SOUTH FLORIDA WATER MANAGEMENT DISTRICT

LOWER WEST COAST WATER SUPPLY PLAN UPDATE

Appendices

2017

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Acronyms and Abbreviations

2008 LORS	2008 Lake Okeechobee Regulation Schedule
AFSIRS	Agricultural Field Scale Irrigation Requirements Simulation
AGR	Agricultural Irrigation
ASR	aquifer storage and recovery
BEBR	Bureau of Economic and Business Research
CERP	Comprehensive Everglades Restoration Plan
CRE	Caloosahatchee River Estuary
District	South Florida Water Management District
DSAP	Detailed Specific Area Plan
DSS	Domestic and Small Public Supply
ENP	Everglades National Park
F.A.C.	Florida Administrative Code
F.S.	Florida Statutes
FAS	Floridan aquifer system
FDACS	Florida Department of Agriculture and Consumer Services
FDEO	Florida Department of Economic Opportunity
FDEP	Florida Department of Environmental Protection
FGUA	Florida Governmental Utility Authority
FPL	Florida Power & Light
FSAID	Florida Statewide Agricultural Irrigation Demand
IAS	intermediate aquifer system
ICI	Industrial/Commercial/Institutional
IQ	irrigation quality
LWC	Lower West Coast
MDL	maximum developable limit
MFL	minimum flow and minimum water level
mgd	million gallons per day
mg/L	milligrams per liter
MPO	metropolitan planning organization
NGVD29	National Geodetic Vertical Datum of 1929
NWTP	North Water Treatment Plant (Marco Island Utilities)

PCUR	per capita use rate
PWR	Power Generation
PWS	Public Water Supply
RAA	Restricted Allocation Area
REC	Recreational/Landscape Irrigation
RIB	rapid infiltration basin
RO	reverse osmosis
SAS	surficial aquifer system
SFWMD	South Florida Water Management District
SWTP	South Water Treatment Plant (Marco Island Utilities)
TAZ	traffic analysis zone
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
Work Plan	Water Supply Facilities Work Plan
WRF	water reclamation facility
WTP	water treatment plant
WWTF	wastewater treatment facility

A

Information for Local Governments

The South Florida Water Management District (SFWMD or District) prepares water supply plans for each of its five planning areas to effectively support planning initiatives and address local issues. The water supply plans address a planning horizon of at least 20 years and are updated every 5 years. Most local governments are required by statute to update their Water Supply Facilities Work Plan (Work Plan) and adopt revisions to their Comprehensive Plan within 18 months following approval of the applicable water supply plan [Section 163.3177(6)(c)3, Florida Statutes (F.S.)].

This appendix contains water supply planning information useful to local governments in 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; Appendix F
Utility Areas Served (2014 and 2040)	Chapter 8; Appendices D and F
Population Projections (2014–2040)	Chapter 2; Appendix B
Demand Projections (2014–2040)	Chapter 2; Appendices B and F
Water Supply Projects (2014–2040)	Chapter 8; Appendix F

This appendix includes the following information for the review and revision of local government documents:

- Comprehensive Plan requirements
- Relevant Florida Statutes
- Utilities serving local governments

COMPREHENSIVE PLAN REQUIREMENTS

Local governments are required to plan for their water and wastewater needs as well as other infrastructure and public service elements of their Comprehensive Plan. To assist in that effort, the SFWMD developed a general checklist of the types of data and information District staff looks for during review of the water supply element, policies, and other topics in the local government Comprehensive Plans. This checklist is not all-inclusive, but provides a general framework for use with the more detailed Florida Department of Economic Opportunity (FDEO) guidelines.

INFO ⓘ

Local Government Planning Documents:

The **Comprehensive Plan** details the guidelines, principles, and strategies for development of the community.

A **Water Supply Facilities Work Plan** describes a local government's plan for identifying water supply projects, conservation, and reuse necessary to meet the service area's water needs over at least a 10-year planning period.

Checklist guidance is given for three water supply-related aspects of Comprehensive Plans:

1. Work Plans and other potable water sub-element revisions
2. Evaluation and appraisal of Comprehensive Plan requirements
3. Plan amendments

Work Plans and Other Potable Water Sub-Element Revisions

This *2017 Lower West Coast Water Supply Plan Update* (2017 LWC Plan Update) provides water demand estimates, water source options, and water supply development projects to ensure adequate water supplies for the region. The data included in the Work Plans (e.g., population and water demand projections, future projects) should be consistent with the 2017 LWC Plan Update. During review of the Work Plans, the SFWMD coordinates with local governments, utilities, and the FDEO to assist local governments as they update their Work Plans.

Identification of Public Water Suppliers

A local government's Work Plan needs to identify the Public Water Supply (PWS) entities serving their population. To be consistent with the 2017 LWC Plan Update, Work Plans should identify, at a minimum, the water demand and adequacy of PWS sources to meet water demand within the local government's boundary. If appropriate, the sale or purchase of water from PWS entities with service areas beyond the local government's boundary should be identified. This 2017 LWC Plan Update only identifies PWS entities with projected average pumpage greater than 0.1 million gallons per day (mgd); therefore, some smaller utilities may not be included in SFWMD regional water supply plan updates. The FDEO and SFWMD guidance for Work Plans recommends including all small community systems and Domestic and Small Public Supply (DSS) users on private wells.

Review of Public Water Supply Utility Summaries

Through coordination with PWS entities, utility summaries were prepared as part of this 2017 LWC Plan Update (Appendix F), containing information such as current and future population projections, per capita use rates, net (finished) water demands (i.e., after any losses due to water treatment), permitted sources and allocations, and recently constructed and proposed water supply development projects. PWS entity staff should confirm the accuracy of information provided in the utility summaries of this 2017 LWC Plan Update. Within 12 months of approval of this plan update, PWS entities must respond to the SFWMD with their intentions to develop and implement the projects identified by the plan update, or provide a list of other projects or methods to meet water demands.

The local government's Work Plan should be in agreement with this 2017 LWC Plan Update's identified 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 water supply plan to project water demand. Generally accepted professional planning methods may be used as input to the local planning process, which may result in differences between the demand and supply estimates provided in this 2017 LWC Plan Update. If planning assumptions are different from this 2017 LWC Plan Update, the Work Plan should identify and explain the basis for any differences.

The minimum planning period for water supply plans is 20 years (referred to as the 20-year planning horizon). However, for local government Work Plans, a minimum 10-year planning horizon is required [Section 163.3177(6)(c)3, F.S.]; a 20-year planning horizon is preferred. Therefore, the Work Plans and the 2017 LWC Plan Update are not required to have the same planning horizon.

To assist local governments in updating their Work Plans, the SFWMD has developed technical assistance tools and informational documents. Technical assistance information is available on the SFWMD website (www.sfwmd.gov). Additional information about developing a Work Plan is available from the FDEO website at http://www.floridajobs.org (Community Planning and Development).

Checklist of Key Considerations

Water Supply Demand Projections

- Revise the adopted Work Plan to be consistent with the water demand estimates and population projections listed in the 2017 LWC Plan Update.
- Plan for gross (raw) and net (finished) water supply demands within the jurisdiction of each supplier.
- Projections must cover at least a 10-year planning period.
- Provide projections that plan for the building of all public and private water supply facilities.
- Provide projections that include the purchase of bulk water necessary to provide water supply service within the local government's jurisdiction.

- If a local government provides water outside of its jurisdiction, plan for gross (raw) and net (finished) water supply demands for the area served.
- Provide separate projections for existing and future DSS.

Water Source Identification

- Review the water supply sources identified by the local government or its water suppliers, as necessary, to meet existing and projected water use demand for the established planning period.
    - Compare this information with the available sources in this plan update.
- Identify the general areas served by DSS.

Water Supply Project Identification

- Incorporate water supply project(s) selected by the utility or utilities providing PWS to the local government, as identified in the 2017 LWC Plan Update, or propose alternatives for inclusion in the Work Plan.
    - All other public and private water supply capital improvements (e.g., wells, treatment plants, distribution systems) necessary to maintain level-of-service standards within the service area should be included in the Work Plan.
- Coordinate the Work Plan water supply projects with this 2017 LWC Plan Update and the water supplier(s) annual progress reports, and update the Work Plan accordingly.
- 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 current and future coordination with existing and future water supply and reuse providers for meeting future demands. This should occur before, during, and after the water supply plan update process.

- Review existing (2014) and future (2040) service area maps, found at the end of this appendix (**Figures A-1** to **A-6**), for each utility. Compare and update the Work Plan as needed.
    - Identify existing or potential service area conflicts and solutions. Include a conflict resolution policy.
    - Ensure the water supply for all areas of the local government are accounted for by the local governments' own utility or other providers.
- Review and update the Work Plan language concerning needed coordination with water supplier(s), local governments and entities, and others.
    - Include updates to agreements (e.g., bulk service agreements, interconnect agreements).
- Private utilities located within local government service areas should provide utility information to the local government responsible for the Work Plan.

Related Comprehensive Plan Amendments

This 2017 LWC Plan Update may require changes to Work Plans and possibly other elements within Comprehensive Plans. Revisions may include population projections, established planning periods, existing and future water resource projects, intergovernmental coordination activities, conservation and reuse measures, and the capital improvements element.

- If additional revisions are needed for coordination with this 2017 LWC Plan Update but are not listed here, incorporate changes into the Comprehensive Plan and Work Plan, as appropriate.
- Review the Comprehensive Plan for consistency among all sections of the Work Plan and other elements in consideration of all proposed modifications. Other Comprehensive Plan elements that may need updating include future land use, potable water, sanitary sewer, conservation, intergovernmental coordination, and capital improvements.

Sector Plan(s)

A Sector Plan is a long-term plan (20 to 50 years) for a geographic area of at least 5,000 acres. The focus of a Sector Plan, which is included in the Comprehensive Plan, should be on water needs, water source and resource development, and water supply development projects needed to address projected development in the Sector Plan area. In accordance with Section 163.3245, F.S., the following information from a local government's adopted Sector Plan, Master Plan, and Detailed Specific Area Plans (DSAPs) must be incorporated into the Work Plan:

- The phasing or staging schedule allocating a portion of the local government's future growth and population to the Sector Plan area through the planning period.
- Projections of water demand and the identification of viable water sources to meet demands.
- Proposed water conservation measures.
- Capital improvements needed to meet demands and to be included in the Local Government's 5-Year Capital Improvements Schedule.
- Identification of general procedures and policies to coordinate with the SFWMD and to incorporate the Sector Plan area's proposed development into the 2017 LWC Plan Update.
- The water needs, source and water resource development, and water supply development projects identified in adopted Sector Plans will be incorporated into applicable regional water supply plans.

Adopted Sector Plans in the Lower West Coast Planning Area

Hendry County has adopted two Sector Plans: the Rodina Sector Plan and the Southwest Hendry County Sector Plan.

Rodina Sector Plan – The Rodina Sector Plan was approved in 2012 and includes a long-term plan for mixed-use development on approximately 25,826 acres in western Hendry County. As proposed, development would include up to 21,000 residential units,

2.45 million square feet of retail space, 1.9 million square feet of office/civic/industrial space, and 400 hotel/motel rooms. A total of 15,430 acres of the mixed-use development has been designated as Long-Term Natural Resources Areas (3,774 acres) and Long-Term Agriculture Areas (11,656 acres). Development, water supplies, sources, and conservation measures for Rodina include the following:

- Each DSAP must include an analysis regarding the facilities needed for water supply, potable water, wastewater treatment, and water conservation. The facilities must be identified in the Work Plan and Capital Improvements Schedule.
- The planned potable water supply sources are the Upper Floridan and Sandstone aquifers. Irrigation water supply is proposed to be a combination of reclaimed water and surface water.
- Potable water demand at buildout is projected to be between 38.21 and 42.80 mgd.
- A planned 9.5 mgd water treatment plant will assist in meeting projected demand.
- No development can occur until one or more DSAPs are approved by Hendry County. Provisions within the Rodina Sector Plan require a plan of development in at least one DSAP within 10 years of the Sector Plan's approval. No DSAP has been approved at the time this 2017 LWC Plan Update was developed.

Southwest Hendry County Sector Plan – The Southwest Hendry County Sector Plan was approved in 2014 and covers approximately 23,500 acres in two planning areas (West and East) in southern Hendry County. The proposed maximum development program would allow up to 22,949 residential dwelling units, 400 hotel rooms, 1.73 million square feet of commercial space, and 3.31 million square feet of industrial space over 50 years. Prior to any development, a DSAP will be required, at which time water supply infrastructure would be addressed.

- The West Planning Area, encompassing 19,798 acres, is intended to be the more urbanized area. The West Planning Area includes the existing SR-82 Mixed-Use District (627 acres), which will retain its existing development entitlements and water supply strategy.
- The Florida Governmental Utility Authority is intended to be the wastewater service provider for the SR-82 Mixed Use District and Consolidated Services of Hendry and Collier County, LLC is intended to serve the remainder of the Sector Plan area.
- The East Planning Area encompasses 3,697 acres limited to natural resources, agriculture, and a total of 21 residential detached housing units. Central water and sewer are not planned in the East Planning Area.
- The planned potable water supply source for the Sector Plan area is the Sandstone aquifer.
- Potable water demand at buildout is projected to be 6.06 mgd.
- Reclaimed water will be utilized for landscape and golf course irrigation when available from the utility provider.
- No development can occur until one or more DSAPs are approved by Hendry County. No DSAP has been approved at the time this 2017 LWC Plan Update was developed.

Exemptions to Updating Work Plans

A small number of local governments are not required to amend their Comprehensive Plan when a water supply plan is updated if they meet certain criteria. A local government that does not own, operate, or maintain its own water supply facilities but rather is served by a PWS entity with a permitted allocation of more than 300 mgd is not required to amend its Comprehensive Plan if the local government's water usage is less than 1 percent of the PWS entity's total permitted allocation. However, the local government must cooperate with the PWS entity that provides service within its jurisdiction and must keep the Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element up to date, as required by Section 163.3191, F.S., (evaluation and appraisal review). In the LWC Planning Area, there are no local governments that qualify for this exemption.

Evaluation and Appraisal Review of Comprehensive Plans

At least every 7 years, local governments shall evaluate the need to amend their Comprehensive Plan, addressing changes in state requirements since the last Comprehensive Plan update. While an evaluation and appraisal report is not required, local governments are encouraged to evaluate and, as necessary, update Comprehensive Plans to reflect changes in local conditions.

Water Supply Project Identification and Selection

Local governments are encouraged to evaluate water supply projects to address the following issues:

- Identify the extent to which the local government has been successful in identifying water supply projects, including water conservation and reuse, necessary to meet projected demands.
- Evaluate the degree to which the Work Plan has been implemented for building all public and private water supply facilities within the local government's jurisdiction necessary to meet projected demands.
- Provide recommendations for revising the Work Plan and the applicable Comprehensive Plan elements to address the conclusions of the evaluation, as necessary.

Plan Amendments (Future Land Use Change)

Water Supply Demand Projections

- Address gross (raw) and net (finished) water supply needs for potable and nonpotable (e.g., irrigation) demands, using professionally acceptable methodologies for population projections and per capita use rates.
- Address existing and future water conservation and reuse commitments as well as levels of service (i.e., per capita use rates) for the proposed future land use change and the Comprehensive Plan.
- Address the build-out time frame for a future land use change and the established planning period for the Comprehensive Plan.

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.
- Provide sufficient planning-level data and analysis to demonstrate the availability of a sustainable water source as identified in the appropriate SFWMD water supply plan update when future demands are not covered by an existing water use permit.

Availability of Water Supply and Public Facilities

- Demonstrate that there is an available gross (raw) water supply from the proposed source(s) for the future land use change, given all other approved land use commitments within the local government's jurisdiction over the proposed amendment's build-out and the established planning period of the Comprehensive Plan.
- Demonstrate that there is sufficient treatment facility capacity and permitted net (finished) water supply for future land use change, given all other commitments for that capacity and supply over the proposed build-out time frame.
- If the availability of water supply and/or public facilities cannot be demonstrated, phasing of the future land use and/or appropriate amendments to the capital improvements element/potable water sub-element will be required to ensure the necessary capital planning and timely availability of the needed infrastructure and water supply.
- If the water provider is an entity other than the local government responsible for the Comprehensive Plan amendment, demonstrate that coordination of the plan amendment has occurred between the water provider and the local government.

Related Comprehensive Plan Amendments

- A future land use change may require amendments to specific elements within the Comprehensive Plan if there is an adjustment to the future population or demand projections, the established planning period, the water supply sources, or water providers required to be addressed.

LAW/CODE	
Relevant Florida Statutes	
Sections 163.3177(4)(a) and 373.709	Coordinate Comprehensive Plan and Work Plan with the applicable regional water supply plan
Section 163.3177(6)(c)	Sanitary sewer and potable water sub-elements
Sections 163.3177(6)(a), (c)3, and (5)	Water Supply Facilities Work Plan
Sections 163.3177(6)(c) and (3)(a)	Level of service standards (per capita use rates) for public facilities
Sections 163.3177(3)(a) and 163.3180 (2)	Concurrency and management systems
Sections 163.3177(6)(a) and (c)	Population and water supply demand projections
Sections 163.3177(6)(c) and 373.709(8)(b)	Identify traditional and alternative water supply projects as well as conservation and reuse programs
Section 163.3177(3)	Annual review and updating of the Capital Improvements element and 5-year capital improvement schedule
Section 163.3177 (6)(a)	Future land use plan-related Comprehensive Plan amendments
Sections 163.3167(9) and 163.3177(6)(d)	Conservation Element amendments of Comprehensive Plan
Section 163.3177 (6)(h)	Intergovernmental Coordination Element amendments of Comprehensive Plan
Section 163.3191	Evaluation and appraisal review of Comprehensive Plan and Work Plan
Section 163.3245	Sector Plans
Section 163.3177(6)(c)4	Exemptions to Work Plans

UTILITIES SERVING LOCAL GOVERNMENTS

Table A-1 identifies the local governments within the LWC Planning Area and the PWS utilities providing them that have treatment capacity and water use of 0.1 mgd or greater. The first column in **Table A-1** lists the name of the local government, and the second column identifies whether that local government owns and operates a PWS utility (yes or no). If the local government does not own and operate a PWS utility, the third column identifies the other local government or private PWS utility, or utilities, providing gross (raw) or net (finished) water to the local government.

Table A-2 identifies the PWS utilities providing gross (raw) or net (finished) water to the local governments within the LWC Planning Area. The first column of **Table A-2** lists the name of the PWS utility, and the second column identifies whether the utility is local government-owned and operated (yes or no). The third column identifies the incorporated and unincorporated areas of the LWC Planning Area within that PWS utility's service area.

Table A-1. Water utilities and entities serving local governments in the LWC Planning Area.

Local Government	Local Government Utility	Other Utility Serving Local Government
Charlotte County		
Charlotte County	Yes	Town and Country Utilities Company
Collier County		
Collier County	Yes	Ave Maria Utility Company; Everglades City; FGUA – Golden Gate; Immokalee Water & Sewer District; Marco Island Utilities; City of Naples Utility Department; and Port of the Islands Community Improvement District
Everglades City	Yes	--
Marco Island, City of	Yes	Collier County Water-Sewer District
Naples, City of	Yes	--
Glades County		
Glades County	No	Port LaBelle Utility System of Hendry County; South Shore Water Association (distributes water purchased from Clewiston Utilities); Clewiston Utilities; and Moore Haven Utilities
Moore Haven, City of	Yes	--
Hendry County		
Clewiston, City of	Yes	--
Hendry County	Yes	South Shore Water Association; and City of LaBelle Department of Public Works
LaBelle, City of	Yes	--
Lee County		
Bonita Springs, City of	No	Bonita Springs Utilities; Citrus Park RV Resort
Cape Coral, City of	Yes	Greater Pine Island Water Association (bulk water)
Estero, Village of	No	Bonita Springs Utilities; and Lee County Utilities
Fort Myers, City of	Yes	Lee County Utilities
Fort Myers Beach	Yes	Lee County Utilities (bulk water)
Lee County	Yes	Bonita Springs Utilities; FGUA – Lehigh Acres; Greater Pine Island Water Association; Island Water Association; FGUA – Lake Fairways; Fort Myers Utility; and Cape Coral Utilities (bulk water only)
Sanibel, City of	No	Island Water Association
Monroe County		
Monroe County	No	--

FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast.

Table A-2. Water utilities and local governments serving the LWC Planning Area.

Utility Name	Local Government Utility	Local Governments Served
Charlotte County		
Charlotte County Utilities	Yes	Charlotte County and Lee County (serving unincorporated Burnt Store Marina)
Town and Country Utilities Company	No	Charlotte County
Collier County		
Ave Maria Utility Company	No	Collier County (serving unincorporated Ave Maria)
Collier County Water-Sewer District	Yes	Collier County (serving unincorporated Goodland, Golden Gate Estates, and Orange Tree); portion of City of Naples; and bulk water to City of Marco Island
Everglades City	Yes	City of Everglades City and Collier County (serving unincorporated Plantation Island and Seaboard Village in Copeland)
FGUA – Golden Gate	No	Collier County (serving unincorporated Golden Gate)
Immokalee Water & Sewer District	No	Collier County (serving unincorporated Immokalee)
Marco Island Utilities	Yes	City of Marco Island and bulk water to Collier County (serving unincorporated Goodland)
Naples, City of – Utility Department	Yes	City of Naples and Collier County (serving unincorporated East Naples)
Port of the Islands Community Improvement District	No	Collier County (serving unincorporated Port of the Islands)
Glades County		
Moore Haven Utilities	Yes	City of Moore Haven and Glades County
Hendry County		
Clewiston Utilities	Yes	City of Clewiston; Hendry County; and Glades County
LaBelle, City of – Department of Public Works	Yes	City of LaBelle and Hendry County
Port LaBelle Utility System of Hendry County	Yes	Hendry and Glades counties
Lee County		
Bonita Springs Utilities	No	City of Bonita Springs; Village of Estero; and Lee County
Cape Coral Utilities	Yes	City of Cape Coral; Greater Pine Island (bulk water sales); andunincorporated Lee County (bulk water sales)
Citrus Park RV Resort	No	City of Bonita Springs
FGUA – Lake Fairways	No	Lee County (serving unincorporated North Fort Myers)
FGUA – Lehigh Acres	No	Lee County (serving unincorporated Lehigh Acres)
Fort Myers, City of – Public Utility	Yes	City of Fort Myers and Lee County (sells water to FGUA – Lehigh Acres)
Greater Pine Island Water Association	No	Lee County (serving unincorporated Pine Island and Matlacha) and a portion of the City of Cape Coral
Island Water Association	No	City of Sanibel and Lee County (serving unincorporated Captiva)
Lee County Utilities	Yes	Lee County; Village of Estero; City of Fort Myers; and bulk water to Town of Fort Myers Beach

FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast.

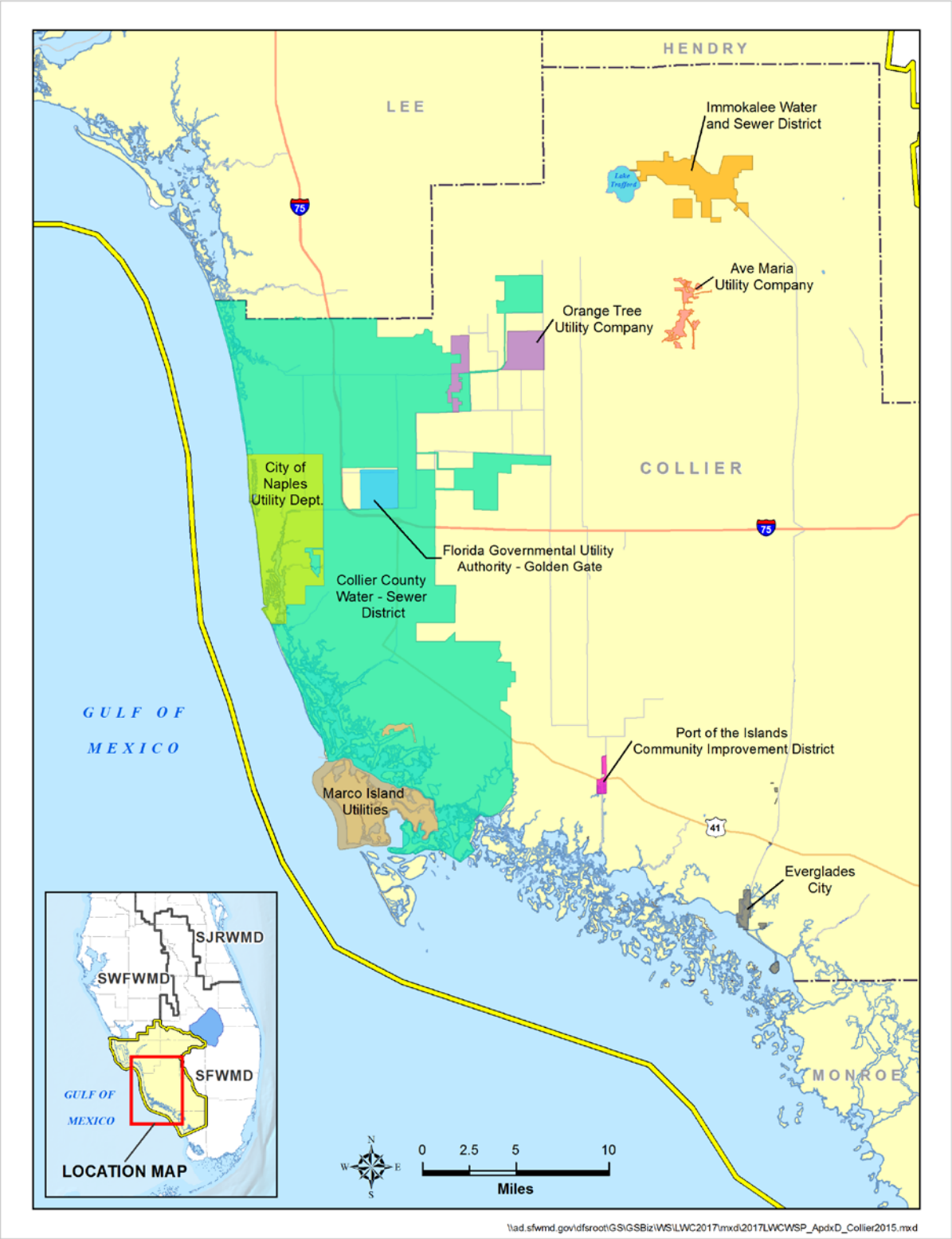

Figure A-1. Current (2014) public water supply utility service areas in Collier County.

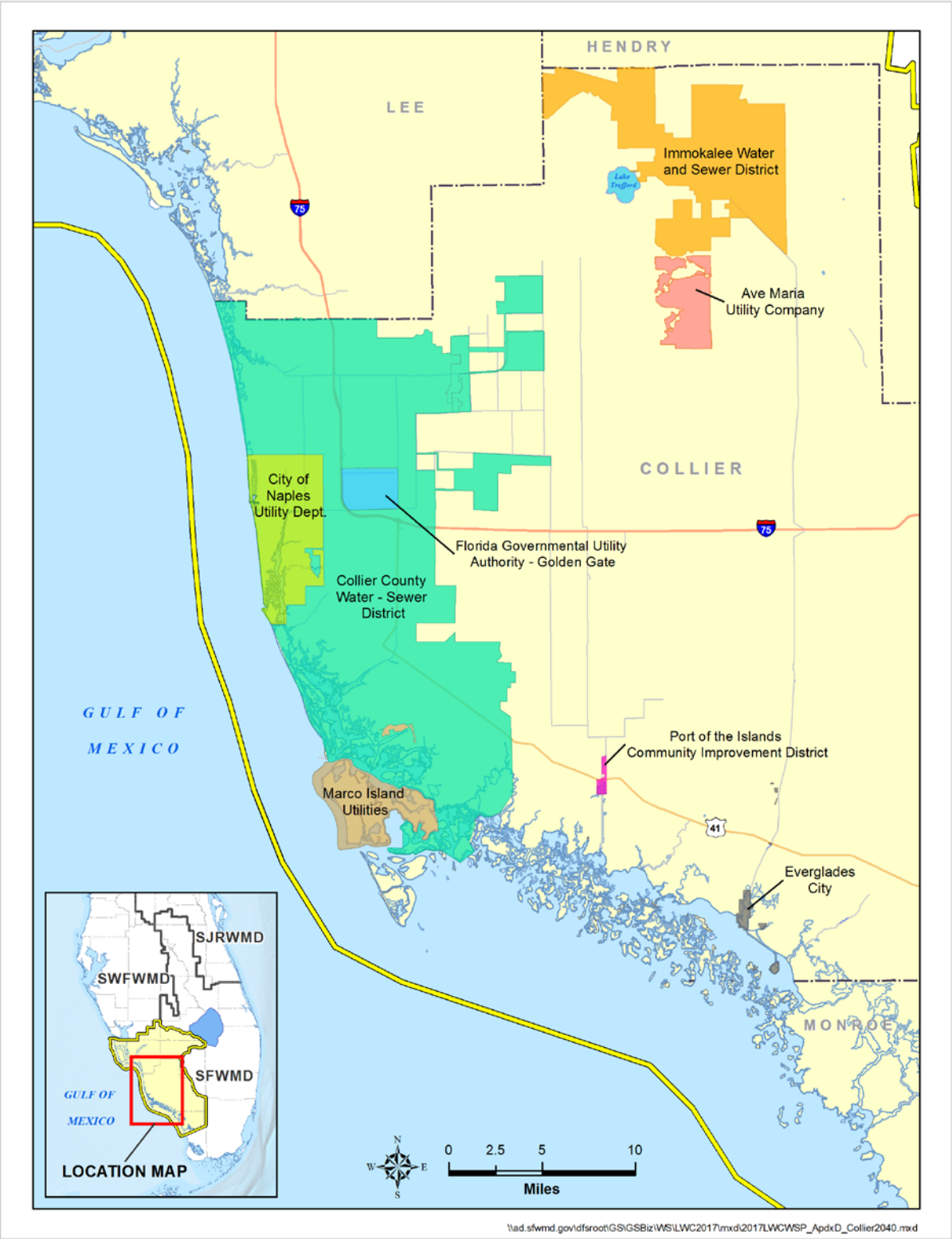

Figure A-2. Future (2040) public water supply utility service areas in Collier County.

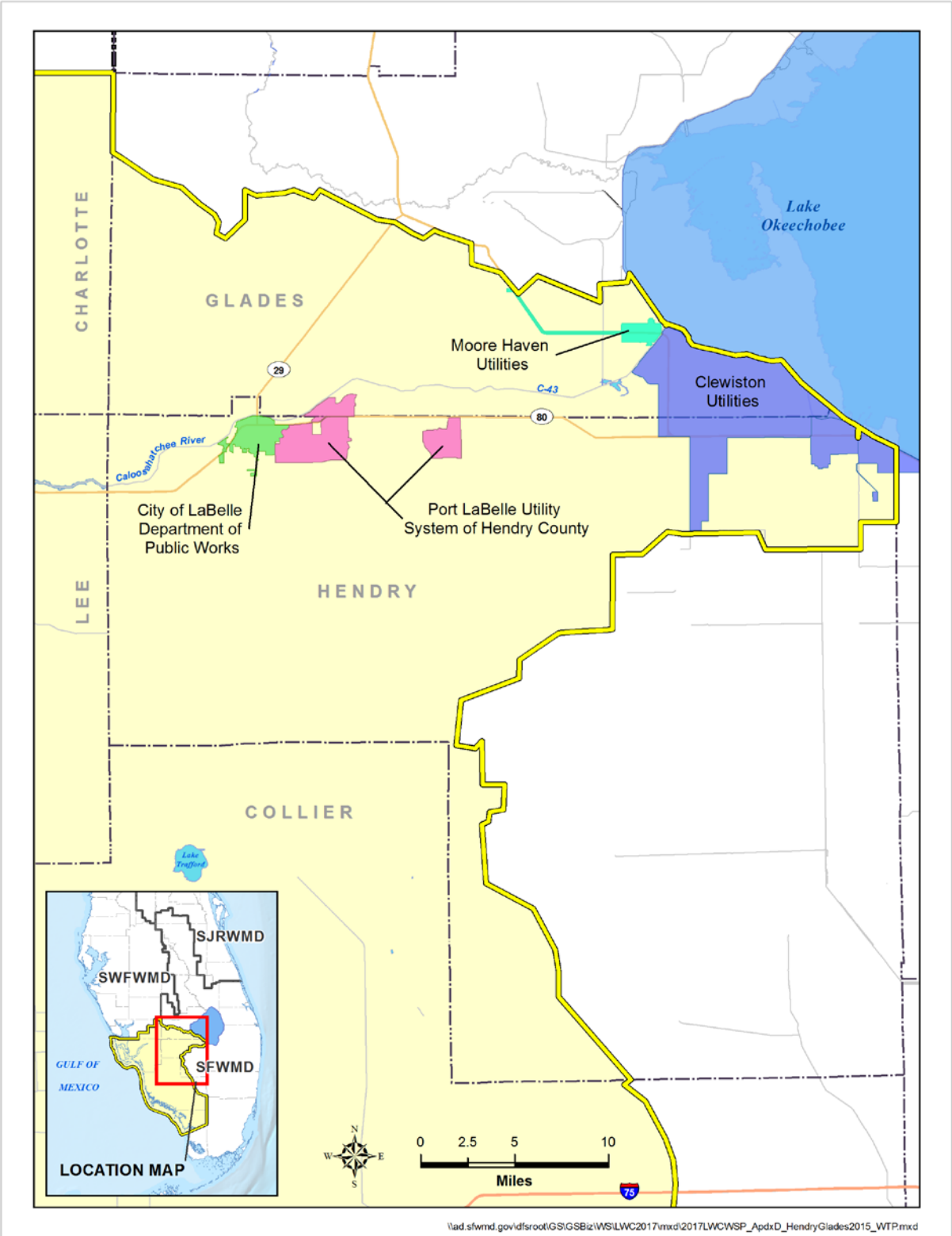

Figure A-3. Current (2014) public water supply utility service areas in Glades and Hendry counties.

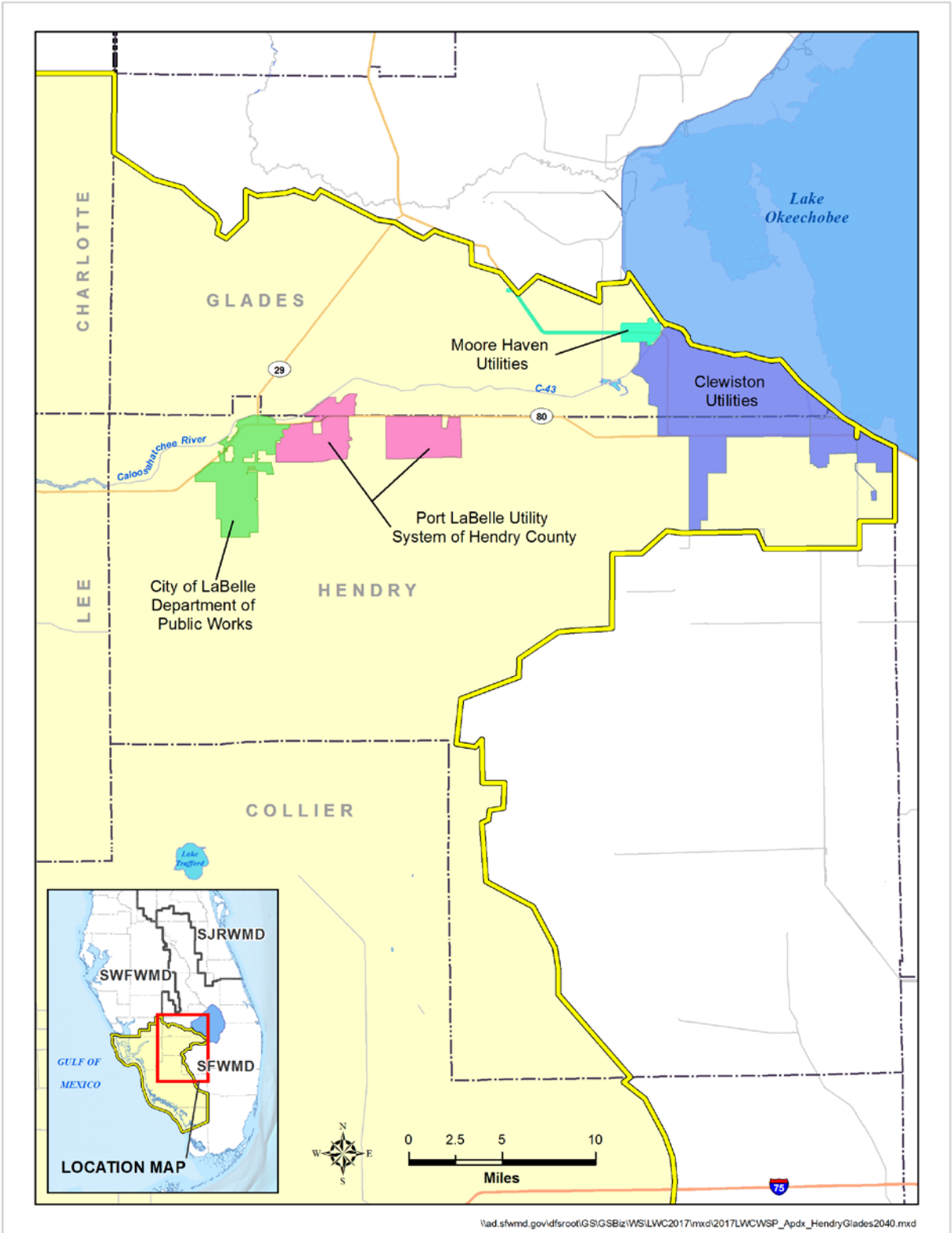

Figure A-4. Future (2040) public water supply utility service areas in Glades and Hendry counties.

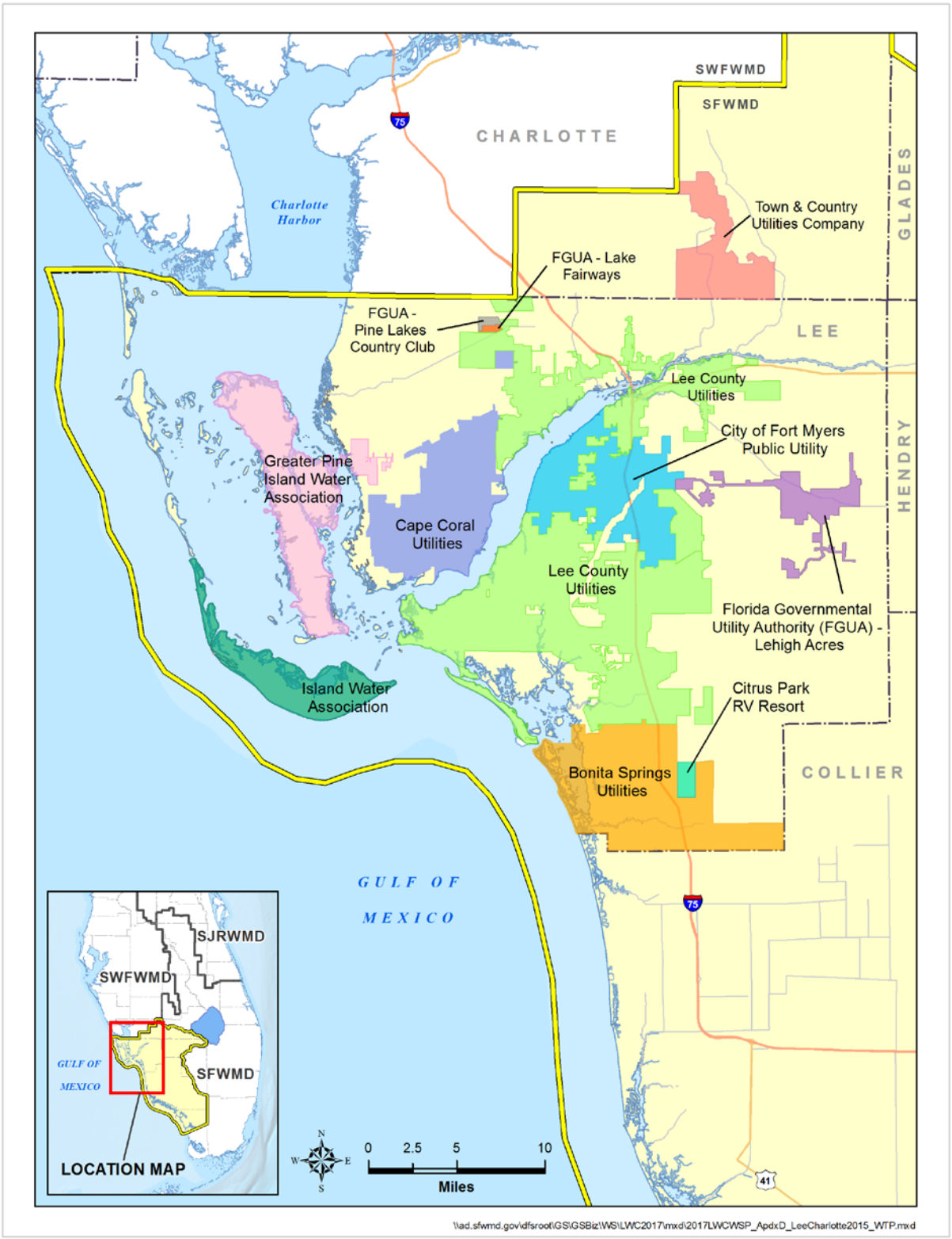

Figure A-5. Current (2014) public water supply utility service areas in Lee and Charlotte counties.

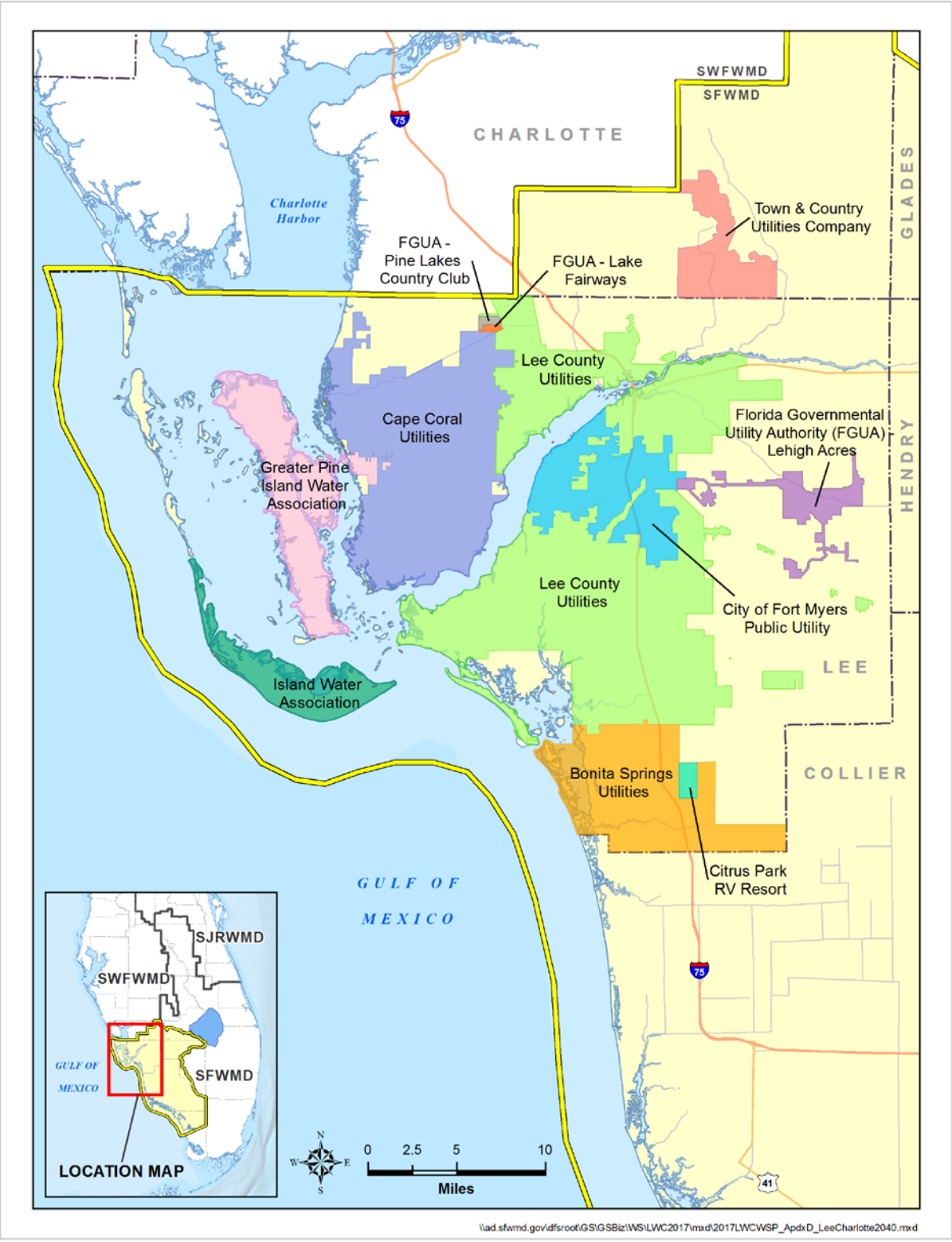

Figure A-6. Future (2040) public water supply utility service areas in Lee and Charlotte counties.

B

Water Demand Projections

The South Florida Water Management District (SFWMD or District) develops water demand projections in coordination with stakeholder groups, other agencies, utilities, and local governments. This appendix describes the methods used to develop water demand estimates using the 2010 United States Census population as a starting point, 2014 as the current year, and 2040 as the projection horizon for the Lower West Coast (LWC) Planning Area.

This appendix provides water demand estimates and projections for the following categories:

- **Public Water Supply (PWS)** – Potable water supplied by water treatment plants with projected average pumpage of 0.1 million gallons per day (mgd) or greater.
- **Domestic and Small Public Supply (DSS)** – Potable water used by households served by small utilities (less than 0.1 mgd) or self-supplied by private wells.
- **Agricultural Irrigation (AGR)** – Self-supplied water used for commercial crop irrigation, greenhouses, nurseries, livestock watering, pasture, and aquaculture.
- **Recreational/Landscape Irrigation (REC)** – Self-supplied water used for irrigation of golf courses, sports fields, parks, cemeteries, and large common areas such as land managed by homeowners' associations and commercial developments.
- **Industrial/Commercial/Institutional (ICI)** – Self-supplied water associated with the production of goods or provision of services by industrial, commercial, or institutional establishments.
- **Power Generation (PWR)** – Self-supplied water used by power generation facilities, excluding the use of seawater.

In general, preparing water demand estimates and projections heavily depends on population growth and dispersion, land use activities, and economic trends. For example, land use maps, information on irrigation technology, and market data are fundamental to estimating AGR water demands. Population census results, water utility infrastructure, and county zoning maps are essential to projecting future PWS demands.

Section 373.309, Florida Statutes (F.S.), states the level-of-certainty planning goal associated with identifying water demands shall be based on meeting demands during 1-in-10 year drought conditions. Therefore, water demand estimates and projections in this *2017 Lower West Coast Water Supply Plan Update* (2017 LWC Plan Update) are provided for each water use category in 5-year increments for average rainfall and 1-in-10 year drought conditions. In addition, demands are described and analyzed in two ways: gross (or raw) demand and net (or finished) demand, and only consumptive use is reported. For further explanation of these terms, please refer to Chapter 2 of this plan update.

PUBLIC WATER SUPPLY AND DOMESTIC AND SMALL PUBLIC SUPPLY

This section presents the methodology used to estimate the 2014 population, projected populations, and gross (raw) and net (finished) PWS and DSS water demands in the LWC Planning Area. Determining population projections is a key step in developing water demand projections, especially for the PWS and DSS categories. Section 373.709(2)(a)1, F.S., prescribes the use of population projections in determining water supply needs in regional water supply plans, as follows:

> *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.*

Population Projection Methodology

Permanent county resident populations from the 2010 United States Census (United States Census Bureau 2012) were used as the basis of population projections in this 2017 LWC Plan Update. Adjustments were made to only include the portions of the counties within the planning area. The 2010 permanent resident populations in the counties (or portions of counties) within the LWC Planning Area were as follows:

- Lee County: 615, 626 residents
- Collier County: 321,485 residents
- Hendry County: 33,878 residents
- Glades County: 8,885 residents
- Charlotte County: 2,012 residents

PWS Utility Service Areas

To begin calculating PWS and DSS demands, each PWS utility's 2014 and 2040 service areas were established. A utility service area refers to the area with distribution infrastructure and actual water customers. The SFWMD developed 2014 and 2040 utility service area maps using data from PWS utilities, the SFWMD's Water Use Regulatory Database, and local government Water Supply Facilities Work Plans. Accuracy of the service area maps is verified through correspondence with PWS utilities. The resulting utility service area maps for 2014 and 2040 are provided in Appendix A of this plan update.

PWS Population Estimates 2014 to 2040

In accordance with Section 373.709, F.S., 2010 county populations were adjusted to 2014 populations using BEBR estimated medium annual growth rates from 2010 through 2014 (Rayer and Wang 2015). The 2014 estimated county populations then were assigned to 2014 utility service areas, resulting in the 2014 PWS service area populations.

To obtain 2040 populations, information from the four metropolitan planning organizations (MPOs) within the LWC Planning Area: Charlotte County MPO, Collier County MPO, Lee County MPO, and Heartland Regional Transportation Planning Organization were utilized. The MPOs published subcounty population estimates and projections as part of their Long-Term Regional Transportation Plans. The 2040 MPO projections were based on the anticipated location of schools, public spaces, transportation infrastructure, residential development, and employment opportunities driven by local development objectives. Building on these key characteristics, the aggregated set of 2040 MPO projections was the basis for calculating relative growth rates across the LWC Planning Area.

The MPOs distributed medium BEBR 2040 county population projections into hundreds of traffic analysis zones (TAZs). The SFWMD assigned individual TAZs to 2040 utility service areas. The relationship among TAZ projections, census blocks, and utility service areas is demonstrated in **Figure B-1**. The top layer shows the extent of utility service areas, and the middle layer displays census blocks. The bottom layer displays TAZs colored according to their relative growth rates; areas in green have higher growth rates than those in red. The 2040 TAZ populations were assigned to 2040 utility service areas to establish the 2040 PWS service area populations. Residents not within a PWS service area were designated as DSS for 2014 and 2040.

