landscape Self-Supply	47.2	47.9	47.9	47.9	47.9
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Broward County	**287.7**	**296.5**	**305.3**	**314.4**	**322.2**
Miami-Dade County					
Public Water Supply	375.1	392.3	410.2	427.4	444.5
Domestic Self-Supply	3.6	3.8	3.9	4.1	4.3
Agricultural Self-Supply	64.6	62.2	62.6	63.0	63.4
Industrial/Commercial/Institutional Self-Supply	37.3	34.6	54.0	51.8	51.8
Recreational/Landscape Self-Supply	15.3	15.4	15.5	15.6	15.7
Power Generation Self-Supply	6.5	7.5	8.5	9.5	10.5
Miami-Dade County	**502.4**	**515.8**	**554.7**	**571.4**	**590.2**
Monroe County					
Public Water Supply	17.0	18.3	19.6	21.0	22.4
Domestic Self-Supply	0.0	0.0	0.0	0.0	0.0
Agricultural Self-Supply	0.04	0.04	0.04	0.04	0.04
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.8	0.8	0.8	0.8	0.8
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Monroe County	**17.8**	**19.1**	**20.4**	**21.8**	**23.2**
Hendry County					
Public Water Supply	0.0	0.0	0.0	0.0	0.0
Domestic Self-Supply	0.2	0.2	0.2	0.2	0.2
Agricultural Self-Supply	114.3	111.0	101.1	108.5	115.0
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.0	0.0	0.0	0.0	0.0
Power Generation Self-Supply	0.0	0.0	7.6	15.2	22.8
Hendry County	**114.5**	**111.2**	**108.9**	**123.9**	**138.0**
LEC Planning Area Total					
Public Water Supply	841.5	883.1	924.0	967.6	1,007.4
Domestic Self-Supply	19.1	19.3	19.7	19.6	19.8
Agricultural Self-Supply	703.1	695.0	687.2	696.2	704.8
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	138.1	137.3	138.7	140.2	141.8
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	1,719.2	1,743.9	1,808.4	1,870.7	1,932.7

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Table A-32. Summary of gross demand for average rainfall conditions by county for each five-year increment.

Water Use Category	Gross Water Demand – Average Rainfall Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County					
Public Water Supply	233.5	249.1	262.8	280.5	294.8
Domestic Self-Supply	13.4	13.4	13.9	13.4	13.3
Agricultural Self-Supply	454.7	452.1	453.8	455.1	457.1
Industrial/Commercial/Institutional Self-Supply	5.4	4.8	3.5	3.5	3.5
Recreational/Landscape Self-Supply	80.6	78.9	80.3	81.8	83.4
Power Generation Self-Supply	5.2	0.0	0.0	0.0	0.0
Palm Beach County	792.8	798.3	814.3	834.3	852.1
Broward County					
Public Water Supply	235.3	243.8	252.6	260.8	268.5
Domestic Self-Supply	1.0	1.0	0.7	1.0	1.1
Agricultural Self-Supply	2.0	1.5	1.8	2.0	2.3
Industrial/Commercial/Institutional Self-Supply	1.6	1.1	1.2	1.3	1.3
Recreational/Landscape Self-Supply	50.3	51.0	51.0	51.0	51.0
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Broward County	**290.2**	**298.4**	**307.3**	**316.1**	**324.2**
Miami-Dade County					
Public Water Supply	355.0	371.2	388.2	404.5	420.7
Domestic Self-Supply	3.5	3.6	3.8	3.9	4.1
Agricultural Self-Supply	66.2	63.7	64.2	64.7	65.1
Industrial/Commercial/Institutional Self-Supply	37.3	34.6	54.0	51.8	51.8
Recreational/Landscape Self-Supply	17.1	17.2	17.3	17.4	17.5
Power Generation Self-Supply	6.5	7.5	8.5	9.5	10.5
Miami-Dade County	**485.6**	**497.8**	**536.0**	**551.8**	**569.7**
Monroe County					
Public Water Supply	17.7	19.0	20.4	21.9	23.3
Domestic Self-Supply	0.0	0.0	0.0	0.0	0.0
Agricultural Self-Supply	0.1	0.1	0.1	0.1	0.1
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.9	0.9	0.9	0.9	0.9
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Monroe County	**18.7**	**20.0**	**21.4**	**22.9**	**24.3**
Hendry County					
Public Water Supply	0.0	0.0	0.0	0.0	0.0
Domestic Self-Supply	0.2	0.2	0.2	0.2	0.2
Agricultural Self-Supply	131.8	129.2	121.6	130.3	139.3
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.0	0.0	0.0	0.0	0.0
Power Generation Self-Supply	0.0	0.0	7.6	15.2	22.8
Hendry County	**132.0**	**129.4**	**129.4**	**145.7**	**162.3**
LEC Planning Area Total					
Public Water Supply	841.5	883.1	924.0	967.6	1007.4
Domestic Self-Supply	18.0	18.2	18.6	18.5	18.7
Agricultural Self-Supply	654.8	646.6	641.5	652.2	663.9
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	148.9	148.0	149.5	151.1	152.8
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	1719.2	1743.9	1808.4	1870.7	1932.7

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Table A-33. Summary of gross demands for 1-in-10 year drought conditions by county for each five-year increment.

Water Use Category	Gross Water Demand – 1-in-10 Year Drought Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County					
Public Water Supply	259.0	276.2	291.4	311.1	327.0
Domestic Self-Supply	14.9	14.9	15.4	14.8	14.8
Agricultural Self-Supply	1,024.2	1,021.0	1,022.8	1,024.6	1,024.2
Industrial/Commercial/Institutional Self-Supply	5.4	4.8	3.5	3.5	3.5
Recreational/Landscape Self-Supply	99.7	97.6	99.3	101.2	103.2
Power Generation Self-Supply	5.2	0.0	0.0	0.0	0.0
Palm Beach County Total	**1,408.4**	**1,414.5**	**1,432.4**	**1,455.2**	**1,472.7**
Broward County					
Public Water Supply	259.1	268.4	278.1	287.1	295.6
Domestic Self-Supply	1.1	1.1	0.8	1.2	1.2
Agricultural Self-Supply	2.4	2.0	2.3	2.6	2.9
Industrial/Commercial/Institutional Self-Supply	1.6	1.1	1.2	1.3	1.3
Recreational/Landscape Self-Supply	62.9	63.8	63.8	63.8	63.8
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Broward County Total	**327.1**	**336.4**	**346.2**	**356.0**	**364.8**
Miami-Dade County					
Public Water Supply	385.9	403.5	422.0	439.7	457.3
Domestic Self-Supply	3.8	3.9	4.1	4.3	4.4
Agricultural Self-Supply	86.5	83.6	84.0	84.6	85.0
Industrial/Commercial/Institutional Self-Supply	37.3	34.6	54.0	51.8	51.8
Recreational/Landscape Self-Supply	20.4	20.5	20.6	20.8	20.9
Power Generation Self-Supply	6.5	7.5	8.5	9.5	10.5
Miami-Dade County Total	**540.4**	**553.6**	**593.2**	**610.7**	**629.9**
Monroe County					
Public Water Supply	18.2	19.6	21.1	22.6	24.0
Domestic Self-Supply	0.0	0.0	0.0	0.0	0.0
Agricultural Self-Supply	0.1	0.1	0.1	0.1	0.1
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	1.0	1.0	1.0	1.0	1.0
Power Generation Self-Supply	0.0	0.0	0.0	0.0	0.0
Monroe County Total	**19.3**	**20.7**	**22.2**	**23.7**	**25.1**
Hendry County					
Public Water Supply	0.0	0.0	0.0	0.0	0.0
Domestic Self-Supply	0.2	0.2	0.2	0.2	0.2
Agricultural Self-Supply	208.5	205.8	194.3	207.7	220.3
Industrial/Commercial/Institutional Self-Supply	0.0	0.0	0.0	0.0	0.0
Recreational/Landscape Self-Supply	0.0	0.0	0.0	0.0	0.0
Power Generation Self-Supply	0.0	0.0	7.6	15.2	22.8
Hendry County	**208.7**	**206.0**	**202.1**	**223.1**	**243.3**
LEC Planning Area Total					
Public Water Supply	922.2	967.8	1,012.6	1,060.4	1,104.0
Domestic Self-Supply	19.9	20.1	20.5	20.5	20.6
Agricultural Self-Supply	1,321.7	1,312.5	1,303.5	1,319.6	1,332.5
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	184.0	182.9	184.7	186.8	188.9
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**2,503.8**	**2,531.3**	**2,596.1**	**2,668.6**	**2,735.9**

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Table A-34. Finished water demand by water use category for the entire LEC Planning Area.

Water Use Category	Finished (Net) Water Demand (MGD)				
	2010	2015	2020	2025	2030
Average Rainfall Conditions					
Public Water Supply	783.8	822.4	860.3	900.9	937.8
Domestic Self-Supply	17.3	17.5	17.9	17.8	17.9
Agricultural Self-Supply	360.0	354.0	348.4	355.2	362.2
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	111.7	111.0	112.2	113.4	114.6
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,328.8**	**1,352.9**	**1,431.6**	**1,468.6**	**1,522.4**
1-in-10 Year Drought Conditions					
Public Water Supply	858.5	901.0	942.3	987.0	1,027.2
Domestic Self-Supply	19.1	19.3	19.7	19.6	19.8
Agricultural Self-Supply	703.1	695.0	687.2	696.2	704.8
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	138.1	137.3	138.7	140.2	141.8
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,774.8**	**1,800.6**	**1,862.7**	**1,924.3**	**1,983.5**

Table A-35. Gross water demand by water use category for the entire LEC Planning Area.

Water Use Category	Gross Water Demand (MGD)				
	2010	2015	2020	2025	2030
Average Rainfall Conditions					
Public Water Supply	841.5	883.1	924.0	967.6	1,007.4
Domestic Self-Supply	18.0	18.2	18.6	18.5	18.7
Agricultural Self-Supply	654.8	646.6	641.5	652.2	663.9
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	148.9	148.0	149.5	151.1	152.8
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,719.2**	**1,743.9**	**1,808.4**	**1,870.7**	**1,932.7**
1-in-10 Year Drought Conditions					
Public Water Supply	922.2	967.8	1,012.6	1,060.4	1,104.0.
Domestic Self-Supply	19.9	20.1	20.5	20.5	20.6
Agricultural Self-Supply	1,321.7	1,312.5	1,303.5	1,319.6	1,332.5
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.7	56.6	56.6
Recreational/Landscape Self-Supply	184.0	182.9	184.7	186.8	188.9
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**2,503.8**	**2,531.3**	**2,596.1**	**2,668.6**	**2,735.9**

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Comparison of 2005–2006 LEC Plan Update Amendment and Current Update Projected Water Demands

The top part of **Table A-36** compares the projected average rainfall condition gross water demand estimated in the 2005–2006 LEC Plan Update with those estimated for this update. The bottom half of **Table A-36** shows the same for the projected 1-in-10 year drought conditions water demand. The most significant differences between the demand estimates in the 2005–2006 LEC Plan Update and this update relate to the following developments:

- Subsequent to approval of the 2005–2006 LEC Plan Update in February 2007, the nation's economy fell into a long recession that had significant impacts on regional water supply planning, lowering population and demand forecasts. The dramatic slowdown in population growth occurred at the same time that consumption of potable water declined as measured in gallons per person per day. Reasons for this decrease in PWS consumption likely include short-term water shortage restrictions in response to droughts, long-term water conservation projects including the SFWMD's Year-Round Landscape Irrigation Conservation Measures, and increased use of reclaimed water.
- The rise in the total REC Self-Supply total demand is attributed to the landscape component, not golf courses. The landscape component grew rapidly in response to community development and common areas requiring self-supply irrigation between the two plan evaluation periods.
- The decline in PWR Self-Supply relates to the continued increase in use of alternative sources such as reclaimed water, seawater, and coastal brackish water for thermo-cooling purposes and improvements in process efficiencies (less water demanded per kilowatt hour of energy produced).

Table A-36. End point projections of gross water demand under average rainfall and 1-in-10 year drought conditions in the 2005–2006 LEC Plan Update and this update.

Water Use Category	2005–2006 LEC Plan Update Demand for 2025 (MGD)	2013 LEC Plan Update Demand for 2030 (MGD)
Average Conditions		
Public Water Supply	1,286.5	1,007.4
Domestic Self-Supply	48.9	18.7
Agricultural Self-Supply	689.1	663.9
Industrial/Commercial/Institutional Self-Supply	61.3	56.6
Recreational/Landscape Self-Supply	84.8	152.8
Power Generation Self-Supply	102.6	33.3
LEC Planning Area Total	**2,273.2**	**1,932.7**
1-in-10 Year Drought Conditions		
Public Water Supply	1,363.7	1,104.0
Domestic Self-Supply	51.8	20.6
Agricultural Self-Supply	1,396.4	1,332.5
Industrial/Commercial/Institutional Self-Supply	61.3	56.6
Recreational/Landscape Self-Supply	104.4	188.9
Power Generation Self-Supply	102.6	33.3
LEC Planning Area Total	**3,080.2**	**2,735.9**

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B

Minimum Flows and Levels Criteria and Recovery and Prevention Strategies

Section 373.709, Florida Statutes (F.S.), requires each regional water supply plan to be based on at least a twenty-year planning period and include, among other items, the minimum flows and levels (MFL) criteria and associated recovery or prevention strategies adopted within the planning region. The plan must also identify any surface water or aquifers for which MFLs are scheduled to be adopted. This appendix provides additional and updated information since the *2000 Lower East Coast Regional Water Supply Plan* (2000 LEC Plan) (SFWMD 2000b) and the *2005–2006 Lower East Cost Water Supply Plan Update* (2005–2006 LEC Plan Update) (SFWMD 2007), as amended in 2008. The previous report on MFL prevention and recovery strategies was included in Appendix H of the 2005–2006 LEC Plan Update.

MINIMUM FLOWS AND LEVELS CRITERIA

The overall goal of Chapter 373, F.S. is to ensure the sustainability of water resources of the state (Section 373.016, F.S.). Chapter 373, F.S. provides the South Florida Water Management District (SFWMD) with several tools to carry out this responsibility, including MFL criteria. MFL criteria are the point at which further withdrawals would cause significant harm to water resources. Significant harm is defined as the level of harm that requires multiple years for the water resource to recover. This is considered more severe than the harm standard imposed in the water use permitting process, which relates to impacts that would occur during a 1-in-10 year drought. Therefore, MFLs in a recovered natural system would not be exceeded until conditions had already exceeded the 1-in-10 year drought level of certainty criteria. Serious harm, the ultimate harm to the water resources contemplated under Chapter 373, F.S., is defined as long-term, irreversible, or permanent loss to water resource functions. MFL water bodies approaching their MFL criteria are a factor the District's Governing Board considers when contemplating water shortage restrictions. The MFL criteria are not utilized to trigger water shortage restrictions during climatic conditions less severe than a 1-in-10 year level of drought. Rather, the District's Governing Board may impose water shortage restrictions if an MFL exceedance

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occurs or is projected to occur during climatic conditions more severe than a 1-in-10 year drought, to the extent consumptive uses contribute to such exceedance.

The levels of impacts—harm, significant harm, and serious harm—are relative resource protection terms. Each plays a role toward achieving a sustainable water resource. The role of MFL criteria is shown conceptually in **Figure B-1**.

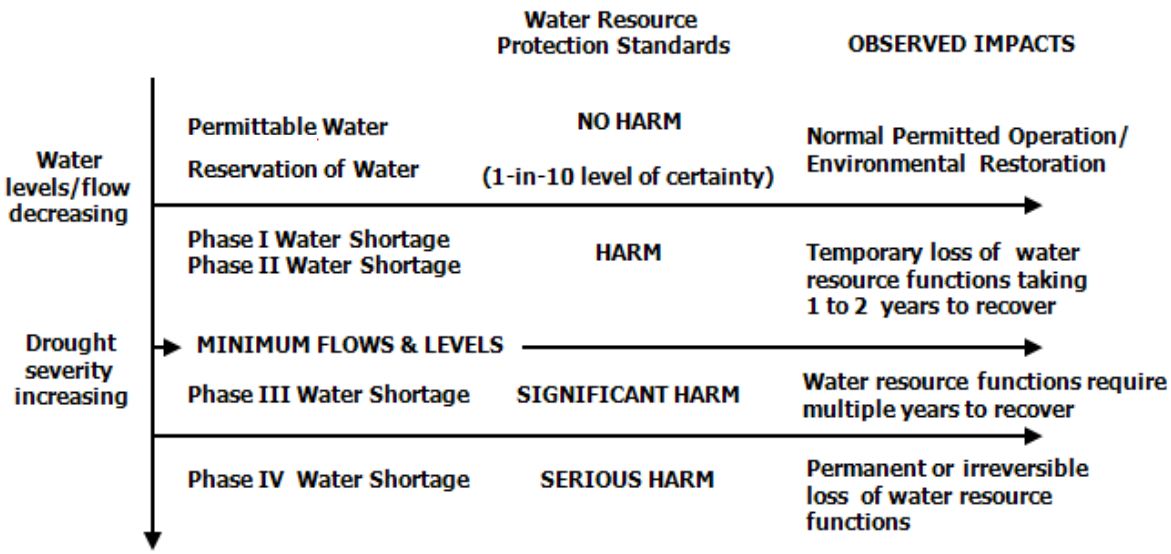

Figure B-1. Conceptual relationship among the harm, significant harm, and serious harm water resource protection standards.

Water use permitting protects the water resources from harm by ensuring water use is reasonable-beneficial, does not interfere with existing legal users, and is consistent with the public interest. As one of the tools for plan implementation, the 2000 LEC Plan recommended rulemaking to incorporate additional resource protection criteria, level of certainty, special designations, and permit durations into water use permitting criteria. A series of rulemaking efforts was completed in September 2003, resulting in amendments to Chapters 40E-1, 40E-2, 40E-5, 40E-8, 40E-20, and 40E-21, Florida Administrative Code (F.A.C.) and the *Basis of Review for Water Use Permit Applications within the South Florida Water Management District*, referred to as the Basis of Review (SFWMD 2012). Among the most significant changes were the amendments to permit duration, permit renewal, wetland protection, supplemental irrigation requirements, saltwater intrusion, aquifer storage and recovery, and model evaluation criteria.

The 2000 LEC Plan recommended that rulemaking should proceed when sufficient information was available and evaluated in the planning process. As a result, additional rules were adopted as technical information to establish MFL criteria became available. Within the Lower East Coast (LEC) Planning Area, between 2001 and 2006, MFL criteria were adopted for five water bodies. MFL rules have been established for Lake Okeechobee, the Everglades, the Biscayne aquifer (SFWMD 2000a), the Northwest Fork of the Loxahatchee River (SFWMD 2002a), and Florida Bay (SFWMD 2006a). Two additional MFL

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rules were established during the same period for the Caloosahatchee River (SFWMD 2000c) and St. Lucie Estuary (SFWMD 2002b) located in the Lower West Coast and Upper East Coast planning areas, respectively. The priority water body schedule submitted to the Florida Department of Environmental Protection in 2013 includes evaluation of the existing MFL criteria for the Caloosahatchee River and Estuary and Florida Bay (Medellin 2013).

Lake Okeechobee

MFL criteria for Lake Okeechobee were established in 2001. Significant harm criteria were based on the relationship between water levels in the lake and the ability to 1) protect the coastal aquifer against saltwater intrusion, 2) supply water to Everglades National Park, 3) provide littoral zone habitat for fish and wildlife, and 4) ensure navigational and recreational access (SFWMD 2000a). Consideration was also given to the lake's function as a storage area for supplying water to adjacent areas, such as the Everglades Agricultural Area (EAA), the Seminole Tribe of Florida reservations, and the Lake Okeechobee Service Area. An MFL violation occurs in Lake Okeechobee when an exceedance occurs more than once every six years. An exceedance is a decline in lake level elevation below 11 feet related to the National Geodetic Vertical Datum of 1929 (NGVD) for more than 80, nonconsecutive or consecutive, days during an eighteen-month period. The eighteen-month period is initiated following the first day Lake Okeechobee falls below 11 feet NGVD, and does not include more than one wet season, defined as May 31 through October 31 of any given calendar year (Rule 40E-8.221, F.A.C.).

Revised Lake Okeechobee Regulation Schedule Effects

In 2000, with the transition to the Water Supply and Environment regulation schedule, an analysis was conducted to determine whether the proposed Lake Okeechobee MFL criteria could be expected to be violated over the next 20 years. This information was needed to assess whether a prevention or recovery strategy would be needed for Lake Okeechobee. The South Florida Water Management Model was used to evaluate the proposed MFL criteria in five-year increments through 2020. The analysis considered projected growth in water use demands on the lake, the scheduled delivery and performance of the Central and Southern Florida Flood Control Project Comprehensive Review Study project components (USACE and SFWMD 1999), and the Water Supply and Environment regulation schedule proposed for the lake. Details regarding the modeling analysis are available in the 2000 LEC Plan.

Under these assumptions, the SFWMD found the proposed Lake Okeechobee MFL criteria would not be violated, and existing, as well as projected, users would have a 1-in-10 level of certainty providing the water shortage trigger line for Lake Okeechobee that existed in 2000 (Chapter 40E-22, F.A.C.) was lowered 0.5 feet. The proposed Water Supply and Environment regulation schedule was adopted by the United States Army Corps of Engineers (USACE) in July 2000. SFWMD conducted rulemaking to modify the water shortage trigger line and adopted the Lake Okeechobee MFL criteria with the associated prevention strategy in 2001.

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However, in response to a series of hurricanes, high lake stage events, and the resulting harmful discharges to the Caloosahatchee and St. Lucie estuaries during 2004 and 2005, USACE initiated a process to revise the Water Supply and Environment regulation schedule to improve management of Lake Okeechobee during high water conditions. The goals of the regulation schedule modification process—known as the Lake Okeechobee Regulation Schedule Study—were later amended to address public health and safety concerns related to the structural competency of the Herbert Hoover Dike. In July 2007, after extensive public participation, USACE published the *Final Environmental Impact Statement Including Appendices A through G – Lake Okeechobee Regulation Schedule* (USACE 2007). The revised lake regulation schedule would effectively reduce lake stages until the completion of Herbert Hoover Dike repairs for Reaches 1, 2, and 3.

In developing the environmental impact statement, the SFWMD, working with USACE, conducted modeling to evaluate the effects of the proposed regulation schedule in terms of frequency, duration, and severity of water shortage cutbacks, and the lake's MFL performance. Results of the modeling indicated that while the regulation schedule would effectively provide protection for public health and safety, the Lake Okeechobee MFL criteria was projected to be violated and existing legal uses were projected to experience significantly greater water shortage cutbacks. Attempts to mitigate the impacts to existing legal users of Lake Okeechobee water were evaluated, including the use of portable water supply pumps (to access lake water at lower stages) and dropping the water shortage trigger line an additional foot. While lowering the water shortage trigger line would reduce the duration and severity of water shortage cutbacks associated with the proposed schedule, it was found that lowering it was inconsistent with the MFL criteria and, therefore, the SFWMD rejected it as an option. Despite the increased water shortage impacts to existing legal users, the protection of public safety as related to the structural integrity of the Herbert Hoover Dike was the overarching factor. USACE issued its record of decision approving the revised lake regulation schedule, referred to as the 2008 Lake Okeechobee Regulation Schedule (2008 LORS), on April 28, 2008.

While 2008 LORS is temporary, it is unclear when a revision can be made to the regulation schedule or what the schedule will entail. As a result, the original MFL prevention strategy included in the 2000 LEC Plan and Chapter 40E-8, F.A.C. was revised to a recovery strategy. The recovery strategy is discussed later in this appendix.

Everglades

MFL criteria were adopted for the Everglades in 2001. Technical relationships considered for developing these MFL criteria included the effects of water levels on hydric soils, plant and wildlife communities, and the frequency and severity of fires (SFWMD 2000a). Impacts associated with significant harm include increased peat oxidation, frequency of severe fires, soil subsidence, loss of aquatic refugia, loss of tree islands, and long-term changes in vegetation or wildlife habitat. The MFL criteria for the Everglades were based on protecting the two dominant soil types, peat-forming and marl-forming wetlands, found within the ecosystem.

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Wetlands overlying organic peat soils (i.e., peatlands) are found within the Water Conservation Areas (WCAs), Rotenberger and Holey Land wildlife management areas, and Shark River Slough, which is within Everglades National Park. The minimum water levels within wetlands overlying organic peat soils shall not fall below ground surface for more than 30 days and shall not fall below 1.0 foot below ground for one day or more of that thirty-day period, at specific return frequencies for different areas. Paragraph 40E-8.221(3), F.A.C. identifies specific water levels for different areas within the Everglades (**Table B-1**).

Marl-forming wetlands are located east and west of Shark River Slough, the Rocky Glades, and Taylor Slough, which are within Everglades National Park. The minimum water levels within marl-forming wetlands shall not fall below ground surface for more than 90 days and shall not fall below 1.5 feet belowground for one day or more of that ninety-day period at specific return frequencies for different areas, as identified in **Table B-1**.

Table B-1. Minimum water level, duration, and return frequency for selected water management gauges located within the Everglades (Rule 40E-8.221(3), F.A.C.).

Area	Key Gauge	Soil Type	Minimum Depth and Duration	Return Frequency
Arthur R. Marshall Loxahatchee National Wildlife Refuge	1-7	Peat	-1.0 foot > 30 days	1-in-4 years
WCA 2A	2A-17	Peat	-1.0 foot > 30 days	1-in-4 years
WCA 2B	SITE_99 [a]	Peat	-1.0 foot > 30 days	1-in-3 years
Holey Land Wildlife Management Area	HoleyG	Peat	-1.0 foot > 30 days	1-in-3 years
Rotenberger Wildlife Management Area	Rotts	Peat	-1.0 foot > 30 days	1-in-2 years
Northwestern corner of WCA 3A	3A-NW	Peat	-1.0 foot > 30 days	1-in-4 years
Northwestern WCA 3A	3A-2	Peat	-1.0 foot > 30 days	1-in-4 years
Northeastern corner of WCA 3A	3A-3	Peat	-1.0 foot > 30 days	1-in-3 years
Northeastern WCA 3A	3A-NE	Peat	-1.0 foot > 30 days	1-in-2 years
Central WCA 3A	3A-4	Peat	-1.0 foot > 30 days	1-in-4 years
Southern WCA 3A	3A-28	Peat	-1.0 foot > 30 days	1-in-4 years
WCA 3B	3BS1W1 [a]	Peat	-1.0 foot > 30 days	1-in-7 years
Northeastern Shark River Slough	NESRS-2	Peat	-1.0 foot > 30 days	1-in-10 years
Central Shark River Slough	NP-33	Peat	-1.0 foot > 30 days	1-in-10 years
Southwestern Shark River Slough	NP 36	Peat	-1.0 foot > 30 days	1-in-7 years
Marl wetlands east of Shark River Slough	NP-38	Marl	-1.5 foot > 90 days	1-in-3 years
Marl wetlands west of Shark River Slough	NP-201 G-620	Marl	-1.5 foot > 90 days	1-in-5 years
Rockland Marl Marsh	RG1 [a]	Marl	-1.5 foot > 90 days	1-in-2 years
Taylor Slough	NP-67	Marl	-1.5 foot > 90 days	1-in-2 years

a. Monitoring locations have been updated to alternative sites since rule adoption.

Since inception, three of the monitoring locations have been updated to alternative monitoring locations. In WCA 2B, the SITE_99 gauge replaced the nearby 2B-21 gauge that became inoperable following hurricane damage. In WCA 3B, the 3BS1W1 gauge is used as a surrogate to the 3B-SE gauge due to availability of real-time data from 3BS1W1 via telemetry that is not available at the original 3B-SE site. Likewise, in Everglades National

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Park, the telemetered, real-time RG1 gauge is used as a surrogate to the G-1502 gauge, which has a several month lag. Only short distance shifts (approximately 1 mile) in monitoring locations were made and no changes were made to the MFL criteria for these sites.

Northwest Fork of the Loxahatchee River

The MFL criteria for Northwest Fork of the Loxahatchee River were adopted in 2002 (40E-8.221(1), F.A.C.). The Loxahatchee River and Estuary watershed is located on the southeastern coast of Florida in Martin and Palm Beach counties. It includes the Northwest, Southwest, and North Forks of the Loxahatchee River, a major drainage canal (C-18), the surrounding watershed, and the estuary. This system is of particular importance because the Northwest Fork was designated as Florida's first National Wild and Scenic River in 1985.

Minimum flow criteria for the Northwest Fork are linked to the concept of protecting valued ecosystem components from significant harm. The value ecosystem component identified for the Northwest Fork is the river's freshwater floodplain swamp. The designation of the Northwest Fork as a National Wild and Scenic River identified the floodplain swamp and its associated cypress forest as a resource of outstanding value that needs to be protected. Since cypress trees tolerate a wide range of salinity conditions and are slow to show a response to salinity stress, an assemblage of six freshwater tree species that, as a group, are a more sensitive indicator of adverse salinity condition were identified as characterizing the floodplain swamp. Protection of these species will assure the floodplain swamp and their associated communities of freshwater species are protected from significant harm. This is described in the *Final Draft Technical Documentation to Support Development of Minimum Flows and Levels for the Northwest Fork of the Loxahatchee River* (SFWMD 2002a).

Pursuant to paragraph 40E-8.221(1), F.A.C., an MFL violation occurs in the Northwest Fork of the Loxahatchee River when an MFL exceedance occurs more than once in a six-year period. An MFL exceedance occurs when flows over the Lainhart Dam decline below 35 cubic feet per second (cfs) for more than 20 consecutive days, or the average daily salinity concentration expressed as a twenty-day rolling average exceeds 2 parts per thousand[4] within any given calendar year. The average daily salinity will be representative of mid-depth in the water column at River Mile 9.2 (SFWMD 2002a).

Flow at Lainhart Dam is estimated using headwater and tailwater elevations, the width of the flow, and estimated elevation of the logs that comprise the dam, also known as the sill elevation. The effective sill elevation changes over time because of debris accumulation (e.g., vegetation, trees branches, etc.) or damage to the logs, leading to the need to regularly measure flows at this site to recalibrate the flow rating equations. Additionally, the earthen banks of the Loxahatchee River at Lainhart Dam have scoured over time, particularly during the last four years. This scouring induces leakage that affects the estimated flows. To ensure that reliable estimates of flow are available for compliance with the 35-cfs minimum flow

[4] While common practice is to no longer use units with salinity measurements, the rule uses the units parts per thousand and were used in this section for consistency with the rule.

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criteria at the Lainhart Dam, the SFWMD made over twenty discharge measurements in the last two years to verify, and when necessary, recalibrate the rating. To ensure that the rating remains valid to assess MFL compliance, new field flow measurements must be collected regularly for flow rating validation and recalibration. The United States Geological Survey is taking over the site and intends to regularly measure flow to recalibrate the rating equations until the dam can be structurally stabilized.

Biscayne Aquifer

In 2001, MFL criteria for the Biscayne aquifer were developed and adopted by rule based on analysis of relationships among groundwater levels and canal water levels, and the potential for saltwater intrusion (SFWMD 2000a). Harm occurs when the saltwater interface moves farther inland than occurred historically due to seasonal water level fluctuations, up to and including a 1-in-10 year drought. Significant harm occurs when saline groundwater moves inland to an extent that it limits the ability of users to obtain fresh groundwater and several years are required for the freshwater source to recover. The MFL criteria do not address the groundwater base flows to Biscayne Bay.

The minimum level for the Biscayne aquifer is the water level associated with movement of the saltwater interface landward to the extent that groundwater quality at the withdrawal point is insufficient to serve as a water supply source. **Table B-2** provides the minimum canal operational levels for 11 primary water management structures that the SFWMD maintains. To meet the operational criteria, the canal stage cannot fall below the levels for more than 180 days, and the average annual stage must be sufficient to allow levels and chloride concentrations in the aquifer to recover to levels that existed before a drought or discharge event occurred.

Table B-2. Minimum canal operation levels of coastal canals associated with the Biscayne aquifer MFL (SFWMD 2000a).

Canal	Structure	Minimum Canal Operation Levels to Protect Against MFL Violations (feet NGVD)
C-51	S-155	7.80
C-16	S-41	7.80
C-15	S-40	7.80
Hillsboro	G-56	6.75
C-14	S-37B	6.50
C-13	S-36	4.00
North New River	G-54	3.50
C-9	S-29	2.00
C-6	S-26	2.50
C-4	S-25B	2.50
C-2	S-22	2.50

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Florida Bay

MFL criteria for Florida Bay were adopted in 2006 (40E-8.221(5), F.A.C.). The rule is supported by analyses documented in the *Technical Documentation to Support Development of Minimum Flows and Levels for Florida Bay* (SFWMD 2006a). An MFL violation occurs in northeastern Florida Bay when an MFL exceedance occurs during two successive years, more than once in a ten-year period. An exceedance of the MFL criteria will be deemed to occur when the average salinity over 30 or more consecutive days exceeds 30 parts per thousand[5] at the Taylor River salinity monitoring station, located at 25° 13' 29" north and 80° 39' 10" west (SFWMD 2006b). Multiple events of 30 or more day periods with salinity greater than 30 parts per thousand, occurring within a single calendar year, are considered a single exceedance.

The criteria are based on the needs of submerged aquatic vegetation (SAV) habitat within the Taylor River/Little Madeira Bay/Eagle Key gradient. SAV is a critical component of the Florida Bay ecosystem. Freshwater discharges from the regional water management system have a direct effect on salinity conditions in the Everglades–Florida Bay Transition Zone and influence adjacent waters of northeastern Florida Bay. Widgeon grass (*Ruppia maritima)* is an indicator of SAV habitat and ecosystem status. Widgeon grass is responsive to salinity change in the transition zone and, compared to other SAV species in this zone, is tolerant of high salinity. When widgeon grass is eliminated by high salinity, SAV habitat is lost. A threshold condition averaging above 30 parts per thousand for 30 days during two consecutive years is identified as a condition that causes a long-term (requiring at least two years for recovery) impact on widgeon grass and the ecosystem. High salinity conditions that cause loss of SAV in the transition zone result in loss of other resources and functions including loss of habitat; decreased productivity and food for waterfowl, forage fishes, and invertebrates; destabilization of sediments; and reduced nutrient retention and degraded water quality throughout the transition zone.

RECOVERY AND PREVENTION STRATEGIES

Section 373.0421, F.S. requires that once the MFL technical criteria have been established, the water management districts must develop and expeditiously implement a recovery or prevention strategy for those water bodies currently exceeding, or expected to exceed, the MFL criteria. Analyses of current and future conditions were conducted for each of the water bodies for which MFL criteria had been defined. When the evaluation showed MFL criteria were not being achieved or will not be met in the future, MFL recovery strategies were developed. When evaluations demonstrated the MFL criteria would not be expected to be violated for the next 20 years, an MFL prevention strategy was developed. The recovery or prevention strategy must include a list of projects that develop additional water supplies and other actions. The phasing or timetable for each project must be included within the strategy.

[5] While common practice is to no longer use units with salinity measurements, the rule uses the units parts per thousand and were used in this section for consistency with the rule.

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Section 373.0421(2), F.S. provides the following in part:

> The recovery or prevention strategy shall include phasing or a timetable which will allow for the provision of sufficient water supplies for all existing and projected reasonable-beneficial uses, including development of additional water supplies and implementation of conservation and other efficiency measures concurrent with, to the extent practical, and to offset, reductions in permitted withdrawals, consistent with the provisions of this chapter.

Section 373.709, F.S., requires regional water supply plans to contain recovery and prevention strategies needed to achieve compliance with MFLs during the planning period. The implementation of such projects will allow for the orderly replacement or enhancement of existing water sources with alternative supplies to provide sufficient water for all existing and projected reasonable-beneficial uses, consistent with Section 373.0421, F.S. Due to extreme variations in water resource conditions, climatic conditions, hydrologic conditions, and economic considerations that will be faced when implementing the MFL rules, it is critical for flexibility to apply such criteria and to reserve for the Governing Board the ability to implement water resource protection and allocation programs considering all of the District's missions under Chapter 373, F.S., and to balance water supply, flood protection, resource protection, and water quality protection needs. Additional information concerning the MFL prevention and recovery strategies can be found in Rule 40E-8.421, F.A.C.

The following sections discuss the MFL recovery and prevention strategies developed for LEC Planning Area water bodies. These include recovery strategies for Lake Okeechobee, the Everglades, and the Northwest Fork of the Loxahatchee River, and prevention strategies for the Biscayne aquifer and Florida Bay. Recovery strategies consist of three elements: 1) capital projects, 2) regulatory, and 3) water shortage.

Capital Projects Element

Projects have been identified that will provide water to meet MFL criteria, some of which have been completed and are operational. The scale of these projects ranges from relatively simple water control structures to over 14,000 acre aboveground impoundments. Multiple agencies support the projects including Comprehensive Everglades Restoration Plan (CERP) projects, USACE projects, and SFWMD initiatives and programs, such as implementing CERP components prior to congressional authorization. Details and the status of projects and programs identified can be found in **Chapter 4.**

CERP provides a framework and guide to restore, protect, and preserve the water resources of central and southern Florida, including the Everglades. It covers 16 counties over an 18,000-square-mile area and centers on an update of the Central & Southern Florida (C&SF) Project also known as the Restudy. The Plan was approved in the Water Resources Development Act (WRDA) of 2000. It includes more than 60 elements, will take more than 30 years to construct, and the current estimate in October 2009 dollars is $12.3 billion for

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projects (see **Table B-3** for some of the CERP projects from the MFL Prevention and Recovery Strategies). The CERP project development process (**Figure B-2**) includes:

Planning – A project Implementation Report (PIR) is developed for each project that includes all of the engineering and environmental studies, project alternative, evaluation and testing results, and summaries of public input. A recommended project plan is identified as the alternative that best meets the goals and objectives of the project and the CERP.

Authorization and Appropriation – The PIR is sent for multiple state and federal agency and U.S. Congressional approvals, authorizations, and funding.

Design – During design, investigations are conducted to provide the information needed to develop detailed final plans and specifications for building the final project. In some cases, a pilot project (test) is conducted.

Construction – The construction period extends from the awarding of construction contract through completion, including supervision and inspection.

Operation and Maintenance – Each project has an Operations Plan that outlines operating schedules and criteria designed to achieve optimum results. Based on routine review and analyses, operations may be fine-tuned for improved performance.

Real Estate Acquisition – Many restoration projects require the acquisition of land. As of September 2012, a total of 243,147 acres, or 60 percent of lands needed to implement CERP were acquired.

Adaptive Assessment and Monitoring – This ongoing process measures the effect of restoration efforts on the greater Everglades ecosystem so, if needed, changes can be made to ensure CERP projects meet their intended objectives.

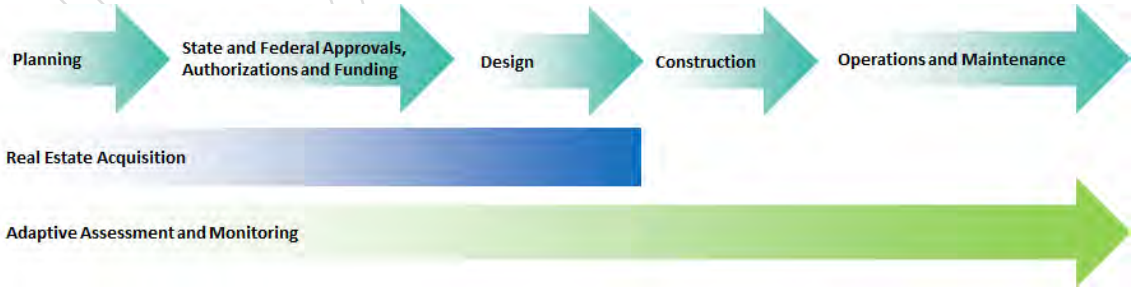

Figure B-2. Schematic of the CERP project development process.

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To help achieve ecosystem benefits early, the SFWMD is fast tracking various Everglades restoration projects. The SFWMD continues to move forward with the design and construction of selected projects or portions of the projects identified in CERP. This includes projects listed on **Table B-3**.

Now under way, the Central Everglades Planning Project (CEPP) combines a series of CERP components into one project implementation report. The purpose of CEPP is to improve the quantity, quality, timing, and distribution of water flows to the central Everglades, which includes WCA 3 and Everglades National Park. Implementation of CEPP should achieve more natural flows by redirecting current regulatory/flood control releases of water from Lake Okeechobee that are discharged to the St. Lucie and Caloosahatchee estuaries and lost to tide. The opportunity to redirect this water south will improve the quality, quantity, timing, and distribution of flows to the Everglades and for other water-related needs in the region.

CEPP's scope includes integrated formulation of the following components envisioned in CERP: EAA Storage Reservoir, Flow to Northwest and Central WCA 3A, WCA 3 Decompartmentalization and Sheetflow Enhancement, Dade-Broward Levee/Pennsuco Wetlands, Bird Drive Recharge Area, L-31N Improvements and S-356 Structure for Seepage Management, and Everglades Rain-Driven Operations. The components under consideration and their benefits are evolving in the CERP planning process. SFWMD Governing Board support will precede the completion of the project implementation report, which will then be followed by the series of required federal approvals. These are needed prior to consideration by the United States Congress for authorization. Approval of federal and state funding for CEPP will then be necessary.

Regulatory Element

Where a recovery strategy has been established for an MFL water body, existing permitted allocations will not be modified or revoked prior to permit expiration unless a new or alternative source is in place and operating to supply the water provided from the MFL water body. When existing permits are renewed, the permittees are required to comply with all conditions of issuance. The rules implementing water resource protection tools, including Chapters 40E-2, 40E-8, 40E-20, 40E-21, 40E-22, F.A.C., and the *Applicant's Handbook Basis of Review for Water Consumptive Use Permits Within the South Florida Water Management District*, incorporated by reference in Rules 40E-2.091 and 40E-20.091, F.A.C., identify the specific factors and conditions will be applied to consumptive use direct and indirect withdrawals form MFL water bodies. Factors considered specific to compliance with the MFL are 1) the extent of MFL shortfall directly caused by existing legal uses and 2) the practicality of avoiding the need for reductions in permitted supplies, including structural and operational measures, by maximizing the beneficial uses of the existing water source.

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Table B-3. Capital projects that provide water supplies for MFL recovery and prevention strategies. [a]

MFL Water Body	Capital Projects	Program	Status
Everglades (including WCAs and Everglades National Park) – projects needed for MFL recovery	Modified Water Deliveries to Everglades National Park	Department of Interior/USACE	Substantially complete
	C-111 Spreader Canal Western	CERP/SFWMD	Operational testing
	C-111 South Dade	SFWMD/USACE	Substantially complete
	Broward County Water Preserve Area – WCA 3A/3B Seepage Management	CERP	Planning and design complete. Waiting for congressional authorization
	Environmental Preserve at Marjory Stoneman Douglas Everglades Habitat [d]	CERP/SFWMD	Operational
	Fran Reich Preserve Reservoir	CERP	Under construction by USACE
	Broward County Water Preserve Area – C-11 Impoundment	CERP	Planning and design complete. Waiting for congressional authorization
	Broward County Water Preserve Area – C-9 Impoundment	CERP	Planning and design complete. Waiting for congressional authorization
	WCA 3 Decompartmentalization and Sheetflow Enhancement	CERP	Draft PIR complete [b]
	EAA Storage Reservoir on EAA A2 Site	CERP	Draft PIR complete [b]
	WCA 3B/Everglades National Park Seepage Management	CERP	Draft PIR complete [b]
Lake Okeechobee – projects needed for MFL recovery	Lake Okeechobee Watershed	CERP	To be determined
	Lake Okeechobee Watershed – Lakeside Ranch STA [d]	SFWMD	Phase I operational
	USACE Herbert Hoover Dike Major Rehabilitation	USACE	2022 [c]
Loxahatchee River - projects needed for MFL recovery	Loxahatchee River Watershed Restoration	CERP	Planning initiated
	Loxahatchee River Watershed Restoration – G-160 and G-161 Structures [d]	CERP/SFWMD	Operational
	Interim Use of L-8 Site	SFWMD	Operational
Florida Bay – projects needed for MFL prevention	Everglades National Park Seepage Management	CERP	Draft PIR complete [b]
	WCA 3 Decompartmentalization and Sheetflow Enhancement	CERP	Draft PIR complete [b]
	C-111 Spreader Canal Western [d]	CERP/SFWMD	Operational testing

a. MFL rules identify the general programs that will be used to develop and implement prevention or recovery, rather than specific projects. The potential role of specific projects to address MFL water needs is generally considered in the respective MFL technical supporting documentation.

b. Component of Central Everglades Planning Project.

c. Time shown is for rehabilitation of Reaches 1, 2, and 3, which may be sufficient to allow additional storage in Lake Okeechobee necessary to prevent MFL violations.

d. CERP project initiated by SFWMD.

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Water Shortage Element

Water use cutbacks during drought conditions can also be implemented (e.g., phased water shortage restrictions to prevent significant or serious harm), if necessary, to minimize or avoid MFL criteria being exceeded, to the extent consumptive uses contribute to such exceedance. The SFWMD may impose water shortage declarations to curb water use withdrawals pursuant to Sections 373.175 and 373.246, F.S. The SFWMD implemented its water shortage authority by restricting water uses based on the concept of shared adversity between users and the water resources (Chapters 40E-21 and 40E-22, F.A.C.). Under this program, different levels or phases of water shortage restrictions with varying levels of severity are imposed relative to drought conditions. The four phases of current water shortage restrictions are based on progressively increasing resource impacts leading up to serious harm. Under the current program, Phase I and II water shortages primarily reduce water use through conservation techniques and minor use restrictions, such as limits on car washing and lawn watering. Phases III and IV require use cutbacks associated with some level of economic impact to the users, such as the potential for crop damage due to agricultural irrigation restrictions.

Established MFLs are considered in the evaluation of current water conditions (Paragraph 40E-21.221(3)(d), F.A.C.), and as one of the criteria for establishing water use restrictions (Paragraph 40E-21-271(3)(d), F.A.C.). This plan update does not propose use of Chapter 40E-21, F.A.C., as an MFL recovery strategy nor do Chapters 40E-8, F.A.C. and 40E-21, F.A.C. contemplate such action. However, when a drought occurs, the SFWMD will rely on this water shortage plan, as needed, to address regional system water availability.

To the extent practicable, the SFWMD attempts to implement water deliveries to reduce or prevent the MFL criteria from being exceeded. In the example of Lake Okeechobee, operational guidelines needed for implementation of water supply deliveries to avoid MFL exceedances, in concert with meeting other required water demands, are identified in the *Final Adaptive Protocols for Lake Okeechobee Operations* (SFWMD 2010).

SPECIFIC MFL RECOVERY AND PREVENTION STRATEGIES

Lake Okeechobee Recovery Strategy

As previously discussed, implementation of 2008 LORS is projected to result in MFL violations. As a result, the MFL recovery strategy is used to moderate impacts of an MFL violation during drought conditions, mitigate impacts of MFL violations during drought conditions, and depending upon USACE's lake regulation schedule in effect, minimize or avoid MFL violations. To achieve these goals, the Lake Okeechobee MFL recovery strategy consists of three elements: 1) capital project construction, 2) regulatory strategies (permit and water shortage criteria), and 3) habitat enhancements implemented during an MFL exceedance or violation.

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Capital Project Element

The capital projects are presented in **Table B-3**. USACE has started the rehabilitation of the Herbert Hoover Dike. The initial step—construction of a 21.4-mile cutoff wall component in Reach 1—is scheduled for completion in 2013, and satisfies the majority of the risk reduction goals. As part of this risk reduction approach, the 32 water control structures (culverts) operated by USACE will be replaced, removed, or abandoned by 2018. Rehabilitation to Reaches 2 and 3 is scheduled for completion by 2022. The USACE has indicated it will consider revisions to the lake regulation schedule at that time. Any increase in the lake's regulation schedule as a result of the repairs will likely be evaluated by USACE through a National Environmental Policy Act analysis of multiple objectives including flood protection, water supply, and the ecological health of the lake and downstream ecosystems. The SFWMD anticipates any additional water resulting from a revised regulation schedule could return the lake to MFL prevention status, enhance the level of certainty to existing permitted users, and support other environmental objectives.

Additional capital projects include the construction of reservoirs north of Lake Okeechobee, which will store wet season flows that would otherwise be discharged to tide under 2008 LORS.

Regulatory Element

The SFWMD implemented regulatory strategies for water uses of the lake that are expected to remain in effect until the Herbert Hoover Dike repairs and structural projects provide sufficient storage and adoption of an associated revised regulation schedule that minimizes or avoids Lake Okeechobee MFL violations. Since 2008 LORS effectively reduces water availability for existing users to less than the 1-in-10 level of certainty and is projected to contribute to MFL violations, modifications to the water use permit application rules affecting users of Lake Okeechobee water were necessary.

Restricted allocation areas are designated areas within the SFWMD boundaries for which allocation limitations are applied to the use of specific sources of water. The water resource limitations in these areas are implemented when there is a lack of water available to meet the projected needs of the region from that specific source of water (SFWMD 2012).

A restricted allocation area rule was adopted for Lake Okeechobee in 2008. This interim rule protects existing legal users of Lake Okeechobee water and prevents increases in total allocations. Increased demands over the base condition water use within the Lake Okeechobee Service Area may be accommodated through reallocation of retired permits, use of alternative sources (such as groundwater), and implementation of offsets to recharge volumes equal to increased withdrawals in accordance with the rule's provisions. The rule also prevents expansion of Public Water Supply uses that exceed a specified threshold as these uses are determined incompatible with the operations, reliability, and limited availability of lake water. Temporary increases in a Public Water Supply user's base condition water use are allowable for limited periods as related to development of alternative water supply projects. Compliance with these rules will also assure that such uses are consistent with Everglades restoration implementation.

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Water Shortage Element

Implementation of 2008 LORS will also result in more frequent and severe lake-based water shortages. To address this, the SFWMD changed the water shortage rules pertaining to Lake Okeechobee—Lake Okeechobee Water Shortage Management (Chapter 40E-21, F.A.C.)—in November 2007 to clarify how water restrictions would be calculated and applied to agricultural uses within the Lake Okeechobee Basin.

Habitat Enhancement Element

Several lake management options can be implemented to improve Lake Okeechobee habitat and mitigate impacts from extreme low lake levels associated with droughts. Periods of low water conditions will allow the SFWMD to conduct native aquatic and tree plantings, as well as sediment scraping and other habitat enhancements, and potentially include efforts to supplement natural apple snail populations. **Table B-4** identifies some of the stage-dependent initiatives that will be undertaken by the SFWMD and other agencies to offset the significant harm that would otherwise be caused by low Lake Okeechobee water levels that exceed MFL criteria.

Table B-4. Habitat enhancement components of the Lake Okeechobee recovery strategy.