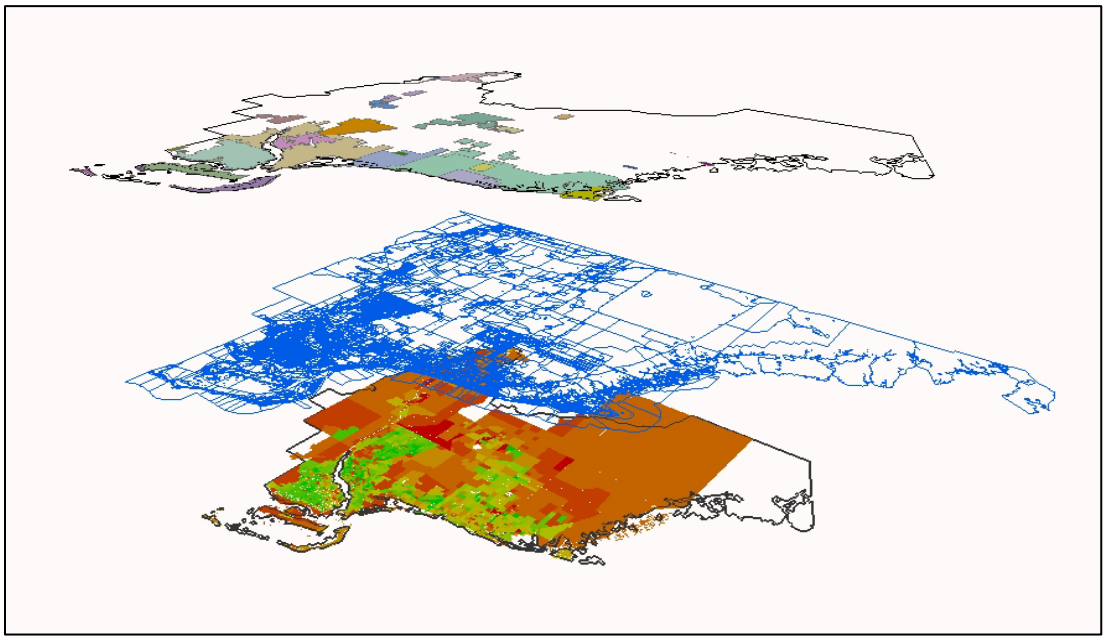

Figure B-1. Three-dimensional representation of utility service area projections (top), United States Census results (middle), and traffic analysis zone projections (bottom).

Population Projection Results

Table B-1 provides the results of the population distributions by county and PWS utility from 2010 to 2040. The results were shared with and reviewed by utility, municipal, and local government staff. Feedback from local stakeholders produced information that led to small adjustments to some service area projections.

Table B-1. PWS and DSS population projections in the LWC Planning Area between 2010 and 2040.

County	PWS Utility or DSS	2010	2014	2020	2025	2030	2035	2040
Charlotte*	Town and Country Utilities Company	72	72	5,358	10,643	15,929	21,214	26,500
	PWS Total	**72**	**72**	**5,358**	**10,643**	**15,929**	**21,214**	**26,500**
	DSS Total	**1,940**	**1,968**	**2,011**	**2,046**	**2,081**	**2,117**	**2,152**
	Charlotte Total	**2,012**	**2,040**	**7,369**	**12,689**	**18,010**	**23,331**	**28,652**
Collier	Ave Maria Utility Company	1,279	3,532	7,078	10,057	13,002	15,875	18,710
	Collier County Water-Sewer District	168,462	176,560	204,905	222,409	238,694	253,737	268,403
	Everglades City	990	989	1,036	1,069	1,094	1,115	1,134
	FGUA Golden Gate	10,064	9,915	10,177	10,323	10,405	10,435	10,453
	Immokalee Water and Sewer District	23,992	23,906	24,945	25,641	26,184	26,593	26,971
	Marco Island Utilities	17,186	17,157	17,952	18,494	18,925	19,259	19,571
	Naples Utility Department, City of	49,578	51,070	55,800	59,414	62,692	65,646	68,510
	Orange Tree Utility Company	5,186	6,033	--	--	--	--	--
	Port of the Islands CID	579	576	599	614	626	634	641
	PWS Total	**277,316**	**289,738**	**322,492**	**348,021**	**371,622**	**393,294**	**414,393**
	DSS Total	**44,169**	**47,045**	**53,649**	**58,884**	**63,801**	**68,386**	**72,865**
	Collier Total	**321,485**	**336,783**	**376,141**	**406,905**	**435,423**	**461,680**	**487,258**
Glades*	Clewiston Utilities	815	828	898	953	1,006	1,056	1,100
	Moore Haven Utilities	3,305	3,202	3,243	3,264	3,274	3,270	3,251
	Port LaBelle Utility System	225	222	232	239	246	251	255
	PWS Total	**4,345**	**4,252**	**4,373**	**4,456**	**4,526**	**4,577**	**4,606**
	DSS Total	**4,540**	**4,610**	**4,993**	**5,299**	**5,591**	**5,861**	**6,102**
	Glades Total	**8,885**	**8,862**	**9,366**	**9,755**	**10,117**	**10,438**	**10,708**
Hendry*	Clewiston Utilities	13,704	13,589	13,676	13,710	13,690	13,629	13,534
	LaBelle Department of Public Works, City of	6,278	6,248	6,322	6,367	6,386	6,387	6,371
	Port LaBelle Utility System	3,539	3,460	3,408	3,354	3,286	3,209	3,124
	PWS Total	**23,521**	**23,297**	**23,406**	**23,431**	**23,362**	**23,225**	**23,029**
	DSS Total	**10,357**	**10,641**	**11,271**	**11,771**	**12,226**	**12,644**	**13,028**
	Hendry Total	**33,878**	**33,938**	**34,677**	**35,202**	**35,588**	**35,869**	**36,057**
Lee	Bonita Springs Utilities	49,376	52,527	61,482	68,985	76,095	82,604	88,662
	Cape Coral Utilities	106,452	121,416	153,454	180,571	206,832	231,501	254,866
	Citrus Park RV Resort	1,747	1,688	1,739	1,776	1,799	1,807	1,807
	FGUA Lake Fairways	2,126	2,057	2,124	2,173	2,205	2,219	2,222
	FGUA Lehigh Acres	24,761	25,141	27,761	29,917	31,876	33,577	35,101
	Fort Myers Public Utility, City of	58,914	62,825	73,746	82,901	91,587	99,549	106,969
	Greater Pine Island Water Association	10,388	10,709	12,061	13,182	14,220	15,144	15,988
	Island Water Association	7,052	6,878	7,185	7,421	7,602	7,720	7,798
	Lee County Utilities	221,398	229,263	259,659	284,917	308,419	329,446	348,714
	PWS Total	**482,214**	**512,504**	**599,211**	**671,843**	**740,635**	**803,567**	**862,127**
	DSS Total	**133,412**	**137,797**	**155,561**	**170,306**	**183,993**	**196,203**	**207,366**
	Lee Total	**615,626**	**650,301**	**754,772**	**842,149**	**924,628**	**999,770**	**1,069,493**
LWC Planning Area PWS Total		**787,468**	**829,863**	**954,840**	**1,058,394**	**1,156,074**	**1,245,877**	**1,330,655**
LWC Planning Area DSS Total		**194,418**	**202,061**	**227,485**	**248,306**	**267,692**	**285,211**	**301,513**
LWC Planning Area Total		**981,886**	**1,031,924**	**1,182,325**	**1,306,700**	**1,423,766**	**1,531,088**	**1,632,168**

CID = Community Improvement District; DSS = Domestic and Small Public Supply; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PWS = Public Water Supply.

* Populations listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Note: Gasparilla Island Water Association and Burnt Store Utilities are not included here because they withdraw water regulated by the Southwest Florida Water Management District.

Lee and Collier counties are projected to continue growing rapidly with rates gradually tapering off through 2040. Large population changes are expected in the portion of Charlotte County within the LWC Planning Area due to development of the Babcock Ranch planned community. Hendry and Glades counties stand in stark contrast to the rest of the LWC Planning Area as little change is projected in their populations.

The permanent resident population of the LWC Planning Area is projected to grow by more than 58 percent between 2014 and 2040, primarily in Lee and Collier counties. Many service areas are expected to expand, increasing the number of PWS customers. However, the region is projected to maintain a substantial DSS population through 2040. The utilities with the largest populations served, both in 2014 and 2040 are Lee County Utilities, the Collier County Water-Sewer District, and Cape Coral Utilities.

Comparing this 2017 LWC Plan Update population projection to those published in the 2012 and 2006 plan updates can provide insight into the importance of population growth on BEBR projections. Prior to the national economic downturn in 2008, high rates of development in the region pointed to substantial population growth (**Figure B-2**). The projections seen in the 2006 LWC Plan Update are a result of the higher population growth rates seen in the LWC Planning Area prior to the recession beginning in 2008. The BEBR projections used in this 2017 LWC Plan Update and the 2012 LWC Plan Update share a more consistent growth pattern based on population estimates post-2008 recession.

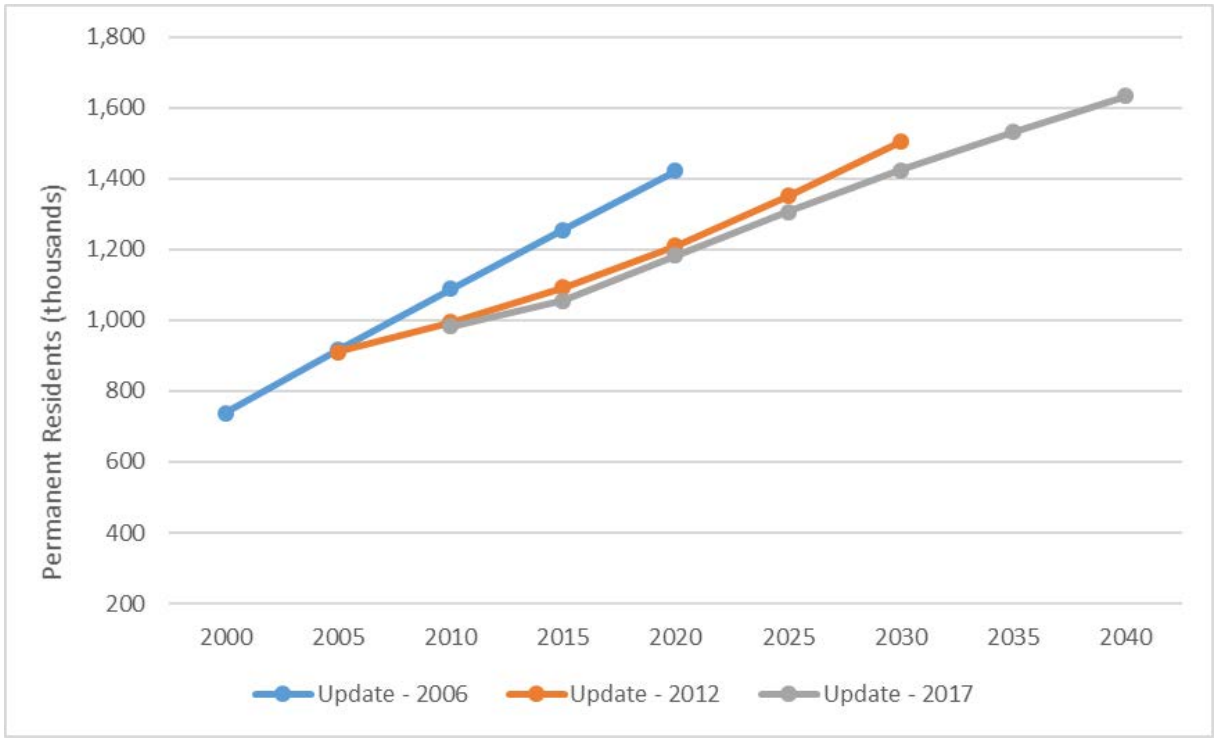

Figure B-2. Comparison of population projections from the 2006, 2012, and 2017 Lower West Coast Water Supply Plan Updates.

PWS and DSS Demand Projection Methodology and Results

Per Capita Use Rates

For each utility, annual net (finished) water per capita use rates (PCURs) were calculated by dividing the annual total PWS net (finished) water volume by the number of permanent residents served, then averaged for the 5-year period from 2010 to 2014 (**Table B-2**). Net (finished) water volumes were obtained from the Florida Department of Environmental Protection's (FDEP's) PWS utility monthly operating reports. The FDEP net (finished) water volume includes all water used by permanent and seasonal residents; industrial, landscaping, and irrigation water from PWS utilities; and any water treatment losses. It does not include water distribution losses. The resulting PCURs conform to guidance provided by the FDEP for consistent statewide water supply planning.

The PCURs for the DSS populations in Lee and Collier counties are the median usage rates from each county's PWS population. Each individual in a county's PWS population is assigned the utility's PCUR so a county-wide median usage rate can be calculated. The same approach was used with Hendry and Glades counties; however, the DSS median PCUR for each county was derived with the combined PWS population. The statewide average PCUR for DSS (106 gallons per capita per day), as reported in Marella (2014), was used for Charlotte County.

Table B-2. Average net (finished) water per capita use rates (gallons per capita per day) for PWS utilities (2010 to 2014).

County	PWS Utility or DSS	2010-2014 Average PCUR
Charlotte*	Town and Country Utilities Company	100
	Charlotte Domestic Self-Supplied	85
	Charlotte County Average	**100**
Collier	Ave Maria Utility Company	91
	Collier County Water-Sewer District	129
	Everglades City	240
	FGUA Golden Gate	139
	Immokalee Water and Sewer District	85
	Marco Island Utilities	386
	Naples Utility Department, City of	281
	Orange Tree Utility Company	57
	Port of the Islands CID	142
	Collier Domestic Self-Supplied	129
	Collier County Average	**168**
Glades*	Clewiston Utilities	106
	Moore Haven Utilities	153
	Port LaBelle Utility System	108
	Glades Domestic Self-Supplied	106
	Glades County Average	**107**
Hendry*	Clewiston Utilities	106
	LaBelle Department of Public Works, City of	87
	Port LaBelle Utility System	108
	Hendry Domestic Self-Supplied	106
	Hendry County Average	**107**
Lee	Bonita Springs Utilities	151
	Cape Coral Utilities	87
	Citrus Park RV Resort	114
	FGUA Lake Fairways	43
	FGUA Lehigh Acres	94
	Fort Myers Public Utility, City of	101
	Greater Pine Island Water Association	120
	Island Water Association	488
	Lee County Utilities	104
	Lee Domestic Self-Supplied	104
	Lee County Average	**109**
LWC Planning Area PWS Average		**129**

CID = Community Improvement District; DSS = Domestic and Small Public Supply; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PCUR = per capita use rate; PWS = public water supply.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Finished to Raw Water Conversion

Knowing the service area population and the PCUR, allows the net (finished) demand to be calculated. The net (finished) demands under average conditions for 2010 through 2040 are provided in **Table B-3**. Gross (raw) water withdrawals need to be determined because water use permit allocations are based on the gross (raw) water volume withdrawn from the source(s). To convert net (finished) water to gross (raw) water, the treatment efficiencies for each PWS facility was determined from information supplied in the water use permit and/or standard treatment process technical documents. For example, if a typical reverse osmosis treatment facility withdraws a gross (raw) volume of 10 mgd and produces 8 mgd of net (finished) water, its treatment losses are 20 percent. Therefore, its raw-to-finished ratio would be 1.25 (10 mgd divided by 8 mgd). **Table B-4** summarizes the raw-to-finished ratios for the PWS utilities in the LWC Planning Area. For DSS water demands, the raw-to-finished water ratio is assumed to be 1.00.

Table B-3. Net (finished) water demand projections for PWS and DSS under average rainfall conditions in the LWC Planning Area between 2010 and 2040.

County	PWS Utility or DSS	Demand - Average Rainfall Conditions (mgd)						
		2010	2014	2020	2025	2030	2035	2040
Charlotte*	Town and Country Utilities Company	0.01	0.01	0.54	1.06	1.59	2.12	2.65
	PWS Total	**0.01**	**0.01**	**0.54**	**1.06**	**1.59**	**2.12**	**2.65**
	DSS Total	**0.16**	**0.17**	**0.17**	**0.17**	**0.18**	**0.18**	**0.18**
	Charlotte Total	**0.17**	**0.17**	**0.71**	**1.24**	**1.77**	**2.30**	**2.83**
Collier	Ave Maria Utility Company	0.12	0.32	0.64	0.92	1.18	1.44	1.70
	Collier County Water-Sewer District	21.73	22.78	26.43	28.69	30.79	32.73	34.62
	Everglades City	0.24	0.24	0.25	0.26	0.26	0.27	0.27
	FGUA Golden Gate	1.40	1.38	1.41	1.43	1.45	1.45	1.45
	Immokalee Water and Sewer District	2.04	2.03	2.12	2.18	2.23	2.26	2.29
	Marco Island Utilities	6.63	6.62	6.93	7.14	7.31	7.43	7.55
	Naples Utility Department, City of	13.93	14.35	15.68	16.70	17.62	18.45	19.25
	Orange Tree Utility Company	0.30	0.34	0.00	0.00	0.00	0.00	0.00
	Port of the Islands CID	0.08	0.08	0.09	0.09	0.09	0.09	0.09
	PWS Total	**46.47**	**48.14**	**53.55**	**57.40**	**60.92**	**64.13**	**67.24**
	DSS Total	**5.70**	**6.07**	**6.92**	**7.60**	**8.23**	**8.82**	**9.40**
	Collier Total	**52.16**	**54.21**	**60.48**	**64.99**	**69.15**	**72.95**	**76.64**
Glades*	Clewiston Utilities	0.09	0.09	0.10	0.10	0.11	0.11	0.12
	Moore Haven Utilities	0.51	0.49	0.50	0.50	0.50	0.50	0.50
	Port LaBelle Utility System	0.02	0.02	0.03	0.03	0.03	0.03	0.03
	PWS Total	**0.62**	**0.60**	**0.62**	**0.63**	**0.63**	**0.64**	**0.64**
	DSS Total	**0.48**	**0.49**	**0.53**	**0.56**	**0.59**	**0.62**	**0.65**
	Glades Total	**1.10**	**1.09**	**1.15**	**1.19**	**1.23**	**1.26**	**1.29**
Hendry*	Clewiston Utilities	1.45	1.44	1.45	1.45	1.45	1.44	1.43
	LaBelle Department of Public Works, City of	0.55	0.54	0.55	0.55	0.56	0.56	0.55
	Port LaBelle Utility System	0.38	0.37	0.37	0.36	0.35	0.35	0.34
	PWS Total	**2.38**	**2.36**	**2.37**	**2.37**	**2.36**	**2.35**	**2.33**
	DSS Total	**1.10**	**1.13**	**1.19**	**1.25**	**1.30**	**1.34**	**1.38**
	Hendry Total	**3.48**	**3.49**	**3.56**	**3.62**	**3.66**	**3.69**	**3.71**
Lee	Bonita Springs Utilities	7.46	7.93	9.28	10.42	11.49	12.47	13.39
	Cape Coral Utilities	9.26	10.56	13.35	15.71	17.99	20.14	22.17
	Citrus Park RV Resort	0.20	0.19	0.20	0.20	0.21	0.21	0.21
	FGUA Lake Fairways	0.09	0.09	0.09	0.09	0.09	0.10	0.10
	FGUA Lehigh Acres	2.33	2.36	2.61	2.81	3.00	3.16	3.30
	Fort Myers Public Utility, City of	5.95	6.35	7.45	8.37	9.25	10.05	10.80
	Greater Pine Island Water Association	1.25	1.29	1.45	1.58	1.71	1.82	1.92
	Island Water Association	3.44	3.36	3.51	3.62	3.71	3.77	3.81
	Lee County Utilities	23.03	23.84	27.00	29.63	32.08	34.26	36.27
	PWS Total	**53.00**	**55.97**	**64.94**	**72.44**	**79.52**	**85.97**	**91.96**
	DSS Total	**13.87**	**14.33**	**16.18**	**17.71**	**19.14**	**20.41**	**21.57**
	Lee Total	**66.87**	**70.30**	**81.12**	**90.15**	**98.66**	**106.38**	**113.52**
	LWC Planning Area PWS Total	**102.47**	**107.08**	**122.01**	**133.90**	**145.03**	**155.21**	**164.82**
	LWC Planning Area DSS Total	**21.32**	**22.18**	**24.99**	**27.29**	**29.43**	**31.37**	**33.18**
	LWC Planning Area Total	**123.79**	**129.26**	**147.01**	**161.19**	**174.46**	**186.57**	**197.99**

CID = Community Improvement District; DSS = Domestic and Small Public Supply; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PWS = Public Water Supply.

* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Table B-4. Raw-to-finished water adjustment ratios for each PWS utility in the LWC Planning Area.

County	PWS Utility	Raw to Finished Ratio
Charlotte*	Town and Country Utilities Company	1.20
Collier	Ave Maria Utility Company	1.18
	Collier County Water-Sewer District	1.22
	Everglades City	1.01
	FGUA Golden Gate	1.16
	Immokalee Water and Sewer District	1.05
	Marco Island Utilities	1.16
	Naples Utility Department, City of	1.05
	Orange Tree Utility Company	1.22
	Port of the Islands CID	1.18
Glades*	Moore Haven Utilities	1.33
Hendry*	Clewiston Utilities	1.33
	LaBelle Department of Public Works, City of	1.33
	Port LaBelle Utility System	1.43
Lee	Bonita Springs Utilities	1.18
	Cape Coral Utilities	1.25
	Citrus Park RV Resort	1.18
	FGUA Lake Fairways	1.01
	FGUA Lehigh Acres	1.05
	Fort Myers Public Utility, City of	1.33
	Greater Pine Island Water Association	1.16
	Island Water Association	1.23
	Lee County Utilities	1.28

CID = Community Improvement District; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PWS = Public Water Supply.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

2040 Projected Raw Demands

To determine gross (raw) water demand for each PWS utility, net (finished) water projections were multiplied by the raw-to-finished ratios in **Table B-4**. This methodology assumes no changes in treatment efficiency from any future plant changes (e.g., lime softening to membrane) or source shifting (e.g., fresh surficial aquifer water system to brackish Floridan aquifer system water). The gross (raw) demands under average conditions for 2010 through 2040 are provided in **Table B-5**.

Table B-5. Gross (raw) water demand projections for PWS and DSS under average rainfall conditions in the LWC Planning Area between 2010 and 2040.

County	PWS Utility or DSS	Demand-Average Rainfall Conditions (mgd)						
		2010	2014	2020	2025	2030	2035	2040
Charlotte*	Town and Country Utilities Company	0.01	0.01	0.64	1.28	1.91	2.55	3.18
	PWS Total	**0.01**	**0.01**	**0.64**	**1.28**	**1.91**	**2.55**	**3.18**
	DSS Total	**0.16**	**0.17**	**0.17**	**0.17**	**0.18**	**0.18**	**0.18**
	Charlotte Total	**0.17**	**0.18**	**0.81**	**1.45**	**2.09**	**2.73**	**3.36**
Collier	Ave Maria Utility Company	0.14	0.38	0.76	1.08	1.40	1.70	2.01
	Collier County Water-Sewer District	26.51	27.79	32.25	35.00	37.57	39.93	42.24
	Everglades City	0.24	0.24	0.25	0.26	0.27	0.27	0.27
	FGUA Golden Gate	1.62	1.60	1.64	1.66	1.68	1.68	1.69
	Immokalee Water and Sewer District	2.14	2.13	2.23	2.29	2.34	2.37	2.41
	Marco Island Utilities	7.70	7.68	8.04	8.28	8.47	8.62	8.76
	Naples Utility Department, City of	14.63	15.07	16.46	17.53	18.50	19.37	20.21
	Orange Tree Utility Company	0.36	0.42	0.00	0.00	0.00	0.00	0.00
	Port of the Islands CID	0.10	0.10	0.10	0.10	0.10	0.11	0.11
	PWS Total	**53.43**	**55.40**	**61.73**	**66.21**	**70.32**	**74.06**	**77.70**
	DSS Total	**5.70**	**6.07**	**6.92**	**7.60**	**8.23**	**8.82**	**9.40**
	Collier Total	**59.13**	**61.47**	**68.65**	**73.80**	**78.55**	**82.88**	**87.10**
Glades*	Clewiston Utilities	0.11	0.12	0.13	0.13	0.14	0.15	0.16
	Moore Haven Utilities	0.67	0.65	0.66	0.66	0.67	0.67	0.66
	Port LaBelle Utility System	0.03	0.03	0.04	0.04	0.04	0.04	0.04
	PWS Total	**0.82**	**0.80**	**0.82**	**0.84**	**0.85**	**0.85**	**0.86**
	DSS Total	**0.48**	**0.49**	**0.53**	**0.56**	**0.59**	**0.62**	**0.65**
	Glades Total	**1.30**	**1.29**	**1.35**	**1.40**	**1.44**	**1.47**	**1.50**
Hendry*	Clewiston Utilities	1.93	1.92	1.93	1.93	1.93	1.92	1.91
	LaBelle Department of Public Works, City of	0.73	0.72	0.73	0.74	0.74	0.74	0.74
	Port LaBelle Utility System	0.55	0.53	0.53	0.52	0.51	0.50	0.48
	PWS Total	**3.20**	**3.17**	**3.19**	**3.19**	**3.18**	**3.16**	**3.13**
	DSS Total	**1.10**	**1.13**	**1.19**	**1.25**	**1.30**	**1.34**	**1.38**
	Hendry Total	**4.30**	**4.30**	**4.38**	**4.44**	**4.47**	**4.50**	**4.51**
Lee	Bonita Springs Utilities	8.80	9.36	10.95	12.29	13.56	14.72	15.80
	Cape Coral Utilities	11.58	13.20	16.69	19.64	22.49	25.18	27.72
	Citrus Park RV Resort	0.24	0.23	0.23	0.24	0.24	0.24	0.24
	FGUA Lake Fairways	0.09	0.09	0.09	0.09	0.10	0.10	0.10
	FGUA Lehigh Acres	2.44	2.48	2.74	2.95	3.15	3.31	3.46
	Fort Myers Public Utility, City of	7.91	8.44	9.91	11.14	12.30	13.37	14.37
	Greater Pine Island Water Association	1.45	1.49	1.68	1.83	1.98	2.11	2.23
	Island Water Association	4.23	4.13	4.31	4.45	4.56	4.63	4.68
	Lee County Utilities	29.47	30.52	34.57	37.93	41.06	43.86	46.42
	PWS Total	**66.21**	**69.94**	**81.17**	**90.57**	**99.44**	**107.52**	**115.01**
	DSS Total	**13.87**	**14.33**	**16.18**	**17.71**	**19.14**	**20.41**	**21.57**
	Lee Total	**80.09**	**84.27**	**97.35**	**108.28**	**118.57**	**127.92**	**136.58**
	LWC Planning Area PWS Total	**123.68**	**129.33**	**147.55**	**162.08**	**175.69**	**188.14**	**199.88**
	LWC Planning Area DSS Total	**21.32**	**22.18**	**24.99**	**27.29**	**29.43**	**31.37**	**33.18**
	LWC Planning Area Total	**145.00**	**151.51**	**172.55**	**189.37**	**205.12**	**219.50**	**233.06**

CID = Community Improvement District; DSS = Domestic and Small Public Supply; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PWS = Public Water Supply.

* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Demand Projections for 1-in-10 Year Drought Conditions

Section 373.709, F.S., states that the level-of-certainty planning goal associated with identifying water demands shall be based on meeting demands during 1-in-10 year drought conditions. Water demand projections for average rainfall conditions were used to calculate 1-in-10 year drought demands. A 1-in-10 year drought is characterized by diminished rain and increased evapotranspiration relative to the historical record for a particular location. The increased PWS and DSS demands for 1-in-10 year drought conditions were calculated using the method described in the *Districtwide Water Supply Assessment* (SFWMD 1998). Drought demand factors for each county (or portion of the county within the LWC Planning Area) are as follows:

NOTE

Average Rainfall and 1-in-10 Year Drought

An **average rainfall** year is defined as a year having rainfall with a 50 percent probability of being exceeded over a 12-month period.

A **1-in-10 year drought** is a drought of such intensity that it is expected to have a return frequency of once in 10 years.

- Charlotte County: 1.05
- Collier County: 1.08
- Glades County: 1.06
- Hendry County: 1.06
- Lee County: 1.05

Average water demands were multiplied by the above ratios to calculate the 1-in-10 year drought condition demands. **Tables B-6** and **B-7** provide PWS and DSS water demands under 1-in-10 year drought conditions for 2010 through 2040.

Table B-6. Net (finished) water demand projections for PWS and DSS under 1-in-10 year drought conditions in the LWC Planning Area between 2010 and 2040.

County	PWS Utility or DSS	Demand - 1-in-10 Year Drought Conditions (mgd)					
		2014	2020	2025	2030	2035	2040
Charlotte*	Town and Country Utilities Company	0.01	0.56	1.12	1.67	2.23	2.78
	PWS Total	**0.01**	**0.56**	**1.12**	**1.67**	**2.23**	**2.78**
	DSS Total	**0.18**	**0.18**	**0.18**	**0.19**	**0.19**	**0.19**
	Charlotte Total	**0.18**	**0.18**	**0.18**	**0.19**	**0.19**	**0.19**
Collier	Ave Maria Utility Company	0.35	0.70	0.99	1.28	1.56	1.84
	Collier County Water-Sewer District	24.60	28.55	30.99	33.25	35.35	37.39
	Everglades City	0.26	0.27	0.28	0.28	0.29	0.29
	FGUA Golden Gate	1.49	1.53	1.55	1.56	1.57	1.57
	Immokalee Water and Sewer District	2.19	2.29	2.35	2.40	2.44	2.48
	Marco Island Utilities	7.15	7.48	7.71	7.89	8.03	8.16
	Naples Utility Department, City of	15.50	16.93	18.03	19.03	19.92	20.79
	Orange Tree Utility Company	0.37	0.00	0.00	0.00	0.00	0.00
	Port of the Islands CID	0.09	0.09	0.09	0.10	0.10	0.10
	PWS Total	**52.00**	**57.84**	**61.99**	**65.79**	**69.26**	**72.62**
	DSS Total	**6.55**	**7.47**	**8.20**	**8.89**	**9.53**	**10.15**
	Collier Total	**58.55**	**65.31**	**70.19**	**74.68**	**78.78**	**82.77**
Glades*	Clewiston Utilities	0.09	0.10	0.11	0.11	0.12	0.12
	Moore Haven Utilities	0.52	0.53	0.53	0.53	0.53	0.53
	Port LaBelle Utility System	0.03	0.03	0.03	0.03	0.03	0.03
	PWS Total	**0.64**	**0.65**	**0.66**	**0.67**	**0.68**	**0.68**
	DSS Total	**0.52**	**0.56**	**0.60**	**0.63**	**0.66**	**0.69**
	Glades Total	**1.16**	**1.21**	**1.26**	**1.30**	**1.34**	**1.37**
Hendry*	Clewiston Utilities	**1.53**	**1.54**	**1.54**	**1.54**	**1.53**	**1.52**
	LaBelle Department of Public Works, City of	**0.58**	**0.58**	**0.59**	**0.59**	**0.59**	**0.59**
	Port LaBelle Utility System	**0.40**	**0.39**	**0.38**	**0.38**	**0.37**	**0.36**
	PWS Total	**2.50**	**2.51**	**2.51**	**2.50**	**2.49**	**2.47**
	DSS Total	**1.20**	**1.27**	**1.32**	**1.37**	**1.42**	**1.46**
	Hendry Total	**3.69**	**3.78**	**3.83**	**3.88**	**3.91**	**3.93**
Lee	Bonita Springs Utilities	8.33	9.75	10.94	12.06	13.10	14.06
	Cape Coral Utilities	11.09	14.02	16.50	18.89	21.15	23.28
	Citrus Park RV Resort	0.20	0.21	0.21	0.22	0.22	0.22
	FGUA Lake Fairways	0.09	0.10	0.10	0.10	0.10	0.10
	FGUA Lehigh Acres	2.48	2.74	2.95	3.15	3.31	3.46
	Fort Myers Public Utility, City of	6.66	7.82	8.79	9.71	10.56	11.34
	Greater Pine Island Water Association	1.35	1.52	1.66	1.79	1.91	2.01
	Island Water Association	3.52	3.68	3.80	3.90	3.96	4.00
	Lee County Utilities	25.04	28.35	31.11	33.68	35.98	38.08
	PWS Total	**58.77**	**68.19**	**76.06**	**83.50**	**90.27**	**96.55**
	DSS Total	**15.05**	**16.99**	**18.60**	**20.09**	**21.43**	**22.64**
	Lee Total	**73.82**	**85.17**	**94.66**	**103.59**	**111.70**	**119.20**
LWC Planning Area PWS Total		**113.91**	**129.75**	**142.35**	**154.14**	**164.92**	**175.10**
LWC Planning Area DSS Total		**23.49**	**26.47**	**28.90**	**31.17**	**33.22**	**35.14**
LWC Planning Area Total		**137.40**	**156.22**	**171.25**	**185.31**	**198.14**	**210.24**

CID = Community Improvement District; DSS = Domestic and Small Public Supply; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PWS = Public Water Supply.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Table B-7. Gross (raw) water demand projections for PWS and DSS under 1-in-10 year drought conditions in the LWC Planning Area between 2010 and 2040.

County	PWS Utility or DSS	Demand - 1-in-10 Year Drought Conditions (mgd)						
		2010	2014	2020	2025	2030	2035	2040
Charlotte*	Town and Country Utilities Company	0.01	0.01	0.68	1.34	2.01	2.67	3.34
	PWS Total	**0.01**	**0.01**	**0.68**	**1.34**	**2.01**	**2.67**	**3.34**
	DSS Total	**0.17**	**0.18**	**0.18**	**0.18**	**0.19**	**0.19**	**0.19**
	Charlotte Total	**0.18**	**0.18**	**0.85**	**1.52**	**2.19**	**2.86**	**3.53**
Collier	Ave Maria Utility Company	0.15	0.41	0.82	1.17	1.51	1.84	2.17
	Collier County Water-Sewer District	28.63	30.01	34.83	37.80	40.57	43.13	45.62
	Everglades City	0.26	0.26	0.27	0.28	0.29	0.29	0.30
	FGUA Golden Gate	1.75	1.73	1.77	1.80	1.81	1.82	1.82
	Immokalee Water and Sewer District	2.31	2.30	2.40	2.47	2.52	2.56	2.60
	Marco Island Utilities	8.31	8.30	8.68	8.94	9.15	9.31	9.46
	Naples Utility Department, City of	15.80	16.27	17.78	18.93	19.98	20.92	21.83
	Orange Tree Utility Company	0.39	0.45	0.00	0.00	0.00	0.00	0.00
	Port of the Islands CID	0.10	0.10	0.11	0.11	0.11	0.11	0.12
	PWS Total	**57.71**	**59.84**	**66.67**	**71.51**	**75.94**	**79.99**	**83.92**
	DSS Total	**6.15**	**6.55**	**7.47**	**8.20**	**8.89**	**9.53**	**10.15**
	Collier Total	**63.86**	**66.39**	**74.14**	**79.71**	**84.83**	**89.52**	**94.07**
Glades*	Clewiston Utilities	0.12	0.12	0.13	0.14	0.15	0.16	0.16
	Moore Haven Utilities	0.71	0.69	0.70	0.70	0.71	0.71	0.70
	Port LaBelle Utility System	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	PWS Total	**0.87**	**0.85**	**0.87**	**0.89**	**0.90**	**0.90**	**0.91**
	DSS Total	**0.51**	**0.52**	**0.56**	**0.60**	**0.63**	**0.66**	**0.69**
	Glades Total	**1.38**	**1.37**	**1.43**	**1.48**	**1.53**	**1.56**	**1.59**
Hendry*	Clewiston Utilities	2.05	2.03	2.04	2.05	2.05	2.04	2.02
	LaBelle Department of Public Works, City of	0.77	0.77	0.78	0.78	0.78	0.78	0.78
	Port LaBelle Utility System	0.58	0.57	0.56	0.55	0.54	0.53	0.51
	PWS Total	**3.40**	**3.36**	**3.38**	**3.38**	**3.37**	**3.35**	**3.32**
	DSS Total	**1.16**	**1.20**	**1.27**	**1.32**	**1.37**	**1.42**	**1.46**
	Hendry Total	**4.56**	**4.56**	**4.64**	**4.70**	**4.74**	**4.77**	**4.78**
Lee	Bonita Springs Utilities	9.24	9.83	11.50	12.91	14.24	15.45	16.59
	Cape Coral Utilities	12.16	13.86	17.52	20.62	23.62	26.43	29.10
	Citrus Park RV Resort	0.25	0.24	0.25	0.25	0.25	0.26	0.26
	FGUA Lake Fairways	0.10	0.09	0.10	0.10	0.10	0.10	0.10
	FGUA Lehigh Acres	2.57	2.61	2.88	3.10	3.30	3.48	3.64
	Fort Myers Public Utility, City of	8.31	8.86	10.40	11.69	12.92	14.04	15.09
	Greater Pine Island Water Association	1.52	1.57	1.76	1.93	2.08	2.21	2.34
	Island Water Association	4.44	4.33	4.53	4.68	4.79	4.87	4.91
	Lee County Utilities	30.95	32.05	36.29	39.82	43.11	46.05	48.74
	PWS Total	**69.52**	**73.44**	**85.23**	**95.10**	**104.41**	**112.89**	**120.77**
	DSS Total	**14.57**	**15.05**	**16.99**	**18.60**	**20.09**	**21.43**	**22.64**
	Lee Total	**84.09**	**88.48**	**102.22**	**113.69**	**124.50**	**134.32**	**143.41**
	LWC Planning Area PWS Total	**131.51**	**137.50**	**156.82**	**172.21**	**186.62**	**199.80**	**212.25**
	LWC Planning Area DSS Total	**22.57**	**23.49**	**26.47**	**28.90**	**31.17**	**33.22**	**35.14**
	LWC Planning Area Total	**154.08**	**160.99**	**183.29**	**201.11**	**217.79**	**233.02**	**247.38**

CID = Community Improvement District; DSS = Domestic and Small Public Supply; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; PWS = Public Water Supply.

* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

AGRICULTURAL IRRIGATION

Water demands reported under AGR include water used for agricultural production, such as farm irrigation, operation of greenhouses and nurseries, and raising livestock. Water used in the processing of agricultural commodities is accounted for under the ICI category.

Previous LWC water supply plan updates relied on various sources to develop agricultural acreage estimates and projections. Primary elements included data related to agricultural water use permits, parcel-level land use maps, and results from the United States Agricultural Census. Irrigated acreages were translated to water volume (mgd) estimates using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model (Smajstrla 1990).

Florida State legislation passed in 2013 [Sections 373.709(2)(a)1b and 570.93, F.S.] prescribed a new approach for water management districts to report agricultural water demands. Section 570.93, F.S., directs the Florida Department of Agriculture and Consumer Services (FDACS) to develop annual statewide agricultural acreage and water demand projections based on the same 20-year planning horizon used in water supply planning. Under Section 373.709(2)(a), F.S., water management districts are required to consider FDACS projections, and any adjustments or deviations from the projections published by FDACS, "…must be fully described, and the original data must be presented along with the adjusted data."

AGR Projection Methodology

FSAID III Acreage and Demands Data

FDACS publishes 20-year agricultural acreage and associated water demand projections annually in Florida Statewide Agricultural Irrigation Demand (FSAID) reports. The third annual report (referred to as FSAID III) was published in 2016. The FSAID III results (**Tables B-8** and **B-9**) were considered for use in this 2017 LWC Plan Update, and feedback was solicited from agricultural stakeholders. SFWMD staff determined that the FSAID III acreage projections for key irrigated crops were reasonable based on information obtained from federal, state, agricultural industry, and academic sources. Therefore, the SFWMD decided to use the acreage estimates and projections in the FSAID III report for this 2017 LWC Plan Update. However, water demands were calculated separately using the AFSIRS model, as discussed below.

Table B-8. LWC Planning Area acreage projections for an average year from the FSAID III report.

Crop	2015	2020	2025	2030	2035	2040
Citrus	124,319	127,133	123,587	121,285	121,256	122,473
Field Crops	1,599	2,805	3,344	3,551	3,900	3,922
Fruit (Non-Citrus)	389	389	446	446	446	446
Greenhouse or Nursery	3,920	3,934	4,213	4,221	4,247	4,246
Hay	21,876	21,876	21,876	22,478	23,928	26,406
Potatoes	1,186	1,166	894	894	905	905
Sod	5,904	5,904	5,904	6,036	6,044	5,987
Sugarcane	82,959	84,775	84,775	84,775	84,775	84,775
Fresh Market Vegetables	63,967	67,573	75,928	82,255	87,288	90,488
Total	**306,119**	**315,555**	**320,967**	**325,941**	**332,789**	**339,648**

FSAID = Florida Statewide Agricultural Irrigation Demand; LWC = Lower West Coast.

Table B-9. LWC Planning Area demand projections (in mgd) for an average year from the FSAID III report.

Crop	2015	2020	2025	2030	2035	2040
Citrus	84.01	87.19	95.89	106.94	115.85	122.09
Field Crops	0.95	1.74	2.13	2.27	2.45	2.47
Fruit (Non-Citrus)	0.59	0.59	0.69	0.69	0.69	0.68
Greenhouse or Nursery	9.97	9.73	10.11	9.98	9.86	9.69
Hay	19.62	16.88	14.75	15.67	17.45	19.94
Potatoes	1.54	1.55	1.37	1.51	1.64	1.74
Sod	7.49	7.5	7.58	7.76	7.82	7.77
Sugarcane	110.48	113.63	93.91	91.09	87.99	84.59
Fresh Market Vegetables	81.29	87.91	112.31	127.4	136.82	142.01
Total	**315.95**	**326.72**	**338.74**	**363.3**	**380.57**	**390.98**

FSAID = Florida Statewide Agricultural Irrigation Demand; LWC = Lower West Coast.

Comparison of FSAID III and AFSIRS

During the SFWMD's evaluation of FSAID III demands, wide differences from AFSIRS demands were discovered (**Figure B-3**).

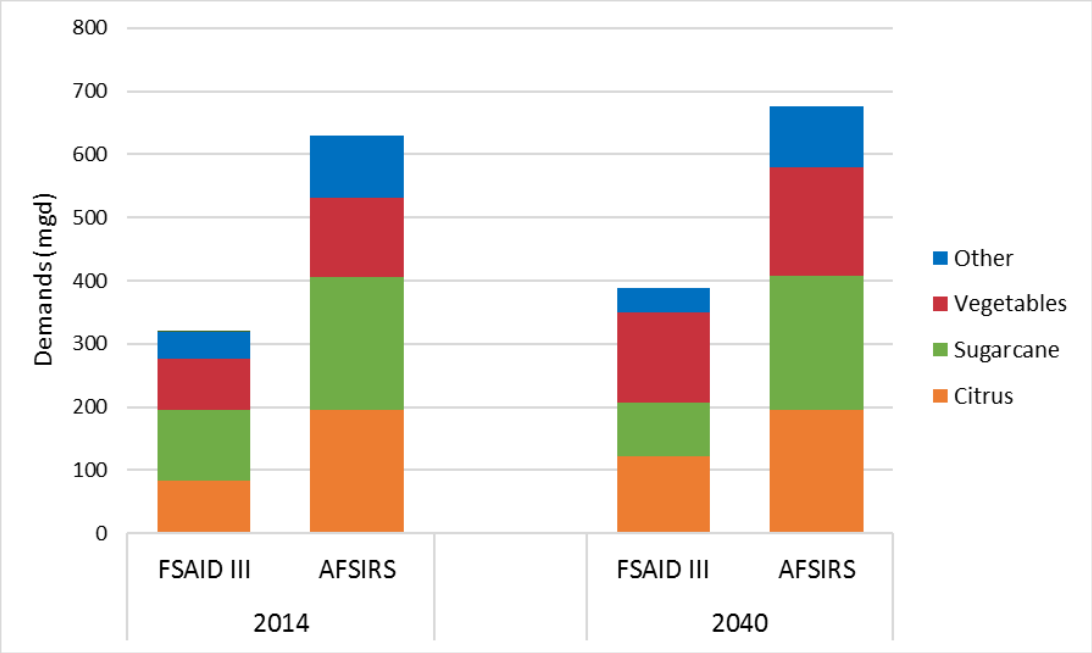

Figure B-3. Comparison of water demand estimates and projections from the third Florida Statewide Agricultural Irrigation Demand (FSAID III) report and the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS).

The SFWMD uses AFSIRS demand data for use in its groundwater models, and the results using the AFSIRS methodology closely resemble those of the SFWMD's permitting methods. The FSAID III methods also include a market-based economic factor that is not included in AFSIRS and significantly affects the results. Differences between the results obtained from AFSIRS and FSAID III can be attributed to variances in the respective models' designs and input parameters (**Table B-10**).

Table B-10. A comparison of agricultural water demand models: AFSIRS and FSAID III.

AFSIRS	FSAID III
A biophysical model based on a wide range of location-specific environmental variables.	A hybrid biophysical economic model based on a limited set of environmental variables as well as national crop revenue and cost estimates published by the USDA. • Soils are not included in the current FSAID model.
Model coefficients are estimated using field experimental data.	Model coefficients are estimated using available water use data from all water management districts in Florida. • The quantity and quality of water use data vary among districts. The model is most representative of water use of the district with the most data, which is SWFWMD. • Permit-level water use must be divided among many fields. • No reported water use from DIV permits are used to calibrate the model.
The AFSIRS model has remained relatively constant since 1992. • However, model results are heavily influenced by modeling parameters selected by the modeler. UF currently is updating AFSIRS for use in Florida.	Model coefficients change each year due to new specifications and new water use data.
AFSIRS models water use at the root zone, which is then scaled to field, county, region, and state levels.	FSAID is a field-based model scaled to county, region, and state.
AFSIRS does not consider farmer water use behavior.	FSAID is built to account for farmer water use behavior.
Output data are daily simulated water demands.	Output data are annual simulated water demands. Annual calculations must be downscaled for use with hydrologic modeling efforts.
The model has been through a rigorous peer review process.	The model has not undergone a rigorous peer review process.
AFSIRS code is publicly available.	The latest model was not released to the public last year, but the model equation was shared with water management districts. Some key assumptions used when developing the model are not shared with districts or the general public.

AFSIRS = Agricultural Field Scale Irrigation Requirements Simulation; DIV = diversion; FSAID = Florida Statewide Agricultural Irrigation Demand; SWFWMD = Southwest Florida Water Management District; UF = University of Florida; USDA = United States Department of Agriculture.

After reviewing water demands from FSAID III and AFSIRS, the SFWMD chose to use water demand estimates and projections from AFSIRS based on irrigated acreages published in the FSAID III report. The decision to deviate from water demands published in the FSAID III report was made for several reasons. First, the latest hydrologic models developed for use in the LWC Planning Area performed better with AFSIRS water use estimates than with FSAID III results. Second, irrigation rates calculated using AFSIRS are closer to the allocation rates in water use permits for key crops in the region. Third, AFSIRS water use estimates are consistent with previous planning efforts for the LWC Planning Area. Lastly, there are unique aspects of agricultural production in the LWC Planning Area, including surface water irrigation and sugarcane production, that likely are underrepresented in the FSAID III report model.

AFSIRS Demand Estimates and Projections

Agricultural water demand estimates and projections were developed using the AFSIRS model with FSAID III crop acreages. The FSAID III acreage data set included permitted irrigation types, which were used for crops present in 2014; the predominant irrigation types by crop and county were used for new irrigated areas through 2040. Additional data used in the AFSIRS model included the SFWMD's long-term rainfall and updated evapotranspiration data sets as well as soil type data from the Natural Resources Conservation Service.

AGR Projection Results

Agricultural acreages and water demands are difficult to predict because they depend on the choices of individual agricultural producers from year to year. Those choices are affected by several factors, including weather, markets, disease, proprietary information, and demand for agricultural land for other uses. Agricultural projections can be affected by population changes as well as future land use conversions. In addition, it is difficult to project acreage and water use demands for crops that are relatively new or expanding rapidly because limited data are available to use for projections. The gross irrigation requirements for various crop types under the AGR category are provided in **Tables B-11** to **B-20**. **Tables B-21** and **B-22** summarize the agricultural acreage in the LWC Planning Area, and **Table B-23** summarizes the gross irrigation requirements for all agricultural acreage in the region.