Lake Level	Recovery Component	Benefits
At 11 feet NGVD and stage is falling	Sediment scraping and other habitat enhancements, including removal of tussocks and other aggregations of organic material, such as the western berm.	Promote natural compaction, removal, and/or oxidation of accumulated organic muck sediments. Remove barriers to fish migration in and out of the western littoral zone.
At or below 11 feet NGVD	Conduct controlled burns if fuel load and weather conditions permit.	Facilitate the removal of exotic species, such as torpedograss (*Panicum repens*).
Below 11 feet NGVD	Allow maintenance and repair work on public boat ramps, and docking and marina facilities.	Restore original design depth of the waterways and provide navigable access.
At 10.5 feet NGVD and stage is falling	Plant native terrestrial and emergent vegetation, such as bulrush (*Scirpus* spp.) (if a method for reestablishment proves to be feasible), native pond apples (*Annona glabra*), and cypress trees (*Taxodium distichum*) on the southern shore islands and on rim canal spoil islands.	Reestablish native trees on the islands to help prevent expansion of exotic and invasive vegetation and provide essential habitat for wading birds, raptors, and endangered species, such as the Everglade snail kite (*Rostrhamus sociabilis plumbeus*) and Okeechobee gourd (*Cucurbita okeechobeensis*).
Between 10 and 11 feet NGVD and stage is rising	Plant native vegetation species, such as SAV and emergent vegetation, such as bulrush.	Reestablish native plant species, which can prevent the expansion of exotic and invasive vegetation, assist in restoring fish and wildlife habitats, prevent uprooting of emergent and submerged plants, and reduce turbidity, which, in turn, promotes and maintains SAV growth.
At 11 feet NGVD and stage is rising	Assess the feasibility of introducing apple snail (*Pomacea paludosa*) populations via an apple snail hatchery or other techniques.	Supplement native apple snail populations for the endangered Everglade snail kite.
Nonlake stage dependent components	Investigate sediment management strategies in the tributaries and the pelagic zone of the lake.	Remove phosphorus-laden sediment that has the potential to resuspend, and thus, reduce light transparency, which discourages growth of SAV and encourages phytoplankton bloom activity.

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Everglades and Northwest Fork of Loxahatchee River Recovery Strategy

Everglades Capital Element

As described in **Chapter 3**, the Everglades were naturally interconnected by sloughs and rivers prior to creation of drainage and other features. The ecosystem components are still connected, but by water management facilities. Extensive efforts are under way to restore more natural water movement to and between the areas, while addressing the needs of a growing population. The largest of these efforts is CERP. The status of CERP projects included in the recovery strategies was already presented **Table B-3**.

Northwest Fork of the Loxahatchee River Capital Element

The MFL study indicated that the Loxahatchee River criteria will be exceeded on a regular and continuing basis. Therefore, a recovery strategy was needed to protect water resources in the river from significant harm. In addition, analysis of historical information showed that over a ten-year period, starting in the early 1990s, the MFL of 35 cfs was exceeded approximately 25 percent of the time (SFWMD 2002a). The criteria could not be met because of the lack of sufficient water conveyance infrastructure and regional storage facilities. To address these issues, an MFL study identified specific projects needed to provide additional water to supplement the river and recommended continuing monitoring efforts to track effects of these changes on water resources.

The structural and operational features of the recovery strategy are implemented through ongoing SFWMD water resource development projects included in **Chapter 4**, projects identified in the 2000 LEC Plan, features of the CERP Loxahatchee River Watershed Restoration Project (formerly known as the Northern Palm Beach County Project – Part 1) (SFWMD 2002c) and CERP (USACE and SFWMD 1999). When implemented, CERP projects will provide the additional water needed to achieve restoration of the river (USACE and SFWMD 2005).

Although sufficient water needed to meet the MFL criteria was provided by projects recommended within the 2000 LEC Plan, the additional water needed to meet the restoration goals will be provided by the CERP Loxahatchee River Watershed Restoration Project. This CERP project includes features that will increase storage in the L-8 Basin (USACE and SFWMD 1999). Modeling studies using discharge scenarios, which included CERP and 2000 LEC Plan projects, indicate that MFL criteria and restoration targets will be met when these facilities are completed and fully operational.

The L-8 site was originally acquired to provide water storage as a component of the CERP Loxahatchee River Watershed Restoration Project and was an element of the MFL recovery strategy for the Loxahatchee River. Recently, the Restoration Strategies Regional Water Quality Plan incorporated the L-8 Site as one of its features. It is now under construction for use as a flow equalization basin for the eastern flow-way, and will provide storage to allow

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for the delivery of consistent flows that are needed to optimize performance of stormwater treatment areas.

While interim operations for the L-8 flow equalization basin may provide for the delivery of dry season flows to the Loxahatchee River, a permanent replacement storage feature for the Loxahatchee River is needed. In 2013, the SFWMD and Palm Beach County conceptually agreed to the acquisition of approximately 1,800 acres owned by the county that could be used to store and deliver water to the Loxahatchee River. The Restoration Strategies Regional Water Quality Plan includes the cost to acquire property and to construct a storage facility on an alternative site, such as this one. Acquisition of the site is expected to be complete in 2014 and design of the storage facility is expected to proceed in 2018.

Northwest Fork of the Loxahatchee River Operation Element

A key component for the river's management is to continuously monitor salinity at River Mile 9.2, measure flow across Lainhart Dam, and periodically assess vegetation communities in the floodplain. This information will be used as a basis to operate water control facilities to deliver a flow of 50 cfs to the river whenever sufficient water is available from the regional system as a means to reduce the upstream migration of salt water in the Northwest Fork. The SFWMD experimented with operations in an effort to convey more water from the L-8 Site to the Northwest Fork of the Loxahatchee River during the 2011 drought and will do so in the future when sufficient water is available. More information can be found in **Chapter 3**.

Everglades and Northwest Fork of the Loxahatchee River Regulatory Element

When the MFL criteria for the Everglades was adopted in 2001, significant harm was found to be occurring to the ecosystem, and a recovery strategy for achieving the MFL was adopted. This recovery strategy did not propose to place limits on projected increased withdrawals from the regional system. However, the recovery strategy assumed that if growth occurred in the projected time frames and CERP was implemented as scheduled, increases in allocations dependent on the Everglades for recharge could continue at a measured pace. This approach was implemented during the next several years.

A permit duration rule was adopted in 2003 that identified the Central and Southern Florida Project for Flood Control and Other Purposes and dependent groundwater sources as a "source of limited availability." This meant that only historically used demands would receive a twenty-year duration at permit renewal, and increases over that amount would only be authorized for a five-year period.

Two general types of withdrawals—direct and indirect—occur within the Everglades that can be attributed to consumptive uses (Section 40E-8.431, F.A.C.). Direct impacts result from pumping of adjacent wellfields that lower the water table along the eastern edge of the Everglades, affecting wetlands along the western side of the north-south perimeter levee. Indirect withdrawals occur due to making regional water deliveries to areas other than the

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Everglades. The SFWMD's water use permitting criteria prohibit the issuance of permits that would cause harm to water resources. As a result, in areas where the MFL criteria are being exceeded (significant harm occurring), no water use permits can be issued that would cause an additional drawdown under the 1-in-10 year level of certainty, unless such withdrawal is consistent with the recovery strategy.

Regulatory implications of the Everglades MFL evolved in the early 2000s as the SFWMD addressed water use permit applications and the need to assure water availability for Everglades restoration and CERP implementation. Eventually, the restricted allocation area criteria for the Everglades and North Palm Beach/Loxahatchee River Watershed water bodies in 2007 were adopted. The criteria are the regulatory element of the MFL recovery strategy for the Everglades and the Northwest Fork of the Loxahatchee River.

These criteria limit allocations for permit renewal or modification to conditions or withdrawals, depending on the specific use class, that existed as of April 1, 2006. This is referred to as the "base condition water use." The criteria only allow allocations over the "base condition water use" if additional impacts to the Everglades are 1) avoided through identification of certified project waters and alternative water source development, 2) eliminated through the implementation of offsets (e.g., recharge barriers and recharge trenches), or 3) utilizes wet season water or water made available through the termination or reduction of base condition water uses. Wet season water can also be allocated if the permit applicant demonstrates such flows are not needed for restoration of the Everglades pursuant to CERP, or the *Northern Palm Beach County Water Management Plan* (for the Loxahatchee River Watershed) (SFWMD 2002c).

Biscayne Aquifer Prevention Strategy

Measures to prevent the MFL criteria from being exceeded for the Biscayne aquifer are as follows: 1) maintain coastal canal stages at the minimum operation levels specified in the MFL rule, 2) implement water use permitting conditions for issuance to prevent saltwater intrusion up to a 1-in-10 year level of certainty, 3) maintain a groundwater monitoring network and use data to initiate water shortage cutbacks should the threat of saltwater movement become imminent, and 4) conduct research in high risk areas to identify where the position of the saltwater interface is adjacent to existing and future potable water sources (SFWMD 2000a). In addition, the SFWMD is conducting studies and providing incentives to local governments to use reclaimed water to provide aquifer recharge, combat saltwater intrusion, reduce the potential for MFL exceedances in the Biscayne aquifer, and reduce conflicts between urban water uses and water needed for protection of natural systems.

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Florida Bay Prevention Strategy

The technical document supporting the criteria contained in the Florida Bay MFL rule, (Subsection 40E-8.221(5), F.A.C.) is the *Draft Technical Documentation to Support Development of Minimum Flows and Levels for Florida Bay* (SFWMD 2006a). This technical document demonstrated that, under current operational procedures, violations to the MFL criteria were not expected. A prevention strategy was adopted simultaneously with the MFL rule (Subsection 40E-8.421(8), F.A.C.). The prevention strategy was implemented to minimize the likelihood that a violation of the MFL criteria will occur in the future.

The prevention strategy for Florida Bay involves two different components. First, modifications to operations for improved management of freshwater discharges to the headwaters of Taylor Slough and the southeastern Everglades will consider the MFL criteria in coordination with the following projects: 1) Modified Water Deliveries to Everglades National Park Project, C-111 Canal Project, and any associated operational and construction plans pursuant to these projects, 2) CERP C-111 Spreader Canal Western Project, and 3) C-111 South Dade Project. Portions of each of these projects are operational. Second, the SFWMD, in cooperation with other agencies, will continue field monitoring and research to assess salinity, water levels, and flow conditions, and biological resource response in the region.

The SFWMD is currently reevaluating MFL criteria for Florida Bay. The technical assessment, scheduled to be complete in 2013, will consider the ecological and hydrologic components and include the research data collected since 2006. In addition, the MFL prevention strategy will be reevaluated concurrently, including whether to retain or modify the prevention strategy or develop a recovery strategy.

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C

Potable Water and Wastewater Treatment Facilities

POTABLE WATER TREATMENT FACILITIES

In the Lower East Coast (LEC) Planning Area, potable water is produced by large water treatment facilities, smaller "package" water treatment facilities, and private wells supplying individual users. This appendix focuses on large facilities with average withdrawals of water equal to or greater than 100,000 gallons per day or 0.1 million gallons per day (MGD).

Descriptions of Existing Facilities

Table C-1 presents summary descriptions for each of the potable water treatment facilities and their withdrawal (water) sources located in the LEC Planning Area. The table lists the name of the utility or supply entity, the South Florida Water Management District (SFWMD) water use permit number, annual water allocation in MGD, raw water withdrawal sources, volume withdrawn in 2010, and the Florida Department of Environmental Protection (FDEP) water treatment facility permit numbers and rated (design) capacity. **Figures C-1** through **C-3** show the locations of potable water treatment facilities in Palm Beach, Broward, and Miami-Dade counties, respectively. Additional information about the water sources identified in the water use permits—surficial aquifer system (SAS), Floridan aquifer system (FAS), upper Floridan aquifer, and surface water—is available from SFWMD's Water Use Regulatory Database, which is accessible online from the following link: http://www.sfwmd.gov/ePermitting/MainPage.do. More information regarding the potable water treatment plants permitted by FDEP can be found at the following site: http://www.dep.state.fl.us/water/drinkingwater/bfr.htm.

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Table C-1. Potable water treatment facilities in the LEC Planning Area.

Utility or Supply Entity	Water Use			Withdrawal Sources (MGD)		Water Treatment	
	SFWMD Permit Number	Permitted Annual Allocation (MGD raw)	Actual 2010 Daily Average (MGD raw)	SAS	FAS	FDEP Permit Number	Rated Capacity (MGD)
Palm Beach County							
A.G. Holley State Hospital [a]	50-01092-W	0.09	0.08	0.08	0.00	4500006	0.36
Boca Raton, City of	50-00367-W	51.53	42.19	42.19	0.00	4500130	70.00
Boynton Beach, City of	50-00499-W	22.42	14.23	13.72	0.51	4500145	29.64
Delray Beach Water and Sewer Department, City of	50-00177-W	19.10	15.27	15.04	0.22	4500351	26.00
Glades Utility Authority [b,c]	50-06857-W	9.43	6.61	0.00	6.61		10.00
Golf, Village of	50-00612-W	0.60	0.51	0.51	0.00	4501528	0.86
Highland Beach, Town of	50-00346-W	3.15	2.05	0.00	2.05	4500609	3.00
Jupiter, Town of	50-00010-W	24.40	16.61	8.15	8.45	4501491	30.00
Lake Worth Utilities, City of	50-00234-W	7.30	4.74	4.74	0.00	4500773	17.40
Lantana, Town of	50-00575-W	2.48	1.84	1.84	0.00	4500784	3.84
Manalapan, Town of	50-00506-W	1.91	1.34	1.34	0.00	4500840	2.35
Mangonia Park, Town of	50-00030-W	0.58	0.33	0.33	0.00	4500841	1.08
Maralago Cay	50-01283-W	0.27	0.19	0.19	0.00	4500062	0.42
Palm Beach County Water Utilities Department	50-00135-W	86.99	59.91	59.91	0.00	4504393	101.38
Palm Springs, Village of	50-00036-W	4.74	4.00	4.00	0.00	4501058	10.00
Riviera Beach, City of	50-00460-W	9.08	6.60	6.60	0.00	4501229	17.50
Seacoast Utility Authority	50-00365-W	19.31	18.09	18.09	0.00	4501124	30.50
Tequesta, Village of	50-00046-W	4.37	3.34	1.51	1.83	4501438	6.33
Wellington Public Utilities Department	50-00464-W	8.02	6.74	6.74	0.00	4500014	12.80
West Palm Beach Public Utilities, City of [d]	50-00615-W	39.30	28.98	28.98	0.00	4501559	47.00
Palm Beach County Total		**315.07**	**233.65**	**213.96**	**19.67**		**420.46**
Broward County							
Broward County Water and Wastewater Services (2A/North Regional)	06-01634-W	22.06	12.69	12.69	0.72	4060163	40.00
Broward County Water and Wastewater Services (1A)	06-00146-W	13.90	7.63	7.63	0.00	4060167	16.00
Cooper City Utility Department, City of	06-00365-W	4.55	3.45	3.45	0.00	4060282	7.00
Coral Springs, City of	06-00102-W	9.44	6.96	6.96	0.00	4060290	16.00
Coral Springs Improvement District	06-00100-W	5.42	3.96	3.96	0.00	4060291	7.20
Dania Beach, City of	06-00187-W	3.10	2.42	2.42	0.00	4060253	5.02
Davie, Town of	06-00134-W	21.01	4.10	4.10	0.00	4060344	7.40
Deerfield Beach, City of	06-00082-W	16.49	10.10	10.10	0.00	4060254	37.80
Fort Lauderdale, City of	06-00123-W	61.19	41.70	41.70	0.00	4060486	82.00
Hallandale Beach, City of	06-00138-W	7.30	5.55	5.55	0.00	4060573	16.00
Hillsboro Beach, Town of	06-00101-W	0.88	0.69	0.69	0.00	4060615	2.25

a. The state closed the AG Holley State Hospital, which had its own PWS facility, in 2012.

b. Glades Utility Authority was absorbed into the Palm Beach County Water Utility Department effective April 2013.

c. As of April 2013, an FDEP permit number for this facility was not available on FDEP's website.

d. Withdrawal source is surface water from Clear Lake, Grassy Waters Preserve, and the M Canal.

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Table C-1. Continued.

Utility or Supply Entity	Water Use			Withdrawal Sources (MGD)		Water Treatment	
	SFWMD Permit Number	Permitted Annual Allocation (MGD raw)	Actual 2010 Daily Average (MGD raw)	SAS	FAS	FDEP Permit Number	Rated Capacity (MGD)
Broward County (Continued)							
Hollywood, City of	06-00038-W	39.37	23.99	22.24	1.75	4060642	59.50
Lauderhill, City of	06-00129-W	8.72	5.76	5.76	0.00	4060787	16.00
Margate, City of	06-00121-W	9.30	5.94	5.94	0.00	4060845	18.00
Miramar, City of	06-00054-W	16.00	12.46	12.46	0.00	4060925	17.75
North Lauderdale, City of	06-00004-W	3.64	2.60	2.60	0.00	4060976	7.50
North Springs Improvement District	06-00274-W	5.18	4.50	4.50	0.00	4064390	6.80
Parkland Utilities, Inc.	06-00242-W	0.35	0.25	0.25	0.00	4061957	0.58
Pembroke Pines, City of	06-00135-W	15.60	12.14	12.14	0.00	4061083	18.00
Plantation, City of	06-00103-W	17.24	14.14	14.14	0.00	4061121	24.00
Pompano Beach, City of	06-00070-W	17.75	14.55	14.55	0.00	4061129	50.00
Royal Utility Corporation	06-00003-W	0.48	0.33	0.33	0.00	4061517	1.00
Seminole Tribe of Florida Utility	NA [a]	2.40	1.13	1.13	0.00	NA	NA
Sunrise, City of	06-00120-W	36.15	28.39	28.39	0.00	4061408 [b]	50.00
Tamarac, City of	06-00071-W	7.19	6.21	6.21	0.00	4061429	16.00
Tindall Hammock Irrigation and Soil Conservation District	06-00170-W	0.74	0.44	0.44	0.00	4060419	1.00
Broward County Total		**345.45**	**235.33**	**233.58**	**2.47**		**522.80**
Miami-Dade County							
Americana Village	13-02004-W	0.26	0.23	0.23	0.00	4131403	0.50
Florida City Water and Sewer Department	13-00029-W	2.44	1.78	1.78	0.00	4130255	4.00
Homestead, City of	13-00046-W	10.95	10.72	10.72	0.00	4130645	16.90
Miami-Dade Water and Sewer Department	13-00017-W	408.51	308.67	308.67	1.09	4130871 [c]	453.93
North Miami, City of	13-00059-W	20.47	11.00	11.00	0.00	4130977	9.30
North Miami Beach, City of	13-00060-W	38.37	22.60	17.00	5.60	4131618	32.00
Miami-Dade County Total		**481.00**	**355.00**	**349.40**	**6.69**		**516.63**
Monroe County							
Florida Keys Aqueduct Authority [d]	13-00005-W	23.97	17.68	16.66	1.01	4134357	29.80
Monroe County Total		**23.97**	**17.68**	**16.66**	**1.01**		**29.80**

a. NA – not applicable.

b. This system has multiple permit numbers, including 4061410.

c. This system has multiple permit numbers, including 4131202.

d. Withdrawals located in Miami-Dade County.

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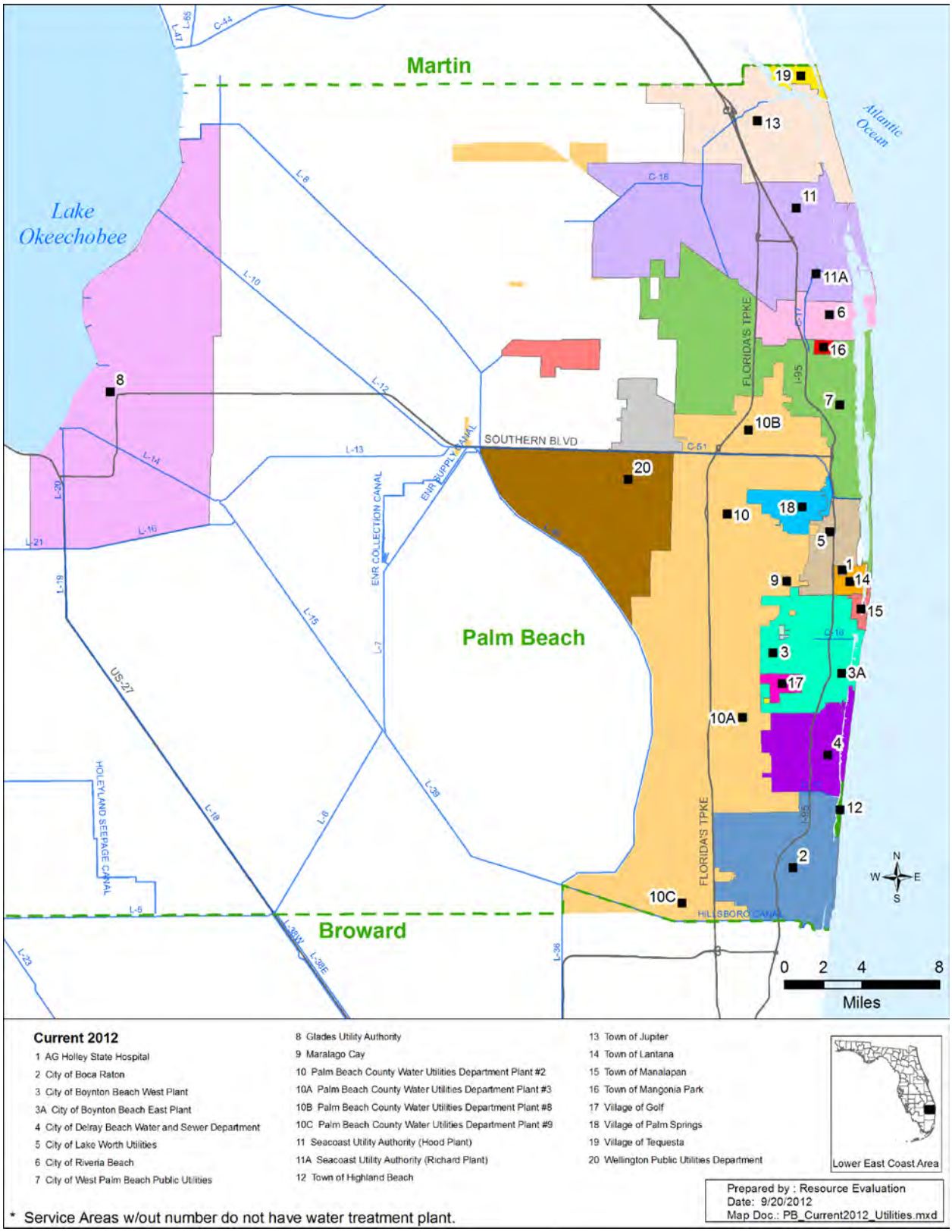

Figure C-1. Potable water treatment facilities in Palm Beach County.

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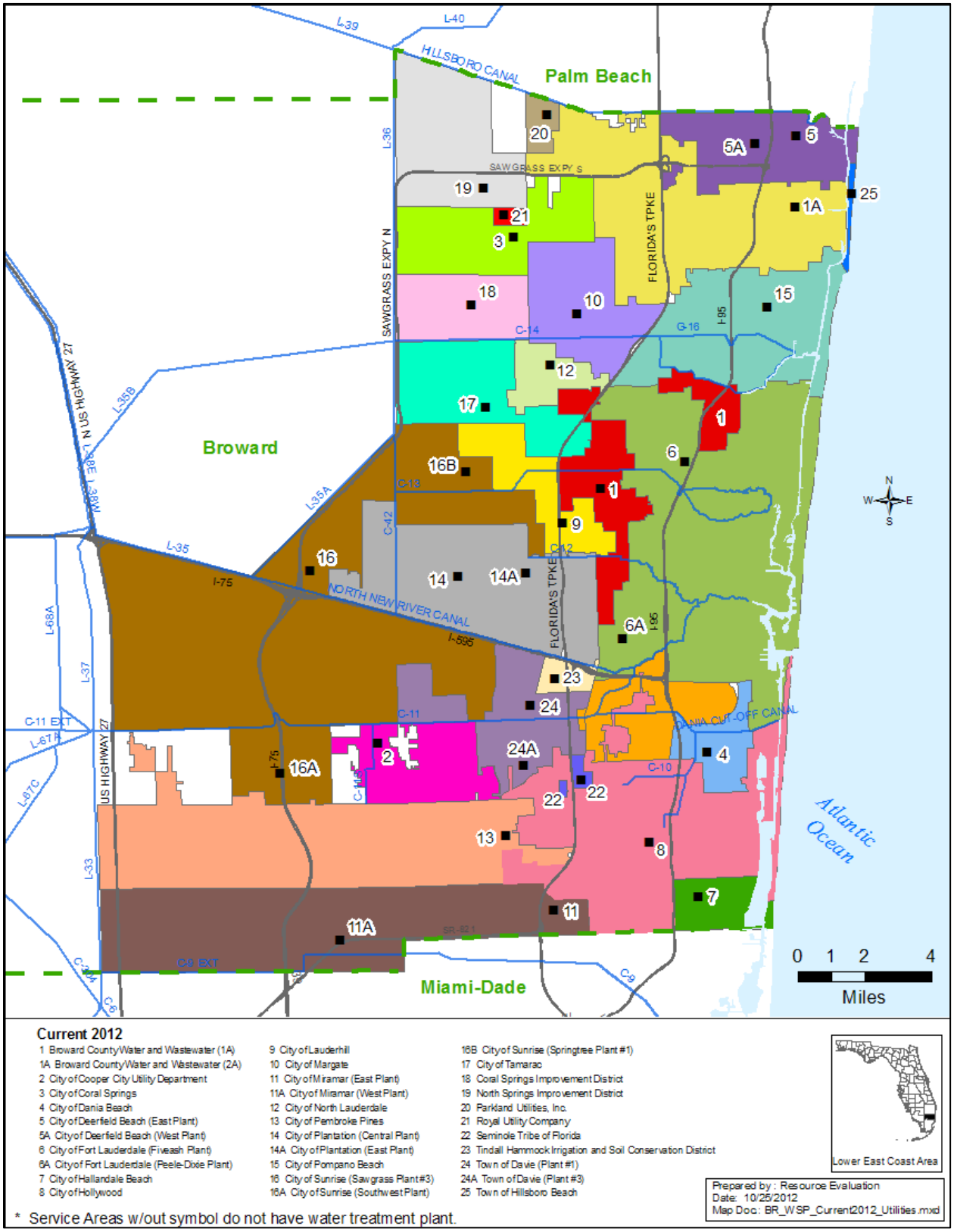

Figure C-2. Potable water treatment facilities in Broward County.

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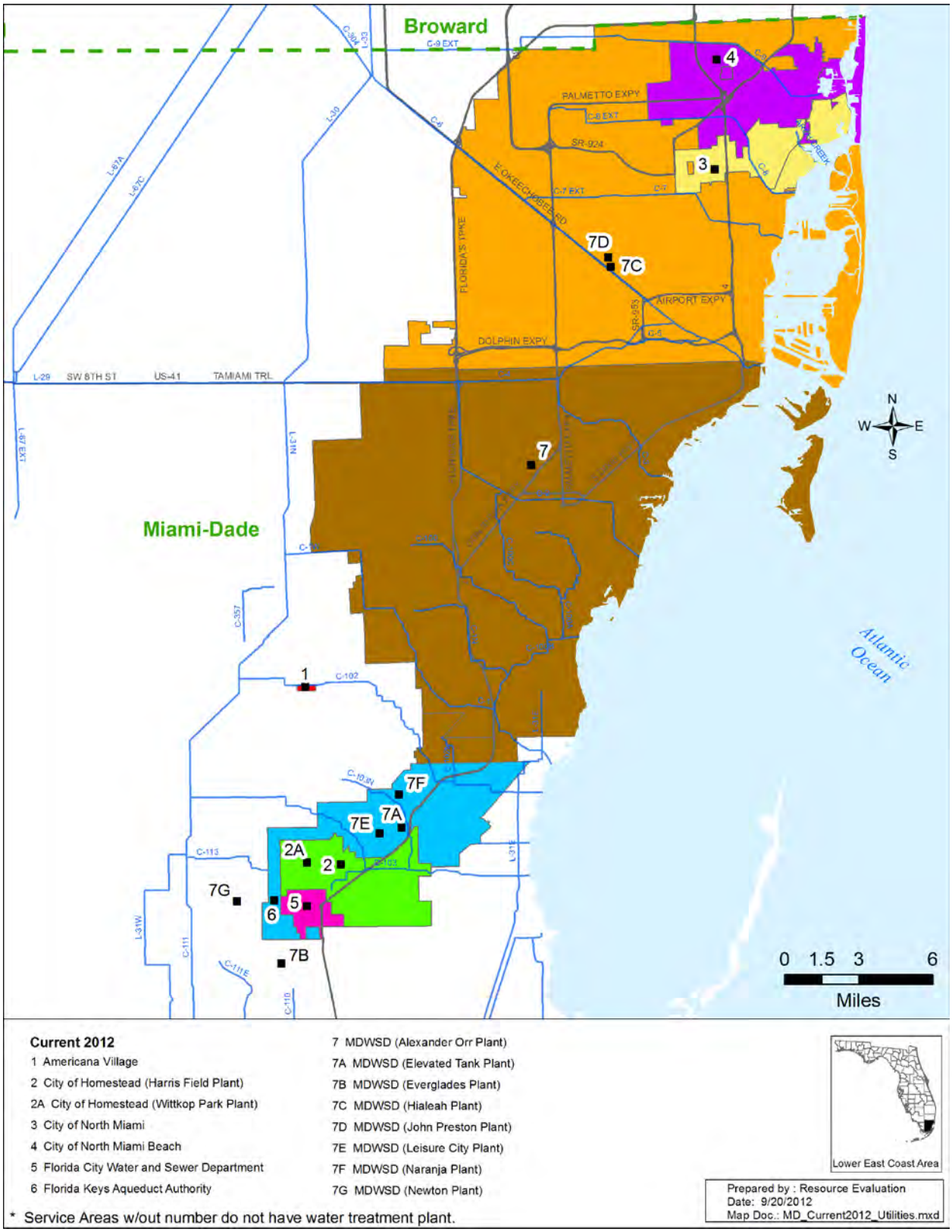

Figure C-3. Potable water treatment facilities in Miami-Dade County.

[Note: MDWSD – Miami-Dade Water and Sewer Department.]

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WASTEWATER TREATMENT FACILITIES

Wastewater treatment is accomplished through regional wastewater treatment facilities (WWTFs), smaller "package plants," and septic tanks. The focus of this appendix is on the larger system facilities with a capacity of 0.1 MGD or greater. These WWTFs allow economy of operation and have sufficient flows to positively impact water resources through reuse of reclaimed water and support a regional reuse program. In the LEC Planning Area, many of these facilities are located close to potential reclaimed water users and/or distribution pipelines.

In 2010, there were 44 WWTFs in the LEC Planning Area, with 25 reusing at least part of their wastewater (FDEP 2011). The locations of WWTFs in the LEC Planning Area and the reclaimed water distribution pipelines are shown in **Figures C-4** through **C-6**.

Tables C-2 through **C-5** show 2010 and 2030 projected data from the 44 WWTFs. The primary source of information for these tables is the *2010 Reuse Inventory* (FDEP 2011). This inventory is a compilation of wastewater and reuse information based on fiscal year data contained in the annual reuse reports submitted by each wastewater utility or system. Secondary sources of information include communications with the utilities and planning documents, such as ten-year water supply facilities work plans, which are prepared by local governments.

Significant increases in both wastewater effluent and water reuse flows are expected by 2030. The term "reuse percentage" is frequently used when describing reuse facilities and is intended to reflect the amount of water reused when compared to the amount of wastewater treated. The annual FDEP reuse inventories use the term "flow ratio," which is defined as "total reuse flow divided by total wastewater flow." The definition continues by clarifying that flow ratios greater than 1.0 (i.e., greater than 100 percent) indicate that reuse may include supplemental water supplies. Any supplemental water supplies (e.g., groundwater or surface water) are included in the "reuse flows." If supplemental flows cause the reuse percentage to exceed 100 percent, the reuse percentage will show 100 percent. This has not occurred with any of the data reported in this appendix.

Tables C-6 through **C-9** show each facility's flows for the different disposal methods and reuse types. The tables demonstrate that public access irrigation (e.g., golf courses, parks, and schools) is currently the primary means of water reuse in the region. By 2030, cooling water for power plants or groundwater recharge could be just as significant in terms of water reuse. For treated wastewater that is not reused, the primary means of disposal has been discharge through ocean outfalls.

In 2008, amendments to Section 403.086, Florida Statues (F.S.), were passed, commonly referred to as the Ocean Outfall Legislation, requiring the elimination of the use of six ocean outfalls in southeastern Florida as a primary means for disposal of treated domestic wastewater and the reuse of at least 60 percent of the outfall flows by 2025. The objectives of this statute were to reduce nutrient loadings to the environment and to achieve the more efficient use of water to meet water supply needs. The profiles provided at the end of this

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appendix indicate if a facility is affected by these amendments. By 2030, deep well injection is expected to replace ocean outfall discharge as the primary means of disposal for wastewater that is not reused.

Although the regionwide capacity of the WWTFs in the LEC Planning Area totals 860 MGD, an average daily flow of 639 MGD of wastewater was treated in 2010. Excess treatment capacity is necessary to ensure a margin of safety in meeting daily peak flows. Regionally, 71 MGD (11 percent) of average daily treated wastewater was reused. Most of the treated wastewater was reused for public access irrigation, primarily in Palm Beach County. Public access irrigation accounted for 41 MGD, groundwater recharge through percolation ponds used 6 MGD, and other miscellaneous uses, such as processes at the WWTF and wetland hydration, used 24 MGD. Treated effluent not reused was disposed of through deep well injection (353 MGD), ocean outfall (240 MGD), or shallow injection wells (1 MGD).

By 2030, it is projected that average daily wastewater flows will increase by 28 percent over the 2010 average daily flows in the LEC Planning Area. Average daily reuse flows are projected to increase from about 71 MGD in 2010 to over 420 MGD by 2030. The significant increase in projected water reuse is primarily due to the ocean outfall utilities meeting the 60 percent reuse requirement by 2025.

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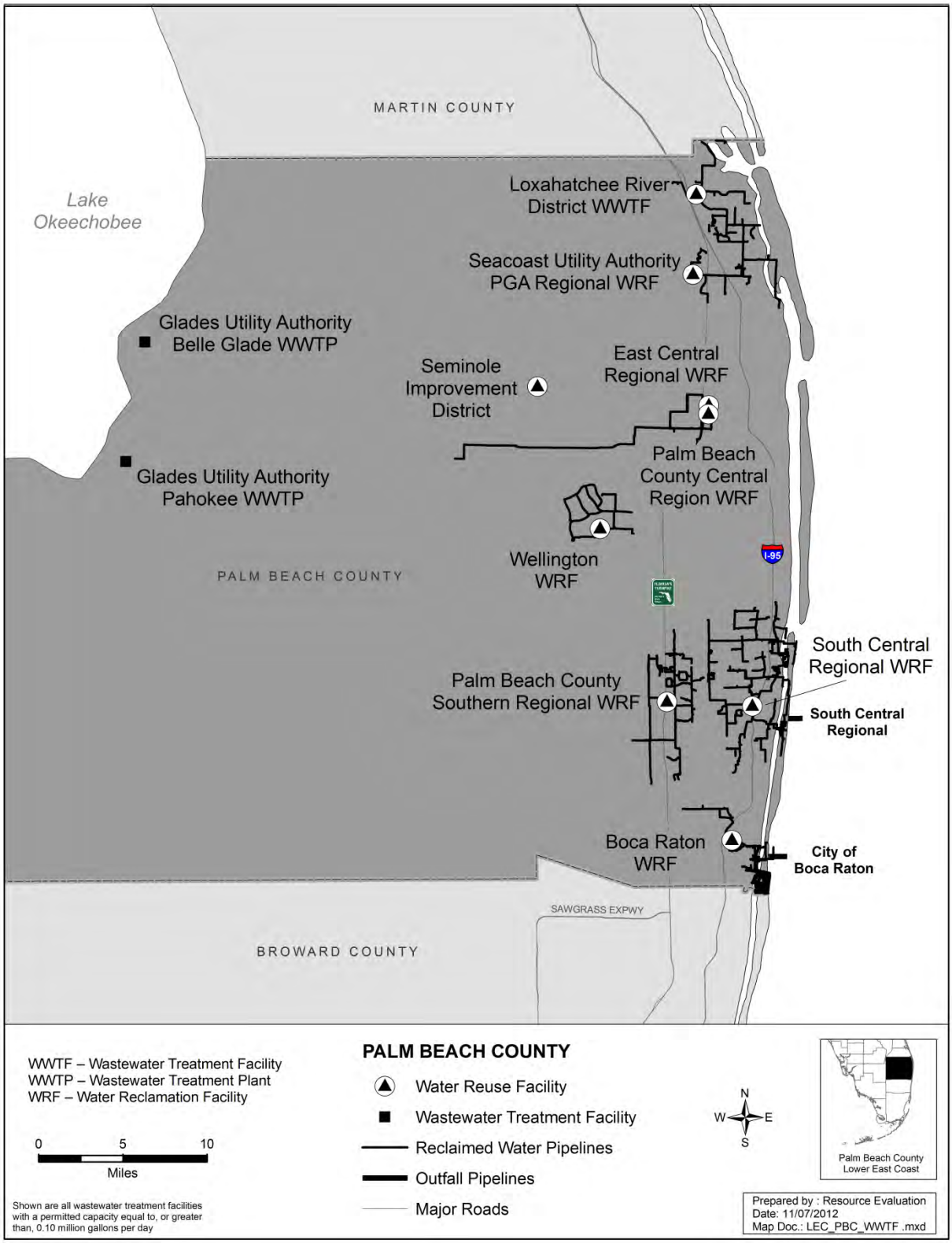

Figure C-4. Wastewater and reuse systems in Palm Beach County.

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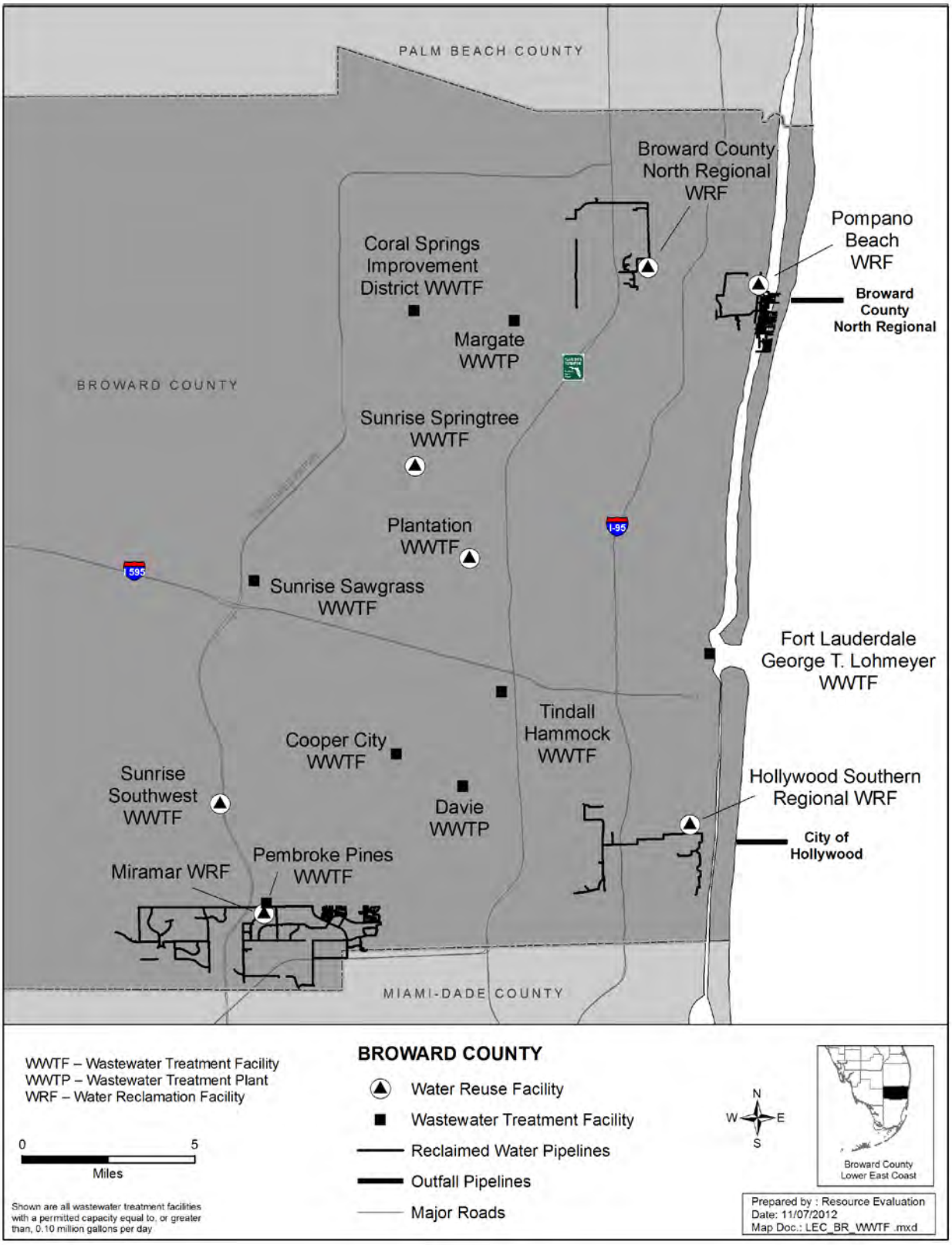

Figure C-5. Wastewater and reuse facilities in Broward County.

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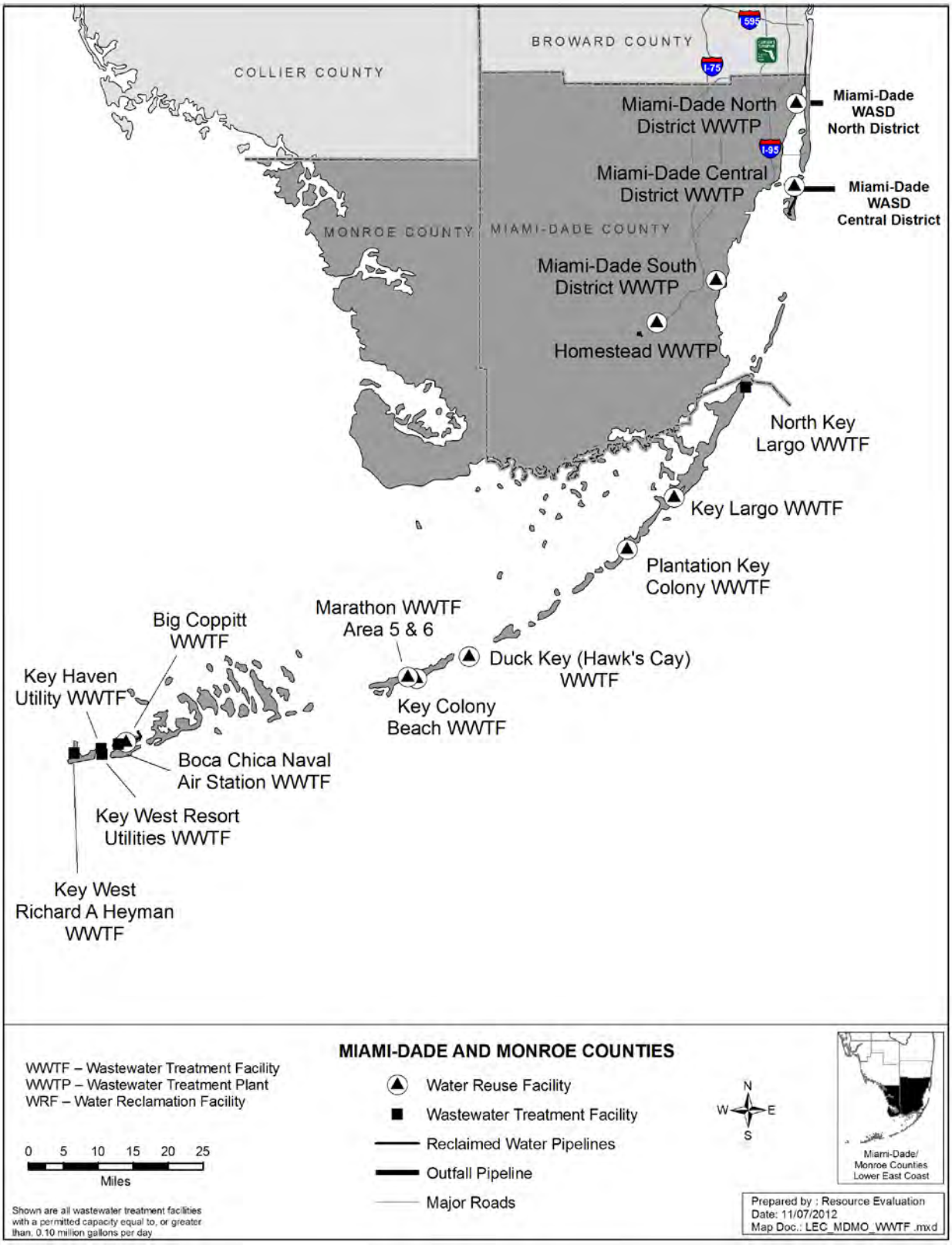

Figure C-6. Wastewater and reuse facilities in Miami-Dade County and the portion of Monroe County within the LEC Planning Area. [Note: WASD – Water and Sewer Department.]

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Table C-2. Summary of capacities and flows for WWTFs with flow greater than 0.1 MGD in Palm Beach County. [a]

Wastewater Treatment Facility	FDEP Permit Number	2010				2030			
		FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)	FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)
Boca Raton	FL0026344	17.50	14.65 [c]	6.62	45%	17.50	14.80	14.80	100%
East Central Regional	FL0041360	64.00	40.94	1.77	4%	64.00 [d]	51.11 [e]	22.00 [f]	43%
Glades Utility Authority – Belle Glade	FLA027740	3.90	2.43	0.13	5%	3.90 [d]	3.04 [e]	0.13 [g]	4%
Glades Utility Authority – Pahokee	FLA136778	1.20	0.83	0.01	1%	1.20 [d]	1.04 [e]	0.01 [g]	1%
Loxahatchee River District	FL0034649	11.00	6.73	6.39	95%	11.00	11.00	8.40	76%
Palm Beach County – Central Region	FL0471275	3.00	0.51	0.51	100%	6.00	6.00	6.00	100%
Palm Beach County – Southern Regional	FL0041424	35.00	22.90	14.20	62%	50.00	30.00	25.00	83%
Seacoast Utility Authority PGA Regional	FL0038768	12.00	7.51	6.11	81%	12.00	10.00	10.00	100%
Seminole Improvement District	FL0170224	0.32	0.04	0.04	100%	0.32 [d]	0.05[e]	0.05 [h]	100%
South Central Regional	FL0035980	24.00	16.76	5.98	36%	24.00	22.63	19.94	88%
Wellington	FLA042595	4.75	4.06	0.10	2%	5.06 [d]	5.06[e]	4.50 [i]	89%
Palm Beach County Total		**176.67**	**117.36**	**41.86**	**36%**	**194.98**	**154.73**	**110.83**	**72%**

a. Historic (2010) data is from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Reuse percentage is calculated by dividing "Average Daily Reuse Flow" by "Average Daily WWTF Flow".

c. Reported 2010 wastewater flow at the Boca Raton Water Reclamation Facility includes reverse osmosis concentrate from the water treatment facility.

d. The utility did not provide the projected 2030 capacity. SFWMD assumes it will remain at the current level unless the projected flow exceeded capacity. In that case, capacity is increased to equal projected flow.

e. The utility did not provide the projected 2030 flow. It is estimated based on the percentage change in potable water flow for the utility from 2010 to 2030.

f. The utility did not provide the projected 2030 reuse flow. It is determined by adding the 2010 flow (1.77 MGD) and an estimated 20 MGD provided to the Florida Power & Light West County Energy Center.

g. The utility did not provide the projected 2030 reuse flow. SFWMD assumes it will remain constant from 2010 to 2030.

h. The utility did not provide the projected 2030 reuse flow. SFWMD assumes it will remain at 100 percent.

i. The utility did not provide the projected 2030 reuse flow. It is based on a projection in the *Village of Wellington Water Supply Facilities Work Plan and Related Comprehensive Plan Amendments* (Village of Wellington 2009).

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Table C-3. Summary of capacities and flows for WWTFs with flow greater than 0.1 MGD in Broward County. [a]

Wastewater Treatment Facility	Permit Number	2010				2030			
		FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)	FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)
Broward County North Regional	FL0031771	84.00	71.00	4.40	6%	100.00	87.00	22.50	26%
Cooper City	FL0040398	3.10	2.24 [c]	0.00	0%	3.10	2.70	0.90	33%
Coral Springs Improvement District	FLA041301	5.72	5.06	0.00	0%	7.72	5.40	0.00	0%
Davie	FL0040541	4.85	0.98	0.00	0%	12.00	12.00	6.30	53%
Fort Lauderdale – George T. Lohmeyer	FLA041378	55.70	37.60	0.00	0%	56.60	45.60	4.00	9%
Hollywood Southern Regional	FL0026255	55.50	45.90	1.79	4%	65.00	64.10	20.40	32%
Margate	FL0041289	10.10	7.21	0.00	0%	10.10	7.20	1.50	21%
Miramar	FLA017025	10.10	7.64	2.09	27%	12.60	11.80	6.00	51%
North Springs Improvement District (proposed)	--	--	--	--	--	5.00	4.00	4.00	100%
Pembroke Pines	FLA013575	9.50	7.07	0.00	0%	9.50	7.70	5.30	69%
Plantation	FL0040401	18.90	13.80	0.41	3%	18.90 [d]	15.54 [e]	1.77 [f]	11%
Pompano Beach	FLA013581	7.50	1.35	1.35	100%	12.50	4.50	4.50	100%
Sunrise – Southwest	FLA013580	0.45	0.37	0.37	100%	0.99	0.99	0.99	100%
Sunrise – Sawgrass	FLA042641	20.00	18.26	0.00	0%	25.00	22.00	8.00	36%
Sunrise – Springtree	FLA041947	10.00	7.19	0.00	0%	16.00	12.00	7.00	58%
Tindall Hammock	FLA013583	0.60	0.27	0.27	100%	0.60	0.40	0.40	100%
Broward County Total		**296.02**	**225.94**	**10.68**	**5%**	**355.61**	**302.93**	**93.56**	**31%**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Reuse percentage is calculated by dividing "Average Daily Reuse Flow" by "Average Daily WWTF Flow."

c. The Cooper City WWTF reports 2010 wastewater flow does not include concentrate from the city's water treatment plant.

d. The utility did not provide the projected 2030 capacity. SFWMD assumes the capacity will remain at the current level unless the projected flow exceeds capacity. In that case, capacity is increased to equal projected flow.

e. The utility did not provide the projected 2030 flow. It is estimated based on the percentage change in potable water flow for the utility from 2010 to 2030.

f. The utility did not provide the projected reuse flow. It is based on the assumption that two golf courses will be provided reclaimed water at their permitted allocations: Jacaranda Golf Course (0.87 MGD) and Plantation Preserve Golf Course (0.90 MGD).

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Table C-4. Summary of capacities and flows for WWTFs with flow greater than 0.1 MGD in Miami-Dade County. [a]

Wastewater Treatment Facility	Permit Number	2010				2030			
		FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)	FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)
Americana Village Condominium	FLA013641	0.20	0.15	0.00	0%	0.20 [c]	0.18 [d]	0.00	0%
Cricket Club Condominium	FLA013637	0.11	0.07	0.00	0%	0.11 [c]	0.08 [d]	0.00	0%
Homestead	FLA013609	6.00	5.30	5.30	100%	10.00	10.00	10.00	100%
Miami-Dade Central District (MDWASD [e])	FLA024805	143.00	101.00	6.22	6%	80.00	69.00	5.00	7%
Miami-Dade North District (MDWASD)	FL0032182	120.00	87.15	2.08	2%	80.00	60.00	1.61	3%
Miami-Dade Northwest District (proposed) (MDWASD)	--	--	--	--	--	62.00	56.00	56.00	100%
Miami-Dade South District (MDWASD)	FLA042137	112.50	93.18	4.54	5%	120.00	120.00	90.00	75%
Miami-Dade West District (proposed) (MDWASD)	--	--	--	--	--	50.00	50.00	50.00	100%
Miami-Dade County Total		**381.81**	**286.85**	**18.14**	**6%**	**402.31**	**365.26**	**212.61**	**58%**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Reuse percentage is calculated by dividing "Average Daily Reuse Flow" by "Average Daily WWTF Flow."

c. The utility did not provide the projected 2030 capacity. SFWMD assumes it will remain at the current level unless the projected flow exceeded capacity. In that case, capacity is increased to equal projected flow.

d. The utility did not provide the projected 2030 flow. It is estimated based on the percentage change in potable water flow for the utility from 2010 to 2030.

e. MDWASD – Miami-Dade Water and Sewer Department

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Table C-5. Summary of capacities and flows for WWTFs with flow greater than 0.1 MGD in Monroe County. [a]

Wastewater Treatment Facility	Permit Number	2010				2030			
		FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)	FDEP-Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage [b] (%)
Big Coppitt Regional	FLA567591	0.32	0.08	0.00	0%	0.40	0.40	0.35	88%
Boca Chica Naval Air Station	FLA147117	0.44	0.09	0.00	0%	0.44 [c]	0.09 [c]	0.00 [c]	0%
Duck Key (Hawk's Cay)	FLA014772	0.10	0.05	0.03	60%	0.30	0.30	0.20	67%
Key Colony Beach	FLA014720	0.34	0.18	0.03	17%	0.34 [c]	0.18 [d]	0.18	100%
Key Haven Utility	FLA014867	0.20	0.09	0.00	0%	--	-- [e]	--	--
Key Largo	FLA370967	0.18	0.07	0.00	0%	0.18 [f]	0.13 [f]	0.00	0%
Key West – Richard A. Heyman	FLA147222	10.00	4.41	0.00	0%	10.00	6.20	0.20	3%
Key West Resort Utilities	FLA014951	0.50	0.29	0.17	59%	0.50 [c]	0.38 [e]	0.38 [e]	100%
Marathon – Service Area 3 [g]	FLA642851	--	--	--	--	0.15 [h]	0.05 [h]	0.03 [i]	60%
Marathon – Service Area 4 [g]	FLA550973	--	--	--	--	0.15 [h]	0.05 [h]	0.03 [i]	60%
Marathon – Service Area 5	FLA187364	0.16	0.07	0.00	0%	0.15 [h]	0.07 [h]	0.04 [i]	57%
Marathon – Service Area 6	FLA579033	0.20	0.02	0.00	0%	0.15 [h]	0.02 [h]	0.00 [i]	0%
Marathon – Service Area 7 [j]	FLA705250	--	--	--	--	0.15 [h]	0.05 [h]	0.03 [i]	60%
North Key Largo (Ocean Reef)	FLA015009	0.55	0.25	0.00	0%	0.50	0.28	0.10	36%
Plantation Key Colony [k]	FLA351849	0.36	0.06	0.00	0%	--	--	--	--
Monroe County Total		**13.35**	**5.66**	**0.23**	**4%**	**13.41**	**8.20**	**1.54**	**19%**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.
b. Reuse percentage is calculated by dividing "Average Daily Reuse Flow" by "Average Daily WWTF Flow."
c. The utility did not provide the projected 2030 capacity and flow. SFWMD assumes both will remain at current levels unless the projected flow exceeded capacity. In that case, capacity is increased to equal projected flow.
d. The utility did not provide the projected 2030 flow. It remains the same as 2010, given no expected increase in potable water use in the Florida Keys.
e. The Key Haven Utility WWTF is expected to be decommissioned by 2016. Flows are projected to be diverted to the Key West Resort Utilities WWTF.
f. The utility did not provide the projected 2030 capacity and flow. SFWMD assumes capacity will remain the same as in 2010. The projected flow is based on no increases from the 2010 flow at the Key Largo WWTF (0.07 MGD) plus flow at the Plantation Key Colony WWTF (0.06 MGD). It is projected that, by 2030, wastewater flow from Plantation Key Colony WWTF will be sent to the Key Largo WWTF for treatment.
g. The system is now complete but was not in operation in 2010.
h. The utility did not provide the projected 2030 capacity and flow. Both are based on the size of other WWTFs in Marathon.
i. The utility did not provide the projected 2030 reuse flow. It is estimated based on a 60 percent reuse at the facility that is documented with the capability to produce reclaimed water.
j. The system is under construction.
k. Islamorada, including Plantation Key Colony, is expecting to begin sending wastewater to the Key Largo WWTF for treatment sometime in the near future.

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Table C-6. Disposal and reuse methods of WWTFs with flow greater than 0.1 MGD in Palm Beach County. [a]

Wastewater Treatment Facility	2010					2030				
	Disposal		Reuse			Disposal		Reuse		
	Ocean Outfall (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)	Ocean Outfall (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)
Boca Raton	13.24	0.00	5.75	0.00	0.87	0.00	0.00	12.80	0.00	2.00
East Central Regional [e]	0.00	39.17	0.00	0.00	1.77	0.00	29.11	2.00	0.00	20.00
Glades Utility Authority – Belle Glade [e]	0.00	2.30	0.00	0.00	0.13	0.00	2.91	0.00	0.00	0.13
Glades Utility Authority – Pahokee [e]	0.00	0.82	0.00	0.01	0.00	0.00	1.03	0.00	0.01	0.00
Loxahatchee River District [f]	0.00	1.61	5.60	0.00	0.79	0.00	2.60	8.40	0.00	0.00
Palm Beach County – Central Region	0.00	0.00	0.51	0.00	0.00	0.00	0.00	6.00	0.00	0.00
Palm Beach County – Southern Regional	0.00	8.70	12.70	0.00	1.50	0.00	8.00	22.00	0.00	3.00
Seacoast Utility Authority PGA Regional	0.00	1.25	6.09	0.00	0.02	0.00	0.00	10.00	0.00	0.00
Seminole Improvement District	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.05
South Central Regional	0.04	10.74	5.87	0.00	0.11	0.00	2.69	19.94	0.00	0.00
Wellington [e]	0.00	3.96	0.03	0.07	0.00	0.00	0.56	4.43	0.07	0.00
Palm Beach County Total	**13.28**	**68.55**	**36.55**	**0.08**	**5.23**	**0.00**	**46.90**	**85.57**	**0.08**	**25.18**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Public access irrigation includes golf courses, parks, schools, common areas, etc.

c. Groundwater recharge includes percolation ponds/pits.

d. Other reuse types include other permitted uses, such as for cooling water, processes at the treatment plant, toilet flushing, etc.

e. The utility did not provide the projected (2030) information. Disposal and reuse is based on projected flows from **Table C-2.** .

f. The Loxahatchee River District WWTF blends concentrate from the Town of Jupiter's water treatment plant into their reuse system, some of which is disposed.

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Table C-7. Disposal and reuse methods of WWTFs with flow greater than 0.1 MGD in Broward County. [a]

Wastewater Treatment Facility	2010					2030				
	Disposal		Reuse			Disposal		Reuse		
	Ocean Outfall (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)	Ocean Outfall (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)
Broward County North Regional	28.00	38.00	0.20	0.00	4.20	0.00	77.50	10.00	0.00	12.50
Cooper City [e]	0.00	0.63	0.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00
Coral Springs Improvement District	0.00	5.06	0.00	0.00	0.00	0.00	5.40	0.00	0.00	0.00
Davie [f]	0.00	0.00	0.00	0.00	0.00	0.00	5.70	1.90	3.00	1.40
Fort Lauderdale – George T. Lohmeyer	0.00	37.60	0.00	0.00	0.00	0.00	45.60	0.00	0.00	4.00
Hollywood Southern Regional	19.60	26.30	1.79	0.00	0.00	0.00	40.70	3.00	20.40	0.00
Margate	0.00	7.21	0.00	0.00	0.00	0.00	5.70	1.00	0.00	0.50
Miramar	0.00	5.55	0.78	0.00	1.31	0.00	5.80	6.00	0.00	0.00
North Springs Improvement District (proposed)	--	--	--	--	--	0.00	0.00	4.00	0.00	0.00
Pembroke Pines	0.00	7.07	0.00	0.00	0.00	0.00	2.40	0.00	5.30	0.00
Plantation	0.00	13.39	0.00	0.00	0.41	0.00	13.77 [g]	1.77 [g]	0.00	0.00
Pompano Beach	0.00	0.00	1.35	0.00	0.00	0.00	0.00	4.50	0.00	0.00
Sunrise – Southwest	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.99	0.00
Sunrise – Sawgrass	0.00	18.26	0.00	0.00	0.00	0.00	14.00	8.00	0.00	0.00
Sunrise – Springtree	0.00	7.19	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00
Tindall Hammock	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.40	0.00
Broward County Total	**47.60**	**166.26**	**4.12**	**0.64**	**5.92**	**0.00**	**216.67**	**48.07**	**30.09**	**18.40**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Public access irrigation includes golf courses, parks, schools, common areas, etc.

c. Groundwater recharge includes percolation ponds/pits.

d. Other reuse types include other permitted uses, such as for cooling water, processes at the treatment plant, toilet flushing, etc.

e. The Cooper City WWTF pumps most of its treated water (1.61 MGD in 2010) to the Hollywood Southern Regional Water Reclamation Facility (WRF), and that is expected to continue to 2030 (1.70 MGD). The 2010 deep injection well flow includes concentrate from the city's water treatment plant.

f. Effluent from the Davie WWTP is pumped to the Hollywood Southern Regional WRF for reuse/disposal (3.38 MGD in 2010).

g. The utility did not provide this information. It is based on 1.77 MGD of water reuse (**Table C-3**) and the remaining flow being disposed using deep well injection.

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Table C-8. Disposal and reuse methods of WWTFs with flow greater than 0.1 MGD in Miami-Dade County. [a]

Wastewater Treatment Facility	2010					2030				
	Disposal		Reuse			Disposal		Reuse		
	Ocean Outfall (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)	Ocean Outfall (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)
Americana Village Condominium [e]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cricket Club Condominium [e]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Homestead	0.00	0.00	0.00	5.30	0.00	0.00	0.00	0.00	10.00	0.00
Miami-Dade Central District (MDWASD) [f]	114.10	0.00	0.00	0.00	6.22	0.00	69.00	0.00	0.00	5.00
Miami-Dade North District (MDWASD)	64.58	19.29	0.11	0.00	1.97	0.00	58.39	0.11	0.00	1.50
Miami-Dade Northwest District (proposed) (MDWASD)	--	--	--	--	--	0.00	0.00	0.00	56.00	0.00
Miami-Dade South District (MDWASD)	0.00	94.82	0.00	0.00	4.54	0.00	30.00	0.00	0.00	90.00 [g]
Miami-Dade West District (proposed) (MDWASD)	--	--	--	--	--	0.00	0.00	0.00	50.00	0.00
Miami-Dade County Total	**178.68**	**114.11**	**0.11**	**5.30**	**12.73**	**0.00**	**157.39**	**0.11**	**116.00**	**96.50**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Public access irrigation includes golf courses, parks, schools, common areas, etc.

c. Groundwater recharge includes percolation ponds/pits.

d. Other reuse types include other permitted uses, such as for cooling water, processes at the treatment plant, toilet flushing, etc.

e. Treated wastewater from this facility is disposed to on-site soakage pits.

f. MDWASD – Miami-Dade Water and Sewer Department.

g. This water is used as cooling water for the Florida Power & Light Turkey Point Energy Facility.

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Table C-9. Disposal and reuse methods of WWTFs with flow greater than 0.1 MGD in Monroe County. [a]

Wastewater Treatment Facility	2010					2030				
	Disposal		Reuse			Disposal		Reuse		
	Shallow Injection Well (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)	Shallow Injection Well (MGD)	Deep Injection Well (MGD)	Public Access Irrigation [b] (MGD)	Groundwater Recharge [c] (MGD)	Other Reuse Types [d] (MGD)
Big Coppitt Regional	0.08	0.00	0.00	0.00	0.00	0.05	0.00	0.30	0.00	0.05
Boca Chica Naval Air Station [e]	0.09	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
Duck Key (Hawk's Cay)	0.02	0.00	0.03	0.00	0.00	0.10	0.00	0.20	0.00	0.00
Key Colony Beach [e]	0.15	0.00	0.03	0.00	0.00	0.15	0.00	0.03	0.00	0.00
Key Haven Utility [f]	0.09	0.00	0.00	0.00	0.00	--	--	--	--	--
Key Largo [g]	0.07	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00
Key West – Richard A. Heyman	0.00	4.41	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.20
Key West Resort Utilities	0.12	0.00	0.14	0.00	0.03	0.00	0.00	0.38	0.00	0.00
Marathon – Service Area 3 [h]	--	--	--	--	--	0.02	0.00	0.03	0.00	0.00
Marathon – Service Area 4 [h]	--	--	--	--	--	0.02	0.00	0.03	0.00	0.00
Marathon – Service Area 5	0.07	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00	0.00
Marathon – Service Area 6	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Marathon – Service Area 7 [i]	--	--	--	--	--	0.02	0.00	0.03	0.00	0.00
North Key Largo (Ocean Reef)	0.25	0.00	0.00	0.00	0.00	0.18	0.00	0.10	0.00	0.00
Plantation Key Colony [g]	0.06	0.00	0.00	0.00	0.00	--	--	--	--	--
Monroe County Total	**1.02**	**4.41**	**0.20**	**0.00**	**0.03**	**0.81**	**6.00**	**1.14**	**0.00**	**0.25**

a. Historic (2010) data are from the *2010 Reuse Inventory* (FDEP 2011). Projected (2030) data are provided by the utilities unless otherwise noted.

b. Public access irrigation includes golf courses, parks, schools, common areas, etc.

c. Groundwater recharge includes percolation ponds/pits.

d. Other reuse types include other permitted uses, such as for cooling water, processes at the treatment plant, toilet flushing, etc.

e. The utility did not provide the projected (2030) information. SFWMD assumes disposal and reuse remain constant from 2010 to 2030.

f. The Key Haven Utility WWTF is expected to be decommissioned by 2016.

g. Islamorada, including Plantation Key Colony, is expecting to begin sending wastewater to the Key Largo WWTF for treatment sometime in the near future.

h. The system is now complete but was not in operation in 2010.

i. The system is under construction.

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Wastewater/Reuse Utility Profiles

The remainder of this appendix contains profiles for each of the wastewater/reuse facilities with a treatment capacity of 0.1 MGD or greater within the LEC Planning Area. The profiles are organized by county then alphabetically by utility. Each profile contains the following:

- **Existing Treatment, Disposal, and Reuse** – This section presents the FDEP-rated treatment capacity and average daily flows of wastewater and reclaimed water. If applicable, the average daily flow of effluent disposal is presented. Current capacity and flow information is gathered from the *2010 Reuse Inventory* (FDEP 2011).
- **Future Treatment, Disposal, and Reuse** – This section provides a summary of any proposed/future plans for the utility, which may include increased capacities, flows, or reclaimed water customers.

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Profiles of Palm Beach County Facilities

Boca Raton Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The City of Boca Raton's Utility Services Department operates the Boca Raton Water Reclamation Facility (WRF). The facility, which has an FDEP-permitted capacity of 17.50 MGD, provides wastewater services for the City of Boca Raton. Since the early 1990s, the city has been reclaiming water at the Glades Road Utility Services Complex. The treatment facility uses a multistage treatment process.

In 2010, the annual average daily effluent flow from the facility was 14.65 MGD. The effluent from the facility is either further treated and reused, or combined with demineralized concentrate from the city's reverse osmosis (RO) system at their water treatment facility and discharged. In 2010, the city reused 6.62 MGD of reclaimed water. Most reuse occurred through public access irrigation, such as parks, schools, golf courses, and residences. The remaining wastewater effluent (8.03 MGD) was combined with the RO concentrate (5.21 MGD) and discharged through the ocean outfall.

The city's reclaimed water supply was also supplemented with groundwater. In 2010, 0.62 MGD of groundwater was used for supplementation on an annual average daily basis. The city is moving toward becoming a 100 percent annual average daily flow facility for reuse activities as authorized by FDEP.

The city is using reclaimed water to meet projected population demands, negate potential impact to wetlands, and meet restricted allocation area criteria. As such, the SFWMD included conditions in the city's permit for connecting a number of customers to their reclaimed water system.

The Boca Raton WRF provides reclaimed water to three universities, six golf courses, three churches, four schools, and four parks. The system also provides reclaimed water to approximately 52 multiple family, 700 single family, and 85 business units. It also includes the irrigation of medians and other public areas.

Primary End Users
Parks, universities, and recreational areas.

Future Treatment, Disposal, and Reuse

In an effort to meet the 2008 Ocean Outfall (Subsection 403.086(9), F.S.) requirements, the City of Boca Raton expanded its reclaimed water production capacity to 17.50 MGD and extended the reclaimed distribution system's capacity to over 17.50 MGD. By 2015, the city is expecting to reclaim and reuse 100 percent of the available treated effluent.

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Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The 2030 information was provided by the City of Boca Raton in March 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**17.50 MGD**	**FDEP-Permitted Treatment Capacity**	**17.50 MGD**
Total Wastewater Effluent	**14.65 MGD**	**Total Wastewater Effluent**	**14.80 MGD**
Disposal		Disposal	
Ocean outfall total	13.24 MGD	Ocean outfall total	0.0 MGD
Wastewater effluent	8.03 MGD		
RO concentrate	5.21 MGD		
Reuse		Reuse	
Total	6.62 MGD	Total	14.80 MGD
Irrigation	5.75 MGD	Irrigation	12.80 MGD
At the facility	0.87 MGD	Industrial	2.00 MGD
Reuse Percentage	**45%**	**Reuse Percentage**	**100%**

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East Central Regional Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The East Central Regional WRF is funded and governed by a board of representatives from the entities served by that facility: the cities of West Palm Beach, Lake Worth, and Riviera Beach; the Town of Palm Beach; and Palm Beach County. Each entity is responsible for its wastewater collection and transmission systems. The facility, which has an FDEP-permitted capacity of 64.00 MGD, treated an annual average daily flow of 40.94 MGD in 2010. Approximately 1.77 MGD of the treated wastewater was reused in 2010, while 39.17 MGD was disposed of through deep well injection.

Some secondary treated effluent from the this facility is sent to the adjacent Palm Beach County Central Region WRF, at which it is further treated to reclaimed water standards and reused for irrigation. Palm Beach County's Central Region WRF is summarized in a separate profile.

There are two reclaimed water treatment systems at the East Central Regional WRF. One of the treatment trains provides reclaimed water to the City of West Palm Beach's Wetlands-Based Water Reclamation Project. In 2006, the city completed construction on the project that involves the discharge of highly treated effluent to an adjacent wetland area to restore and recharge the wetland and the SAS. Withdrawals from the city's SAS wellfield are dependent on the reclaimed water application rate at the wetlands. The city encountered problems with the advanced wastewater treatment process at the facility, resulting in lower than planned recharge volumes to the Wetlands-Based Water Reclamation Project.

The second reclaimed water treatment system at the East Central Regional WRF is rated for 26 MGD and primarily provides advanced secondary reclaimed water to the Florida Power & Light (FPL) West County Energy Center for cooling. The distribution pipeline between the East Central Regional WRF and the FPL facility was constructed and is maintained by the Palm Beach County Water Utilities Department. Reclaimed water deliveries to the FPL center started in 2011.

Primary End Users
City of West Palm Beach Wetlands-Based Water Reclamation Project
FPL West County Energy Center

Future Treatment, Disposal, and Reuse

The agreement between the Palm Beach County Water Utilities Department and FPL is for delivery of up to 27 MGD of reclaimed water. Additional reclaimed water users located along the length of the pipeline between the East Central Regional WRF and the FPL center will depend on future demands and supplies.

The City of West Palm Beach may make changes to the advanced wetland treatment system at the East Central Regional WRF to increase the output of reclaimed water and its deliveries to the Wetlands-Based Water Reclamation Project. The facility will continue to

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provide secondary-treated wastewater to the Palm Beach County's Central Regional WRF for the benefit of water reuse customers in their service area.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of West Palm Beach did not provide 2030 projections. SFWMD assumes the 2030 treatment capacity will remain at the current level. The increase in wastewater flow is estimated to increase in proportion to the increase in potable water supply in the City of West Palm Beach from 2010 to 2030. The projected reuse flow is a combination of an estimated 2.0 MGD through the city and 20.0 MGD from the Palm Beach County Water Utilities Department to the FPL West County Energy Center.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**64.00 MGD**	**FDEP-Permitted Treatment Capacity**	**64.00 MGD**
Total Wastewater Effluent	**40.94 MGD**	**Total Wastewater Effluent**	**51.11 MGD**
Disposal		Disposal	
Deep well injection	39.17 MGD	Deep well injection	29.11 MGD
Reuse		Reuse	
Total	1.77 MGD	Total	22.0 MGD
Wetlands	1.77 MGD	Cooling	20.0 MGD
		Irrigation	2.0 MGD
Reuse Percentage	**4%**	**Reuse Percentage**	**43%**

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Glades Utility Authority – Belle Glade Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The 2009 partnership agreement between Palm Beach County and the cities of Belle Glade, Pahokee, and South Bay created and formed the Glades Utility Authority. The authority is responsible for developing a regional water and wastewater infrastructure system, and providing a regional solution for sustainable water and wastewater utilities in the tri-city area.

The City of Belle Glade operates and maintains its own wastewater collection and treatment system. The Belle Glade Wastewater Treatment Plant (WWTP) has an FDEP-permitted capacity of 3.90 MGD. It provides wastewater services for Belle Glade and, on a contract basis, for the City of South Bay. In 2010, the annual average daily flow from the plant was 2.43 MGD. Most of the treated effluent (2.30 MGD) was disposed of through deep well injection. A small amount (0.13 MGD) of water was reused for agricultural irrigation.

Future Treatment, Disposal, and Reuse

The Glades Utility Authority does not currently have plans to implement a reclaimed water system. Previously, the City of Belle Glade determined a water reuse system was not feasible. In the future, the Glades Utility Authority may determine such an initiative would enhance water availability.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Glades Utility Authority did not provide the 2030 information. SFWMD assumes the 2030 treatment capacity will remain at the current level. The increase in wastewater flow is anticipated to increase in proportion to the increase in potable water supply from 2010 to 2030. The projected reuse flow is assumed to remain constant.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**3.90 MGD**	**FDEP-Permitted Treatment Capacity**	**3.90 MGD**
Total Wastewater Effluent	**2.43 MGD**	**Total Wastewater Effluent**	**3.04 MGD**
Disposal		Disposal	
Deep well injection	2.30 MGD	Deep well injection	2.91 MGD
Reuse		Reuse	
Agricultural irrigation	0.13 MGD	Agricultural irrigation	0.13 MGD
Reuse Percentage	**5%**	**Reuse Percentage**	**4%**

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Glades Utility Authority – Pahokee Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The 2009 partnership agreement between Palm Beach County and the cities of Belle Glade, Pahokee, and South Bay created and formed the Glades Utility Authority. The authority is responsible for developing a regional water and wastewater infrastructure system, and providing a regional solution for sustainable water and wastewater utilities in the tri-city area.

The City of Pahokee operates and maintains its own wastewater collection and treatment system. The Pahokee WWTP has an FDEP-permitted capacity of 1.20 MGD. In 2010, the annual average daily flow from the plant was 0.83 MGD, with a small amount (0.01 MGD) of reuse through on-site percolation ponds. Most of the treated effluent (0.82 MGD) is disposed of through deep well injection.

Future Treatment, Disposal, and Reuse

The Glades Utility Authority does not currently have plans to implement a reclaimed water system. Previously, the City of Pahokee determined a water reuse system was not feasible. In the future, the Glades Utility Authority may determine such an initiative would enhance water availability.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Glades Utility Authority did not provide the 2030 projections. SFWMD assumes the 2030 treatment capacity will remain at the current level. The increase in wastewater flow is anticipated to increase in proportion to the increase in potable water supply from 2010 to 2030. The projected reuse is assumed to remain constant between 2010 and 2030.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**1.20 MGD**	**FDEP-Permitted Treatment Capacity**	**1.20 MGD**
Total Wastewater Effluent	**0.83 MGD**	**Total Wastewater Effluent**	**1.04 MGD**
Disposal		Disposal	
Deep well injection	0.82 MGD	Deep well injection	1.03 MGD
Reuse		Reuse	
Percolation ponds	0.01 MGD	Groundwater recharge	0.01 MGD
Reuse Percentage	**1%**	**Reuse Percentage**	**1%**

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Loxahatchee River District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

In 1971, the state legislature created the Loxahatchee River Environmental Control District, now referred to as the Loxahatchee River District. The district owns, operates, and maintains a WWTF in the Town of Jupiter. The facility serves the municipalities of Jupiter, Tequesta, and Juno Beach, along with the unincorporated areas of northern Palm Beach and southern Martin counties. The facility has an FDEP-permitted capacity of 11.00 MGD, with an annual average daily wastewater flow of 6.73 MGD in 2010. Approximately 6.39 MGD of the treated wastewater was reused in 2010, while 1.61 MGD was disposed through deep well injection. The reclaimed water is used primarily for irrigation of residences, golf courses, parks, and schools.

Concentrate from the Town of Jupiter's water treatment plant is blended with reclaimed water from the Loxahatchee River District. The blended concentrate increases Loxahatchee River District's reclaimed water supply and reduces the need for supplemented supplies from traditional sources of water. In 2010, Loxahatchee River District provided reclaimed water to 14 golf courses, 14 parks, 3 schools, and over 4,400 residences for irrigation.

Primary End Users
Abacoa Golf Club
Abacoa Development
Admiral's Cove East
Admiral's Cove West
Bear's Club
Frenchman's Creek North
Golf Club of Jupiter
Indian Creek Golf Club
Jonathan's Landing Golf Club
Jupiter Country Club
Jupiter Hills Club Numbers 1 and 2
Loxahatchee Club (Maplewood)
Riverbend Country Club
Riverbend Golf Club
Turtle Creek Golf Club
Tequesta Country Club

Future Treatment, Disposal, and Reuse

Although the Loxahatchee River District reuses most of its reclaimed water, some expansion of the system is expected in the future as the wastewater treatment flow increases. The goal is to optimize the overall water reuse efficiency, and correspondingly reduce disposal through deep well injection.

Future reclaimed water uses for the Loxahatchee River District WWTF depend upon an existing agreement with Seacoast Utility Authority. Under the agreement, Seacoast Utility

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Authority sends reclaimed water to the Abacoa development for irrigation. If the agreement is renewed, the Loxahatchee River District will likely use their increased reclaimed water to meet the water needs of additional users. If it is not renewed, much of the additional reclaimed water produced by Loxahatchee River District may be used at Abacoa.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The 2030 information was provided by the Loxahatchee River District in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**11.00 MGD**	**FDEP-Permitted Treatment Capacity**	**11.00 MGD**
Total Wastewater Effluent	**6.73 MGD**	**Total Wastewater Effluent**	**11.00 MGD**
Disposal		Disposal	
Deep well injection [a]	1.61 MGD	Deep well injection	2.6 MGD
Reuse		Reuse	
Total	6.39 MGD	Total	8.4 MGD
Irrigation	5.60 MGD	Irrigation	8.4 MGD
At the facility	0.79 MGD		
Reuse Percentage	**95%**	**Reuse Percentage**	**76%**

a. Disposal includes concentrate water from the Town of Jupiter's water treatment plant.

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Palm Beach County – Central Region Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department constructed the Central Region WRF on the site of the former Century Village WWTP. The facility, which began operation in 2008, receives secondary-treated effluent from the adjacent East Central Regional WRF and treats it to reclaimed water quality for irrigation. The Central Region WRF has an FDEP-permitted capacity of 3.00 MGD and treated an annual average daily flow of 0.51 MGD in 2010. All of the reclaimed water from the facility was reused in 2010.

Reclaimed water from this facility is used to irrigate a golf course and various landscaped areas. The Central Region WRF provides reclaimed water for irrigation and eliminates competition for groundwater withdrawn by the nearby Palm Beach County System Number 8 Wellfield and the City of West Palm Beach's wellfield.

Primary End Users
Century Village
Cypress Lakes
Emerald Dunes Golf Course
Vista Center

Future Treatment, Disposal, and Reuse

Although all of the reclaimed water from the Central Region WRF is reused, some expansion and optimization of the system may be planned. Potential future reclaimed water end users will be determined in the near future.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Palm Beach County Water Utilities Department provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**3.00 MGD**	**FDEP-Permitted Treatment Capacity**	**6.0 MGD**
Total Wastewater Effluent	**0.51 MGD**	**Total Wastewater Effluent**	**6.0 MGD**
Reuse		Reuse	
Irrigation	0.51 MGD	Irrigation	6.0 MGD
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

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Palm Beach County – Southern Regional Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department operates and maintains the Southern Regional WRF located in unincorporated Boynton Beach. The facility treats wastewater and provides reclaimed water for unincorporated areas of Boynton Beach and Delray Beach. The facility had an FDEP-permitted capacity of 35.00 MGD, with an annual average daily flow of 22.90 MGD in 2010. Approximately 14.20 MGD of the treated wastewater was reused in 2010, while 8.70 MGD was disposed through deep well injection. The reclaimed water is primarily used for irrigation. However, a portion of the reclaimed water hydrates the Wakodahatchee and Green Cay wetlands.

The Wakodahatchee Wetlands were constructed from former percolation ponds and act as a natural filter for nutrients before recharging the shallow aquifer. The 114-acre Green Cay Wetlands, located on former agricultural land, are used to recharge the local aquifer system, create ecologically significant wildlife habitat, and extend the function of the nearby Wakodahatchee Wetlands.

The facility provides reclaimed water to nine golf courses, two parks, one school, and more than 6,000 residences for irrigation.

Primary End Users
Aberdeen
Addison Reserve Country Club
Amherst Partners
Avalon Estates of Boynton Beach
Boynton Beach Medical Center
Briella Townhomes
Bruce Stumpf, Inc.
Canyon Lakes
Casa Bella
Cascades Association
Cypress Lakes Master Homeowner's Association
Enclave at Westchester
GL Homes of Boynton Beach
Gleneagles Country Club
Green Cay Wetlands
Greystone at Boynton Beach Homeowner's Association
Hagen Ranch Road median
Indian Springs East and West
Indian Springs Golf Course
Karl Corporation
Lake Lexington Club
Lakeridge Falls Homeowner's Association
Lexington Club Community
Monterey Estates
Palm Isles West Association

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Polo Trace Golf Course
Polo Trace West
Ponte Vecchio Homeowner's Association
Reform Temple at Shaarei Shalom
San Marco Homeowner's Association
Sawgrass Lakes Homeowner's Association
Seacrest Services
Shops at San Marco
Southern Golf Partners
St. Andrews Country Club
Tivoli Reserve of Palm Beach County Homeowner's Association
Tivoli Lakes of Palm Beach County Homeowner's Association
United Civic Association
Valencia Falls Homeowner's Association
Valencia Isles Homeowner's Association
Valencia Lakes Homeowner's Association
Valencia Palms
Valencia Pointe Master Homeowner's Association
Valencia Reserve
Villa Borghese Homeowner's Association
Water Treatment Plant System 3
Wakodahatchee Wetlands
Westchester Golf Course
Woolbright Jog Limited Liability Company

Future Treatment, Disposal, and Reuse

Palm Beach County has a mandatory reuse zone ordinance for new developments within a section of its service area. The Palm Beach County Water Utilities Department continues to pursue additional water reuse opportunities in this zone and surrounding areas. The goal is to increase the overall water reuse percentage and reduce disposal through deep well injection.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Palm Beach County Water Utilities Department provided the 2030 information in April 2012.

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**35.00 MGD**	**FDEP-Permitted Treatment Capacity**	**50.00 MGD**
Total Wastewater Effluent	**22.90 MGD**	**Total Wastewater Effluent**	**30.00 MGD**
Disposal		Disposal	
Deep well injection	8.70 MGD	Deep well injection	8.00 MGD
Reuse		Reuse	
Total	14.20 MGD	Total	25.00 MGD
Irrigation	12.70 MGD	Irrigation	22.00 MGD
Wetlands	1.50 MGD	Wetlands	3.00 MGD
Reuse Percentage	**62%**	**Reuse Percentage**	**83%**

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Seacoast Utility Authority PGA Regional Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The Seacoast Utility Authority owns, operates, and maintains the PGA Regional WRF. The facility services some unincorporated areas of northern Palm Beach County, the incorporated areas of the City of Palm Beach Gardens, the Village of North Palm Beach, the Town of Lake Park, and portions of the Town of Juno Beach. The PGA Regional WRF has an FDEP-permitted capacity of 12.00 MGD, with an annual average daily flow of 7.51 MGD in 2010, which includes a transfer of 1.27 MGD to the Loxahatchee River District.

In 2010, 0.20 MGD of groundwater, 0.72 MGD of water from the C-17 Canal, and 0.21 MGD of potable water on an annual average basis supplemented the Seacoast Utility Authority's reclaimed water supply. Approximately 6.11 MGD of reclaimed water was reused in 2010, while 1.25 MGD was disposed through deep well injection. The reclaimed water is primarily used for irrigation of golf courses, residences, parks, and streetscapes.

In 2010, Seacoast Utility Authority provided reclaimed water to ten golf courses, roadway medians, and two parks, among other users, for irrigation.

Primary End Users
Abacoa
Ballen Isles East Golf Course
Ballen Isles West Golf Course
Central Park
Crystal Pointe
Eastpointe Country Club
Eastpointe Golf and Racquet
Eastpointe Briar Lake
Everglades Condominium
FPL Administrative Complex
FPL Monet Substation
Frenchman's Creek Golf Course
Frenchman's Reserve
Gardens Mall
Gemini Condominium
Governor's Pointe
Lost Tree Village Golf Course
Mariners Cove
McArthur (Regional) Center
Mirasol
Mirasol Walk
Hibiscus
Oak Harbour
Old Palm Golf Course
Old Port Cove
North Palm Beach Country Club
Paloma

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Palm Beach Gardens Regional Park
PGA Boulevard streetscape
Royale Harbour Condominium
Seamark Condominium
Seacoast Utility Authority Water Treatment Plant
Seasons 52 Restaurant
Shady Lakes Homeowner's Association
Southampton
The Bears Club
The Isles
Waterway Terrace Condominium
Seacoast Utility Authority administration building

Future Treatment, Disposal, and Reuse

Although most of the treated effluent from the PGA Regional WRF is reused, the Seacoast Utility Authority will continue its efforts to promote the use of reclaimed water as an alternative water supply. The goal is to increase the overall water reuse percentage and reduce disposal through deep well injection. Seacoast Utility Authority projects use of deep well injection only during wet weather conditions and periodic testing of the well.

Potential End Users
Bent Tree
Cimarron

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Seacoast Utility Authority provided the 2030 information in April 2012.

FACILITY SUMMARY

2010		Projected 2030	
FDEP-Permitted Treatment Capacity	**12.00 MGD**	**FDEP-Permitted Treatment Capacity**	**12.00 MGD**
Total Wastewater Effluent [a]	**7.51 MGD**	**Total Wastewater Effluent**	**10.00 MGD**
Disposal		Disposal	
Deep well injection	1.25 MGD	Deep well injection	0.0 MGD
Reuse		Reuse	
Total	6.11 MGD	Total	10.00 MGD
Irrigation	6.09 MGD	Irrigation	10.00 MGD
At the facility	0.02 MGD		
Reuse Percentage	**81%**	**Reuse Percentage**	**100%**

a. 1.27 MGD of reclaimed water from the facility was transferred to the Loxahatchee River District.

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Seminole Improvement District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Seminole Improvement District is an independent Chapter 298 special district that provides potable water, sewer, and reclaimed water service to the central-western communities of Palm Beach County. In 2006, an agreement was executed between the county and Seminole Improvement District to define its service area and to work cooperatively on regional wastewater treatment and water reuse. The Seminole Improvement District WRF has an FDEP-permitted capacity of 0.32 MGD, with an annual average daily flow of 0.04 MGD in 2010. All of the reclaimed water is land applied for agricultural irrigation.

Future Treatment, Disposal, and Reuse

The Seminole Improvement District does not have plans to modify their existing water reuse system. However, the Seminole Improvement District and the county may determine in the future that modifications may provide enhanced water availability.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). Neither the Seminole Improvement District nor Palm Beach County provided the 2030 information. SFWMD assumes the 2030 treatment capacity remains at the current level. The increase in wastewater flow is anticipated to increase in proportion to the increase in potable water. Reuse is anticipated to remain at 100 percent.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.32 MGD**	**FDEP-Permitted Treatment Capacity**	**0.32 MGD**
Total Wastewater Effluent	**0.04 MGD**	**Total Wastewater Effluent**	**0.05 MGD**
Reuse		Reuse	
Agricultural irrigation	0.04 MGD	Agricultural irrigation	0.05 MGD
Reuse Percentage	**100 %**	**Reuse Percentage**	**100%**

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South Central Regional Wastewater Reclamation Facility

Existing Treatment, Disposal, and Reuse

The South Central Regional Wastewater and Disposal Board, formed in 1974 as a special district, treats wastewater from the cities of Boynton Beach and Delray Beach at the South Central Regional Wastewater Reclamation Facility. Each city operates and maintains wastewater collection systems in their respective service areas. Older contracts with end users were directly with the South Central Regional Wastewater and Disposal Board. The more recent contracts for reclaimed water are between the end users and the cities of Boynton Beach and Delray Beach.

The South Central Regional Wastewater Reclamation Facility has an FDEP-permitted capacity of 24.00 MGD, with an annual average daily flow of 16.76 MGD in 2010. Approximately 5.98 MGD of the treated wastewater was reused in 2010. About 10.74 MGD of treated wastewater was disposed through deep well injection and 0.04 MGD through an ocean outfall. Among other uses, the facility distributes the reclaimed water to both the cities of Boynton Beach and Delray Beach for their customers to irrigate 9 golf courses, 1 school, and 500 residences. The facility directly contracts with several customers for an allotment of 4.00 MGD, which is used for irrigation.

The 2008 Ocean Outfall statute (Subsection 403.086(9), F.S.) mandated the elimination of ocean outfalls by 2025 with the additional requirement that 60 percent of facility flow be beneficially reused. The South Central Regional Wastewater Reclamation Facility utilizes one of these outfalls. Based on historic flows to the ocean outfall, the facility is required to reuse 7.7 MGD of treated wastewater by 2025. The South Central Regional Wastewater and Disposal Board plans to meet the requirements of the statute by increasing the capacity of water reuse in the cities of Boynton Beach and Delray Beach. A deep injection well was installed, thereby nearly eliminating discharge through the ocean outfall. The ocean outfall will remain in place for emergency discharges.

City of Boynton Beach

The City of Boynton Beach's Utilities Department operates and maintains the city's wastewater and reclaimed water systems. The city receives reclaimed water from the South Central Regional Wastewater Reclamation Facility and reuses it, primarily for irrigation purposes. The city's permitted allocation is conditioned on the provision of reclaimed water to various identified entities.

Primary End Users
Bethesda Hospital
Bethesda Service Center
Boynton Ball Park
Boynton Beach Cemetery
Boynton Beach Children's Museum
Boynton Beach Water Treatment Plant
Boynton Library

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Boynton Senior Center
City Tennis Courts
Congress Avenue Park and Tennis Center
Country Club of Florida*
Delray Dunes*
East Water Plant
Entrance to Chapel Hill
Forest Park Elementary
Hunters Run Golf and Racquet Club
Hunters Run*
Las Ventanas
Little League Ball Park
Pence Park
Pine Tree Golf Club*
Quail Ridge*
Sterling Village
Village of Golf*

* Customer of the South Central Regional Wastewater and Disposal Board within the City of Boynton Beach service area.

City of Delray Beach

The City of Delray Beach's Public Utilities Division operates and maintains the city's wastewater and reclaimed water systems. The city receives reclaimed water from the South Central Regional WRF and uses it, primarily for irrigation purposes. The reclaimed water has largely replaced potable use and permitted withdrawals from the SAS. The city's water use permit contains limiting conditions requiring the provision of reclaimed water to four irrigation users (Delray Beach Municipal Golf Course, Hamlet Country Club, Del-Aire Country Club, and Lakeview Golf Club).

Primary End Users
Barrier island residential (north of Atlantic Avenue)
Clearbrook Homeowner's Association
Crosswinds of Delray
Del-Aire Golf Club
Delray Beach Municipal Golf Course
Delray Business Center
Fairways of Delray
Hamlet Golf Course
Lakeview Golf Club
Medians
New Atlantic High School
North Water Storage Tank/Pump Station (200 Northwest First Avenue)
Northwest Second Street corridor (Martin Luther King, Jr. Drive)
Pines of Delray Association, East and West
Pompey Park
St. Mary's Church (Atlantic Avenue/Homewood Boulevard)
Verona Woods Homeowner's Association
Wahoo Properties

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Future Treatment, Disposal, and Reuse

City of Boynton Beach

As the City of Boynton Beach's reclaimed water system expands, it is expected that reclaimed water will replace both current groundwater withdrawals from the SAS and potable demand on the system. The ultimate build-out capacity of the city's reclaimed water system is estimated at 11.0 MGD. The city proposes irrigation as the primary use for the future expansion of the reclaimed system.

Potential End Users
Banyan Springs
Barrier Island residential
Barton Memorial Park
Bent Tree
Boynton Beach Civic Center
Caloosa Park
Cascade Lakes
Colonial Club
Colonial Estates
Congress Avenue Park
Congress Middle School
Crosspointe Elementary School
Cypress Creek Golf Course
Greentree Villas
Hampshire Gardens
Highpoint residential
Holiday Inn
Hunters Run Residential Homeowner's Association
Indian Hills at Indian Spring
Jaycees Park
Leisureville Golf Course
Limetree
Little Club
Los Mangos
Oakwood Lakes
Palm Chase
Palmetto Greens Park
Santa Cruz
Snug Harbor
St. Andrews Golf Club
St. Vincent de Paul Seminary
Tuscany Bay (Military Trail)
Tuscany on the Intracoastal
WXEL

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City of Delray Beach

The City of Delray Beach has an ordinance requiring customers to connect to the reclaimed water system based on proximity to reclaimed water pipelines. As the city's reclaimed water system expands, it is expected that the reclaimed water will replace both current groundwater withdrawals from the SAS and potable demand on the system. The ultimate build-out capacity of the city's reclaimed water system is estimated at approximately 8.0 MGD. Water produced by expansion of the reclaimed system is primarily expected to be for irrigation along the barrier island.

Potential End Users
Banyan Creek Elementary
Carver Middle School
Carver Recreation Center
City Hall
Country Manors
Delray Beach City Cemetery
Environmental Services Department Complex
Gulf Stream Country Club
High Point
Lavers
Little Club
Miller Park
Old Atlantic High School
Old School Square
Orchardview Park
Pine Grove Elementary
Plumosa Elementary
Police station/courthouse
Rainberry Bay Homeowner's Association
Barrier island residential (south of Atlantic Avenue)
Sherwood Park Golf Course

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). South Central Regional Wastewater Disposal Board provided the City of Delray Beach 2030 information in April 2012. The City of Boynton Beach provided 2030 information in April 2012. These 2030 projections are dependent on the cities of Boynton Beach and Delray Beach reusing a total of 15.94 MGD (7.97 MGD for each city).

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**24.00 MGD**	**FDEP-Permitted Treatment Capacity**	**24.00 MGD**
Total Wastewater Effluent	**16.76 MGD**	**Total Wastewater Effluent**	**22.63 MGD**
Disposal		Disposal	
Total	10.78 MGD	Total	2.69 MGD
Deep well injection	10.74 MGD	Deep well injection	2.69 MGD
Ocean outfall	0.04 MGD		
Reuse		Reuse	
Total	5.98 MGD	Total	19.94 MGD
Irrigation	5.87 MGD	Irrigation – Boynton Beach	7.97 MGD
At the facility	0.11 MGD	Irrigation – Delray Beach	7.97 MGD
		Irrigation – Contracts	4.00 MGD
Reuse Percentage	**36%**	**Reuse Percentage**	**88%**

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Wellington Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The Village of Wellington's Utilities Department owns, operates, and maintains the Wellington WRF. The facility serves the village with wastewater collection services, treatment, and water reuse. The facility has an FDEP-permitted capacity of 4.75 MGD, with an annual average daily flow of 4.06 MGD in 2010. Approximately 0.10 MGD of the treated wastewater was reused in 2010, while 3.96 MGD was disposed through deep well injection. Construction to upgrade the treatment system slightly reduced reclaimed water flows from the facility in 2010, down from 0.25 MGD in 2009.

Reclaimed water from the Wellington WRF is primarily used for irrigation of local parks and for groundwater recharge at Wetland Park, which was constructed to provide wildlife habitat and public access.

Primary End Users
Boys and Girls Club Park
K-Park
Olympia Park
Tigershark Cove Park
Town Center
Village Park

Future Treatment, Disposal, and Reuse

Construction to upgrade the treatment system temporarily reduced reclaimed water flows; however, it will increase the reclaimed capacity to 4.5 MGD. With the increased capacity, the village intends to provide reclaimed water to the past/current users and evaluate the feasibility of future expansion.

Potential End Users
Big Blue Trace
Forest Hill Boulevard
Greenview Shores Boulevard
International Polo
Old Polo (a and b)
Pierson Polo
Polo Golf Course
Polo South
Southshore Boulevard (north)
Southshore Boulevard (south)
Wellington Trace West
Wellington Trace East

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Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The utility did not provide the 2030 information. The increase in wastewater flow is anticipated to increase in proportion to the increase in potable water supply in the village from 2010 to 2030. The projected capacity is assumed to increase to match the estimated flow. The projected reuse flow is from the *Village of Wellington Water Supply Facilities Work Plan and Related Comprehensive Plan Amendments* (Village of Wellington 2009). All reuse is assumed to be for irrigation purposes, except the groundwater recharge was kept constant from 2010 to 2030.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**4.75 MGD**	**FDEP-Permitted Treatment Capacity**	**5.06 MGD**
Total Wastewater Effluent	**4.06 MGD**	**Total Wastewater Effluent**	**5.06 MGD**
Disposal		Disposal	
Deep well injection	3.96 MGD	Deep well injection	0.56 MGD
Reuse		Reuse	
Total	0.10 MGD	Total	4.50 MGD
Irrigation	0.03 MGD	Irrigation	4.43 MGD
Groundwater recharge	0.07 MGD	Groundwater recharge	0.07 MGD
Reuse Percentage	**2%**	**Reuse Percentage**	**89%**

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Profiles of Broward County Facilities

Broward County North Regional Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

Broward County Water and Wastewater Services operates the Broward County North Regional WRF located in the City of Pompano Beach. The facility has an FDEP-permitted capacity of 95.00 MGD. It provides wastewater services for northern Broward County. In 2010, the annual average daily wastewater flow at the facility was 71.00 MGD. Approximately 4.40 MGD of the treated wastewater is reused at the facility or at adjacent facilities for irrigation, process, or cooling water.

In 2010, most of the treated wastewater was disposed of via deep injection wells (38.0 MGD) and ocean outfall (28.0 MGD). Of the water sent to the ocean outfall, an average 1.35 MGD was captured by the City of Pompano Beach in 2010 for further treatment and reuse. Overall, water reuse at the facility was approximately 6 percent of the wastewater treated at the facility.

Primary End Users
Broward County Septage Receiving Facility
Broward County North Regional WRF
Pompano Beach Park of Commerce
Wheelabrator Environmental Services

Future Treatment, Disposal, and Reuse

Based on historic flows to the ocean outfall, the facility is required to reuse 21.45 MGD of treated wastewater by 2025 to comply with the 2008 Ocean Outfall statute (Subsection 403.086(9), F.S.). The county is promoting collaborative regional water supply strategies to meet the required 60 percent water reuse by 2025. The county also intends to develop a regional reuse master plan along with a new or amended county ordinance(s) for the establishment of mandatory reuse zones.

Broward County Water and Wastewater Services continues to investigate means to increase its reclaimed water usage, both as a method to meet future water needs and the requirements of the 2008 Ocean Outfall requirements. The county is partnering with Palm Beach County Water Utilities Department to send reclaimed water into southern Palm Beach County for irrigation. Some irrigation customers will be included in northern Broward County as the reclaimed water is sent northward. The county is also in the process of extending reclaimed water to the Pompano Highlands neighborhood for irrigation. The City of Coconut Creek, which is within the North Regional WRF's service area, installed infrastructure to accept reclaimed water from the facility, primarily for irrigation. The first phase of the City of Coconut Creek reclaimed water system is planned to be operational in 2013. The City of Pompano Beach, which takes treated wastewater from the county's ocean outfall pipeline, is expected to continue expanding its reclaimed system.

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Potential End Users
City of Coconut Creek
Pompano Highlands
Potential larger users (e.g., golf courses, parks, and schools)

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). Broward County Wastewater Services provided the 2030 information in May 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**84.00 MGD**	**FDEP-Permitted Treatment Capacity**	**100.00 MGD**
Total Wastewater Effluent	**71.00 MGD**	**Total Wastewater Effluent**	**87.00 MGD**
Disposal		Disposal	
Total	66.00 MGD	Total	77.50 MGD
Deep well injection	38.00 MGD	Deep well injection	77.50 MGD
Ocean outfall	28.00 MGD		
Reuse		Reuse	
Total	4.40 MGD	Total	23.60 MGD
At the facility	2.90 MGD	Industrial or other	4.20 MGD
Cooling water	1.30 MGD	Irrigation	19.40 MGD
Irrigation	0.20 MGD		
Reuse Percentage	**6%**	**Reuse Percentage**	**27%**

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Cooper City Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Cooper City Utility Department operates the Cooper City WWTF, which has an FDEP-permitted capacity of 3.10 MGD. The facility provides wastewater services to its customers in the city and small sections of Davie and Southwest Ranches. In 2010, the annual average daily flow from the facility was 2.24 MGD. Treated effluent is disposed of through deep well injection or pumped to the Hollywood Southern Regional WRF. A contract between Cooper City and the City of Hollywood requires a minimum of 1.7 MGD of treated effluent be sent to the Hollywood facility. The salinity of treated effluent from Cooper City is lower than from the Hollywood facility and, therefore, is preferable for reuse applications.

Future Treatment, Disposal, and Reuse

Cooper City has a National Pollutant Discharge Elimination System permit with FDEP for its discharges through the Hollywood ocean outfall. Therefore, Cooper City is obligated to meet the reuse requirements. Based on historic flows to the ocean outfall, the Cooper City WWTF is required to reuse 0.9 MGD of treated wastewater by 2025.

The Cooper City WWTF currently does not have plans to implement a water reuse system within the city. The city will continue to evaluate reclaimed water as an alternative water supply source. SFWMD anticipates the city will work with neighboring utilities to leverage resources and take advantage of economies of scale to meet the 2008 Ocean Outfall requirements (Subsection 403.086(9), F.S.). Costs and potential increases for allocation based on terminated base condition water use and offsets are components of future considerations for water reuse in the city.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Cooper City Utility Department provided the 2030 information.

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**3.10 MGD**	**FDEP-Permitted Treatment Capacity**	**3.10 MGD**
Total Wastewater Effluent [a]	**2.24 MGD**	**Total Wastewater Effluent [a]**	**2.70 MGD**
Disposal		Disposal	
Total	2.24MGD	Total	1.80 MGD
Deep well injection	0.63 MGD	Deep well injection	0.10 MGD
Pumped to Hollywood	1.61 MGD	Pumped to Hollywood	1.70 MGD
Reuse		Reuse	
In Cooper City [b]	0.00 MGD	In Cooper City [b]	0.90 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**33%**

a. Treated effluent from the WWTF is combined with concentrate from the water treatment plant before it is sent to the City of Hollywood or deep well injected.

b. Some reuse using wastewater from Cooper City occurs through the City of Hollywood's system.

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Coral Springs Improvement District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Coral Springs Improvement District WWTF has an FDEP-permitted capacity of 5.72 MGD and provides wastewater services to customers within its service area. In 2010, the annual average daily flow from the facility was 5.06 MGD. Treated effluent from the district's facility is disposed through two deep injection wells. The facility also has a 0.01-MGD on-site rapid infiltration basin for short-term, emergency backup disposal. Coral Springs Improvement District determined water reuse is not feasible at this time.