Citrus

Table B-11 presents the SFWMD acreage projections for citrus and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-11. Gross irrigation requirements (in mgd) for citrus acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	5,308	5,308	5,470	5,372	6,041	6,353
Average rainfall	9.11	9.11	9.36	9.25	10.22	10.71
1-in-10 year drought	11.19	11.19	11.50	11.37	12.62	13.24
Collier County						
Irrigated acreage	37,229	36,799	35,446	33,030	31,012	28,850
Average rainfall	57.48	56.83	54.71	51.23	48.02	44.70
1-in-10 year drought	72.57	71.73	69.00	64.56	60.57	56.45
Glades County*						
Irrigated acreage	6,599	9,490	10,210	12,888	14,982	18,461
Average rainfall	11.29	16.21	17.34	21.54	25.63	31.66
1-in-10 year drought	14.28	20.42	21.85	27.09	32.12	39.67
Hendry County*						
Irrigated acreage	62,231	62,777	60,633	58,694	58,683	58,753
Average rainfall	98.41	99.27	96.10	92.60	92.50	92.68
1-in-10 year drought	122.94	124.00	120.00	115.80	115.69	115.86
Lee County						
Irrigated acreage	12,952	12,759	11,828	11,301	10,538	10,056
Average rainfall	19.45	19.15	17.77	17.05	15.87	15.13
1-in-10 year drought	24.36	24.00	22.29	21.38	19.89	18.96
LWC Planning Area Total						
Irrigated acreage	**124,319**	**127,133**	**123,587**	**121,285**	**121,256**	**122,473**
Average rainfall	**195.74**	**200.58**	**195.28**	**191.67**	**192.24**	**194.88**
1-in-10 year drought	**245.34**	**251.34**	**244.64**	**240.20**	**240.89**	**244.18**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Sugarcane

Table B-12 presents the SFWMD acreage projections for sugarcane and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-12. Gross irrigation requirements (in mgd) for sugarcane acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	0	519	519	519	519	519
Average rainfall	0.00	1.10	1.10	1.07	1.10	1.10
1-in-10 year drought	0.00	1.24	1.24	1.21	1.24	1.24
Collier County						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Glades County*						
Irrigated acreage	29,994	30,571	30,571	30,571	30,571	30,571
Average rainfall	76.97	78.27	78.28	78.58	78.27	78.27
1-in-10 year drought	86.91	88.41	88.42	88.77	88.41	88.41
Hendry County*						
Irrigated acreage	52,965	53,685	53,685	53,685	53,685	53,685
Average rainfall	133.07	134.74	134.74	134.91	134.78	134.73
1-in-10 year drought	151.66	153.52	153.52	153.72	153.57	153.51
Lee County						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.09	0.09	0.09	0.09	0.09
1-in-10 year drought	0.00	0.10	0.10	0.10	0.10	0.10
LWC Planning Area Total						
Irrigated acreage	**82,959**	**84,775**	**84,775**	**84,775**	**84,775**	**84,775**
Average rainfall	**210.04**	**214.20**	**214.21**	**214.65**	**214.23**	**214.18**
1-in-10 year drought	**238.57**	**243.27**	**243.28**	**243.80**	**243.31**	**243.26**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Fresh Market Vegetables

Table B-13 presents the SFWMD acreage projections for fresh market vegetables and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-13. Gross irrigation requirements (in mgd) for fresh market vegetable acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	3,487	3,626	3,905	4,213	4,501	4,519
Average rainfall	6.64	6.94	7.55	8.35	8.92	8.96
1-in-10 year drought	7.51	7.85	8.53	9.42	10.05	10.10
Collier County						
Irrigated acreage	38,865	38,381	38,778	40,424	41,752	43,048
Average rainfall	84.54	83.50	84.30	87.67	90.38	93.07
1-in-10 year drought	95.51	94.35	95.19	98.88	101.80	104.77
Glades County*						
Irrigated acreage	1,072	2,775	4,875	5,246	5,976	5,976
Average rainfall	2.54	6.27	11.22	11.83	14.05	14.05
1-in-10 year drought	2.98	7.19	12.85	13.57	16.18	16.18
Hendry County*						
Irrigated acreage	14,489	16,737	21,434	25,143	27,169	28,863
Average rainfall	25.12	29.76	35.90	40.49	43.01	45.13
1-in-10 year drought	28.71	33.88	41.05	46.54	49.53	52.03
Lee County						
Irrigated acreage	6,054	6,054	6,936	7,229	7,890	8,082
Average rainfall	11.18	11.19	12.24	12.60	13.36	13.28
1-in-10 year drought	12.77	12.77	13.99	14.42	15.30	15.24
LWC Planning Area Total						
Irrigated acreage	**63,967**	**67,573**	**75,928**	**82,255**	**87,288**	**90,488**
Average rainfall	**130.02**	**137.66**	**151.21**	**160.94**	**169.72**	**174.49**
1-in-10 year drought	**147.48**	**156.05**	**171.61**	**182.83**	**192.86**	**198.32**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Sod Production

Table B-14 presents the SFWMD acreage projections for sod and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-14. Gross irrigation requirements (in mgd) for sod acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	1,007	1,007	1,007	1,007	1,007	1,007
Average rainfall	2.86	2.86	2.86	2.86	2.86	2.86
1-in-10 year drought	3.26	3.26	3.26	3.26	3.26	3.26
Collier County						
Irrigated acreage	756	756	756	756	756	691
Average rainfall	1.96	1.96	1.96	1.96	1.96	1.82
1-in-10 year drought	2.24	2.24	2.24	2.24	2.24	2.09
Glades County*						
Irrigated acreage	1,976	1,976	1,976	2,108	2,116	2,124
Average rainfall	6.16	6.16	6.16	6.56	6.59	6.62
1-in-10 year drought	6.99	6.99	6.99	7.44	7.47	7.51
Hendry County*						
Irrigated acreage	1,339	1,339	1,339	1,339	1,339	1,339
Average rainfall	3.52	3.52	3.52	3.52	3.52	3.52
1-in-10 year drought	3.97	3.97	3.97	3.97	3.97	3.97
Lee County						
Irrigated acreage	826	826	826	826	826	826
Average rainfall	1.70	1.70	1.70	1.70	1.70	1.70
1-in-10 year drought	1.92	1.92	1.92	1.92	1.92	1.92
LWC Planning Area Total						
Irrigated acreage	**5,904**	**5,904**	**5,904**	**6,036**	**6,044**	**5,987**
Average rainfall	**16.21**	**16.21**	**16.21**	**16.60**	**16.64**	**16.53**
1-in-10 year drought	**18.39**	**18.39**	**18.39**	**18.84**	**18.87**	**18.75**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Greenhouse/Nursery

Table B-15 presents the SFWMD acreage projections for greenhouse/nursery and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-15. Gross irrigation requirements (in mgd) for greenhouse/nursery acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Collier County						
Irrigated acreage	619	598	598	598	598	598
Average rainfall	1.41	1.36	1.36	1.36	1.36	1.36
1-in-10 year drought	1.50	1.45	1.45	1.45	1.45	1.45
Glades County*						
Irrigated acreage	300	335	561	569	599	645
Average rainfall	0.82	0.91	1.48	1.55	1.57	1.68
1-in-10 year drought	0.89	0.98	1.60	1.67	1.69	1.82
Hendry County*						
Irrigated acreage	322	322	395	395	431	473
Average rainfall	0.76	0.76	0.94	0.94	1.03	1.14
1-in-10 year drought	0.82	0.82	1.02	1.02	1.11	1.23
Lee County						
Irrigated acreage	2,679	2,679	2,659	2,659	2,619	2,530
Average rainfall	6.60	6.60	6.56	6.56	6.46	6.23
1-in-10 year drought	7.04	7.04	7.00	7.00	6.90	6.65
LWC Planning Area Total						
Irrigated acreage	**3,920**	**3,934**	**4,213**	**4,221**	**4,247**	**4,246**
Average rainfall	**9.59**	**9.62**	**10.34**	**10.41**	**10.42**	**10.41**
1-in-10 year drought	**10.25**	**10.29**	**11.06**	**11.13**	**11.15**	**11.14**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Field Crops

Table B-16 presents the SFWMD acreage projections for field crops and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-16. Gross irrigation requirements (in mgd) for field crop acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	1,599	1,599	1,599	1,599	1,599	1,599
Average rainfall	3.90	3.94	3.94	3.98	3.94	3.94
1-in-10 year drought	4.44	4.49	4.49	4.53	4.49	4.49
Collier County						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Glades County*						
Irrigated acreage	0	637	1,086	1,200	1,377	1,399
Average rainfall	0.00	1.42	2.44	2.58	3.13	3.18
1-in-10 year drought	0.00	1.62	2.81	2.97	3.59	3.65
Hendry County*						
Irrigated acreage	0	569	659	752	924	924
Average rainfall	0.00	1.10	1.30	1.17	1.70	1.70
1-in-10 year drought	0.00	1.24	1.47	1.32	1.92	1.92
Lee County						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
LWC Planning Area Total						
Irrigated acreage	**1,599**	**2,805**	**3,344**	**3,551**	**3,900**	**3,922**
Average rainfall	**3.90**	**6.45**	**7.68**	**7.73**	**8.77**	**8.82**
1-in-10 year drought	**4.44**	**7.35**	**8.76**	**8.82**	**10.00**	**10.06**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Fruit (Non-Citrus)

Table B-17 presents the SFWMD acreage projections for fruit (non-citrus) and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-17. Gross irrigation requirements (in mgd) for fruit (non-citrus) acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Collier County						
Irrigated acreage	80	80	80	80	80	80
Average rainfall	0.12	0.12	0.12	0.12	0.12	0.12
1-in-10 year drought	0.16	0.16	0.16	0.16	0.16	0.16
Glades County*						
Irrigated acreage	170	170	181	181	181	181
Average rainfall	0.28	0.28	0.30	0.30	0.30	0.30
1-in-10 year drought	0.36	0.36	0.39	0.38	0.39	0.39
Hendry County*						
Irrigated acreage	0	0	46	46	46	46
Average rainfall	0.00	0.00	0.08	0.08	0.08	0.08
1-in-10 year drought	0.00	0.00	0.10	0.10	0.10	0.10
Lee County						
Irrigated acreage	139	139	139	139	139	139
Average rainfall	0.12	0.12	0.12	0.12	0.12	0.12
1-in-10 year drought	0.15	0.15	0.15	0.15	0.15	0.15
LWC Planning Area Total						
Irrigated acreage	**389**	**389**	**446**	**446**	**446**	**446**
Average rainfall	**0.52**	**0.53**	**0.62**	**0.62**	**0.62**	**0.62**
1-in-10 year drought	**0.66**	**0.67**	**0.79**	**0.79**	**0.79**	**0.79**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Potatoes

Table B-18 presents the SFWMD acreage projections for potatoes and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-18. Gross irrigation requirements (in mgd) for potato acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Collier County						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Glades County*						
Irrigated acreage	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County*						
Irrigated acreage	0	0	0	0	11	11
Average rainfall	0.00	0.00	0.00	0.00	0.02	0.02
1-in-10 year drought	0.00	0.00	0.00	0.00	0.03	0.03
Lee County						
Irrigated acreage	1,186	1,166	894	894	894	894
Average rainfall	2.56	2.52	1.94	1.94	1.94	1.94
1-in-10 year drought	2.81	2.76	2.13	2.13	2.13	2.13
LWC Planning Area Total						
Irrigated acreage	**1,186**	**1,166**	**894**	**894**	**905**	**905**
Average rainfall	**2.56**	**2.52**	**1.94**	**1.94**	**1.97**	**1.97**
1-in-10 year drought	**2.81**	**2.76**	**2.13**	**2.13**	**2.16**	**2.16**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Pasture/Hay

Table B-19 presents the SFWMD acreage projections for pasture/hay and the projected gross irrigation requirement (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table B-19. Gross irrigation requirements (in mgd) for pasture/hay acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	5,430	5,430	5,430	5,545	5,675	6,141
Average rainfall	11.75	11.75	11.75	11.98	12.28	13.62
1-in-10 year drought	13.53	13.53	13.53	13.80	14.14	15.66
Collier County						
Irrigated acreage	577	577	577	577	577	519
Average rainfall	1.19	1.19	1.19	1.19	1.19	1.07
1-in-10 year drought	1.36	1.36	1.36	1.36	1.36	1.22
Glades County*						
Irrigated acreage	5,947	5,947	5,947	6,255	7,117	8,201
Average rainfall	13.29	13.29	13.29	13.94	15.52	17.98
1-in-10 year drought	15.22	15.22	15.22	15.97	17.78	20.61
Hendry County*						
Irrigated acreage	9,500	9,500	9,500	9,679	10,154	11,140
Average rainfall	19.13	19.13	19.13	19.54	20.54	22.48
1-in-10 year drought	21.86	21.86	21.86	22.33	23.47	25.68
Lee County						
Irrigated acreage	422	422	422	422	405	405
Average rainfall	0.60	0.60	0.60	0.60	0.58	0.58
1-in-10 year drought	0.72	0.72	0.72	0.72	0.69	0.69
LWC Planning Area Total						
Irrigated acreage	**21,876**	**21,876**	**21,876**	**22,478**	**23,928**	**26,406**
Average rainfall	**45.97**	**45.97**	**45.97**	**47.25**	**50.11**	**55.73**
1-in-10 year drought	**52.69**	**52.69**	**52.69**	**54.18**	**57.44**	**63.87**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Livestock

Table B-20 presents the FSAID III water demand projections for livestock.

Table B-20. Gross water requirements (in mgd) for livestock in the LWC Planning Area between 2014 and 2040.

2014	2020	2025	2030	2035	2040
Charlotte County*					
0.07	0.07	0.07	0.07	0.07	0.07
Collier County					
0.14	0.14	0.14	0.14	0.14	0.14
Glades County*					
0.16	0.16	0.16	0.16	0.16	0.16
Hendry County*					
0.67	0.67	0.67	0.67	0.67	0.67
Lee County					
0.16	0.16	0.16	0.16	0.16	0.16
LWC Planning Area Total					
1.20	**1.20**	**1.20**	**1.20**	**1.20**	**1.20**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.
Note: Water demands for livestock were obtained from the third Florida Statewide Agricultural Irrigation Demand (FSAID III) report, not calculated using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model.

Summary of Agricultural Results

Agricultural acreages are projected to increase 11 percent over the 2040 planning horizon, from approximately 306,000 to 340,000 acres (**Table B-21**). Hendry County accounts for the most AGR acreage in the LWC Planning Area (**Figure B-4**). As expected, citrus, fresh market vegetables, and sugarcane are projected to cover nearly 90 percent of the total acres in 2040 (**Figure B-5**).

Table B-21. Agricultural acres in the LWC Planning Area, by county, between 2014 and 2040.

County	2014	2020	2025	2030	2035	2040
Charlotte*	16,831	17,489	17,930	18,255	19,342	20,138
Collier	78,126	77,191	76,235	75,465	74,775	73,786
Glades*	46,058	51,901	55,407	59,018	62,919	67,558
Hendry*	140,846	144,929	147,691	149,733	152,442	155,234
Lee	24,258	24,045	23,704	23,470	23,311	22,932
LWC Total Irrigated Acres	**306,119**	**315,555**	**320,967**	**325,941**	**332,789**	**339,648**

LWC = Lower West Coast.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

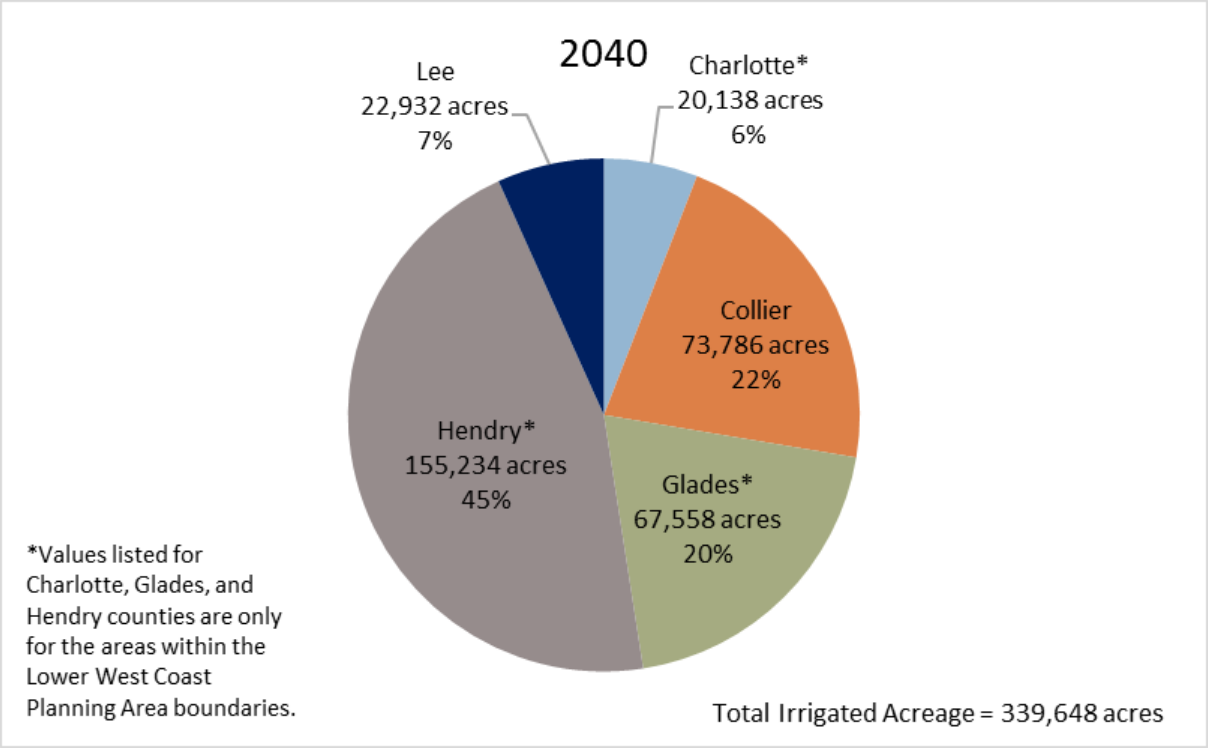

Figure B-4. Summary of 2040 agricultural irrigated acres, by county.

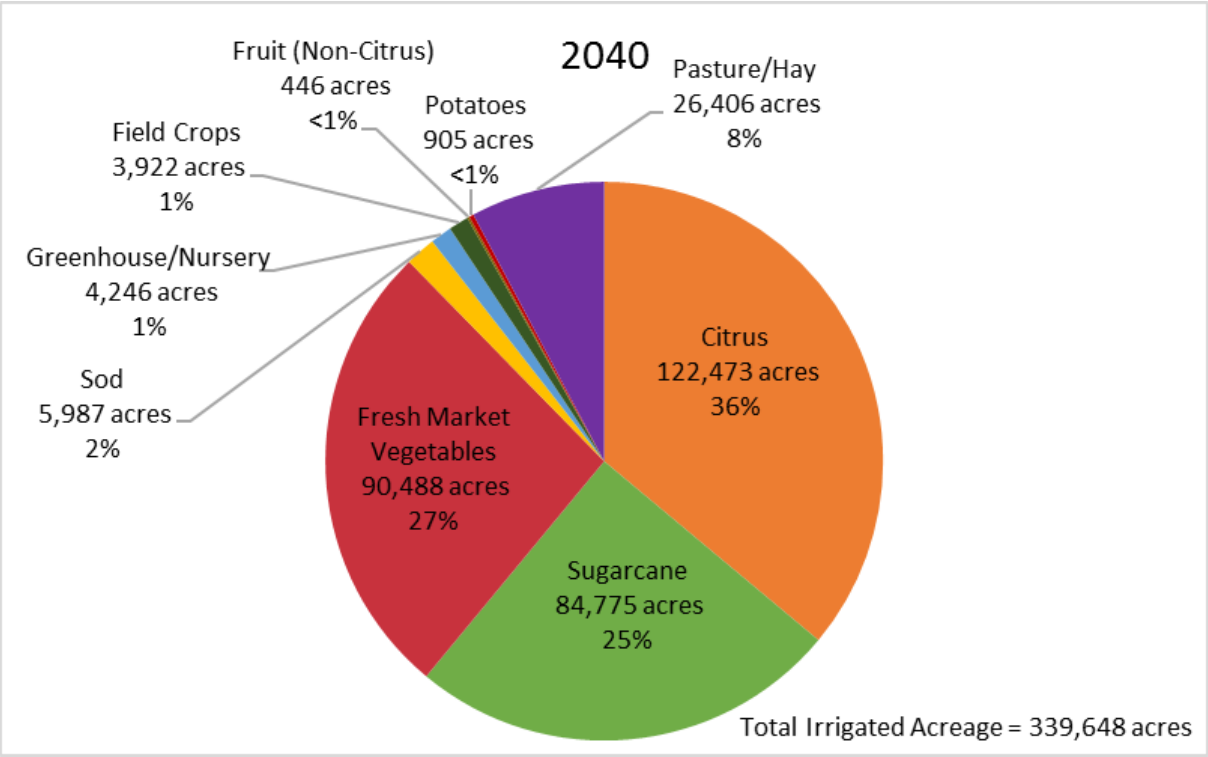

Figure B-5. Summary of 2040 agricultural irrigated acres, by crop, in the Lower West Coast Planning Area.

Hendry County accounts for the largest 2040 AGR-related water demand, followed by Glades and Collier counties (**Figure B-6**). Sugarcane, citrus, and fresh market vegetables are the largest AGR water users in the LWC Planning Area, collectively constituting for nearly 90 percent of projected 2040 demands (**Figure B-7**).

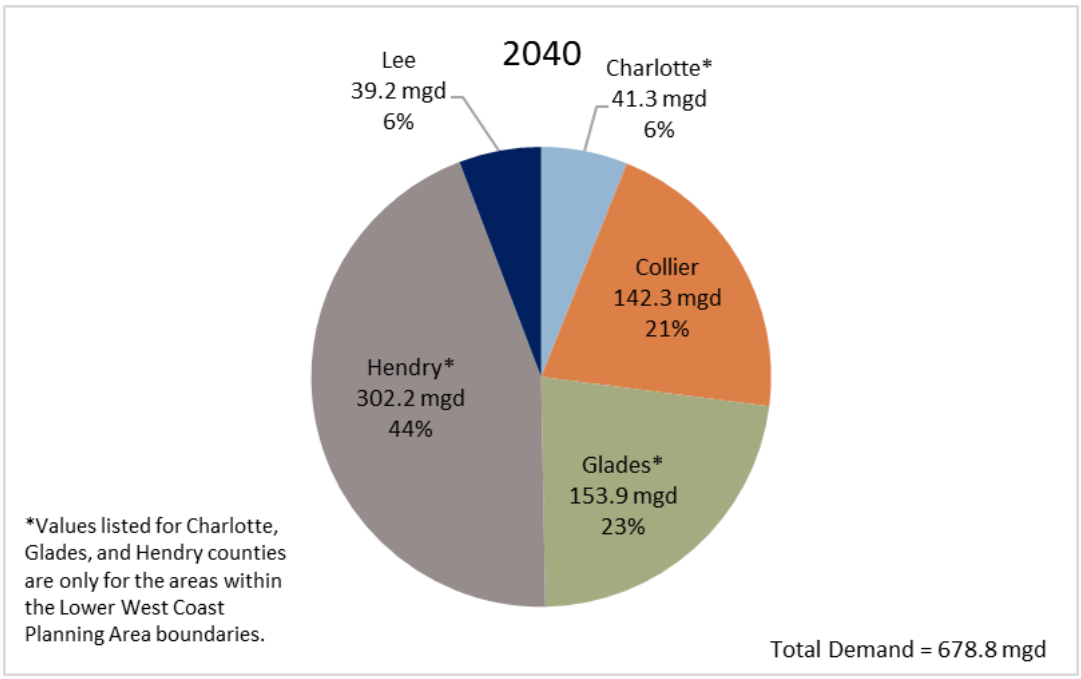

Figure B-6. Summary of 2040 projected Agricultural Irrigation (AGR) water demand, by county.

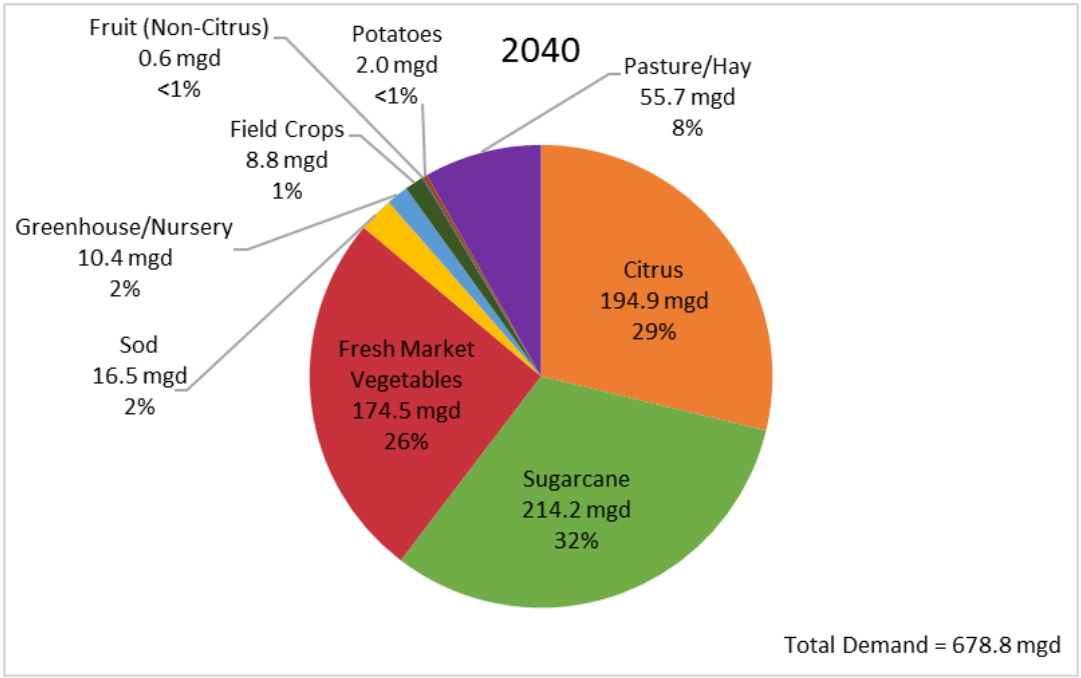

Figure B-7. Summary of 2040 projected Agricultural Irrigation (AGR) water demand, by crop, in the Lower West Coast Planning Area.

Little change is anticipated in AGR water demands for nearly all crops within the LWC Planning Area. However, fresh market vegetable water demands are projected to increase approximately 45 mgd by 2040. Overall, LWC Planning Area total gross water demands under average rainfall conditions for AGR are estimated to increase approximately 10 percent, from 616 mgd in 2014 to 679 mgd in 2040 (**Table B-22**).

Table B-22. Gross irrigation requirements (in mgd), by county, for all agricultural acreage in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
Charlotte County*						
Irrigated acreage	16,831	17,489	17,930	18,255	19,342	20,138
Average rainfall	34.33	35.77	36.63	37.56	39.39	41.26
1-in-10 year drought	40.01	41.64	42.62	43.66	45.87	48.06
Collier County						
Irrigated acreage	78,126	77,191	76,235	75,465	74,775	73,786
Average rainfall	146.84	145.10	143.77	143.66	143.16	142.28
1-in-10 year drought	173.49	171.42	169.54	168.79	167.72	166.28
Glades County*						
Irrigated acreage	46,058	51,901	55,407	59,018	62,919	67,558
Average rainfall	111.52	122.96	130.67	137.04	145.22	153.91
1-in-10 year drought	127.79	141.35	150.29	158.02	167.80	178.40
Hendry County*						
Irrigated acreage	140,846	144,929	147,691	149,733	152,442	155,234
Average rainfall	280.69	288.96	292.39	293.93	297.86	302.15
1-in-10 year drought	330.63	339.97	343.66	345.47	350.05	354.99
Lee County						
Irrigated acreage	24,258	24,045	23,704	23,470	23,311	22,932
Average rainfall	42.38	42.13	41.19	40.82	40.29	39.24
1-in-10 year drought	49.93	49.63	48.46	47.98	47.24	46.00
LWC Planning Area Total						
Irrigated acreage	**306,119**	**315,555**	**320,967**	**325,941**	**332,789**	**339,648**
Average rainfall	**615.75**	**634.93**	**644.66**	**653.01**	**665.92**	**678.83**
1-in-10 year drought	**721.85**	**744.01**	**754.57**	**763.92**	**778.68**	**793.72**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

RECREATIONAL/LANDSCAPE IRRIGATION

The REC category includes self-supplied water used for irrigation of golf courses, sports fields, parks, cemeteries, large common areas such as land managed by homeowners' associations and commercial developments. REC water demands are divided into two categories: landscape irrigation and golf course irrigation. A large portion of residential landscaped area within the LWC Planning Area is irrigated with water from utilities or household wells and thus are considered under the PWS and DSS categories, respectively.

Wastewater utilities within the LWC Planning Area provide approximately 74 mgd of reclaimed water, and more than 95 percent of that volume is used to meet a portion of 2014

REC water demands (FDEP 2015). To account for the substantial contribution of reclaimed water, current and future REC demands are presented with and without reclaimed water volumes.

REC Projection Methodology

Irrigated landscape and golf course acreages were calculated using 2014 LWC land use coverage data (see Chapter 1, Figure 1-4 of the plan update) and water use permit information (**Table B-23**). Lee and Collier counties account for the majority of REC-related acreage demands due to their larger populations.

Table B-23. Acreage for REC water use in the LWC Planning Area between 2014 and 2040.

County	Irrigation Type	2014	2020	2025	2030	2035	2040
Charlotte*	Landscape	6	22	37	53	69	84
	Golf	0	120	120	240	240	360
Charlotte County Total		**6**	**142**	**157**	**293**	**309**	**444**
Collier	Landscape	18,688	20,872	22,579	24,162	25,619	27,038
	Golf	10,732	10,732	10,732	10,732	10,732	10,732
Collier County Total		**29,420**	**31,604**	**33,311**	**34,894**	**36,351**	**37,770**
Glades*	Landscape	181	191	199	207	213	219
	Golf	52	52	52	52	52	52
Glades County Total		**233**	**243**	**251**	**259**	**265**	**271**
Hendry*	Landscape	1,725	1,763	1,789	1,809	1,823	1,833
	Golf	134	134	134	134	134	134
Hendry County Total		**1,859**	**1,897**	**1,923**	**1,943**	**1,957**	**1,967**
Lee	Landscape	11,714	13,592	15,163	16,646	17,997	19,250
	Golf	9,846	9,846	9,846	9,846	9,846	9,846
Lee County Total		**21,560**	**23,438**	**25,009**	**26,492**	**27,843**	**29,096**
LWC Planning Area Total		**53,078**	**57,324**	**60,651**	**63,881**	**66,725**	**69,548**

LWC = Lower West Coast; REC = Recreational/Landscape Irrigation.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

The landscape irrigation demands for each county were assumed to increase at the same rate as a county's permanent resident population. Golf course demands by county were projected to increase at a much slower growth rate based on industry and local planning estimates. The ratio of reclaimed water to self-supplied water is assumed to remain constant throughout the planning horizon.

REC Projection Results

REC gross irrigation demand projections under average rainfall conditions, and not including reclaimed water, are presented in **Table B-24**. **Table B-25** shows the additional quantity of reclaimed water provided to meet projected demands.

Table B-24. Gross irrigation demand, not including reclaimed water, under average rainfall conditions for REC in the LWC Planning Area between 2014 and 2040.

County	Use	Demand - Average Rainfall Conditions (mgd)					
		2014	2020	2025	2030	2035	2040
Charlotte*	Landscape	0.04	0.00	0.00	0.00	0.00	0.00
	Golf	0.05	0.05	0.05	0.05	0.05	0.05
	Charlotte County Total	**0.09**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Collier	Landscape	28.43	31.75	34.35	36.76	38.97	41.13
	Golf	16.84	16.84	16.84	16.84	16.84	16.84
	Collier CountyTotal	**45.27**	**48.59**	**51.19**	**53.60**	**55.81**	**57.97**
Glades*	Landscape	0.11	0.12	0.12	0.13	0.13	0.14
	Golf	0.06	0.06	0.06	0.06	0.06	0.06
	Glades County Total	**0.17**	**0.17**	**0.18**	**0.18**	**0.19**	**0.19**
Hendry*	Landscape	1.26	1.29	1.31	1.32	1.33	1.34
	Golf	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**1.26**	**1.29**	**1.31**	**1.32**	**1.33**	**1.34**
Lee	Landscape	47.09	54.64	60.95	66.91	72.34	77.38
	Golf	14.00	14.00	14.00	14.00	14.00	14.00
	Lee County Total	**61.08**	**68.63**	**74.95**	**80.91**	**86.34**	**91.37**
LWC Planning Area	**Landscape Total**	**76.93**	**87.79**	**96.73**	**105.12**	**112.78**	**119.98**
	Golf Total	**30.94**	**30.94**	**30.94**	**30.94**	**30.94**	**30.94**
	LWC Planning Area Total	**107.87**	**118.73**	**127.67**	**136.06**	**143.72**	**150.92**

LWC = Lower West Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Table B-25. Reclaimed water supplement under average rainfall conditions for REC in the LWC Planning Area between 2014 and 2040.

County	Use	Demand - Average Rainfall Conditions (mgd)					
		2014	2020	2025	2030	2035	2040
Charlotte*	Landscape	0.00	0.83	1.64	2.45	3.27	4.08
	Golf	0.00	0.27	0.27	0.54	0.54	0.81
	Charlotte County Total	**0.00**	**1.09**	**1.91**	**2.99**	**3.81**	**4.89**
Collier	Landscape	13.52	15.10	16.34	17.48	18.54	19.57
	Golf	9.43	9.43	9.43	9.43	9.43	9.43
	Collier County Total	**22.95**	**24.53**	**25.77**	**26.91**	**27.97**	**28.99**
Glades*	Landscape	0.00	0.00	0.00	0.00	0.00	0.00
	Golf	0.00	0.00	0.00	0.00	0.00	0.00
	Glades County Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Hendry*	Landscape	0.00	0.00	0.00	0.00	0.00	0.00
	Golf	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Lee	Landscape	35.36	41.03	45.77	50.24	54.32	58.10
	Golf	11.41	11.41	11.41	11.41	11.41	11.41
	Lee County Total	**46.77**	**52.44**	**57.18**	**61.66**	**65.73**	**69.52**
LWC Planning Area Total	**Landscape Total**	**48.88**	**56.96**	**63.75**	**70.18**	**76.13**	**81.75**
	Golf Total	**20.84**	**21.11**	**21.11**	**21.38**	**21.38**	**21.65**
	LWC Planning Area Total	**69.72**	**78.07**	**84.86**	**91.56**	**97.51**	**103.40**

LWC = Lower West Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Table B-26 sums the results of **Tables B-24** and **B-25** under average rainfall conditions. **Table B-27** contains total REC projections under 1-in-10 year drought conditions. Increases in REC demand projections largely are due to expected growth in landscape irrigation needs associated with a growing population. The only change projected for golf course irrigation demands is from new golf course construction at Babcock Ranch in Charlotte County.

Table B-26. Gross irrigation demand under average rainfall conditions for REC in the LWC Planning Area between 2014 and 2040.

County	Demand - Average Rainfall Conditions (mgd)					
	2014	2020	2025	2030	2035	2040
Charlotte*	0.09	1.14	1.96	3.04	3.86	4.94
Collier	68.22	73.12	76.96	80.51	83.78	86.96
Glades*	0.17	0.17	0.18	0.18	0.19	0.19
Hendry*	1.26	1.29	1.31	1.32	1.33	1.34
Lee	107.85	121.07	132.13	142.57	152.07	160.89
LWC Planning Area Total	**177.59**	**196.79**	**212.54**	**227.62**	**241.23**	**254.32**

LWC = Lower West Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Table B-27. Gross irrigation demand under 1-in-10 year drought conditions for REC in the LWC Planning Area between 2014 and 2040.

County	Demand - 1-in-10 Year Drought Conditions (mgd)					
	2014	2020	2025	2030	2035	2040
Charlotte*	0.10	1.20	2.06	3.19	4.05	5.19
Collier	73.68	78.97	83.12	86.95	90.48	93.92
Glades*	0.18	0.18	0.19	0.19	0.20	0.20
Hendry*	1.34	1.37	1.39	1.40	1.41	1.42
Lee	114.32	128.33	140.06	151.12	161.19	170.54
LWC Planning Area Total	**189.61**	**210.04**	**226.81**	**242.85**	**257.34**	**271.26**

LWC = Lower West Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

INDUSTRIAL/COMMERCIAL/INSTITUTIONAL

The ICI category includes the consumptive use of self-supplied water associated with the production of goods or provision of services by industrial, commercial, or institutional establishments. Water used for industrial, commercial, and institutional uses that is supplied by utilities is included under the PWS category. Activities typically considered under the ICI category include mining, geothermal heating and cooling, and processing agricultural products.

ICI Projection Methodology

Activities included under the ICI category are closely tied to activities under other use categories. For example, mining operations provide materials used for construction and infrastructure, which are directly related to population growth. Therefore, mining operation water demands are projected to grow at the same rate as the permanent resident population. In addition, the processing of agricultural products is closely tied to the agricultural sector, and the AGR demands were evaluated when developing those ICI demand projections. However, water used for ICI activities (e.g., mining operations, geothermal heating and cooling) that is returned to the source is not included in demand estimates and projections. For all ICI demands, estimates and projections are presumed to be unchanged between average and 1-in-10 year drought conditions.

ICI Projection Results

Table B-28 summarizes the current and projected ICI demand in the LWC Planning Area in 5-year increments through the planning horizon. The largest increase in demands is projected to occur in Lee County due to its relatively large mining sector.

Table B-28. ICI demand projections (in mgd) in the LWC Planning Area between 2014 and 2040.

County	2014	2020	2025	2030	2035	2040
Charlotte*	1.50	1.65	1.81	1.95	2.08	2.20
Collier	6.50	6.29	6.39	6.48	6.56	6.63
Glades*	1.30	1.44	1.58	1.71	1.83	1.95
Hendry*	7.90	7.98	8.06	8.14	8.21	8.28
Lee	8.23	8.29	8.76	9.21	9.62	10.01
LWC Planning Area Total	**25.43**	**25.65**	**26.60**	**27.49**	**28.30**	**29.07**

ICI = Industrial/Commercial/Institutional; LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

POWER GENERATION

The PWR water use category includes the consumptive use of self-supplied water by power generation facilities, excluding use of seawater. At thermoelectric power plants, water primarily is used for cooling purposes and is returned to the source. Such use is not considered consumptive and therefore is not considered in water demand estimates and projections. Additional water uses at power plants include make-up water and ancillary uses such as domestic use by employees.

PWR Projection Methodology

Water demand projections were made in coordination with Florida Power & Light (FPL) to reflect 1) expectations for increased power demand; 2) strategies for meeting power demands, including power plant construction; 3) types and locations of power plants; 4) types of cooling facilities; and 5) efficiencies in water use. Proposed power generation projects in the LWC Planning Area include the Hammock Solar Energy Facility and installation of new generation technology at the FPL Fort Myers facility. Increased demands from these projects were considered in this analysis. Projections for PWR water demands are based on current usage and are assumed to remain approximately the same between average and 1-in-10 year drought conditions. Withdrawal demands are considered equal to user demands.

PWR Projection Results

Table B-29 shows anticipated PWR water demands through the 2040 planning horizon. PWR demands are expected to increase to serve the needs of a growing population and economy in the LWC Planning Area.

Table B-29. Average gross water demand (in mgd) for PWR in the LWC Planning Area between 2014 and 2040.

	2014	2020	2025	2030	2035	2040
FPL Fort Myers	0.40	0.40	0.40	0.40	0.40	0.40
FPL demands from additional generation capacity	0.00	0.00	0.00	0.00	15.00	15.00
LWC Planning Area Total	**0.40**	**0.40**	**0.40**	**0.40**	**15.40**	**15.40**

FPL = Florida Power & Light; LWC = Lower West Coast; mgd = million gallons per day; PWR = Power Generation.

SUMMARY OF LWC DEMAND PROJECTIONS

Total demands for the LWC Planning Area are anticipated to increase by 25 percent, largely due to increased demands from the AGR, PWS, DSS, and REC water use categories. Together, these four categories account for 92 percent of demand growth over the planning horizon. AGR demands account for more than half of all demands in LWC Planning Area, and even the relatively small increase in projected estimates is noteworthy. New AGR demands largely are a result of regional growth in fresh market vegetable production. Increases in PWS and DSS demands are due to the rapidly growing populations in Lee and Collier counties. Increases in landscape irrigation demands under the REC category driven by population growth. Gross water demand estimates (2014) and projections (2040) under average conditions for each water use category are shown in **Figure B-8**. Gross water demands in 5-year increments by county are provided in **Table B-30** for average rainfall conditions and **Table B-31** for 1-in-10 year drought conditions.

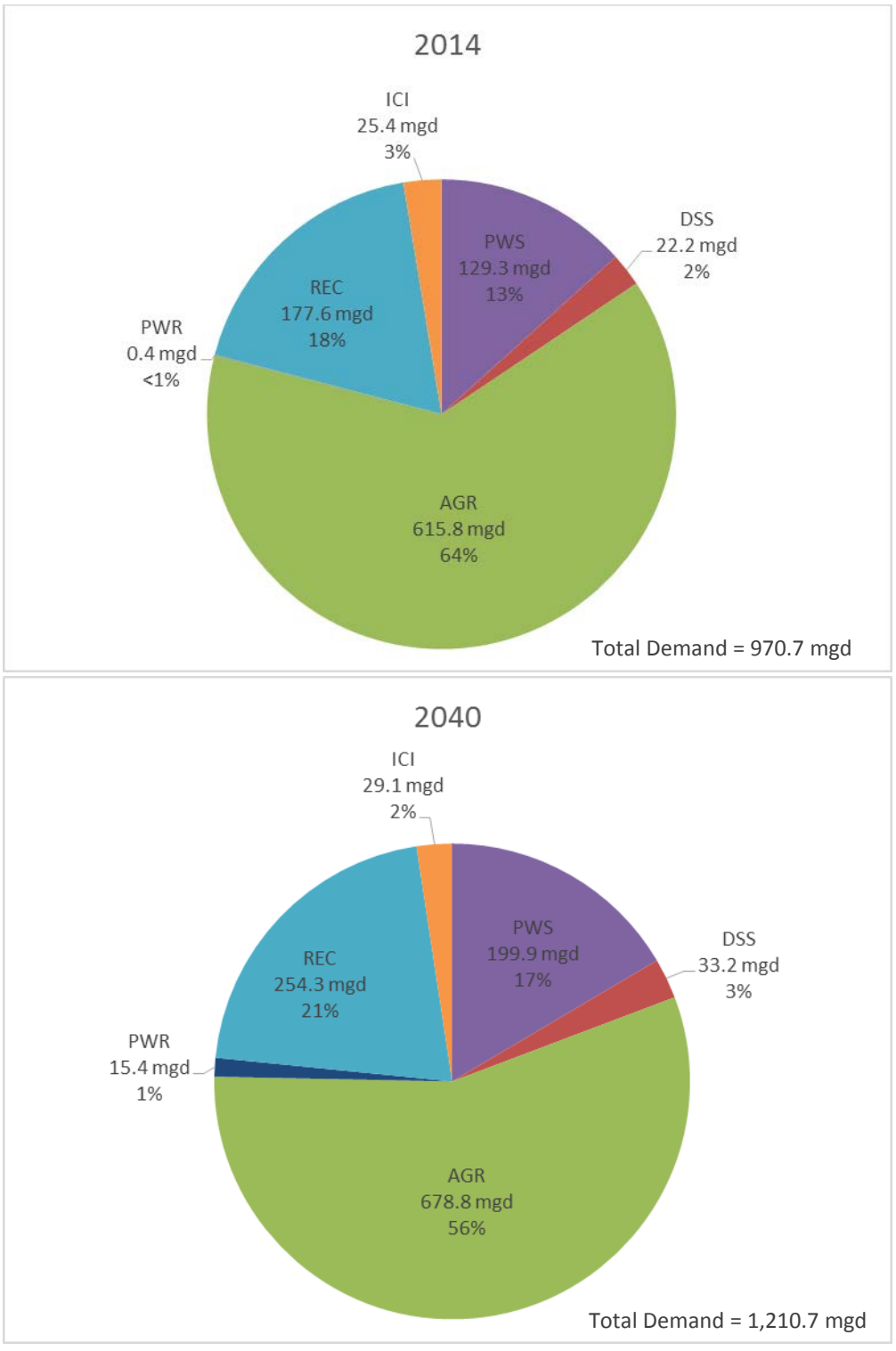

Figure B-8. Estimated (2014) and projected (2040) gross demands for all water use categories in the Lower West Coast Planning Area.

Table B-30. Summary of gross demands for average rainfall conditions, by water use category.

County	Water Use Category	Demand - Average Rainfall Conditions (mgd)					
		2014	2020	2025	2030	2035	2040
Charlotte*	Public Water Supply	0.01	0.64	1.28	1.91	2.55	3.18
	Domestic and Small Public Supply	0.17	0.17	0.17	0.18	0.18	0.18
	Agricultural Irrigation	34.33	35.77	36.63	37.56	39.39	41.26
	Industrial/Commercial/Institutional	1.50	1.65	1.81	1.95	2.08	2.20
	Recreational/Landscape Irrigation	0.09	1.14	1.96	3.04	3.86	4.94
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Charlotte* Total	**36.09**	**39.37**	**41.85**	**44.64**	**48.05**	**51.76**
Collier	Public Water Supply	55.40	61.73	66.21	70.32	74.06	77.70
	Domestic and Small Public Supply	6.07	6.92	7.60	8.23	8.82	9.40
	Agricultural Irrigation	146.84	145.10	143.77	143.66	143.16	142.28
	Industrial/Commercial/Institutional	6.50	6.29	6.39	6.48	6.56	6.63
	Recreational/Landscape Irrigation	68.22	73.12	76.96	80.51	83.78	86.96
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Collier Total	**283.03**	**293.16**	**300.93**	**309.20**	**316.39**	**322.97**
Glades*	Public Water Supply	0.80	0.82	0.84	0.85	0.85	0.86
	Domestic and Small Public Supply	0.49	0.53	0.56	0.59	0.62	0.65
	Agricultural Irrigation	111.52	122.96	130.67	137.04	145.22	153.91
	Industrial/Commercial/Institutional	1.30	1.44	1.58	1.71	1.83	1.95
	Recreational/Landscape Irrigation	0.17	0.17	0.18	0.18	0.19	0.19
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Glades* Total	**114.28**	**125.93**	**133.83**	**140.37**	**148.72**	**157.55**
Hendry*	Public Water Supply	3.17	3.19	3.19	3.18	3.16	3.13
	Domestic and Small Public Supply	1.13	1.19	1.25	1.30	1.34	1.38
	Agricultural Irrigation	280.69	288.96	292.39	293.93	297.86	302.15
	Industrial/Commercial/Institutional	7.90	7.98	8.06	8.14	8.21	8.28
	Recreational/Landscape Irrigation	1.26	1.29	1.31	1.32	1.33	1.34
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry* Total	**294.15**	**302.61**	**306.20**	**307.86**	**311.89**	**316.28**
Lee	Public Water Supply	69.94	81.17	90.57	99.44	107.52	115.01
	Domestic and Small Public Supply	14.33	16.18	17.71	19.14	20.41	21.57
	Agricultural Irrigation	42.38	42.13	41.19	40.82	40.29	39.24
	Industrial/Commercial/Institutional	8.23	8.29	8.76	9.21	9.62	10.01
	Recreational/Landscape Irrigation	107.85	121.07	132.13	142.57	152.07	160.89
	Power Generation	0.40	0.40	0.40	0.40	15.40	15.40
	Lee Total	**243.13**	**269.24**	**290.76**	**311.57**	**345.30**	**362.12**
LWC Planning Area Total		**970.68**	**1,030.31**	**1,073.56**	**1,113.64**	**1,170.35**	**1,210.68**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

Table B-31. Summary of gross demands for 1-in-10 year drought conditions, by water use category.

County	Water Use Category	Demand - 1-in-10 Year Drought Conditions (mgd)					
		2014	2020	2025	2030	2035	2040
Charlotte*	Public Water Supply	0.01	0.68	1.34	2.01	2.67	3.34
	Domestic and Small Public Supply	0.18	0.18	0.18	0.19	0.19	0.19
	Agricultural Irrigation	40.01	41.64	42.62	43.66	45.87	48.06
	Industrial/Commercial/Institutional	1.50	1.65	1.81	1.95	2.08	2.20
	Recreational/Landscape Irrigation	0.10	1.20	2.06	3.19	4.05	5.19
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Charlotte* Total	**41.79**	**45.34**	**48.01**	**51.00**	**54.87**	**58.98**
Collier	Public Water Supply	59.84	66.67	71.51	75.94	79.99	83.92
	Domestic and Small Public Supply	6.55	7.47	8.20	8.89	9.53	10.15
	Agricultural Irrigation	173.49	171.42	169.54	168.79	167.72	166.28
	Industrial/Commercial/Institutional	6.50	6.29	6.39	6.48	6.56	6.63
	Recreational/Landscape Irrigation	73.68	78.97	83.12	86.95	90.48	93.92
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Collier Total	**320.06**	**330.82**	**338.75**	**347.05**	**354.27**	**360.89**
Glades*	Public Water Supply	0.85	0.87	0.89	0.90	0.90	0.91
	Domestic and Small Public Supply	0.52	0.56	0.60	0.63	0.66	0.69
	Agricultural Irrigation	127.79	141.35	150.29	158.02	167.80	178.40
	Industrial/Commercial/Institutional	1.30	1.44	1.58	1.71	1.83	1.95
	Recreational/Landscape Irrigation	0.18	0.18	0.19	0.19	0.20	0.20
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Glades* Total	**130.63**	**144.40**	**153.53**	**161.44**	**171.39**	**182.14**
Hendry*	Public Water Supply	3.36	3.38	3.38	3.37	3.35	3.32
	Domestic and Small Public Supply	1.20	1.27	1.32	1.37	1.42	1.46
	Agricultural Irrigation	330.63	339.97	343.66	345.47	350.05	354.99
	Industrial/Commercial/Institutional	7.90	7.98	8.06	8.14	8.21	8.28
	Recreational/Landscape Irrigation	1.34	1.37	1.39	1.40	1.41	1.42
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry* Total	**344.42**	**353.96**	**357.81**	**359.75**	**364.44**	**369.47**
Lee	Public Water Supply	73.44	85.23	95.10	104.41	112.89	120.77
	Domestic and Small Public Supply	15.05	16.99	18.60	20.09	21.43	22.64
	Agricultural Irrigation	49.93	49.63	48.46	47.98	47.24	46.00
	Industrial/Commercial/Institutional	8.23	8.29	8.76	9.21	9.62	10.01
	Recreational/Landscape Irrigation	114.32	128.33	140.06	151.12	161.19	170.54
	Power Generation	0.40	0.40	0.40	0.40	15.40	15.40
	Lee Total	**261.37**	**288.87**	**311.38**	**333.21**	**367.77**	**385.36**
LWC Planning Area Total		**1,098.27**	**1,163.39**	**1,209.49**	**1,252.45**	**1,312.74**	**1,356.84**

LWC = Lower West Coast; mgd = million gallons per day.
* Values listed for Charlotte, Glades, and Hendry counties are only for the areas within the LWC Planning Area boundaries.

DEMAND PROJECTIONS IN PERSPECTIVE

Pursuant to Section 373.709, F.S., this 2017 LWC Plan Update presents demands during average rainfall and 1-in-10 year drought conditions based on the best available information. The projections reflect trends, economic circumstances, and industry intentions that will change over time. Like any predictive tool based on past assumptions, there is uncertainty and a margin for error. **Table B-32** shows the 2030 gross demands projected for the region in the 2012 LWC Plan Update compared to the 2040 demands projected in this 2017 LWC Plan Update. The total average demand projection for 2040 in this 2017 LWC Plan Update (1,211 mgd) is less than the estimated average 2030 demand (1,218 to 1,263 mgd) previously projected in the 2012 LWC Plan Update.

Table B-32. Comparison of demand projections (in mgd) from the 2012 and 2017 LWC Water Supply Plan Updates.

Water Use Category	2012 LWC Plan Update Demand for 2030	2017 LWC Plan Update Demand for 2040
Average Conditions		
Public Water	232.1	199.9
Domestic Self-supply	24.0	33.2
Agricultural	695.9-740.9	678.8
Industrial/Commercial/Institutional	35.3	29.1
Recreational/Landscape	188.5	254.3
Power Generation	42.1	15.4
LWC Planning Area Total	**1,217.9-1,262.9**	**1,210.7**
1-in-10 Drought Conditions		
Public Water	247.8	212.2
Domestic Self-supply	25.7	35.1
Agricultural	919.4-981.4	793.7
Industrial/Commercial/Institutional	35.30	29.1
Recreational/Landscape	242.8	271.3
Power Generation	42.1	15.4
LWC Planning Area Total	**1,513.1-1,575.1**	**1,356.8**

LWC = Lower West Coast; mgd = million gallons per day.

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C

MFLs and Recovery and Prevention Strategies

Section 373.709, Florida Statutes (F.S.), requires each South Florida Water Management District (SFWMD or District) regional water supply plan to be based on at least a 20-year planning period and include, among other items, the Minimum Flow and Minimum Water Level (MFL) criteria and associated recovery or prevention strategies adopted within the planning area. This appendix provides additional and updated information on MFLs and recovery and prevention strategies adopted for water bodies in the Lower West Coast (LWC) Planning Area.

LEGAL BASIS

Minimum Flows and Minimum Water Levels

The overall goal of Chapter 373, F.S., is to ensure the sustainability of water resources in Florida [Section 373.016, F.S.]. Chapter 373, F.S., provides the SFWMD with several tools to carry out this responsibility, including authority to establish MFLs. MFL criteria are flows or levels at which water resources or the ecology of the area would experience significant harm from further withdrawals. Significant harm is defined in Subsection 40E-8.021(31), Florida Administrative Code (F.A.C.), as the temporary loss of water resource functions, which results from a change in surface water or groundwater hydrology, that takes more than 2 years to recover, but which is considered less severe than serious harm (**Figure C-1**). Significant harm is considered more severe than the no-harm standard imposed in the water use permitting process, associated with a 1-in-10 year drought level of certainty. Therefore, MFLs in a recovered natural system would not be exceeded until rainfall conditions exceeded the 1-in-10 year drought level of certainty permitting criteria. Per Subsection 40E-8.021(17), F.A.C., an MFL exceedance means "to fall below a minimum flow or level, which is established in Parts II and III of Chapter 40E-8, F.A.C., for a duration greater than specified for the MFL water body".

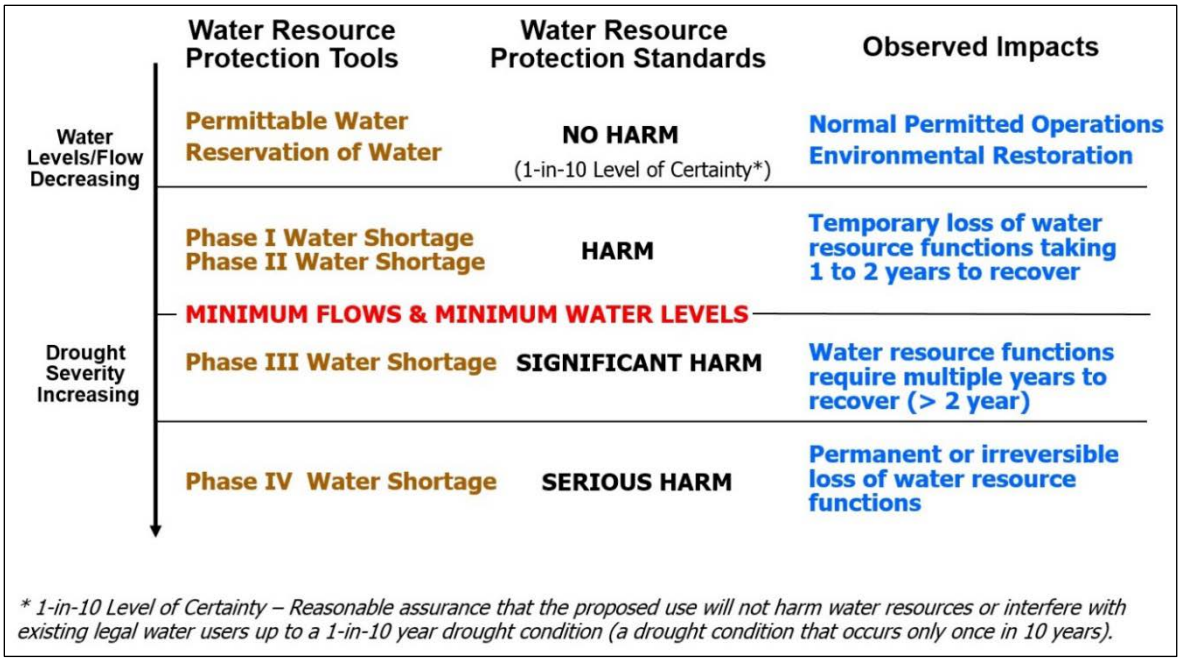

Figure C-1. Conceptual relationship among water resource protection standards at various levels of water resource harm.

Serious harm, the ultimate harm to 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 threshold criteria are factors the District Governing Board considers when contemplating water shortage restrictions. However, MFL criteria are not utilized to trigger water shortage restrictions during climatic conditions less severe than a 1-in-10-year drought. The District Governing Board may impose water shortage restrictions if an MFL exceedance 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.

MFL criteria are applied individually to affected water bodies and define the minimum flow or minimum water level for surface water bodies, or minimum water level for groundwater in aquifers. When establishing MFLs, the District Governing Board considers changes and structural alterations to watersheds, surface waters, and aquifers as well as the effects such changes or alterations have had, and the constraints such changes or alterations have placed on the hydrology of an affected watershed, surface water body, or aquifer [Section 373.0421, F.S.].

The SFWMD developed water resource protection standards, consistent with legislative direction, that are implemented in phases to prevent various levels of harm (**Figure C-1**). Each standard plays a role in achieving a sustainable water resource. **Figure C-1** represents the conceptual relationship among the water resource protection standards, associated conditions, and water shortage severity.

The water use permitting program protects water resources from harm by ensuring water use is reasonable-beneficial, does not interfere with existing legal water uses, and is consistent with the public interest. In 2001, MFLs were adopted for four water bodies in the LWC Planning Area: Caloosahatchee River, LWC Aquifers, Lake Okeechobee, and the freshwater portions of Everglades National Park (ENP) (**Figure C-2**).

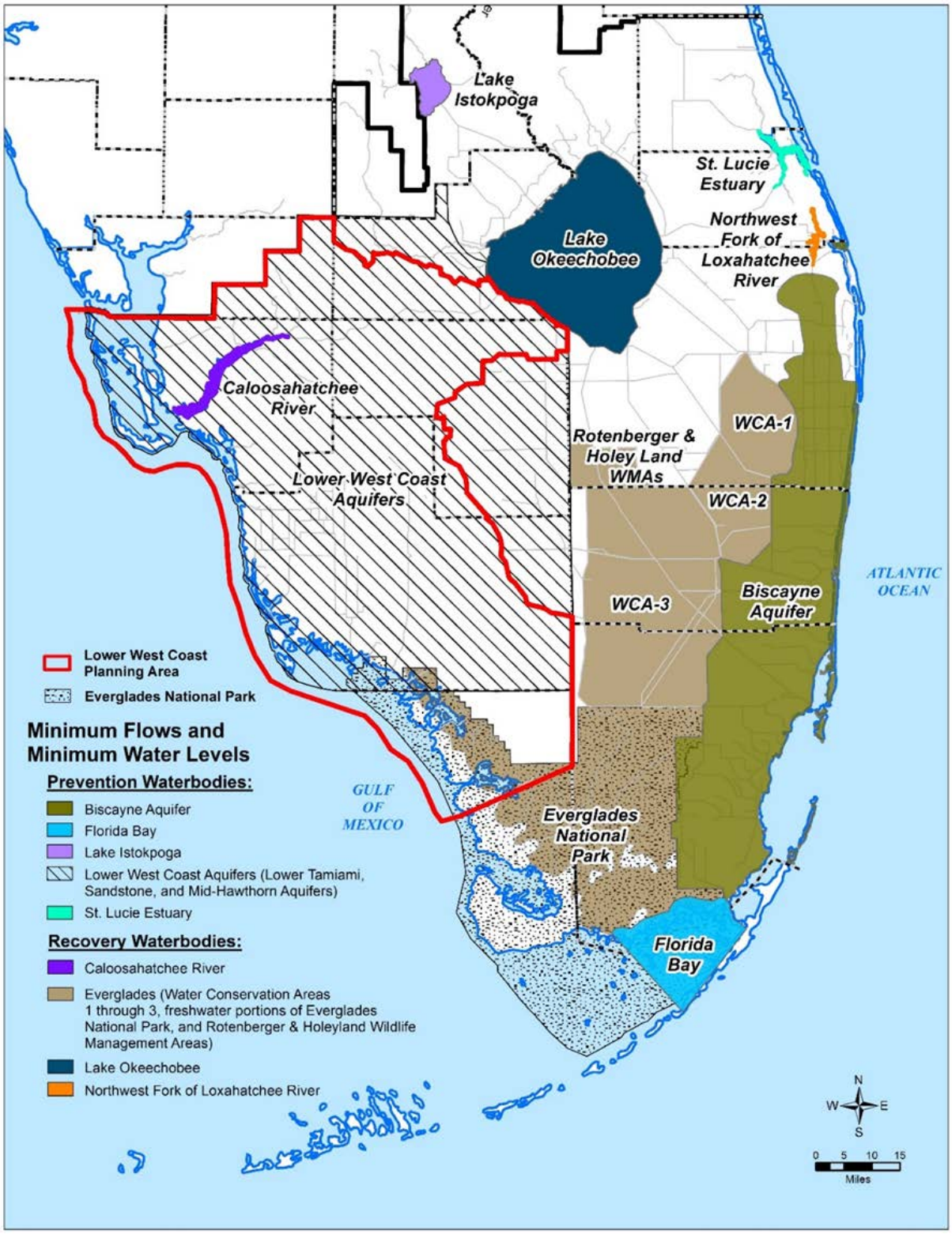

Figure C-2. Adopted Minimum Flows and Minimum Water Levels in the South Florida Water Management District.

Recovery and Prevention Strategies

Section 373.0421, F.S., requires the water management districts to develop and implement a recovery or prevention strategy for water bodies with flows or levels that are below, or are projected to fall within 20 years below, the adopted MFL criteria. Analyses of current and future conditions are conducted for each water body for which MFL criteria are defined. MFL recovery strategies are developed when MFL criteria are violated [Subsection 40E-8.021(25), F.A.C.]. MFL prevention strategies are developed when MFL criteria currently are not violated, but are projected to be violated within 20 years of the establishment of the MFL [Subsection 40E-8.021(24), F.A.C.]. 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 in the strategy. Section 373.0421(2), F.S., in part, provides the following:

> *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. These strategies may include development of additional water supplies and implementation of conservation and other efficiency measures. The implementation of 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.

In the LWC Planning Area, a prevention strategy was developed and adopted for the LWC Aquifers [Subsection 40E-8.421(4), F.A.C.], and recovery strategies were developed and adopted for the Caloosahatchee River, Lake Okeechobee, and the freshwater portions of ENP [Subsection 40E-8.421(2), F.A.C.]. Recovery and prevention strategies can consist of multiple components within the following categories: capital projects, regulatory measures and requirements, water shortage measures, and environmental projects.

LOWER WEST COAST MFL WATER BODIES

Caloosahatchee River

MFL Criteria

In 2001, the SFWMD adopted an MFL for the Caloosahatchee River [Subsection 40E-8.221(2), F.A.C.]. The Caloosahatchee River MFL water body is defined in Subsection 40E-8.021(2), F.A.C. as the surface waters that flow through the S-79 water control structure, combined with tributary contributions below the structure that collectively flow southwest to San Carlos Bay (**Figures C-2** and **C-3**). This is essentially the estuarine portion of the waterway that flows west from Lake Okeechobee to San Carlos Bay. The portion of this waterway located upstream of the S-79 structure is considered the C-43 Canal.

Figure C-3. Caloosahatchee River Minimum Flow and Minimum Water Level water body and watershed.

The current MFL criterion for the Caloosahatchee River is a minimum mean monthly flow of 300 cubic feet per second (cfs) at the S-79 structure. At the time of MFL adoption in 2001, this flow rate was determined necessary to prevent an MFL exceedance (when the MFL is not met) and sustain submersed aquatic vegetation in the Caloosahatchee River Estuary (CRE).

An MFL exceedance occurs when the 30-day average salinity exceeds 10 or the single-day average salinity exceeds 20 at the Fort Myers salinity monitoring station (**Figure C-3**). An MFL violation occurs when at least one exceedance occurs in each of two consecutive 365-day periods (return frequency).

Analyses completed for the *2000 Lower East Coast Water Supply Plan* (SFWMD 2000a) showed that long-term regional storage was necessary to achieve proposed MFL criteria, and that MFL violations would continue until a recovery strategy was implemented. As a result, the SFWMD projected that a recovery strategy based on construction of regional storage would be necessary to achieve the MFL. Historic information on the MFL water body and the basis of the current MFL criteria can be found in technical documentation reports available on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels).

MFL Re-evaluation

The Caloosahatchee River MFL has been under re-evaluation since 2013. The re-evaluation includes application of new and updated models as well as a resource-based approach to historical and new data and information regarding the CRE to accomplish the following:

- Evaluate alterations in the CRE watershed and the effects on flows to the CRE
- Better understand water sources and their contributions to the CRE
- Assess responses of multiple ecological indicators to various flow scenarios
- Evaluate the performance of the MFL recovery strategy
- Re-evaluate current MFL criteria to protect the CRE in light of new analyses

Re-evaluation activities completed to date include the following:

- Researched effects of flow scenarios on a suite of environmental indicators in the CRE, including oysters (*Crassostrea virginica*), blue crabs (*Callinectes sapidus*), ichthyoplankton, zooplankton, phytoplankton, smalltooth sawfish (*Pristis pectinata*), benthic macrofauna, and tape grass (*Vallisneria americana*)
- Assessed the effect of low flows on the aforementioned environmental indicators and summarized the associated science (SFWMD 2017a)
- Held the Caloosahatchee Science Symposium (September 15-16, 2016) to gain public input on the completed low-flow assessment
- Completed additional data collection and analyses as well as model development, update, and application to predict environmental responses to flow and salinity conditions in the CRE
- Completed the technical document supporting the re-evaluation (SFWMD 2017b)
- Completed an independent, scientific peer review of the technical document and re-evaluation approach, which included a public peer-review session
- Completed the re-evaluation and revision of MFL criteria through public consensus
- Gained support for the re-evaluation from the District Water Resources Advisory Commission and Governing Board
- Initiated rulemaking for revision of the MFL rule [Subsection 40E-8.221(2), F.A.C.]

The revised MFL rule is expected to go before the District Governing Board for adoption in mid-2018. Further information about the MFL and re-evaluation can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels).

Recovery Strategy

In 2001, when the MFL for the Caloosahatchee River was adopted, the MFL criteria were projected to be exceeded until storage could be constructed and operated in the watershed to capture excess surface water flows for release to the river during times of need. Therefore, a recovery strategy was adopted for the river simultaneously with MFL adoption. The recovery strategy has two parts: 1) the construction of the Comprehensive Everglades Restoration Plan (CERP) Caloosahatchee River (C-43) West Basin Storage Reservoir, and 2) the adoption of a Water Reservation rule [Subsection 40E-10.041(3), F.A.C.] to protect the

water in the reservoir for fish and wildlife in the CRE and to ensure the intended benefits of the reservoir. The Water Reservation rule was adopted in 2014.

CERP identifies restoration of the CRE as an integral step in achieving system-wide benefits in the South Florida ecosystem. Promoting a balanced and healthy salinity regime in the CRE is essential for maintaining the ecological integrity and associated economic benefits of this unique habitat on Florida's southwest coast. Construction of the Caloosahatchee River (C-43) West Basin Storage Reservoir serves to address these CERP objectives as well as SFWMD objectives to improve flows to the CRE to meet MFL criteria.

The SFWMD is the state-designated local sponsor of the reservoir project with the United States Army Corp of Engineers (USACE). In accordance with the Water Resources Development Act of 2000, which requires the legal protection of water for CERP projects constructed under cost-share agreements between the SFWMD and USACE prior to construction, a Water Reservation rule was adopted for the reservoir in 2014 [Subsection 40E-10.041(3), F.A.C.]. The Water Reservation rule reserves from consumptive use all water within and released from the reservoir. The reservoir construction project was authorized in 2014.

The reservoir site is located on a 10,700-acre parcel, formerly known as Berry Groves, in Hendry County, southwest of the S-78 structure and the City of LaBelle, as shown in **Figure C-4** and described in Appendix 1-12 of Chapter 40E-10, F.A.C.

Flows to the CRE will be moderated through capture of surface water flows and a portion of Lake Okeechobee releases in the reservoir during wet periods, and release of water from the reservoir to the CRE during dry periods. This will provide a more natural, consistent flow of fresh water to the CRE and a more balanced salinity regime by improving the timing, quality, and quantity of water inflows.

Key features of the reservoir include the following:

- 170,000 acre-feet of water storage (>55 billion gallons) stored in two cells (**Figure C-5**)
- Normal pool depth when full: 15 to 25 feet
- External and internal embankments and canals
- Two pump stations (S-470 and S-476)
- Sixteen internal control and outflow water control structures
- Environmental features to provide fish and wildlife habitat and recreational opportunities for the public

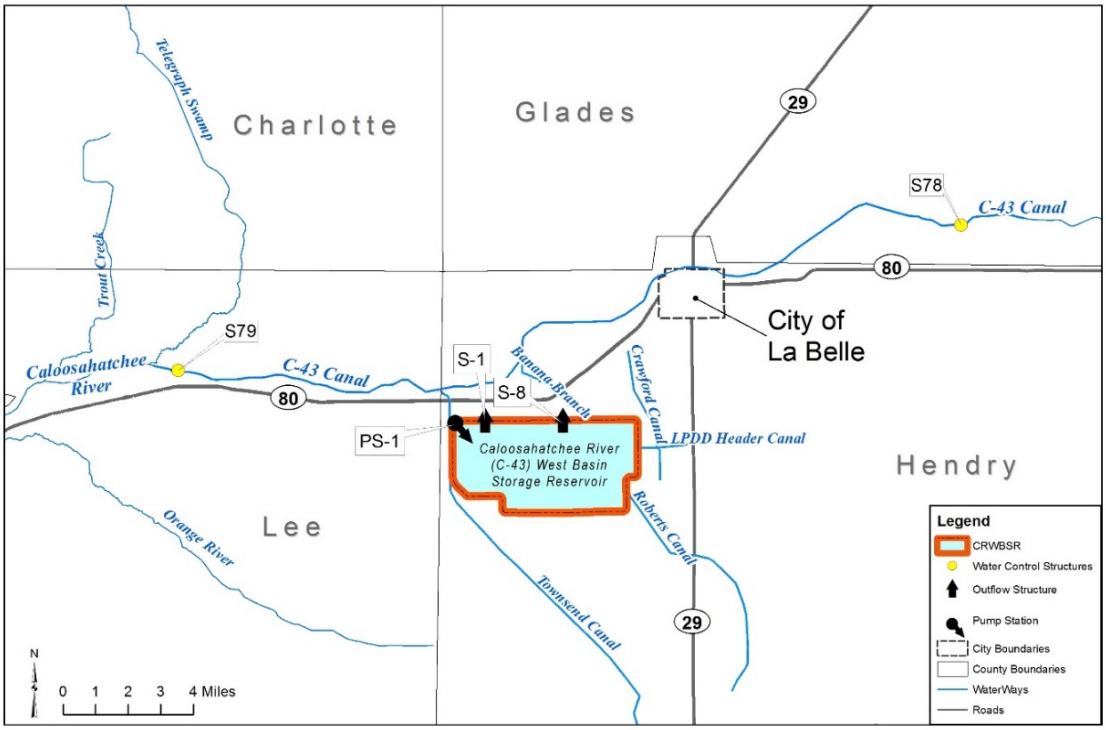

Figure C-4. Location of the Comprehensive Everglades Restoration Plan Caloosahatchee River (C-43) West Basin Storage Reservoir.

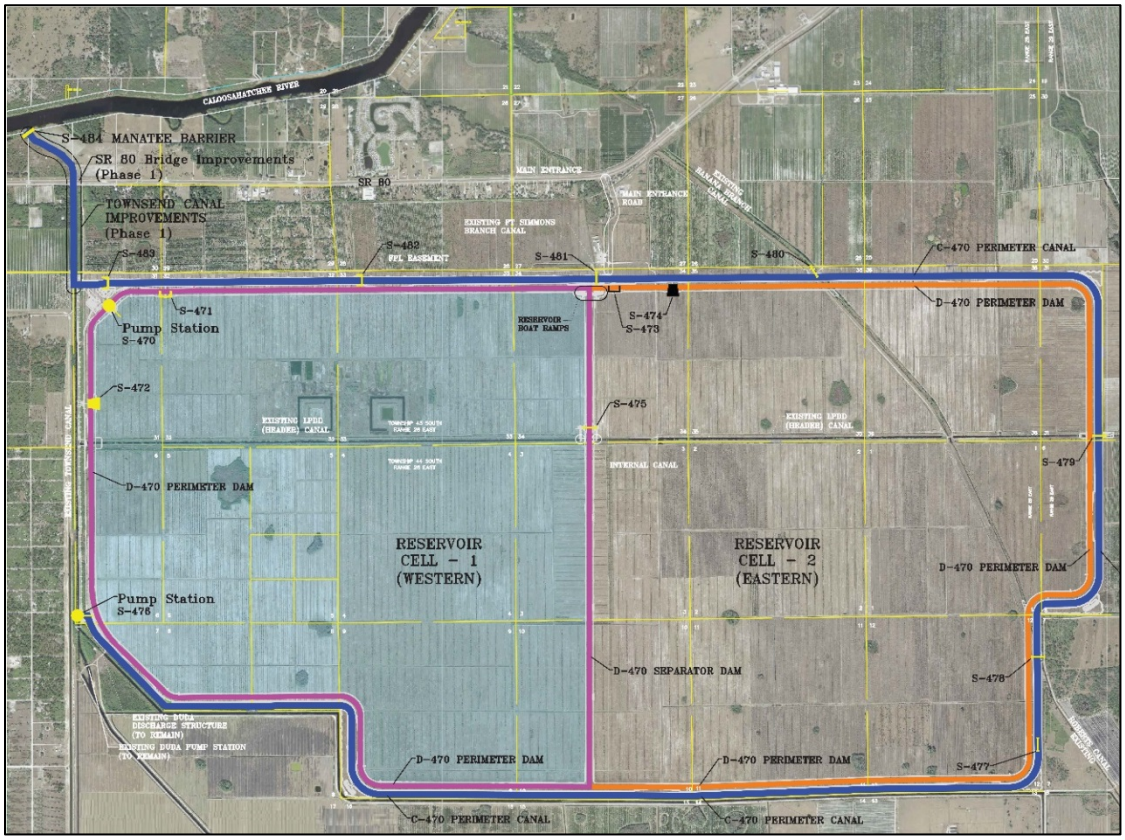

Figure C-5. Caloosahatchee River (C-43) West Basin Storage Reservoir site plan.

Construction of the reservoir began in 2015, and it is expected to be complete by 2022. One to two years of operational testing and verification will occur before the reservoir is put into operation.

Further information about the recovery strategy for the Caloosahatchee River can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels) and in Subsection 40E-8.421(2), F.A.C. More information on the Water Reservation rule can be obtained in Subsection 40E-10.041(3), F.A.C., and on the SFWMD website (www.sfwmd.gov; Search: Water Reservations). Information specific to the CERP reservoir project is available at www.evergladesrestoration.gov and USACE (2016).

Lower West Coast Aquifers

MFL Criteria

The LWC Aquifers (**Figure C-2**) comprise the Lower Tamiami, Sandstone, and Mid-Hawthorn aquifers. In 2001, the SFWMD adopted an MFL specifying that the minimum water levels for the LWC Aquifers must equal the structural top of the aquifers [Subsection 40E-8.331, F.A.C.]. In 2015, the SFWMD published maps (**Figures C-6** to **C-8**) indicating the elevation of the structural top of the Lower Tamiami, Sandstone, and Mid-Hawthorn aquifers (Geddes et al. 2015).

A violation of the MFL criteria occurs when water levels in the aquifers drop below the top of the uppermost geologic strata that composes the aquifer at any point in time. Water level measurements used to determine the conditions of the aquifers for the purpose of this rule are collected no closer than 50 feet from any existing pumping well, as required pursuant to Rule 40E-8.331, F.A.C. Further information about the MFL for the LWC Aquifers can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels).

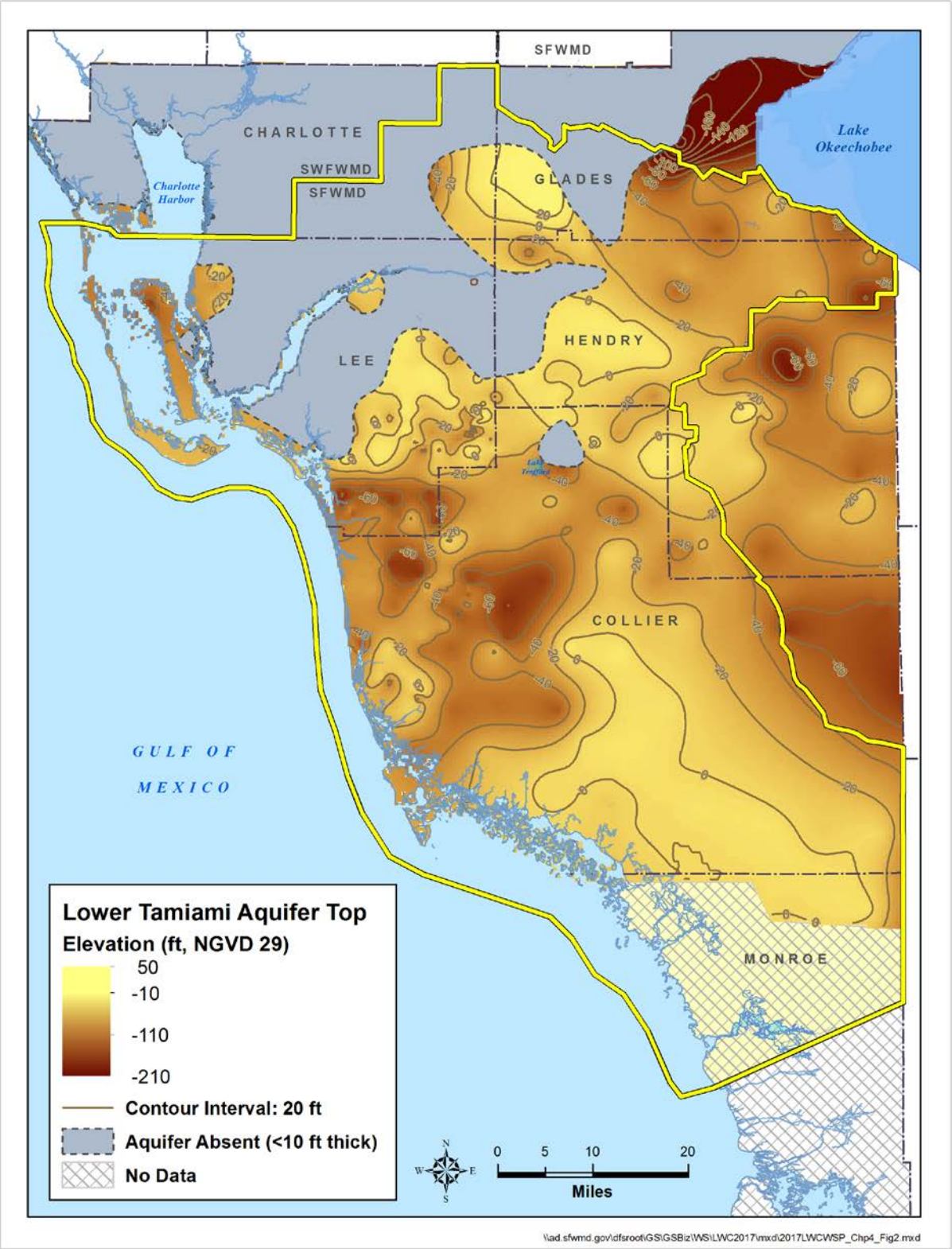

Figure C-6. Structural top of the Lower Tamiami aquifer in the Lower West Coast Planning Area.

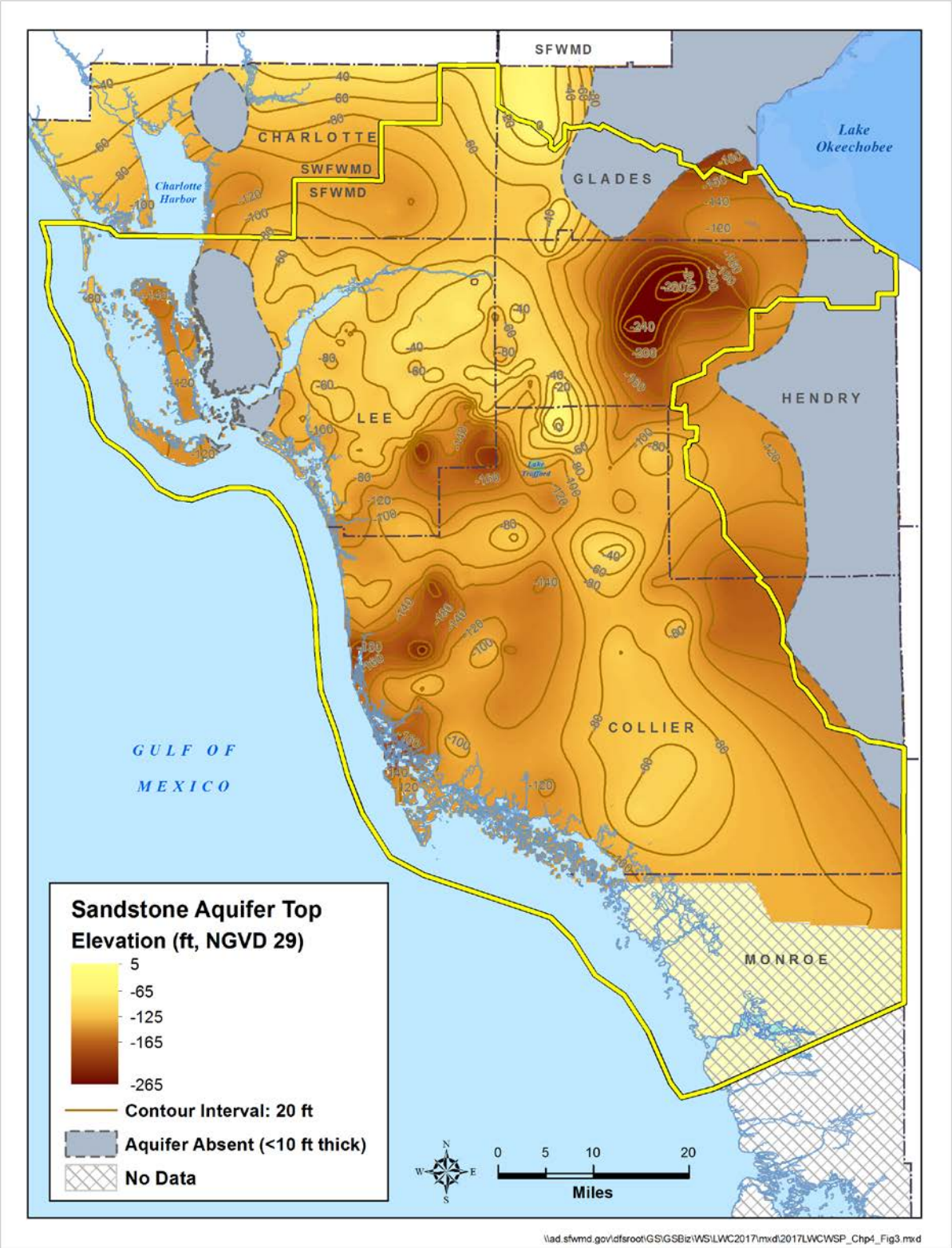

Figure C-7. Structural top of the Sandstone aquifer in the Lower West Coast Planning Area.

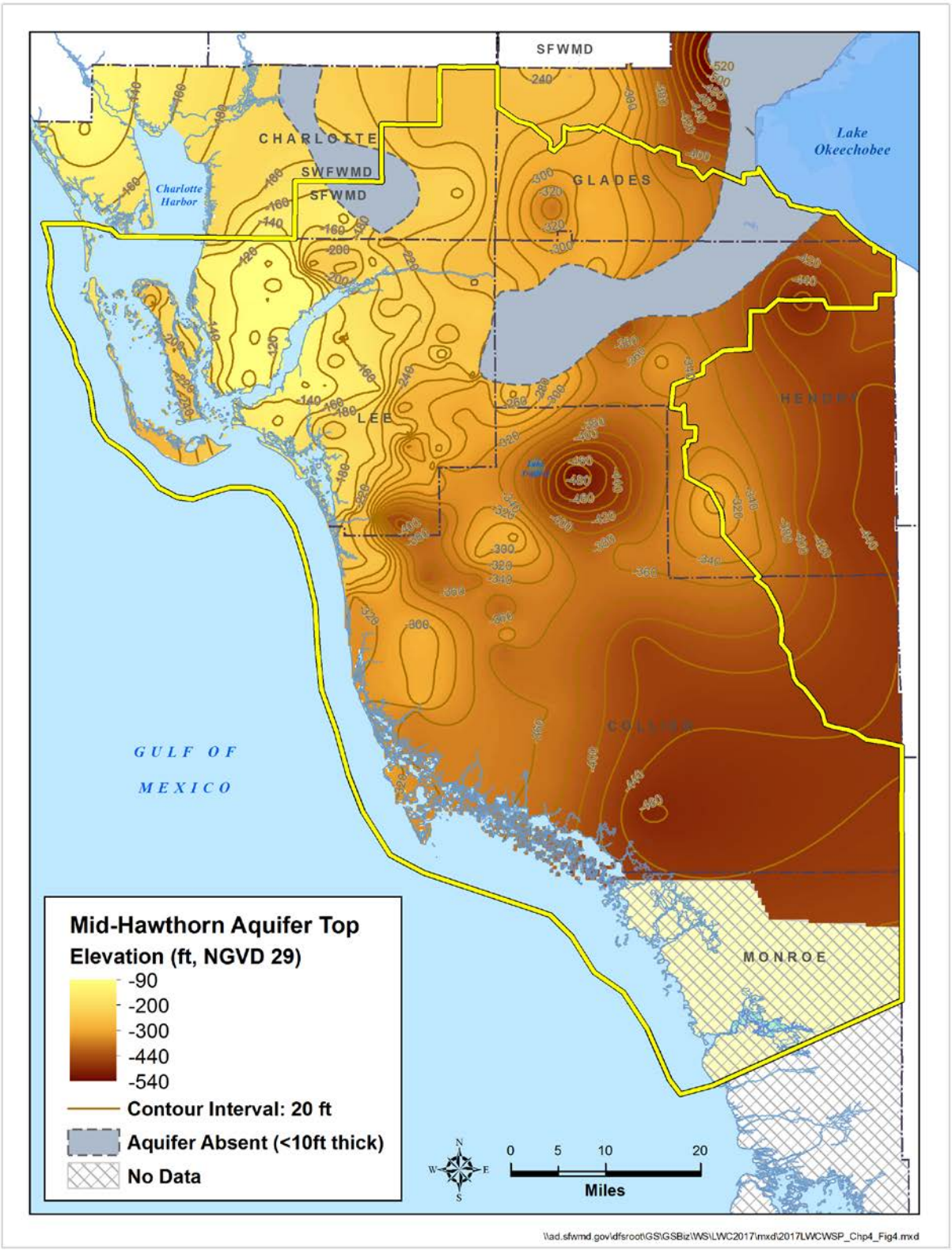

Figure C-8. Structural top of the Mid-Hawthorn aquifer in the Lower West Coast Planning Area.

Prevention Strategy

In 2001, when the MFL for the LWC Aquifers was adopted, the water level criteria of the MFL were not violated, and current water levels in the aquifers are well above the MFL criteria (Chapter 6 of the plan update). However, to minimize the likelihood of a violation and to prevent water levels within the aquifers from declining below the MFL criteria in the future, a prevention strategy was adopted for the aquifers simultaneously with the MFL [Subsection 40E-8.421(4), F.A.C.]. The prevention strategy for the aquifers consists of the following components:

- Establish "no harm" maximum permittable levels for each aquifer (regulatory levels) for a 1-in-10 year drought level of certainty
- Implement rule criteria to prevent harm through the water use permitting process, including conditions for permit issuance in Rule 40E-2.301, F.A.C.
- Construct and operate water resource and supply development projects
- Implement the water shortage plan in Chapter 40E-21, F.A.C., as needed to prevent serious harm during drought conditions in excess of a 1-in-10 year drought level of certainty

In order to prevent the LWC Aquifers from falling below the minimum water level, the SFWMD adopted Maximum Developable Limits (MDLs) in 2003. The MDLs, contained in the *Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District* (Applicant's Handbook; SFWMD 2015), prohibit water withdrawals that lower the potentiometric head (water level) within the Lower Tamiami, Sandstone, and Mid-Hawthorn aquifers to less than 20 feet above the top of the uppermost geologic strata of the aquifer at any point during a 1-in-10 year drought condition. MDLs are permitting constraints that prevent the region's aquifers from experiencing harm due to withdrawals. Further details about the prevention strategy for the LWC Aquifers can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels) and in Subsection 40E-8.421(4), F.A.C.

Lake Okeechobee

MFL Criteria

Lake Okeechobee (**Figure C-2**) is the largest lake in the southeastern United States and a central component of the hydrology and environment of South Florida. Lake Okeechobee is used for multiple purposes, including urban, agricultural, and environmental water supply; flood control; navigation; and commercial and recreational fishing. The lake also is a key ecological component of the Greater Everglades ecosystem. It receives water from a 5,400-square-mile watershed that includes the Kissimmee Chain of Lakes, Kissimmee River, Lake Istokpoga, Fisheating Creek, and other drainage basins. The lake has two major outlets for flood control and water delivery to downstream rivers and estuaries: the C-44 (St. Lucie) Canal to the east and the C-43 Canal to the west. Water also can be delivered south to the Everglades Protection Area. Additional flood control discharges from Lake Okeechobee to the lower east coast are possible via the West Palm Beach, Hillsboro, North New River, and Miami canals. The 143-mile long Herbert Hoover Dike encircles the lake to protect the surrounding communities from flooding.

An MFL of 11 feet National Geodetic Vertical Datum of 1929 (NGVD29) was adopted for Lake Okeechobee in 2001 [Subsection 40E-8.221(1), F.A.C.]. The MFL criterion was based on the relationship between water levels in the lake and abilities to 1) protect the coastal aquifer against saltwater intrusion, 2) supply water to ENP, 3) provide littoral zone habitat for fish and wildlife, and 4) ensure navigational and recreational access (SFWMD 2000b). Consideration was given to the lake's function as a storage area for supplying water to adjacent areas such as the Everglades Agricultural Area, the Seminole Tribe of Florida reservations, and the Lake Okeechobee Service Area.

Lake Okeechobee

An MFL exceedance is a decline below 11 feet NGVD29 for more than 80 nonconsecutive or consecutive days during an 18-month period. The 18-month period over which MFL compliance is assessed starts following the first day Lake Okeechobee falls below 11 feet NGVD29, and the period can 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.]. An MFL violation occurs when an exceedance occurs more than once every 6 years. Further information about the Lake Okeechobee MFL can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels), and in the *2013 Lower East Coast Water Supply Plan Update* (SFWMD 2013).

Recovery Strategy

When the Lake Okeechobee MFL was adopted in 2001, the lake met the MFL criteria and the criteria were not anticipated to be violated during the next 20 years. Therefore, a prevention strategy was adopted for the lake simultaneous with MFL adoption. However, MFL exceedances were anticipated in 2008, with the transition from the Water Supply and Environment lake regulation schedule to the Lake Okeechobee Regulation Schedule (2008 LORS). The 2008 LORS was implemented to accommodate lower lake levels necessary for maintaining the Herbert Hoover Dike until it could be fully rehabilitated. Therefore, the strategy for the lake was changed in 2008 from prevention to recovery. When repairs to the Herbert Hoover Dike are complete and the lake's regulation schedule is revised, lake levels are expected to rise and return the lake to an MFL prevention strategy. The additional water held in Lake Okeechobee will enhance the level of certainty to existing permitted users receiving less than 1-in-10 year drought level of certainty and support environmental objectives. While the 2008 LORS is temporary, it is unclear when a revision of the regulation schedule can be made or what the revised schedule will entail. In the meantime, the recovery strategy for Lake Okeechobee will remain in effect until the MFL criteria are met, pursuant to Section 373.0421, F.S. Further details about the recovery strategy for Lake Okeechobee can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels), in Subsection 40E-8.421(2), F.A.C., and SFWMD (2013).

Everglades

MFL Criteria

An MFL was adopted for the Everglades in 2001 [Subsection 40E-8.221(3), F.A.C.], which includes the lands and waters of the Water Conservation Areas, the Holeyland/Rotenberger wildlife management areas, and the freshwater portions of ENP [Subsection 40E-8.021(7), F.A.C.]. A small area of the freshwater portion of ENP lies within the LWC Planning Area (**Figure-2**).

The MFL criteria 1) are based on changes and structural alterations to the pre-drainage conditions of the Everglades that existed at the time of MFL adoption; 2) are specific to the peat- and marl-forming wetlands of the Water Conservation Areas, Holeyland/Rotenberger wildlife management areas, Shark River Slough, wetlands east and west of Shark River Slough, the Rocky Glades, and Taylor Slough; and 3) specify limits on the decline of water levels below ground, under specific conditions and at specific return frequencies, as measured at the locations listed in Table 1 of Rule 40E-8.221, F.A.C. None of the measurement locations listed in Table 1 of Rule 40E-8.221, F.A.C. are located in the LWC Planning Area. However, the MFL still applies to the aforementioned lands.

An MFL exceedance is considered to have occurred when the MFL criteria [Subsection 40E-8.221(3), F.A.C], regarding water levels below ground at the monitoring locations specified in Table 1 of the rule, are not met. It is the SFWMD's intent to modify the MFL criteria through rule amendment as changes and alterations to the Everglades are corrected through measures put forth in the Lower East Coast Water Supply Plan Updates and CERP. These measures are expected to achieve minimum hydropattern return frequencies that approximate CERP-compatible pre-drainage conditions in the Everglades. Further information about the Everglades MFL can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels) and in SFWMD (2013).

Recovery Strategy

In 2007, a Restricted Allocation Area (RAA) was established for the Lower East Coast Everglades Waterbodies (Subsection 3.2.1.E of the Applicant's Handbook [SFWMD 2015]), and the RAA is a component of the Everglades MFL recovery strategy. In the RAA, water allocations are limited to base condition water uses permitted as of April 1, 2006.

CERP has a critical relationship with water supply planning in the SFMWD and includes capital projects needed for the recovery and restoration of the Everglades. A number of CERP components are being formulated and evaluated as part of the Central Everglades Planning Project, which is identifying and planning projects on publicly owned land to direct more water south to Water Conservation Area 3, ENP, and Florida Bay, while providing for other water-related needs of the region. Further details about the Everglades recovery strategy can be found on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels), in Subsection 40E-8.421(2), F.A.C., and in SFWMD (2013). More information on the Lower East Coast Everglades Waterbodies RAA can be obtained in Chapter 4 of the plan update and in Subsection 3.2.1 of the Applicant's Handbook (SFWMD 2015). A list of CERP projects planned or implemented in the LWC Planning Area to protect and restore natural systems and provide water supply can be found in SFWMD (2013).

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D

Potable and Wastewater Treatment Facilities

POTABLE WATER TREATMENT FACILITIES

Potable water used in the Lower West Coast (LWC) Planning Area is produced by large water treatment facilities, some smaller "package" water treatment facilities, and self-supply (i.e., private wells supplying individual users). This appendix focuses on large facilities with average pumpages of at least 100,000 gallons per day, or 0.1 million gallons per day (mgd).

Gross (raw) water withdrawal sources in the LWC Planning Area include water from the surficial, intermediate, and Floridan aquifer systems (SAS, IAS, and FAS). **Table D-1** summarizes the potable water treatment facilities located in the LWC Planning Area. **Figures D-1** to **D-3** show the locations of potable water treatment facilities and 2014 utility service areas in Collier, Hendry, Glades, Lee, and Charlotte counties. Additional information about each public water supply utility is available from the South Florida Water Management District (SFWMD or District) Water Use Regulatory Database, which is available on the SFWMD website (www.sfwmd.gov).

Table D-1. Potable water treatment plants in the Lower West Coast Planning Area.

Supply Entity – Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)						FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Annual Allocation	Surface Water	SAS	IAS	FAS	ASR		
Charlotte County									
Town and Country Utilities Company	08-00122-W	0.78			0.78			5084116	0.25
Charlotte County Total		**0.78**	**0.00**	**0.00**	**0.78**	**0.00**	**0.00**		**0.25**
Collier County									
Ave Maria Utility Company	11-02298-W	1.16		0.81	0.81			5114154	1.00
Collier County Water-Sewer District – North and South County Regional	11-00249-W	55.53		26.50	16.00	19.52		5114069	52.00
Everglades City	11-00160-W	0.25		0.25				5110089	0.50
FGUA – Golden Gate	11-00148-W	2.49		2.49				5110117	2.10
Immokalee Water & Sewer District – Airport Road, Jerry Warden, Carson Road	11-00013-W	4.15		3.45		0.70		5110142	5.60
Marco Island Utilities – Marco Island Lime and RO	11-00080-W	13.16	5.39		3.62		4.15	5110183	12.67
Naples, City of – Utility Department	11-00017-W	18.42		18.42				5110198	30.00
Orange Tree Utility Company	11-00419-W	0.91		0.91				5114085	0.75
Port of the Islands Community Improvement District	11-00372-W	0.55		0.55				5110230	0.44
Collier County Total		**96.62**	**5.39**	**53.38**	**20.43**	**20.22**	**4.15**		**105.06**
Glades County									
Moore Haven Utilities	22-00045-W	0.89		0.89				5220192	0.96
Glades County Total		**0.89**	**0.00**	**0.89**	**0.00**	**0.00**	**0.00**		**0.96**
Hendry County									
Clewiston Utilities	26-00769-W	2.58				2.58		5260053	3.00
LaBelle, City of – Department of Public Works	26-00105-W	1.06		0.13		0.92		5260050	2.50
Port LaBelle Utility System of Hendry County	26-00096-W	0.53			0.53			5260226	0.90
Hendry County Total		**4.17**	**0.00**	**0.13**	**0.53**	**3.50**	**0.00**		**6.40**
Lee County									
Bonita Springs Utilities – Lime Softening	36-00008-W	5.74		5.74				5360025	9.00
Bonita Springs Utilities – RO	36-04062-W	13.07				13.07		5360025	6.60
Cape Coral Utilities – RO Facilities 1 & 2	36-00046-W	39.25				39.25		5360325	30.00
Citrus Park RV Resort	36-00208-W	0.23		0.23				5360048	0.54

Table D-1. (Continued).

Supply Entity – Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)						FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Annual Allocation	Surface Water	SAS	IAS	FAS	ASR		
FGUA – Lake Fairways	36-00081-W	0.10			0.10			5364040	0.20
FGUA – Lehigh Acres	36-00166-W	3.15			3.15			5360172	3.10
Fort Myers, City of – Public Utility	36-00035-W	11.95				11.95		5360102	13.00
Greater Pine Island Water Association	36-00045-W	2.49				2.49		5360322	3.29
Island Water Association	36-00034-W	5.22				5.22		5360146	5.99
Lee County Utilities – North Fort Myers, Waterway Estates, Estero	36-00152-W	16.68		0.09	0.46	16.13		5364048	11.60
Lee County Utilities – Olga, Corkscrew, Green Meadows	36-00003-W	40.29	4.43	7.84	13.81	14.21		5364048	29.00
Lee County Utilities – Pinewoods	36-00122-W	7.36		1.85	0.60	4.91		5364048	5.30
Lee County Total		**145.53**	**4.43**	**15.75**	**18.12**	**107.23**	**0.00**		**117.62**
LWC Planning Area Total		**247.99**	**9.82**	**70.15**	**39.86**	**130.95**	**4.15**		**230.29**

Note: Where cells are blank, no water was allocated from that source.
ASR = aquifer storage and recovery; FAS = Floridan aquifer system; FDEP = Florida Department of Environmental Protection; FGUA = Florida Governmental Utility Authority; IAS = intermediate aquifer system; PWS ID = Public Water System Identification Number; RO = reverse osmosis; SAS = surficial aquifer system; SFWMD = South Florida Water Management District.

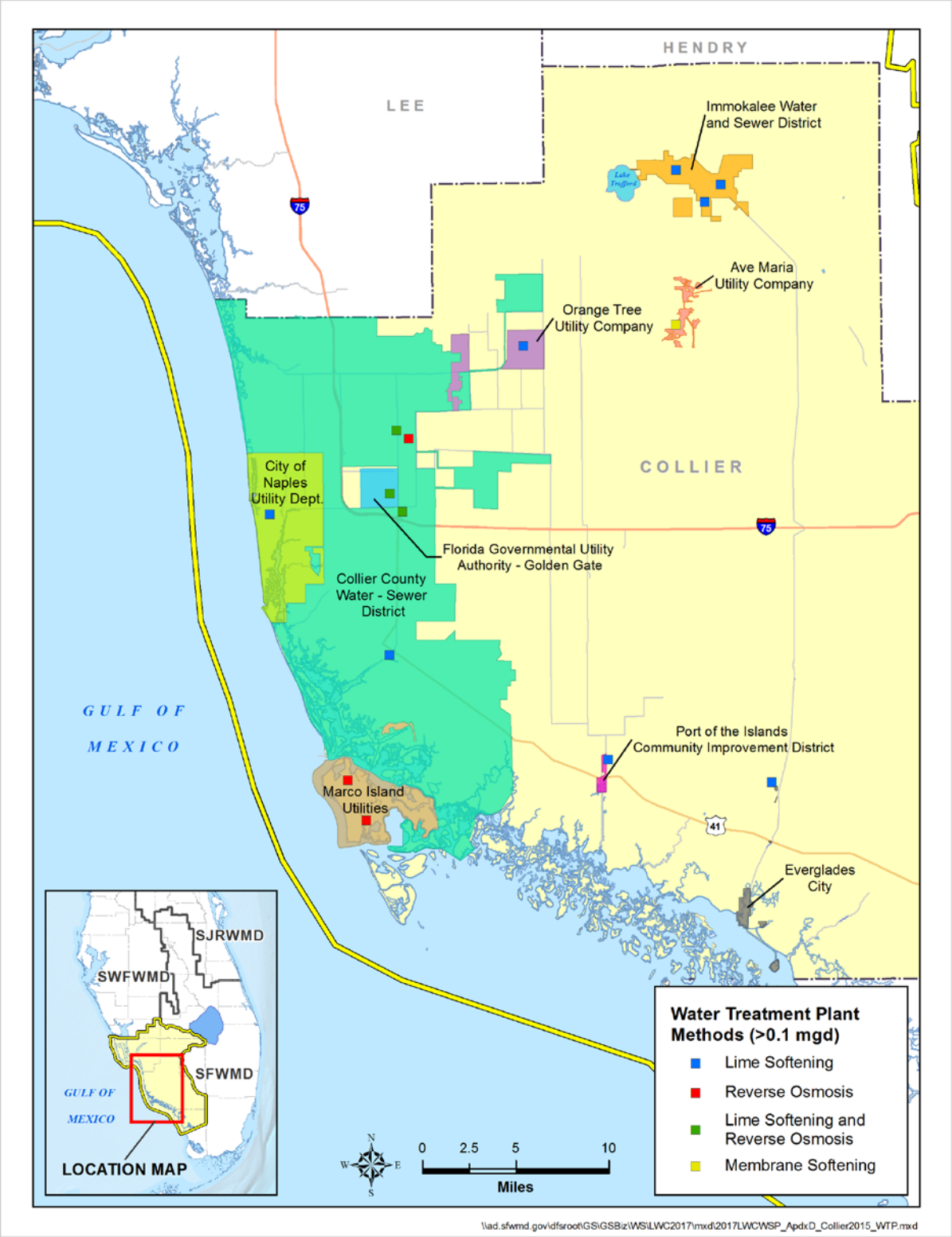


Figure D-1. Potable water treatment plants and 2014 utility service areas in Collier County.