Future Treatment, Disposal, and Reuse

Coral Springs Improvement District will upgrade the WWTF and continue to evaluate the potential of producing reclaimed water.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Coral Springs Improvement District provided the 2030 information in May 2012. Additional data is from the Coral Springs Improvement District FDEP permit (FLA041301).

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**5.72 MGD**	**FDEP-Permitted Treatment Capacity**	**7.72 MGD**
Total Wastewater Effluent	**5.06 MGD**	**Total Wastewater Effluent**	**5.40 MGD**
Disposal		Disposal	
Deep well injection	5.06 MGD	Deep well injection	5.40 MGD
Reuse		Reuse	
Total	0.00 MGD	Total	0.00 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

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Davie Wastewater Treatment Plant/Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The Town of Davie Utilities Department operates the Davie WWTP. The facility has an FDEP-permitted capacity of 4.85 MGD and provides wastewater services to the majority of eastern Davie and the Seminole Tribe of Florida Hard Rock Hotel complex. The Cooper City and Tindall Hammock WWTFs also provide service to a small portion of the town. The remaining sections of the Town of Davie (predominantly the western portions) are served by Broward County, and the cities of Hollywood, Fort Lauderdale, and Sunrise. A WRF is under construction at the facility.

In 2010, the annual average daily flow at the Davie WWTP was 0.98 MGD. The town pumps treated effluent to the Hollywood Southern Regional WRF, which also receives effluent from the Cooper City WWTF. Through a large user agreement, the Davie facility is required to send treated effluent to the Hollywood facility until 2037. The salinity of treated effluent from the Davie facility is lower than that from the Hollywood facility and, therefore, is preferable for reuse applications. Currently, the Town of Davie's facility does not yet produce reclaimed water.

Future Treatment, Disposal, and Reuse

The Town of Davie has a National Pollutant Discharge Elimination System permit with FDEP for its discharges through the City of Hollywood's ocean outfall and is obligated to meet the 2008 Ocean Outfall requirements (Subsection 403.086(9), F.S.). Based on historic flows to the ocean outfall, the Town of Davie Utility Department must reuse 1.2 MGD of treated wastewater by 2025.

The Town of Davie is in the process of constructing a WRF. The facility is expected to provide up to 2.0 MGD of reclaimed water for irrigation and industrial uses in 2013. It is anticipated the volume will double by 2023. When the new WRF becomes operational, the town will divert flows from their existing WWTP to the WRF, reducing the amount of wastewater effluent sent to the Hollywood Southern Regional WRF.

Potential End Users
Arrowhead Country Club
Broward College
Broward County schools
Davie Bamford Pine Island Park Sports Complex
Grand Oaks Country Club
McFatter Technical Center
Nova Southeastern University Main Campus
Sunforest Complex
University of Florida Research Center

As part of the town's reuse program, aquifer recharge and indirect potable reuse is planned for the existing Davie WWTP (System II). Future System II expansions and upgrades include

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high-level disinfection and two Biscayne aquifer recharge wells. The existing WWTP will have the capacity to recharge up to 3.0 MGD into the aquifer.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Town of Davie Reclaimed Water Distribution System and Davie Utilities Department provided the 2030 information in October 2011 and April 2012, respectively.

FACILITY SUMMARY			
2010		**Projected 2030[b]**	
FDEP-Permitted Treatment Capacity	**4.85 MGD**	**FDEP-Permitted Treatment Capacity**	**12.00 MGD**
Total Wastewater Effluent	**0.98 MGD**	**Total Wastewater Effluent**	**12.00 MGD**
Disposal/Reuse [a]		Disposal	
Pumped to Hollywood	3.38 MGD	Deep well injection	5.7 MGD
Reuse		Reuse	
Total	0.00 MGD	Total	6.30 MGD
		Irrigation	1.90 MGD
		Groundwater recharge	3.00 MGD
		Other types of reuse	1.40 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**53%**

a. Some reuse using wastewater occurs through the Hollywood Southern Regional WRF.

b. Includes both the existing WWTP and the WRF now under construction.

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Fort Lauderdale George T. Lohmeyer Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Fort Lauderdale's George T. Lohmeyer WWTF is designed as a central regional facility and is used to treat all wastewater generated in a region encompassing Port Everglades, the cities of Fort Lauderdale, Wilton Manors and Oakland Park, and parts of the City of Tamarac, Town of Davie, and unincorporated Broward County. The facility has an FDEP-permitted capacity of 55.70 MGD and a 2010 annual average daily flow of 37.60 MGD. Treated effluent from the facility is disposed through five deep injection wells.

The facility does not currently provide reclaimed water for reuse. The facility is located far from any traditional users of reclaimed water and space to construct the necessary treatment facilities is limited at the plant site or vicinity. In addition, the treated effluent has elevated chloride concentrations limiting its viability as reuse water. Therefore, the city determined that water reuse alternatives are not feasible at this time.

Future Treatment, Disposal, and Reuse

The City of Fort Lauderdale continues to consider water reuse, particularly options that can be used to help develop alternative water supplies. Indirect potable reuse systems are under consideration because of the dual benefits of providing more disposal capacity and augmenting local water supplies.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Fort Lauderdale provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**55.70 MGD**	**FDEP-Permitted Treatment Capacity**	**56.60 MGD**
Total Wastewater Effluent	**37.60 MGD**	**Total Wastewater Effluent**	**45.60 MGD**
Disposal		Disposal	
Deep well injection	37.60 MGD	Deep well injection	41.60 MGD
Reuse		Reuse	
Total	0.00 MGD	At the facility	4.00 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**9%**

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Hollywood Southern Regional Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The City of Hollywood Department of Public Utilities operates the city-owned Hollywood Southern Regional WRF. The facility, which has an FDEP-permitted capacity of 55.50 MGD, provides wastewater services for the City of Hollywood and southern Broward County. In 2010, the annual average daily flow of treated wastewater from the facility was 45.90 MGD. The facility received additional treated wastewater from the Town of Davie and Cooper City. Approximately 45.90 MGD of the treated wastewater was disposed through deep well injection and an ocean outfall, while 1.79 MGD was reused. Most of the reclaimed water reuse was for public access irrigation. Overall, the facility reused approximately 4 percent of the wastewater treated at the facility in 2010.

Influent to the facility is relatively high in salinity making it unusable for typical irrigation purposes. However, the city implemented a reclaimed water reuse system making use of lower salinity effluent from the Town of Davie and Cooper City.

Primary End Users
Diplomat Country Club
Eco Grande Golf Course
Emerald Hills Golf Course
City nursery (from tanker truck)
David Park
Dowdy Field
Hillcrest Country Club
Hollywood Beach Golf Course
Hollywood Boulevard median
Lincoln Park Elementary School
Memorial Regional Hospital East Campus
Orangebrook Country Club
Rotary Park
Townhomes of Emerald Hills
U.S. Highway 1 median

Future Treatment, Disposal, and Reuse

The Hollywood Southern Regional WRF is one of the two ocean outfalls in Broward County utilized by regional wastewater service providers to dispose of treated wastewater. Based on historic flows to the ocean outfall, the facility is required to reuse 20.4 MGD of treated wastewater by 2025 to fulfill the requirements of the 2008 Ocean Outfall statute (Subsection 403.086(9), F.S.).

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The City of Hollywood Department of Public Utilities is expected to meet the 60 percent reuse requirement of the 2008 Ocean Outfall amendments (Subsection 403.086(9), F.S.) primarily through recharge of the upper Floridan aquifer, with some additional irrigation.

Potential End Users
City of Dania Beach
City of Hallandale Beach
City of Hollywood remaining green areas
Topeekeegee Yugnee Park, Sheridan Street, and Park Road
West Lake Village

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The 2030 information is from the *City of Hollywood Wastewater Master Plan* (Hazen & Sawyer, P.C. 2007). This master plan went to 2025. Therefore, the 2030 flow projections were estimated from the 2025 projections.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**55.50 MGD**	**FDEP-Permitted Treatment Capacity**	**65.00 MGD**
Total Wastewater Effluent	**45.90 MGD**	**Total Wastewater Effluent**	**64.10 MGD**
Disposal		Disposal	
Total	45.90 MGD	Total	43.70 MGD
Deep well injection	26.30 MGD	Deep well injection	43.70 MGD
Ocean outfall	19.60 MGD		
Reuse [a]		Reuse	
Total	1.79 MGD	Total	21.61 MGD
Irrigation	1.79 MGD	Irrigation	3.00 MGD
		Aquifer recharge	18.61 MGD
Reuse Percentage	**4%**	**Reuse Percentage**	**34%**

a. Due to elevated salinity in the City of Hollywood's wastewater, most reuse occurs using treated wastewater received from the Cooper City WWTF and Town of Davie WWTP.

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Margate Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The City of Margate's Department of Environmental and Engineering Services operates the Margate WWTP. The WWTP has an FDEP-permitted capacity of 10.10 MGD and provides wastewater services to the entire developed area within city limits and a section of southern Coconut Creek. In 2010, the annual average daily flow from the facility was 7.21 MGD. As of 2010, all treated wastewater was disposed of through deep well injection.

Future Treatment, Disposal, and Reuse

The City of Margate is planning for the design and construction of a 1.5-MGD reclaimed water treatment plant, along with the associated transmission and distribution system piping. The West Water Treatment Plant will be located within the city's West WWTP and will produce reclaimed water primarily for irrigation of nearby golf courses and roadway medians and for in-plant processes. Completion is expected in 2015. In the future, the city hopes to expand reclaimed water use to city parks and residential neighborhoods.

Primary End Users
Carolina Golf Club
Coral Cay (Colonies of Margate I, II, and III)
In-plant process water and spray irrigation
Margate Executive Golf Course
Oriole Golf and Tennis Club of Margate
Palm Springs III

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The 2030 information was provided by the City of Margate and the University of Florida's Bureau of Economic and Business Research 2030 medium population projections (BEBR 2011).

FACILITY SUMMARY

2010		Projected 2030	
FDEP-Permitted Treatment Capacity	**10.10 MGD**	**FDEP-Permitted Treatment Capacity**	**10.10 MGD**
Total Wastewater Effluent	**7.21 MGD**	**Total Wastewater Effluent**	**7.20 MGD**
Disposal		Disposal	
Deep well injection	7.21 MGD	Deep well injection	5.7 MGD
Reuse		Reuse	
Total	0.00 MGD	Total	1.50 MGD
		Irrigation	1.00 MGD
		Plant process water	0.50 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**21%**

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Miramar Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The City of Miramar's Utilities Department operates a WRF that serves the western section of the city. Wastewater collected from the eastern part of the city is sent to the Hollywood Southern Regional WRF for treatment. The Miramar WRF has an FDEP-permitted capacity of 10.10 MGD, and in 2010, the annual average daily flow from the facility was 7.64 MGD. Approximately 5.55 MGD of the treated wastewater was disposed through deep well injection, while 2.09 MGD was reused. Most of the water reuse was for public access irrigation.

Primary End Users
Ansin Sport Complex Avalon
City hall
GSA-ICE building
Hiatus Road, Miramar Parkway, Southwest 130th Avenue, and Southwest 145th Avenue medians
Miramar Park of Commerce (north only)
Monarch Lakes (common areas)
Renaissance Middle School
Villages of Renaissance

Future Treatment, Disposal, and Reuse

The City of Miramar will continue evaluating options for increasing the amount of water reuse, both to help meet the 2008 Ocean Outfall statute requirements (Subsection 403.086(9), F.S.) for the City of Hollywood outfall and increase water supplies. The city recently completed a 2.0-MGD reclaimed water system expansion and is in the process of connecting more irrigation users to the distribution system. The city is anticipating that the increased use of reclaimed water within the vicinity of its western wellfield will decrease the stress on traditional sources of water and might yield substitution credits (or terminated base condition water use) or offsets to the city's western wells.

Potential End Users
Huntington Park
Miramar Park of Commerce – Phase V
Silver Falls
Trammel Crow Industrial Center
Vizcaya Park and common area

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Miramar provided the 2030 information in April 2012.

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**10.10 MGD**	**FDEP-Permitted Treatment Capacity**	**12.60 MGD**
Total Wastewater Effluent	**7.64 MGD**	**Total Wastewater Effluent**	**11.80 MGD**
Disposal		Disposal	
Deep well injection	5.55 MGD	Deep well injection	5.80 MGD
Reuse		Reuse	
Total	2.09 MGD	Total	6.0 MGD
Irrigation	0.78 MGD	Irrigation	6.0 MGD
At the treatment facility	1.31 MGD		
Reuse Percentage	**27%**	**Reuse Percentage**	**51%**

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North Springs Improvement District Water Reclamation Facility (proposed)

Existing Treatment, Disposal, and Reuse

The North Springs Improvement District funds, operates, and maintains a wastewater collection system in northeastern Broward County. This system provides wastewater services to businesses and residents in the cities of Coral Springs and Parkland. Broward County North Regional Water Reclamation Facility receives, treats, and disposes of the wastewater collected by North Springs Improvement District.

Future Treatment, Disposal, and Reuse

North Springs Improvement District intends to expand its service area to capture the properties in a section of Broward County known as "the wedge" by constructing a WRF. (The state legislature approved the transfer of the 1,949-acre wedge shaped property from Palm Beach County to Broward County. The transfer became official in 2009). The reuse facility will treat wastewater and produce irrigation quality water for distribution to properties within the North Springs Improvement District boundaries and new development within the wedge. Potentially, users beyond the North Springs Improvement District boundaries could also be supplied.

Currently, four major developers have been identified for reclaimed water reuse within the wedge area: Lenar Homes, Standard Pacific, WCI, and Triple H. North Springs Improvement District met with each of the developers to obtain site plans and to calculate irrigation demands. The irrigation end users within this area will be 90 percent residential and 10 percent commercial.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The North Springs Improvement District provided the 2030 information in March 2012.

FACILITY SUMMARY			
2010 [a]		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.00 MGD**	**FDEP-Permitted Treatment Capacity**	**5.00 MGD**
Total Wastewater Effluent	**0.00 MGD**	**Total Wastewater Effluent**	**4.00 MGD**
Disposal		Disposal	
Total	0.00 MGD	Deep well injection [b]	0.00 MGD
Reuse		Reuse	
Total	0.00 MGD	Total	4.00 MGD
		Irrigation	4.00 MGD
		Wetland recharge [c]	0.00 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**100%**

a. The facility was not built in 2010.
b. Deep well injection will only be used for emergencies.
c. Reuse water will only be used for wetland recharge if irrigation demand is met.

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Pembroke Pines Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Pembroke Pines Division of Environmental Services operates the Pembroke Pines WWTF. The facility has an FDEP-permitted capacity of 9.50 MGD and serves the western section of the city. The Hollywood Southern Regional Water Reclamation Plant receives and treats wastewater from the eastern portion of the city. In 2010, the annual average daily treated wastewater flow from the Pembroke Pines WWTF was 7.07 MGD. Currently, the city does not treat wastewater for reuse. Treated wastewater from the city's facility is disposed of through deep well injection.

Future Treatment, Disposal, and Reuse

The City of Pembroke Pines evaluated two options for water reuse: irrigation reuse and aquifer recharge. In 2011, the city completed a pilot project to evaluate the feasibility of recharging the SAS with reclaimed water. Based on the results of the pilot project, the concept was deemed technically feasible, but no further progress was made toward evaluating and implementing aquifer recharge. Additionally, the city is concerned about the potential cost to meet the county's nutrient limitations for phosphorous and nitrogen.

Potential End Users
Biscayne aquifer
City of Pembroke Pines

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Pembroke Pines provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**9.50 MGD**	**FDEP-Permitted Treatment Capacity**	**9.50 MGD**
Total Wastewater Effluent	**7.07 MGD**	**Total Wastewater Effluent**	**7.70 MGD**
Disposal		Disposal	
Deep well injection	7.07 MGD	Deep well injection	2.40 MGD
Reuse		Reuse	
Total	0.00 MGD	Aquifer recharge	5.3 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**69%**

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Plantation Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Plantation Utilities Department operates and maintains the Plantation WWTF, which serves the entire incorporated area. The facility has an FDEP-permitted capacity of 18.90 MGD. In 2010, the annual average daily flow through the facility was 13.80 MGD. Approximately 13.39 MGD of the treated wastewater was disposed by deep well injection, while 0.41 MGD was reused for treatment processes including irrigation at the facility.

In 2008, the City of Plantation completed a pilot project to evaluate potential treatment options to use reclaimed water to recharge the SAS. The project indirectly recharged the aquifer through surface water discharge into a local canal. Although the concept is technically feasible from a treatment perspective, costs and regulatory constraints stalled its progress.

Future Treatment, Disposal, and Reuse

The City of Plantation Utilities Department will continue to evaluate options to increase the amount of water reuse. It is considering using reclaimed water for irrigation at the Plantation Preserve and Jacaranda golf courses within the city. The increased use of reclaimed water within the city is anticipated to decrease stress on traditional sources of water and yield substitution credits or offsets, in compliance with the LEC regional water availability criteria, to increase the city's allocation from the SAS. The offset and substitution credits need to be identified for their cost-effectiveness.

Flat population levels and conservation efforts delayed the immediate need for alternative water supply capacity. These factors, as well as current funding limitations, delayed implementation of reclaimed water projects. However, the city purchased 6.6 acres of adjacent property for future plant expansions, as needed. The projected flow for the facility in 2030 is yet to be determined.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The utility did not provide the 2030 information. The capacity was assumed to remain the same as in 2010. Flows were projected based on the percentage change in potable water flow for the utility from 2010 to 2030. SFWMD assumed reclaimed water for irrigation is to be used at the Jacaranda and Plantation Preserve golf courses.

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**18.90 MGD**	**FDEP-Permitted Treatment Capacity**	**18.90 MGD**
Total Wastewater Effluent	**13.80 MGD**	**Total Wastewater Effluent**	**15.54 MGD**
Disposal		Disposal	
Deep well injection	13.39 MGD	Deep well injection	13.77 MGD
Reuse		Reuse	
Facility Processes	0.41 MGD	Irrigation	1.77 MGD
Reuse Percentage	**3%**	**Reuse Percentage**	**11%**

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Pompano Beach Water Reclamation Facility

Existing Treatment, Disposal, and Reuse

The City of Pompano Beach Utilities Department operates and maintains a reclaimed water treatment and distribution system named "Our Alternative Supply Irrigation System" referred to as OASIS. The city does not have its own WWTP. The Broward County North Regional Water Reclamation Facility collects wastewater within the city. Pompano Beach diverts a portion of the effluent from the Broward County North Regional WRF ocean outfall pipeline. The diverted effluent undergoes further treatment with filtration and high-level disinfection at the Pompano Beach facility before being reused within the city. The city's water reuse system has an FDEP-permitted capacity of 7.50 MGD. In 2010, the annual average daily flow from the reuse system was 1.35 MGD.

The Pompano Beach WRF provides reclaimed water for irrigation of the Municipal Golf Course, Pompano Community Park, landscaping along Federal Highway and Copans Road, city medians, and residential areas east of Dixie Highway. Water reuse produced by the City of Pompano Beach will contribute towards the Broward County North Regional WRF's goal of achieving 60 percent water reuse by 2025.

Primary End Users
Citi Centre Mall
City cemetery
City Municipal Golf Course
City nursery
City parks
Medians
Residential areas
Sand and Spurs Stables
Schools

Future Treatment, Disposal, and Reuse

The city intends to continue expanding its water reuse system by adding customers, including residential customers in the eastern section of the city. In 2011, the city, with Broward County as a partner, implemented a program to complete and pay for the upfront connection costs for single family residential properties. Pompano Beach has a reclaimed water large user agreement with the City of Lighthouse Point that could result in additional users in the future. The city will also negotiate an agreement with Broward County to provide reuse water through a master meter to customers of Pompano Highlands, located in Broward County's service area.

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Potential End Users
Additional Pompano Beach residential irrigation and other public access irrigation
Broward County (Pompano Highlands)
Lighthouse Point residences and other public access irrigation

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Pompano Beach provided the 2030 information in March 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**7.50 MGD**	**FDEP-Permitted Treatment Capacity**	**12.50 MGD**
Reuse Effluent Flow	**1.35 MGD**	**Total Wastewater Effluent**	**4.50 MGD**
Reuse		Reuse	
Irrigation	1.35 MGD	Irrigation	4.50 MGD
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

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Sunrise Wastewater Treatment Facilities

Existing Treatment, Disposal, and Reuse

The City of Sunrise Utilities Department operates and maintains three WWTFs, serving the cities of Sunrise and Weston, the Town of Southwest Ranches, and about 60 percent of the Town of Davie. The Sawgrass and Springtree WWTFs do not currently provide reclaimed water for reuse. These facilities dispose of treated effluent using deep well injection. The Sawgrass WWTP has an FDEP-permitted capacity of 20.00 MGD and had an average daily flow of 18.26 MGD in 2010. The Springtree WWTP has an FDEP-permitted capacity of 10.00 MGD and had an average daily flow of 7.19 MGD in 2010. The Southwest WWTF treats effluent through four percolation ponds. The Southwest WWTF has an FDEP-permitted capacity of 0.45 MGD, and in 2010, the annual average daily wastewater flow was 0.37 MGD.

Future Treatment, Disposal, and Reuse

The City of Sunrise intends to pursue additional water reuse opportunities at the Southwest and Sawgrass WWTFs in an effort to reduce irrigation demands from potable water. Irrigation will be the primary focus of reclaimed water reuse in the future at both locations. At the Southwest WWTF, irrigation of the facility's grounds will be the initial focus followed by expansion to surrounding tracts. The Sawgrass WWTF is expected to expand to provide reclaimed water for irrigation to offset withdrawals from the Biscayne aquifer.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Sunrise provided the 2030 information in April 2012.

FACILITY SUMMARY – SOUTHWEST WWTF			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.45 MGD**	**FDEP-Permitted Treatment Capacity**	**0.99 MGD**
Total Wastewater Effluent	**0.37 MGD**	**Total Wastewater Effluent**	**0.99 MGD**
Reuse		Reuse	
Percolation Ponds	0.37 MGD	Groundwater recharge	0.99 MGD
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

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FACILITY SUMMARY – SAWGRASS WWTF			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**20.00 MGD**	**FDEP-Permitted Treatment Capacity**	**25.00 MGD**
Total Wastewater Effluent	**18.26 MGD**	**Total Wastewater Effluent**	**22.00 MGD**
Disposal		Disposal	
Deep well injection [a]	25.45 MGD	Deep well injection	18.00 MGD
Reuse		Reuse	
Total	0.00 MGD	Irrigation	8.0 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**36%**

a. Effluent from the Springtree WWTF is transferred to the Sawgrass WWTF for disposal through deep injection wells.

FACILITY SUMMARY – SPRINGTREE WWTF			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**10.00 MGD**	**FDEP-Permitted Treatment Capacity**	**16.00 MGD**
Total Wastewater Effluent	**7.19 MGD**	**Total Wastewater Effluent**	**12.00 MGD**
Disposal		Disposal	
Deep well injection [a]	0.00 MGD	Deep well injection [a]	0.00 MGD
Reuse		Reuse	
Total	0.00 MGD	Irrigation	7.00 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**58%**

a. Effluent from the Springtree WWTF is transferred to the Sawgrass WWTF for disposal through deep injection wells.

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Tindall Hammock Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Tindall Hammock Irrigation and Soil Conservation District operates and maintains a wastewater collection and treatment system that serves a small area within the Town of Davie. The WWTF, which has an FDEP-permitted capacity of 0.60 MGD, had an annual average daily flow of 0.27 MGD in 2010. The treated effluent is discharged to an on-site borrow pit lake, which recharges the SAS.

Future Treatment, Disposal, and Reuse

No changes are proposed for the Tindall Hammock WWTF water reuse system. The small facility will continue to use the on-site borrow pit lake for recharge of the shallow aquifer.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Tindall Hammock Irrigation and Soil Conservation District provided the 2030 information.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.60 MGD**	**FDEP-Permitted Treatment Capacity**	**0.60 MGD**
Total Wastewater Effluent	**0.27 MGD**	**Total Wastewater Effluent**	**0.40 MGD**
Reuse		Reuse	
Rapid infiltration basin	0.27 MGD	Borrow-pit lake	0.40 MGD
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

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Profiles of Miami-Dade County Facilities

Homestead Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The City of Homestead Public Works and Engineering Department operates and maintains the Homestead WWTP, which has an FDEP-permitted capacity of 6.00 MGD. The annual average daily flow from the Homestead WWTP was 5.30 MGD in 2010. Excess wastewater flows are pumped to the Miami-Dade South District WWTP. All of the treated water is discharged to a series of rapid infiltration trenches that recharge the Biscayne aquifer. The Homestead WWTP reused 100 percent of the wastewater treated at the facility in 2010.

Future Treatment, Disposal, and Reuse

The City of Homestead evaluated various alternative water supply projects to meet future growth demands. The city determined it could provide reclaimed water from its WWTP to the city-owned electric generating plant for cooling water purposes. The electric generating plant would then discharge to rapid infiltration basins, recharging the Biscayne aquifer. Currently, the electric generating plant utilizes the Biscayne aquifer for its cooling towers. The city will continue evaluating options for increasing reclaimed water reuse. It anticipates that increased use of reclaimed water within the city might decrease stress on traditional sources of water and might yield substitution credits or offsets to the city's allocation from the Biscayne aquifer, provided such use meets the LEC regional water availability criteria.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Homestead provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**6.00 MGD**	**FDEP-Permitted Treatment Capacity**	**10.00 MGD**
Total Wastewater Effluent	**5.30 MGD**	**Total Wastewater Effluent**	**10.00 MGD**
Reuse		Reuse	
On-site rapid infiltration trenches	5.30 MGD	Rapid infiltration basin	10.00 MGD
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

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Miami-Dade Water and Sewer Department Wastewater Treatment Plants

The Miami-Dade Water and Sewer Department (MDWASD) collects and treats most of the wastewater generated in Miami-Dade County. MDWASD wastewater service area is divided into three regional districts. The North District, Central District, and South District WWTPs are located in the eastern portion of the county. MDWASD is considering a new West District Water Reclamation Plant.

MDWASD currently uses two ocean outfalls and 21 deep injection wells to dispose of treated wastewater. The North District WWTP uses a combination of ocean outfall and deep injection for disposal, the Central District WWTP uses solely ocean outfall, and the South District WWTP uses solely deep well injection. Each facility reuses a small amount of treated wastewater, mostly for processes at the facilities.

Two factors are driving the commitment to increased water reuse in Miami-Dade County. First, the utility's water use permit stipulates that 170 MGD of water reuse must be in place before volumes over its base condition water use are withdrawn from the Alexander Orr and South Dade subarea wellfields. The intent of the requirement is to comply with the LEC restricted allocation area criteria and implement projects that recharge the aquifer with highly treated reclaimed water, thereby offsetting impacts to the regional system.

Secondly, the 2008 Ocean Outfall amendments mandate significant reuse (Subsection 403.086(9), F.S.). Because all of MDWASD's WWTPs are interconnected, the three plants are considered one system. Therefore, MDWASD may meet the reuse requirement on a systemwide basis. MDWASD will be required to beneficially reuse 117.5 MGD of treated wastewater by 2025. MDWASD's intent is to reuse most of the water at their South District WWTP, diverting flows from the North and Central District WWTPs to the South District WWTP. It also proposed the construction of the West District Water Reclamation Plant to support reuse projects located near that site.

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Miami-Dade Central District Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The Miami-Dade Central District WWTP services the area from Northwest 79th Street to the Tamiami Canal and includes a portion of the City of Coral Gables to Southwest 156th Street. This district services the unincorporated areas inside its boundary and the municipalities of Doral, Miami, Miami Beach, Miami Springs, Medley, Coral Gables, South Miami, Bal Harbor, and Key Biscayne. The facility has an FDEP-permitted capacity of 143 MGD, and in 2010 had an annual average flow of 101 MGD. In 2010, an average rate of 114.1 MGD of treated wastewater was discharged through the Central District ocean outfall, and 6.22 MGD was reused. The water reuse was for in-plant processes at the facility.

Primary End User
In-plant processes at the Central District WWTP (e.g., flushing, wash downs, and pump seal lubrication)

MDWASD installed reclaimed water piping in the Village of Key Biscayne. However, the connection to the Central District WWTP has not been made. The purpose of the project was to replace potable water irrigation at Crandon Park and areas of Key Biscayne. The future of this project is uncertain at this time.

Future Treatment, Disposal, and Reuse

To meet the 2018 deadline for reducing nutrients from the ocean outfall, MDWASD is considering installing deep injection wells at the Central District WWTP and/or recharge wells on Virginia Key. Wastewater not disposed through the Central District ocean outfall could be sent south and/or west for reuse at other locations. MDWASD is currently evaluating the options to meet the reuse requirements. MDWASD, as part of the ocean outfall implementation plan submitted on July 1, 2013, more fully describes the scope of its reclaimed water plan for its system, including the Central District WWTP. The plan for this facility is to recharge the upper Floridan aquifer at about 9.2 MGD.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). MDWASD provided the 2030 information in April 2012.

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**143.00 MGD**	**FDEP-Permitted Treatment Capacity**	**80.00 MGD**
Total Wastewater Effluent	**101.00 MGD**	**Total Wastewater Effluent**	**69.00 MGD**
Disposal		Disposal	
Ocean outfall	114.10 MGD	Deep well injection	69.00 MGD
Reuse		Reuse	
At the facility	6.22 MGD	At the facility	5.00 MGD
		Aquifer recharge	9.2 MGD
Reuse Percentage	**6%**	**Reuse Percentage**	**21%**

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Miami-Dade North District Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The Miami-Dade North District WWTP services from the north county boundary line to near Northwest 79th Street and includes unincorporated areas, and the municipalities of Hialeah, Hialeah Gardens, North Miami, Miami Gardens, Miami Lakes, Miami Shores, Opa-Locka, and North Miami Beach. The facility has three independent process trains: one to treat lower-chlorides wastewater from the western part of the district and two to treat high chlorides from a mixture of wastewaters from the western and coastal areas. The facility has an FDEP-permitted capacity of 112.50 MGD, and had an annual average daily flow of 87.15 MGD in 2010. In 2010, a total of 64.58 MGD of treated wastewater was discharged through ocean outfall, 19.29 MGD was disposed through four deep injection wells, and 3.25 MGD of sludge was transferred to the Miami-Dade Central District WWTP. On average, in 2010, approximately 2.08 MGD of water was reused.

Primary End Users
Florida International University – Biscayne Bay
Miami-Dade North District WWTP (in-plant processes)

MDWASD was considering water reuse opportunities with the cities of North Miami and North Miami Beach, but those cities have been unable to provide the needed reclaimed water distribution facilities. Those opportunities are currently on hold.

Future Treatment, Disposal, and Reuse

To meet the 2018 deadline for reducing nutrients from the ocean outfall, MDWASD is considering installing additional deep injection wells at the North District WWTP. Wastewater not disposed at the North District WWTP could be sent south or west for reuse at other locations. MDWASD is evaluating options, such as groundwater recharge at the other facilities, to meet reuse requirements. MDWASD is currently diverting flows from the ocean outfall to four injections wells to meet the advanced wastewater treatment equivalent requirement.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011) and MDWASD in April 2012. MDWASD provided the 2030 information in April 2012.

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FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**120.00 MGD**	**FDEP-Permitted Treatment Capacity**	**80.00 MGD**
Total Wastewater Effluent	**87.15 MGD**	**Total Wastewater Effluent**	**60.00 MGD**
Disposal		Disposal	
Total	87.12 MGD	Total	58.39 MGD
Ocean outfall	64.58 MGD	Deep well injection	58.39 MGD
Deep well injection	19.29 MGD		
Sludge transfer to Central District WWTP	3.25 MGD		
Reuse		Reuse	
Total	2.08 MGD	Total	1.61 MGD
At the facility	1.97 MGD	Irrigation	0.11 MGD
Irrigation	0.11 MGD	At the facility	1.50 MGD
Reuse Percentage	**2%**	**Reuse Percentage**	**3%**

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Miami-Dade South District Wastewater Treatment Plant

Existing Treatment, Disposal, and Reuse

The Miami-Dade South District WWTP services unincorporated areas located between the Tamiami Canal and Southwest 360th Street, the municipalities of Pinecrest, Palmetto Bay and Florida City, and Homestead Air Force Base. The facility has an FDEP-permitted capacity of 112.50 MGD, and in 2010 had an annual average daily flow of 93.18 MGD. In 2010, treated wastewater was disposed through deep well injection an average rate of 94.82 MGD, while 4.54 MGD was reused. The water reuse was for in-plant processes at the facility.

Primary End User
In-plant processes at South District WWTP (e.g., flushing, wash downs, and pump seal lubrication)

Future Treatment, Disposal, and Reuse

The South District WWTP does not include an ocean outfall. Wastewater is disposed of through deep well injection. MDWASD is currently evaluating options, including groundwater recharge, to meet the reuse requirements of the ocean outfall amendments. The scope of water reuse at the South District WWTP was part of the ocean outfall implementation plan delivered to FDEP on July 1, 2013.

The implementation plan includes the reuse of reclaimed water by FPL. To ensure their commitment to reclaimed water supplies, MDWASD and FPL signed a joint participation agreement for the delivery of reclaimed water from the South District Water Reclamation Plant to the FPL Turkey Point Energy Facility. This project would provide up to 90 MGD of reclaimed water for FPL use. The construction of the treated water pipeline is scheduled to be completed in 2021.

In addition to the cooling water, MDWASD is planning to include about 9.2 MGD of upper Floridan aquifer recharge at this facility.

Miami-Dade County approved the design of the new South District Water Reclamation Plant in 2007. In February 2011, the project was put on hold. Due to lower demands and updated population projections, along with additional reuse opportunities, MDWASD is reevaluating its water supply demands before proceeding with construction.

Miami-Dade County had committed to reclaimed water reuse as part of the Comprehensive Everglades Restoration Plan. MDWASD conducted a pilot project to test different treatment technologies and gain insights into the biological and ecological response of typical wetlands to highly treated effluent. The results of the pilot project will help to optimize the treatment system and the preferred areas for rehydration to maximize the benefits to wetlands and Biscayne Bay. FDEP, SFWMD, and Biscayne National Park are currently evaluating the final report's results and conclusions.

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Potential End User
FPL Turkey Point Energy Facility

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). MDWASD provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**112.50 MGD**	**FDEP-Permitted Treatment Capacity**	**120.00 MGD**
Total Wastewater Effluent	**93.18 MGD**	**Total Wastewater Effluent**	**120.00 MGD**
Disposal		Disposal	
Deep well injection	94.82 MGD	Deep well injection	30.00 MGD
Reuse		Reuse	
At the facility	4.54 MGD	Cooling water for FPL Turkey Point Energy Facility	90.00 MGD
		Aquifer recharge	9.2 MGD
Reuse Percentage	**5%**	**Reuse Percentage**	**83%**

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Miami-Dade West District Water Reclamation Plant (Proposed)

Proposed Treatment, Disposal, and Reuse

The *Miami-Dade Water and Sewer Department Reuse Feasibility Update* (MDWASD 2007) recommended the addition of the West District Water Reclamation Plant. The facility would include wastewater treatment with storage facilities for peak wet weather conditions in the central-west area of the county. MDWASD evaluated potential sites for the proposed plant. Various alternatives, including plant capacity associated with reclaimed water opportunities, are being developed in conjunction with systemwide wastewater transmission and treatment facilities. Reclaimed water produced at this plant could be used as an offset to avoid impacts created by additional groundwater withdrawals at MDWASD's Southwest Wellfield and comply with the LEC regional water availability criteria. MDWASD tentatively scheduled this plant to come on line by 2026.

Reclaimed water from the proposed plant could be used to meet the ocean outfall requirements. MDWASD is currently planning to include about 9.2 MGD of upper Floridan aquifer recharge at this facility.

Information Source

MDWASD provided this information in April 2012.

FACILITY SUMMARY			
2010 [a]		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.00 MGD**	**FDEP-Permitted Treatment Capacity**	**50.00 MGD**
Total Wastewater Effluent	**0.00 MGD**	**Total Wastewater Effluent**	**50.00 MGD**
Reuse		Reuse	
Total	0.00 MGD	Aquifer recharge	9.2 MGD
Reuse Percentage		**Reuse Percentage**	**18%**

a. The facility was not built in 2010.

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Profile of Monroe County Facilities

Big Coppitt Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Florida Keys Aqueduct Authority (FKAA) operates and maintains the Big Coppitt Regional WWTF. The facility, located on Rockland Key, provides service to Big Coppitt, Rockland, Geiger, and Shark keys. The facility has an FDEP-permitted capacity of 0.32 MGD, with an annual average daily flow of 0.08 MGD in 2010. Currently, treated wastewater is disposed through shallow injection wells.

Future Treatment, Disposal, and Reuse

Although the *Monroe County Sanitary Wastewater Master Plan* (CH2MHILL 2000) concluded that reclaimed water was not feasible to install, operate, and maintain in the Florida Keys/Monroe County, FKAA plans to evaluate each of its wastewater service areas to determine ways to implement and feasibly provide reclaimed water for its customers. FKAA is installing a reclaimed water distribution system. The reclaimed water will be utilized for nonpotable water uses to reduce disposal through shallow injection wells. Potential nonpotable uses include irrigation and boat washing.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). FKAA provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.32 MGD**	**FDEP-Permitted Treatment Capacity**	**0.40 MGD**
Total Wastewater Effluent	**0.08 MGD**	**Total Wastewater Effluent**	**0.40 MGD**
Disposal		Disposal	
Shallow well injection	0.08 MGD	Shallow well injection	0.05 MGD
Reuse		Reuse	
Total	0.00 MGD	Total	0.35 MGD
		Irrigation	0.30 MGD
		Other (e.g., concrete mix, equipment wash down	0.05 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**88%**

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Boca Chica Naval Air Station Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The United States Navy owns and operates a wastewater collection system and treatment plant at Boca Chica Field. The Boca Chica WWTF has an FDEP-permitted capacity of 0.44 MGD, with an annual average daily flow of 0.09 MGD in 2010. Currently, treated wastewater is disposed of through six shallow injection wells.

Future Treatment, Disposal, and Reuse

Currently, Boca Chica WWTP has no plans to reuse treated wastewater.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The United States Navy did not provide the 2030 information. SFWMD assumes the projected capacity and flows will remain the same as in 2010.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.44 MGD**	**FDEP-Permitted Treatment Capacity**	**0.44 MGD**
Total Wastewater Effluent	**0.09 MGD**	**Total Wastewater Effluent**	**0.09 MGD**
Disposal		Disposal	
Shallow well injection	0.09 MGD	Shallow well injection	0.09 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

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Duck Key (Hawk's Cay) Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

Duck Key is a small island community consisting of five islands located east of the City of Marathon in unincorporated Monroe County. FKAA acquired the Duck Key Utility Service Area, which includes Hawk's Cay Resort, Conch Key, and a residential area. The Duck Key WWTF provides service to the area, and has an FDEP-permitted capacity of 0.10 MGD and has an annual average daily flow of 0.05 MGD in 2010. The Duck Key facility, as of 2010, is reusing 0.03 MGD of the treated wastewater, while 0.02 MGD is disposed of through shallow injection wells. The Duck Key WWTF was upgraded to advanced wastewater treatment standards.

Future Treatment, Disposal, and Reuse

A reclaimed water distribution system and service connections are being installed, which is expected to provide irrigation for approximately 230 residential and commercial properties. The use of reclaimed water will assist in offsetting the use of potable water for outdoor use. Residential customers on Duck Key are being given the opportunity to tie into the reuse system.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). FKAA provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.10 MGD**	**FDEP-Permitted Treatment Capacity**	**0.30 MGD**
Total Wastewater Effluent	**0.05 MGD**	**Total Wastewater Effluent**	**0.30 MGD**
Disposal		Disposal	
Shallow well injection	0.02 MGD	Shallow well injection	0.10 MGD
Reuse		Reuse	
Irrigation	0.03 MGD	Irrigation	0.20 MGD
Reuse Percentage	**60%**	**Reuse Percentage**	**67%**

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Key Colony Beach Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Key Colony Beach operates and maintains a wastewater collection and treatment system to serve the city. The Key Colony Beach WWTF has an FDEP-permitted capacity of 0.34 MGD, with an annual average daily flow of 0.18 MGD in 2010. In 2010, 0.03 MGD of the treated wastewater was reused. The remainder was disposed of through a series of shallow injection wells.

Although the wastewater is relatively high in salinity, the water is treated using RO and is cheaper to produce than buying potable water from FKAA.

Primary End Users
City parks (delivered by truck)
Key Colony Beach Golf Course

Future Treatment, Disposal, and Reuse

The Key Colony Beach WWTF plans to upgrade the RO system to allow for the production of additional reuse water to irrigate the Key Colony Beach Golf Course and city parks. Because the irrigation demands of these users exceed the projected capacity of the facility, no additional reclaimed water customers are expected in the future.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The city did not provide information for 2030. SFWMD assumes the capacity and flows will remain the same as in 2010. Projected reuse is 100 percent based on utility input.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.34 MGD**	**FDEP-Permitted Treatment Capacity**	**0.34 MGD**
Total Wastewater Effluent	**0.18 MGD**	**Total Wastewater Effluent**	**0.18 MGD**
Disposal		Disposal	
Shallow well injection	0.15 MGD		0.00 MGD
Reuse		Reuse	
Golf course irrigation	0.03 MGD	Irrigation	0.18 MGD
Reuse Percentage	**17%**	**Reuse Percentage**	**100%**

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Key Haven Utility Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

Key Haven Utility operated and maintained a wastewater collection and treatment system serving the Key Haven development. In 2009, FKAA acquired the wastewater utility. The facility has an FDEP-permitted capacity of 0.20 MGD, with an annual average daily flow of 0.09 MGD in 2010. Currently, treated wastewater is disposed through shallow injection wells.

Future Treatment, Disposal, and Reuse

FKAA may decommission the Key Haven WWTP. If decommissioned, the target date would be December 31, 2015, and the flow from the service area will be routed to the Key West or Stock Island WWTFs (Key West Resort Utilities) for treatment.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011).

FACILITY SUMMARY			
2010		**Projected 2030[a]**	
FDEP-Permitted Treatment Capacity	**0.20 MGD**	**FDEP-Permitted Treatment Capacity**	**0.00 MGD**
Total Wastewater Effluent	**0.09 MGD**	**Total Wastewater Effluent**	**0.00 MGD**
Disposal		Disposal	
Shallow well injection	0.09 MGD	Total	0.00 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

a. The Key Haven WWTF may be decommissioned prior to December 31, 2015. The decision to decommission has not yet been made.

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Key Largo Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The State of Florida created the Key Largo Wastewater Treatment District in 2002. The district operates and maintains a wastewater collection and treatment system that serves an area generally from the north end of the Florida Keys at the Miami-Dade County line extending south and westward to Tavernier Creek, excluding the community of Ocean Reef. The Key Largo WWTF has an FDEP-permitted capacity of 0.18 MGD, with an annual average daily flow of 0.07 MGD in 2010. Currently, all of the treated wastewater is disposed through shallow injection wells.

Future Treatment, Disposal, and Reuse

The Key Largo Wastewater Treatment District is considering expanding its service to Islamorada. The district is negotiating with portions of Islamorada to treat its wastewater at the Key Largo WWTF instead of Islamorada building its own treatment plant. This is expected to occur prior to 2030. Presently, the Key Largo Wastewater Treatment District does not plan to reuse treated wastewater.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Key Largo Wastewater Treatment District did not provide the 2030 information. SFWMD assumes the projected 2030 capacity will remain the same. The projected flow is based on no increase from the 2010 flow at the Key Largo WWTF (0.07 MGD) plus 2010 flow at the Plantation Key Colony WWTF (0.06 MGD) since it is projected that, by 2030, wastewater flow from Plantation Key Colony will be sent to the Key Largo WWTF for treatment.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.18 MGD**	**FDEP-Permitted Treatment Capacity**	**0.18 MGD**
Total Wastewater Effluent	**0.07 MGD**	**Total Wastewater Effluent**	**0.13 MGD**
Disposal		Disposal	
Shallow well injection	0.07 MGD	Shallow well injection	0.13 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

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Key West – Richard A. Heyman Environmental Protection Facility

Existing Treatment, Disposal, and Reuse

The City of Key West Utilities Department owns a wastewater collection and treatment system known as the Richard A. Heyman Environmental Protection Facility. The facility serves the city and is located on Flemming Key just off the island of Key West. It has an FDEP-permitted capacity of 10.00 MGD and an annual average flow of 4.41 MGD in 2010. Currently, the treated effluent is disposed through two deep injection wells.

Future Treatment, Disposal, and Reuse

The City of Key West does not have current plans to reuse wastewater. Although the WWTF treats water to advanced water treatment standards, the relatively high salinity of the wastewater/effluent make it a challenge to reuse, especially for irrigation.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The City of Key West provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**10.00 MGD**	**FDEP-Permitted Treatment Capacity**	**10.00 MGD**
Total Wastewater Effluent	**4.41 MGD**	**Total Wastewater Effluent**	**6.20 MGD**
Disposal		Disposal	
Deep well injection	4.41 MGD	Deep well injection	6.00 MGD
Reuse		Reuse	
Total	0.00 MGD	Facility processes	0.20 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**3%**

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Key West Resort Utilities Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

Key West Resort Utilities operates and maintains a wastewater collection and treatment system that serves southern Stock Island. The facility uses a vacuum collection system and has an FDEP-permitted capacity of 0.50 MGD. The average flow in 2010 was 0.29 MGD. In 2010, 0.17 MGD of the treated wastewater was reused. The remainder was disposed of via three shallow injection wells. The facility pumps reclaimed water to a percolation pond for irrigation at the Key West Country Club. Reclaimed water is also provided to the Monroe County Detention Center for nonpotable purposes (e.g., toilet flushing).

Primary End Users
Key West Country Club
Monroe County Detention Center

Future Treatment, Disposal, and Reuse

Key West Resort Utilities expanded distribution capabilities to provide reclaimed water to a school, a hospital, and a college. However, these potential users have not yet agreed to accept the reclaimed water.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The Key West Resort Utilities provided the 2030 information in April 2012. The plan assumes flows include those from the Key Haven Utility facility, which is scheduled for decommissioning by December 31, 2015.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.50 MGD**	**FDEP-Permitted Treatment Capacity**	**0.50 MGD**
Total Wastewater Effluent	**0.29 MGD**	**Total Wastewater Effluent**	**0.38 MGD**
Disposal		Disposal	
Shallow well injection	0.12 MGD	Shallow well injection	0.00 MGD
Reuse		Reuse	
Total	0.17 MGD	Total	0.38 MGD
Golf course irrigation	0.14 MGD	Irrigation	0.38 MGD
Toilet flushing	0.03 MGD		
Reuse Percentage	**59%**	**Reuse Percentage**	**100%**

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Marathon Wastewater Treatment Facilities

Existing Treatment, Disposal, and Reuse

The City of Marathon Utility Department oversees a series of wastewater collection and treatment systems. The area serviced by the Marathon WWTFs is defined as the east end of the Seven Mile Bridge extending eastward to Tom's Harbor Bridge and includes Knight's Key, Vaca Key, Boot Key, the Sombrero area, Fat Deer Key, Coco Plum, Long Point Key, Little Crawl Key, Crawl Key, Valhalla Island, and Grassy Key. The facilities have a combined capacity of 0.36 MGD and treated 0.09 MGD in 2010. Since incorporating in 1999, Marathon pursued a citywide sewer system and determined that a system of force mains combined with vacuum collection systems is best suited for the area.

Wastewater services are divided into seven service areas:

- **Service Area 1:** Knight's Key (entire island) – Wastewater collection system has been completed.
- **Service Area 2:** Boot Key (entire island) – Plans for wastewater service for Boot Key were suspended following the closure of the Boot Key Drawbridge.
- **Service Area 3:** Vaca Key West (11th Street to 39th Street) – The wastewater collection systems and the WWTP are complete but were not operating in 2010.
- **Service Area 4:** Vaca Key Central (39th Street to 60th Street) – The wastewater collection systems and the WWTF were completed in March 2010. FDEP approved a reclaimed system. Although initial elevated chloride levels inhibited the distribution of the reclaimed water, it is used for park facility irrigation.
- **Service Area 5:** Vaca Key East (60th Street to Vaca Cut) – The wastewater collection systems are complete. The WWTF expansion is also complete and property owners have been notified to connect to the system.
- **Service Area 6:** Fat Deer Key West–Coco Plum (Vaca Cut to Coco Plum) – The wastewater collection system is complete. The WWTF is operating and connections continue.
- **Service Area 7:** Grassy Key (Fat Deer Key East through Grassy Key) – Most of the collection system has been installed. Construction on the WWTF continues. A portion of the collection system has been cleared for use. The city notified more than half of the properties to connect to the system.

Future Treatment, Disposal, and Reuse

The City of Marathon is considering water reuse in the future. However, the city must complete upgrades to the treatment systems and resolve issues with elevated salinity. The city has the capability of producing reclaimed water at wastewater treatment facilities within service areas 3, 4, 5, and 7.

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Potential End Users
Marathon High School (Service Area 4)
Parks and event fields (Service Area 3)
Sombrero Beach (Service Area 4)
Sombrero Country Club (Service Area 4)

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The utility did not provide the 2030 information. The projected capacity and flow are based on 2010 numbers. These are a combination of all the existing and proposed treatment facilities in service areas 3, 4, 5, 6, and 7. The plan update assumes all facilities, except Service Area 6, have reuse capabilities.

FACILITY SUMMARY			
2010[a]		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.36 MGD**	**FDEP-Permitted Treatment Capacity**	**0.75 MGD**
Total Wastewater Effluent	**0.09 MGD**	**Total Wastewater Effluent**	**0.24 MGD**
Disposal		Disposal	
Shallow well injection	0.09 MGD	Shallow well injection	0.11 MGD
Reuse		Reuse	
Total	0.00 MGD	Irrigation	0.13 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**54%**

a. WWTFs in service areas 3, 4, and 7 were not operating in 2010.

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North Key Largo (Ocean Reef) Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The North Key Largo Utility Corporation operates and maintains a wastewater collection and treatment system serving the Ocean Reef community in North Key Largo. The North Key Largo WWTF facility has an FDEP-permitted capacity of 0.55 MGD, with an annual average daily flow of 0.25 MGD in 2010. Currently, all of the treated wastewater is disposed of through shallow injection wells. Recent facility upgrades enabled the production of reclaimed water.

Future Treatment, Disposal, and Reuse

A portion of the effluent treated by the North Key Largo WWTF will be reused for golf course irrigation.

Primary End User
Ocean Reef Golf Club (Card Sound Golf Course)

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The North Key Largo Utility Corporation provided the 2030 information in April 2012.

FACILITY SUMMARY			
2010		**Projected 2030**	
FDEP-Permitted Treatment Capacity	**0.55 MGD**	**FDEP-Permitted Treatment Capacity**	**0.50 MGD**
Total Wastewater Effluent	**0.25 MGD**	**Total Wastewater Effluent**	**0.28 MGD**
Disposal		Disposal	
Shallow well injection	0.25 MGD	Shallow well injection	0.18 MGD
Reuse		Reuse	
Total	0.00 MGD	Irrigation	0.10 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	**36%**

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Plantation Key Colony Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The four-island Village of Islamorada operates and maintains a wastewater collection and treatment system within Plantation Key. The Plantation Key Colony WWTF has an FDEP-permitted capacity of 0.36 MGD, with an annual average daily flow of 0.06 MGD in 2010. Currently, the treated wastewater is disposed through shallow injection wells.

Future Treatment, Disposal, and Reuse

The Village of Islamorada, excluding Plantation Key Colony, is considering centralizing its wastewater services with the Key Largo Wastewater Treatment District. Islamorada is negotiating with Key Largo to treat its wastewater at the Key Largo WWTF instead of building its own treatment facility.