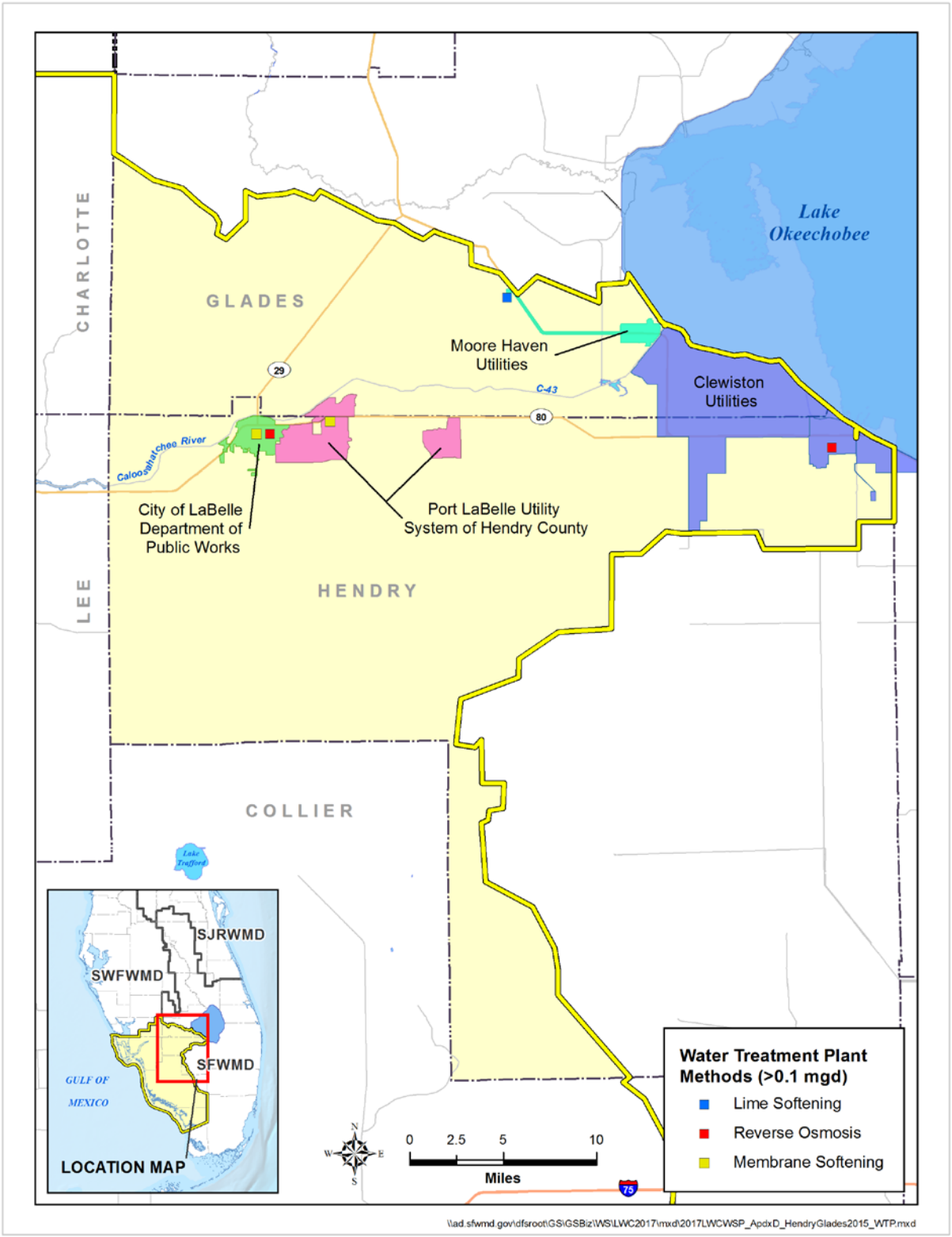


Figure D-2. Potable water treatment plants and 2014 utility service areas in Glades and Hendry counties.

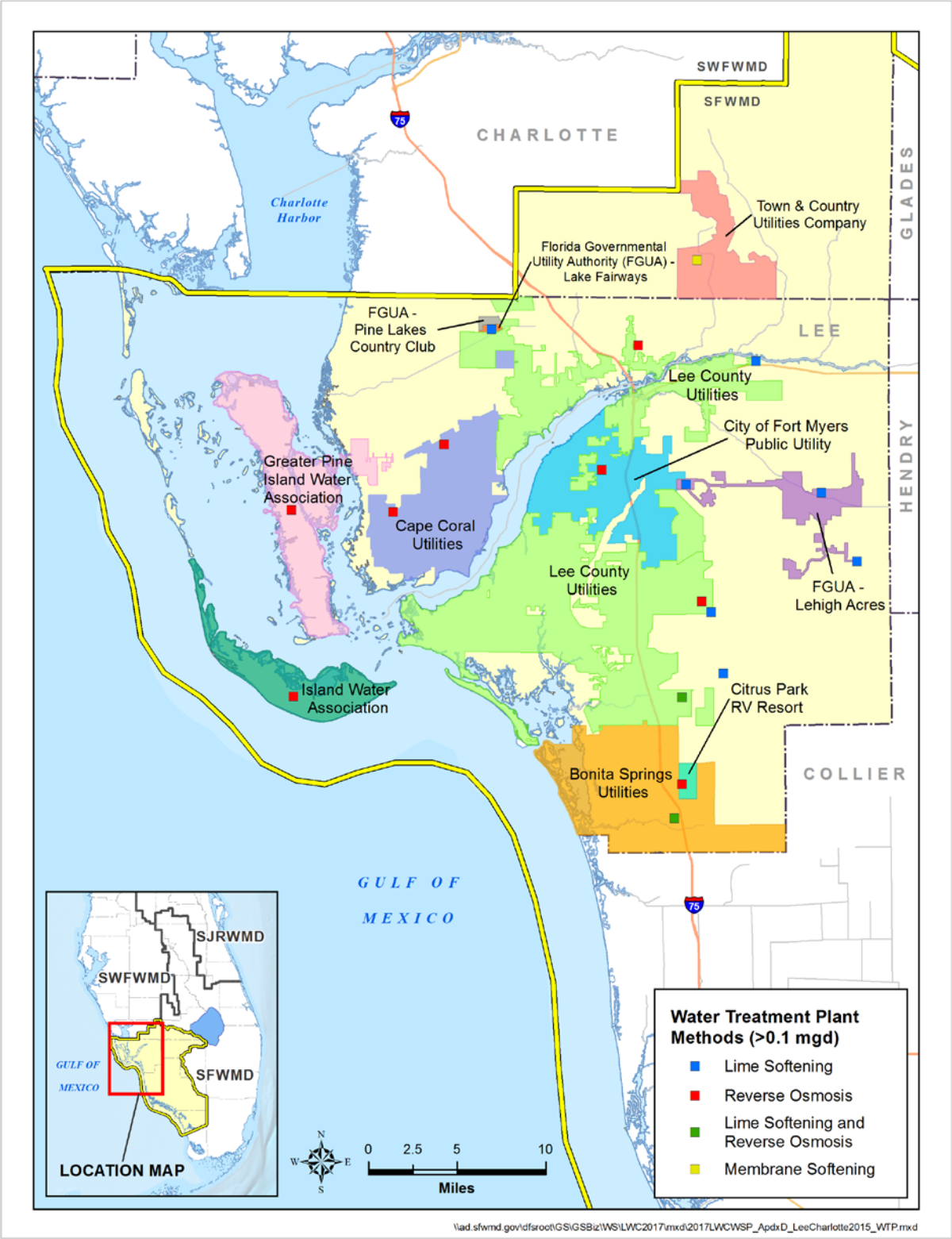


Figure D-3. Potable water treatment plants and 2014 utility service areas in Lee and Charlotte counties.

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 within the LWC Planning Area because they allow economy of operation and have flows sufficient to positively impact water resources through reuse and support for regional reuse programs. Many facilities are near potential reclaimed water users while others use distribution pipelines to serve reclaimed water customers.

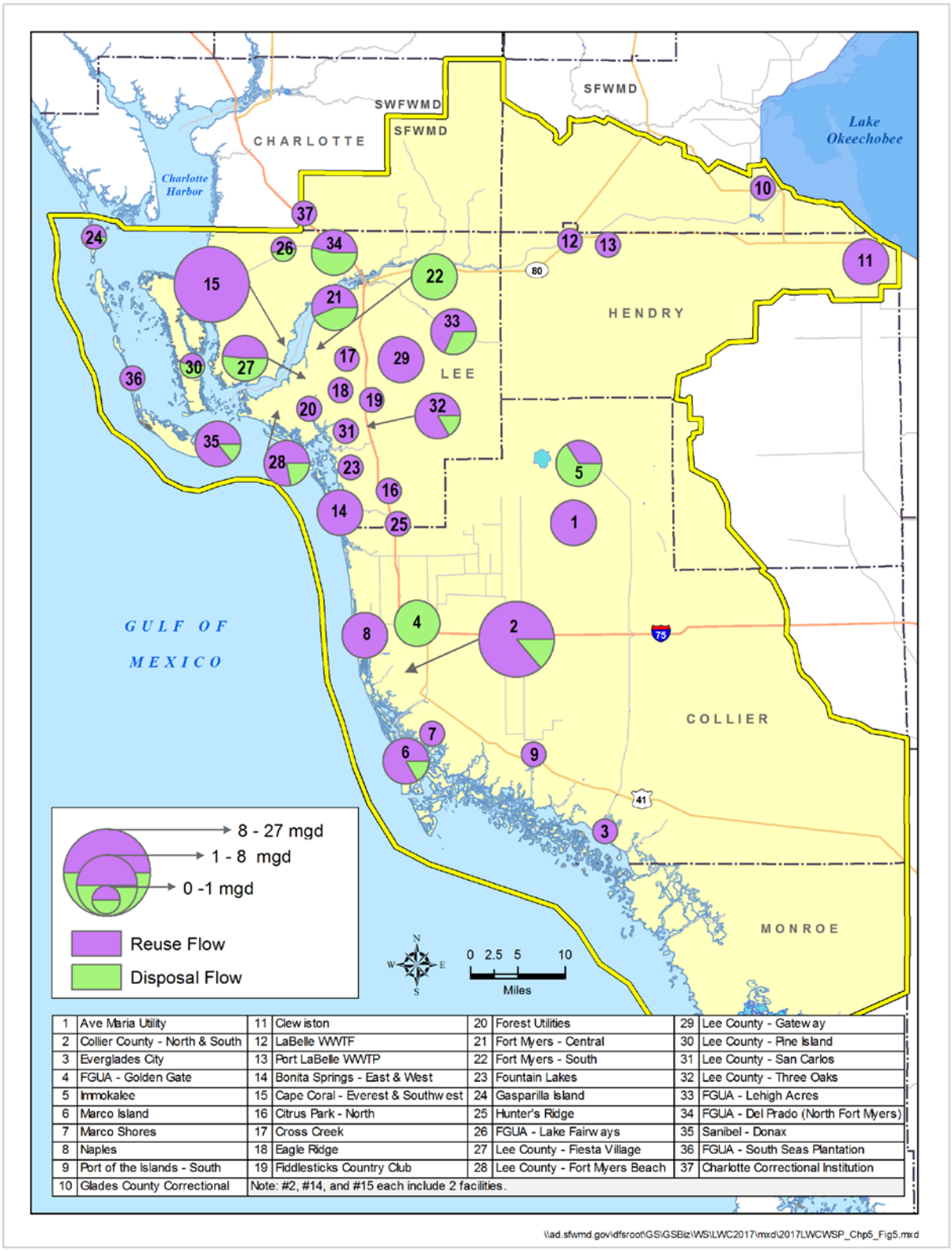
Figure D-4 shows the locations of the 40 WWTFs in the LWC Planning Area with treatment capacity of at least 0.1 mgd (as of 2014). According to the Florida Department of Environmental Protection (FDEP 2015), 38 of the WWTFs reuse at least part of their wastewater. **Table D-2** presents the 2014 wastewater and water reuse information for the WWTFs shown in **Figure D-4**. In the past, the WWTFs tended to be smaller, providing reclaimed water to a single local development or golf course. Today, many of the smaller facilities have been incorporated into larger, expanded utilities that serve larger areas. In the long term, continued expansion of water reuse is expected, primarily due treatment facility improvements as well as increased storage and supplementation.

Although the regionwide capacity of the WWTFs in the LWC Planning Area totals 158.92 mgd, only an annual average of 76.76 mgd of wastewater were treated in 2014. Excess treatment capacity is needed to ensure a margin of safety in meeting daily peak flows. Regionally, 76.77 mgd (including supplemental water) was reused in 2014. More than 90 percent of that water was used for public access irrigation, which includes irrigation of golf courses, parks, schools, and residences. The remaining amount was used for groundwater recharge, agriculture, wetlands, and cooling water. Treated effluent not reused was disposed of through deep well injection (8.54 mgd) or surface discharge (11.86 mgd).

By 2040, wastewater utilities project flows to increase by 84 percent over the 2014 flows in the LWC Planning Area. Similarly, utilities estimate water reuse will increase 120 percent, to 163 mgd, by 2040. The increase in projected water reuse may be attributed to greater use of supplemental sources of water and the addition of large-capacity users.

Because supplemental reuse sources, such as groundwater or surface water, are used in some cases, reuse flow may exceed processed wastewater flow at the WWTF. If so, the reuse percentage would exceed 100 percent. In these cases, the reuse percentage is reported herein as 100 percent to avoid confusion. This is consistent with how the reuse percentage is reported in the FDEP's annual reuse inventory.

Data in **Table D-3**, in the *Wastewater and Water Reuse Data* section, summarize the past, present, and future wastewater and reuse flows for the facilities profiled in this appendix. **Table D-4** shows the flows for the different reuse types for each of the profiled facilities. **Table D-5** presents flows for the various disposal options.



1	Ave Maria Utility	11	Clewiston	20	Forest Utilities	29	Lee County - Gateway
2	Collier County - North & South	12	LaBelle WWTF	21	Fort Myers - Central	30	Lee County - Pine Island
3	Everglades City	13	Port LaBelle WWTP	22	Fort Myers - South	31	Lee County - San Carlos
4	FGUA - Golden Gate	14	Bonita Springs - East & West	23	Fountain Lakes	32	Lee County - Three Oaks
5	Immokalee	15	Cape Coral - Everest & Southwest	24	Gasparilla Island	33	FGUA - Lehigh Acres
6	Marco Island	16	Citrus Park - North	25	Hunter's Ridge	34	FGUA - Del Prado (North Fort Myers)
7	Marco Shores	17	Cross Creek	26	FGUA - Lake Fairways	35	Sanibel - Donax
8	Naples	18	Eagle Ridge	27	Lee County - Fiesta Village	36	FGUA - South Seas Plantation
9	Port of the Islands - South	19	Fiddlesticks Country Club	28	Lee County - Fort Myers Beach	37	Charlotte Correctional Institution
10	Glades County Correctional	Note: #2, #14, and #15 each include 2 facilities.					

Figure D-4. Wastewater treatment facilities with treatment capacity of at least 0.1 mgd in the LWC Planning Area.

Table D-2. Capacity and flows (in mgd) as well as reuse percentages of existing wastewater treatment facilities (2014) in the LWC Planning Area with capacities of 0.1 mgd or greater.

Entity/Facility	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse Percentage
Charlotte County				
Charlotte Correctional Institution	0.25	0.19	0.19	100.0%
Charlotte County Subtotal (1 Facility)	**0.25**	**0.19**	**0.19**	**100.0%**
Collier County				
Ave Maria	0.90	0.19	1.00	100.0%
Collier County – North	24.10	8.97	14.87	91.8%
Collier County – South	16.00	7.22		
Everglades City	0.20	0.26	0.26	100.0%
FGUA – Golden Gate	1.50	1.08	0.00	0.0%
Immokalee	2.50	1.56	0.53	34.0%
Marco Island	4.92	2.01	1.77	88.1%
Marco Shores	0.30	0.10	0.10	100.0%
Naples, City of	10.00	5.23	4.66	89.1%
Port of the Islands – South	0.20	0.06	0.23	100.0%
Collier County Subtotal (10 Facilities)	**60.62**	**26.68**	**23.42**	**87.8%**
Glades County				
Glades County Correctional	0.24	0.17	0.17	100.0%
Glades County Subtotal (1 Facility)	**0.24**	**0.17**	**0.17**	**100.0%**
Hendry County				
Clewiston	1.50	1.36	1.36	100.0%
LaBelle, City of	0.75	0.43	0.43	100.0%
Port LaBelle	0.50	0.23	0.23	100.0%
Hendry County Subtotal (3 Facilities)	**2.75**	**2.02**	**2.02**	**100.0%**
Lee County				
Bonita Springs – East	4.00	3.02	5.89	100.0%
Bonita Springs – West	7.00	1.23		
Cape Coral – Everest	13.40	6.75	27.13	100.0%
Cape Coral – Southwest	15.00	5.69		
Citrus Park – North	0.20	0.08	0.08	100.0%
Cross Creek	0.25	0.18	0.18	100.0%
Eagle Ridge	0.32	0.21	0.21	100.0%
FGUA – Del Prado (North Fort Myers)	4.25	2.63	1.14	43.7%
FGUA – Lake Fairways	0.30	0.13	0.07	53.8%
FGUA – Lehigh Acres	3.00	2.02	1.35	66.8%
FGUA – South Seas Plantation	0.26	0.15	0.15	100.0%
Fiddlesticks Country Club	0.15	0.07	0.07	100.0%
Forest Utilities	0.80	0.23	0.23	100.0%
Fort Myers – Central	11.00	5.33	3.00	56.3%
Fort Myers – South	12.00	8.23	0.00	0.0%
Fountain Lakes	0.19	0.11	0.11	100.0%
Gasparilla Island	0.71	0.37	0.34	91.9%

Table D-2. (Continued).

Entity/Facility	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse Percentage
Hunter's Ridge	0.20	0.04	0.34	100.0%
Lee County – Fiesta Village	5.00	2.52	1.21	48.0%
Lee County – Fort Myers Beach	6.00	3.34	3.37	100.0%
Lee County – Gateway	3.00	1.11	2.39	100.0%
Lee County – Pine Island	0.25	0.12	0.06	50.0%
Lee County – San Carlos	0.30	0.13	0.13	100.0%
Lee County – Three Oaks	6.00	2.75	2.30	83.6%
Sanibel, City of – Donax	2.38	1.26	1.22	96.8%
Lee County Subtotal (25 Facilities)	**95.96**	**47.70**	**50.97**	**100.0%**
LWC Planning Area Total (40 Facilities)	**158.92**	**76.76**	**76.77**	**100.0%**

FDEP = Florida Department of Environmental Protection; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; mgd = million gallons per day; WWTF = wastewater treatment facility.

Profiles of Water Reuse Facilities

The following sections provide profiles for the larger WWTFs within the LWC Planning Area. The facilities profiled are as follows:

Collier County

- Ave Maria
- Collier County
- Golden Gate
- Immokalee
- Marco Island
- Naples

Hendry County

- Clewiston
- LaBelle

Lee County

- Bonita Springs
- Cape Coral
- Fort Myers
- Lee County
- Lehigh Acres
- North Fort Myers
- Sanibel

The profiles are organized by county then by utility. Each profile contains the following information:

- **Treatment/Flows** – This section presents the FDEP-rated capacity and average daily flows of wastewater and reclaimed water. Current capacity and flow information was gathered from the *2014 Reuse Inventory* (FDEP 2015).
- **Reuse/Disposal** – This section presents information about the types and flows of water reuse and disposal. A list of primary end users, if available, is included.
- **Proposed/Future** – This section provides a summary of any proposed/future plans for the utility, which may include increased capacities, flows, or reclaimed water customers. Each of the profiled utilities were requested to provide 2040 projections; however, in some cases, the utility was only able to project out to 2030 or 2034.

Collier County Wastewater Treatment Facilities

Ave Maria Wastewater Treatment Facility

Treatment/Flows

The Ave Maria WWTF has an FDEP-rated capacity of 0.90 mgd. On average, the facility processed 0.19 mgd of wastewater in 2014.

Reuse/Disposal

Reclaimed water is pumped from the WWTF to three water storage ponds, which serve as the source of irrigation water for the Town of Ave Maria and Ave Maria University. In 2014, Ave Maria distributed an average of 0.38 mgd of irrigation water for parks and schools and 0.62 mgd for 228 residences. The 0.19 mgd of reclaimed water produced in 2014 was supplemented with 0.81 mgd of groundwater for the irrigation water supply.

Primary End Users

- Ave Maria North Park
- Ave Maria South Park
- Ave Maria Aquatic Facility
- Ave Maria Lake Park
- Ave Maria University
- Rhodora J. Donahue of Ave Maria

Proposed/Future

Wastewater flow to the Ave Maria WWTF is projected to increase to 2.63 mgd by 2040. Expansion of the facility's capacity is planned in several phases. All of the reclaimed water from the facility is intended to be used for irrigation in the future, as it was in 2014. The utility plans to add reclaimed water storage ponds within Ave Maria, and a wetlands storage system for seasonal water storage.

Collier County – North County Water Reclamation Facility

Treatment/Flows

North County Water Reclamation Facility (WRF) has a rated capacity of 24.10 mgd. It is one of two water reclamation facilities owned and operated by the Collier County Water-Sewer District. The 2014 average wastewater flow treated by the WRF was 8.97 mgd. The North and South systems are hydraulically connected, but the capacity of the connection is limited. Capital projects that will significantly increase the conveyance capacity of the interconnection are under way. These projects will enable the county to direct flow between service areas to take advantage of the combined treatment capacity of the North and South County WRFs. The current combined capacity of both WRFs is 40.10 mgd.

Reuse/Disposal

In the *2014 Reuse Inventory* (FDEP 2015), water reuse and disposal was reported as a combination of the North and South County WRFs. The 2014 combined annual average reuse flow was 14.87 mgd, including supplemental flow. On average, groundwater provided 1.05 mgd of supplemental flow to the reuse system. The supplementation primarily occurs during the low-flow/high-irrigation demand months of March through May. Treated effluent at the North County WRF is reused primarily at golf courses, parks, and residences. The WRF provides reclaimed water to 7 golf courses, 3 parks, 1 school, and more than 2,200 residences.

The average flow of reclaimed water for the combined North and South County WRF system was 7.82 mgd for residences, 6.20 mgd for golf courses, and 0.86 mgd for public access lands such as parks and medians. The remaining 2.37 mgd of treated wastewater flow was disposed of through deep well injection.

Major End Users

- Collier County Vineyards Park
- Collier County Veterans Park
- Collier County North County Regional Park
- Collier County Department of Transportation
- Vineyards Elementary School
- Autumn Woods Community Association
- Audubon Country Club
- Beachwalk
- Colliers Reserve Country Club
- Imperial Golf Club
- La Playa Golf Club
- Vineyards Golf Club and Residences
- The Club at Pelican Bay (Golf Course)
- Pelican Bay
- Pelican Marsh
- Tarpon Cove
- Charleston Square
- Bermuda Greens
- Calusa Bay

Proposed/Future

Wastewater flow to the North County WRF is expected to increase to approximately 15.60 mgd in 2034. Due to the expected increasing demand for reclaimed water, reuse flows at the North County WRF are projected to increase to 13.60 mgd by 2034. Deep well injection disposal is expected to continue during the wet months when treated effluent exceeds the demand for reclaimed water; however, the volumes are expected to decrease as several aquifer storage and recovery (ASR) wells are brought on line.

Collier County – South County Water Reclamation Facility

Treatment/Flows

South County WRF has a rated capacity of 16.00 mgd. It is one of two water reclamation facilities owned and operated by the Collier County Water-Sewer District. The 2014 average wastewater flow treated by the WRF was 7.22 mgd. The North and South systems are hydraulically connected, but the capacity of the connection is limited. Capital projects that will significantly increase the conveyance capacity of the interconnection are under way. Once completed, the County will be able to direct flow between service areas to take advantage of the combined treatment capacity of the South and North County WRFs. The current combined capacity of both WRFs is 40.10 mgd.

Reuse/Disposal

In the *2014 Reuse Inventory* (FDEP 2015), water reuse and disposal was reported as a combination of the South and North County WRFs. The 2014 combined annual average reuse flow was 14.87 mgd, including supplemental flow. On average, groundwater provided 1.05 mgd of supplemental flow to the reuse system. The supplementation primarily occurs during the low-flow/high-irrigation demand months of March through May. Treated effluent at the South County WRF is reused primarily at golf courses, parks, and residences. The WRF provides reclaimed water to 13 golf courses, 2 parks, 1 school, more than 1,500 residences, and 1 created wetland. Reclaimed water also provides cooling for the chillers at the Government Center campus.

The average flow of reclaimed water for the combined South and North County WRF system was 7.82 mgd for residences, 6.20 mgd for golf courses, and 0.86 mgd for public access lands such as parks and medians. The remaining 2.37 mgd of treated wastewater flow was disposed of through deep well injection.

Primary End Users

- Collier County Facilities Management
- Foxfire Golf and Country Club (27 holes)
- Lely Resort Golf and Country Club (54 holes)
- Lely Community Development District
- Windstar Golf Club
- Lely Community Development District
- Hibiscus Golf Club
- Riviera Golf Course
- Countryside Golf and Country Club
- Glades Golf & Country Club (36 holes)
- Lakewood Golf Club
- Lakewood Community Services Association
- Royal Palm Golf Club

Proposed/Future

Wastewater flow to the South County WRF is expected to increase to approximately 12.70 mgd in 2034. Due to the expected increasing demand for reclaimed water, reuse flows at the South County WRF are projected to increase to 9.70 mgd by 2034. Deep well injection disposal is expected to continue during the wet months when treated effluent exceeds the demand for reuse water; however, the volumes are expected to decrease as several ASR wells are brought on line.

Florida Governmental Utility Authority – Golden Gate Wastewater Treatment Facility

Treatment/Flows

Operated by the Florida Governmental Utility Authority (FGUA), the FDEP-permitted capacity of the Golden Gate WWTF was 1.50 mgd in 2014. The average wastewater flow in 2014 was 1.08 mgd.

Reuse/Disposal

Historically, reclaimed water was processed through the facility's on-site 7-acre, 4-pond rapid infiltration basins; however, as reported in the *2014 Reuse Inventory* (FDEP 2015), all 1.08 mgd of treated effluent was disposed of through deep well injection.

Proposed/Future

The capacity may be expanded to 2.00 mgd by 2030. The FGUA is evaluating adding customers to the water reuse system, which would require additional upgrades to the WWTF. The only large potential user of reclaimed water in the service area is the Golden Gate Country Club. The FGUA has installed a 12-inch diameter pipeline to Golden Gate Country Club in anticipation of providing reclaimed water in the future. Residential use of reclaimed water is not deemed practical within the service area.

Immokalee Wastewater Treatment Facility

Treatment/Flows

The Immokalee WWTF has an FDEP-rated capacity of 2.50 mgd. In 2014, the average wastewater flow treated by the facility was 1.56 mgd.

Reuse/Disposal

Water reuse is achieved through irrigation of agricultural crops. In 2014, the average water reuse was 0.53 mgd, and 1.03 mgd of the remaining effluent was disposed of through deep well injection.

Proposed/Future

The Immokalee Water and Sewer District proposes improvements to its WWTF to provide public access irrigation. The Immokalee Water and Sewer District has been contacting nearby agricultural users about providing reclaimed water to replace dependence on existing irrigation wells. Future expansion is expected to add advanced wastewater treatment of 1.50 mgd. The total planned wastewater treatment capacity for the facility is 5.50 mgd by 2040. The 2040 treated wastewater flow is estimated to be 3.36 mgd, with 2.36 mgd of reuse. The remaining 1.00 mgd of treated wastewater would be disposed of through deep well injection.

Marco Island – Marco Island Wastewater Treatment Facility

Treatment/Flows

The FDEP-rated capacity of the Marco Island WWTF is 4.92 mgd. The 2014 average wastewater flow treated was 2.01 mgd. The amount of water reclaimed averaged 1.77 mgd.

Reuse/Disposal

Based on 2014 data, reclaimed water was used for irrigation of three golf courses, three parks, and two schools. The golf courses received an average of 0.50 mgd of reclaimed water. Parks, schools, businesses, hotels, and condominiums received an average of 1.27 mgd. The remaining 0.24 mgd of treated wastewater was disposed of through deep well injection.

Primary End Users

- Marco Island Golf Course
- Marco Shores Golf Course
- Hideaway Beach Golf Course
- Jane Hitler Park
- Veterans Park
- Tommie Barfield Elementary School
- Marco Island Charter Middle School

Proposed/Future

Wastewater flow to the Marco Island WWTF is expected to increase to 2.70 mgd by 2040. The treatment capacity of the facility is expected to remain at 4.92 mgd. Projected 2040 reuse flows are 2.20 mgd. Water reuse for public access areas such as golf courses, parks, and schools is expected to continue; however, no reuse water supply is planned for residential irrigation. Deep well injection of an estimated 0.50 mgd of treated wastewater is planned through 2040.

Marco Island – Marco Shores Wastewater Treatment Facility

Treatment/Flows

The FDEP-rated capacity of the Marco Shores WWTF is 0.30 mgd. The 2014 average wastewater flow treated by the facility was 0.10 mgd, and the water reclaimed averaged 0.10 mgd.

Reuse/Disposal

Based on 2014 data, all 0.10 mgd of wastewater were reused through a rapid infiltration basin.

Proposed/Future

The City is designing a new pump station and force main that would eliminate the need for this WWTF. Future wastewater flows would be sent to the Marco Island WWTF for treatment and disposal. Design of the pump station and force main is expected to be finished in August 2017 with construction beginning in the last quarter of 2017. Decommissioning of the Marco Shores WWTF is expected in late 2018 or early 2019.

Naples Wastewater Treatment Facility

Treatment/Flows

The Naples WWTF has an FDEP-rated capacity of 10.0 mgd. The 2014 average wastewater flow treated by the facility was 5.23 mgd. The average of water reused was 4.66 mgd.

Reuse/Disposal

The Naples WWTF used reclaimed water to irrigate 10 golf courses, 8 parks, 3 schools, and various other public access areas, including residential users. The city supplements its reclaimed water supply by capturing excess surface water from the Golden Gate Canal and storing it in ASR wells for later use. The city also has an approved surface water discharge to the Gordon River.

Primary End Users

- Moorings Country Club
- Royal Poinciana
- Country Club of Naples
- Hole-In-The-Wall Golf Club
- Quail Run Country Club
- High Point Country Club
- Naples Beach Club
- Bear's Paw Condo
- Wilderness Country Club
- Grey Oaks (The Estuary)
- Moorings Park
- 1,200+ residential and commercial connections
- City roadway medians and right-of ways

Proposed/Future

Wastewater flows to the Naples WWTF are expected to increase to 8.31 mgd by 2040. The permitted capacity of the facility is 10.00 mgd. Projected average reuse flows are 12.30 mgd.

Expansion of the reclaimed water irrigation system is ongoing within city limits. The City of Naples is increasing the reuse capacity by constructing, permitting, and operating three on-site ASR wells, with a fourth ASR well planned. The City is permitted to receive up to 10.00 mgd of surface water from the Golden Gate Canal to provide supplemental water to the reclaimed water distribution system.

Hendry County Wastewater Treatment Facilities

Clewiston Wastewater Treatment Facility

Treatment/Flows

The Clewiston WWTF has an FDEP-rated capacity of 1.50 mgd. The facility processed an average of 1.36 mgd of wastewater in 2014.

Reuse/Disposal

Water reuse is performed using land application at a 193-acre sprayfield. The sprayfield has under-drains that lead to a perimeter ditch. All 1.36 mgd of average wastewater flow was reused in 2014.

Proposed/Future

Wastewater flows to the facility and the resulting reclaimed water flows to the sprayfield are expected to increase to 1.60 mgd by 2040. The planned capacity for the facility is 2.25 mgd; however, formal plans for expansion were not prepared at the time this plan update was developed.

LaBelle Wastewater Treatment Facility

Treatment/Flows

The City of LaBelle WWTF has an FDEP-rated capacity of 0.75 mgd. The facility processed 0.43 mgd of average wastewater flow in 2014.

Reuse/Disposal

The distribution system for the WWTF's reclaimed water includes a 99-acre absorption field with an FDEP-rated total capacity of 0.75 mgd (average flow). All 0.43 mgd of reclaimed water were reused at the absorption field.

Proposed/Future

The City of LaBelle projects its wastewater flow will remain relatively stable out to 2040, possibly increasing approximately 1 percent per year. The WWTF's treatment capacity is planned to expand, if necessary, to meet potential needs. The City anticipates that reclaimed water will be provided for public access irrigation within the city and the west Hendry County area. Any plans to include public access irrigation likely will focus on new development in the area.

Lee County Wastewater Treatment Facilities

Bonita Springs – East Water Reclamation Facility

Treatment/Flows

The Bonita Springs East WRF has an FDEP-rated capacity of 4.00 mgd. Wastewater flows to the facility averaged 3.02 mgd in 2014.

Reuse/Disposal

Water reuse, reported as a combined flow from the East and West facilities and supplemental water, was 5.89 mgd in 2014. The remaining treated wastewater flow of 0.05 mgd was disposed of through deep well injection. Reclaimed water from both facilities is distributed by the bulk utility, Resource Conservation Systems, and supplemented with groundwater and stormwater for irrigation of 5 golf courses, 4 parks, and more than 6,600 residences.

Primary End Users

- Bonita Bay
- The Brooks
- Highland Woods (irrigation water supplemented with groundwater)
- Cedar Creek

Proposed/Future

Wastewater flows at the Bonita Springs East and West WRFs are projected to increase to an average 6.93 mgd by 2030, and an expansion at the East WRF is anticipated to meet the future flows. Water reuse flows for the entire service area, including supplemental flows by Resource Conservation Systems, are projected to reach 12.47 mgd by 2030.

Bonita Springs – West Water Reclamation Facility

Treatment/Flows

The Bonita Springs West WRF has an FDEP-rated capacity of 7.00 mgd. Wastewater flows to the facility averaged 1.23 mgd in 2014.

Reuse/Disposal

Water reuse, reported as a combined flow from the East and West WRFs and supplemental water, was 5.89 mgd in 2014. The remaining treated wastewater flow of 0.05 mgd was disposed of through deep well injection. Reclaimed water from both WRFs is distributed by the bulk utility, Resource Conservation Systems, and supplemented with groundwater and stormwater for irrigation of 5 golf courses, 4 parks, and more than 6,600 residences.

Primary End Users

- Bonita Bay
- The Brooks
- Highland Woods (irrigation water supplemented with groundwater)
- Cedar Creek

Proposed/Future

Wastewater flows at the Bonita Springs East and West WRFs are projected to increase to an average 6.93 mgd by 2030, and an expansion at the East WRF is anticipated to meet the future flows. Water reuse flows for the entire service area, including supplemental flows by Resource Conservation Systems, are projected to reach 12.47 mgd by 2030.

Cape Coral – Everest Water Reclamation Facility

Treatment/Flows

The Everest WRF is part of the Water Independence for Cape Coral utility. The Everest WRF has an FDEP-rated capacity of 13.40 mgd. In 2014, the WRF treated an average of 6.75 mgd of wastewater for reuse.

Reuse/Disposal

In 2014, a total average of 27.13 mgd was reused by the Water Independence for Cape Coral utility through the Everest and Southwest WRFs. This total includes 14.69 mgd of supplemental surface water that was combined with treated wastewater for irrigation water supply. On average, 0.04 mgd of treated effluent were disposed of through deep well injection.

The city's reclaimed water primarily is used for residential irrigation and irrigation of public areas such as parks, schools, and medians. Based on 2014 data, the system provided 21.63 mgd of irrigation for more than 44,000 residences, and 5.50 mgd of reclaimed water for 25 parks, 11 schools, and other public areas. A small amount (0.04 mgd) of treated effluent was discharged through deep well injection in 2014.

Proposed/Future

The capacity at the Everest WRF (13.40 mgd) is anticipated to meet the wastewater treatment needs of the service area, but additional water will be needed to meet future irrigation demands. ASR, increased canal storage, and importing reclaimed water from other utilities are options to increase supply, while irrigation metering and water conservation measures are options for future demand management. The total citywide wastewater flow is estimated to be 23.00 mgd by 2040. The citywide irrigation demand by 2040 is estimated to be 56.00 mgd, with 33.00 mgd coming from supplemental sources.

Cape Coral – Southwest Water Reclamation Facility

Treatment/Flows

The Southwest WRF is part of the Water Independence for Cape Coral utility. As reported in the *2014 Reuse Inventory* (FDEP 2015), the Southwest WRF had an FDEP-rated capacity of 15.00 mgd. In 2014, the WRF treated an average of 5.69 mgd of wastewater.

Reuse/Disposal

In 2014, a total average of 27.13 mgd of water was reused by the Water Independence for Cape Coral utility through the Everest and Southwest WRFs. This total includes 14.69 mgd of supplemental surface water that was combined with treated wastewater for irrigation water supply. On average, 0.04 mgd of treated effluent were disposed of through deep well injection.

The city's reclaimed water primarily is used for residential irrigation and irrigation of public areas such as parks, schools, and medians. Based on 2014 data, the system provided 21.63 mgd of irrigation for more than 44,000 residences, and 5.50 mgd of reclaimed water for 25 parks, 11 schools, and other public areas. A small amount (0.04 mgd) of treated effluent was discharged through deep well injection in 2014.

Proposed/Future

The 15.0 mgd treatment capacity at the Southwest WRF should meet wastewater treatment demands, but additional water will be necessary to meet future irrigation demands. ASR, increased canal storage, and importing reclaimed water from other utilities are options to increase supply, while irrigation metering, and water conservation measures are options for future demand management. The total citywide wastewater flow is estimated to be 23.00 mgd by 2040. The citywide irrigation demand by 2040 is estimated to be 56.00 mgd, with 33.00 mgd coming from supplemental sources.

Cape Coral – North Cape Water Reclamation Facility (Proposed)

Proposed/Future

The proposed North Cape WRF would serve the northern part of the City of Cape Coral's service area. The proposed initial reclaimed water capacity for the North Cape WRF is 5.00 mgd, with phased expansions to 8.00 mgd by 2030, and 20 mgd by 2050. This facility would be integrated into the Water Independence for Cape Coral program, with reclaimed water reused for irrigation within the city.

Florida Governmental Utility Authority – Lehigh Acres Wastewater Treatment Facility

Treatment/Disposal

Operated by the FGUA, the Lehigh Acres WWTF has an FDEP-rated capacity of 3.00 mgd, with a design capacity of 3.50 mgd. The WWTF is limited by its disposal capacity. In 2014, the facility's average wastewater flow was 2.02 mgd.

Reuse/Disposal

All of the reclaimed water in 2014 (1.35 mgd) was used for golf course irrigation and groundwater recharge via rapid infiltration basins. Most of the reclaimed water (0.79 mgd) was used for irrigating the Lehigh Resort, Mirror Lakes, and Majestic golf courses. The remaining reclaimed water (0.56 mgd) was sent to rapid infiltration basins. Disposal of the remaining treated effluent (0.67 mgd) was through deep well injection.

Proposed/Future

Wastewater flows to the WWTF are expected to increase to 2.31 mgd by 2030. Treatment capacities are planned to increase to 5.00, 6.00, and ultimately 8.00 mgd as sufficient growth occurs within the service area. The 5.00-mgd capacity will be needed by 2030. FGUA plans to extend reclaimed water lines to Copperhead and Westminster golf courses; construction is anticipated by 2020.

Florida Governmental Utility Authority – Del Prado Wastewater Treatment Facility

Treatment/Flows

The FGUA – Del Prado WWTF (formerly referred to as North Fort Myers) has an FDEP-rated capacity of 4.25 mgd. The facility processed an average of 2.63 mgd of wastewater in 2014.

Reuse/Disposal

Water reused in 2014 averaged 1.14 mgd, and 1.34 mgd were disposed of through deep well injection. Reclaimed water from the Del Prado WWTF is used for irrigation of golf courses and residences. In 2014, irrigation of 6 golf courses averaged 0.88 mgd, and residential irrigation (500 residences) averaged 0.26 mgd. The 1.34 mgd of wastewater not reused was disposed of through deep well injection.

Primary End Users

- Magnolia Landing
- Herons Glenn Recreational District
- Del Tura Country Club
- Sable Springs Golf & Racquet Club
- Estates of Entrada
- Riverbend Golf Course
- Six Lakes Country Club

Proposed/Future

The FGUA expects wastewater flow to the Del Prado WWTF will increase to 7.00 mgd by 2030. The planned capacity of the facility is 7.50 mgd. FGUA recently contracted with the City of Cape Coral to supply reclaimed water to the city's irrigation system. The reclaimed water will be pumped through a pipeline interconnect to the Cape Coral irrigation system. This interconnect will allow FGUA to reduce discharges to their existing deep injection well.

Fort Myers – Central Wastewater Treatment Facility

Treatment/Flows

The Fort Myers – Central WWTF has an FDEP-rated capacity of 11.00 mgd. In 2014, the average treated wastewater flow was 5.33 mgd.

Reuse/Disposal

In 2014, a total of 3.00 mgd of reclaimed water was reused. Most of the reclaimed water (1.62 mgd) was used for irrigation of three golf courses. Other uses included irrigation at two parks (0.13 mgd), use at the WWTF (0.27 mgd), use for industrial purposes such as the Lee County Resource Recovery Facility cooling towers (0.94 mgd), and other miscellaneous uses (0.04 mgd). Effluent management for this WWTF includes surface water discharge to the Caloosahatchee River Estuary. In 2014, an average of 2.32 mgd of treated effluent was discharged to the river.

Primary End Users

- Heritage Palms Country Club
- Eastwood Golf Course
- Red Sox Minor League Park
- Buckingham Park
- Valley Crest Landscaping
- Calvary Gardens Cemetery
- City Nursery
- Housing Authority of Fort Myers
- Medians on MLK Blvd.
- Fort Myers Water Treatment Plant
- Eastwood Golf Course
- Colonial Country Club
- Clemente Park
- City Fire Department
- Lee County BOCC
- City Parks Department
- Various city facilities and public areas

Proposed/Future

Wastewater flows to the facility are expected to increase to 9.00 mgd by 2040. According to the City's plans, reclaimed water treatment capacity at the Central WWTF will be expanded to the full plant capacity (11.00 mgd).

Fort Myers – East Water Reclamation Facility (Future)

The City of Fort Myers plans to add the East WRF to its existing reuse distribution system by 2024. The WRF is expected to be dedicated 100 percent to water reuse, serving the eastern portion of the city. The planned capacity of the WRF is 8.00 mgd, with flows anticipated to exceed 7.00 mgd. The primary use of the facility's reclaimed water would be public access irrigation.

Fort Myers – South Wastewater Treatment Facility

Treatment/Flows

In 2014, the Fort Myers – South WWTF had an FDEP-rated capacity of 12.00 mgd and treated an average of 8.23 mgd of wastewater.

Reuse/Disposal

The South WWTF did not provide reclaimed water in 2014; all 8.23 mgd of treated wastewater was discharged to the Caloosahatchee River Estuary.

Proposed/Future

In the future, the City of Fort Myers plans to upgrade the South WWTF and construct an injection well to dispose of treated wastewater flows. Future interconnection with the City of Cape Coral's Everest WRF is possible, but a proposed project was not prepared at the time this plan update was developed. Wastewater flows to the South WWTF are expected to increase to 12.00 mgd by 2040, with reuse of 9.90 mgd.

Lee County – Fiesta Village Wastewater Treatment Facility

Treatment/Flows

The Lee County – Fiesta Village WWTF has an FDEP-rated capacity of 5.00 mgd. In 2014, an average flow of 2.52 mgd was treated at the facility. The Fiesta Village system is interconnected with the Lee County – Fort Myers Beach system.

Reuse/Disposal

A total of 1.21 mgd of reclaimed water was used in 2014, primarily for irrigation of 4 golf courses, 2 parks, 1 school, and 75 residences. Reclaimed water use was 0.80 mgd for golf course irrigation, 0.33 mgd for residential irrigation, and 0.08 mgd for parks and the school. The remaining 1.31 mgd of treated wastewater was discharged to the Caloosahatchee River Estuary.

Primary End Users

- Crown Colony
- Cypress Lake Country Club
- Laguna Lakes Community
- Landings Yacht and Golf Club
- Myerlee Country Club
- Parker Lakes Development

Proposed/Future

Wastewater flow to the Fiesta Village WWTF is expected to increase to 4.54 mgd by 2040, with 4.10 mgd of reuse. The planned capacity of the WWTF is projected to increase to 5.10 mgd. Lee County Utilities' goal is to achieve close to 100 percent water reuse at the Fiesta Village WWTF, and the utility is exploring the feasibility of ASR to provide seasonal storage of reclaimed water. Additional storage and the existing interconnect with the Fort Myers Beach system will allow the Fiesta Village WWTF to expand water reuse and minimize discharge to the Caloosahatchee River Estuary. Excess reclaimed water from the Fiesta Village WWTF may be used to supplement reclaimed water flows in the Fort Myers Beach service area. Any excess flows could be disposed of in the Fort Myers Beach injection well instead of being discharged to the Caloosahatchee River Estuary.

Future Major Users

- Edison Community College
- Village of Seven Lakes
- Principa
- Golfview Country Club
- Cypress Cove

Lee County – Fort Myers Beach Wastewater Treatment Facility

Treatment/Flows

The Lee County – Fort Myers Beach WWTF has an FDEP-rated capacity of 6.00 mgd. In 2014, an average flow of 3.34 mgd was treated at the facility. The Fort Myers Beach system is interconnected with the Lee County – Fiesta Village system.

Reuse/Disposal

Total average reuse flows were 3.37 mgd during 2014. Of the 3.37 mgd of total reuse, 1.72 mgd were used for golf course irrigation, 0.48 mgd for residences, and 0.69 mgd for parks and schools. An additional 0.48 mgd were reused for groundwater recharge via percolation ponds. A total of 0.94 mgd of treated wastewater flow was disposed of through deep well injection at the Fort Myers Beach location.

Primary End Users

- Bayside Estates
- Shellpoint Woodlands
- Shellpoint Village
- Summerlin Ridge
- Kelly Greens
- Lexington
- Shellpoint
- Health Park Hospital
- Gulf Harbor

Proposed/Future

Wastewater flows to the Fort Myers Beach WWTF are expected to increase to 4.15 mgd by 2040, with water reuse flows increasing to 3.74 mgd. The capacity of the WWTF is not expected to increase during that period. Lee County Utilities' goal is to achieve close to 100 percent water reuse at the Fort Myers Beach WWTF. The excess demand is expected to be met through additional storage (i.e., ASR) and an existing interconnect with the utility's Fiesta Village system. The additional storage and flexibility will allow the Fort Myers Beach WWTF to expand water reuse and minimize discharges using deep well injection.

Future Major Users

- Lucaya
- Cinnamon Cove
- Waterstone

Lee County – Gateway Wastewater Treatment Facility

Treatment/Flows

The Lee County – Gateway WWTF has an FDEP-rated capacity of 3.00 mgd. In 2014, an average flow of 1.11 mgd was treated at the facility.

Reuse/Disposal

The average flow of reclaimed water was 2.39 mgd, including 1.28 mgd of supplemental flow from groundwater. Most of the reclaimed water from the Gateway WWTF is used for irrigation. Irrigation of 3,200 residences accounted for 2.00 mgd of the reuse flow. The remaining flow (0.40 mgd) was for irrigation of three schools and three parks.

Proposed/Future

Wastewater flows to the Gateway WWTF are expected to increase to 3.47 mgd by 2040. The planned capacity of the WWTF is planned to be 4.00 mgd by that time. Irrigation demand within the service area is projected to exceed the amount of reclaimed/supplemental water that will be available in 2040.

Lee County – Pine Island Wastewater Treatment Facility

Treatment/Flows

The Lee County – Pine Island WWTF has an FDEP-rated capacity of 0.25 mgd. In 2014, an average flow of 0.12 mgd was treated.

Reuse/Disposal

Reclaimed water from the Pine Island WWTF is primarily used in sprayfields and a local tree farm (0.06 mgd) adjacent to an existing pipeline. The remaining flow (0.06 mgd) is disposed of through deep well injection.

Primary End Users

- Village Links Sprayfield
- Pine Island Tree Farm
- Island Acre Estates
- Pine Island Wastewater Treatment Facility Sprayfield

Proposed/Future

Wastewater flows to the Pine Island WWTF are expected to increase to 1.59 mgd by 2040, with reuse of 1.43 mgd. The planned facility capacity is expected to increase incrementally to 2.00 mgd. Although irrigation demand within the service area exceeds the amount of reclaimed water that will be available in 2040, no additional reclaimed water projects or additional supplemental water sources were planned at the time this plan update was developed.

Lee County – San Carlos Wastewater Treatment Facility

Treatment/Flows

The Lee County – San Carlos WWTF has an FDEP-rated capacity of 0.30 mgd. In 2014, the average wastewater flow to the facility was 0.13 mgd.

Reuse/Disposal

On average in 2014, 0.11 mgd of reclaimed water were reused for golf course irrigation at the San Carlos Country Club and 0.02 mgd were used at the WWTF. The remaining water demand for the golf course is met using traditional water sources.

Proposed/Future

Wastewater flow to the San Carlos WWTF recently was diverted to the Three Oaks WWTF. No additional wastewater reuse projects within the San Carlos service area were proposed at the time this plan update was developed.

Lee County – Three Oaks Wastewater Treatment Facility

Treatment/Flows

The Lee County – Three Oaks WWTF has an FDEP-rated capacity of 6.00 mgd. In 2014, an average flow of 2.75 mgd was treated at the facility.

Reuse/Disposal

A total of 2.30 mgd of water was reused in 2014. Most of the reclaimed water was used for irrigation of six golf courses (1.93 mgd), medians and a park (0.21 mgd), residences (0.10 mgd), and at the WWTF (0.06 mgd). Wastewater not reused (0.45 mgd) was disposed of through a deep injection well. In 2014, Lee County Utilities completed the Three Oaks Reuse Augmentation project that provided an additional annual average of 0.21 mgd of supply to the reclaimed water system.

Primary End Users

- Vines Country Club
- Pelican Sound
- West Bay Club
- Stoneybrook
- Grandezza (formerly known as Grand Oaks)
- Villages of Country Creek
- Preserves at Corkscrew
- Estero Community Park
- Meadows at Pelican Sound

Proposed/Future

Wastewater flow to the Three Oaks WWTF is expected to increase to 7.04 mgd by 2040, with reuse of 6.34 mgd. The planned capacity of the expanded facility is 8.00 mgd by 2040. The service area's existing and proposed demands for reclaimed water exceed the facility's current and planned future capacity. These demands are expected to reduce the deep well injection of effluent. Lee County Utilities is proposing to add the following users:

- Miromar Lakes
- Florida Gulf Coast University
- Resource Conservation Systems

Sanibel – Donax Water Reclamation Facility

Treatment/Flows

The Sanibel – Donax WRF has an FDEP-rated capacity of 2.38 mgd. In 2014, the facility treated an average of 1.26 mgd of wastewater.

Reuse/Disposal

The Donax WRF provides reclaimed water (1.22 mgd) for irrigation, primarily to 3 golf courses, 1 park, 1 school, and 14 residences. An average of 0.04 mgd of treated effluent was disposed of through deep well injection via a well shared with the Island Water Association (Sanibel's potable water provider).

Proposed/Future

Wastewater flows to the Donax WRF are expected to increase to 1.75 mgd by 2030. No expansion of capacity is currently planned.

WASTEWATER AND WATER REUSE DATA

Tables D-3 to **D-5** provide information about wastewater and water reuse in the LWC Planning Area. The primary source of baseline information for these tables is the FDEP *2014 Reuse Inventory* (FDEP 2015). **Tables D-3** to **D-5** also include information from the FDEP *2010 Reuse Inventory* (FDEP 2011) as historical reference. These annual inventories are compilations of wastewater and reuse information from around the state. The information is based on fiscal year data from annual reuse reports submitted to the FDEP by each wastewater utility or system. It should be noted that in the FDEP 2010 and 2014 Reuse Inventories, flows at the Collier County (North and South), Bonita Springs (East and West), and Cape Coral (Everest and Southwest) facilities were reported as a combined total for each utility.

Tables D-3 to **D-5** include projections, provided by the utilities, of future capacities and flows. In most cases, 2040 projection were available; however, in a few cases the utility was able to provide only 2030 (Bonita Springs, FGUA) or 2034 (Collier County) data.

Table D-3 compares historical, current, and projected data from the larger profiled utilities and their WWTFs in the LWC Planning Area. The table shows a flat trend in wastewater and water reuse flows in the region from 2010 to 2014. However, a significant increase is expected by 2040.

In **Tables D-2** and **D-3**, the reuse percentage frequently is used when describing reuse facilities and is intended to reflect the amount of water reused when compared with the amount of wastewater treated. In the annual FDEP reuse inventories, "flow ratio" is used and defined as "the total reuse flow divided by the total wastewater flow." The definition continues by clarifying "…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 be listed as 100 percent.

Table D-4 provides the types of water reuse practiced by the profiled facilities in Collier, Hendry, and Lee counties. These three counties represent all reuse in the LWC Planning Area. The table shows that public access irrigation (e.g., golf courses, parks, schools) has been, and will continue to be, the primary means of water reuse in the region. **Table D-5** lists the types of effluent disposal used by the profiled facilities in Collier, Hendry, and Lee counties. This is for reclaimed water/effluent that is not reused, and is used as a backup to reuse. As shown, the primary means of disposal has been surface water discharge. By 2040, it is expected that deep well injection will replace surface water discharge as the primary means of disposal.

Table D-3. Wastewater/reclaimed flows (in mgd) and reuse percentages for facilities with capacities of 0.1 mgd or greater in the LWC Planning Area.

Entity/Facility	2010					2014					2040				
	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Supp. Flow	Reuse (%)	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Supp. Flow	Reuse (%)	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Supp. Flow	Reuse (%)
Collier County															
Ave Maria	0.90	0.14	1.38	1.24	100%	0.90	0.19	1.00	0.81	100%	3.25	2.63	2.77	0.14	100%
Collier County – North County	24.10	7.26	7.07	0.59	97%	24.10	8.97	14.87	1.05	92%	24.10	15.60	13.60	0.80	87%
Collier County – South County	16.00	7.04	5.21	0.00	74%	16.00	7.22				16.00	12.70	9.70	0.60	76%
FGUA – Golden Gate	1.50	1.03	0.49	0.12	48%	1.50	1.08	0.00	0.00	0%	2.00	1.39	1.39	0.00	100%
Immokalee	2.50	1.50	0.54	0.00	29%	2.50	1.56	0.53	0.00	34%	5.50	3.36	2.36	0.00	70%
Marco Island – Marco Island	3.50	1.80	1.46	0.00	81%	4.92	2.01	1.77	0.00	88%	4.92	2.70	2.20	0.00	81%
Marco Island – Marco Shores	0.30	0.09	0.09	0.00	100%	0.30	0.10	0.10	0.10	100%	0.00	0.00	0.00	0.00	0%
Naples, City of	10.00	6.59	4.65	0.00	71%	10.00	5.23	4.66	1.79	89%	10.00	8.31	12.30	3.99	100%
Collier County Subtotal	**58.80**	**25.45**	**20.89**	**1.95**	**82%**	**60.22**	**26.36**	**22.93**	**3.75**	**87%**	**65.77**	**46.69**	**44.32**	**5.53**	**95%**
Hendry County															
Clewiston	1.50	1.18	1.18	0.00	100%	1.50	1.36	1.36	0.00	100%	2.25	1.60	1.60	0.00	100%
LaBelle, City of	0.75	0.33	0.33	0.00	100%	0.75	0.43	0.43	0.00	100%	0.75	0.38	0.38	0.00	100%
Hendry County Subtotal	**2.25**	**1.51**	**1.51**	**0.00**	**100%**	**2.25**	**1.79**	**1.79**	**0.00**	**100%**	**3.00**	**1.98**	**1.98**	**0.00**	**100%**
Lee County															
Bonita Springs – East	4.00	2.50	7.20	3.31	100%	4.00	3.02	5.89	1.70	100%	6.00	6.93	6.93	0.00	100%
Bonita Springs – West	7.00	1.38				7.00	1.23				7.00				
Cape Coral – Everest	13.40	6.51	23.39	10.12	100%	13.40	6.75	27.13	14.69	100%	13.40	23.00	56.00	33.00	100%
Cape Coral – Southwest	6.60	7.03				15.00	5.69				20.00				
Cape Coral – North Cape	--	--	--	--	--	--	--	--	--	--	10.00				
FGUA – Del Prado	3.50	1.87	1.39	0.00	74%	4.25	2.63	1.15	0.00	44%	7.50	7.00	5.25	0.00	75%
FGUA – Lehigh Acres	2.50	1.97	1.70	0.00	86%	3.00	2.02	1.35	0.00	67%	5.00	2.31	2.31	0.00	100%
Fort Myers, City of – Central	11.00	5.42	2.56	0.00	47%	11.00	5.33	3.00	0.00	56%	11.00	9.00	9.00	0.00	100%
Fort Myers, City of – South	12.00	9.44	0.00	0.00	0%	12.00	8.23	0.00	0.00	0%	12.00	9.90	9.90	0.00	100%
Fort Myers, City of – East	--	--	--	--	--	--	--	--	--	--	8.00	7.00	7.00	0.00	100%

Table D-3. (Continued).

Entity/Facility	2010					2014					2040				
	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Supp. Flow	Reuse (%)	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Supp. Flow	Reuse (%)	FDEP Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Supp. Flow	Reuse (%)
Lee County – Fiesta Village	5.00	2.88	1.02	0.00	35%	5.00	2.52	1.21	0.00	48%	5.00	4.54	4.10	0.00	90%
Lee County – Fort Myers Beach	6.00	4.00	3.04	0.00	76%	6.00	3.34	3.37	0.00	100%	6.00	4.15	3.74	0.00	90%
Lee County – Gateway	1.00	0.72	2.44	1.72	100%	3.00	1.11	2.39	1.28	100%	4.00	3.47	3.47	0.00	100%
Lee County – Pine Island	0.25	0.09	0.09	0.00	100%	0.25	0.12	0.06	0.00	50%	2.00	1.59	1.43	0.00	90%
Lee County – San Carlos[a]	0.30	0.14	0.14	0.00	100%	0.30	0.13	0.13	0.00	100%	--	--	--	--	--
Lee County – Three Oaks	6.00	2.41	1.62	0.00	67%	6.00	2.75	2.30	0.00	84%	8.00	7.04	6.34	0.00	90%
Lee County – Waterway Estates[b]	1.25	0.14	0.00	0.00	0%	--	--	--	--	--	--	--	--	--	--
Sanibel, City of – Donax	2.38	1.52	1.03	0.00	68%	2.38	1.26	1.22	0.00	97%	2.38	1.75	1.22	0.00	70%
Lee County Subtotal	**82.18**	**48.02**	**45.62**	**15.15**	**94%**	**92.58**	**46.13**	**49.20**	**17.67**	**100%**	**127.28**	**87.68**	**116.69**	**33.00**	**100%**
LWC Planning Area Total	**143.23**	**74.98**	**68.02**	**17.10**	**91%**	**155.05**	**74.28**	**73.92**	**21.42**	**100%**	**196.05**	**136.35**	**162.99**	**38.53**	**100%**

FDEP = Florida Department of Environmental Protection; FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; mgd = million gallons per day; WWTF = wastewater treatment facility.

[a] Lee County – San Carlos was decommissioned in 2015.

[b] Lee County – Waterway Estates was decommissioned in 2012.

Table D-4. Reuse types and volumes (in mgd) for facilities with capacities of 0.1 mgd or greater in the LWC Planning Area.

Entity/Facility	2010			2014			2040		
	Public Access Irrigation[a]	Groundwater Recharge[b]	Other[c]	Public Access Irrigation[a]	Groundwater Recharge[b]	Other[c]	Public Access Irrigation[a]	Groundwater Recharge[b]	Other[c]
Collier County									
Ave Maria	0.90	0.00	0.00	1.00	0.00	0.00	2.77	0.00	0.00
Collier County – North County[d]	7.07	0.00	0.00	14.87	0.00	0.00	13.60	0.00	0.00
Collier County – South County[d]	4.13	0.00	0.00				7.70	0.00	2.00
FGUA – Golden Gate[e]	0.00	0.49	0.00	0.00	0.00	0.00	0.25	1.14	0.00
Immokalee	0.00	0.00	0.54	0.00	0.00	0.53	1.85	0.51	0.00
Marco Island – Marco Island	1.46	0.00	0.00	1.77	0.00	0.00	0.00	0.00	0.00
Marco Island – Marco Shores	0.00	0.09	0.00	0.00	0.10	0.00	2.20	0.00	0.00
Naples, City of	4.65	0.00	0.00	4.66	0.00	0.00	12.30	0.00	0.00
Collier County Subtotal	**18.21**	**0.58**	**1.62**	**22.31**	**0.10**	**0.53**	**40.67**	**1.65**	**2.00**
Hendry County									
Clewiston	0.00	0.00	1.18	0.00	0.00	1.36	0.00	0.00	1.60
LaBelle, City of	0.00	0.33	0.00	0.00	0.43	0.00	0.00	0.38	0.00
Hendry County Subtotal	**0.00**	**0.33**	**1.18**	**0.00**	**0.43**	**1.36**	**0.00**	**0.38**	**1.60**
Lee County									
Bonita Springs – East[e]	7.20	0.00	0.00	5.90	0.00	0.00	7.55	0.00	0.00
Bonita Springs – West[e]									
Cape Coral (Everest/Southwest/North Cape)[f]	23.39	0.00	0.00	27.13	0.00	0.00	56.00	0.00	0.00
FGUA – Del Prado[e]	1.39	0.00	0.00	1.14	0.00	0.00	5.25	0.00	0.00
FGUA – Lehigh Acres[e]	0.67	1.03	0.00	0.79	0.56	0.00	1.38	0.83	0.10
Fort Myers, City of – Central	1.48	0.00	1.08	1.75	0.00	1.25	7.00	0.00	2.00
Fort Myers, City of – East	--	--	--	--	--	--	7.00	0.00	0.00
Fort Myers, City of – South	0.00	0.00	0.00	0.00	0.00	0.00	9.90	0.00	0.00
Lee County – Fiesta Village	0.99	0.00	0.04	1.21	0.00	0.00	4.10	0.00	0.00
Lee County – Fort Myers Beach	2.43	0.12	0.48	2.89	0.48	0.00	3.74	0.00	0.00
Lee County – Gateway	0.72	1.72	0.00	2.40	0.00	0.00	3.47	0.00	0.00
Lee County – Pine Island	0.00	0.00	0.08	0.00	0.00	0.05	1.43	0.00	0.00
Lee County – San Carlos[g]	0.14	0.00	0.00	0.11	0.00	0.02	--	--	--
Lee County – Three Oaks	1.37	0.00	0.25	2.24	0.00	0.06	6.34	0.00	0.00
Lee County – Waterway Estates[h]	0.00	0.00	0.00	--	--	--	--	--	--
Sanibel, City of – Donax	0.88	0.00	0.16	1.22	0.00	0.00	0.80	0.42	0.00
Lee County Subtotal	**40.66**	**2.87**	**2.09**	**46.78**	**1.04**	**1.38**	**113.96**	**1.25**	**2.10**
LWC Planning Area Total	**58.87**	**3.78**	**4.89**	**69.09**	**1.57**	**3.27**	**154.63**	**3.28**	**5.70**

FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; mgd = million gallons per day.

[a] Public access irrigation includes golf courses, residential, parks, common areas, and other public access areas.

[b] Groundwater recharge includes rapid infiltration basins, percolation ponds, and aquifer storage and recovery (ASR) wells.

[c] Other includes agriculture, wetlands, cooling water, treatment processes, toilet flushing.

[e] Projected flows are for 2034.

[f] Projected flows are for 2030.

[i] The North Cape Facility is proposed at this time.

[j] Lee County/San Carlos was decommissioned in 2015.

[k] Lee County/Waterway Estates was decommissioned in 2012.

Table D-5. Wastewater disposal types and volumes (in mgd) for facilities with capacities of 0.1 mgd or greater in the LWC Planning Area.

Entity/Facility	2010		2014		2040	
	Deep Injection Well	Surface Water Discharge	Deep Injection Well	Surface Water Discharge	Deep Injection Well	Surface Water Discharge
Collier County						
Ave Maria	0.00	0.00	0.00	0.00	0.00	0.00
Collier County – North County[a]	1.60	0.00	2.37	0.00	1.20	0.00
Collier County – South County[a]	1.93	0.00			2.40	0.00
FGUA – Golden Gate[b]	0.65	0.00	1.08	0.00	0.20	0.00
Immokalee	0.96	0.00	1.03	0.00	1.00	0.00
Marco Island – Marco Island	0.34	0.00	0.35	0.00	0.50	0.00
Marco Island- Marco Shores	0.00	0.00			0.00	0.00
Naples, City of	0.00	1.94	0.00	0.00	0.00	0.01
Collier County Subtotal	**5.48**	**1.94**	**4.83**	**0.00**	**5.30**	**0.01**
Hendry County						
Clewiston	0.00	0.00	0.00	0.00	0.00	1.47
LaBelle, City of	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.47**
Lee County						
Bonita Springs – East[b]	0.04	0.00	0.05	0.00	0.00	0.00
Bonita Springs – West[b]						
Cape Coral (Everest/Southwest/North Cape)[c]	0.27	0.00	0.04	0.00	0.00	0.00
FGUA – Del Prado[b]	0.60	0.00	1.34	0.00	1.75	0.00
FGUA – Lehigh Acres[b]	0.28	0.00	0.62	0.00	0.10	0.00
Fort Myers, City of – Central	0.00	3.16	0.00	2.32	0.00	0.00
Fort Myers, City of – East	--	--	--	--	0.00	0.00
Fort Myers, City of – South	0.00	9.44	0.00	8.23	0.00	0.00
Lee County – Fiesta Village	0.00	1.86	0.00	1.31	0.00	0.44
Lee County – Fort Myers Beach	0.96	0.00	0.94	0.00	0.41	0.00
Lee County – Gateway	0.00	0.00	0.00	0.00	0.00	0.00
Lee County – Pine Island	0.00	0.00	0.07	0.00	0.16	0.00
Lee County – San Carlos[d]	0.00	0.00	0.00	0.00	--	--
Lee County – Three Oaks	0.79	0.00	0.45	0.00	0.70	0.00
Lee County – Waterway Estates[e]	0.00	0.14	--	--	--	--
Sanibel, City of – Donax	0.40	0.00	0.20	0.00	0.00	0.00
Lee County Subtotal	**3.34**	**14.60**	**3.71**	**11.86**	**3.12**	**0.44**
LWC Planning Area Total	**8.82**	**16.54**	**8.54**	**11.86**	**8.42**	**1.92**

FGUA = Florida Governmental Utility Authority; LWC = Lower West Coast; mgd = million gallons per day.
[a] Projected flows are for 2034.
[b] Projected flows are for 2030.
[c] The North Cape Facility is proposed at this time.
[d] Lee County – San Carlos was decommissioned in 2015.
[e] Lee County – Waterway Estates was decommissioned in 2012.

REFERENCES

FDEP. 2011. *2010 Reuse Inventory*. Water Reuse Program, Florida Department of Environmental Protection, Tallahassee, FL.

FDEP. 2015. *2014 Reuse Inventory*. Water Reuse Program, Florida Department of Environmental Protection, Tallahassee, FL.

E

Existing Conditions

This appendix provides additional hydrogeologic data on existing conditions of the aquifers in the Lower West Coast (LWC) Planning Area. A series of maps, tables, and figures identify chloride concentrations within the Water Table, Lower Tamiami, Sandstone, and Mid-Hawthorn aquifers in coastal Collier and Lee counties. A discussion of Public Water Supply (PWS) utilities that are vulnerable to saltwater intrusion during drought conditions (i.e., Utilities of Concern and Utilities at Risk) is provided in this appendix also.

SALTWATER INTRUSION MAPPING

The South Florida Water Management District (SFWMD or District) periodically develops maps to document the position of the saltwater interface over time to understand the potential effects on wellfields and coastal aquifers. Salinity data from monitor wells were compiled from multiple sources (e.g., United States Geological Survey [USGS], SFWMD, water use permittees) and contoured to estimate the position of the saltwater interface, defined herein as the line with a chloride concentration of 250 milligrams per liter (mg/L). The 250 mg/L concentration is a secondary drinking water standard and used as a reference. Two series of maps have been developed, 2009 and 2014, and the intent is to update the maps every 5 years. This approach tracks the saltwater interface position over time, can identify areas of concern that may require additional monitoring, and may suggest the need for changes in wellfield operations.

Chloride graphs of selected wells, labeled on each map and listed in a table following each map, represent the period of record for each well through May 2014. The colored symbols used in the chloride graphs depict ranges in chloride concentration and correlate to the symbols in the maps. The dashed lines on each map mark approximations of the farthest landward extent of the saltwater interface as defined by the 250 mg/L isochlor, regardless of well depth, and/or the farthest landward extent of saline water in 2009 and 2014.

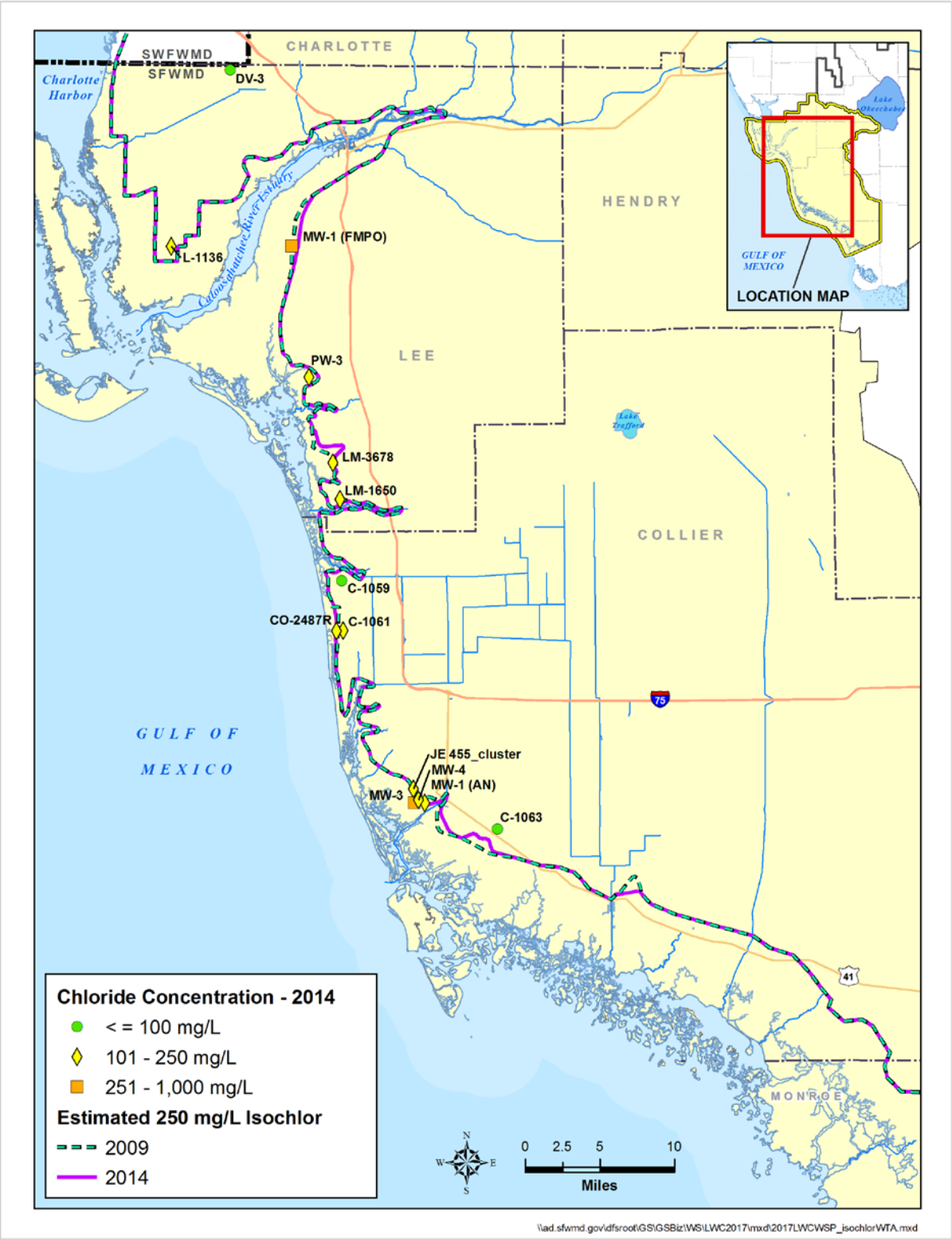


Figure E-1. Estimated position of the saltwater interface within the Water Table aquifer in Collier and Lee counties in March-May 2014. Well details are provided in **Table E-1**.

Table E-1. Chloride levels measured at Water Table aquifer wells within Collier and Lee counties in March-May 2014.

Figure Number	Project Name	Well Name	X	Y	Depth (feet bls)		Chloride (mg/L)
					Casing	Total	
E-2	USGS 261604081480901	C-1059	393246	704137	10	25	26
E-3	The Club Pelican Bay	CO-2487R	391408	686268	17	20	228
E-4	Artesia Naples	MW-3	418897	625569	15	20	406
E-5	Artesia Naples	MW-1	422662	625479	15	20	171
E-6	USGS 261311081480101	C-1061	393838	686494	10	25	160
E-7	Treviso Bay	JE 455_cluster	418691	630481	0	4	130
E-8	Artesia Naples	MW-4	420450	626553	15	20	105
E-9	USGS 260137081375901	C-1063	448406	616391	30	55	68
E-10	USGS 263532081592202	L-1136	332950	822316	15	20	160
E-11	Shadow Wood Preserve	PW-3	381661	776089	20	40	210
E-12	Bayside	LM-3678	390263	745808	21	30	243
E-13	Herons Glen	DV-3	353815	884739	5	15	83
E-14	Fort Myers Post Office	MW-1	375671	822526	5	15	735
E-15	Bonita Bay	LM-1650	392648	732811	20	25	192

bls = below land surface; mg/L = milligrams per liter; USGS = United States Geological Survey.

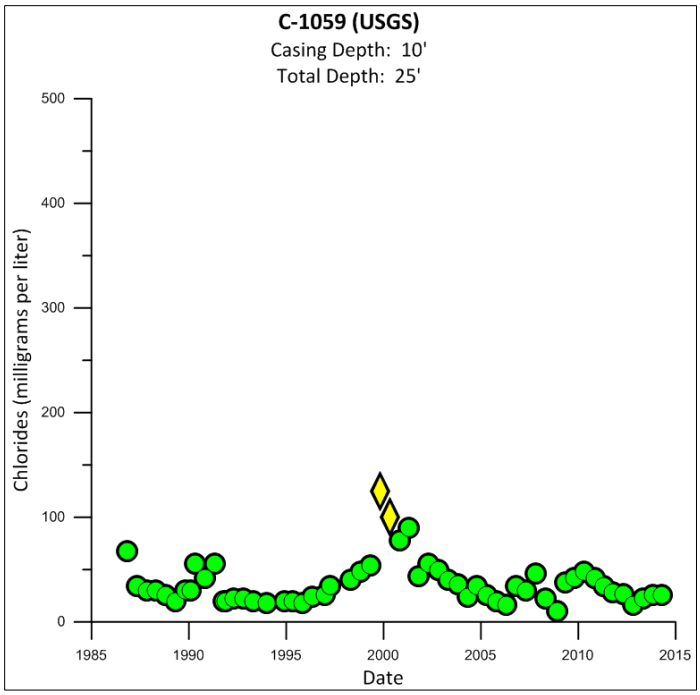


Figure E-2. Chloride levels at USGS well C-1059.

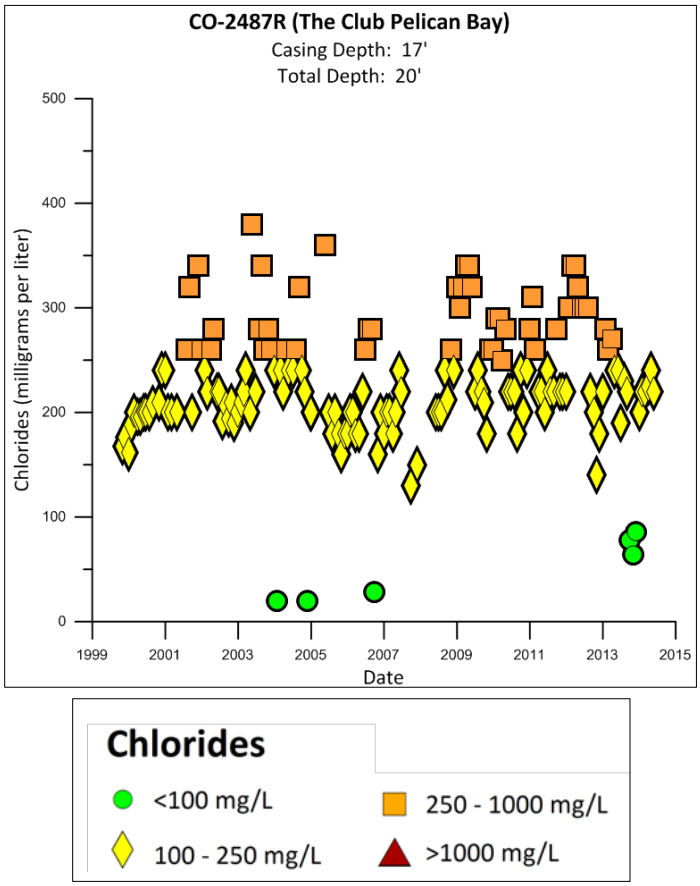


Figure E-3. Chloride levels at The Club Pelican Bay well CO-2487R.

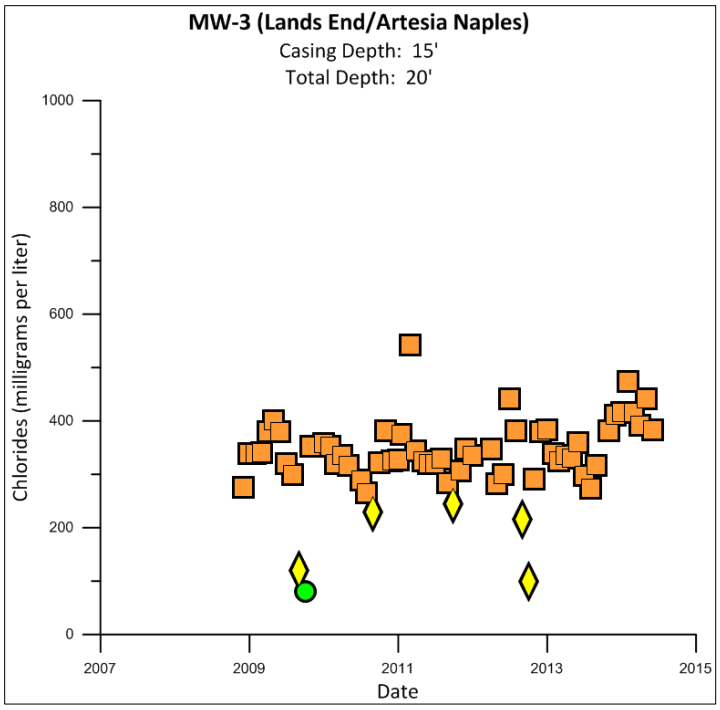


Figure E-4. Chloride levels at Lands End/Artesia Naples well MW-3.

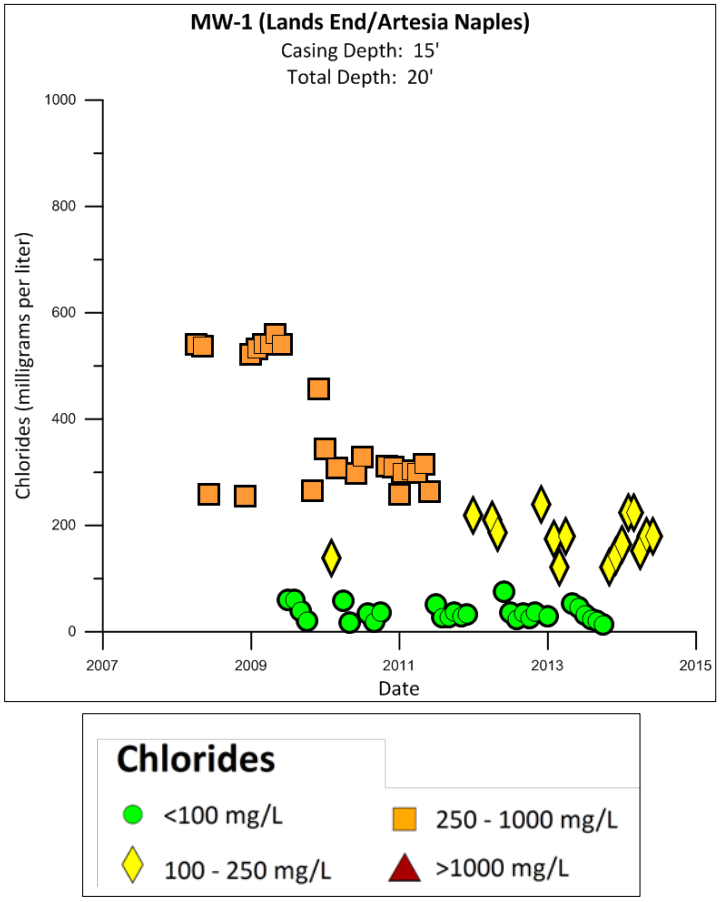


Figure E-5. Chloride levels at Lands End/Artesia Naples well MW-1.

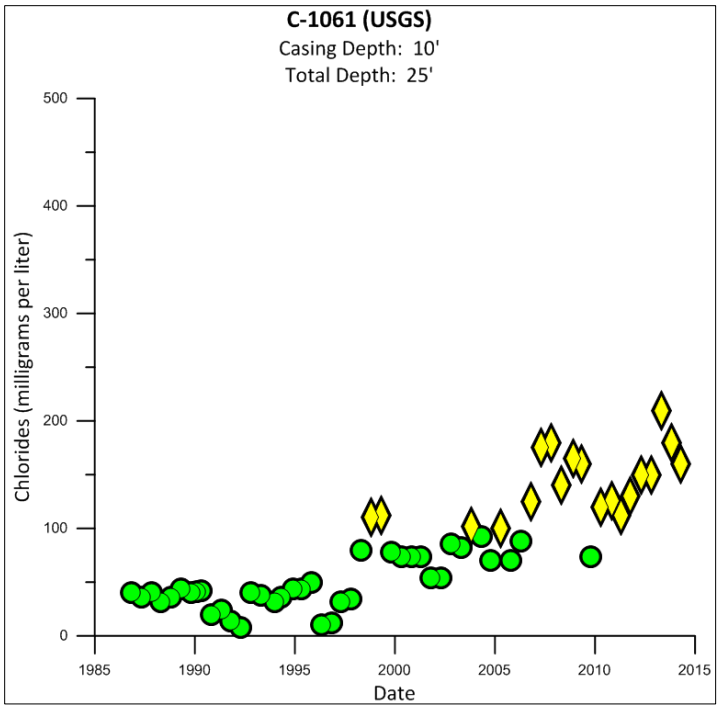


Figure E-6. Chloride levels at USGS well C-1061.

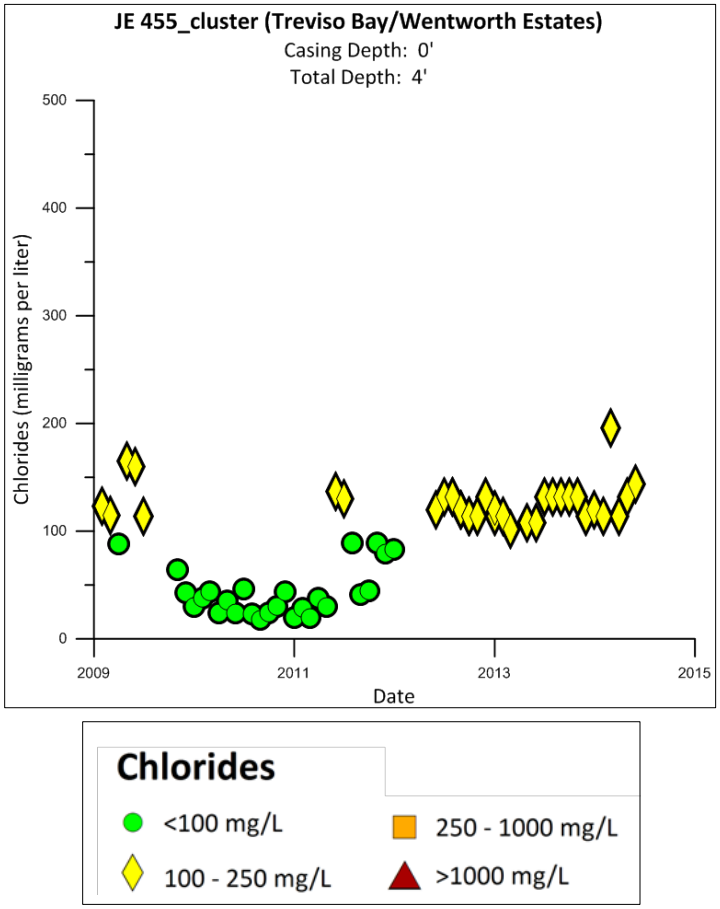


Figure E-7. Chloride levels at Treviso Bay/Wentworth Estates well JE 455_cluster.

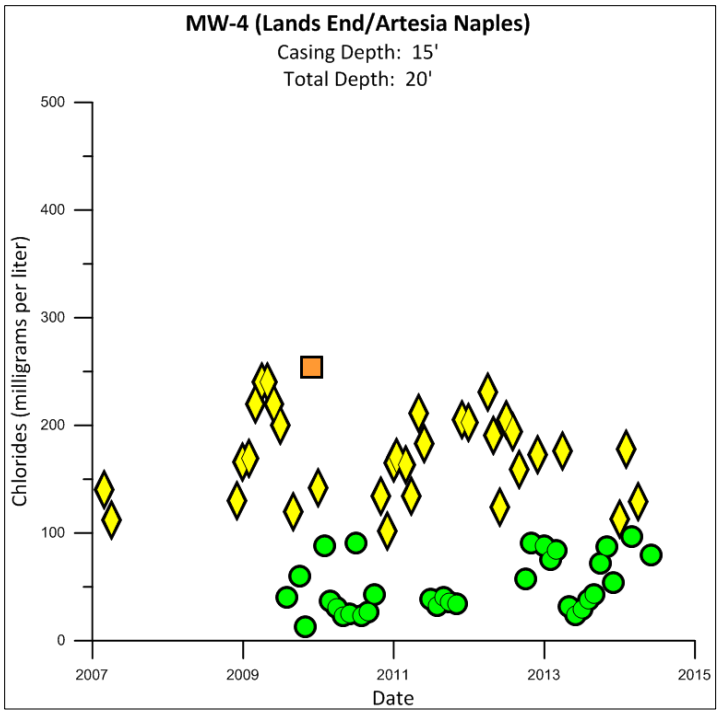


Figure E-8. Chloride levels at Lands End/Artesia Naples well MW-4.

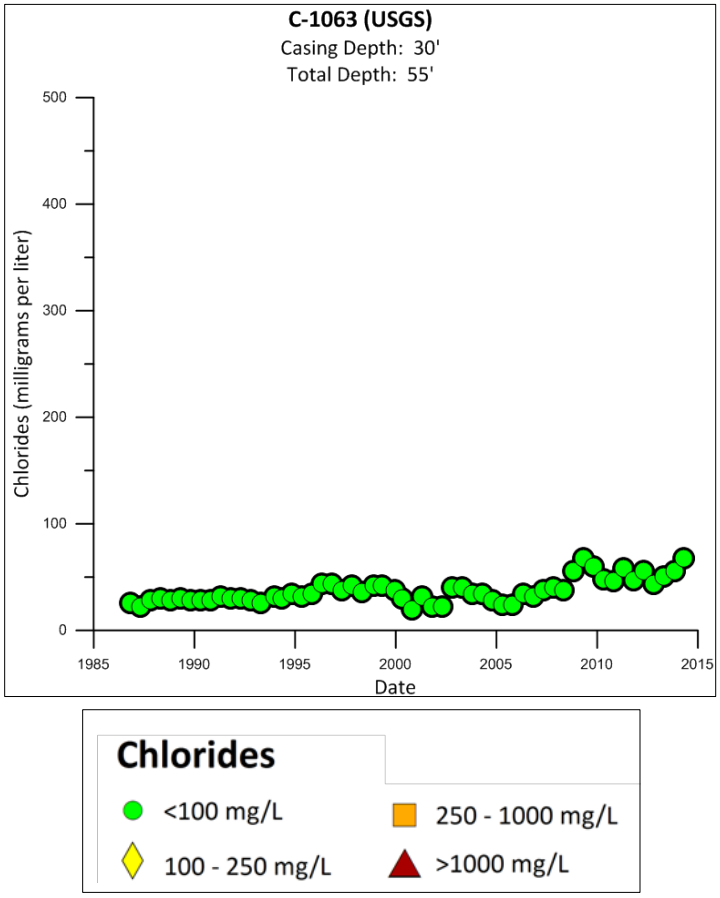


Figure E-9. Chloride levels at USGS well C-1063.

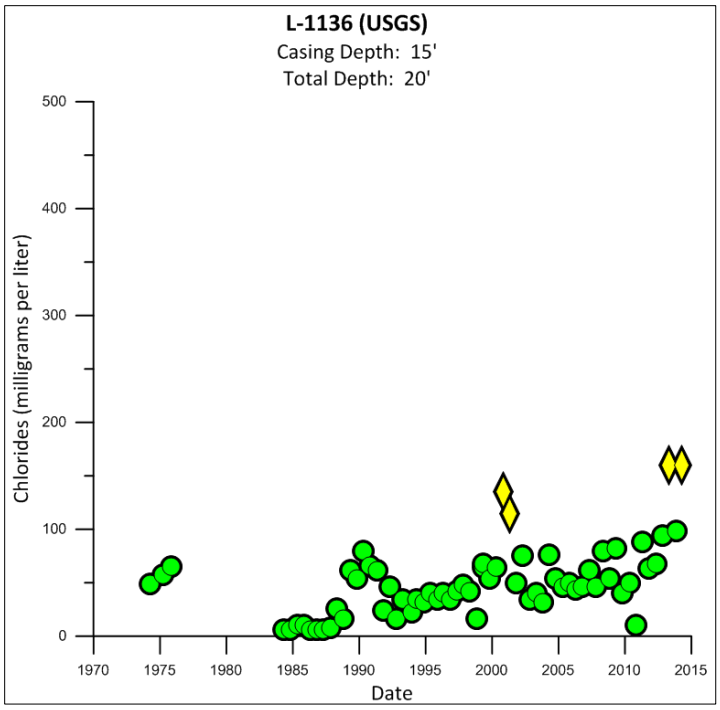


Figure E-10. Chloride levels at USGS well L-1136.

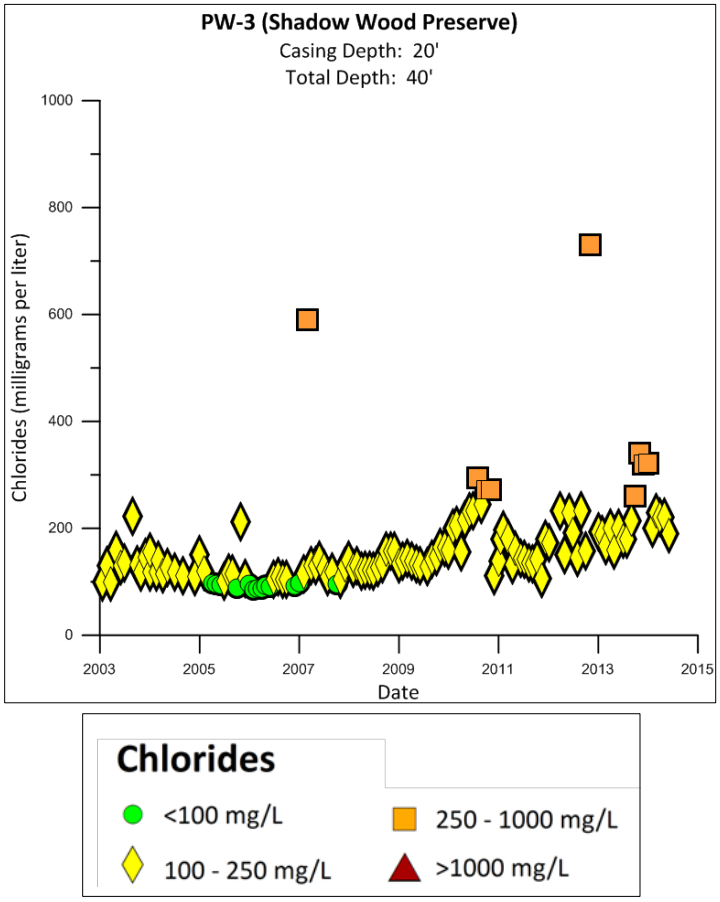


Figure E-11. Chloride levels at Shadow Wood Preserve well PW-3.

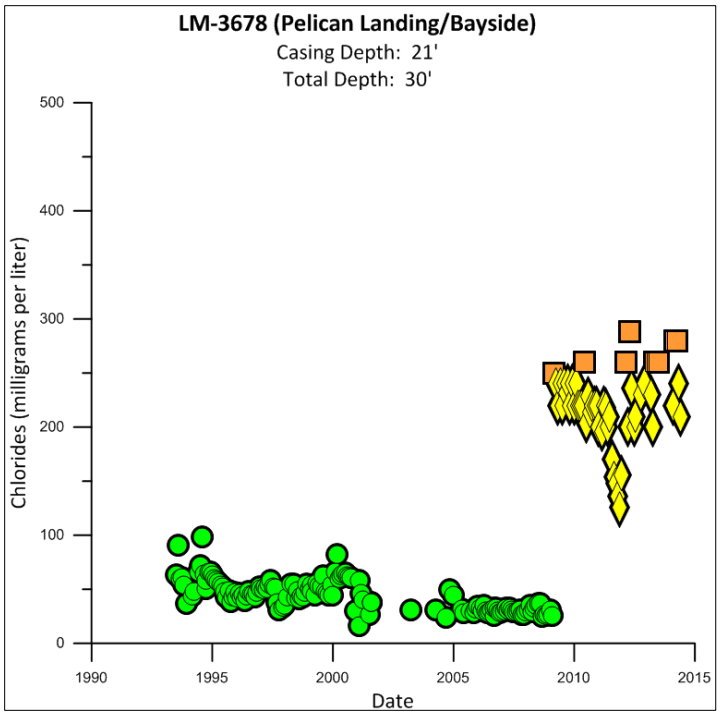


Figure E-12. Chloride levels at Pelican Landing/Bayside well LM-3678.

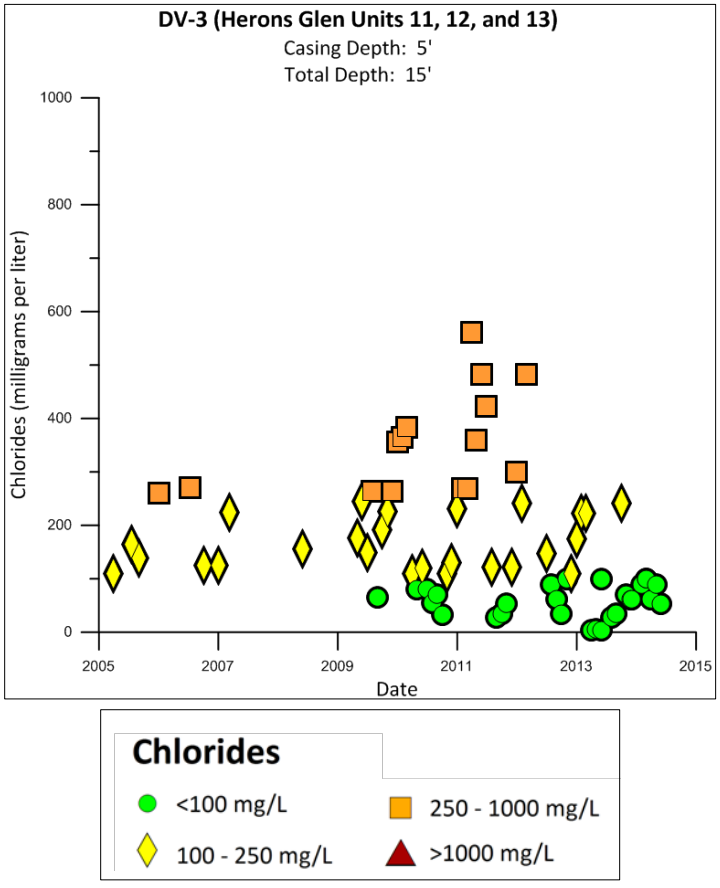


Figure E-13. Chloride levels at Herons Glen Units 11, 12, and 13 well DV-3.

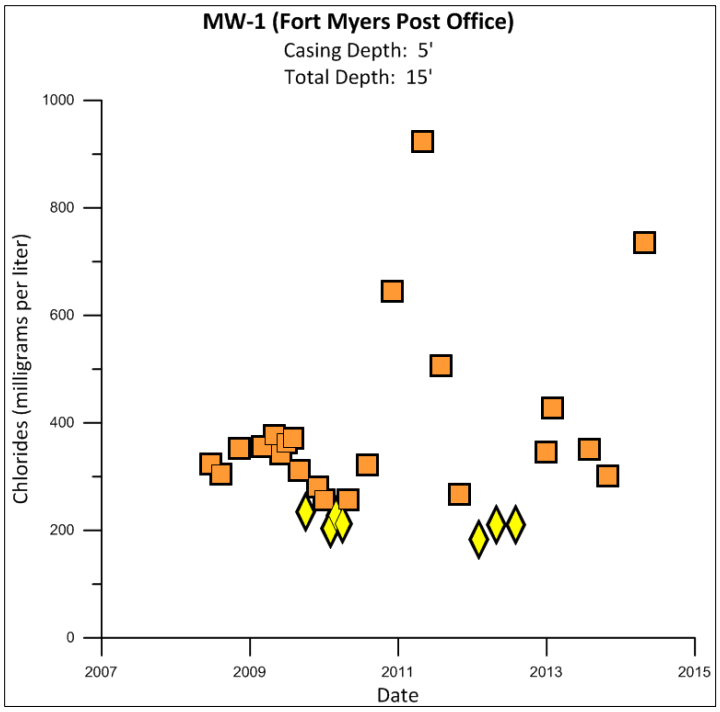


Figure E-14. Chloride levels at Fort Myers Post Office well MW-1.

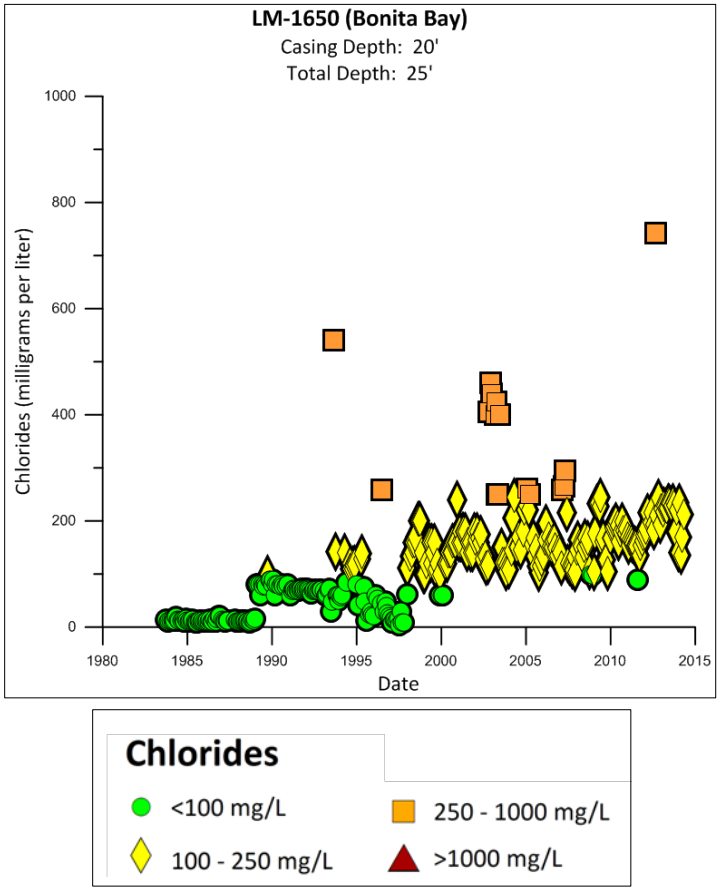


Figure E-15. Chloride levels at Bonita Bay well LM-1650.