Currently, there are no plans within the Village of Islamorada, or the Key Largo WWTF, to reuse treated wastewater.

Information Sources

The 2010 information is from the *2010 Reuse Inventory* (FDEP 2011). The 2030 information was provided by Plantation Key Colony in May 2012.

FACILITY SUMMARY			
2010		**Projected 2030[a]**	
FDEP-Permitted Treatment Capacity	**0.36 MGD**	**FDEP-Permitted Treatment Capacity**	**0.00 MGD**
Total Wastewater Effluent	**0.06 MGD**	**Total Wastewater Effluent**	**0.00 MGD**
Disposal		Disposal	
Shallow well injection	0.06 MGD	Shallow well injection	0.00 MGD
Reuse Percentage	**0%**	**Reuse Percentage**	

a. At the time of this writing, wastewater flows from Plantation Key Colony are expected to be sent to the Key Largo WWTF by 2030.

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D
Water Conservation

INTRODUCTION

Water conservation, covered in **Chapter 5** of the Planning Document of this update, is essential for water supply planning and water resource management. Water conservation is considered a water source option because it reduces or delays the need for future expansion of the water supply infrastructure.

This appendix provides further detail about water conservation in the Lower East Coast (LEC) Planning Area and includes the following:

- Water Savings Incentive Program (WaterSIP) projects funded for Fiscal Year (FY) 2005–FY 2012
- Fixture and appliance retrofits
- Water Conservation Hotel and Motel Program (Water CHAMP)
- Potential savings for the Industrial/Commercial/Institutional (ICI) Self-Supply use class
- Status of Public Water Supply (PWS) water conservation implementation
- Water conservation rate structures
- Water conservation versus development of alternative water supplies
- Miami-Dade Goal-Based Water Conservation Plan

WATERSIP

WaterSIP is the South Florida Water Management District's (SFWMD's) funding assistance program. Local governments, businesses, and nonprofit organizations may apply for WaterSIP funding annually during an open application period. Since its inception in 2003, SFWMD allocated $4.6 million in funding to support 161 local water conservation projects within SFWMD's boundaries, representing a total estimated water savings of approximately 2.7 billion gallons of water per year, or 7.3 million gallons of water per day. **Table D-1** lists the LEC Planning Area projects supported by the WaterSIP from FY 2005–2012. Additional information regarding Water SIP can be found in the *2011–2013 Water Supply Plan Support Document* (SFWMD 2013).

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Table D-1. WaterSIP projects funded in the LEC Planning Area FY 2005–FY 2012.

County	Entity Name	Project Title	Total Project Cost	Approved Funding	Proposed Water Savings (MGY) [a]
FY 2012					
Palm Beach	West Palm Beach, City of	Community Water Conservation Strategies – Phase II	$50,000	$20,000	4.67
Broward	Broward County Natural Resources Planning and Management Division on behalf of Broward Water Partnership	High Efficiency Toilet (HET) Rebate Program	$200,000	$50,000	7.85
	Coral Springs, City of	Automatic Flushers for Distribution System	$81,000	$35,000	7.00
Miami-Dade	Miami-Dade Water and Sewer Department (MDWASD)	Residential HET Rebate Project 2011–2012	$81,500	$30,000	12.70
Monroe	Florida Keys Aqueduct Authority (FKAA)	HET Retrofit Rebate Program	$20,000	$10,000	2.30
FY 2011					
Palm Beach	West Palm Beach, City of	Community Water Conservation Strategies – Phase I (residential indoor retrofit/ commercial prerinse spray valves)	$61,868	$24,200	68.96
	Glades Utility Authority	Water Meter Change Out (automated meter reading)	$154,470	$50,000	24.00
Broward	Pompano Beach, City of	Restaurant Spray Valves	$17,300	$5,500	11.30
	Margate, City of	Prerinse Spray Valve Replacement Program	$17,300	$6,600	10.10
	Sunrise, City of	Automatic Flushing Devices	$59,800	$29,900	10.26
	Tamarac, City of	Indoor Plumbing Retrofit Project	$90,750	$13,437	8.22
Miami-Dade	MDWASD	Residential HET Rebate Program	$122,000	$25,000	21.17
Monroe	FKAA	HET Retrofit Rebate Program	$20,000	$7,925	2.30
FY 2010					
Palm Beach	Palm Beach Parks and Recreation Department	Irrigation System Improvement Program	$74,240	$37,120	21.44
Broward	Fort Lauderdale, City of	Automatic Line Flushing Devices	$30,049	$15,000	18.70
	Lighthouse Point, City of	Water Conservation to Irrigation Systems on All City-Owned Properties	$66,000	$33,000	9.70
	Pompano Beach, City of	Showerhead, Bath, & Kitchen Aerators Kit Distribution	$29,900	$14,950	56.21
	Broward County	United States Environmental Protection Agency WaterSense® HET Replacement/ Credit Program	$300,000	$75,000	15.20
	Plantation, City of	HET Retrofit	$100,000	$50,000	10.22
Miami-Dade	North Miami Beach, City of	Rain Sensor Controller Retrofit Program	$16,000	$8,000	3.36
	MDWASD	Senior and Low Income Full Plumbing Retrofit Project – Phase IV	$315,000	$75,000	23.40
		Homeowner Association Landscape Irrigation Evaluations – Phase IV	$230,750	$38,875	15.70
		Residential HET Rebate Program	$125,000	$50,000	10.50
Monroe	FKAA	HET Rebate Program	$60,000	$30,000	4.38

a. MGY – million gallons per year.

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Table D-1. Continued.

County	Entity Name	Project Title	Total Project Cost	Approved Funding	Proposed Water Savings (MGY) [a]
FY 2009					
Palm Beach	Pahokee, City of	Water Meter Change Out	$226,500	$50,000	8.76
	West Palm Beach, City of	Landscape Irrigation Technology Retrofit Project – Phase II	$100,000	$50,000	3.00
	Florida Atlantic University Division of Research	Water Conservation Landscaping Project	$37,500	$18,750	0.30
	School District of Palm Beach County	Waterless Urinal Installation Project	$23,040	$11,520	0.10
Broward	Fort Lauderdale, City of Parks & Recreation	Rain Sensor and Irrigation System Technology Installation	$37,247	$18,360	60.00
	Oakland Park, City of	Water Conservation Measures – Indoor Plumbing Fixture Retrofit Project	$17,500	$8,750	103.00
	Tamarac, City of	Indoor Plumbing Retrofit Project	$57,000	$27,000	13.60
	Plantation, City of	Dual Flush/HET Retrofit Rebate Program	$100,000	$50,000	10.00
	Miramar, City of	Residential Plumbing Fixture Replacement Program	$19,500	$9,750	6.60
	Coconut Creek, City of	Residential Dual Flush Valve Installation	$100,000	$50,000	5.50
	Miramar, City of	Flush Valve Replacement Program	$2,600	$1,300	1.12
	Hallandale Beach, City of	Selective Volume Flush Toilet Retrofit Program	$50,000	$25,000	10.00
	Hollywood, City of	Automatic Water Line Flushing Program	$59,840	$29,920	4.16
	14th Street Townhomes Association	Indoor Plumbing Retrofit and Rain Shut-Off Device Program	$30,574	$15,286	2.27
	Plantation, City of	Distribution System Automatic Flushing Devices	$103,218	$50,000	0.54
Miami-Dade	North Miami Beach, City of	Showerhead Exchange Program	$50,000	$25,000	36.80
	MDWASD	Senior and Low Income Full Plumbing Retrofit Project Phase III	$308,000	$25,000	23.40
		Industrial, Commercial, and Institutional Plumbing Fixture Retrofit Rebate Project	$113,800	$25,000	15.33
		Water Loss Reduction Plan – Automatic Meter Reading with Leak Detection Monitoring Project	$241,000	$25,000	24.00
		Industrial, Commercial, and Institutional Water Use Evaluations Project	$250,000	$25,000	18.20
		Urban Conservation Unit Project Water Irrigation Evaluation with Soil Moisture Sensor	$224,500	$17,875	22.80
		Multiple Family High Efficiency Full Retrofit Project	$129,000	$25,000	9.80
		Single Family HET Rebate Project	$125,000	$25,000	10.50
	Miami Springs, City of	Rain Sensors for Miami Springs	$2,220	$1,110	2.45
	Opa Locka, City of	Automatic Hydrant Flushing	$100,000	$50,000	8.40
	North Miami Beach, City of	Rain Harvesting Irrigation Program	$14,000	$7,000	0.54
Monroe	FKAA	HET Retrofit Rebate in Paradise	$100,000	$25,000	7.00
		Cisterns in Paradise: Florida Keys Rain Catchment Initiative	$100,000	$25,000	0.90

a. MGY – million gallons per year.

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Table D-1. Continued.

County	Entity Name	Project Title	Total Project Cost	Approved Funding	Proposed Water Savings (MGY) [a]
FY 2008					
Palm Beach	Palm Healthcare Foundation	Rainwater Collection & Irrigation System	$75,000	$20,588	0.33
Broward	Hollywood, City of	Restaurant Prerinse Spray Valve Replacement Program	$13,974	$6,987	9.20
	Tamarac, City of	Indoor Plumbing Retrofit	$92,100	$42,000	17.90
	Coral Springs, City of	Automatic Flushers for Distribution	$99,950	$49,975	20.52
	Coconut Creek, City of	Prerinse Spray Valve Retrofit	$4,500	$2,250	1.97
	Hallandale Beach, City of	Rain Sensor Retrofit Program	$100,000	$25,000	23.00
Miami-Dade	North Miami Beach, City of	Advanced Automated Flushing Technology	$20,000	$10,000	34.00
		Showerhead Exchange Program	$50,000	$25,000	36.80
		Water Demand Management Using Fixed-Ratio Network Meter Reading Technology	$300,000	$25,000	48.00
	MDWASD	Single Family Plumbing Fixture Retrofit Kit Exchange	$36,790	$12,000	0.70
		Multiple Family Plumbing Retrofit Kit Exchange	$31,400	$9,200	0.70
Monroe	FKAA	Low Flow Retrofit Program	$64,000	$32,000	4.48
FY 2007					
Palm Beach	West Palm Beach, City of	Landscape Irrigation Efficiency Project	$100,000	$50,000	27.00
Broward	Hollywood, City of	Showerhead Exchange Program	$16,435	$8,218	36.00
Miami-Dade	North Miami Beach, City of	Fixed Radio Network Meter Reading Technology	$300,000	$50,000	48.00
	MDWASD	Plumbing Fixture Retrofit Seniors' Pilot	$212,500	$50,000	15.60
		Water Use Evaluations	$250,000	$50,000	18.25
		Landscape Irrigation Efficiency Project	$64,000	$32,000	7.40
		Low Flow Toilet Rebate Project	$120,500	$50,000	6.00
	Virginia Gardens	Sports Field Irrigation Project	$56,000	$28,000	6.50
Monroe	FKAA	Prerinse Spray Valve Retrofit	$100,000	$25,000	53.40
FY 2006					
Palm Beach	Pompano Beach, City of	Automatic Flushing Devices	$20,000	$7,500	0.14
Broward	Tamarac, City of	Plumbing and Irrigation Retrofit	$58,200	$30,000	25.00
	Plantation, City of	Water Savings Grass Installation	$312,280	$50,000	78.00
	Coconut Creek, City of	Sabal Pines Park Wash Station	$95,000	$40,000	0.50
Miami-Dade	Town of Medley	Water Consumption Awareness, Leak Detection	$100,595	$50,000	21.20
	Roots in the City, Inc.	Water Reclamation	$72,000	$36,000	0.30
	Plaza Del Prado Condominium	Water Conservation	$159,800	$50,000	7.90
	City of Miami Springs	"Save Your Water – Save Your Dollars"	$15,155	$5,000	14.60
	Miami-Dade Cooperative Extension Service Division	Residential Irrigation Efficiency Project	$100,000	$25,000	7.00
	Town of Medley	Public Restrooms Water Use Reduction Program	$30,000	$7,500	0.45
FY 2005					
Palm Beach	United Civic Organization of Century Village, Inc.	Convert Irrigation System to Reclaimed	$115,000	$25,000	74.70
	City of Boynton Beach Utilities	Turf Replacement	$100,000	$50,000	7.60
Monroe	FKAA	Showerhead Retrofit for Hotels	$100,000	$50,000	15.00
		Totals	**$8,430,145**	**$2,480,346**	**1,457.00**

a. MGY – million gallons per year.

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FIXTURE AND APPLIANCE RETROFITS

Newer water fixtures and appliances provide significant water savings compared with older appliances and fixtures. For example, a more efficient washing machine generates a potential estimated savings of 20 gallons of water per use. A family washing five loads of laundry each week could save more than 5,000 gallons of water per year. **Table D-2** shows water consumption for common indoor fixtures and appliances.

The SFWMD recommends several online resources for consumers, building managers, utilities, and municipalities for research and comparison of indoor retrofit program devices:

- ENERGY STAR Program (www.energystar.gov)
- Consortium for Energy Efficiency (www.cee1.org)
- Food Service Technology Center (www.fishnick.com)
- United States Environmental Protection Agency WaterSense Program (www.epa.gov/WaterSense/)
- Alliance for Water Efficiency (www.allianceforwaterefficiency.org)
- California Urban Water Conservation Council (www.cuwcc.org)
- Conserve Florida Water Clearinghouse (http://www.conservefloridawater.org/overview.asp)

Table D-2. Gallons of water consumed for common indoor water fixtures and appliances.

	Water Consumption					
	Toilets (gallons per flush)	Showerheads (gallons per minute)	Faucets (gallons per minute)	Urinals (gallons per flush)	Dishwashers (gallons per load)	Clothes Washers (gallons per load)
Pre-1984	5.0–7.0	5.0–8.0	4.0–7.0	5.0	14.0	56.0
1984–1994	3.5–4.5	2.8-4.0	2.8–3.0	1.5–4.5	10.5–12.0	39.0–51.0
Post-1994	1.6	2.5 [a]	2.5 [a]	1.0	10.5	27.0 [b]
WaterSense Max	1.3	2.0	1.5	0.5	--	--
Highest Efficiency	0.8–1.0	1.2–1.5	0.5–1.0	0.0–0.125 [c]	4.5–6.5	16.0–22.0

a. At 80 pounds per square inch or 2.2 gallons per minute at 60 pounds per square inch.

b. Post-1998.

c. Waterless urinals are only recommended under specific conditions.

WATER CHAMP

Water CHAMP recognizes lodging facilities that have taken steps to increase water use efficiency. Specifically, participating properties conduct voluntary linen and towel reuse programs and install high efficiency (1 gallon per minute) faucet aerators in guest bathrooms. Participation in Water CHAMP supports the water conservation criteria needed to join the Florida Green Lodging Program, which was recently approved by the Florida Department of Environmental Protection. **Table D-3** summarizes the Water CHAMP water conservation potential for the LEC Planning Area.

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Table D-3. Potential water savings of the Water CHAMP in the LEC Planning Area. [a]

County	Number of Hotel and Motel Units [b]	Number of Rooms in Florida Green Lodging Program	Potential Water CHAMP Rooms	Potential Water Savings [c] (MGY) [d]
Palm Beach	16,822	9,077	7,745	33.9
Broward	30,500	10,786	19,714	86.3
Miami-Dade	48,490	13,679	34,811	152.5
Monroe	7,957	2,912	3,515 [e]	15.4
LEC Planning Area Totals	103,769	36,454	62,270	288.1

a. Source: Florida Department of Business and Professional Regulation (http://www.myfloridalicense.com/dbpr/)
b. Accounts for hotels, motels, and bed-and-breakfast properties.
c. Potential savings over nonconserving hotels built to current plumbing standards.
d. MGY – million gallons per year.
e. Excludes 1,530 rooms currently enrolled in the program.

POTENTIAL WATER SAVINGS

The SFWMD advocates the adoption of local building ordinances that incorporate the WaterSense and ENERGY STAR fixture and appliance standards and/or follow Florida Water Star, Leadership in Energy and Environmental Design, or Florida Green Building Coalition building criteria. Potential water savings resulting from residential indoor retrofits were estimated for Palm Beach, Broward, Miami-Dade, and Monroe counties using county parcel and population data, and a methodology similar to that used in the *EZ Guide* by the Conserve Florida Water Clearinghouse (2009). **Table D-4** summarizes potential water use savings in the LEC Planning Area based on the following assumptions:

- High efficiency fixtures are installed in both single and multiple family residential units.
- Measures to realize a 15–35 percent reduction in water use are implemented by all ICI Self-Supply equivalent square footage.

The estimated water use reductions in **Table D-4** assume 100 percent participation in conservation activities for the ICI Self-Supply water use category and residential indoor water use. These numbers illustrate maximum potential water savings based on a particular set of assumptions and are not intended to serve as a realistic objective. As a utility implements options such as plumbing retrofits, rebates, and rate structures, the utility's potential to reduce future use declines.

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Table D-4. Summary of potential savings in millions of gallons per year (MGY) of the ICI Self-Supply water use category and residential indoor water use through water conservation in Palm Beach, Broward, Miami-Dade, and Monroe counties. [a]

Indoor Water Use	Savings (MGY)							
	Palm Beach County		Broward County		Miami-Dade County		Monroe County	
Single Family Residential								
Pre-1984	4,204.6		7,149.2		9,536.1		464.9	
1984–1994	1,995.9		1,773.6		1,519.4		147.9	
Post-1994	1,096.8		983.7		904.1		55.2	
Multiple Family Residential								
Pre-1984	1,301.1		2,566.2		5,747.5		152.7	
1984–1994	451.4		616.4		599.9		17.5	
Post-1994	215.9		259.2		356.0		4.6	
Total Residential Savings	9,265.7		13,348.3		18,662.9		842.8	
Indoor Water Use	**Efficiency Increase (MGY)**							
	15%	**35%**	**15%**	**35%**	**15%**	**35%**	**15%**	**35%**
Industrial	130.2	303.8	287.4	670.7	473.6	1,105.1	3.1	7.3
Commercial	1,042.4	2,432.2	1,382.0	3,224.8	2,255.5	5,267.7	92.4	215.7
Institutional	398.5	929.9	492.5	1,149.1	844.1	1,969.5	29.1	68.0
Total ICI Savings	1,571.1	3,665.9	2,162.0	5,044.6	3,573.2	8,337.4	124.7	290.9
Total Savings	**10,836.8**	**12,931.6**	**15,510.3**	**18,392.9**	**22,236.0**	**27,000.2**	**967.4**	**1,133.6**

a. Replacement with high efficiency features.

STATUS OF PUBLIC WATER SUPPLY WATER CONSERVATION IMPLEMENTATION

Tables D-5 through **D-8** provide the status of PWS water conservation implementation for Palm Beach, Broward, Miami-Dade, and Monroe counties, respectively.

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Table D-5. Palm Beach County PWS water conservation implementation status.

PWS Utility	Irrigation Hours Ordinance	Florida-Friendly Landscape Ordinance [a]	Ultralow Volume Fixtures Ordinance [b]	Rain Sensor Ordinance	Water Conservation Rate Structure	Leak Detect & Repair Program [c]	Public Education Program [d]	Water Use Permit Number
A.G. Holley State Hospital [e]	NA [f]	NA	NA	NA	NA	yes	yes	50-01092-W
Boca Raton, City of	yes [g]	yes	yes	yes	yes	yes	yes	50-00367-W
Boynton Beach, City of	yes	yes	yes	yes	yes	yes	yes	50-00499-W
Delray Beach Water and Sewer Department, City of	yes	yes [h]	yes	yes	yes	yes	yes	50-00177-W
Glades Utility Authority [i]	no	no	no	no	yes	yes	yes	50-06857-W
Golf, Village of	yes	yes	yes	no	yes	yes	yes	50-00612-W
Highland Beach, Town of	yes	yes	yes	yes	yes	yes	yes	50-00346-W
Jupiter, Town of	yes	yes	yes	yes	yes	yes	yes	50-00010-W
Lake Worth Utilities, City of	yes [j]	yes	yes	no	yes	yes	yes	50-00234-W
Lantana, Town of	yes	yes	yes	yes	yes	yes	yes	50-00575-W
Manalapan, Town of	yes	yes	yes	yes	no	yes	yes	50-00506-W
Mangonia Park, Town of	yes	no	yes	yes	no	yes	yes	50-00030-W
Maralago Cay	NA	NA	NA	NA	no [k]	yes	yes	50-01283-W
Palm Beach County Water Utilities Department	yes	yes	yes	yes	yes	yes	yes	50-00135-W 50-00444-W 50-06857-W
Palm Springs, Village of	yes [g]	yes [g]	yes	no	yes	yes	yes	50-00036-W
Riviera Beach, City of	yes	yes [h]	yes	yes	yes	yes	yes [h]	50-00460-W
Seacoast Utility Authority	yes	yes	yes	yes	yes	yes	yes	50-00365-W
Seminole Improvement District [l]	NA	NA	NA	NA	yes	yes	yes	50-03711-W
Tequesta, Village of	yes	yes [h]	yes	yes [h]	yes	yes	yes	50-00046-W
Wellington Public Utilities Department	yes	no	yes	yes	yes	yes	yes	50-00464-W
West Palm Beach Public Utilities, City of	yes	yes	yes	yes	yes	no [m]	yes	50-00615-W

a. Includes Xeriscape ordinances that have not been updated to reflect Florida-Friendly Landscaping principles.
b. Utility either adopts its own ordinance or follows the Florida Building Code.
c. Program initiated when unaccounted for water is greater than 10 percent.
d. Program can vary depending on permit requirements and other factors.
e. A.G. Holley State Hospital closed in 2012.
f. NA – not applicable.
g. Adheres to Palm Beach County code of ordinances.
h. Ordinance in development as part of the water use permit renewal process.
i. Glades Utility Authority was absorbed into the Palm Beach County Water Utility Department effective April 2013.
j. One-day-per-week irrigation ordinance, which is more restrictive than SFWMD year-round restrictions.
k. Per conversation with George McDonald, P.E., of McDonald Group International, Inc., consultant to Maralago Cay.
l. This utility does not have the authority to enact ordinances. It complies with local government ordinances.
m. Per David Hanks, Utility Director, City of West Palm Beach, a leak detection program will be implemented upon the purchase of leak detection equipment.

Table D-6. Broward County PWS water conservation implementation status.

PWS Utility	Irrigation Hours Ordinance	Florida-Friendly Landscape Ordinance [a]	Ultralow Volume Fixtures Ordinance [b]	Rain Sensor Ordinance	Water Conservation Rate Structure	Leak Detect & Repair Program [c]	Public Education Program [d]	Water Use Permit Number
Broward County Water & Wastewater Services	yes	yes	yes	yes	yes	yes	yes	06-00146-W
Cooper City Utility Department, City of	yes [e]	no [f]	yes	yes [e]	yes	yes	yes	06-00365-W
Coral Springs, City of	yes [f]	yes [f]	yes	yes [f]	yes	yes	yes	06-00102-W
Coral Springs Improvement District [g]	NA [h]	NA	NA	NA	yes	yes	yes	06-00100-W
Dania Beach, City of	yes	yes [f]	yes	yes [f]	yes	yes	yes	06-00187-W
Davie, Town of	yes [e]	yes	yes	yes	yes	yes	yes	06-00134-W
Deerfield Beach, City of	yes	yes	yes	yes	yes	yes	yes	06-00082-W
Fort Lauderdale, City of	yes [i]	yes	yes [e]	yes	yes	yes	yes	06-00123-W
Hallandale Beach, City of	yes	yes	yes	yes	yes	yes	yes	06-00138-W
Hillsboro Beach, Town of	yes	yes	yes	yes	yes	yes	yes	06-00101-W
Hollywood, City of	yes	no	yes	no	yes	yes	yes	06-00038-W
Lauderhill, City of	yes	yes	yes	yes	yes	yes	yes	06-00129-W
Margate, City of	yes	yes	yes	yes	yes	yes	yes	06-00121-W
Miramar, City of	yes	yes	yes	yes	yes	yes	yes	06-00054-W
North Lauderdale, City of	yes	yes	yes	yes	yes	yes	yes	06-00004-W
North Springs Improvement District [g]	NA	NA	NA	NA	yes	yes	yes	06-00274-W
Parkland Utilities, Inc.	yes [e]	yes [e]	yes [e]	yes [e]	no	yes	yes	06-00242-W
Pembroke Pines, City of	yes	yes	yes	yes	yes	yes	yes	06-00135-W
Plantation, City of	yes	yes	yes	yes	yes	yes	yes	06-00103-W
Pompano Beach, City of	yes	yes	yes	yes	yes	yes	yes	06-00070-W
Royal Utility Corporation [g]	NA	NA	NA	NA	no	yes	yes	06-00003-W
Seminole Tribe of Florida Utility [j]	NA	NA	NA	NA	NA	NA	NA	06-02088-W
Sunrise, City of	yes	yes	yes	yes	yes	yes	yes	06-00120-W
Tamarac, City of	yes	yes	yes	yes	yes	yes	yes	06-00071-W
Tindall Hammock Irrigation and Soil Conservation District [g, k]	NA	NA	NA	NA	no	no	yes	06-00170-W

a. Includes Xeriscape ordinances that have not been updated to reflect Florida-Friendly Landscaping principles.
b. Utility either adopts its own ordinance or follows the Florida Building Code.
c. Program initiated when unaccounted for water is greater than 10 percent.
d. Program can vary depending on permit requirements and other factors.
e. Adheres to Broward County code of ordinances.
f. Ordinance in development as part of the water use permit renewal process.
g. This utility does not have the authority to enact ordinances. It complies with local government ordinances.
h. NA – not applicable
i. City of Fort Lauderdale ordinance allows three-day-per-week landscape irrigation.
j. The Seminole Tribe of Florida is not required to comply with SFWMD *Basis of Review for Water Use Permit Application within the South Florida Water Management District* (SFWMD 2012) water conservation measures.
k. Previously Ferncrest Utilities, Inc.

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Table D-7. Miami-Dade County PWS water conservation implementation status.

PWS Utility	Irrigation Hours Ordinance	Florida-Friendly Landscape Ordinance [a]	Ultralow Volume Fixtures Ordinance [b]	Rain Sensor Ordinance	Water Conservation Rate Structure	Leak Detect & Repair Program [c]	Public Education Program [d]	Water Use Permit Number
Americana Village	yes	yes	yes	yes	yes [e]	yes [e]	yes [e]	13-02004-W
Florida City Water and Sewer Department	no	no	no	no	no	no	no	13-00029-W
Homestead, City of	yes	yes	yes	yes	yes	yes	yes	13-00046-W
Miami-Dade Water and Sewer Department	yes	yes	yes	yes	yes	yes	yes	13-00017-W
North Miami, City of	no	no	yes	no	no	yes	yes	13-00059-W
North Miami Beach, City of	yes	yes	yes	yes	yes	yes	yes	13-00060-W

a. Includes Xeriscape ordinances that have not been updated to reflect Florida-Friendly Landscaping principles.
b. Utility either adopts its own ordinance or follows the Florida Building Code.
c. Program initiated when unaccounted for water is greater than 10 percent.
d. Program can vary depending on permit requirements and other factors.
e. Adheres to Miami-Dade Water and Sewer Department water rates.

Table D-8. Monroe County PWS water conservation implementation status.

PWS Utility	Irrigation Hours Ordinance	Florida-Friendly Landscape Ordinance [a]	Ultra Low Volume Fixtures Ordinance [b]	Rain Sensor Ordinance	Water Conservation Rate Structure	Leak Detect & Repair Program [c]	Public Education Program [d]	Water Use Permit Number
Florida Keys Aqueduct Authority	yes	yes	yes	yes	yes	yes	yes	13-00005-W

a. Includes Xeriscape ordinances that have not been updated to reflect Florida-Friendly Landscaping principles.
b. Utility either adopts its own ordinance or follows the Florida Building Code.
c. Program initiated when unaccounted for water is greater than 10 percent.
d. Program can vary depending on permit requirements and other factors.

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WATER CONSERVATION RATE STRUCTURES

Table D-9 provides information on single family residential water rates for each utility. Some PWS utilities listed in **Table D-9** provide water to municipalities for a fee who then resell it to their residents. These entities often create water rate structures that anticipate the cost of the purchased water plus an added handling fee. These rate structures, in turn, have an impact on conservation measures that residents employ, which influences the per capita use rate of the utility.

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Table D-9. Single family residential water rates in the LEC Planning Area by dollars per each 1,000 gallons.

Utility Name	Effective Date	Utility Tax	Base Charge	Single Family Residential Water Rates Cost per 1,000 gallons						Cost per 3,000 Gallons	Cost per 7,000 Gallons	Cost per 10,000 Gallons
				Block 1	Block 2	Block 3	Block 4	Block 5	Block 6			
Palm Beach County												
Boca Raton, City of (inside city)	October 2010	-	**$12.13**	**$0.713** 0–25,000	**$1.717** 25,001–50,000	**$2.189** >50,000	-	-	-	**$14.27**	**$17.12**	**$19.26**
Boca Raton, City of (outside city)	October 2010	-	**$15.16**	**$0.891** 0–25,000	**$2.146** 25,001–50,000	**$2.736** >50,000	-	-	-	**$17.83**	**$20.51**	**$23.18**
Boynton Beach, City of (inside city)	October 2010	-	**$10.76**	**$1.44** 0–9,000	**$2.58** 9,001–30,000	**$3.44** 30,001–50,000	**$4.24** >50,000	-	-	**$15.08**	**$20.84**	**$26.30**
Boynton Beach, City of (outside city)	October 2010	-	**$13.45**	**$1.80** 0–9,000	**$3.23** 9,001–30,000	**$4.30** 30,001–50,000	**$5.30** >50,000	-	-	**$18.85**	**$26.05**	**$32.88**
Delray Beach Water and Sewer Department, City of (inside city)	October 2010	-	**$15.72**	**$0.00** 0–3,000	**$1.25** 3,001–12,000	**$2.00** 12,001–25,000	**$3.50** 25,001–50,000	**$4.50** >50,000	-	**$15.72**	**$20.72**	**$24.47**
Delray Beach, Water and Sewer Department, City of (outside city)	October 2010	-	**$19.65**	**$0.00** 0–3,000	**$1.56** 3,001–12,000	**$2.50** 12,001–25,000	**$4.38** 25,001–50,000	**$5.63** >50,000	-	**$19.65**	**$25.89**	**$30.57**
Glades Utility Authority	October 2012	-	**$16.75**	**$1.50** 0–3,000	**$4.67** 3,001–6,000	**$5.80** 6,001–15,000	**$7.50** >15,000	-	-	**$21.25**	**$41.06**	**$58.46**
Golf, Village of (inside city)	-	-	**$29.58**	**$0.00** 0–10,000	**$0.95** >10,000	-	-	-	-	**$29.58**	**$29.58**	**$29.58**
Golf, Village of (outside city)	-	-	**$36.98**	**$0.00** 0–10,000	**$1.18** >10,000	-	-	-	-	**$36.98**	**$36.98**	**$36.98**
Highland Beach, Town of	December 2009	-	**$15.00**	**$2.15** 0–9,500	**$3.74** 9,501–24,500	**$4.60** >24,501	-	-	-	**$21.45**	**$30.05**	**$37.30**
Hypoluxo, Town of [a]	July 2008	-	**$40.39**	**$2.22**	-	-	-	-	-	**$47.05**	**$55.93**	**$62.59**

a. Water provided by the City of Boynton Beach and resold by this utility.

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Table D-9. Continued.

Utility Name	Effective Date	Utility Tax	Base Charge	Single Family Residential Water Rates Cost per 1,000 gallons						Cost per 3,000 Gallons	Cost per 7,000 Gallons	Cost per 10,000 Gallons
				Block 1	Block 2	Block 3	Block 4	Block 5	Block 6			
Palm Beach County (Continued)												
Jupiter, Town of (inside city)	November 2009	-	**$18.28**	**$1.14** 0–6,000	**$1.55** 6,001–14,000	**$2.74** 14,001–30,000	**$3.62** >30,000	-	-	**$21.70**	**$26.67**	**$31.32**
Jupiter, Town of (outside city)	November 2009	-	**$22.85**	**$1.43** 0–6,000	**$1.94** 6,001–14,000	**$3.43** 14,001–30,000	**$4.53** >30,000	-	-	**$27.14**	**$33.37**	**$39.19**
Lake Worth Utilities, City of	October 2010	-	**$12.50**	**$2.69** 0–4,000	**$4.15** 4,001–8,000	**$5.60** 8,001–12,000	**$9.81** 12,001–20,000	**$12.26** >20,000	-	**$20.57**	**$35.71**	**$51.06**
Lantana, Town of	July 2009	-	**$19.06**	**$1.18** 0–5,000	**$1.79** 5,001–10,000	**$2.52** 10,001–20,000	**$3.06** 20,001–40,000	**$3.15** >40,000	-	**$22.60**	**$28.54**	**$33.91**
Manalapan, Town of	July 2008	-	**$33.66**	**$1.85**	-	-	-	-	-	**$39.21**	**$46.61**	**$52.16**
Mangonia Park, Town of	-	-	**$11.58**	**$1.95**	-	-	-	-	-	**$17.43**	**$25.23**	
Maralago Cay	NA [a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Palm Beach County Water Utilities Department	November 2010	-	**$10.95**	**$1.09** 0–4,000	**$2.45** 4,001–10,000	**$6.15** 10,001–25,000	**$7.64** >25,000	-	-	**$14.22**	**$22.66**	**$30.01**
Palm Springs, Village of (inside city)	October 2010	-	**$8.90**	**$2.34** 0–6,000	**$3.04** 6,001–20,000	**$3.74** >21,000	-	-	-	**$15.92**	**$25.98**	**$35.10**
Palm Springs, Village of (outside city)	October 2010	-	**$11.12**	**$2.93** 0–6,000	**$3.79** 6,001–20,000	**$4.68** >21,000	-	-	-	**$19.91**	**$32.49**	**$43.86**
Riviera Beach, City of	-	-	**$12.22**	**$2.51** 0–9,000	**$3.14** 9,001–14,000	**$3.77** 14,001–19,000	**$4.40** >19,000	-	-	**$19.75**	**$29.79**	**$37.95**
Seacoast Utility Authority	December 2010	-	**$17.27**	**$0.88** 0–6,000	**$3.45** 6,001–30,000	**$5.19** >30,000	-	-	-	**$19.91**	**$26.00**	**$36.35**
Seminole Improvement District [b]	NA	-	**$0.00**	**$2.00**	-	-	-	-	-	**$6.00**	**$14.00**	**$20.00**

a. NA – not available.
b. No rate structure.

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Table D-9. Continued.

Utility Name	Effective Date	Utility Tax	Base Charge	Single Family Residential Water Rates Cost per 1,000 gallons						Cost per 3,000 Gallons	Cost per 7,000 Gallons	Cost per 10,000 Gallons
				Block 1	Block 2	Block 3	Block 4	Block 5	Block 6			
Palm Beach County (Continued)												
Tequesta, Village of (inside city)	October 2010	9%	**$13.27**	**$2.11** 0–12,000	**$3.54** 12,001–25,000	**$4.81** 25,001–40,000	**$6.17** >40,000	-	-	**$21.36**	**$32.49**	**$42.31**
Tequesta, Village of (outside city)	October 2010	-	**$16.59**	**$2.64** 0–12,000	**$4.43** 12,001–25,000	**$6.01** 25,001–40,000	**$7.71** >40,000	-	-	**$24.51**	**$35.07**	**$42.99**
Wellington Public Utilities Department (inside city)	October 2010	-	**$16.46**	**$1.86** 0–6,000	**$2.77** 6,001–15,000	**$3.72** 15,001–25,000	**$6.11** >25,000	-	-	**$22.04**	**$30.39**	**$38.70**
Wellington Public Utilities Department (outside city)	October 2010	-	**$20.56**	**$2.32** 0–6,000	**$3.46** 6,001–15,000	**$4.64** 15,001–25,000	**$7.63** >25,000	-	-	**$27.52**	**$37.94**	**$48.32**
West Palm Beach Public Utilities, City of (inside city)	October 2010	-	**$17.70**	**$2.05** 0–6,000	**$2.57** 6,001–12,000	**$3.02** 12,000–26,900	**$3.54** 26,901–56,850	**$4.08** 56,851–149,600	**$4.58** >149,600	**$23.85**	**$32.57**	**$40.28**
West Palm Beach Public Utilities, City of (outside city)	October 2010	-	**$22.13**	**$2.56** 0–6,000	**$3.21** 6,001–12,000	**$3.78** 12,001–26,900	**$4.43** 26,901–56,850	**$5.10** 56,851–149,600	**$5.73** >149,600	**$29.81**	**$40.70**	**$50.33**
Broward County												
Broward County Water & Wastewater Services	October 2010	-	**$14.20**	**$1.32** 0–3,000	**$2.31** 3,001–6,000	**$4.79** 6,001–12,000	**$6.43** >12,000	-	-	**$18.16**	**$29.88**	**$44.25**
Coconut Creek [a]	April 2011	8%	**$14.96**	**$3.50** 0–3,000	**$4.99** 3,001–7,000	**$6.24** 7,001–10,000	**$8.41** 10,001–20,000	**$11.77** >20,000	-	**$27.50**	**$49.05**	**$69.27**
Cooper City Utility Department, City of	NA [b]	-	**$10.91**	**$2.70** 0–5,000	**$3.12** 5,001–10,000	**$3.96** 10,001–20,000	**$5.20** >20,000	-	-	**$19.01**	**$30.65**	**$40.01**
Coral Springs, City of	NA	-	**$12.55**	**$1.47** 0–4,000	**$2.10** 4,001–8,000	**$2.63** 8,001–12,000	**$3.53** 12,001–20,000	**$5.33** >20,000	-	**$16.96**	**$24.73**	**$32.09**
Coral Springs Improvement District	October 2010		**$15.69**	**$0.00** 0–3,000	**$2.98** 3,001–12,600	**$4.72** 12,601–25,200	**$6.47** >25,200	-	-	**$15.69**	**$27.61**	**$36.55**

a. Water provided by Broward County Water and Wastewater Services and resold by this utility.
b. NA – not available.

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Table D-9. Continued.

Utility Name	Effective Date	Utility Tax	Base Charge	Single Family Residential Water Rates Cost per 1,000 gallons						Cost per 3,000 Gallons	Cost per 7,000 Gallons	Cost per 10,000 Gallons
				Block 1	Block 2	Block 3	Block 4	Block 5	Block 6			
Broward County (continued)												
Dania Beach, City of	January 2011	-	**$12.50**	**$3.54** 0–5,000	**$5.67** 5,001–14,000	**$7.09** >14,000	-	-	-	**$23.12**	**$41.54**	**$58.55**
Davie, Town of	October 2010	-	**$17.40**	**$2.87** 0–5,000	**$4.28** 5,001–10,000	**$5.72** 10,001–20,000	**$7.15** 20,001–30,000	**$8.60** 30,001–50,000	**$10.03** >50,000	**$26.01**	**$40.31**	**$53.15**
Deerfield Beach, City of	March 2008	-	**$15.00**	**$2.65** 0–6,000	**$3.67** 6,001–12,000	**$4.03** >12,000	-	-	-	**$22.95**	**$34.57**	**$45.58**
Fort Lauderdale, City of	August 2010	-	**$5.46**	**$1.72** 0–3,000	**$3.83** 4,000–8,000	**$4.78** 9,000–12,000	**$6.45** 13,000–20,000	**$9.35** >20,000	-	**$10.80**	**$26.12**	**40.46**
Hallandale Beach, City of	October 2009	10%	**$21.00**	**$1.03** 0–2,000	**$1.10** 2,001–5,000	**$1.43** 5,001–10,000	**$2.25** 10,001–25,000	**$2.45** >25,000	-	**$26.58**	**$32.14**	**$36.86**
Hillsboro Beach, Town of	January 2011	-	**$24.00**	**$0.00** 0–2,000	**$3.40** 2,001–9,000	**$4.19** 9,001–17,000	**$4.87** >17,000	-	-	**$27.40**	**$41.00**	**$51.99**
Hollywood, City of	October 2010	-	**$4.76**	**$2.70** 0–3,740	**$5.39** 3,741–7,480	**$6.72** 7,481–11,220	**$8.07** 11,221–14,960	**$9.41** >14,960	-	**$12.86**	**$32.43**	**$51.95**
Lauderhill, City of [a]	October 2010	10%	**$10.74**	**$1.73**	-	-	-	-	-	**$17.52**	**$25.14**	**$30.84**
Lighthouse Point [b]	October 2010	-	**$14.20**	**$1.32** 0–3,000	**$2.31** 3,001–6,000	**$4.79** 6,001–12,000	**$6.43** >12,000	-	-	**$18.16**	**$29.88**	**$44.25**
Margate, City of (inside city)	October 2010	-	**$10.72**	**$3.21** 0–6,000	**$4.01** 6,001–15,000	**$4.82** 15,001–25,000	**$5.61** >25,000	-	-	**$20.35**	**$33.99**	**$46.02**
Margate, City of (outside city)	October 2010	-	**$13.40**	**$4.01** 0–6,000	**$5.01** 6,001–15,000	**$6.03** 15,001–25,000	**$7.01** >25,000	-	-	**$25.43**	**$42.47**	**$57.50**
Miramar, City of	May 2011	10%	**$10.73**	**$2.13** 0–5,000	**$2.61** 5,001–15,000	**$3.27** >15,000	-	-	-	**$18.83**	**$29.26**	**$37.87**

a. No rate structure.
b. Water provided by Broward County Water & Wastewater Services and resold by this utility.

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Table D-9. Continued.

Utility Name	Effective Date	Utility Tax	Base Charge	Single Family Residential Water Rates Cost per 1,000 gallons						Cost per 3,000 Gallons	Cost per 7,000 Gallons	Cost per 10,000 Gallons
				Block 1	Block 2	Block 3	Block 4	Block 5	Block 6			
Broward County (continued)												
North Lauderdale, City of	May 2009	-	**$11.44**	**$2.77** 0–10,000	**$4.71** >10,000	-	-	-	-	**$19.75**	**$30.83**	**$39.14**
North Springs Improvement District	NA [a]	-	**$17.85**	**$1.73** 0–12,600	**$3.45** 12,601–25,200	**$5.18** >25,200	-	-	-	**$23.04**	**$29.96**	**$35.15**
Parkland Utilities, Inc. [b]	April 2011	-	**$18.70**	**$4.38** 0–3,000	**$6.24** 3,001–7,000	**$7.80** 7,001–10,000	**$10.51** 10,001–20,000	**$14.71** >20,000	-	**$31.84**	**$56.80**	**$80.20**
Pembroke Park [c]	October 2010	-	**$14.20**	**$1.32** 0–3,000	**$2.31** 3,001–6,000	**$4.79** 6,001–12,000	**$6.43** >12,000	-	-	**$18.16**	**$29.88**	**$44.25**
Pembroke Pines, City of	October 2010	-	**$11.93**	**$0.00** 0–3,000	**$4.64** >3,000	-	-	-	-	**$11.93**	**$30.49**	**$44.41**
Plantation, City of	October 2010	-	**$11.06**	**$1.57** 0–6,000	**$3.14** 6,001–12,000	**$4.72** 12,001–20,000	**$6.29** 20,001–30,000	**$7.86** 30,001–50,000	**$9.43** >50,000	**$15.77**	**$23.62**	**$33.04**
Pompano Beach, City of (inside city)	January 2011	-	**$12.88**	**$2.24** 0–10,000	**$3.07** 10,001–15,000	**$4.27** 15,001–25,000	**$6.00** >25,000	-	-	**$19.60**	**$28.56**	**$35.28**
Pompano Beach, City of (outside city)	January 2011	-	**$16.10**	**$2.80** 0–10,000	**$3.84** 10,001–15,000	**$5.34** 15,001–25,000	**$7.50** >25,000	-	-	**$24.50**	**$35.70**	**$44.10**
Oakland Park, City of [c]	October 2010	-	**$12.54**	**$4.19** 0–3,000	**$4.86** 3,001–8,000	**$5.75** 8,001–14,000	**$6.64** >14,000	-	-	**$25.11**	**$44.55**	**$60.91**
Royal Utility Corporation [d]	August 2010	-	**$11.19**	**$2.87**	-	-	-	-	-	**$19.80**	**$31.28**	**$39.89**
Seminole Tribe of Florida Utility [e]	NA	-	-	**$3.39**	-	-	-	-	-	**$10.17**	**$23.73**	**$33.90**

a. NA – not available.
b. Water provided by Coconut Creek and resold by this utility.
c. Water provided by Broward County Water & Wastewater Services and resold by this utility.
d. No rate structure.
e. Service provided by the Town of Davie.

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Table D-9. Continued.

Utility Name	Effective Date	Utility Tax	Base Charge	Single Family Residential Water Rates Cost per 1,000 gallons						Cost per 3,000 Gallons	Cost per 7,000 Gallons	Cost per 10,000 Gallons
				Block 1	Block 2	Block 3	Block 4	Block 5	Block 6			
Broward County (continued)												
Sunrise, City of (inside city)	October 2010	10%	**$14.35**	**$2.81** 0–30,000	**$3.57** >30,000	-	-	-	-	**$25.06**	**$37.42**	**$46.70**
Sunrise, City of (outside city)	October 2010	-	**$17.94**	**$3.51** 0–30,000	**$4.46** >30,000	-	-	-	-	**$28.47**	**$42.51**	**$53.04**
Sunrise, City of (Southwest Plant)	October 2010	-	**$15.15**	**$3.74**						**$25.68**	**$40.64**	**$51.86**
Tamarac, City of	NA [a]	-	**$9.57**	**$1.80** 0–6,000	**$2.24** 6,001–15,000	**$2.64** >15,000	-	-	-	**$14.97**	**$22.61**	NA
Tindall Hammock Irrigation and Soil Conservation District [b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wilton Manors [c]	NA	10%	**$28.36**	**$3.47** 0–15,000	**$4.34** 15,001–30,000	**$5.42** >30,000	-	-	-	**$42.65**	**$57.92**	**$69.37**
Miami-Dade County												
Americana Village	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Florida City Water and Sewer Department	NA	-	**$6.10**	**$0.00** 0–2,000	**$2.00** >2,000	-	-	-	-	**$8.10**	**$16.10**	**$22.10**
Homestead, City of	April 2010	-	**$7.01**	**$0.80** 0–3,000	**$1.11** 3,001–9,000	**$1.30** 9,001–14,000	**$1.75** >14,000	-	-	**$9.41**	**$13.85**	**$17.37**
MDWASD	October 2011	-	**$3.20**	**$0.50** 0–3,740	**$3.00** 3,741–6,750	**$3.90** 6,751–12,716	**$5.16** >12,717	-	-	**$4.70**	**$15.08**	**$26.78**
North Miami, City of	July 2012	25%	**$11.40**	**$1.73** 0–5,000	**$2.42** 5,001–12,000	**$3.11** 12,001–20,000	**$3.46** >20,000	-	-	**$20.74**	**$31.11**	**$42.78**
North Miami Beach, City of	October 2011	-	**$11.94**	**$2.94** 0–7,000	**$3.28** 7,001–12,000	**$4.08** >12,000	-	-	-	**$20.76**	**$32.52**	**$42.36**
Monroe County												
Florida Keys Aqueduct Authority	May 2011	-	**$13.04**	**$5.47** 0–6,000	**$8.00** 6,001–12,000	**$8.96** 12,001–30,000	**$9.99** 30,001–50,000	**$10.97** >50,000	-	**$29.45**	**$56.39**	**$80.39**

a. NA – not available.
b. Previously Ferncrest Utilities, Inc.
c. Water provided by the City of Fort Lauderdale and resold by this utility.

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WATER CONSERVATION VERSUS DEVELOPMENT OF ALTERNATIVE WATER SUPPLIES

For many utilities, water conservation can be more cost-effective than developing alternative water supply solutions. The costs associated with three alternative water supply development scenarios were evaluated:

- Full facility construction, between 1 and 5 million gallons per day (MGD), using fresh water from the surficial aquifer system or brackish water from the upper Floridan aquifer as the water source.
- Expansion of current facility production through the addition of a low pressure reverse osmosis (RO) train.
- Expansion of current facility production using a nanofiltration train.

Alternative Water Supply Options

Full Facility Construction

Costs for full facility construction to provide 1 to 5 MGD capacity range from $3.42 per 1,000 gallons for a nanofiltration facility using fresh groundwater, to $11.33 per 1,000 gallons for a low pressure RO facility using brackish groundwater (CDM 2007a, 2007b). Costs include expenses for raw water supply, pretreatment, nanofiltration, or RO process train(s), and post-treatment. Costs such as annual operations and maintenance expenses, and renewal and replacement fund deposits that are not part of the operations and maintenance expense, are also included. The cost estimates presented in this appendix are considered to be order-of-magnitude estimates as defined by the American Association of Cost Engineers and accurate within +50 percent or -30 percent.

Low Pressure Reverse Osmosis Facility Expansion

Facility expansion costs through the purchase and operation of 1 to 5 MGD capacity low pressure RO trains range from $3.69 to $10.38 per 1,000 gallons (CDM 2007a, 2007b). Facility expansion costs include expenses for cartridge filters, membrane feed pumps, pretreatment chemicals, RO membrane units, piping inside the membrane building, cleaning system, instruments and controls, and electrical equipment.

Nanofiltration Facility Expansion

Facility expansion costs for the purchase and operation of 1 to 5 MGD nanofiltration process trains range from $3.13 to $9.07 per 1,000 gallons of finished water (CDM 2007a, 2007b). Facility expansion costs include expenses for cartridge filters, membrane feed pumps, pretreatment chemicals, nanofiltration membrane units, piping inside the membrane building, cleaning system, instruments and controls, and electrical equipment.

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MIAMI-DADE GOAL-BASED WATER CONSERVATION PLAN

A good example of a goal-based water conservation plan is the *Miami-Dade County Water Use Efficiency 20-Year Plan* (Miami-Dade County 2007), which is expected to generate an estimated 20 MGD in water savings by 2026. Since 2006, the Miami-Dade Water and Sewer Department spent $3 million implementing its water conservation plan and estimates that each dollar spent deferred or eliminated between $5 and $9 in capital project costs. This calculation is based on the initial cost estimates of water supply development and quantified water conservation savings observed through 2012.

The actual reduction in per capita water demand (from 154 gallons per capita per day in 2005 to 134 gallons per capita per day in 2012) enabled MDWASD to reschedule its water supply development plan and extend its water use permit. **Figures D-1** and **D-2** show the original and revised water supply project schedules, and the pre- and post-conservation finished water demand curves.

Projects 1 and 2 on **Figure D-1** were initially halted due to water quality issues and were not replaced. Water savings achieved through conservation efforts is credited as one reason why the county's projects were not replaced. Miami-Dade is currently experiencing actual finished water demands 44 MGD lower than anticipated population growth, along with the implementation of the county's irrigation restrictions, Water Loss Reduction Program, and Water Use Efficiency Program. Miami-Dade County's new water supply development schedule postpones the construction of four of its remaining six projects.

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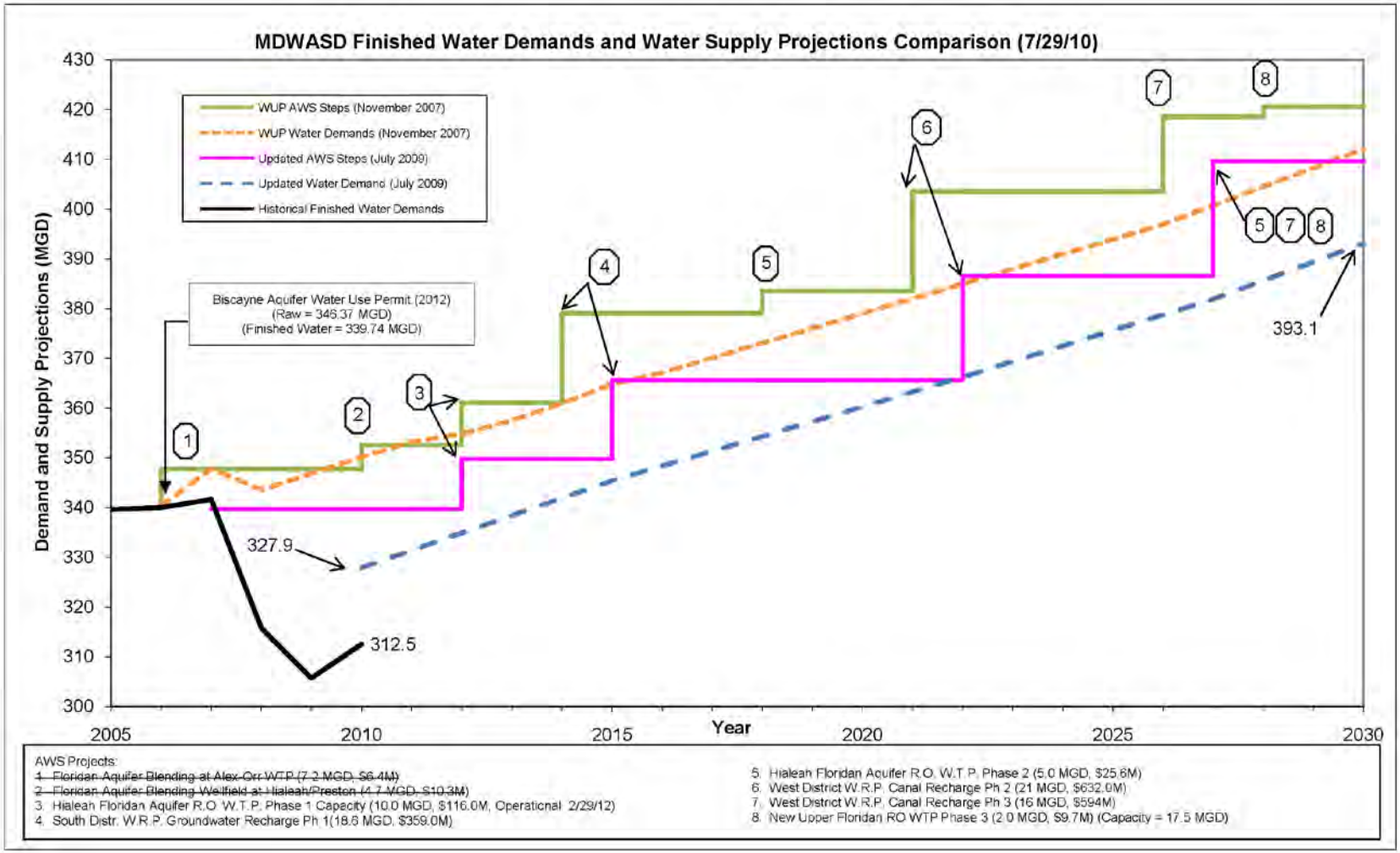

Figure D-1. MDWASD finished water demands and water supply projections comparison as of July 29, 2010. The green line shows the original work plan schedule. The pink line shows the adjusted work plan resulting from conservation success.

Key: AWS – alternative water supply; Distr. – district; M – million; MDWASD – Miami-Dade Water and Sewer Department; MGD – million gallons per day; Ph – phase; RO and R.O. – reverse osmosis; WRP and W.R.P. – water reclamation plant; WTP and W.T.P. – water treatment plant; WUP – water use permit.

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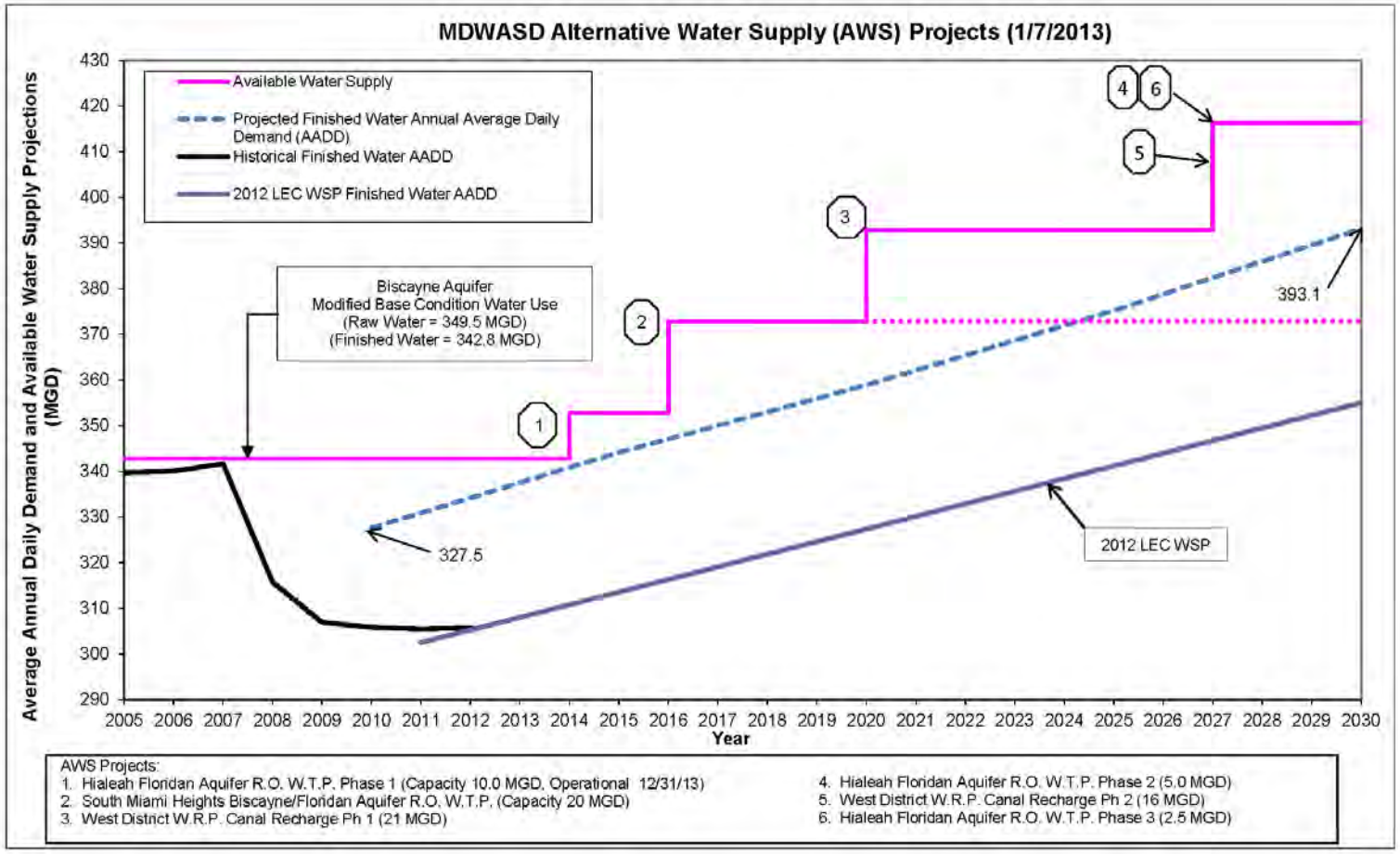

Figure D-2. MDWASD finished water demands and water supply projections comparison as of January 7, 2013.

Key: AADD – annual average daily demand; MGD – million gallons per day; Ph – phase; RO and R.O. – reverse osmosis; W.R.P. – water reclamation plant; WSP – water supply plan; W.T.P. – water treatment plant.

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REFERENCES

CDM. 2007a. *Water Supply Cost Estimation Study*. Prepared by Camp Dresser & McKee, Inc., Naples, FL, for South Florida Water Management District, West Palm Beach, FL.

CDM. 2007b. *Water Supply Cost Estimation Study – Phase II Addendum*. Prepared by Camp Dresser & McKee, Inc., Naples, FL, for South Florida Water Management District, West Palm Beach, FL.

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SFWMD. 2012. *Basis of Review for Water Use Permit Application within the South Florida Water Management District*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2013. *2011–2013 Water Supply Plan Support Document.* South Florida Water Management District, West Palm Beach, FL.

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E

Information for Local Government Comprehensive Plans

The South Florida Water Management District (SFWMD) prepares water supply plans for each of its four planning areas to effectively support planning initiatives and address local issues. The regional water supply plans encompass a twenty-year future planning horizon and are updated every five years. All local governments are required by statute to update their water supply facilities work plan and adopt revisions to their comprehensive plan within 18 months following the approval of this plan update.

This appendix contains water supply planning information useful to local governments for preparing and amending comprehensive plans. In addition to this appendix, the following chapters and appendices are particularly relevant for local governments:

Water Sources	Chapter 5
Utility Service Areas (2010 and 2030)	Chapter 6; Appendices C and E
Population Projections (2010–2030)	Chapter 2; Appendix A
Demand Projections (2010–2030)	Chapter 2; Appendix A
Water Supply Projects (2010–2030)	Chapter 6; Appendix F

This appendix includes the following information useful for the review and revision of local government comprehensive plans:

1. SFWMD's Checklist of Needed Comprehensive Plan Data
2. Relevant portions of cited statutory provisions
3. Tables identifying which utilities serve each Lower East Coast (LEC) Planning Area jurisdiction
4. Maps of utility areas currently served (2010) and future utility service areas expected to be served (2030)

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1. COMPREHENSIVE PLAN DATA CHECKLIST

Local governments are required to plan for their water and wastewater needs along with other infrastructure and public service elements in their comprehensive plans. This section provides a general checklist of the types of data and information SFWMD water supply planning staff look for during their review of the water supply element, policies, and other topics in local government comprehensive plans. This checklist is not all inclusive but provides a broad, general framework for use with the more detailed Florida Department of Economic Opportunity related guidelines and SFWMD comments on specific water supply topics.

Checklist guidance is given for three water supply-related aspects of comprehensive plans:

A. Work plans and other potable water sub-element revisions

B. Evaluation and appraisal of comprehensive plan requirements

C. Plan amendments (future land use change)

A. Work Plan and Other Potable Water Sub-Element Revisions

(To be completed within 18 months following final publication of this plan update.)

Overall Guidance

For consistency in the water supply planning process, SFWMD, local governments, and utilities work closely with the Florida Department of Economic Opportunity projecting demands and proposing water supply projects for the future. This plan update provides water demand estimates, water source options, and water supply development projects to ensure adequate water supplies to support the region. Local governments should demonstrate consistency with the regional water supply plan and updates when developing or updating their work plans. The following guidance is provided to local governments for updating their work plans.

Confirm Major PWS Entities Providing Service within Local Government's Jurisdiction

To be consistent with the regional water supply plan and updates, the local government's work plan should be in agreement with the major Public Water Supply (PWS) entities serving most of the urban population. This plan update identifies PWS entities with projected average pumpage greater than 0.1 million gallons per day (MGD) serving most of the urban population. Smaller communities or municipalities may not be identified. The Florida Department of Economic Opportunity guidance for work plans recommends including all small community systems and Domestic Self-Supply (DSS) users on private wells. Information on these small in-community systems and DSS can be found on the Florida Department of Environmental Protection website at http://www.dep.state.fl.us/water/drinkingwater/flow.htm.

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This plan update provides information about PWS entities and urban water use by PWS service area. To be consistent with the regional water supply plan and updates, at a minimum, the work plan should identify the urban water demand and adequacy of PWS sources within the municipal boundary to meet such water demand. If appropriate, the sale or purchase of water from PWS entities with service areas outside of the municipal boundary should also be identified. Municipal boundaries and land use are not primary determinants of water use.

Review PWS Utility Summaries Provided in Chapter 6

The SFWMD worked with staff from PWS entities to identify water supply development projects for this plan update. Utility summaries were compiled using information from various sources, including input from PWS entities. These utility summaries are provided in **Chapter 6**. The utility summaries provide baseline information about finished water demands, existing permitted sources and allocations, and recently constructed and proposed projects that create water capacity, as well as other related information. Multiple sources of water supply may be needed to accommodate projected water demand. PWS entity staff should confirm the information provided in the utility summaries in this plan update. Subsequent to adoption of the plan update, PWS entities must respond within 12 months to the SFWMD with their intentions to develop and implement the projects identified by this plan update, or provide a list of other projects or methods to meet water demands.

To be consistent with the regional water supply plan, the local government's work plan should be in general agreement with this plan update's utility summaries' water sources and schedule of water sources to be made available to meet projected water demands. However, it is not necessary to use the same population projections or per capita use rates used by the regional water supply plan to project water demand. Generally accepted professional planning methods and more recent sources of data may be used as input to the local planning process. This may result in differences between the population and demand estimates provided in this plan update's utility summaries. In such cases, the work plan should identify and explain the basis for any differences.

Furthermore, consistency between a work plan and regional water supply plan does not require the same planning periods. The minimum planning period for regional water supply plans is 20 years (referred to as the twenty-year planning horizon). However, a minimum ten-year planning period is required for local government work plans (Subsection 163.3177(6)(c)3, Florida Statutes [F.S.]) and a twenty-year planning period is preferred.

Additional information about developing a work plan including guidelines is available on the Florida Department of Economic Opportunity website at the following link: http://www.floridajobs.org/community-planning-and-development/programs/technical-assistance/planning-initiatives/natural-resource-planning/water-supply-planning.

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Checklist of Key Considerations

Water Supply Demand Projections

- Review this plan update and revise the local government's adopted work plan to be consistent with the water demand estimates and population projections cited in this plan update. The objective is to provide the best available data. If the local government can provide data that improves the information in this plan, then the local government data should be used in the work plan. All differences in water demand estimates and population projections used in the work plan should be identified and explained.
    - Plan for both gross and net water supply demands within the city or county jurisdiction for each supplier.
    - The projections should cover at least a ten-year planning period, but projections for the entire established local government comprehensive plan's planning period are preferred.
    - The projections should plan for the building of all public, private, and regional water supply facilities and bulk sales of water that will be necessary to provide water supply service within the local government's jurisdiction.

Water Source Identification

- Review the water supply sources identified by the local government or its water suppliers as necessary to meet and achieve the existing and projected water use demand for the established planning period.
    - Compare this information with the available sources in this plan update.
- Provide separate projections for existing and future DSS.
    - Identify the general areas served by DSS.

Water Supply Project Identification

- Either incorporate water supply project(s) selected by the local government's utility or utilities providing PWS to the local government, as identified in the regional water supply plan, or propose alternatives for inclusion in the work plan.
    - All other public and private water supply capital improvements, including wells, treatment plants, distribution systems, etc., necessary to maintain level-of-service standards within the jurisdiction should also be included in the work plan.
- Coordinate the work plan water supply projects with this plan update and the water supplier(s) annual progress reports.
    - Update the work plan accordingly.

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- Identify sufficient water conservation, reclaimed water, and water supply projects necessary to meet projected demands.
- Update the capital improvements element as required.

Water Supply Intergovernmental Coordination

- The work plan should address ongoing and future coordination with existing and future water supply and reclaimed water providers for meeting future demands. This should occur before, during, and after the water supply plan update process.
- Review existing and future utility service areas for each provider within the jurisdiction. Refer to the maps provided in this appendix. Compare and update the work plan as needed.
    - Identify existing or potential service area conflicts and solutions. Include a conflict resolution policy.
    - Ensure all areas of the local government are accounted for by the local government's own utility or other providers.
- Review and update the work plan language concerning needed coordination with water supplier(s), other local governments and entities, and others.
    - Include updates to agreements (e.g., bulk service agreements and interconnect agreements).

Related Comprehensive Plan Amendments

- If additional revisions are needed for coordination with this plan update, but are not listed here, incorporate changes into the comprehensive plan and work plan, as appropriate.
- This plan update will require changes to the work plan and possibly other elements within the comprehensive plan. Revisions may include population projections, established planning period, existing and future water resource projects, intergovernmental coordination activities, conservation and reclaimed water measures, and the capital improvements element.
    - Review the comprehensive plan for consistency between all elements of the work plan and other comprehensive plan elements in consideration of all proposed modifications to the comprehensive plan. Other comprehensive plan elements include, but may not be limited to, future land use, potable water, sanitary sewer, conservation, intergovernmental coordination, and capital improvements.

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B. Evaluation and Appraisal of Comprehensive Plans Paragraphs 163.3191(1) – (3), F.S.

(Evaluation of the comprehensive plan after the adoption of a work plan.)

Water Supply Project Identification and Selection

At least every seven years, local governments must evaluate whether the need exists to amend their comprehensive plan since the last comprehensive plan update. The evaluation should address changes in state requirements since the last comprehensive plan update.

While an evaluation and appraisal report is not required, local governments are encouraged to comprehensively evaluate, and as necessary, update comprehensive plans to reflect changes in local conditions. The evaluation could address the issues below related to their work plans.

- Identify the extent to which the local government has been successful in identifying water supply projects, including water conservation and reclaimed water, necessary to meet projected demands.
- Evaluate the degree to which the work plan has been implemented for building all public, private, and regional water supply facilities within the jurisdiction necessary to meet projected demands.
- Include recommendations for revising the work plan and the applicable comprehensive plan elements to address the conclusions of the evaluation, as necessary.

C. Plan Amendments (Future Land Use Change)

Water Supply Demand Projections

- Address both gross (raw) and finished (i.e., after any losses due to water treatment) water supply needs for both potable and nonpotable (i.e., irrigation) demands, using professionally acceptable methodologies for population projections and per use capita rates.
- Address existing and future water conservation and reclaimed water commitments, and levels of service (i.e., per capita use rates), for both the proposed future land use change and the comprehensive plan.
- Address both the build-out time frame for a proposed future land use change, and the established planning time frame for the comprehensive plan.

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Water Source Identification

- For existing demands, reflect water source(s) from supplier's water use permit.
- For future demands covered by a supplier's commitment to provide service under remaining available capacity of an existing water use permit, reflect the source(s) from the supplier's water use permit, including bulk supply contracted quantities, duration, and provider.
- For future demands not covered by an existing water use permit, provide sufficient planning-level data and analysis to demonstrate the availability of a sustainable water source as identified in this plan update.

Availability of Water Supply and Public Facilities

- Demonstrate an availability of gross water supply from the proposed source(s) of gross demand for the future land use change, given all other approved land use commitments within the local government's jurisdiction over both the proposed amendment's build-out and the established planning period of the comprehensive plan (see Subsections 163.3167(9) and 163.3177(6)(a), F.S.).
- Demonstrate an availability of both treatment facility capacity and permitted, available, finished water supply for the future land use change, given all other commitments for that capacity and supply over the proposed build-out period.
- If the availability of either water supply and/or public facilities is not currently demonstrable, then either phasing of the future land use (see Subsections 163.3177(6)(h)1, F.S.) and/or the appropriate amendments to the capital improvements element/potable water sub-element is required to ensure the necessary capital planning and timely availability of the needed infrastructure and water supply (see Subsections 163.3177(3)(a), 163.3177(6)(c), and 163.3177(6)(h)3.b., F.S.).
- If the water provider is an entity other than the local government responsible for the comprehensive plan amendment, then demonstrate that coordination of the plan amendment occurred between the water provider and the local government (see Subsection 163.3177(6)(h)3.b., F.S.).

Related Comprehensive Plan Amendments

- A future land use change may also require amendments to other specific elements within the comprehensive plan if it requires an adjustment to either the plan's future population or demand projections, the comprehensive plan's established planning period, the water supply sources, or water providers required to be addressed in the comprehensive plan (see Subsections 163.3167(9), 163.3177(4)(a), 163.3177(5)(a), 163.3177(6)(a), 163.3177(6)(c), and 163.3177(6)(d), F.S., and Section 163.3180, F.S.).

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2. CITED FLORIDA STATUTE PROVISIONS (RELEVANT PORTIONS ONLY)

163.3167(9): Each local government shall address in its comprehensive plan, as enumerated in this chapter, the water supply sources necessary to meet and achieve the existing and projected water use demand for the established planning period, considering the applicable plan developed pursuant to s. 373.709.

163.3177(3)(a): The comprehensive plan shall contain a capital improvements element designed to consider the need for and the location of public facilities in order to encourage the efficient use of such facilities and set forth:

1. A component that outlines principles for construction, extension, or increase in capacity of public facilities, as well as a component that outlines principles for correcting existing public facility deficiencies, which are necessary to implement the comprehensive plan. The components shall cover at least a 5-year period.
2. Estimated public facility costs, including a delineation of when facilities will be needed, the general location of the facilities, and projected revenue sources to fund the facilities.
3. Standards to ensure the availability of public facilities and the adequacy of those facilities including acceptable levels of service.
4. A schedule of capital improvements which includes any publicly funded project of federal, state or local government, and which may include privately funded projects for which the local government has no fiscal responsibility. Projects necessary to ensure that any adopted level-of-service standards are achieved and maintained for the 5-year period must be identified as either funded or unfunded and given a level of priority for funding.

163.3177(4)(a): Coordination of the local comprehensive plan with the comprehensive plans of adjacent municipalities, the county, adjacent counties, or the region; with the appropriate water management district's regional water supply plans approved pursuant to s. 373.709; and with adopted rules pertaining to designated areas of critical state concern shall be a major objective of the local comprehensive planning process. To that end, in the preparation of a comprehensive plan or element thereof, and in the comprehensive plan or element as adopted, the governing body shall include a specific policy statement indicating the relationship of the proposed development of the area to the comprehensive plans of adjacent municipalities, the county, adjacent counties, or the region, as the case may require and as such adopted plans or plans in preparation may exist.

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163.3177(5)(a): Each local government comprehensive plan must include at least two planning periods, one covering at least the first 5-year period occurring after the plan's adoption and one covering at least a 10-year period. Additional planning periods for specific components, elements, land use amendments, or projects shall be permissible and accepted as part of the planning process.

163.3177(6)(a): A future land use plan element designating proposed future general distribution, location, and extent of the uses of land for residential uses, commercial uses, industry, agriculture, recreation, conservation, education public facilities, and other categories of the public and private uses of land. The approximate acreage and the general range of density or intensity of use shall be provided for the gross land area included in each existing land use category. The element shall establish the long-term end toward which land use programs and activities are ultimately directed.

163.3177(6)(a)2.: The future land use plan and plan amendments shall be based upon surveys, studies, and data regarding the area, as applicable including:

a. The amount of land required to accommodate anticipated growth.

b. The projected permanent and seasonal population of the area.

c. The character of undeveloped land.

d. The availability of water supplies, public facilities, and services.

e. The need for redevelopment, including the renewal of blighted areas and the elimination of nonconforming uses which are inconsistent with the character of the community.

163.3177(6)(c): A general sanitary sewer, solid waste, drainage, potable water, and natural groundwater aquifer recharge element correlated to principles and guidelines for future land use, indicating ways to provide for future potable water, drainage, sanitary sewer, solid waste, and aquifer recharge protection requirements for the area. The element may be a detailed engineering plan including a topographic map depicting areas of prime groundwater recharge.

1. Each local government shall address in the data and analyses required by this section those facilities that provide service within the local government's jurisdiction. Local governments that provide facilities to serve areas within other local government jurisdictions shall also address those facilities in the data and analyses required by this section, using data from the comprehensive plan for those areas for the purpose of projecting facility needs as required in this subsection. For shared facilities, each local government shall indicate the proportional capacity of the systems allocated to serve its jurisdiction.

2. The element shall describe the problems and needs and the general facilities that will be required for solution of the problems and needs including correcting existing facility deficiencies. The element shall address coordinating the extension of, or increase in the capacity of,

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facilities to meet future needs while maximizing the use of existing facilities and discouraging urban sprawl; conserving potable water resources; and protecting the functions of natural groundwater recharge areas and natural drainage features.

3. Within 18 months after the governing board approves an updated regional water supply plan, the element must incorporate the alternative water supply project or projects selected by the local government from those identified in the regional water supply plan pursuant to s. 373.709(2)(a) or proposed by the local government under s. 373.709(8)(b). If a local government is located within two water management districts, the local government shall adopt its comprehensive plan amendment within 18 months after the later updated regional water supply plan. The element must identify such alternative water supply projects and traditional water supply projects and conservation and reuse necessary to meet the water needs identified in s. 373.709(2)(a) within the local government's jurisdiction and include a work plan, covering at least a 10-year planning period, for building public, private, and regional water supply facilities, including development of alternative water supplies, which are identified in the element as necessary to serve existing and new development. The work plan shall be updated, at a minimum, every five years within 18 months after the governing board of a water management district approves an updated regional water supply plan. Local governments, public and private utilities, regional water supply authorities, special districts, and water management districts are encouraged to cooperatively plan for the development of multijurisdictional water supply facilities that are sufficient to meet projected demands for established planning periods, including the development of alternative water sources to supplement traditional sources of groundwater and surface water supplies.

163.3177(6)(d): A conservation element for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, water wells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources, including factors that affect energy conservation.

1. The following natural resources, where present within the local government's boundaries, shall be identified and analyzed and existing recreational or conservation uses, known pollution problems, including hazardous wastes, and the potential for conservation, recreation, use, or protection shall also be identified:

   a. Rivers, bays, lakes, wetlands including estuarine marshes, groundwaters, and springs, including information on quality of the resource available.

   b. Floodplains.

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2. The element must contain principles, guidelines, and standards for conservation that provide long-term goals and which:

   b. Conserves, appropriately uses, and protects the quality and quantity of current and projected water sources and waters that flow into estuarine waters or oceanic waters and protect from activities and land uses known to affect adversely the quality and quantity of identified water sources, including natural groundwater recharge areas, wellhead protection areas, and surface waters used as a source of public water supply.

   c. Provides for the emergency conservation of water sources in accordance with the plans of the regional water management district.

3. Current and projected needs and sources for at least a 10-year period based on the demands for industrial, agricultural, and potable water use and the quality and quantity of water available to meet these demands shall be analyzed. The analysis shall consider the existing levels of water conservation, use, and protection and applicable policies of the regional water management district and further must consider the appropriate regional water supply plan approved pursuant to s. 373.709, or, in the absence of an approved regional water supply plan, the district water management plan approved pursuant to s. 373.036(2). This information shall be submitted to the appropriate agencies…

163.3177(6)(h)1.: An intergovernmental coordination element showing relationships and stating principles and guidelines to be used in coordinating the adopted comprehensive plan with the plans of school boards, regional water supply authorities, and other units of local government providing services but not having regulatory authority over the use of land, with the comprehensive plans of adjacent municipalities, the county, adjacent counties, or the region, with the state comprehensive plan and with the applicable regional water supply plan approved pursuant to s. 373.709, as the case may require and as such adopted plans or plans in preparation may exist…

   a. The intergovernmental coordination element must provide procedures for identifying and implementing joint planning areas, especially for the purpose of annexation, municipal incorporation, and joint infrastructure service areas.

163.3177(6)(h)3.b.: Ensure coordination in establishing level of service standards for public facilities with any state, regional, or local entity having operational and maintenance responsibility for such facilities.

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163.3180: Concurrency.—

163.3180(1)(a): Sanitary sewer, solid waste, drainage, and potable water are the only public facilities and services subject to the concurrency requirement on a statewide basis…

163.3180(1)(b): The local government comprehensive plan must demonstrate, for required or optional concurrency requirements, that the levels of service adopted can be reasonably met. Infrastructure needed to ensure that adopted level-of-service standards are achieved and maintained for the 5-year period of the capital improvement schedule must be identified pursuant to the requirements of s. 163.3177(3). The comprehensive plan must include principles, guidelines, standards, and strategies for the establishment of a concurrency management system.

163.3180(2): Consistent with public health and safety, sanitary sewer, solid waste, drainage, adequate water supplies, and potable water facilities shall be in place and available to serve new development no later than the issuance by the local government of a certificate of occupancy or its functional equivalent. Prior to approval of a building permit or its functional equivalent, the local government shall consult with the applicable water supplier to determine whether adequate water supplies to serve the new development will be available no later than the anticipated date of issuance by the local government of a certificate of occupancy or its functional equivalent…

163.3180(3): Governmental entities that are not responsible for providing, financing, operating, or regulating public facilities needed to serve development may not establish binding level-of-service standards on governmental entities that do bear those responsibilities.

163.3191: **Evaluation and appraisal of comprehensive plan.—**

163.3191(1): At least once every 7 years, each local government shall evaluate its comprehensive plan to determine if plan amendments are necessary to reflect changes in state requirements in this part since the last update of the comprehensive plan, and notify the state land planning agency as to its determination.

163.3191(2): If the local government determines amendments to its comprehensive plan are necessary to reflect changes in state requirements, the local government shall prepare and transmit within 1 year such plan amendment or amendments for review pursuant to s. 163.3184.

163.3191(3): Local governments are encouraged to comprehensively evaluate and, as necessary, update comprehensive plans to reflect changes in local conditions.

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3. UTILITIES AND JURISDICTIONS SERVED

This section contains two tables showing local government jurisdictions and utilities that provide gross (raw) or finished water to local governments. The utilities listed have treatment capacity and water use greater than 0.1 MGD.

Table E-1 identifies the local governments within the jurisdiction of the LEC Planning Area and the PWS utilities or entities serving those local governments. The first column in **Table E-1** lists the name of the local government. The second column identifies the local government, private PWS utility, or utilities providing raw or finished water to the local government.

Table E-1. Utilities and local governments serving local governments in the LEC Planning Area.

Local Government	Utility/Entity Serving Local Government
Palm Beach County	
Palm Beach County (unincorporated)	Palm Beach County Water Utilities Department, City of Boynton Beach, Village of Golf, Town of Jupiter, Maralago Cay, Village of Palm Springs, Seacoast Utility Authority, Seminole Improvement District, Tropical Breeze Estates, and Village of Wellington
Atlantis, City of	Palm Beach County Water Utilities Department
Belle Glade, City of	Glades Utility Authority [a]
Boca Raton, City of	City of Boca Raton
Boynton Beach, City of	City of Boynton Beach and Palm Beach County Water Utilities Department
Briny Breezes, Town of	City of Boynton Beach
Cloud Lake, Town of	Palm Beach County Water Utilities Department
Delray Beach, City of	City of Delray Beach
Glen Ridge, Town of	Palm Beach County Water Utilities Department
Golf, Village of	Village of Golf
Greenacres, City of	Palm Beach County Water Utilities Department
Gulf Stream, Town of	City of Delray Beach
Haverhill, Town of	Palm Beach County Water Utilities Department
Highland Beach, Town of	Town of Highland Beach
Hypoluxo, Town of	City of Boynton Beach and Town of Manalapan
Juno Beach, Town of	Town of Jupiter and Seacoast Utility Authority
Jupiter, Town of	Town of Jupiter
Jupiter Inlet Colony, Town of	Village of Tequesta
Lake Clarke Shores, Town of	Palm Beach County Water Utilities Department, Town of Lake Worth, and Village of Palm Springs
Lake Park, Town of	Seacoast Utility Authority
Lake Worth, City of	City of Lake Worth and Palm Beach County Water Utilities Department
Lantana, Town of	Town of Lantana
Loxahatchee Groves, Town of	Unincorporated Palm Beach County
Manalapan, Town of	Town of Manalapan
Mangonia Park, Town of	Town of Mangonia Park
North Palm Beach, Village of	Seacoast Utility Authority
Ocean Ridge, Town of	City of Boynton Beach
Pahokee, City of	Glades Utility Authority [a]

a. Glades Utility Authority was absorbed into the Palm Beach County Water Utility Department effective May 2013.

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Table E-1. Continued.

Local Government	Utility/Entity Serving Local Government
Palm Beach, Town of	City of West Palm Beach Public Utilities
Palm Beach Gardens, City of	Seacoast Utility Authority
Palm Beach Shores, Town of	City of Riviera Beach
Palm Springs, Village of	Village of Palm Springs
Riviera Beach, City of	City of Riviera Beach
Royal Palm Beach, Village of	Palm Beach County Water Utilities Department and Wellington Public Utilities Department
South Bay, City of	Glades Utility Authority [a]
South Palm Beach, Town of	City of West Palm Beach Public Utilities
Tequesta, Village of	Village of Tequesta
Wellington, Village of	Village of Wellington and Palm Beach County Water Utilities Department
West Palm Beach, City of	City of West Palm Beach Public Utilities and Palm Beach County Water Utilities Department
Broward County	
Broward County (unincorporated)	Broward County Water & Wastewater Services, City of Hollywood, and Sunrise Utilities Department
Coconut Creek, City of	Broward County Water & Wastewater Services and City of Margate
Cooper City, City of	Cooper City Utilities Department
Coral Springs, City of	City of Coral Springs, Coral Springs Improvement District, North Springs Improvement District, and Royal Utility Corporation
Dania Beach, City of	City of Dania Beach, City of Hollywood, and Broward County Water & Wastewater Services
Davie, Town of	City of Hollywood, Town of Davie, City of Fort Lauderdale, Sunrise Utilities Department, Tindell Hammock, and Broward County Water & Wastewater Services
Deerfield Beach, City of	City of Deerfield Beach and Broward County Water & Wastewater Services
Fort Lauderdale, City of	City of Fort Lauderdale
Hallandale Beach, City of	City of Hallandale Beach and Broward County Water & Wastewater Services
Hillsboro Beach, Town of	Town of Hillsboro Beach
Hollywood, City of	City of Fort Lauderdale, City of Hollywood, and Broward County Water & Wastewater Services
Lauderdale-by-the-Sea, Town of	City of Fort Lauderdale and City of Pompano Beach Utilities Department
Lauderdale Lakes, City of	Broward County Water & Wastewater Services
Lauderhill, City of	City of Lauderhill
Lazy Lake, Village of	City of Fort Lauderdale
Lighthouse Point, City of	City of Pompano Beach Utilities Department and Broward County Water & Wastewater Services
Margate, City of	City of Margate
Miramar, City of	City of Miramar
North Lauderdale, City of	City of North Lauderdale and Broward County Water & Wastewater Services
Oakland Park, City of	City of Fort Lauderdale and Broward County Water & Wastewater Services
Parkland, City of	Parkland Utilities, Inc., North Springs Improvement District, and Broward County Water & Wastewater Services
Pembroke Park, Town of	Broward County Water & Wastewater Services
Pembroke Pines, City of	City of Pembroke Pines and Broward County Water & Wastewater Services
Plantation, City of	City of Plantation
Pompano Beach, City of	City of Pompano Beach Utilities Department and Broward County Water & Wastewater Services
Sea Ranch Lakes, Village of	City of Fort Lauderdale
Seminole Tribe of Florida	Seminole Hollywood Reservation
Southwest Ranches, Town of	City of Pembroke Pines and Sunrise Utilities Department
Sunrise, City of	Sunrise Utilities Department

a. Glades Utility Authority was absorbed into the Palm Beach County Water Utility Department effective April 2013.

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Table E-1. Continued.

Local Government	Utility/Entity Serving Local Government
Tamarac, City of	City of Tamarac, City of Fort Lauderdale, and Broward County Water & Wastewater Services
Weston, City of	Sunrise Utilities Department
West Park, City of	Broward County Water & Wastewater Services
Wilton Manors, City of	City of Fort Lauderdale
Miami-Dade County	
Miami-Dade County (unincorporated)	City of Homestead, City of North Miami Beach, City of North Miami, and Miami-Dade Water & Sewer Department
Aventura, City of	City of North Miami Beach and Miami-Dade Water & Sewer Department
Bal Harbour Village, City of	Miami-Dade Water & Sewer Department
Bay Harbor Islands, Town of	Miami-Dade Water & Sewer Department
Biscayne Park, Village of	City of North Miami
Coral Gables, City of	Miami-Dade Water & Sewer Department
Cutler Bay, Town of	Miami-Dade Water & Sewer Department
Doral, City of	Miami-Dade Water & Sewer Department
El Portal, Village of	Miami-Dade Water & Sewer Department
Florida City, City of	Florida City Water and Sewer Department and City of Homestead
Golden Beach, Town of	City of North Miami Beach
Hialeah, City of	Miami-Dade Water & Sewer Department
Hialeah Gardens, City of	Miami-Dade Water & Sewer Department
Homestead, City of	City of Homestead and Miami-Dade Water & Sewer Department
Indian Creek, Village of	Miami-Dade Water & Sewer Department
Key Biscayne, Village of	Miami-Dade Water & Sewer Department
Medley, Town of	Miami-Dade Water & Sewer Department
Miami, City of	Miami-Dade Water & Sewer Department
Miami Beach, City of	Miami-Dade Water & Sewer Department
Miami Gardens, City of	City of North Miami Beach and Miami-Dade Water & Sewer Department
Miami Lakes, Town of	Miami-Dade Water & Sewer Department
Miami Shores, Village of	City of North Miami and Miami-Dade Water & Sewer Department
Miami Springs, City of	Miami-Dade Water & Sewer Department
North Bay Village, City of	Miami-Dade Water & Sewer Department
North Miami, City of	City of North Miami and Miami-Dade Water & Sewer Department
North Miami Beach, City of	City of North Miami Beach
Opa-Locka, City of	Miami-Dade Water & Sewer Department
Palmetto Bay, Village of	Miami-Dade Water & Sewer Department
Pinecrest, Village of	Miami-Dade Water & Sewer Department
South Miami, City of	Miami-Dade Water & Sewer Department
Sunny Isles Beach, City of	City of North Miami Beach
Surfside, Town of	Miami-Dade Water & Sewer Department
Sweetwater, City of	Miami-Dade Water & Sewer Department
Virginia Gardens, Village of	Miami-Dade Water & Sewer Department
West Miami, City of	Miami-Dade Water & Sewer Department
Monroe County	
Monroe County (unincorporated)	Florida Keys Aqueduct Authority
Islamorada, Village of	Florida Keys Aqueduct Authority
Key Colony Beach, City of	Florida Keys Aqueduct Authority
Key West, City of	Florida Keys Aqueduct Authority
Layton, City of	Florida Keys Aqueduct Authority
Marathon, City of	Florida Keys Aqueduct Authority

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Table E-2 identifies the utilities providing raw or finished water. The first column of **Table E-2** lists the name of the utility or entity. The second column identifies whether the utility is part of a special district such as 298, privately owned, or part of the local government. The third column identifies the incorporated and unincorporated areas of the LEC Planning Area served by the utility or entity. In addition to the PWS utilities that serve communities, the AG Holley State Hospital in the Town of Lantana in Palm Beach County has its own utility; however, the hospital closed in July 2012.

Table E-2. Utilities and local governments that serve the LEC Planning Area.

Utility/Entity Name	Utility Type	Local Governments Served (Raw or Finished)
Palm Beach County		
Boca Raton, City of	local government	City of Boca Raton and unincorporated Palm Beach County
Boynton Beach, City of	local government	City of Boynton Beach, Town of Briny Breezes, Town of Hypoluxo, Town of Ocean Ridge, and unincorporated Palm Beach County
Delray Beach, City of	local government	City of Delray Beach, Town of Gulf Stream, and unincorporated Palm Beach County
Glades Utility Authority [a]	local government	City of Belle Glade, City of Pahokee, and City of South Bay
Golf, Village of	local government	Village of Golf and unincorporated Palm Beach County
Highland Beach, Town of	local government	Town of Highland Beach
Jupiter, Town of	local government	Town of Jupiter, Town of Juno Beach, and unincorporated Martin [b] and Palm Beach counties
Lake Worth, City of	local government	City of Lake Worth, Town of Lake Clarke Shores, and unincorporated Palm Beach County
Lantana, Town of	local government	Town of Lantana
Manalapan, Town of	local government	Town of Manalapan and Town of Hypoluxo
Mangonia Park, Town of	local government	Town of Mangonia Park
Maralago Cay	privately owned	Unincorporated Palm Beach County
Palm Beach County Water Utilities Department	local government	City of Atlantis, City of Boynton Beach, Town of Cloud Lake, Town of Glen Ridge, City of Greenacres, Town of Haverhill, Town of Lake Clarke Shores, City of Lake Worth, Town of Loxahatchee Groves, Village of Palm Springs, City of Parkland, Village of Royal Palm Beach, Seminole Improvement District, Village of Wellington, City of West Palm Beach, and unincorporated Palm Beach County
Palm Springs, Village of	local government	Village of Palm Springs, Town of Lake Clarke Shores, and unincorporated Palm Beach County
Riviera Beach, City of	local government	City of Riviera Beach and Town of Palm Beach Shores
Seacoast Utility Authority	special district	Town of Juno Beach, Town of Lake Park, Village of North Palm Beach, City of Palm Beach Gardens, and unincorporated Palm Beach County
Seminole Improvement District	special district	Unincorporated Palm Beach County
Tequesta, Village of	local government	Village of Tequesta and Town of Jupiter Inlet Colony
Tropical Breeze Estates	privately owned	Unincorporated Palm Beach County
Wellington, Village of	local government	Village of Royal Palm Beach, Village of Wellington, and unincorporated Palm Beach County
West Palm Beach Public Utilities, City of	local government	City of West Palm Beach, Town of Palm Beach, and Town of South Palm Beach

a. Glades Utility Authority was absorbed into the Palm Beach County Water Utility Department effective April 2013.

b. Unincorporated Martin County is outside of the LEC Planning Area.

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Table E-2. Continued.

Utility/Entity Name	Utility Type	Local Governments Served (raw & finished)
Broward County		
Broward County Water and Wastewater Services	local government	City of Coconut Creek (Coconut Creek distributes to the City of Parkland and Seminole Tribe Coconut Creek Reservation), City of Dania Beach, Town of Davie, City of Deerfield Beach, City of Hallandale Beach, City of Hollywood, City of Lauderdale Lakes, City of Lighthouse Point, City of North Lauderdale, City of Oakland Park, City of Parkland, City of Pembroke Park, City of Pembroke Pines, City of Pompano Beach, City of Tamarac, City of West Park, and unincorporated Broward County
Cooper City Utilities Department	local government	City of Cooper City
Coral Springs, City of	local government	City of Coral Springs
Coral Springs Improvement District	special district	City of Coral Springs
Dania Beach, City of	local government	City of Dania Beach
Davie, Town of	local government	Town of Davie and Seminole Reservation (Hard Rock Casino)
Deerfield Beach, City of	local government	City of Deerfield Beach
Fort Lauderdale, City of	local government	Town of Davie, City of Fort Lauderdale, City of Hollywood, Town of Lauderdale-by-the-Sea, Village of Lazy Lake, City of Oakland Park, Village of Sea Ranch Lakes, City of Tamarac, and City of Wilton Manors
Hallandale Beach, City of	local government	City of Hallandale Beach
Hillsboro Beach, Town of	local government	Town of Hillsboro Beach
Hollywood, City of	local government	City of Hollywood, City of Dania Beach, Seminole Hollywood Reservation, City of West Park, and unincorporated Broward County
Lauderhill, City of	local government	City of Lauderhill
Margate, City of	local government	City of Margate and City of Coconut Creek
Miramar, City of	local government	City of Miramar
North Lauderdale, City of	local government	City of North Lauderdale
North Springs Improvement District	special district	City of Parkland and City of Coral Springs
Parkland Utilities, Inc.	privately owned	City of Parkland
Pembroke Pines, City of	local government	City of Pembroke Pines and Town of Southwest Ranches
Plantation, City of	local government	City of Plantation
Pompano Beach Utilities Department, City of	local government	City of Pompano Beach, City of Lighthouse Point, and Town of Lauderdale-By-The-Sea
Royal Utility Corporation	privately owned	City of Coral Springs
Seminole Tribe of Florida Utility	not applicable	Seminole Hollywood Reservation
Sunrise Utilities Department	local government	City of Sunrise, Town of Davie, Town of Southwest Ranches, City of Weston, and unincorporated Broward County
Tamarac, City of	local government	City of Tamarac
Tindall Hammock	special district	Town of Davie
Miami-Dade County		
Americana Village	privately owned	Unincorporated Miami-Dade County
Florida City Water & Sewer Department	local government	City of Florida City
Homestead, City of	local government	City of Florida City, City of Homestead, and unincorporated Miami-Dade County

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Table E-2. Continued.

Utility/Entity Name	Utility Type	Local Governments Served (raw & finished)
Miami-Dade Water and Sewer Department	local government	City of Aventura, Village of Bal Harbour, Town of Bay Harbour Islands, City of Coral Gables, Town of Cutler Bay, City of Doral, Village of El Portal, City of Hialeah Gardens, City of Hialeah, City of Homestead, Village of Indian Creek, Village of Key Biscayne, Town of Medley, City of Miami Beach, City of Miami Gardens, Town of Miami Lakes, Village of Miami Shores, City of Miami, City of Miami Springs, City of North Bay Village, City of North Miami, City of Opa-Locka, Village of Palmetto Bay, Village of Pinecrest, City of South Miami, Town of Surfside, City of Sweetwater, Village of Virginia Gardens, City of West Miami, and unincorporated Miami-Dade County
North Miami, City of	local government	City of North Miami, Village of Biscayne Park, Village of Miami Shores, and unincorporated Miami-Dade County
North Miami Beach, City of	local government	City of North Miami Beach, City of Aventura, Town of Golden Beach, City of Miami Gardens, City of Sunny Isles Beach, and unincorporated Miami-Dade County
Monroe County		
Florida Keys Aqueduct Authority	special district	Village of Islamorada, City of Key Colony Beach, City of Key West, City of Layton, City of Marathon, and unincorporated Monroe County

4. MAPS OF UTILITY AREAS CURRENTLY SERVED (2010) AND FUTURE UTILITY AREA SERVICE (2030)

Figure E-1 is a map of the 2010 utility service areas in Palm Beach County. **Figure E-2** is a map of the projected 2030 utility service area maps in Palm Beach County. **Figures E-3** and **E-4** provide this same information for Broward County and **Figures E-5** and **E-6** provide this information for Miami-Dade County. The portion of Monroe County within the LEC Planning Area has only one PWS utility, Florida Keys Aqueduct Authority; therefore, no service area map is provided. The portion of Hendry County within the LEC Planning Area is not served by any PWS utility.

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Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

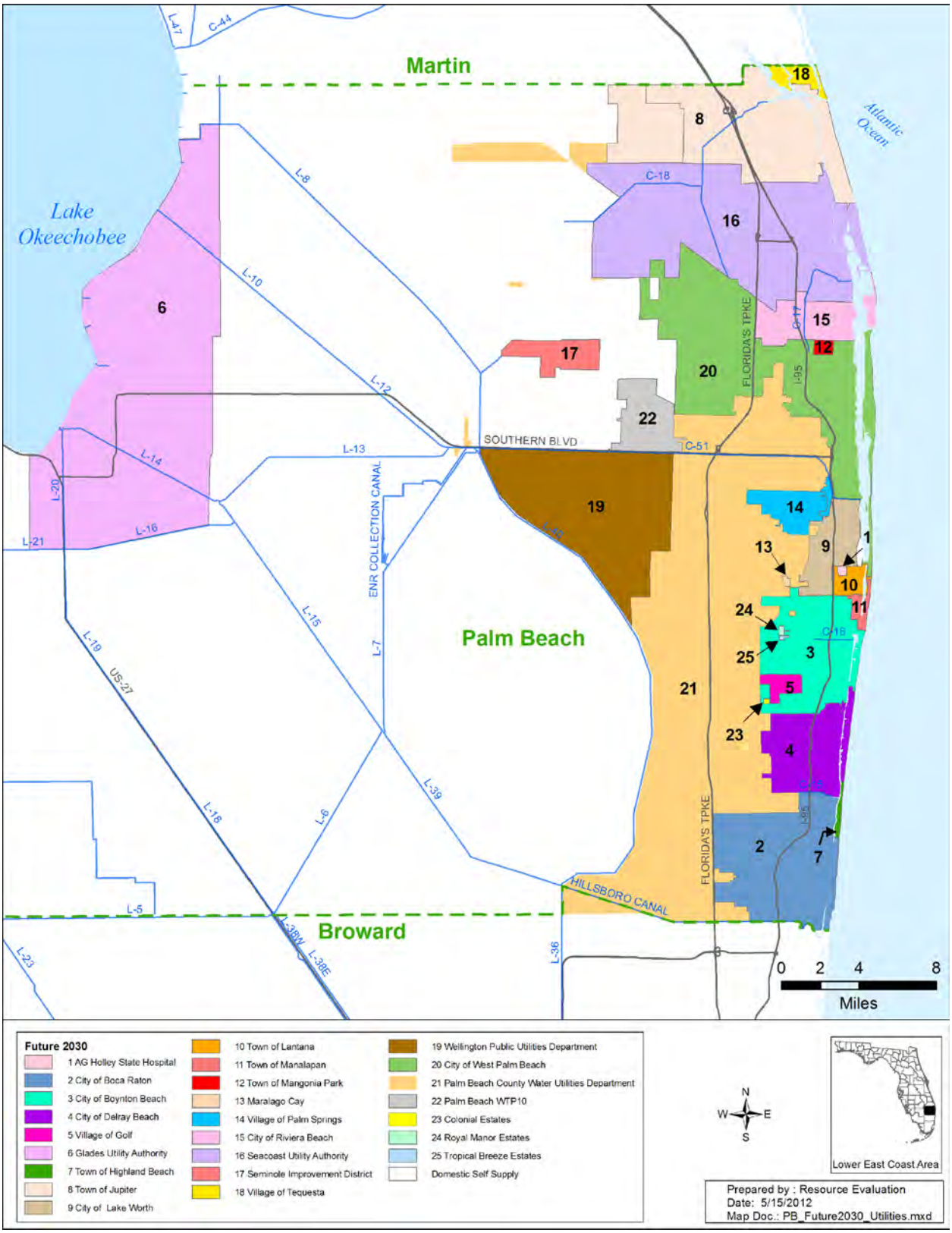

Figure E-1. 2010 utility service areas in Palm Beach County.

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

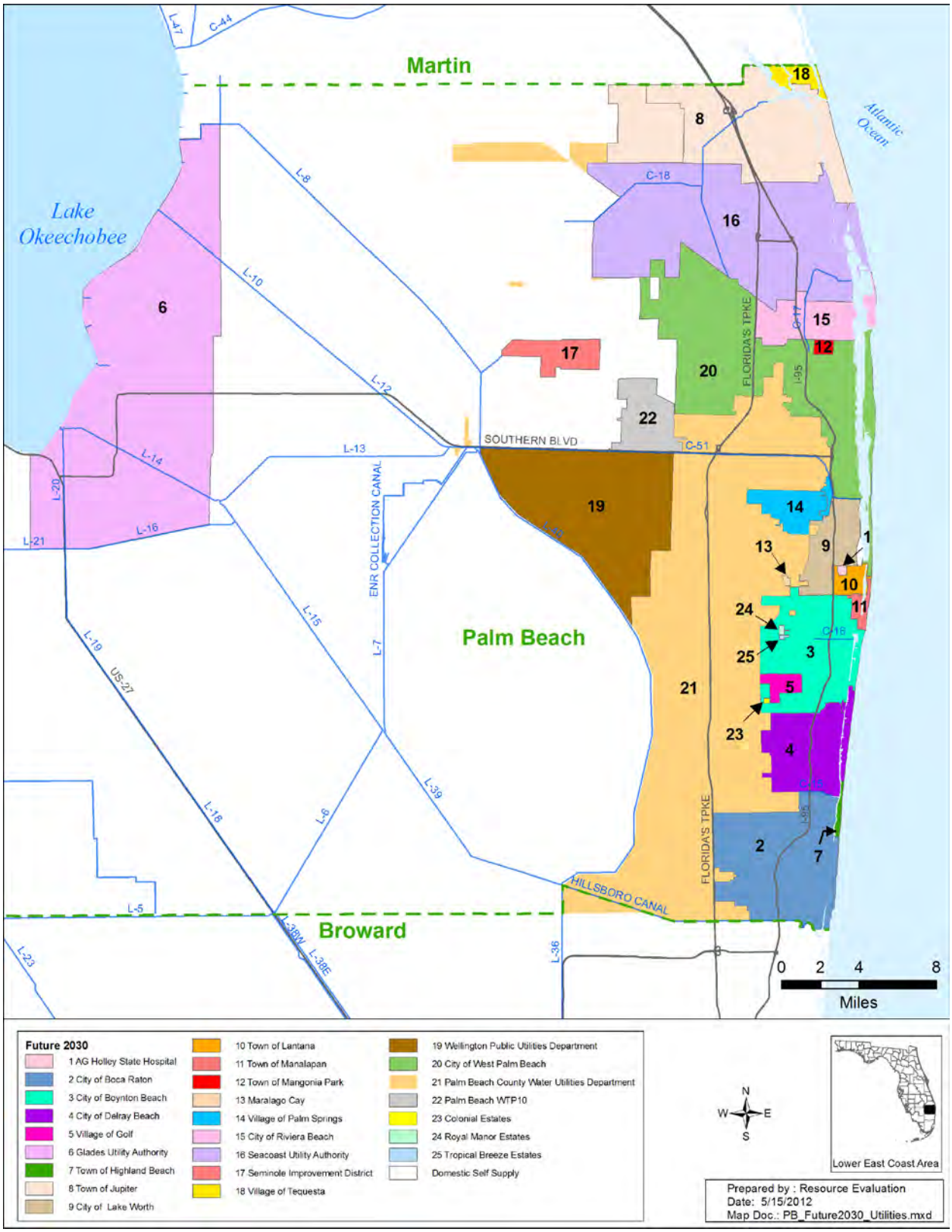

Figure E-2. Projected 2030 utility service areas in Palm Beach County.