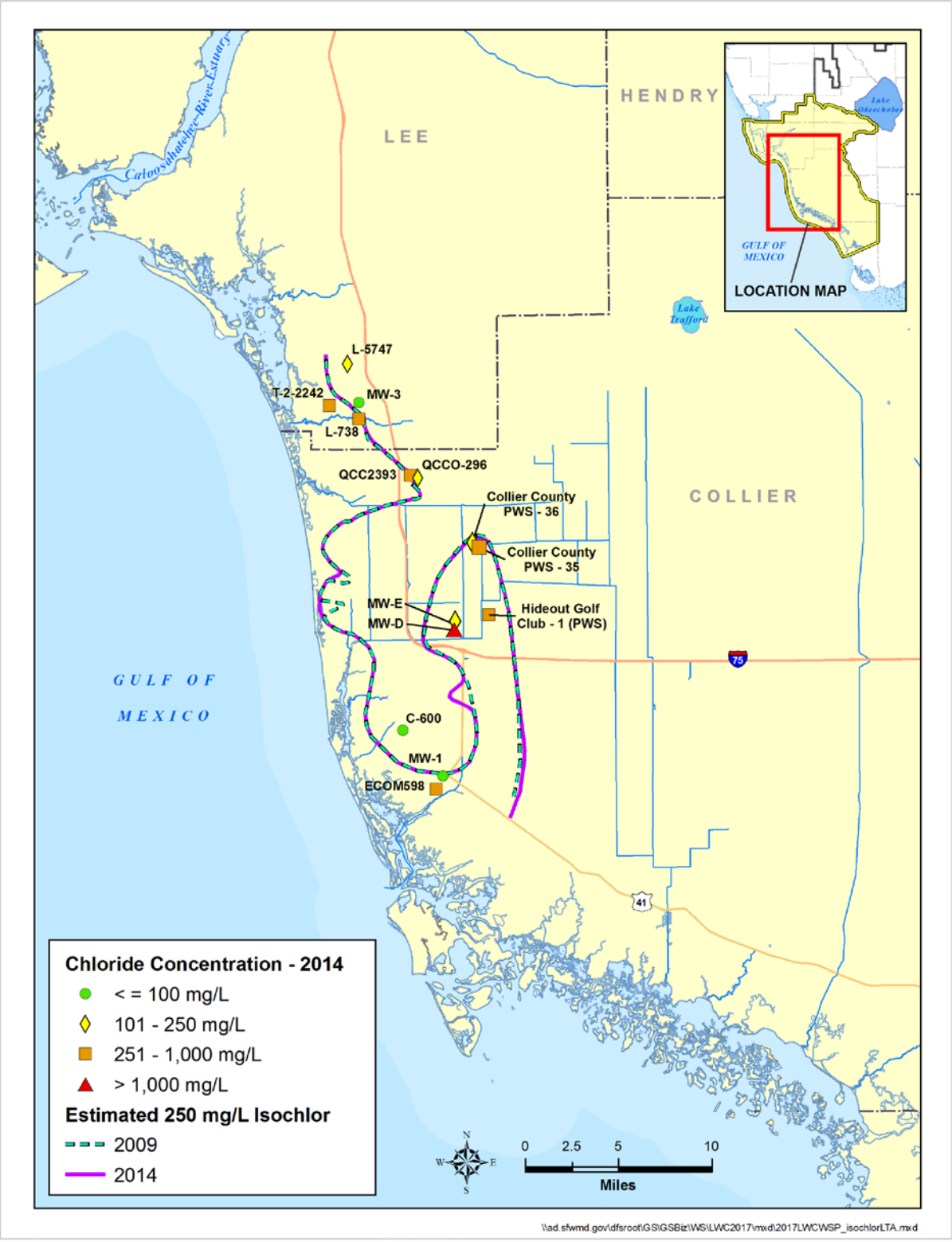


Figure E-16. Estimated position of the saltwater interface within the Lower Tamiami aquifer in Collier and Lee counties in March-May 2014. Well details are provided in **Table E-2**.

Table E-2. Chloride levels measured at Lower Tamiami aquifer wells within Collier and Lee counties in March-May 2014.

Figure Number	Project Name	Well Name	X	Y	Depth (feet bls)		Chloride (mg/L)
					Casing	Total	
E-17	Bonita Bay	T-2-2242	393039	733783	80	120	437
E-18	USGS 262022081464201	L-738	401414	730066	61	75	330
E-19	Quail Creek Country Club	QCC2393	415992	714146	80	105	333
E-20	Collier County Public Water Supply	35	434500	695150	102	145	429
E-21	Hideout Golf Club	1 (PWS)	438166	674729	60	80	481
E-22	Golden Gate Water Treatment Facility	MW-D	428597	672071	98	101	1,755
E-23	Eagle Creek Country Club	ECOM598	423325	625355	35	40	900
E-24	USGS 262258081471802	L-5747	398134	745646	59	105	140
E-25	Bonita Springs Utilities	MW-3	401337	734703	53	70	36
E-26	Quail Creek Country Club	QCCO-296	418046	713357	70	105	207
E-27	Collier County Public Water Supply	36	433550	695115	92	125	195
E-28	Golden Gate Water Treatment Facility	MW-E	428583	671986	50	52	189
E-29	USGS 260549081441901	C-600	413831	642051	48	52	89
E-30	Eagle Creek Country Club	MW-1	425220	629115	No Data	18	90

bls = below land surface; mg/L = milligrams per liter; USGS = United States Geological Survey.

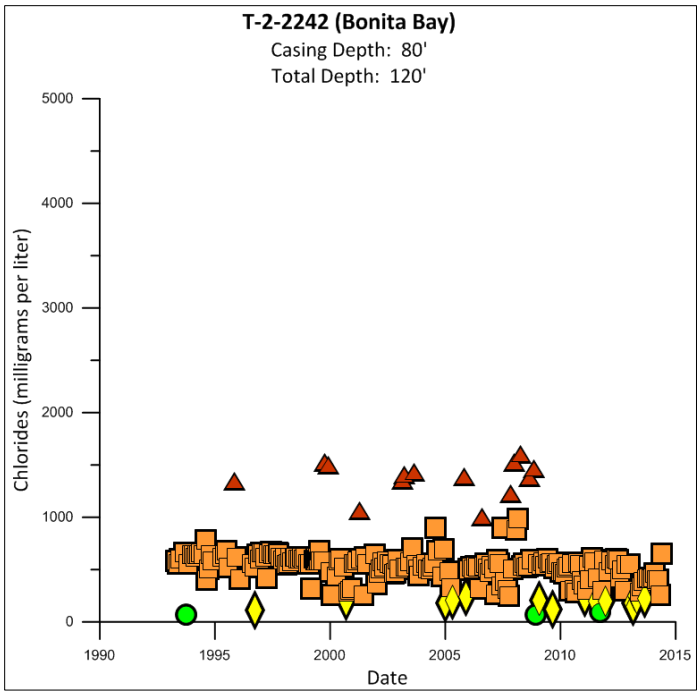


Figure E-17. Chloride levels at Bonita Bay well T-2-2242.

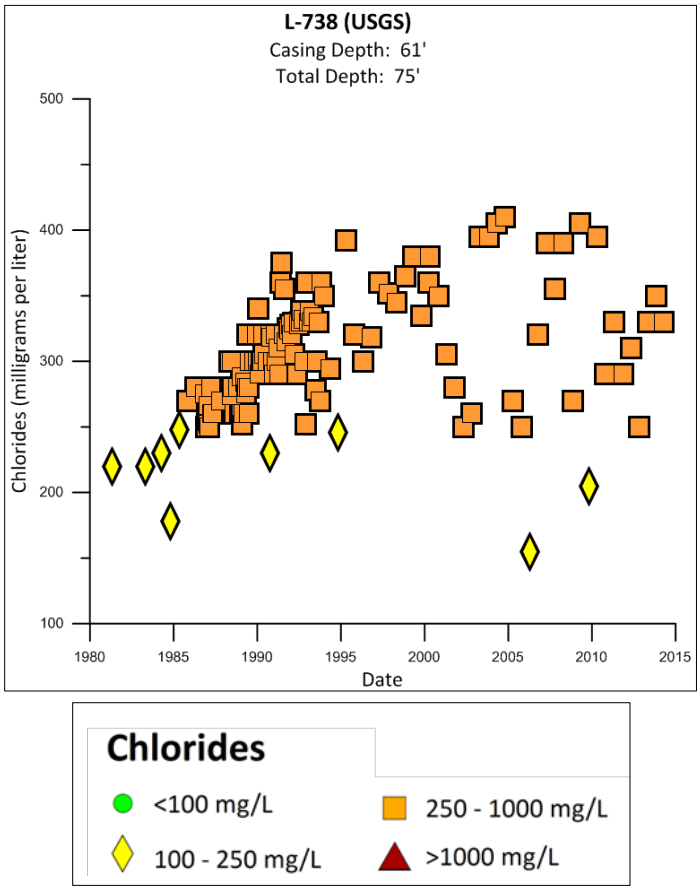


Figure E-18. Chloride levels at USGS well L-738.

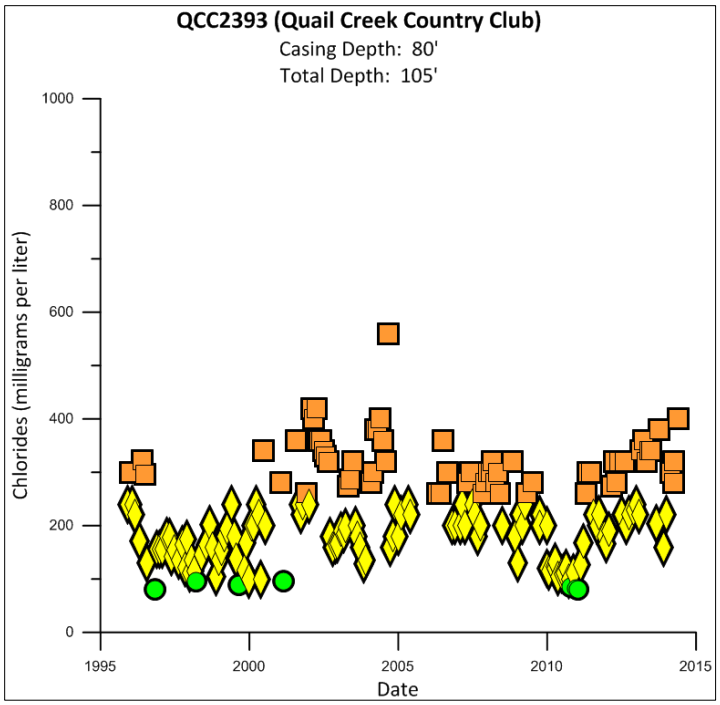


Figure E-19. Chloride levels at Quail Creek Country Club well QCC2393.

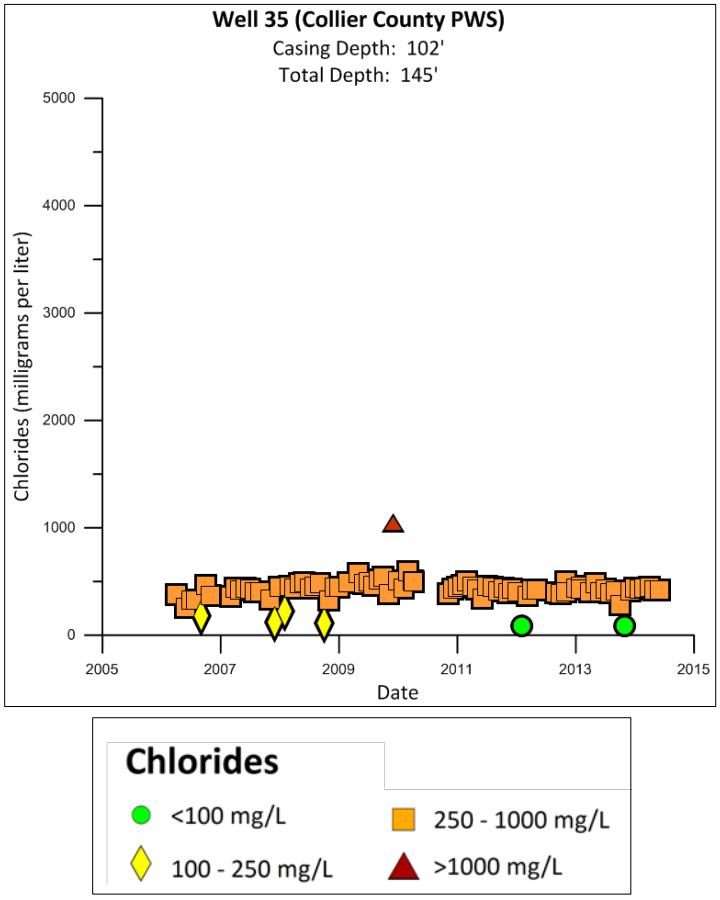


Figure E-20. Chloride levels at Collier County PWS well 35.

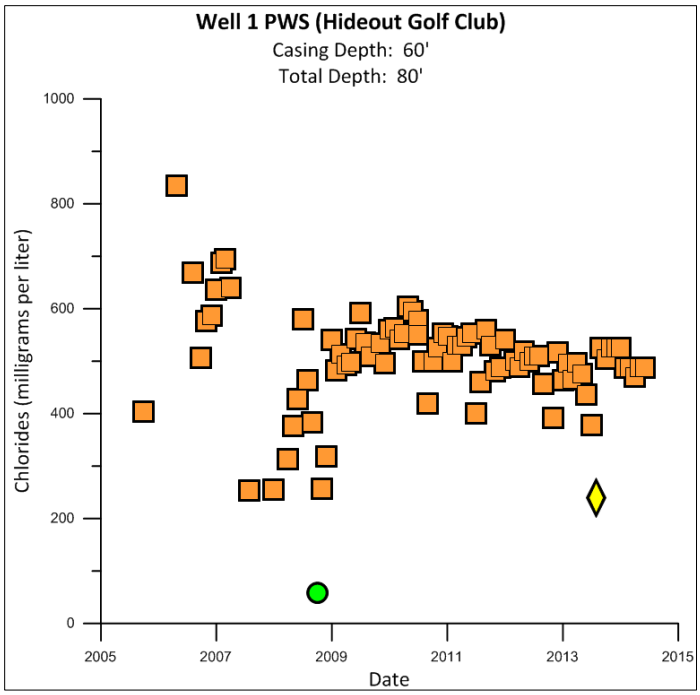


Figure E-21. Chloride levels at Hideout Golf Club well 1 PWS.

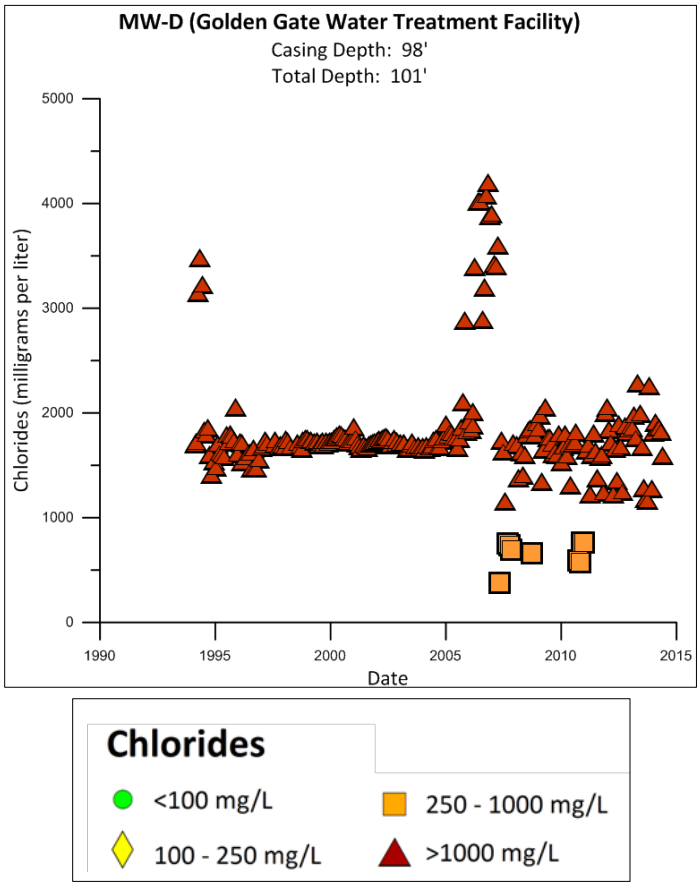


Figure E-22. Chloride levels at Golden Gate Water Treatment Facility well MW-D.

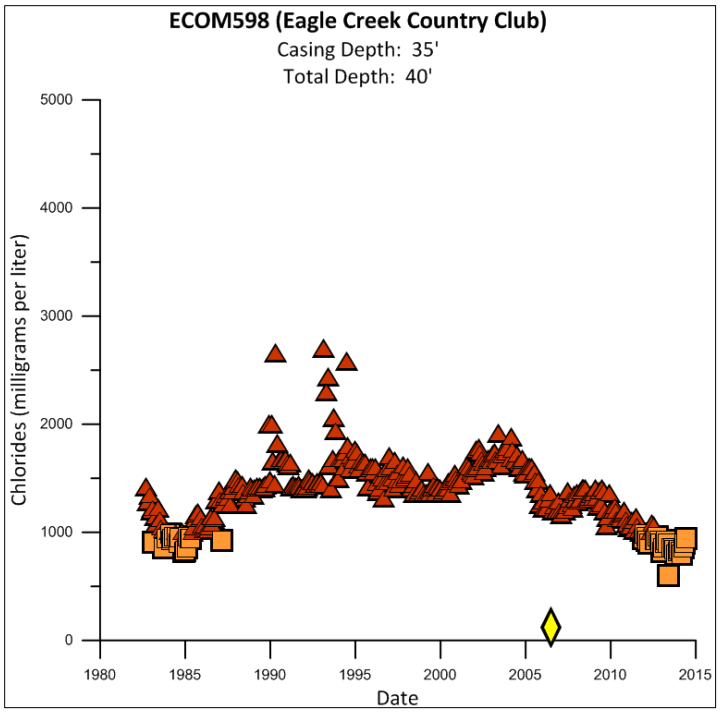


Figure E-23. Chloride levels at Eagle Creek Country Club well ECOM598.

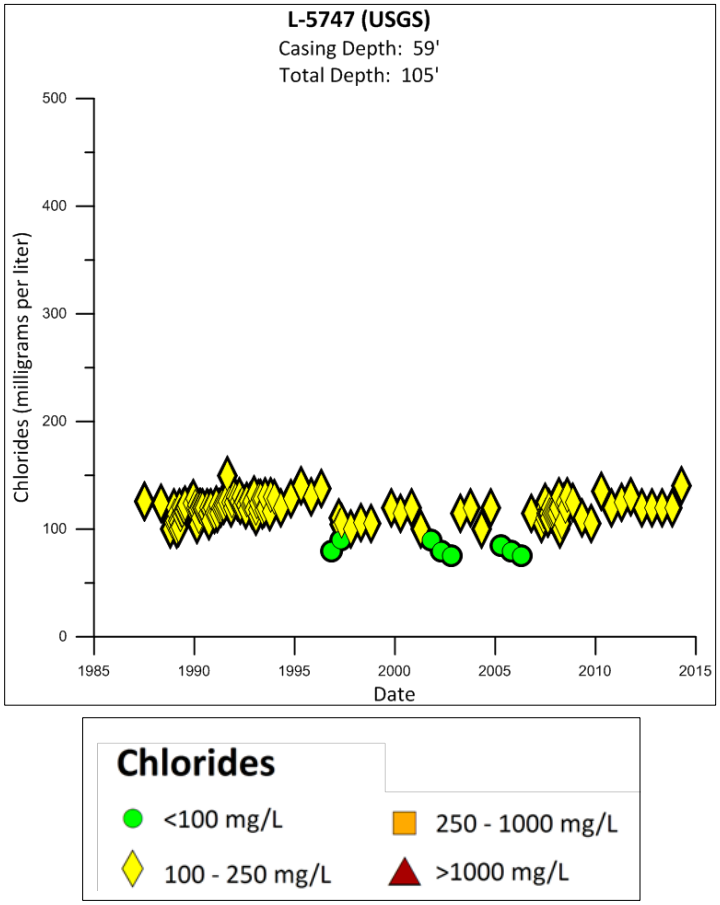


Figure E-24. Chloride levels at USGS well L-5747.

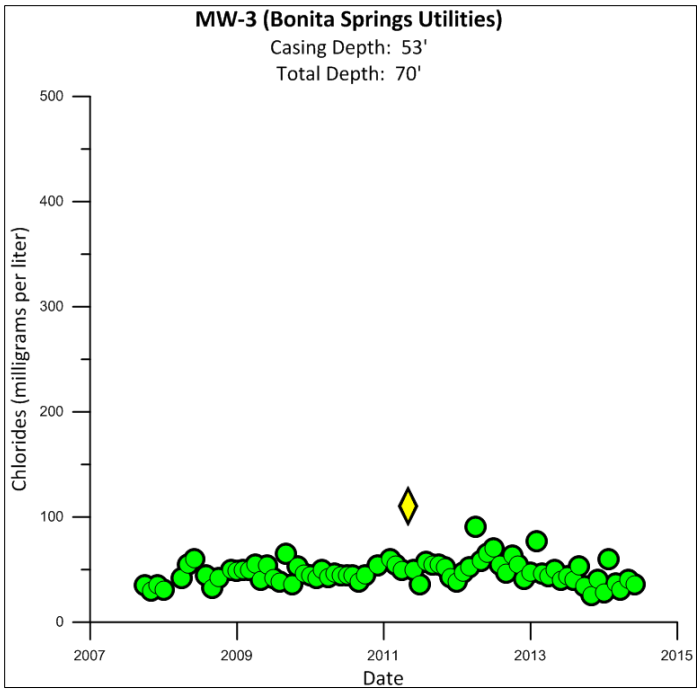


Figure E-25. Chloride levels at Bonita Springs Utilities well MW-3.

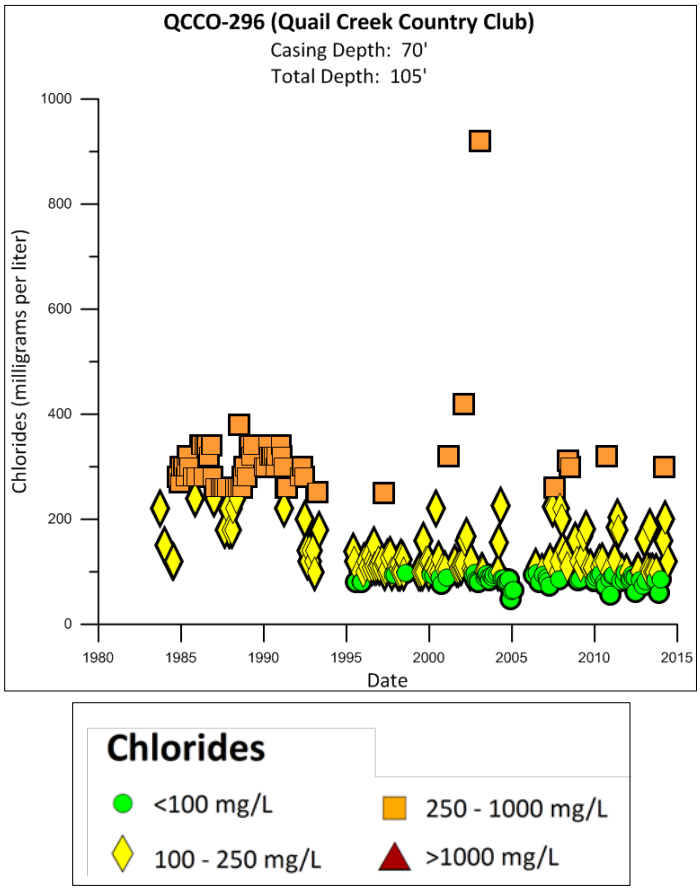


Figure E-26. Chloride levels at Quail Creek Country Club well QCCO-296.

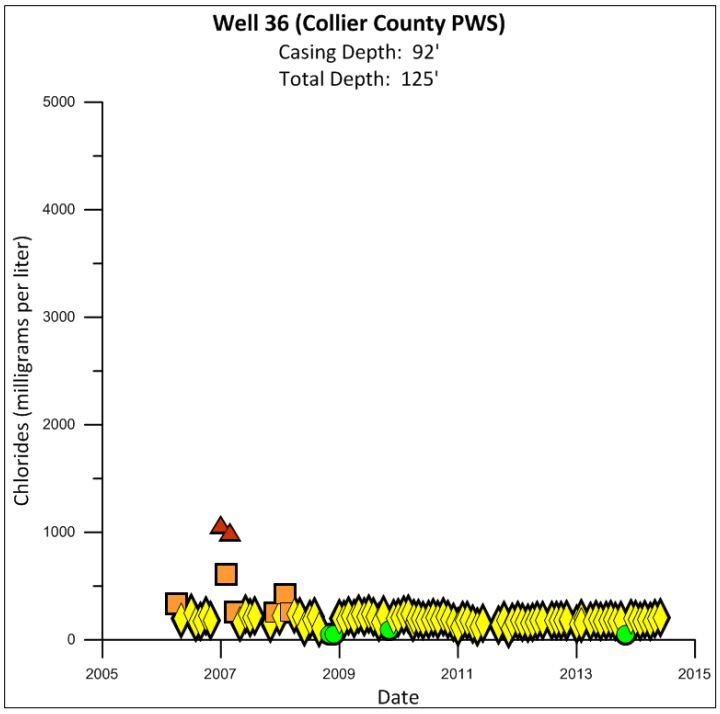


Figure E-27. Chloride levels at Collier County PWS well 36.

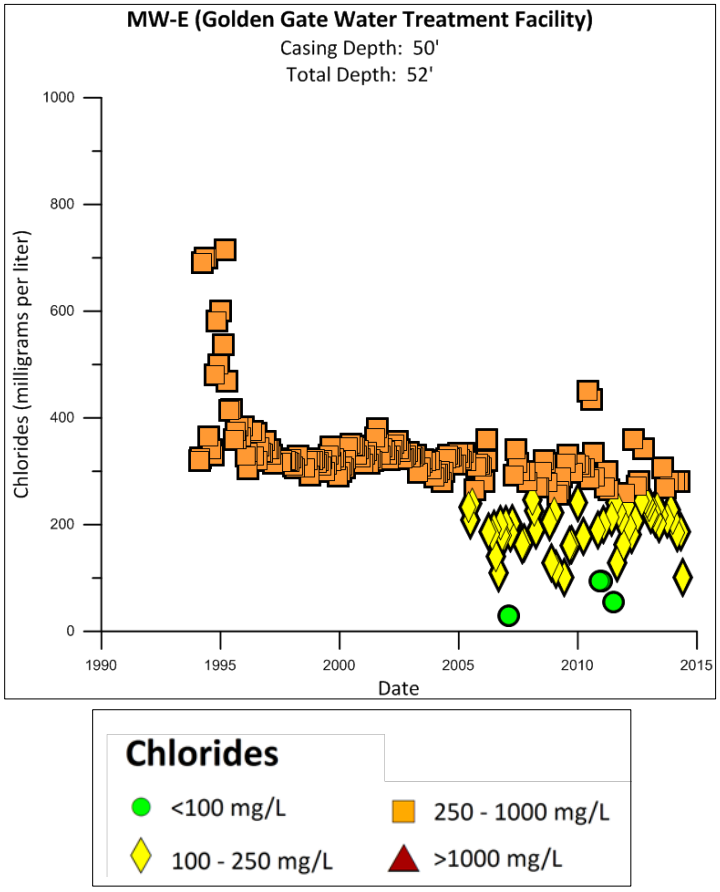


Figure E-28. Chloride levels at Golden Gate Water Treatment Facility well MW-E.

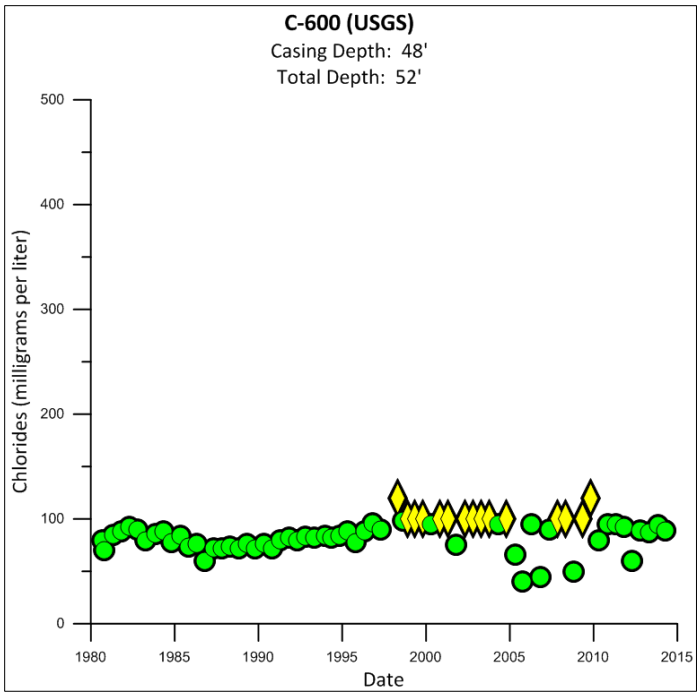


Figure E-29. Chloride levels at USGS well C-600.

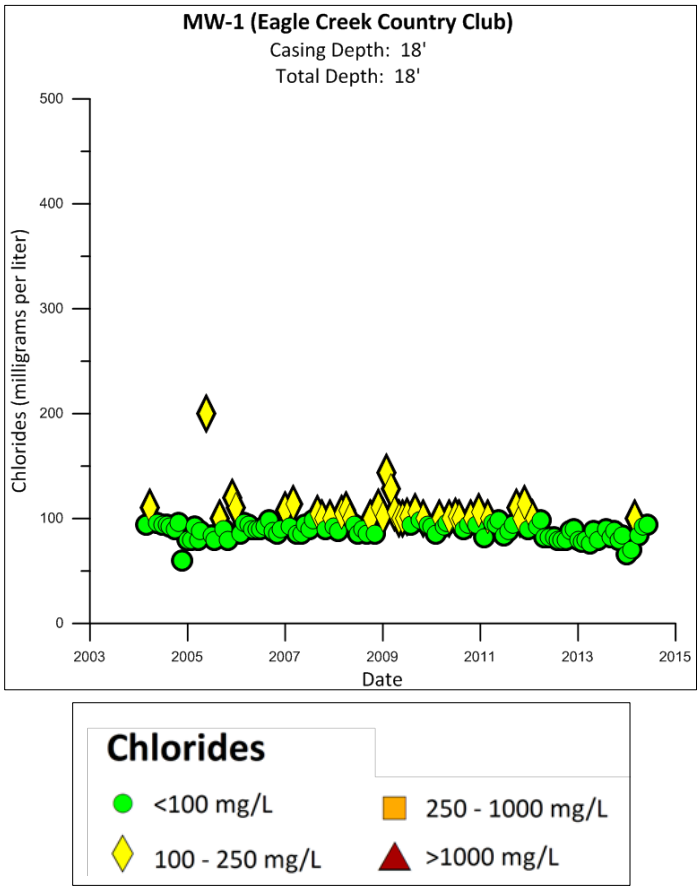


Figure E-30. Chloride levels at Eagle Creek Country Club well MW-1.

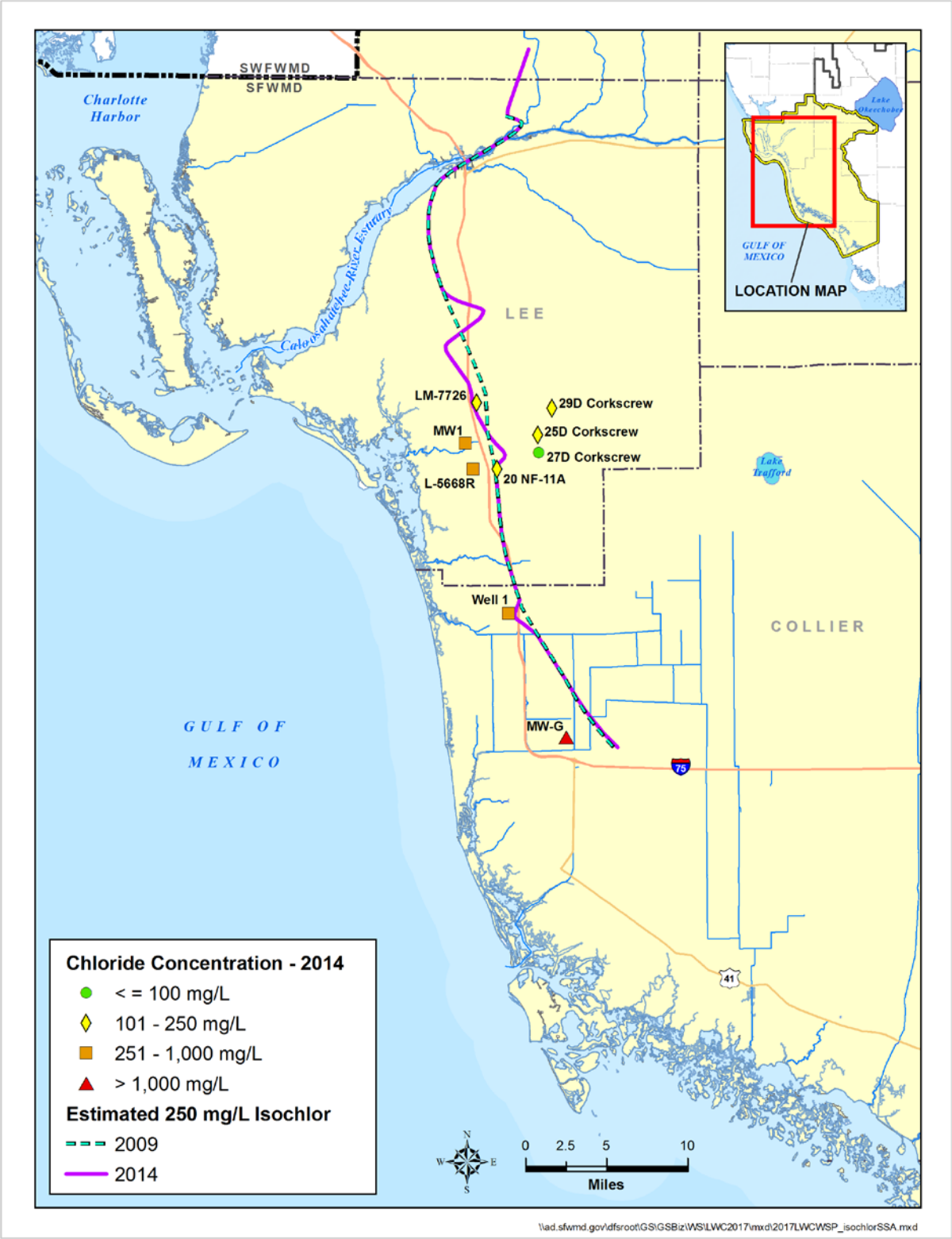


Figure E-31. Estimated position of the saltwater interface within the Sandstone aquifer in Collier and Lee counties in March-May 2014. Well details are provided in **Table E-3**.

Table E-3. Chloride levels measured at Sandstone aquifer wells within Collier and Lee counties in March-May 2014.

Figure Number	Project Name	Well Name	X	Y	Depth (feet bls)		Chloride (mg/L)
					Casing	Total	
E-32	Rookery Pointe	MW1	395459	767828	90	100	420
E-33	USGS 262513081472002	L-5668R	397949	759336	No Data	155	760
E-34	Turnberry Woods	Well 1	409527	712429	145	175	378
E-35	Golden Gate Water Treatment Facility	MW-G	428404	672116	230	240	1,245
E-36	Ben Hill Griffin Parkway	LM-7726	399128	780993	108	108	213
E-37	Lee County Utilities	29D Corkscrew	423714	779180	105	180	173
E-38	Lee County Utilities	25D Corkscrew	419135	770391	115	180	126
E-39	Lee County Utilities	27D Corkscrew	419299	764683	120	170	64
E-40	Pinewoods Public Water Supply	20 (NF-11A)	405841	759345	94	130	184

bls = below land surface; mg/L = milligrams per liter; USGS = United States Geological Survey.

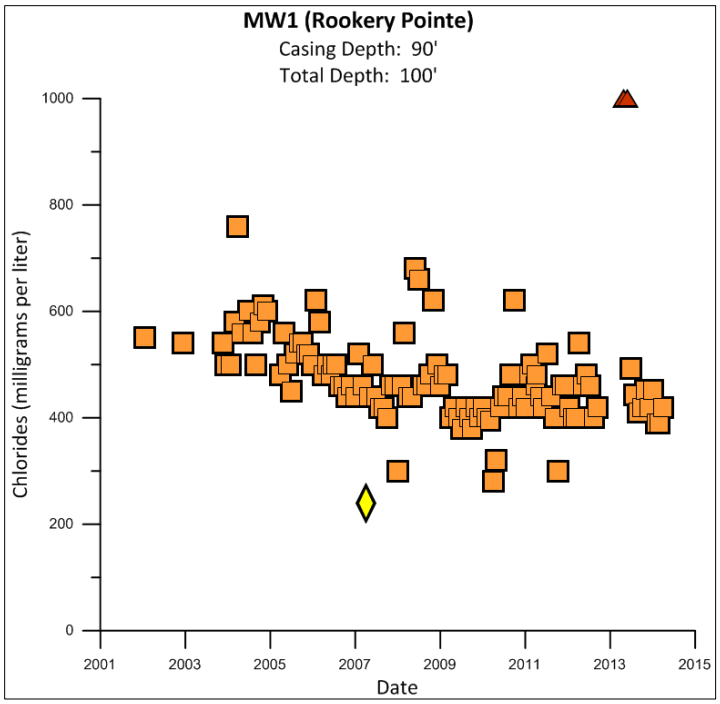


Figure E-32. Chloride levels at Rookery Pointe well MW1.

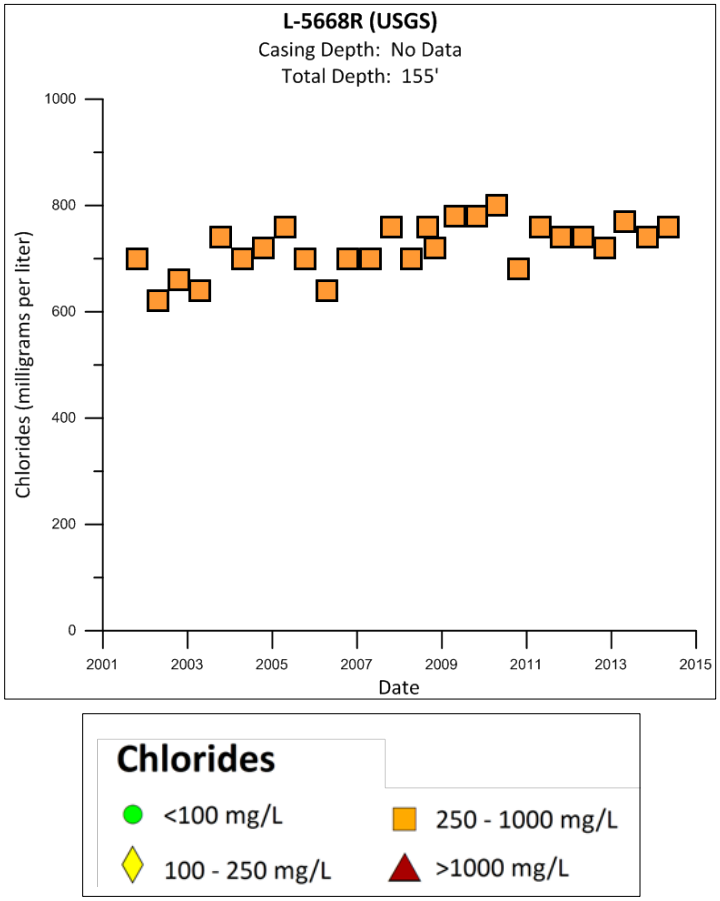


Figure E-33. Chloride levels at USGS well L-5668R.

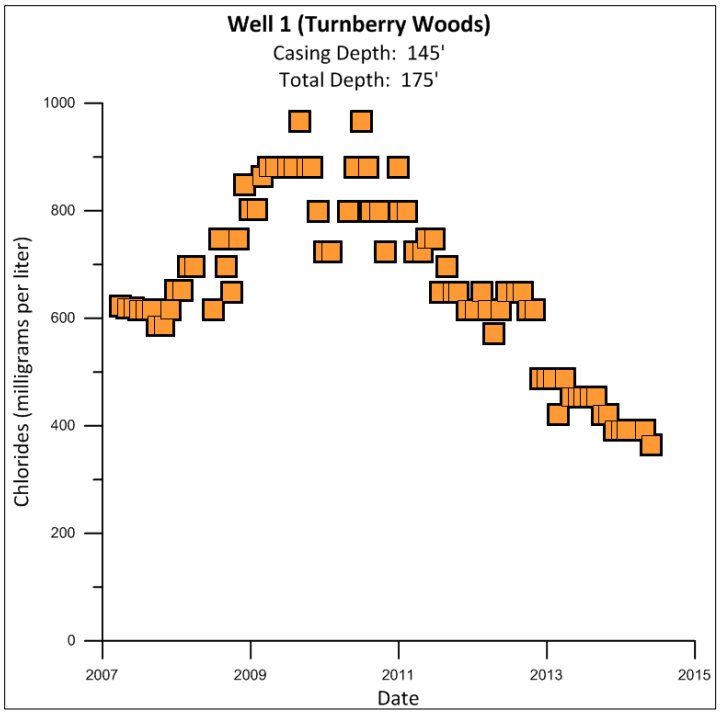


Figure E-34. Chloride levels at Turnberry Woods well 1.

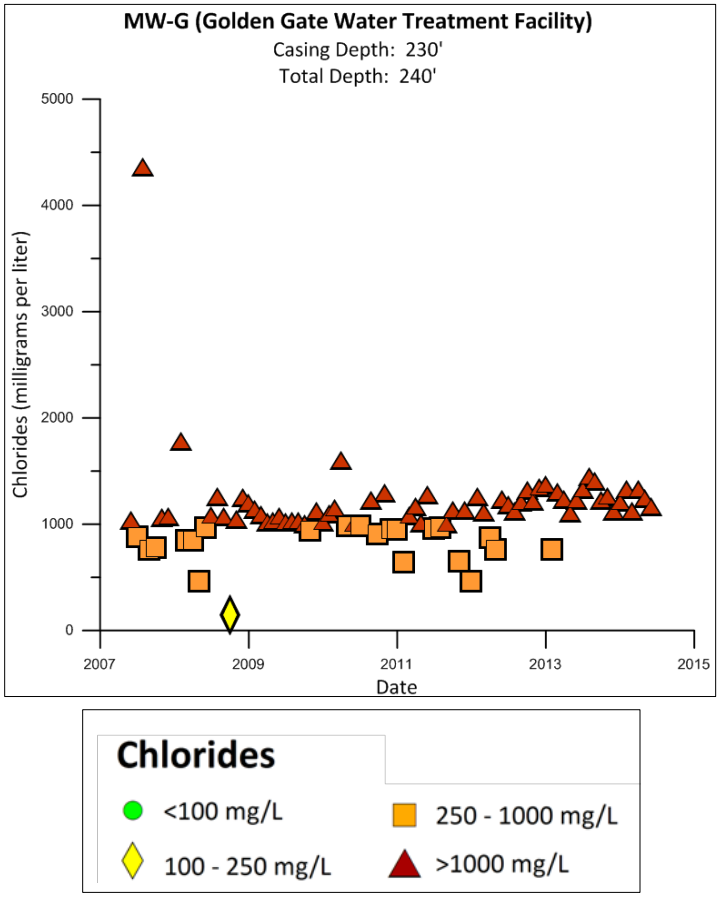


Figure E-35. Chloride levels at Golden Gate Water Treatment Facility well MW-G.

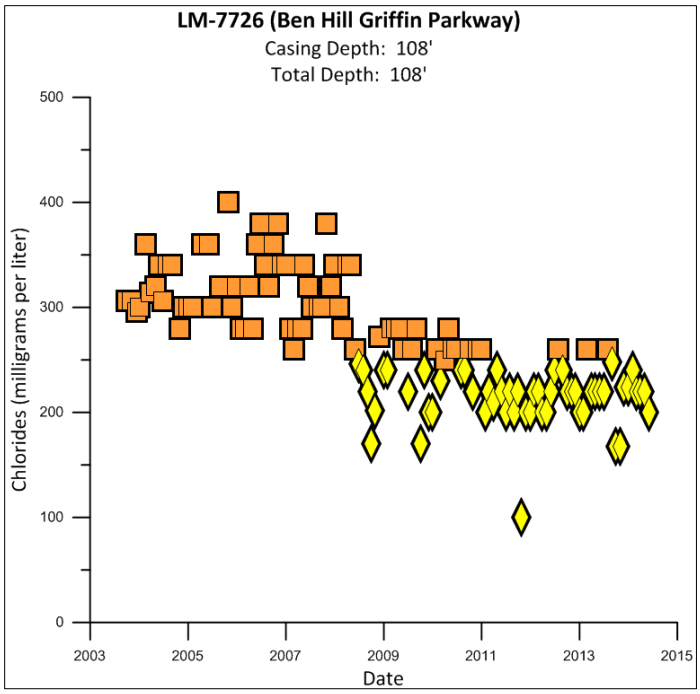


Figure E-36. Chloride levels at Ben Hill Griffin Parkway well LM-7726.

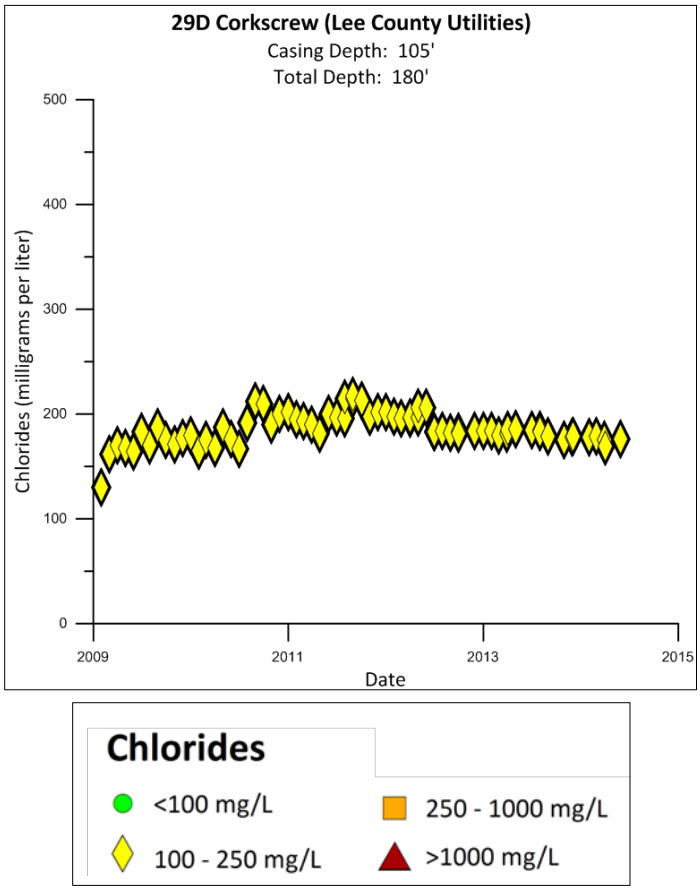


Figure E-37. Chloride levels at Lee County Utilities well 29D Corkscrew.

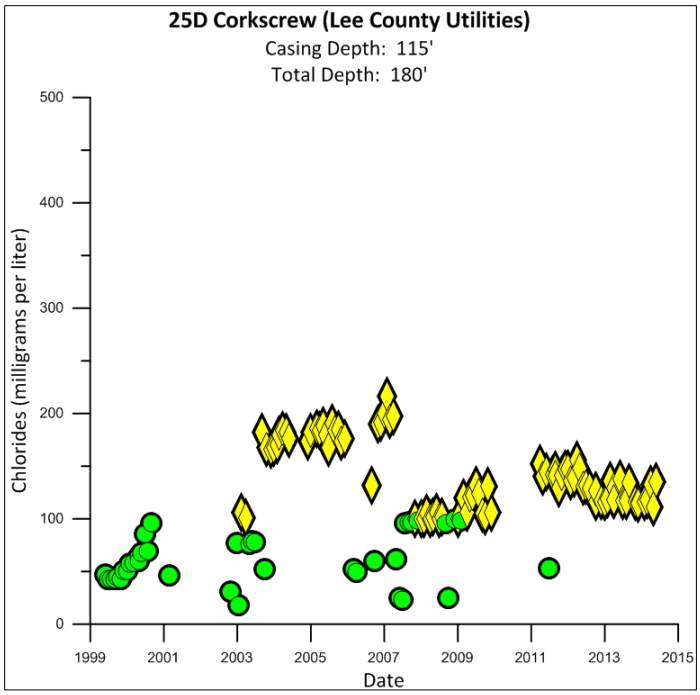


Figure E-38. Chloride levels at Lee County Utilities well 25D Corkscrew.

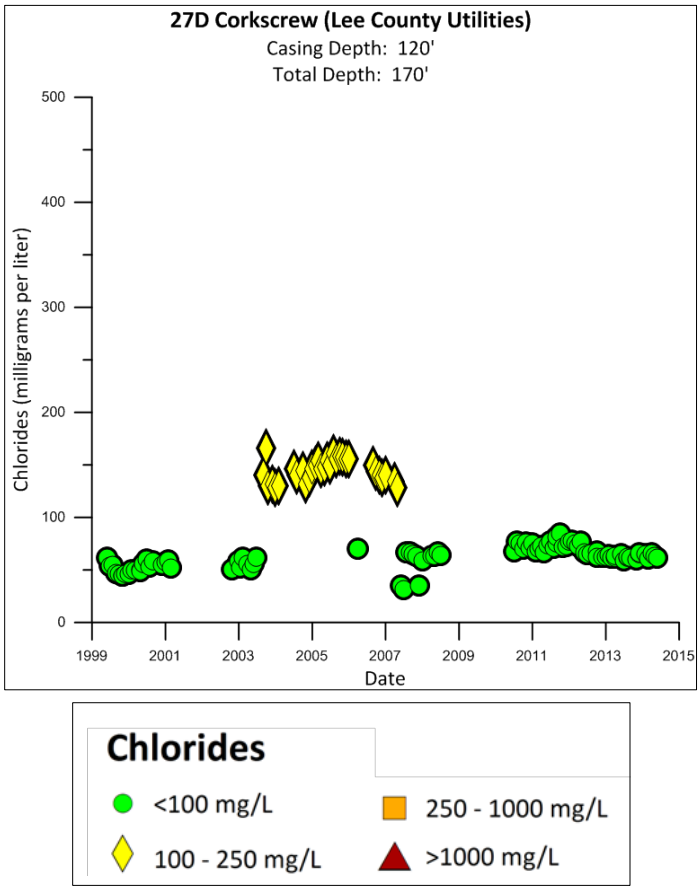


Figure E-39. Chloride levels at Lee County Utilities well 27D Corkscrew.