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

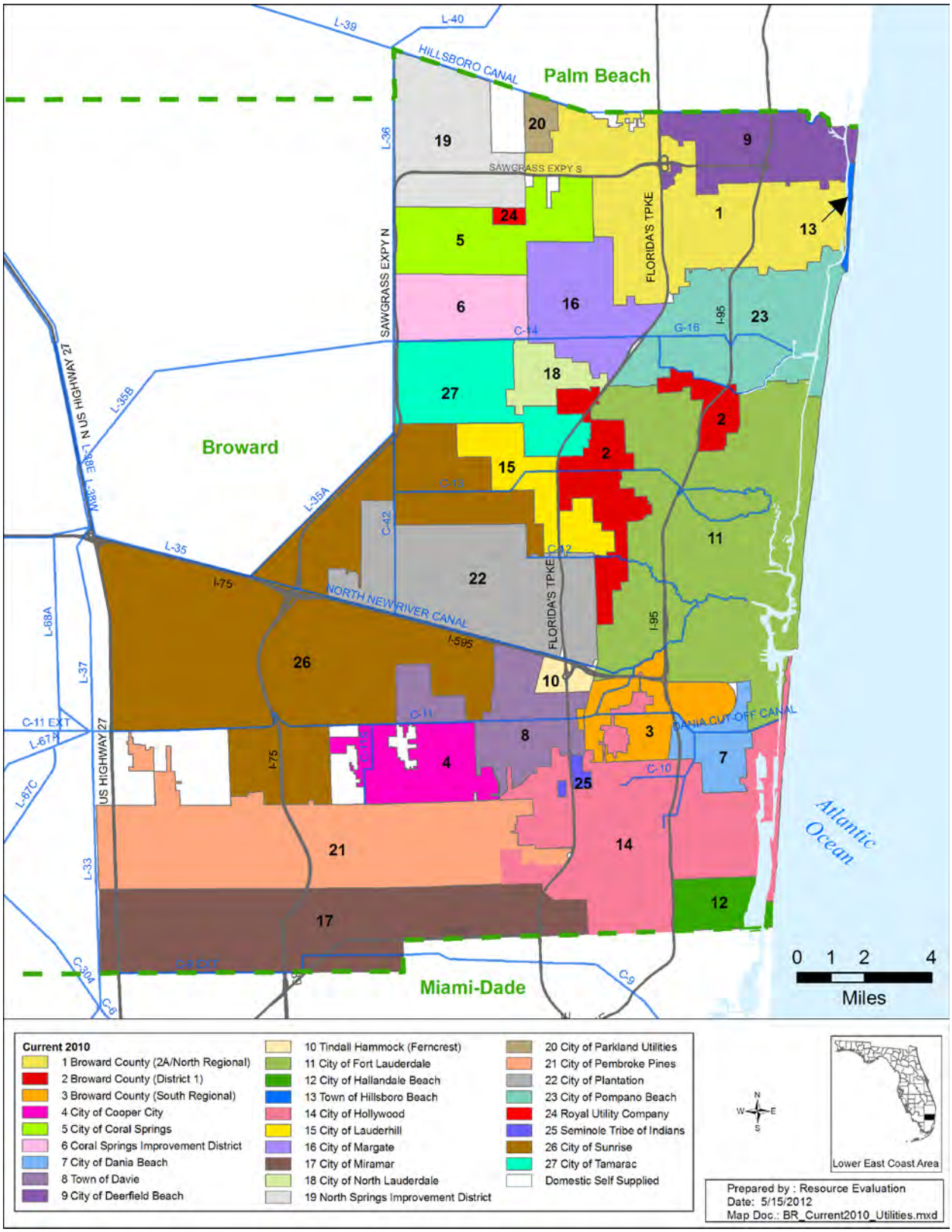

Figure E-3. 2010 utility service areas in Broward County.

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

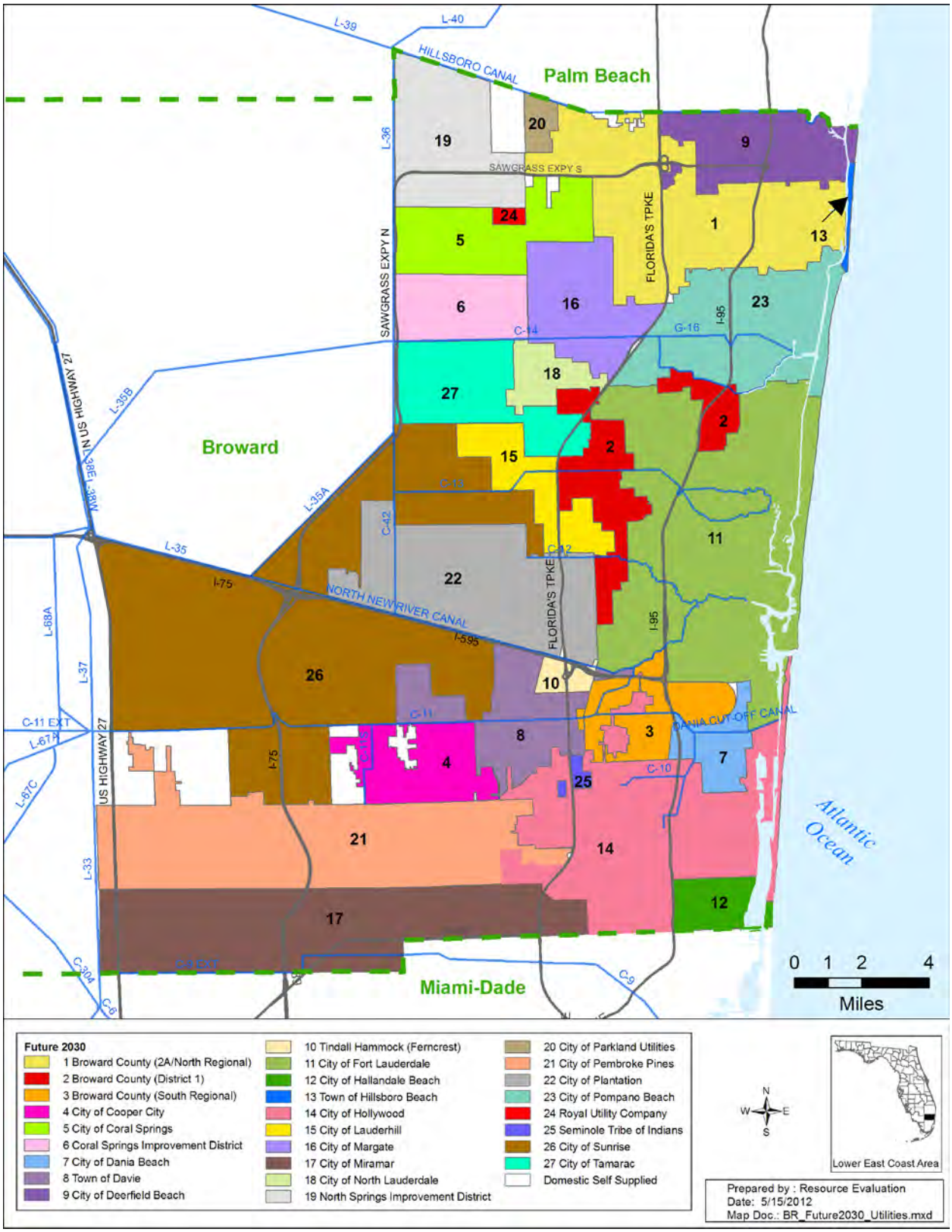

Figure E-4. Projected 2030 utility service areas in Broward County.

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

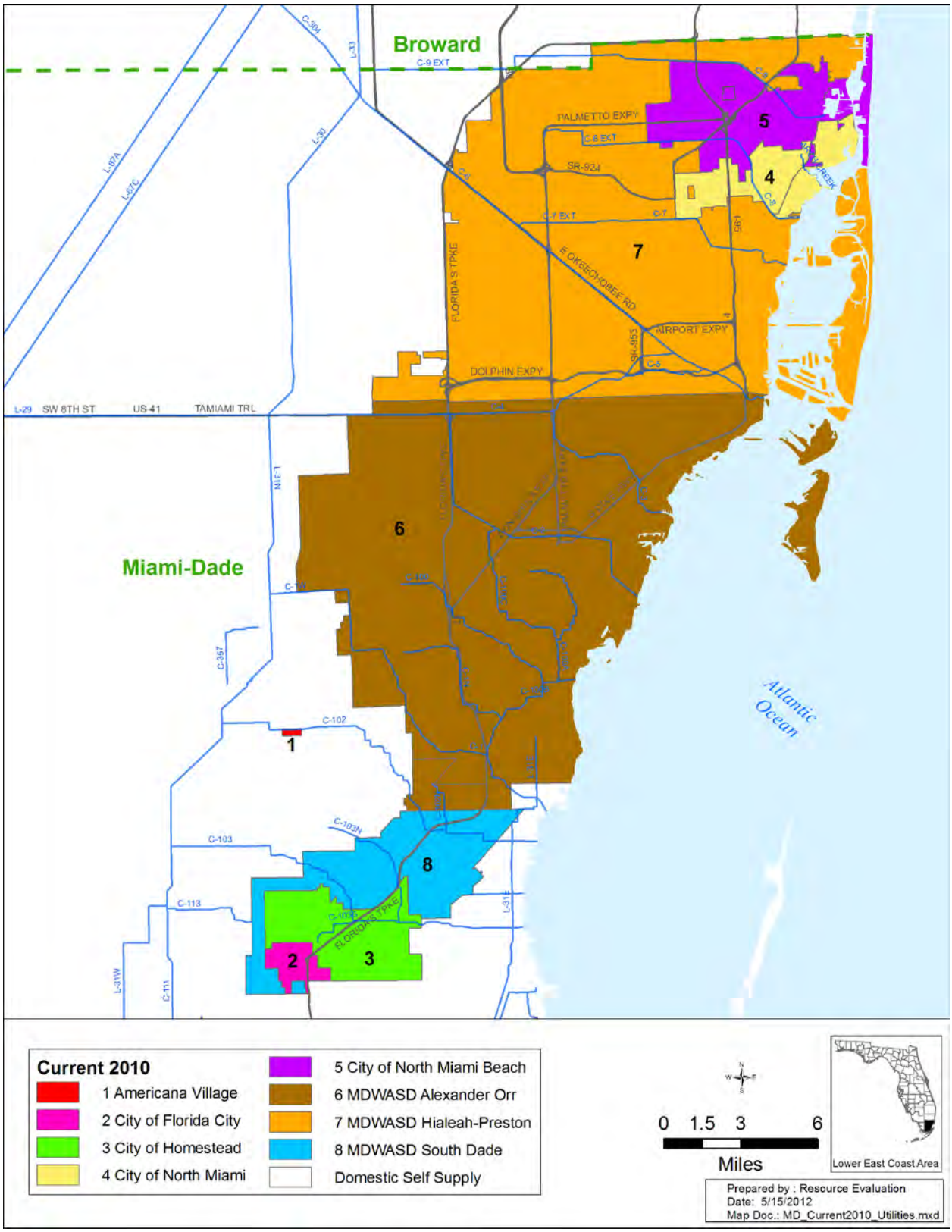

Figure E-5. 2010 utility service areas in Miami-Dade County.

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

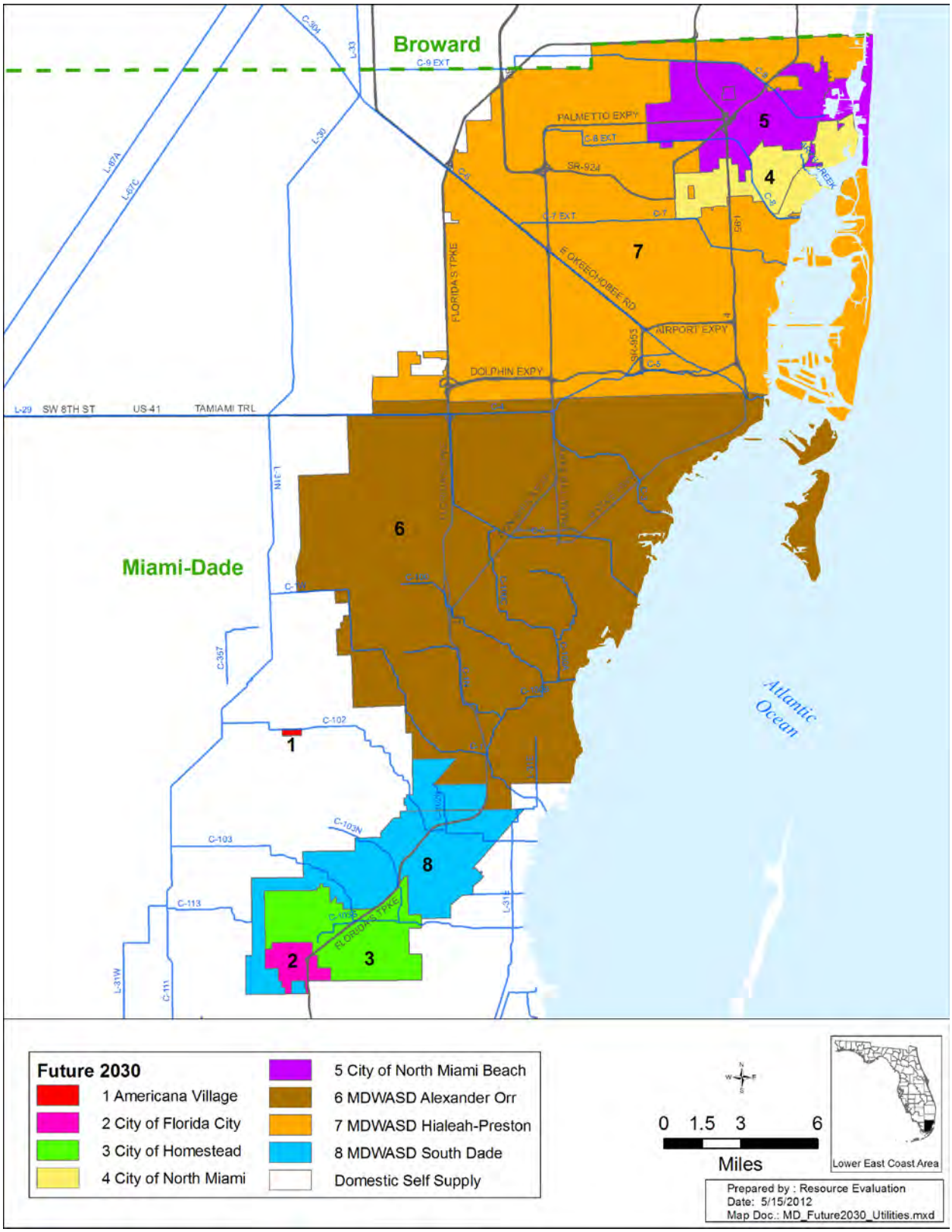

Figure E-6. Projected 2030 utility service areas in Miami-Dade County.

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

F

Water Supply Development Projects

This plan update promotes the diversification of sources for the water supply projects needed to meet future demands. Projects proposed for inclusion in this update were evaluated based on the level of detail provided by the utilities (i.e., project scope, cost, and schedule), and whether the project is expected to contribute to new water supply, resulting in a potentially permittable increase in their allocations or a treatment system's rated capacity.

Summary tables of all water supply development projects that are proposed to be complete by 2030 for the Lower East Coast Planning Area are provided in this appendix. Projects with a freshwater source are shown in **Table F-1**. Proposed projects supplied from a brackish water source are provided in **Table F-2**. Stormwater and surface water capture projects are shown in **Table F-3**. Reclaimed water projects are shown in **Table F-4**. Conservation projects are shown in **Table F-5**. A summary of all water supply development projects that provide new capacity to treat potable and nonpotable water by source is shown in **Table F-6**. A summary of all proposed potable, nonpotable, and conservation projects is shown in **Table F-7**.

A project identified for inclusion in this plan update may not necessarily be selected for development by the utility. In accordance with Section 373.709(6), Florida Statutes, nothing contained in the water supply component of a regional water supply plan should be construed to require local governments, public or privately owned utilities, special districts, self-suppliers, multi-jurisdictional entities, and other water suppliers to select that identified project. If the projects identified in this plan update are not selected by an utility, the utility will need to identify another method to meet its needs and advise the South Florida Water Management District of the alternative projects(s), and a local government will need to include such information in its water supply facilities work plan.

One reason a project may not be selected for implementation is need. Several utilities have proposed projects that exceed the projected demands for 2030 (see **Chapter 6**). As happened with the previous plan update, utilities may replace or eliminate projects that are not needed, or defer projects beyond the twenty-year planning horizon of this update.

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Table F-1. Proposed water supply development projects utilizing a freshwater source. [a]

County	Utility/Entity	Project Count	Project	Completion Date	Total Capital Costs ($M)	Cumulative Treatment Capacity (MGD)	
						2020	2030
Palm Beach	Palm Beach County Water Utilities Department	1.	WTP 2 Expansion	2025	$15.00	0.00	8.50
	Wellington Public Utilities Department	2.	WTP Low Pressure RO Expansion – Phase 1 and 2 (efficiency improvements)	2025	$0.80	0.50	1.40
				Totals	**$15.80**	**0.50**	**9.90**

a. Key to abbreviations: $M – millions of dollars; MGD – million gallons per day; RO – reverse osmosis; WTP – Water Treatment Plant

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Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply

Table F-2. Proposed water supply development projects utilizing a brackish water source. [a]

County	Utility/Entity	Project Count	Project	Completion Date	Total Capital Costs ($M)	Cumulative Treatment Capacity (MGD)	
						2020	2030
Broward	Broward County Water & Wastewater Services	1.	District 1A Treatment Plant Expansion (RO WTP, Floridan wells, and a disposal well)	2017	$41.10	1.50	2.50
	Davie, Town of	2.	RO Addition to WTP	2030	$16.00	0.00	6.00
	Fort Lauderdale, City of	3.	Dixie Floridan Water Supply/WTP	2030	$22.90	0.00	6.00
	Hollywood, City of	4.	RO Expansion (one train and two Floridan wells)	2027	$7.10	0.00	2.00
	Lauderhill, City of	5.	Floridan Well and RO WTP Phase I (disposal well and RO WTP)	2017	$27.50	1.00	1.00
		6.	Floridan Well and RO WTP Phase 2 (expansion of RO WTP)	2018	$5.50	0.00	2.00
	Tamarac, City of	7.	RO WTP	2022	$19.00	0.00	2.00
Miami-Dade	Miami-Dade Water & Sewer Department	8.	South Miami Heights RO WTP	2015	$194.70	20.00	20.00
		9.	Hialeah Floridan Aquifer RO WTP Phase 2 and 3 (including concentrate disposal)	2026	$37.80	0.00	7.50
	North Miami Beach, City of	10.	Floridan Wells, Lines, Mains, and RO WTP Phases 2 and 3	planned	$8.21	12.50	12.50
		11.	Floridan Wells, Lines, Mains, and RO WTP Phase 4	planned	$37.50	0.00	5.00
				Totals	**$417.31**	**35.00**	**66.50**

a. Key to abbreviations: $M – millions of dollars; MGD – million gallons per day; RO – reverse osmosis; WTP – water treatment plant.

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Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply

Table F-3. Proposed stormwater and surface water capture projects. [a]

County	Utility/Entity	Project Count	Project	Water Source Type	Completion Date	Total Capital Costs ($M)	Cumulative Project Capacity (MGD)	
							2020	2030
Palm Beach	West Palm Beach Public Utilities, City of	1.	ASR Well Reactivation at Clear Lake	surface water	2013	$10.00	8.00	8.00
		2.	C-17 Pump Station	stormwater	2020	$2.50	8.00	8.00
Miami-Dade	Florida City Water and Sewer Department, City of	3.	Stormwater Reuse Program	stormwater	planned	$13.50	0.35	0.35
		4.	Friedland Manor Stormwater for Indirect Potable Use	stormwater	planned	$30.30	0.65	0.65
					Totals	**$56.30**	**17.00**	**17.00**

a. Key to abbreviations: ASR – aquifer storage and recovery; $M – millions of dollars; MGD – million gallons per day.

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Table F-4. Reclaimed water development projects. [a]

County	Utility/Entity	Project Count	Project	Completion Date	Total Capital Costs ($M)		Cumulative Distribution Capacity [b] (MGD)		Cumulative Treatment Capacity (MGD)	
					Distribution Project	Treatment Project	2020	2030	2020	2030
Palm Beach	Boca Raton, City of	1.	Recycling of Membrane Concentrate for Reuse Water	2013	$2.00	-	4.25	4.25	-	-
	Boynton Beach, City of	2.	Reclaimed Water Transmission Phase 2 (US 1 Corridor & Cypress Creek)	2014	$2.00	-	1.00	1.00	-	-
		3.	Leisureville Golf Course	2014	$2.00	-	0.65	0.65	-	-
		4.	Seacrest Boulevard Water Line	2013	$0.26	-	0.10	0.10	-	-
	Delray Beach Water & Sewer Department, City of	5.	Reclaimed Water (Area 12A Phase 1 – Barrier Island South, Atlantic Avenue to Casuarina Road, and Gleason Street trunk line)	2013	$1.70	-	0.25	0.25	-	-
		6.	Reclaimed Water (Area 12A Phase 2 and Area 12B Barrier Island South)	2014	$1.20	-	0.25	0.25	-	-
	Palm Beach County Water Utilities Department	7.	Morikami Reclaimed Pump Station	2013	$0.05	-	2.00	2.00	-	-
	Seacoast Utility Authority	8.	Nanofiltration Concentrate Blending for Reuse Water	2013	-	$4.50	-	-	3.00	3.00
	Wellington Public Utilities Department	9.	Phased Reclaimed System Expansions	2011-2030	$0.01	-	1.30	2.90	-	-
Broward	Broward County Water & Wastewater Services	10.	Reclaimed Water Highlands Pompano Beach	2013	$6.50	-	0.30	0.30	-	-
	Davie, Town of	11.	Reclaimed Water Facility	under way	-	$7.50	-	-	3.50	3.50
	Margate, City of	12.	WWTP Effluent Reuse System	2015		$9.50			1.50	1.50
	North Springs Improvement District	13.	Water Reuse Plant	2017	-	NA	-	-	4.00	4.00
	Pompano Beach, City of	14.	Reuse Distribution Expansion Program through Fiscal Year 2025	under way	$5.70	-	1.40	2.20	-	-
		15.	Broward County Reuse Distribution	under way	NA	-	0.10	0.10	-	-
	Sunrise, City of	16.	Irrigation Reuse at the Sawgrass WWTP	2018	-	NA	-	-	2.00	4.00
Miami-Dade	Miami-Dade Water & Sewer Department	17.	North District WWTP Reuse	2025	-	$13.50	-	-	0.00	7.00
		18.	Central District WWTP Reuse – Floridan Aquifer Recharge [c]	2025	-	NA	-	-	0.00	0.00
		19.	West District Canal Water Reclamation Plant Recharge Phase 2	2021	-	$665.00	-	-	0.00	21.00
		20.	West District Canal Water Reclamation Plant Recharge Phase 3	2021	-	$593.00	-	-	0.00	16.00
		21.	Biscayne Coastal Wetlands Rehydration	2022	-	$1,120.00	-	-	0.00	89.00
		22.	South District WWTP – FPL Distribution (72-inch pipeline)	2021	$95.00	-	0.00	90.00	-	-
Monroe	FKAA	23.	Reclaimed Water Systems in Unincorporated Monroe County	2015	-	$12.00	-	-	1.00	2.10
Totals					$116.42	$2,425.00	11.60	104.00	15.00	151.10

a. Key to abbreviations: $M – millions of dollars; FKAA – Florida Keys Aqueduct Authority; FPL – Florida Power & Light; MGD – million gallons per day; NA – information not available; WWTP – wastewater treatment plant.

b. The 11 projects of distribution capacity are not included in **Tables F-6** and **F-7** to avoid double counting of overall reuse capacity.

c. Central District Wastewater Treatment Plant Reuse – Floridan Aquifer Recharge 27.10 MGD was not included in capacity totals.

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Table F-5. Proposed water conservation projects. [a]

County	Utility/Entity	Project Count	Project	Completion Date	Total Capital Costs ($M)	Cumulative Project Capacity (MGD)	
						2020	2030
Broward	Broward County Water Partnership (includes municipalities of Coconut Creek, Cooper City, Coral Springs, Broward County, Dania Beach, Davie, Deerfield Beach, Fort Lauderdale, Hallandale Beach, Hollywood, Hillsboro Beach, Lauderhill, Margate, Miramar, Pembroke Pines, Plantation, and Sunrise)	1.	High Efficiency Toilet Replacement and Conservation Devices/Credit Program	under way	NA	0.00	30.00
	Pompano Beach, City of	2.	Conservation and Irrigation Restrictions	2025	NA	0.10	0.10
Miami-Dade	Miami-Dade Water & Sewer Department	3.	Conservation Program	2030	$20.00	12.01	15.19
Monroe	Florida Keys Aqueduct Authority	4.	Low Flow Fixture Distribution	under way	$0.25	0.10	0.15
				Totals	**$20.25**	**12.21**	**45.44**

a. Key to abbreviations: $M – millions of dollars; MGD – million gallons per day; NA – information not applicable.

Table F-6. Summary of proposed new water supply development projects by source. [a]

Potable/Nonpotable	Project Type	Number of Projects	Total Capital Costs ($M)	Cumulative Project Capacity (MGD)	
				2020	2030
Potable	Freshwater Source	2	$15.80	0.50	9.90
	Brackish Water Source	11	$417.31	35.00	66.50
Nonpotable	Stormwater and Surface Water Capture	4	$56.30	17.00	17.00
	Reclaimed Treatment Capacity	11	$2,425.00	15.00	151.10
	Totals	**28**	**$2,914.41**	**67.50**	**244.50**

a. Key to abbreviations: $M – millions of dollars; MGD – million gallons per day.

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Table F-7. Summary of all proposed potable, nonpotable, and conservation projects. [a]

Project Type	Number of Projects/Programs	Total Capital Costs ($M)	Cumulative Project Capacity (MGD)	
			2020	2030
Potable	13	$433.11	35.50	76.40
Nonpotable	15	$2,481.30	32.00	168.10
Conservation	4	$20.25	12.21	45.44
Totals	**32**	**$2,934.66**	**79.71**	**289.94**

a. Key to abbreviations: $M – millions of dollars; MGD – million gallons per day.

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Meeting South Florida's water supply needs while safeguarding its natural systems requires innovative solutions, cohesive planning, and a shared vision.

South Florida Water Management District

Committed to managing and protecting our region's water resources

South Florida Water Management District
3301 Gun Club Road • West Palm Beach, Florida 33406
561-686-8800 • FL WATS 1-800-432-2045 • www.sfwmd.gov
MAILING ADDRESS: P.O. Box 24680 • West Palm Beach, FL 33416-4680

sfwmd.gov

Attachment: LEC_App_final_draft_2013 (1466 : Enter a Final Order Approving the 2013 LEC Water Supply Plan Update)

M E M O R A N D U M

TO: Governing Board Members

FROM: Karen Estock, Division Director

DATE: September 12, 2013

SUBJECT: Directing staff to move forward to analyze options for disposal of 12,341 acres

Background:
Over six decades, the South Florida Water Management District has acquired nearly 1.5 million acres of land within its 16-county jurisdiction to support flood control infrastructure, protect water resources and restore impaired ecosystems. As part of a broad effort to maximize its resources to meet mission-critical responsibilities, the District is conducting a comprehensive land assessment to ensure that each parcel is being put to its most effective use. For the land assessment process, the 16-county District has been divided into five geographic regions for which each parcel of District land is thoroughly analyzed to determine how its current use contributes to the agency's core mission of balancing and improving water quality, flood control, natural systems and water supply. The completion of the comprehensive process for this region has resulted in conclusions involving the potential for surplus with respect to tracts comprising 12,341 acres, more or less, located in the Palm Beach, Broward, and Miami-Dade Counties. The tracts are depicted and the respective background facts and considerations are briefly summarized on Exhibits “A-1” through “A-5” attached hereto and made a part hereof.

It is intended that District staff will now further analyze options for their potential surplus and thereafter propose recommendations to the Governing Board for further consideration. With respect to these subject tracts, they may be offered by the District to another governmental entity pursuant to terms and conditions approved by the Governing Board, they may be conveyed as part of an exchange transaction upon terms and conditions approved by the Governing Board, or they may be offered to the public for bid and be sold for the highest price obtainable but not less than the appraised value. Whatever tracts or portions thereof are further considered for surplus, the final acres and applicable market values may be altered based on certain easement rights that may be reserved and/or certain cut outs that may occur. With respect to any of the subject tracts, the conveyance of the fee title may be subject to certain reservations and/or adjustments because of project needs or other considerations. All disposals shall be conditioned on United States Army Corps of Engineers and Florida Department of Environmental Protection approval where required.

How this helps meet the District’s 10-year Strategic Plan:
The continuation of the land assessment process represented by this item, contributes to the agency's core mission of balancing and improving water quality, flood control, natural systems and water supply.

Funding Source:
All disposals shall be subject to funding source requirements.

This Board item impacts what areas of the District, both resource areas and geography:
The item will fall under the entire Operations, Maintenance and Construction Division resource area.

What concerns could this Board item raise?
There are no concerns regarding this Board item.

Why should the Governing Board approve this item?
As stated herein, the land assessment process is being conducted as part of a broad effort to maximize District resources to meet mission-critical responsibilities and ensure that land is being put to its most effective use. With approval of this item, further necessary analysis will be conducted to allow further recommendations to the Governing Board regarding the potential surplus of specific tracts or portions thereof.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0922

A Resolution of the Governing Board of the South Florida Water Management District, directing staff to move forward to analyze options, including but not limited to, disposal of land interests containing 12,341 acres, more or less, in Palm Beach, Broward, and Miami-Dade Counties, together with any structures and improvements and personal property appurtenant thereto, and thereafter propose recommendations to the Governing Board for further approval; providing an effective date. (OMC, Ray Palmer, ext. 2246)

WHEREAS, as part of a land assessment process conducted by District staff, certain lands containing a total of 12,341 acres, more or less, located in the Palm Beach, Broward, and Miami-Dade Counties have been identified as potentially being surplus to District needs; and

WHEREAS, the Governing Board, pursuant to Section 373.056, Florida Statutes, has the authority to convey to any governmental entity, land or rights in land owned by the District not required for its purposes, under terms and conditions determined by the Governing Board; and

WHEREAS, the Governing Board, pursuant to Section 373.089, Florida Statutes, has the authority to convey as part of an exchange transaction, land or rights in land owned by the District not required for its purposes, under terms and conditions determined by the Governing Board; and

WHEREAS, the Governing Board, pursuant to Section 373.089, Florida Statutes, has the authority to sell lands, or interests, or rights in land owned by the District not required for its purposes, for the highest price obtainable, but not less than the appraised value; and

WHEREAS, the Governing Board concurs with staff that the land assessment process has identified certain lands as potentially being surplus to District needs and directs staff to move forward to analyze the options, including but not limited to, disposal of the subject lands and thereafter propose recommendations to the Governing Board for further approval.

NOW THEREFORE, **BE IT RESOLVED** by the Governing Board of the South Florida Water Management District:

Section 1: The Governing Board of the South Florida Water Management District hereby concurs with the staff that the land assessment process has identified certain lands described in Exhibits “A-1” through “A-5” attached hereto and made a part hereof, together with any structures and improvements and personal property appurtenant thereto, containing a total of 12,341 acres, more or less, located in the Palm Beach, Broward, and Miami-Dade Counties as potentially being surplus to District needs.

Section 2: The Governing Board directs staff to move forward to analyze the options, including but not limited to, disposal of the subject lands and thereafter propose recommendations to the Governing Board

for further approval, which recommendations may include: (i) conveying to a governmental entity upon terms and conditions approved by the Governing Board in accordance with the provisions of Section 373.056 Florida Statutes, (ii) conveying as part of an exchange transaction upon terms and conditions approved by the Governing Board in accordance with the provisions of Section 373.089 Florida Statutes, and/or (iii) offering to the public for bid and sold for the highest price obtainable, but in no event less than the appraised value, in accordance with the provisions of Section 373.089, Florida Statutes.

Section 3: All disposals will be subject to funding source requirements, and conditioned on United Stated Army Corps of Engineers and/or Florida Department of Environmental approval where required.

Section 4: This Resolution is effective immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

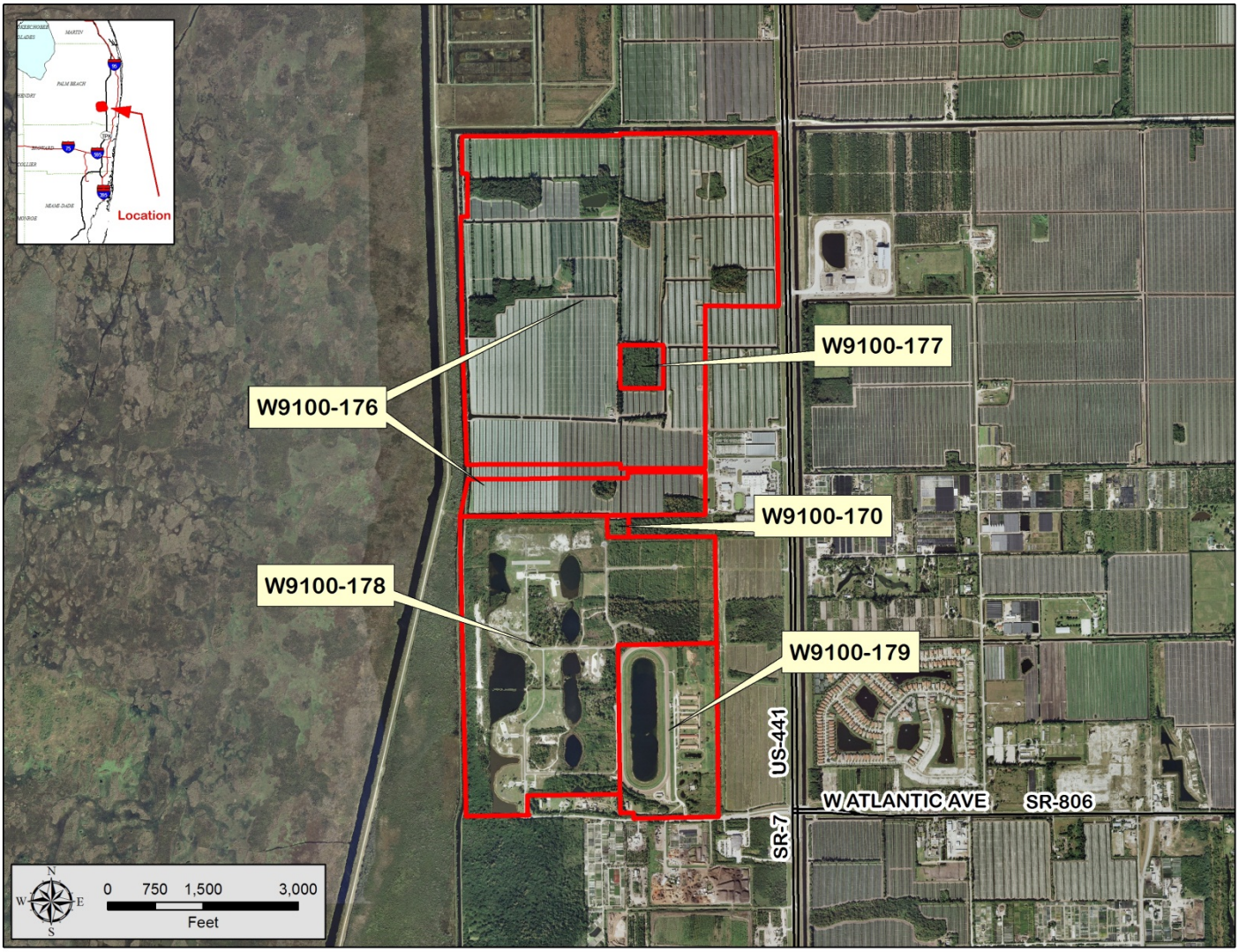
Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

EXHIBIT A-1
Exchange or Surplus



Palm Beach County
East Coast Buffer - Palm Beach County Ag. Reserve Reservoir

W9100-176 (~570.77 acres)
W9100-177 (~10.47 acres)
W9100-178 (~313.37 acres)
W9100-170 (~2.6 acres)
W9100-179 (~97.01 acres)

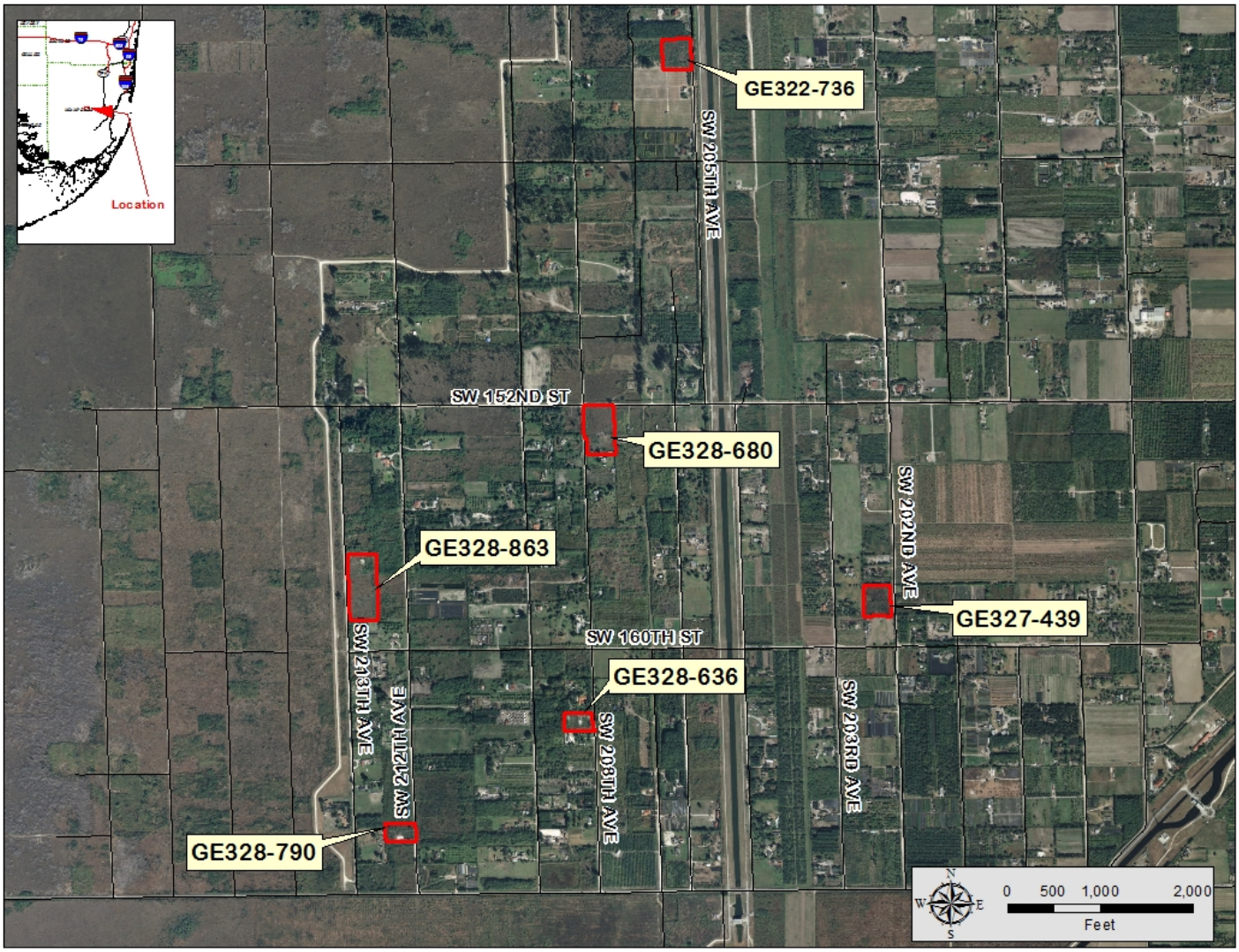
There are three leases on this site: (W9100-176) a pepper farm operation, (W9100-179) an equestrian training facility, and (W9100-178) a lease to Palm Beach County for the operation of the West Delray Regional Park. Due to proximity to the Loxahatchee Wildlife Refuge, staff recognizes that there may be an interest by either the County or USFWS to acquire the property from the District. The District no longer has an interest in the property for water management purposes, and has no other planned use for the property.

The further evaluation of these tracts will determine if there is an interest on the part of Palm Beach County or the U.S. Fish and Wildlife Service to acquire the land, and if not, staff will consider the exchange or surplus of the District's fee-simple interest in the sites.

Funding: Federal, Palm Beach County and District-CERP

Attachment: da_om_203_Region 5_Exhibits_v6 (Resolution No. 2013 - 0922 : Directing staff to move forward to analyze options for disposal of

EXHIBIT A-2
Exchange or Surplus



Miami-Dade County
East Coast Buffer - 8½ SMA

GE328-636 (~1.26 acres)
GE327-439 (~2.24 acres)
GE328-790 (~1.44 acres)
GE328-863 (~5.04 acres)
GE328-680 (~3.76 acres)
GE322-736 (~2.31 acres)

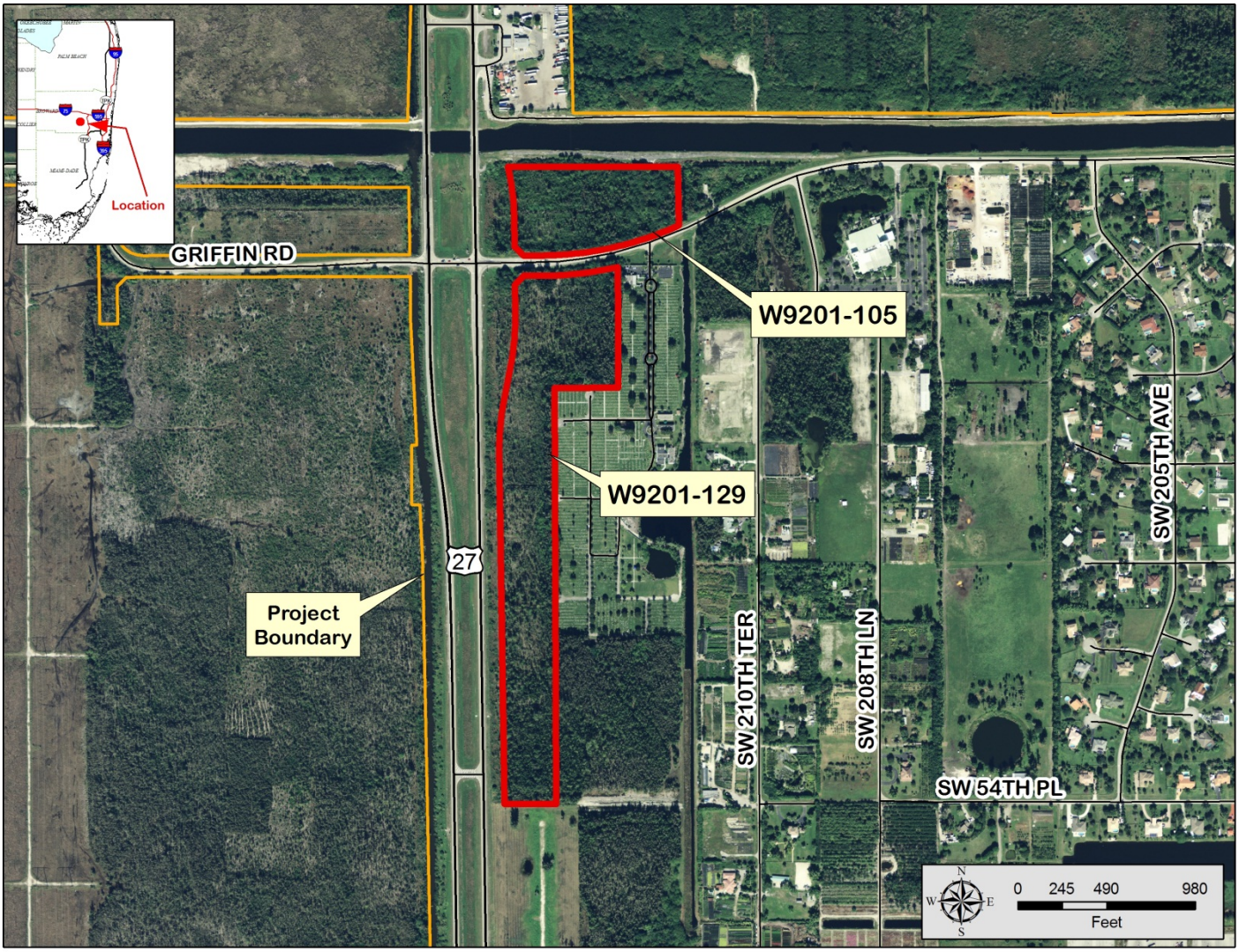
The 81/2 Square Mile Area project included the construction of a levee and a seepage collection canal to allow for greater water flows into the northeastern portion of Everglades National Park. These parcels are isolated tracts that lie outside the project boundary in a rural residential area. The area to the west of the new levee and west of these parcels contains large areas of marsh and wet prairie. The District no longer has an interest in the properties for project purposes, and has no other plans for the properties.

The further evaluation of these tracts will consider the exchange or surplus of the District's fee-simple interest in the sites.

Funding: District

Attachment: da_om_203_Region 5_Exhibits_v6 (Resolution No. 2013 - 0922 : Directing staff to move forward to analyze options for disposal of

EXHIBIT A-3
Exchange or Surplus



Broward County
East Coast Buffer – Broward WPA - Griffin Road Parcel
W9201-105 (~9.24 acres)
W9201-129 (~23.41 acres)

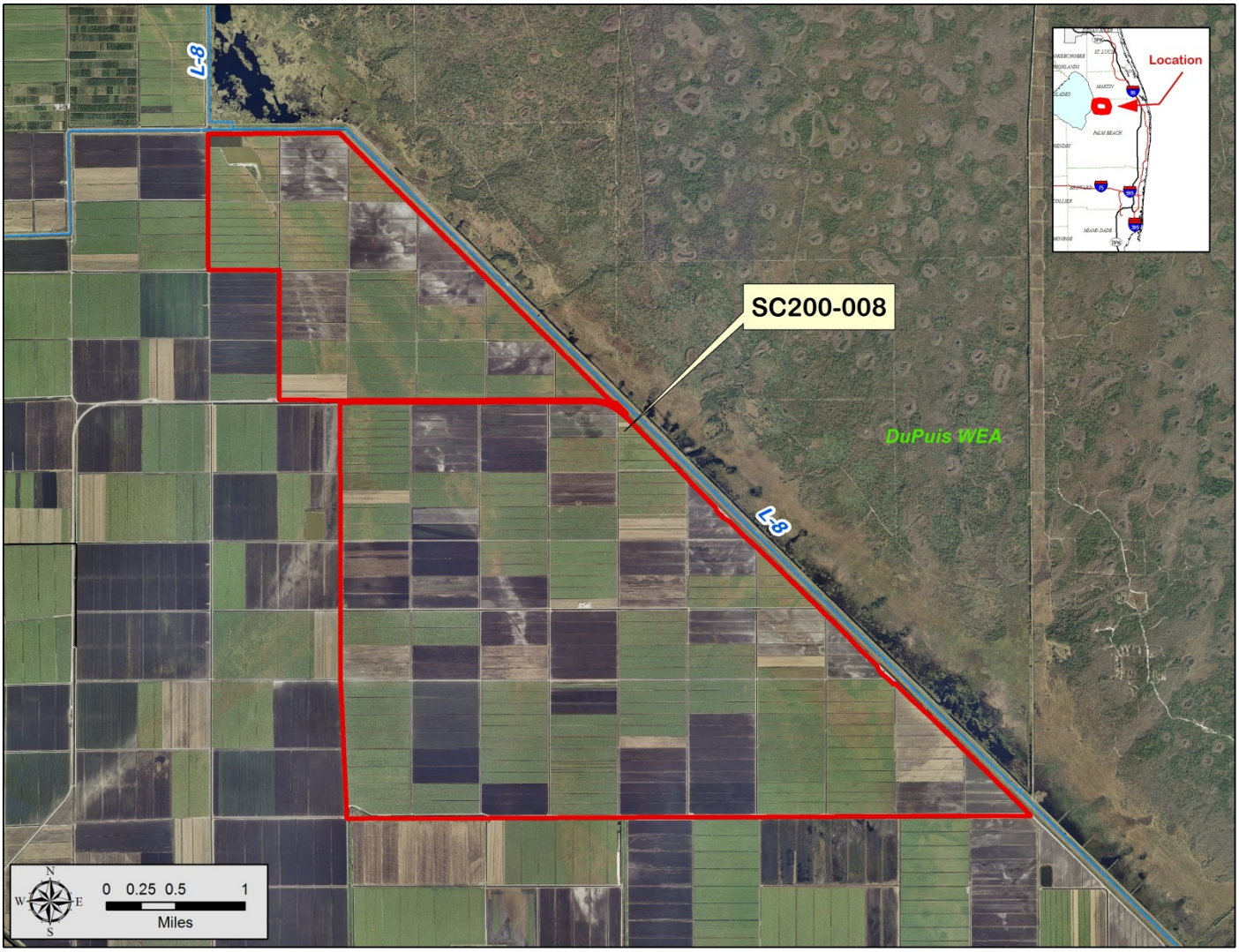
These parcels lie outside the approved project boundary and are not needed for the BCWPA project. The size and location of the Griffin Road parcels are not adequate to support other District initiatives.

The further evaluation of these tracts will consider the exchange or surplus of the District's fee-simple interest in the sites.

Funding: Federal and P-2000

Attachment: da_om_203_Region 5_Exhibits_v6 (Resolution No. 2013 - 0922 : Directing staff to move forward to analyze options for disposal of

EXHIBIT A-4
Exchange



Palm Beach County
Unassociated Parcels - L-8 Parcel
SC100-008 (~8,712.67 acres)

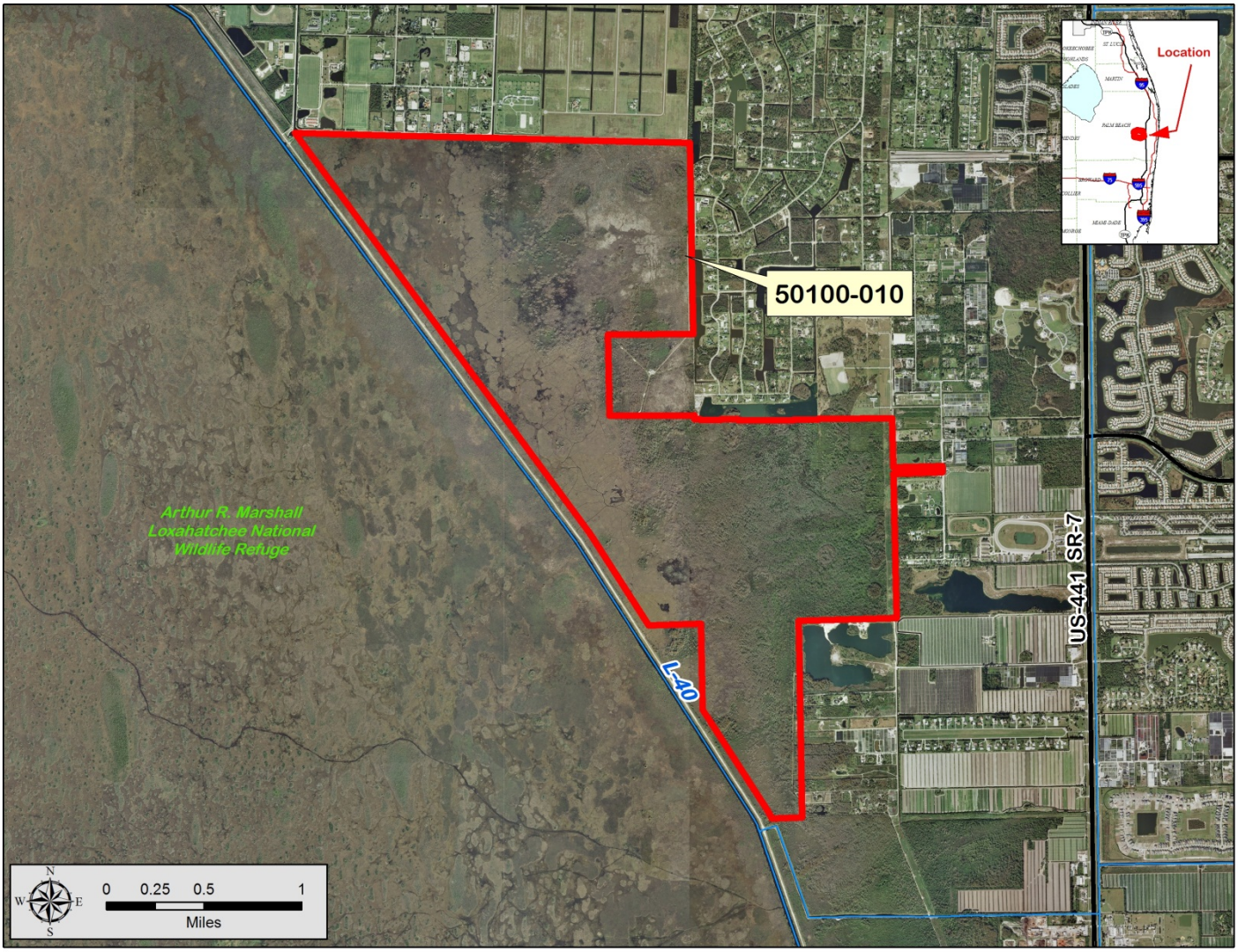
The EAA L-8 Parcel was purchased by the District in 2010. The parcel is not part of a Restoration Strategies project footprint, but negotiations are in progress for potential exchange of lands suitable for possible expansion of STA-1W project. This parcel is under lease for sugar cane production and provides no significant wildlife habitat and no public use.

The further evaluation of this tract will consider continuing negotiations for an exchange of the District's fee-simple interest in the site for lands needed for the expansion of STA1W stormwater treatment facilities. Those lands will better support the District's core mission objectives.

Funding: District

Attachment: da_om_203_Region 5_Exhibits_v6 (Resolution No. 2013 - 0922 : Directing staff to move forward to analyze options for disposal of

EXHIBIT A-5
Exchange



Palm Beach County
50100-010 Strazzulla parcel (~2,585.12 acres)

The wetlands on this site serve as an important buffer between urban uses and the Loxahatchee wildlife Refuge. The site provides water quality, flood protection, and natural systems management benefits. This area marked a transition from the flatwood-associated wet prairies and the Everglades mosaic. The District has been negotiating a transfer of ownership to the U.S. Fish and Wildlife Service for inclusion in the Refuge. A proposed exchange of lands on terms acceptable to both parties would be beneficial to both the Department of the Interior and to the District's core mission objectives.

The further evaluation of this tract will consider continuing negotiations with the Department of Interior for an exchange of the District's fee-simple interest in the site for lands within the EAA that will better support the District's core mission objectives while ensuring that this property remain in conservation.

Funding: P-2000 and WMLTF

Attachment: da_om_203_Region 5_Exhibits_v6 (Resolution No. 2013 - 0922 : Directing staff to move forward to analyze options for disposal of

M E M O R A N D U M

TO: Governing Board Members

FROM: Dan DeLisi, Chief of Staff

DATE: September 12, 2013

SUBJECT: Naples - Reclaimed Water System Distribution Expansion – Phase III

Agenda Item Description
This item is to seek District Governing Board authorization to enter into one-year cost-share agreements with the City of Naples, which will provide partial funding to support the construction of Phase III of the City's Reclaimed Water System Distribution Expansion project, an alternative water supply development project.

Background
The Big Cypress Basin Board has been providing financial assistance to the City of Naples for several years to support construction of projects for enhancing alternative water supplies. The funding provided in this agreement is to continue the construction of the City's Reclaimed Water System Distribution Expansion project to provide alternative water supply for irrigation. The scope of work for Phase III includes the installation of approximately 17,000 linear feet of 12" and 8" reclaimed water distribution main, including all associated valves and appurtenances.

The agreement shall commence on October 1, 2013 and terminate on September 30, 2014. Individual projects were identified, scoped and budgeted to fit within the coming fiscal year and staff is confident that this project will be completed within FY14. This item was reviewed and approved by the Big Cypress Basin Board on May 16, 2013.

Core Mission and Strategic Priorities
This program supports the District's core missions of alternative water supply development and improvement of water quality as set forth in the priorities of the 10-Year Strategic Plan. This project will assist the City of Naples in meeting the future demands for alternative water supply.

Funding Source
The total construction cost of the project is estimated to be $4,500,000. The District's contribution is not to exceed $1,000,000 in dedicated Big Cypress Basin ad valorem funds, budgeted for FY14.

Staff Recommendation
Staff recommends approval for authorization to enter into a one-year cost-share agreement with the City of Naples for providing partial funding to support construction of Phase III of this project.

If you have any questions, please call me at ext. 6232.

DD/mg

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Resolution No. 2013 - 0923

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering into a one year agreement with the City of Naples in the amount not to exceed $1,000,000, for the construction of Phase III of the City's Reclaimed Water System Distribution Expansion project, for which dedicated FY14 Big Cypress Basin ad valorem funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (EXO, Dan Delisi, ext. 6232)

WHEREAS, the Governing Board of the South Florida Water Management District deems it necessary, appropriate and in the public interest to authorize entering into a one (1) year cooperative agreement with the City of Naples for the construction of the Reclaimed Water System Distribution Expansion Phase III project, for the not to exceed amount of $1,000,000, for which dedicated Big Cypress Basin funds are budgeted; subject to Governing Board approval of the FY14 budget; providing an effective date. (Agreement Number 4600002928)

NOW AND THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT:

Section 1. The Governing Board of the South Florida Water Management District hereby authorizes the execution of the Agreement Number 4600002928 with the City of Naples.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED and **ADOPTED** this 12th day of September, 2013.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD
By:

_____
Chairman

Attest:

_____
District Clerk/Secretary

Legal form approved:
By:

_____
Office of Counsel

Print name:

_____

M E M O R A N D U M

TO: Governing Board Members

FROM: Doug Bergstrom, Director, Administrative Services Division

DATE: September 12, 2013

SUBJECT: Monthly Financial Statement – July 2013

The attached financial status report is provided for your review. This report provides a high level snapshot of District financial activity and includes revenue collections by source and expenditures by program. Also attached is a summary in the State Program format in compliance with Chapter 373.536(4)(e) F.S., requiring each District to provide a monthly financial statement in the form and manner prescribed by the Department of Financial Services to the District's Governing Board and make such monthly financial statement available for public access on its website. This unaudited financial statement is provided as of July 31, 2013, with 83% of the fiscal year completed.

Schedule of Sources and Uses – This financial statement compares revenues received and encumbrances / expenditures made against the District's FY2013 $622.2 million consumable budget. Encumbrances represent orders for goods and services which have not yet been received.

- As of July 31, 2013, with the fiscal year 83% complete, 90.0% of the District's budgeted operating revenue (excludes fund balance) has been collected. The primary source of operating revenue received to date is taxes. Ad Valorem taxes comprise 68% of the budgeted operating revenues and drive collections based on the annual cycle of the property tax bill. The remaining revenue source is fund balance which represents the amount of prior year residual revenue that is budgeted in the current year and has already been received. Total FY2013 sources collected were 93.7% of budget or $582.9 million.

- As of July 31, 2013, 99.3% of budgeted Ad Valorem tax revenue and 102.1% of budgeted Agricultural Privilege tax revenue have been collected. Ad Valorem and Agricultural Privilege tax collections peak November through January driven by the mailing of property tax bills in October and the 4% maximum discount available when paid in full by November 30. These taxes are budgeted at a discounted rate of 95% to allow for the discounts property owners may take advantage of through early payment options. Historical ad valorem trends for the past five years through July support an average collection rate of 98.3%. Ad Valorem tax revenue will receive one more boost in receipts during the last quarter when June tax certificates are sold by the county tax collectors for delinquent property tax bills.

- As of July 31, 2013, 32.6% of budgeted intergovernmental revenues have been collected. In addition to reimbursement agreements, intergovernmental revenues include proceeds from the sale of Indian River Lagoon and Everglades license plates. Revenue received through July for the sale of license plates totals $297K. The bulk of intergovernmental revenue is from reimbursements from the Save Our Everglades Trust Fund, Water Management Lands Trust Fund, and the Florida Fish and Wildlife

Attachment: Monthly Financial Statement Memo July FY13 (1451 : Monthly Financial Statement - July 2013)

Conservation Commission. Reimbursement requests are submitted to the state based on actual expenses incurred and are typically received later in the fiscal year.

- As of July 31, 2013, $3.6 million or 73% of budgeted Investment Earnings have been realized. The District budgeted $4.95 million in investment earnings for FY2013 distributed as follows: $4.59 million in ad valorem funds and $362K in non-ad valorem funds. Year to date interest earnings in ad valorem funds amount to $3.0 million or 65.5% of the budgeted amount, while interest earnings in non-ad valorem funds amount to $610K or 168.5% of the budgeted level. Projected interest earnings in FY2013 in ad valorem funds amount to $3.5 million which is a shortfall of $1.1 million. This will be offset by greater than budgeted revenues from USACE reimbursements, surplus sale proceeds, and permit fees. Investment earnings reflect a downward trend over the past years and are representative of lower cash balances, reduced ad valorem tax levies and lower interest rate yields.

- Lease revenue represents amounts collected from leases of real property owned by the District. The timing of revenue received is based on the fee schedules within the agreements – monthly, semi-annual or annual payments – and these varying timing issues impact the collection rate. The District has currently collected $3.5 million which represents 145.4% of the current year budgeted lease revenue of $2.4 million. The use of lease revenue collected for lands purchased with State or Federal funds is restricted based on the guidelines in the acquisition or grant.

- Budgeted licenses, permits and fees revenue is from water use permits, environmental resource permits and right of way permits. FY2013 income received totals $19.4 million and is primarily due to unbudgeted receipts of $16.7 million from dedicated Lake Belt and Wetland mitigation fees from restoration projects and fees for mining tonnage removed. The balance of receipts includes permit fees $819K (100.8% of budgeted revenue) and licenses/miscellaneous fees of $1.8 million (121.8% of budgeted revenue). Based on current trend data, there is a projected surplus in environmental resource permit revenue of $708K, and there is a projected surplus in water use permits of approximately $130K.

- Budgeted revenue in the Other category includes $275K in civil penalties and enforcement fees and $250K in miscellaneous revenues such as cash discounts, insurance reimbursements, refunds for prior year expenditures, and sale of recycled oil and scrap metal. Fiscal year collections amount to $667K representing 127% of the budgeted $525K.

- Sale of District Property represents the sale of real property and land. This is budgeted conservatively at $250,000 due to the uncertainty involved. FY2013 revenues received total $483K.

- Self-insurance premiums represent the District's contribution and the contribution from active and retired District employees to the self-funded health benefits program. Also included is the District's contribution to the workers compensation, auto and general liability self-insurance program. Contributions of $24.0 million received through July equate to 93.4% of the $25.7 million budget and reflect monthly premiums.

Attachment: Monthly Financial Statement Memo July FY13 (1451 : Monthly Financial Statement - July 2013)

Expenditure and Encumbrance Status:

As of July 31, 2013, with 83% of the year complete, the District has expended **$323.1 million or 57.9%** and has encumbered **$98.8 million or 17.7%** of its non-reserve budget. The District has obligated (encumbrances plus expenditures) **$421.9 million** or **75.7%** of its non-reserve budget.

Summary of Expenditures and Encumbrances by Program – This financial statement illustrates the effort to date for each of the District's program areas. Provided below is a discussion of the primary uses of funds by program.

- The **Comprehensive Everglades Restoration Plan Program** has obligated 50.4% and expended 20.6% of their $124.7 million budget. Principal expenditures include personnel services ($4.8 million), contractual services ($3.4 million), operating ($878K), and capital outlay ($16.7 million). Contractual services and operating encumbrances ($7.8 million) and capital outlay encumbrances ($29.3 million) include the following projects: L-8 Flow Equalization Basin (FEB), C-44 Reservoir/STA Project, CERP Monitoring and Assessment, CERP Water Quality Studies, C-111 Spreader Canal, Southern CREW, Loxahatchee Impoundment Landscape Assessment, Picayune Strand, South Miami Dade Seasonal Operations Study, Biscayne Bay Coastal Wetlands, WCA3 Decompartmentalization and Sheetflow Equalization, CERP Data Management updates, Nubbin Slough STA/Pump Station Repairs, and Modified Water Deliveries & South Dade C-111 Project. Of the $61.9 million in available balance, $26.1 million is intended for the Mecca land acquisition, $4.8 million for indirect costs which typically get posted at year end, and $20.7 million has been re-budgeted to FY14 for L-8 FEB Pump Station, C-111 South Contract #8, C-44 Reservoir/STA Project, Cost Share with City of WPB on the Loxahatchee Watershed Restoration Project, Southern CREW (Ronto Settlement), CERP Water Quality Studies, C-111 Soil Moisture Study, and Risk Management; $8 million is deferred to future multi-year spend down plan projects.

- The **Coastal Watersheds Program** has obligated 79.6% and expended 43.2% of their total $17.9 million budget. Principal expenditures include personnel services ($2.6 million), contractual services ($4.5 million), operating ($91K), and capital outlay ($451K). Contractual services encumbrances primarily consist of interagency agreements ($5.3 million) including: St. Lucie River and Indian River Lagoon Initiatives Projects; St. Lucie River License Tag Projects in Martin, St. Lucie, and Palm Beach counties; Loxahatchee River Preservation Initiative Projects; Big Cypress Basin Stormwater Projects; Spanish Creek/Four Corners; Miami Gardens NW 178th Dr. Stormwater Retrofit; Miami River Ecosystem Restoration; El Portal Stormwater Improvements; Mirror Lakes/Halfway Pond Rehydration; and Lakes Park Restoration. Remaining contractual encumbrances ($1 million) include: St. Lucie River and Caloosahatchee River Regulatory Source Controls; Loxahatchee River and St. Lucie River Watershed Research and Water Quality Monitoring; Florida Bay and Coastal Wetlands Project; Lake Trafford Biological Monitoring; Big Cypress Basin Saltwater Network Plan; Big Cypress Basin Real-time Hydrologic Monitoring and Modeling System; public process to development a restoration vision of the Caloosahatchee River and Estuary; refinement of hydrological model for Naples Bay; and Collier County Water Quality Monitoring. Capital outlay encumbrances ($185K) include environmental assessment and survey and mapping of Duda property and preliminary survey and geo-tech services and preliminary design for the Lake Hicpochee Hydrologic Enhancement project. Of the $3.6 million in available balance, $66,586 is for Indian River Lagoon License Tag projects; $34,556 is SOETF fund balance from a funds swap with state appropriated

funds; $8,839 is state appropriations for Florida Keys/Florida Bay which will be returned to the State; and $2.3 million has been re-budgeted to FY14 for Lake Hicpochee Hydrologic Enhancement project, C-43 Water Quality Testing Facility (BOMA), 28th Street Culvert Replacement (BCB), Indian River Lagoon Issues Team projects, Mirror Lakes/Halfway Pond Restoration, and modeling efforts in the St. Lucie River and Caloosahatchee River watersheds.

- The **District Everglades Program** has obligated 66.4% and expended 59.9% of their total $53.0 million budget. Principal expenditures include personnel services ($14.0 million), contractual services ($5.2 million), operating ($6.8 million), and capital outlay ($5.8 million). Contractual services encumbrances ($1.4 million) primarily include the operations monitoring, maintenance, and repair of Stormwater Treatment Areas (STA's), Diesel Oxidation Catalyst Installation, STA 1E Exterior Levee Certification, STA Structure Inspection Program, Sulfur Action Plan, and Everglades Regulation Source Control. Operating encumbrances ($478K) are in support of the overall operations and maintenance of vegetation and exotic plant control of the STA's. Capital outlay encumbrances ($1.5 million) include work on Everglades Agricultural Area A1 Flow Equalization Basin, and STA1W Expansion, completing Compartment C, G-250S and G-337 Pump Bearing replacement. Of the $17.8 million in available balance, $26K is for a cash payment to USACE for S-319, $1.2 million is for property appraiser and tax collector fees along with STA operations such as fuel, electricity, and chemicals, $13.7 million is allocated for Restoration Strategies and spend down plan projects of which $11.7 million is re-budgeted in FY14 for projects such as the A1 Flow Equalization Basin, STA1W Expansion, and the Science Plan.

- The **Kissimmee Watershed Program** has obligated 59.7% and expended 9.4% of their total $31.4 million budget. Principal expenditures include personnel services ($1.4 million), contractual services ($916K), operating ($27K), and capital outlay ($587K). Contractual services and operating encumbrances ($865K) primarily consist of the Kissimmee River Restoration Evaluation ($111K), Kissimmee Basin Modeling and Operating System ($520K), the Oak Creek project ($99K), Rolling Meadows ($9K), hydrologic monitoring ($71K), and land acquisition costs and environmental risk assessments ($55K). Capital outlay encumbrances ($15.0 million) are primarily for the Kissimmee River Restoration land acquisition cases. Of the $12.6 million in available balance, $524 is planned for the current year in such funds as mitigation funds for Rolling Meadows and Kissimmee Basin Hydrologic Monitoring projects, $3.0 million of authority is being re-directed in the current year for a payment to Department of Emergency Management for FEMA's de-obligation of funds for prior year hurricane expenses. $5.6 million of the balance has been re-budgeted to FY14: $3.2 million for external risk management and $2.4 million in mitigation funds for Rolling Meadows; $26K for Kissimmee River Restoration Evaluation Program and Kissimmee Basin Modeling and Operations Study; and $2.8 million is planned for a future year spend down plan obligation in FY15.

- The **Lake Okeechobee Program** has obligated 69.6% and expended 28.7% of their total $21.4 million budget. Principal expenditures include personnel services ($3.2 million), contractual services ($2.4 million), operating ($371K), and capital outlay ($154K). Contractual services and operating encumbrances ($8.7 million) primarily consist of the Dispersed Water Management (DWM) and Florida Ranchland Environmental Services Projects ($7.9 million), Information Technology Support ($337K), Northshore Navigation Canal project ($95K), Lake Okeechobee Watershed

Pre-Drainage Characterization study ($76K), Phosphorous Source Control project ($34K), Phosphorus Reduction projects ($37K), Water Quality Assessments and reporting ($93K), and Lakeside Ranch STA ($83K). Capital outlay encumbrances ($37K) are primarily for the Lakeside Ranch STA. Of the $6.5 million in available balance, $309K is planned for current year DWM projects; $5.1 million is allocated for spend down plan projects of which $3.8 million of the balance has been re-budgeted to FY14: $3.0 million for DWM, $739K for Lemkin Creek, and $66K for LO Watershed Pre-drainage Characterization project; and $1.3 million is planned for DWM in future years of the spend down plan.

- The **Land Stewardship Program** has obligated 66.5% and expended 49.2% of their total $18.2 million budget. Principal expenditures include personnel services ($3.3 million), contractual services ($4.5 million), operating ($882K), and capital outlay ($246K). Contractual and operating encumbrances ($2.8 million) include the maintenance of vegetation and exotic plant control, provision of law enforcement services, and management of District owned lands and facilities. Capital outlay encumbrances ($344K) are primarily for work on the C-139 Annex Mitigation project. Of the $6.1 million in available balance, $1.3 million in mitigation funds is for the 8.5 Square Mile Area Mitigation project of which $100K has been re-budgeted for environmental remediation work and the balance deferred to a future year, and $954K in mitigation and lease revenue funds is for the C-139 Annex, mitigation projects and land management activities.

- The **Mission Support Program** has obligated 76.5% and expended 69.5% of their total $51.6 million budget. Principal expenditures include personnel services ($19.1 million), contractual services ($5.2 million), operating ($10.2 million), and capital outlay ($1.1 million). Contractual services encumbrances ($2.5 million) include Information Technology consulting services, hardware, software, and systems maintenance for the fiscal year; facilities maintenance and repair services, and audit and legal professional services. Operating encumbrances ($1.1 million) include utilities, space rental, computer parts and supplies, printing and advertising. Capital outlay encumbrances ($47K) include computer hardware components; and engineering during construction for the upgrade to the Emergency Operations Center chiller system. Of the $12.1 million in available budget, the majority is for healthcare and insurance claims, $300K has been re-budgeted to FY14 to upgrade the chiller system to provide redundant cooling capacity for the IT data center, located within the Emergency Operations Center, and $200K for retiree healthcare benefits. An additional $5.7 million is reserved for future retiree healthcare benefits. The balance of the remaining budget will be used for facility and information technology maintenance and projects.

- The **Modeling and Science Support Program** has obligated 84.6% and expended 75.9% of their total $12.8 million budget. Principal expenditures include personnel services ($7.5 million), contractual services ($1.5 million), operating ($507K), and capital outlay ($126K). Contractual services and operating encumbrances ($1.1 million) include technical and peer reviews, computer hardware and software, organic analysis, sediment/water quality sampling, utilities, and equipment rental. Of the $2.0 million in available balance, $244K is planned for current year technical review, laboratory parts, supplies, maintenance, and repairs, $200K is re-budgeted to FY14 for spend down plan modeling support.

Attachment: Monthly Financial Statement Memo July FY13 (1451 : Monthly Financial Statement - July 2013)

- The **Operations and Maintenance Program** has obligated 94.7% and expended 84.5% of their total $142.0 million budget. Principal expenditures include personnel services ($44.7 million), contractual services ($37.0 million), operating ($28.4 million), and capital outlay ($9.7 million). Encumbrances for contractual services and capital outlay ($13.3 million) primarily relate to the O&M capital program for maintenance and repair of existing water management system canals and water control structures including C-41A Canal Bank Stabilization, North Shore Trash Rake Project, Miami B-47 Building Replacement, Hillsboro Canal Bank Stabilization Design, S-193 Navigation Lock Refurbishment, Diesel Oxidation Catalyst Installation, S-5A Hardening and Service Bridge Refurbishment, S-13 Repower and Automation, S-21 Cathodic Protection, Information Technology Shelters, BCB Field Station Design/Build, Central and Southern and Central Flood Control Structure Inspections, L-40 Exterior Levee Certification, East Coast Protective Levee, Central Bridges Repairs/Replacements, project culvert replacements, the SCADA Systems Study, Operations Decision Support System and Vertical Datum-NAVD88. Operating encumbrances ($1.0 million) are primarily associated with field station daily operations and maintenance including vegetation and exotic plant control for the Central and Southern Flood Control system. Of the $7.6 million in available balance, $1.8 million includes funds for health insurance for medical claims, FWC invasive plant fund for aquatic spraying, and expenses related to fuel.

- The **Regulation Program** has obligated 87.1% and expended 84.1% of their total $25.1 million budget. Principal expenditures include personnel services ($14.1 million), contractual services ($1.4 million), operating ($5.5 million), and capital outlay ($193K). Contractual services and operating encumbrances ($546K) include application development, permit scanning and support contractors, computer hardware and software, equipment rental, and fuel. Capital outlay encumbrances ($207K) consist primarily of the ePermitting enhancement project which saves time and expenses with online filing/searching of permits. Of the $3.2 million in available balance, $510K is planned for current year health insurance, $234K for items including North Oak Mitigation Project, and other operating expenses.

- The **Water Supply Program** has obligated 87.7% and expended 63.6% of their total $17.5 million budget. Principal expenditures include personnel services ($4.7 million), contractual services ($1.2 million), operating ($5.0 million), and capital outlay ($235K). Contractual services and operating encumbrances ($4.2 million) include the Caloosahatchee Rule Making ($58K), Central Florida Water Initiative (CFWI) ($401K), WaterSIP grants ($265K), Lower Floridan Aquifer (LFA) ($93K), interagency agreements for Alternative Water Supply projects ($1.7 million), Big Cypress Basin ($1.4 million), hydrologic data gathering ($236K), and education/outreach ($15K). Of the $2.2 million in available balance, $495K is planned for current year health insurance, $126K for LFA Project, $270K for Hydro-geologic Data, and $405K is a re-budget to FY14 for CFWI Model, peer reviews, 3D Hydro Model, and Water Conservation.

- **Reserves** of $65.0 million are held for future transfer to program areas as project needs and requirements are identified by staff and presented to the Governing Board for review. Sixty million dollars ($60.0 million) of these reserves are designated as economic stabilization reserves, including $10.0 million for O&M capital projects. Remaining managerial reserves include programmatic balances of $117K for Everglades, $100K for Mission Support, $69K for regulatory support, $62K for CERP, $28K for Lake Okeechobee, $9K for scientific support, $6K for O&M, and $5K for Coastal Watersheds. FY13 funds intended for FY14 re-budget were moved to reserves.

Programmatic balances for these re-budget reserves include $1.3 million for the C-139 Annex Mitigation Restoration Project, $88K for land and vegetation management, $1.4 million for Lake Okeechobee Dispersed Water Management Projects, $65,500 for the Lake Okeechobee Watershed pre-drainage Characterization Project, $705K for the CERP C-111 Project, $122K for Indian River Lagoon Issues Team Projects, $50K for Mirror Lakes, $60K for a St. Lucie Watershed model upgrade, $95K for Kissimmee River Littoral Zone Topographic Mapping, $35K for Kissimmee vegetation mapping, $50K for the Everglades EFA Source Control Program, $183K to upgrade the chiller system to provide redundant cooling capacity for the IT data center, located within the Emergency Operations Center, and $15K for educational outreach (Great Water Odyssey). There was $3K transferred from District Divisions and District Programs remaining in the emergency reserves to respond to District fuel and electric demands in support of pumping operations.

- **Debt Service** expenses amount to 100% of the total $42.1 million budget. Debt service principal and interest payments include Land Acquisition Bonds issued through the Water Management Lands Trust Fund and Certificates of Participation. Scheduled debt service payments are structured into a single principal payment and partial payment of interest in October and the balance of interest due was paid in April.

We hope these reports and the associated narrative will aid in understanding the District's financial condition as well as expenditure performance against the approved budget. If you have any questions, please feel free to call Chris Flierl at (561) 682-6078 or Mike Smykowski at (561) 682-6295.

DB/CF/MS
Attachment

Attachment: Monthly Financial Statement Memo July FY13 (1451 : Monthly Financial Statement - July 2013)

South Florida Water Management District

Statement of Sources and Uses of Funds (Unaudited)

For the month ended: July 31, 2013. Percent of fiscal year completed: 83%

SOURCES	ANNUAL BUDGET	ACTUALS THROUGH 7/31/2013	VARIANCE (UNDER) / OVER BUDGET	ACTUALS AS A % OF BUDGET
Ad Valorem Property Taxes	$ 268,114,920	$ 266,302,563	$ (1,812,357)	99.3%
Agricultural Privilege Taxes	11,352,040	11,593,535	241,495	102.1%
	-	-		
Intergovernmental - Ad Valorem Funds	5,423,928	9,469,537	4,045,609	174.6%
Intergovernmental - Non Ad Valorem Funds	73,312,901	16,163,240	(57,149,661)	22.0%
Intergovernmental Total	***78,736,829***	***25,632,777***	***(53,104,052)***	***32.6%***
Investment Earnings - Ad Valorem Funds	4,592,000	3,008,145	(1,583,855)	65.5%
Investment Earnings - Non Ad Valorem Funds	362,300	610,437	248,137	168.5%
Investment Earnings Total	***4,954,300***	***3,618,583***	***(1,335,717)***	***73.0%***
Leases	2,403,736	3,495,084	1,091,348	145.4%
	-	-		
Permit Fees	812,160	818,510	6,350	100.8%
Licenses and Miscellaneous Fees	1,487,150	1,811,771	324,621	121.8%
Mitigation Fees - Lake Belt & Wetlands	105,000	16,729,594	16,624,594	15932.9%
Licenses, Permits and Fees Total	***2,404,310***	***19,359,875***	***16,955,565***	***805.2%***
Other	525,000	666,855	141,855	127.0%
Sale of District Property	250,000	483,278	233,278	193.3%
Self Insurance Premiums	25,712,821	24,022,972	(1,689,849)	93.4%
SUB-TOTAL OPERATING REVENUES	***394,453,956***	***355,175,522***	***(39,278,434)***	***90.0%***
Fund Balance	227,722,654	227,722,654	-	100.0%
TOTAL SOURCES	**$ 622,176,610**	**$ 582,898,177**	**$ (39,278,434)**	**93.7%**

USES	ANNUAL BUDGET	EXPENDITURES	ENCUMBRANCES[1]	REPORTED AVAILABLE BUDGET	% EXPENDED	% ENCUMBERED	% OBLIGATED[2]
CERP	$ 124,720,010	$ 25,723,361	$ 37,105,637	$ 61,891,012	20.6%	29.8%	50.4%
Coastal Watersheds	17,878,985	7,726,502	6,507,568	3,644,914	43.2%	36.4%	79.6%
District Everglades	52,963,256	31,736,205	3,415,177	17,811,874	59.9%	6.4%	66.4%
Kissimmee Watershed	31,398,776	2,936,240	15,821,378	12,641,158	9.4%	50.4%	59.7%
Lake Okeechobee	21,353,631	6,124,757	8,740,872	6,488,003	28.7%	40.9%	69.6%
Land Stewardship	18,218,956	8,956,403	3,162,356	6,100,197	49.2%	17.4%	66.5%
Mission Support	51,581,836	35,835,106	3,630,198	12,116,533	69.5%	7.0%	76.5%
Modeling & Sci Supp	12,822,994	9,727,101	1,122,377	1,973,515	75.9%	8.8%	84.6%
Ops & Maintenance	141,913,150	119,964,606	14,366,062	7,582,482	84.5%	10.1%	94.7%
Regulation	25,126,690	21,134,243	754,058	3,238,389	84.1%	3.0%	87.1%
Water Supply	17,483,193	11,121,176	4,203,024	2,158,993	63.6%	24.0%	87.7%
Debt Service	42,136,957	42,136,954	-	3	100.0%	0.0%	100.0%
SUB-TOTAL NON-RESERVES USES	*557,598,434*	*323,122,654*	*98,828,706*	*135,647,073*	*57.9%*	*17.7%*	*75.7%*
Reserves	64,578,177	-	-	64,578,177	0.0%	0.0%	0.0%
TOTAL USES	**$ 622,176,610**	**$ 323,122,654**	**$ 98,828,706**	**$ 200,225,250**	**51.9%**	**15.9%**	**67.8%**

[1] Represents unexpended balances of open purchase orders

[2] Represents the sum of expenditures and encumbrances as a percentage of the annual budget

Attachment: Statement of Sources and Uses of Funds_July_FY13_Programmatic (1451 : Monthly

South Florida Water Management District
Statement of Sources and Uses of Funds
For the Month ending July 31, 2013
(Unaudited)

	CURRENT BUDGET	ACTUALS THROUGH 7/31/2013	VARIANCE (UNDER) / OVER BUDGET	ACTUALS AS A % OF BUDGET
Sources				
Taxes[1]	$ 279,466,960	$ 277,896,098	$ (1,570,862)	99.4%
Intergovernmental Revenues	78,736,829	25,632,777	(53,104,052)	32.6%
Interest on Invested Funds	4,954,300	3,618,583	(1,335,717)	73.0%
License and Permit Fees	2,404,310	19,359,875	16,955,565	805.2%
Other[2]	28,891,557	28,668,190	(223,367)	99.2%
Fund Balance	227,722,654	227,722,654	-	100.0%
Total Sources	**$ 622,176,610**	**$ 582,898,177**	**$ (39,278,434)**	**93.7%**

[1] Includes Ad Valorem and Agricultural Privilege Taxes

[2] Includes Leases, Sale of District Property, and Self Insurance Premiums

	CURRENT BUDGET	EXPENDITURES	ENCUMBRANCES [3]	AVAILABLE BUDGET	% EXPENDED	% OBLIGATED [4]
Uses						
Water Resources Planning and Monitoring	$ 54,824,257	$ 36,643,601	$ 9,632,315	$ 8,548,341	66.8%	84.4%
Acquisition, Restoration and Public Works	240,653,353	75,155,399	66,254,398	99,243,556	31.2%	58.8%
Operation and Maintenance of Lands and Works	252,706,730	155,778,526	19,784,089	77,144,115	61.6%	69.5%
Regulation	28,923,452	23,942,210	1,105,515	3,875,728	82.8%	86.6%
Outreach	2,766,018	2,214,594	57,011	494,413	80.1%	82.1%
Management and Administration	42,302,801	29,388,324	1,995,379	10,919,098	69.5%	74.2%
Total Uses	**$ 622,176,610**	**$ 323,122,654**	**$ 98,828,706**	**$ 200,225,250**	**51.9%**	**67.8%**

[3] Encumbrances represent unexpended balances of open purchase orders and contracts.

[4] Represents the sum of expenditures and encumbrances as a percentage of the current budget.

This unaudited financial statement is prepared as of July 31, 2013, and covers the interim period since the most recent audited financial statements.

Attachment: Statement of Sources and Uses of Funds_July_FY13_State (1451 : Monthly Financial

South Florida Water Management District

Summary of Uses - Statement of Sources and Uses of Funds (Unaudited)

As of: July 31, 2013

	Annual Budget	Expenditures	Encumbrances	Reported Available Budget	% Expended	% Encumbered	% Obligated
CERP							
Personnel Services	$ 6,627,080	$ 4,779,462	$ -	$ 1,847,618	72.1%	0.0%	72.1%
Contractual Services	18,343,759	3,362,221	7,813,228	7,168,310	18.3%	42.6%	60.9%
Operating	1,179,249	878,371	31,450	269,428	74.5%	2.7%	77.2%
Travel	59,635	27,565	581	31,489	46.2%	1.0%	47.2%
Capital Outlay	93,760,286	16,675,741	29,260,378	47,824,168	17.8%	31.2%	49.0%
CERP Indirect	4,750,000			4,750,000	0.0%	0.0%	0.0%
Total CERP	**124,720,010**	**25,723,361**	**37,105,637**	**61,891,012**	**20.6%**	**29.8%**	**50.4%**
Coastal Watersheds							
Personnel Services	3,594,908	2,637,932	-	956,976	73.4%	0.0%	73.4%
Contractual Services	12,516,760	4,535,762	6,322,040	1,658,958	36.2%	50.5%	86.7%
Operating	99,100	90,631	387	8,081	91.5%	0.4%	91.8%
Travel	22,198	11,380	404	10,414	51.3%	1.8%	53.1%
Capital Outlay	1,646,020	450,797	184,737	1,010,485	27.4%	11.2%	38.6%
Total Coastal Watersheds	**17,878,985**	**7,726,502**	**6,507,568**	**3,644,914**	**43.2%**	**36.4%**	**79.6%**
District Everglades							
Personnel Services	16,614,970	13,998,355		2,616,616	84.3%	0.0%	84.3%
Contractual Services	11,263,167	5,178,873	1,396,564	4,687,730	46.0%	12.4%	58.4%
Operating	8,219,366	6,750,723	477,565	991,078	82.1%	5.8%	87.9%
Travel	31,650	15,776	520	15,354	49.8%	1.6%	51.5%
Capital Outlay	16,834,103	5,792,478	1,540,529	9,501,096	34.4%	9.2%	43.6%
Total District Everglades	**52,963,256**	**31,736,205**	**3,415,177**	**17,811,874**	**59.9%**	**6.4%**	**66.4%**
Kissimmee Watershed							
Personnel Services	2,029,500	1,394,331	-	635,168	68.7%	0.0%	68.7%
Contractual Services	11,331,906	916,215	841,576	9,574,115	8.1%	7.4%	15.5%
Operating	66,163	26,760	23,500	15,903	40.4%	35.5%	76.0%
Travel	19,629	12,424	500	6,704	63.3%	2.5%	65.8%
Capital Outlay	17,951,578	586,510	14,955,801	2,409,267	3.3%	83.3%	86.6%
Total Kissimmee Watershed	**$ 31,398,776**	**$ 2,936,240**	**$ 15,821,378**	**$ 12,641,158**	**9.4%**	**50.4%**	**59.7%**

Attachment: Summary Statement of Sources and Uses of Funds_July_ FY13_08222013 (1451 : Monthly

South Florida Water Management District

Summary of Uses - Statement of Sources and Uses of Funds (Unaudited)

As of: July 31, 2013

	Annual Budget	Expenditures	Encumbrances	Reported Available Budget	% Expended	% Encumbered	% Obligated
Lake Okeechobee							
Personnel Services	$ 4,263,312	$ 3,214,425	$ -	$ 1,048,886	75.4%	0.0%	75.4%
Contractual Services	16,254,473	2,385,149	8,626,109	5,243,215	14.7%	53.1%	67.7%
Operating	634,142	370,829	77,832	185,481	58.5%	12.3%	70.8%
Travel	6,356	248	-	6,108	3.9%	0.0%	3.9%
Capital Outlay	195,348	154,105	36,931	4,312	78.9%	18.9%	97.8%
Total Lake Okeechobee	**21,353,631**	**6,124,757**	**8,740,872**	**6,488,003**	**28.7%**	**40.9%**	**69.6%**
Land Stewardship							
Personnel Services	3,631,548	3,293,187	-	338,361	90.7%	0.0%	90.7%
Contractual Services	11,107,337	4,524,525	2,672,882	3,909,931	40.7%	24.1%	64.8%
Operating	1,254,884	882,415	145,812	226,657	70.3%	11.6%	81.9%
Travel	15,750	10,770	-	4,980	68.4%	0.0%	68.4%
Capital Outlay	2,209,437	245,507	343,662	1,620,268	11.1%	15.6%	26.7%
Total Land Stewardship	**18,218,956**	**8,956,403**	**3,162,356**	**6,100,197**	**49.2%**	**17.4%**	**66.5%**
Mission Support							
Personnel Services	22,637,231	19,065,251	-	3,571,980	84.2%	0.0%	84.2%
Contractual Services	8,281,420	5,212,388	2,503,177	565,854	62.9%	30.2%	93.2%
Operating	23,425,138	10,206,129	1,050,783	12,168,226	43.6%	4.5%	48.1%
Travel	398,387	268,880	29,610	99,898	67.5%	7.4%	74.9%
Capital Outlay	1,589,661	1,082,457	46,628	460,575	68.1%	2.9%	71.0%
CERP Indirect	(4,750,000)	-	-	(4,750,000)	0.0%	0.0%	0.0%
Total Mission Support	**51,581,836**	**35,835,106**	**3,630,198**	**12,116,533**	**69.5%**	**7.0%**	**76.5%**
Modeling & Science Support							
Personnel Services	9,038,352	7,528,604	-	1,509,748	83.3%	0.0%	83.3%
Contractual Services	2,901,327	1,546,303	1,009,783	345,242	53.3%	34.8%	88.1%
Operating	718,183	506,901	111,901	99,381	70.6%	15.6%	86.2%
Travel	37,435	19,226	694	17,516	51.4%	1.9%	53.2%
Capital Outlay	127,697	126,067	-	1,630	98.7%	0.0%	98.7%
Total Modeling & Science Support	**$ 12,822,994**	**$ 9,727,101**	**$ 1,122,377**	**$ 1,973,515**	**75.9%**	**8.8%**	**84.6%**

Attachment: Summary Statement of Sources and Uses of Funds_July_ FY13_08222013 (1451 : Monthly

South Florida Water Management District

Summary of Uses - Statement of Sources and Uses of Funds (Unaudited)

As of: July 31, 2013

	Annual Budget	Expenditures	Encumbrances	Reported Available Budget	% Expended	% Encumbered	% Obligated
Operations & Maintenance							
Personnel Services	$ 50,497,471	$ 44,681,187	$ -	$ 5,816,284	88.5%	0.0%	88.5%
Contractual Services	44,434,248	37,022,481	5,605,677	1,806,091	83.3%	12.6%	95.9%
Operating	29,037,266	28,429,968	1,027,374	(420,076)	97.9%	3.5%	101.4%
Travel	160,927	123,882	12,595	24,450	77.0%	7.8%	84.8%
Capital Outlay	17,783,239	9,707,089	7,720,416	355,734	54.6%	43.4%	98.0%
Total Operations & Maintenance	**141,913,150**	**119,964,606**	**14,366,062**	**7,582,482**	**84.5%**	**10.1%**	**94.7%**
Regulation							
Personnel Services	16,568,145	14,081,029	-	2,487,116	85.0%	0.0%	85.0%
Contractual Services	1,981,509	1,387,282	421,681	172,546	70.0%	21.3%	91.3%
Operating	6,146,117	5,450,435	123,961	571,722	88.7%	2.0%	90.7%
Travel	30,685	22,222	1,458	7,005	72.4%	4.7%	77.2%
Capital Outlay	400,233	193,274	206,959	-	48.3%	51.7%	100.0%
Total Regulation	**25,126,690**	**21,134,243**	**754,058**	**3,238,389**	**84.1%**	**3.0%**	**87.1%**
Water Supply							
Personnel Services	5,630,817	4,677,728	-	953,089	83.1%	0.0%	83.1%
Contractual Services	6,074,544	1,245,076	4,175,746	653,722	20.5%	68.7%	89.2%
Operating	5,517,507	4,959,900	27,237	530,370	89.9%	0.5%	90.4%
Travel	9,926	3,708	41	6,177	37.4%	0.4%	37.8%
Capital Outlay	250,399	234,764	-	15,635	93.8%	0.0%	93.8%
Total Water Supply	**17,483,193**	**11,121,176**	**4,203,024**	**2,158,993**	**63.6%**	**24.0%**	**87.7%**
Reserves							
Reserves	64,578,177	-	-	64,578,177	0.00%	0.00%	0.00%
Total Reserves	**64,578,177**	**-**	**-**	**64,578,177**	**0.00%**	**0.00%**	**0.00%**
Debt Service							
Debt Service	42,136,957	42,136,954	-	3	100.0%	0.0%	100.0%
Total Debt Service	**42,136,957**	**42,136,954**	**-**	**3**	**100.0%**	**0.0%**	**100.0%**
Grand Total	**$ 622,176,610**	**$ 323,122,654**	**$ 98,828,706**	**$ 200,225,250**	**51.9%**	**15.9%**	**67.8%**

Attachment: Summary Statement of Sources and Uses of Funds_July_ FY13_08222013 (1451 : Monthly

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INDIVIDUAL PERMITS ISSUED BY
AUTHORITY DELEGATED TO EXECUTIVE DIRECTOR
FROM August 1, 2013 TO August 31, 2013

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Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

COLLIER COUNTY

1. ORANGE TREE UTILITY COMPANY
ORANGE TREE UTILITY CO
SEC 13, 14, 17, 20, 22, 23 TWP 48S RGE 27E

APPL. NO. 091110-10
PERMIT NO. 11-00419-W
ACREAGE: N/A
LAND USE: PUBLIC WATER SUPPLY

PERMIT TYPE: WATER USE MODIFICATION/RENEWAL
WATER SOURCE: LOWER TAMIAMI AQUIFER
ALLOCATION: 33.03 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: SEPTEMBER 2, 2013

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2. S R 846 LAND TRUST
S R 846 LAND TRUST
SEC 1,2,34,35,36 TWP 47,48S RGE 27E

APPL. NO. 130513-12
PERMIT NO. 11-01194-W
ACREAGE: 706.00
LAND USE: AGRICULTURAL

PERMIT TYPE: WATER USE MODIFICATION
WATER SOURCE: LOWER TAMIAMI AQUIFER, ON-SITE BORROW PITS
ALLOCATION: 108.34 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: AUGUST 11, 2013

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3. SILVER STRAND IV
BARRON COLLIER PARTNERSHIP LTD
SEC 4-9,16-18,29-30,33-36 TWP 47,48S RGE 29E

APPL. NO. 130528-14
PERMIT NO. 11-00261-W
ACREAGE: 3458.00
LAND USE: AGRICULTURAL

PERMIT TYPE: WATER USE MODIFICATION/RENEWAL
WATER SOURCE: WATER TABLE AND LOWER TAMIAMI AQUIFERS
ALLOCATION: 704.71 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: AUGUST 26, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

HENDRY COUNTY

1. MAGNUM SEEDS - FELDA
   MAGNUM SEEDS INC
   SEC 33 TWP 45S RGE 29E

   APPL. NO. 130603-14
   PERMIT NO. 26-00520-W
   ACREAGE: 77.50
   LAND USE: AGRICULTURAL

   PERMIT TYPE: WATER USE MODIFICATION
   WATER SOURCE: SANDSTONE AQUIFER
   ALLOCATION: 17.5 MILLION GALLONS PER MONTH
   LAST DATE FOR AGENCY ACTION: SEPTEMBER 1, 2013

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2. NEW HOPE GROVE WEST
   NEW HOPE GROVES INC
   SEC 22,27 TWP 43S RGE 28E

   APPL. NO. 110322-8
   PERMIT NO. 26-00286-W
   ACREAGE: 101.00
   LAND USE: AGRICULTURAL

   PERMIT TYPE: WATER USE RENEWAL
   WATER SOURCE: BANANA BRANCH CANAL, SANDSTONE AQUIFER, ON-SITE LAKES
   ALLOCATION: 16.99 MILLION GALLONS PER MONTH
   LAST DATE FOR AGENCY ACTION: SEPTEMBER 12, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

LEE COUNTY

1. BRIDGETOWN AT THE PLANTATION MASTER DEWATERING
CENTEX HOMES
SEC 11-14 TWP 45S RGE 25E

APPL. NO. 130605-18
PERMIT NO. 36-08010-W

ACREAGE: 1.00
LAND USE: DEWATERING

PERMIT TYPE: WATER USE PROPOSED
WATER SOURCE: WATER TABLE AQUIFER
ALLOCATION: NOT REQUIRED
LAST DATE FOR AGENCY ACTION: SEPTEMBER 3, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

MARTIN COUNTY

1. JONATHANS LANDING AT OLD TRAIL
   JONATHANS LANDING GOLF CLUB INC
   SEC 23-24 TWP 40S RGE 41E

APPL. NO. 091203-11
PERMIT NO. 43-00221-W

ACREAGE: 225.00
LAND USE: GOLF COURSE

PERMIT TYPE: WATER USE RENEWAL
WATER SOURCE: SURFICIAL AQUIFER SYSTEM AND ON-SITE LAKES
ALLOCATION: 38.98 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: SEPTEMBER 25, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

MIAMI-DADE COUNTY

1. EAST GLADE GROWERS INC
   EAST GLADE GROWERS INC
   SEC 13,31 TWP 56,57S RGE 39,40E

APPL. NO. 061222-22
PERMIT NO. 13-05379-W

ACREAGE: 278.00
LAND USE: AGRICULTURAL

PERMIT TYPE: WATER USE EXISTING/UNPERMITTED

WATER SOURCE: BISCAYNE AQUIFER

ALLOCATION: 27.6 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: SEPTEMBER 9, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

ORANGE COUNTY

1. BECK / OVERSTREET PD
LAKE SAWYER PROPERTIES INC
SEC 26 TWP 23S RGE 27E

APPL. NO. 130410-6
PERMIT NO. 48-02257-P
ACREAGE: 79.60
LAND USE: RESIDENTIAL

PERMIT TYPE: ENVIRONMENTAL RESOURCE (NEW CONSTRUCTION/OPERATION), INCLUDES CONSERVATION EASEMENT TO THE DISTRICT)
RECEIVING BODY: RCID WETLAND SYSTEM VIA STORM SYSTEM
LAST DATE FOR AGENCY ACTION: AUGUST 20, 2013

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2. MAGNOLIA ESTATES - VILLAGE F P D AND PANTHER VIEW
MAGNOLIA ESTATES LLC
SEC 5,33 TWP 23,24S RGE 27E

APPL. NO. 130502-1
PERMIT NO. 48-02254-P
ACREAGE: 251.89
LAND USE: RESIDENTIAL

PERMIT TYPE: ENVIRONMENTAL RESOURCE (CONCEPTUAL APPROVAL AND NEW CONSTRUCTION/OPERATION, INCLUDES CONSERVATION EASEMENT TO THE DISTRICT)
RECEIVING BODY: HUCKLEBERRY LAKE AND LAKE PANTHER
LAST DATE FOR AGENCY ACTION: AUGUST 20, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

OSCEOLA COUNTY

1. HOLOPAW GROVES 1
   CIRCLE Y GROVES LLC
   SEC 33 TWP 27S RGE 32E

APPL. NO. 120426-4
PERMIT NO. 49-02305-W

ACREAGE: 650.00
LAND USE: AGRICULTURAL

PERMIT TYPE: WATER USE EXPIRED/PREVIOUSLY PERMITTED

WATER SOURCE: UPPER FLORIDAN AQUIFER

ALLOCATION: 107.04 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: SEPTEMBER 23, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

PALM BEACH COUNTY

1. WINSTON GUEST
DUCK PUDDLE SOUTH LP
SEC 25,36 TWP 43S RGE 40E

APPL. NO. 130529-5
PERMIT NO. 50-00372-W

ACREAGE: 174.00
LAND USE: DIV & IMP
SECONDARY USER
AGRICULTURAL

PERMIT TYPE: WATER USE MODIFICATION/RENEWAL
WATER SOURCE: LOXAHATCHEE GROVES WATER CONTROL DISTRICT
ALLOCATION: 16.4 MILLION GALLONS PER MONTH
LAST DATE FOR AGENCY ACTION: AUGUST 27, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)

ST LUCIE COUNTY

1. FLORIDA GAS TRANSMISSION ST LUCIE COUNTY MASTER
FLORIDA GAS TRANSMISSION COMPANY, LLC
SEC TWP 34S RGE 39E

APPL. NO. 130620-1
PERMIT NO. 56-03295-W

ACREAGE: 10.00
LAND USE: DEWATERING

PERMIT TYPE: WATER USE PROPOSED
WATER SOURCE: WATER TABLE AQUIFER
ALLOCATION: NOT REQUIRED
LAST DATE FOR AGENCY ACTION: SEPTEMBER 18, 2013

Attachment: IP Issued by ED August 2013 (1486 : Executive Director's Report)