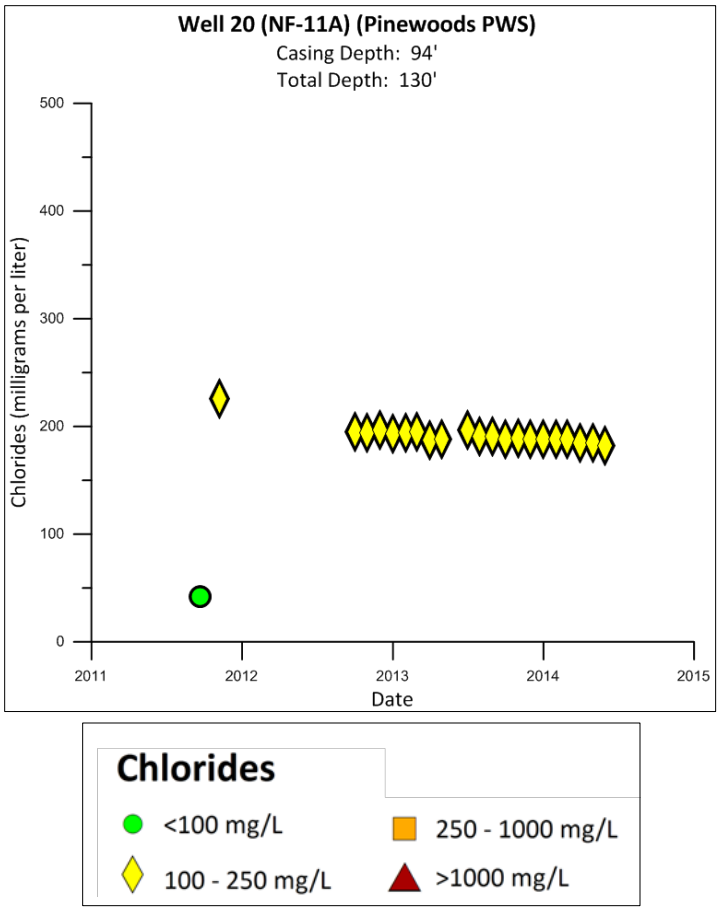


Figure E-40. Chloride levels at Pinewoods PWS well 20 (NF-11A).

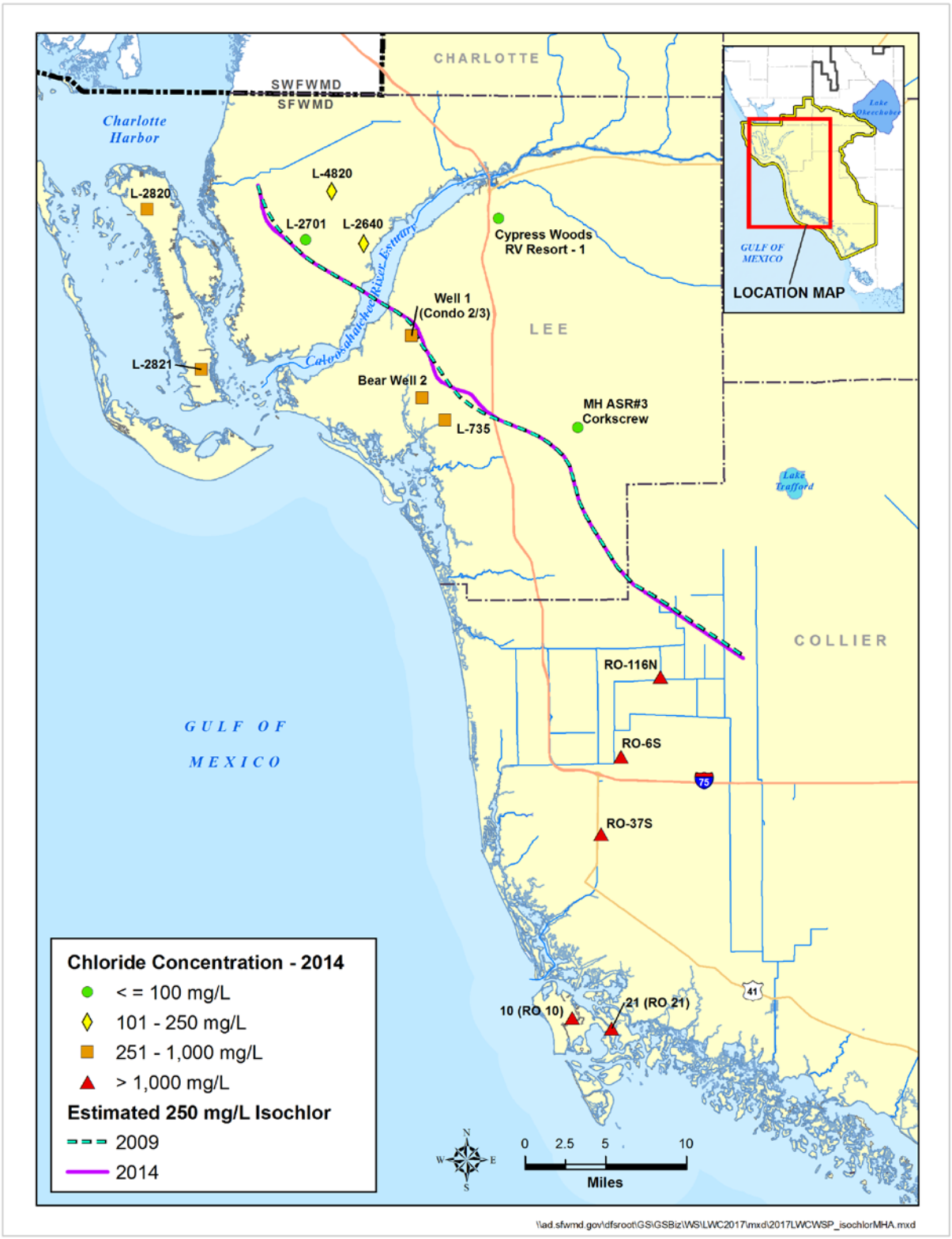


Figure E-41. Estimated position of the saltwater interface within the Mid-Hawthorn aquifer in Collier and Lee counties in March-May 2014. Well details are provided in **Table E-4**.

Table E-4. Chloride levels measured at Mid-Hawthorn aquifer wells within Collier and Lee counties in March-May 2014.

Figure Number	Project Name	Well Name	X	Y	Depth (feet bls)		Chloride (mg/L)
					Casing	Total	
E-42	Collier County Public Water Supply	RO-116N	451442	696456	400	500	1,087
E-43	Collier County Public Water Supply	RO-6S	438460	670306	317	421	2,490
E-44	Collier County Public Water Supply	RO-37S	432015	645040	300	420	2,630
E-45	Marco Island Utilities	10 (RO 10)	422544	585014	410	580	9,429
E-46	Marco Island Utilities	21 (RO 21)	435462	581508	350	500	3,598
E-47	USGS 263955082083102	L-2820	283342	849083	192	241	820
E-48	Seven Lakes	Well 1 (Condo 2/3)	369830	807823	140	225	707
E-49	USGS 263117082051002	L-2821	301085	796803	290	340	1,000
E-50	The Forest Country Club	Bear Well 2	373349	787528	180	250	943
E-51	USGS 262839081503100	L-735	380816	780278	223	270	420
E-52	USGS 264053081572501	L-4820	343752	855059	128	190	130
E-53	Cypress Woods RV Resort	1	398300	846200	180	250	41
E-54	USGS 263813081552801	L-2640	354287	837916	128	180	160
E-55	USGS 263819081585801	L-2701	335193	839169	175	206	70
E-56	Lee County Utilities	MH ASR#3 Corkscrew	424270	777778	285	347	77

bls = below land surface; mg/L = milligrams per liter; USGS = United States Geological Survey.

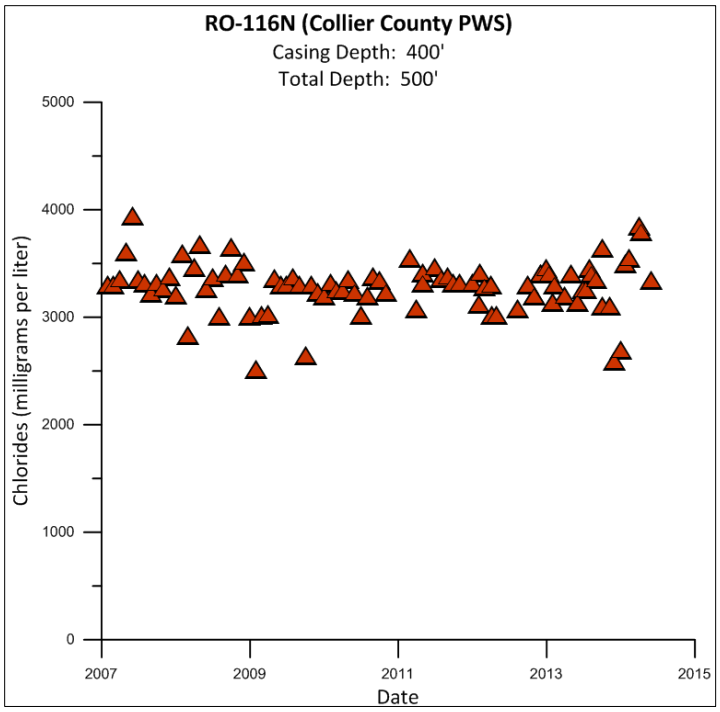
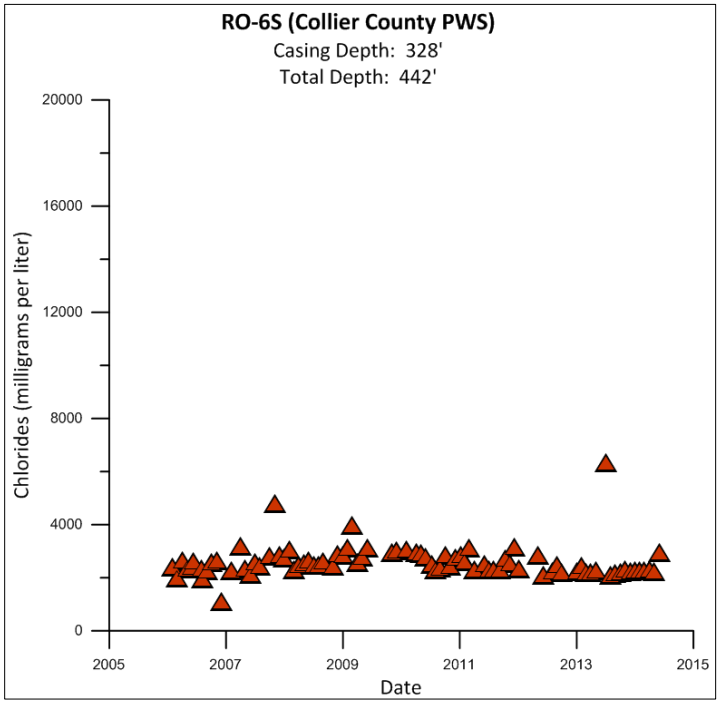


Figure E-42. Chloride levels at Collier County PWS well RO-116N.



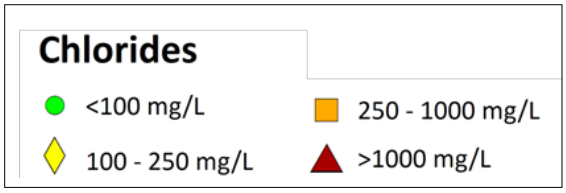


Figure E-43. Chloride levels at Collier County PWS well RO-6S.

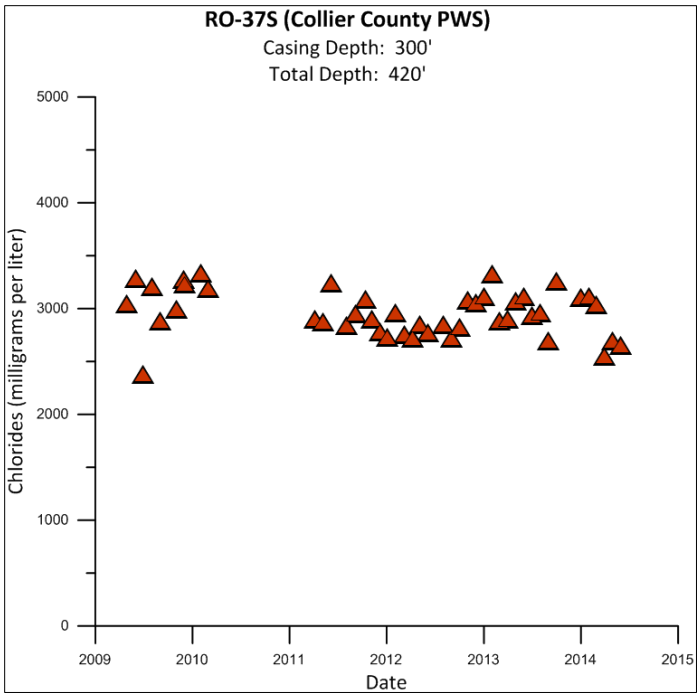


Figure E-44. Chloride levels at Collier County PWS well RO-37S.

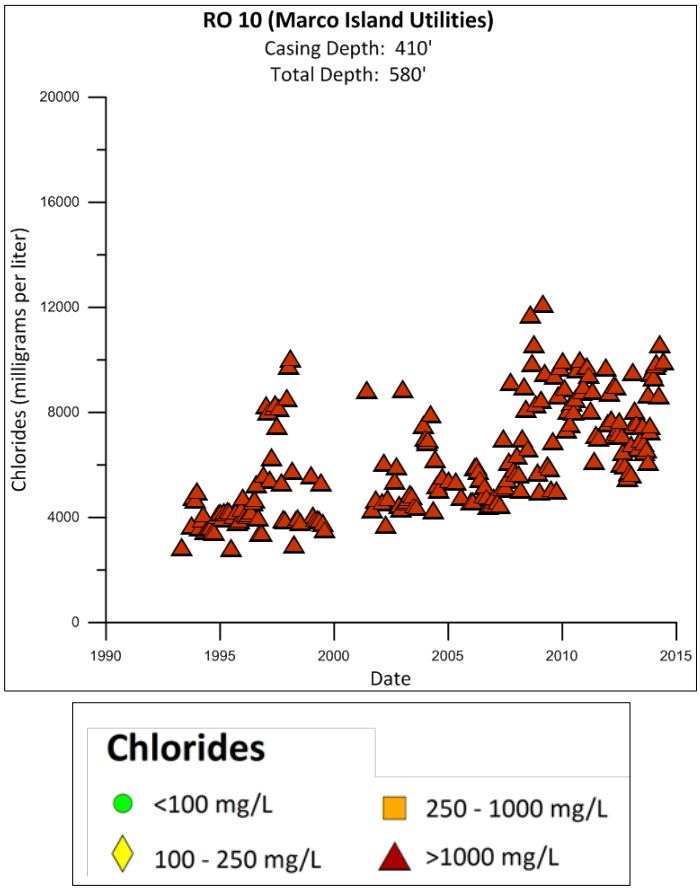


Figure E-45. Chloride levels at Marco Island Utilities well RO 10.

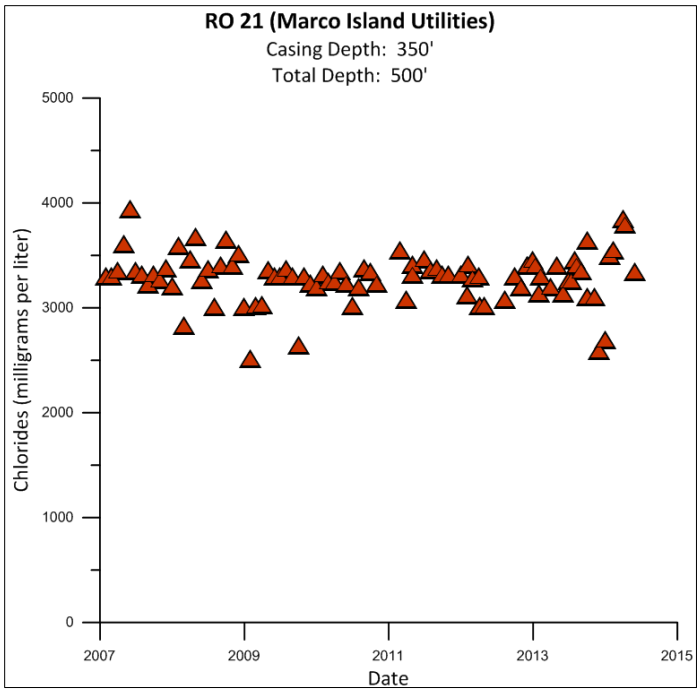


Figure E-46. Chloride levels at Marco Island Utilities well RO 21.

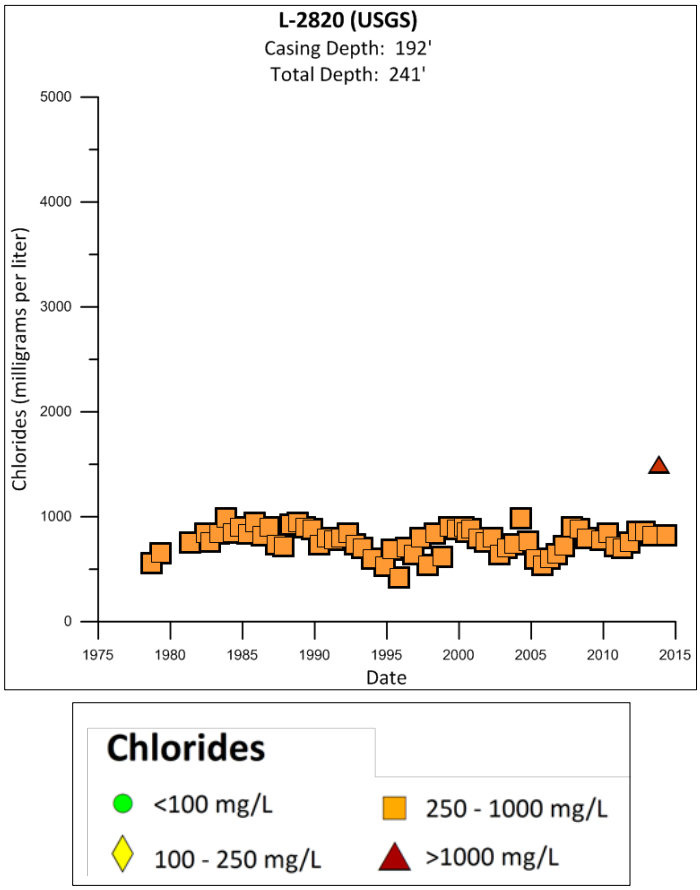


Figure E-47. Chloride levels at USGS well L-2820.

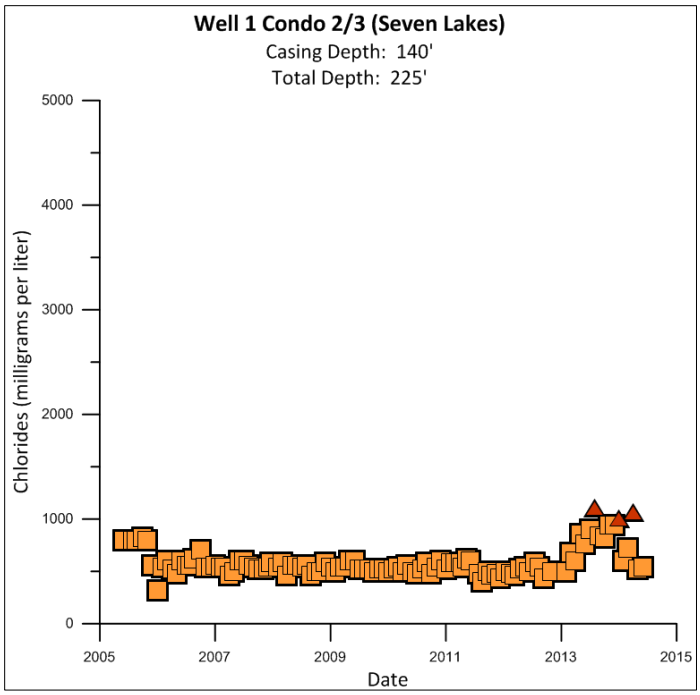


Figure E-48. Chloride levels at Seven Lakes well 1 Condo 2/3.

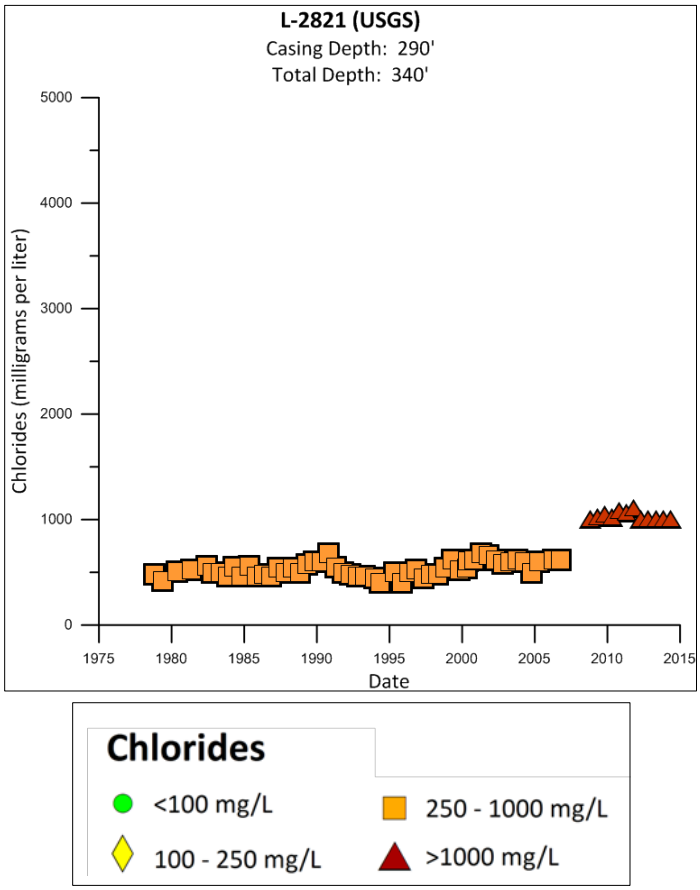


Figure E-49. Chloride levels at USGS well L-2821.

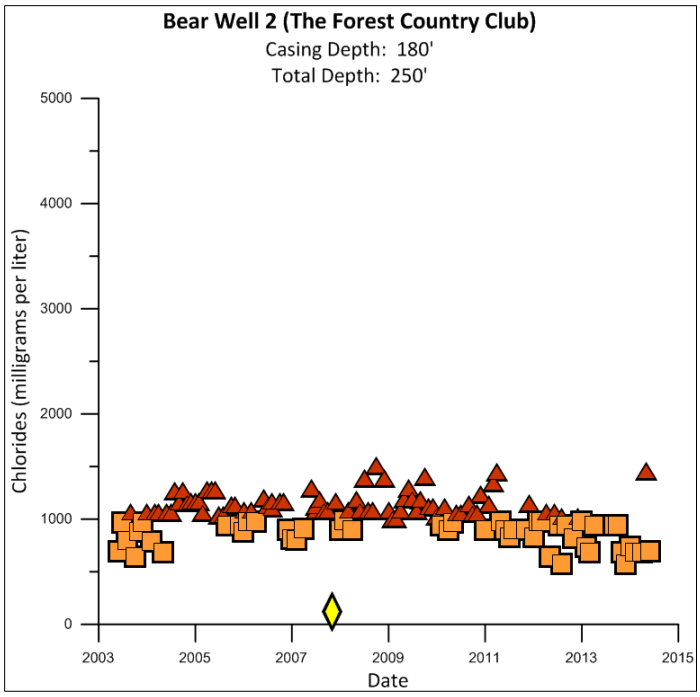


Figure E-50. Chloride levels at The Forest Country Club well Bear Well 2.

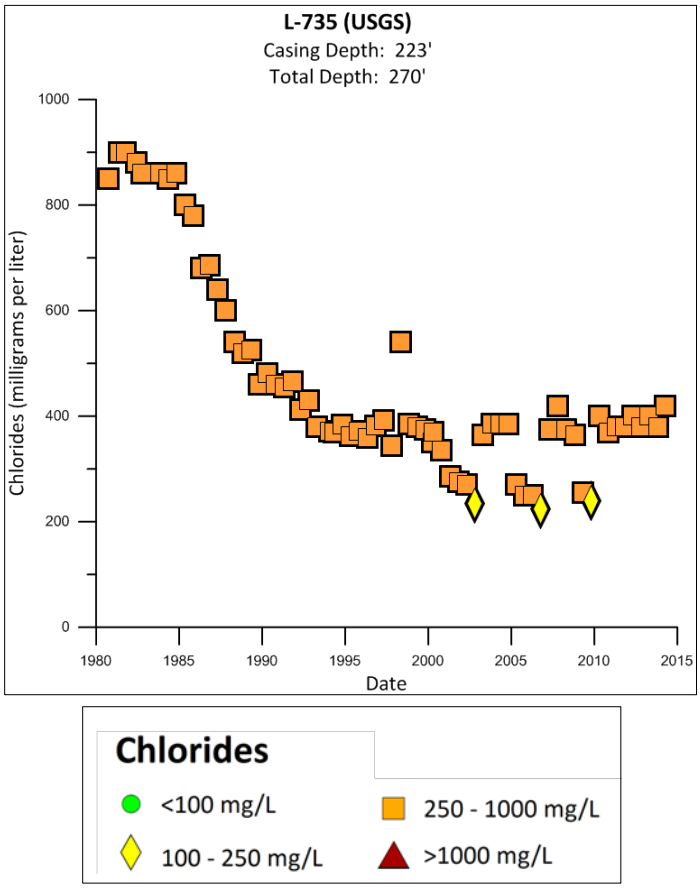


Figure E-51. Chloride levels at USGS well L-735.

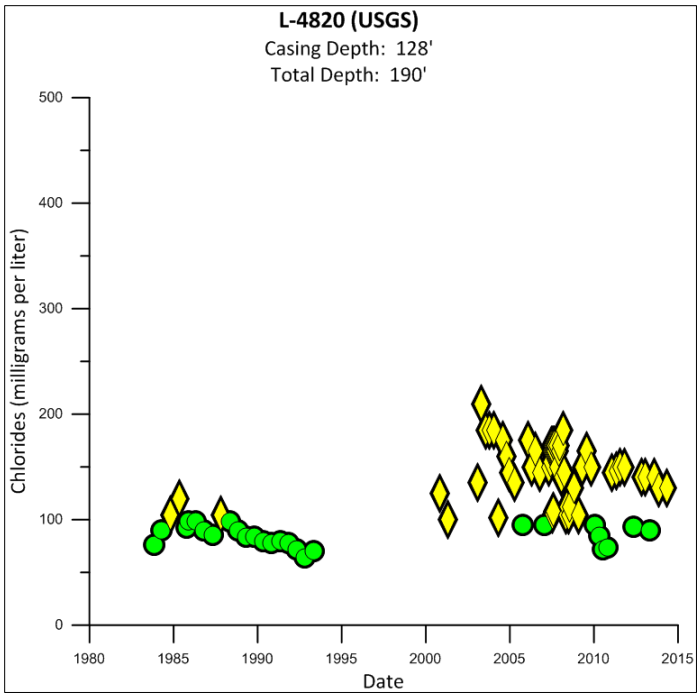


Figure E-52. Chloride levels at USGS well L-4820.

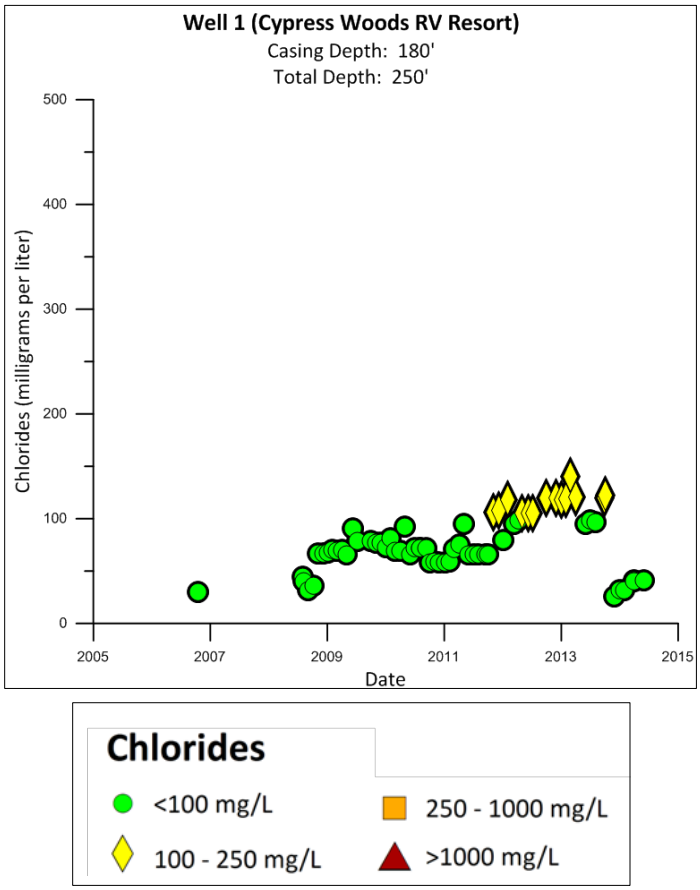


Figure E-53. Chloride levels at Cypress Woods RV Resort well 1.

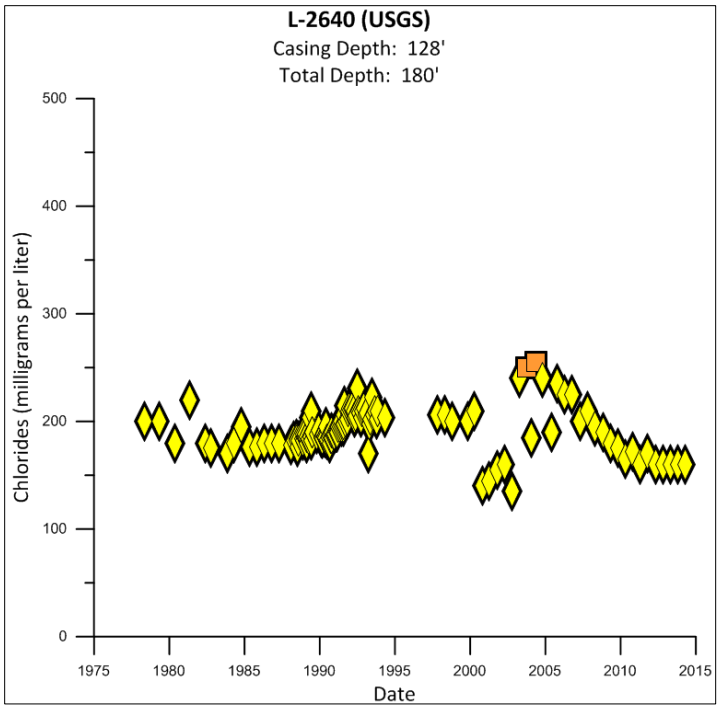


Figure E-54. Chloride levels at USGS well L-2640.

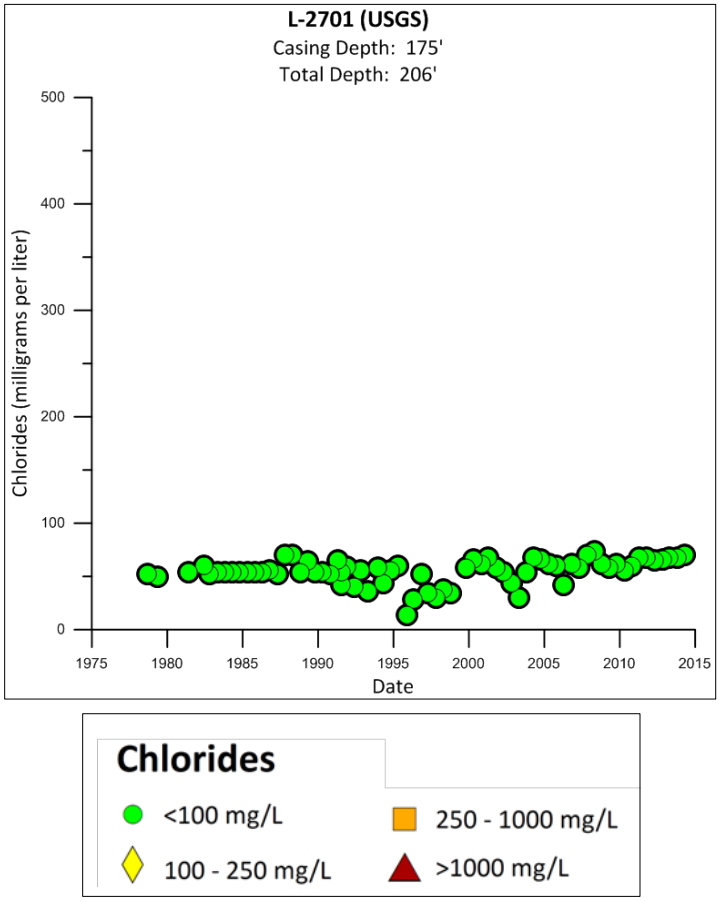


Figure E-55. Chloride levels at USGS well L-2701.

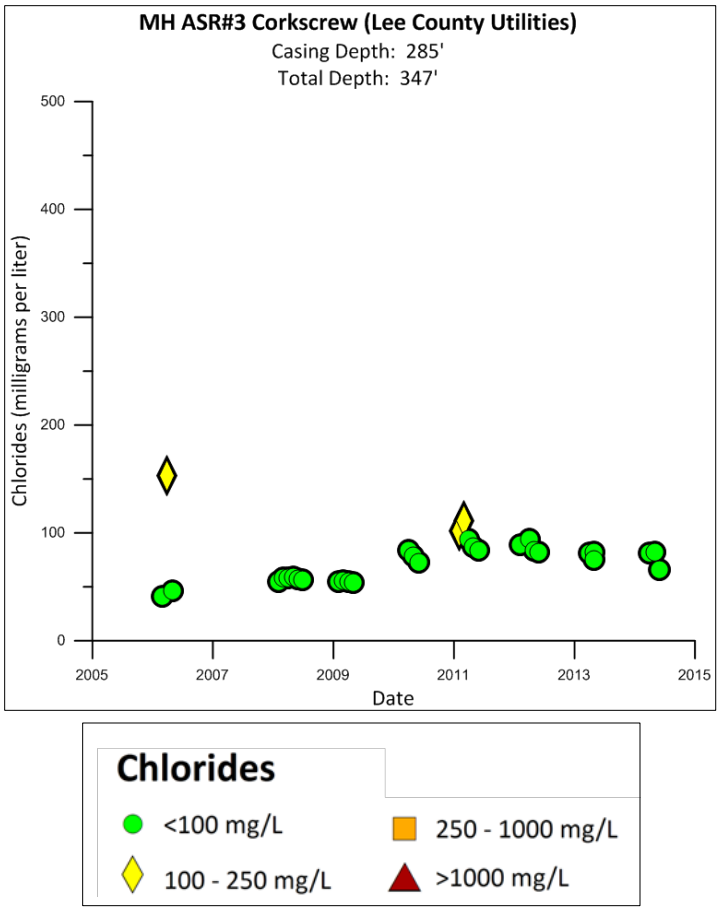


Figure E-56. Chloride levels at Lee County Utilities well MH ASR#3 Corkscrew.

UTILITIES AT RISK AND UTILITIES OF CONCERN

In 2007, the SFWMD evaluated and identified PWS utilities throughout the District that had supply sources vulnerable to saltwater intrusion during drought conditions (SFWMD 2007). The effort classified vulnerable PWS utilities into two groups: Utilities of Concern and Utilities at Risk. There was no formal definition for Surface Water Utilities of Concern in SFWMD (2007); therefore, all utilities that relied on surface water supplies were classified as "at risk" in 2007.

In 2015, the classifications were re-evaluated to reflect new data and source diversification projects undertaken by PWS utilities since 2007. The re-evaluation used 1) new maps of the estimated position of the saltwater interface in the surficial and intermediate aquifer systems (SAS and IAS) in Lee and Collier counties (provided earlier in this appendix); 2) information on new capital improvement projects implemented by PWS utilities; 3) hydrogeologic investigations published since 2007; and 4) performance of PWS utilities during drought conditions since 2007. Capital improvement projects that reduce a utility's vulnerability to drought conditions may warrant re-evaluation of Utility of Concern/Utility at Risk status. For the 2015 re-evaluation, the projects must be completed and operational since 2007; proposed projects for future development were not considered as they are not guaranteed.

Five PWS utilities in the LWC Planning Area were classified as Utilities at Risk or Utilities of Concern in 2007, and the classifications did not change during the 2015 re-evaluation.

Surface Water Utilities at Risk in the LWC Planning Area:

- Lee County (Olga)
- Marco Island (Marco Lakes)
- Cape Coral Utilities (IQ System)

Coastal Utilities of Concern in the LWC Planning Area:

- Bonita Springs Utilities
- City of Naples Utility Department

Definitions

Classification as a Utility of Concern or Utility at Risk depends on whether a utility has an alternate supply source that can be utilized if the vulnerable wellfield or water supply source becomes compromised. The classifications are defined as follows:

- **Surface Water Utilities of Concern** – Utilities that rely on surface water sources and have adequate supply provided by some combination of groundwater supplies, storage, alternative sources not threatened by drought, or interconnects with other utilities.
- **Surface Water Utilities at Risk** – Utilities that rely on surface water sources and do not have adequate supply provided by some combination of groundwater supplies, storage, alternative sources not threatened by drought, or interconnects with other utilities.

- **Coastal Utilities of Concern** – Utilities that have SAS or IAS wellfields near the saltwater interface but have adequate supply provided by some combination of an inland wellfield, alternative sources, or interconnects with other utilities.
- **Coastal Utilities at Risk** – Utilities with SAS or IAS wellfields near the saltwater interface that do not have an inland wellfield, have not developed alternative sources of water, or have limited ability to meet user needs through interconnects with other utilities.

Surface Water Utilities at Risk

Lee County Utilities (Olga)

Lee County Utilities operates the Olga Water Treatment Plant (WTP), which draws surface water from the C-43 Canal approximately 1 mile upstream of the S-79 water control structure (Franklin Lock and Dam). During severe droughts, the risk of saltwater reaching the Olga WTP intake rises as freshwater discharges from Lake Okeechobee to the canal are reduced.

Franklin Lock and Dam (S-79)

The primary drinking water standard for sodium (160 mg/L) and the secondary drinking water standard for chloride (250 mg/L) were exceeded at the Olga WTP during the severe 2007 drought (197 mg/L and 330 mg/L, respectively). Due to high sodium concentrations in net (finished) water, Lee County Utilities issued a health advisory for customers served by the Olga WTP system. Lee County Utilities (Olga) was classified as a Surface Water Utility at Risk in 2007 because of supply disruptions at the Olga WTP during drought conditions.

Lee County Utilities (Olga) remains a Surface Water Utility at Risk as it still depends on surface water supply from the C-43 Canal and has limited access to alternative sources at the Olga location.

Marco Island Utilities (Marco Lakes)

Marco Island Utilities operates two WTPs: the South Water Treatment Plant (SWTP) and the North Water Treatment Plant (NWTP). The SWTP is located on Marco Island and has a brackish wellfield developed in the Mid-Hawthorn aquifer using reverse osmosis (RO) treatment. The NWTP, also located on Marco Island, is supplied solely via an 8-mile pipeline extending to Marco Lakes on the mainland. Marco Lakes captures surface water from Henderson Creek, which is vulnerable to droughts. For this reason, Marco Island Utilities (Marco Lakes) was listed as a Surface Water Utility at Risk in 2007.

Marco Island Utilities (Marco Lakes) remains a Surface Water Utility at Risk because of the SWTP's dependence on Henderson Creek for supply.

Cape Coral Utilities (IQ System)

Cape Coral Utilities operates a dual water system utilizing two separate piping systems. One system distributes potable water and the other distributes nonpotable or irrigation quality (IQ) water. The potable water system is supplied by wellfields developed in the Floridan aquifer system (FAS) and treated by RO plants. Therefore, the potable system is less vulnerable to seasonal drought and was not classified as "at risk" or "of concern" in 2007 or 2015. The IQ water system is used primarily for landscape irrigation but also supports a portion of Cape Coral's fire hydrants. The IQ system is supplied from the utility's reclaimed water facilities and supplemented by the Cape Coral freshwater canal system when IQ water demand is more than the utility's reclaimed water facilities can produce.

Cape Coral Utilities (IQ System) was classified as a Surface Water Utility at Risk in 2007 because surface water supply source (i.e., canal water) is susceptible to seasonal drought. Since 2007, improvements have been made to the IQ system to reduce vulnerability to drought. Cape Coral's Canal Weirs Improvement Program added higher control elevations and operable weirs to store more fresh water in the freshwater canal system during wet conditions. These improvements added 1.7 mgd of new supply capacity to the IQ system. However, during times of severe drought, the canal system is still susceptible to extreme low water conditions that can render it incapable of providing water supply for fire protection. Cape Coral Utilities (IQ System) remains a Surface Water Utility at Risk.

Coastal Utilities of Concern

Bonita Springs Utilities

Bonita Springs Utilities was classified as a Coastal Utility of Concern in 2007 due to saltwater intrusion in the Lower Tamiami aquifer near the utility's West wellfield (**Figure E-57**). Bonita Springs Utilities also operates a second wellfield located approximately 2 miles farther inland, the East wellfield, that provides an alternative supply. The East wellfield allows for operational flexibility to shift groundwater withdrawals away from the coast during drought conditions. In addition, the utility operates the Bonita Springs Utilities Reverse Osmosis WTP, which draws on the Upper Floridan aquifer (Lower Hawthorn and Suwannee formations). The RO facility and the East wellfield provide water supply alternatives for the West wellfield, which is why Bonita Springs Utilities was classified as "of concern" rather than "at risk" in 2007.

Bonita Springs Utilities remains a Coastal Utility of Concern. The Lower Tamiami aquifer, especially near the West wellfield, is vulnerable to saltwater intrusion. The utility's alternative supplies (i.e., the East wellfield and the Bonita Springs Utilities Reverse Osmosis WTP) are still in place. Based on the availability of these alternate supplies, Bonita Springs Utilities remains classified as "of concern" rather than "at risk".

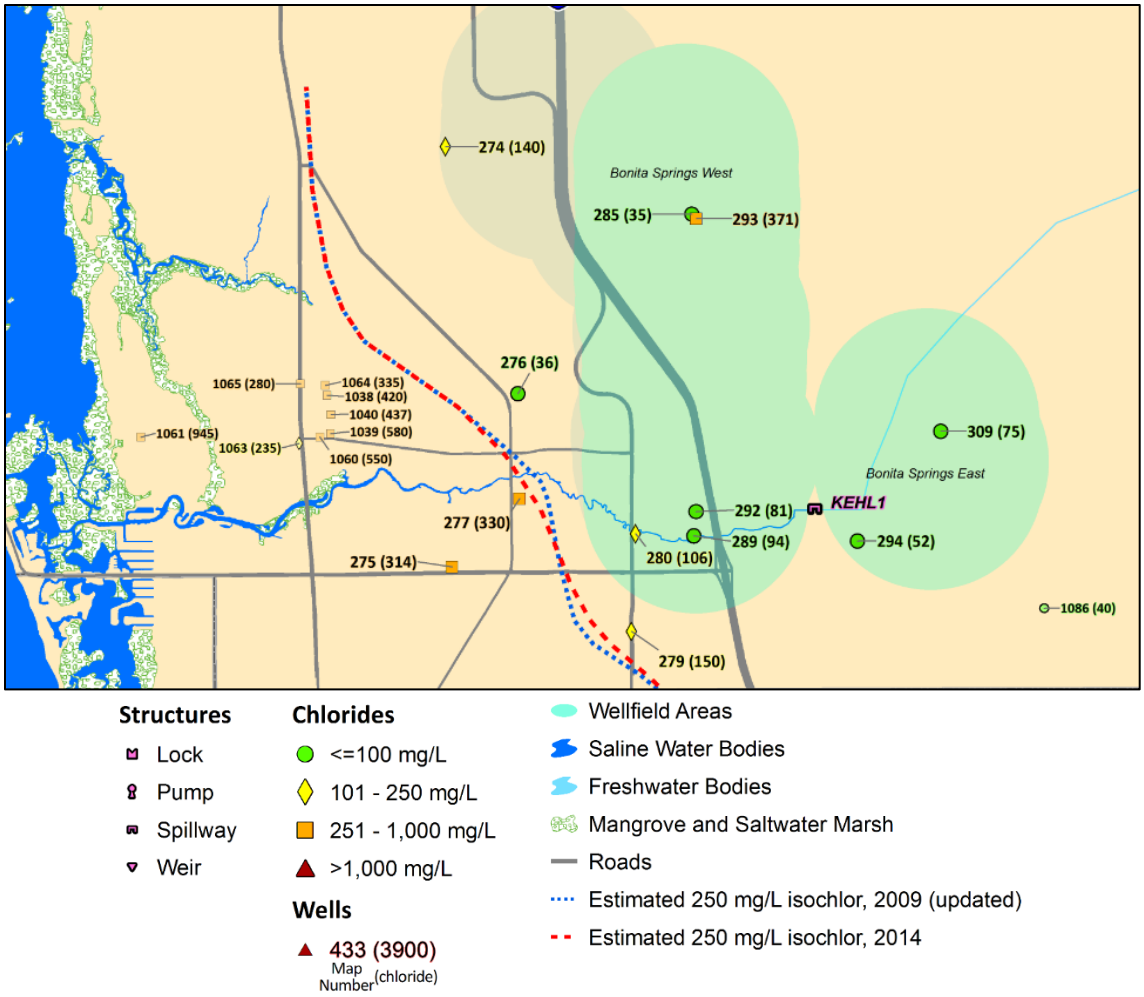


Figure E-57. Saltwater intrusion (250 mg/L isochlor) in the Lower Tamiami aquifer in 2009 and 2014 near Bonita Springs Utilities' West and East wellfields.

City of Naples Utility Department

The City of Naples Utility Department maintains two wellfields, both of which are developed in the Lower Tamiami aquifer: Coastal Ridge and East Golden Gate. The City of Naples Utility Department was classified as a Coastal Utility of Concern in 2007 due to the proximity of the Coastal Ridge wellfield to the Gulf of Mexico and its related potential for saltwater intrusion. The East Golden Gate wellfield is located farther inland and provides an alternative supply for the Coastal Ridge wellfield, which is why the City of Naples Utility Department was classified as "of concern" rather than "at risk".

The City of Naples Utility Department remains a Coastal Utility of Concern because its potable supply is derived from the Lower Tamiami aquifer, which is vulnerable to saltwater intrusion. The city's Coastal Ridge wellfield is located near the Gulf of Mexico and its production zone (i.e., the Lower Tamiami aquifer) is between aquifers intruded by saltwater (the Water Table and Mid-Hawthorn aquifers). In addition, the 250 mg/L isochlor is located inside some areas of the Coastal Ridge wellfield's zone of influence (**Figure E-58**). The utility is not considered "at risk" because alternate supply is available from the East Golden Gate wellfield, which typically accounts for more than 70 percent of the utility's total supply.

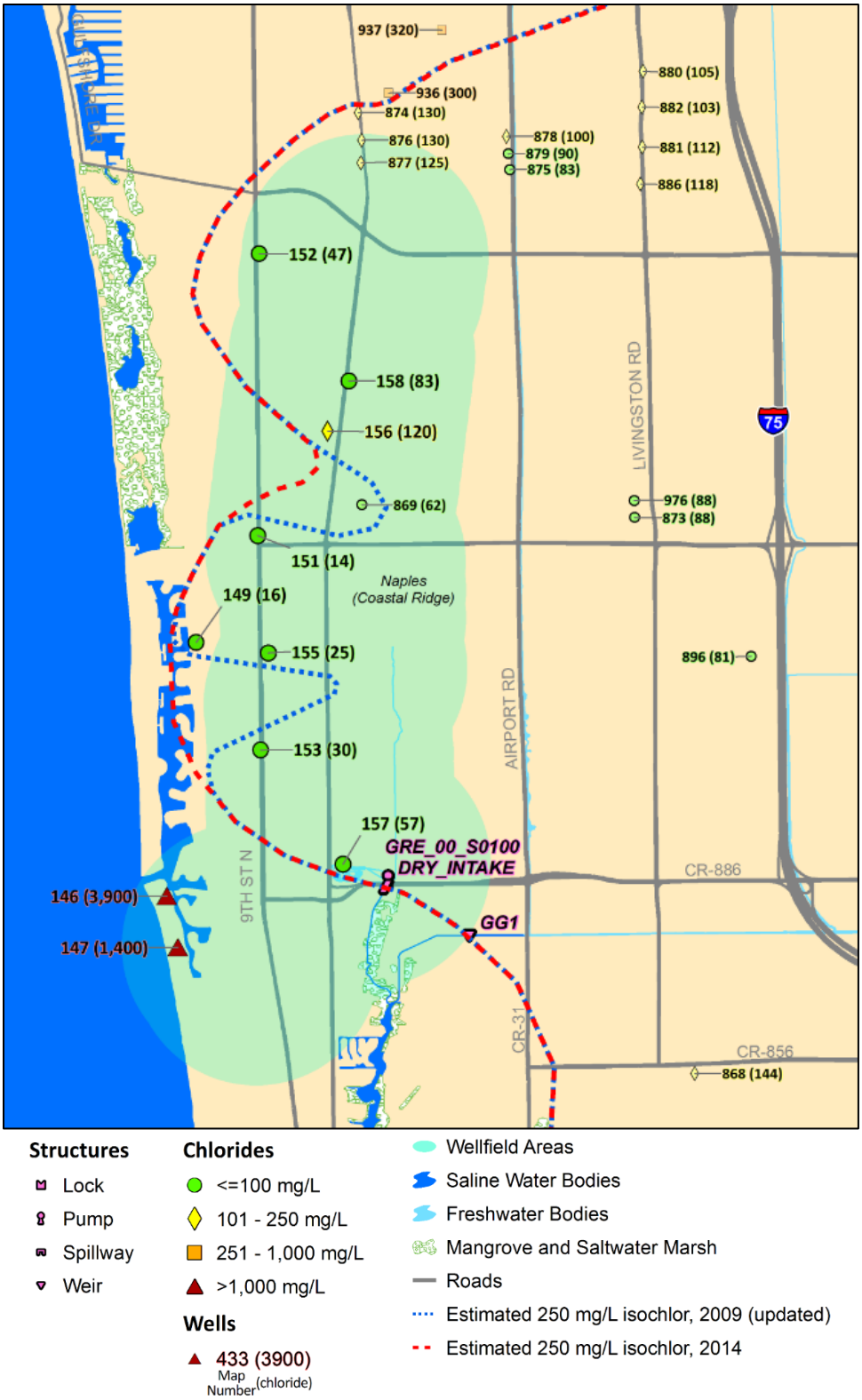


Figure E-58. Saltwater intrusion isochlor in Lower Tamiami aquifer in 2009 and 2014 near City of Naples Utility Department's Coastal Ridge Wellfield.

REFERENCES

SFWMD. 2007. *Utilities of Concern in the Lower West Coast Region*. South Florida Water Management District, West Palm Beach, FL.

F

Public Water Supply Utility Summaries

This appendix includes utility summaries for the Public Water Supply (PWS) utilities that provide 0.1 million or greater gallons per day (mgd) of net (finished) potable water for the Lower West Coast (LWC) Planning Area. In 2014, South Florida Water Management District (SFWMD or District) staff updated the utility summaries by querying the Florida Department of Environmental Protection (FDEP) website for drinking water and reclaimed water capacity (FDEP 2015). In addition, the proposed projects were updated with information supplied to the SFWMD in the statute-required November 2014 utility reports and from direct contact with the utilities in 2014 through 2017. A sample table with descriptions of the information that can be found in the utility profiles is provided on the following pages.

Potential future water conservation savings are not included in the following utility summaries. Chapter 3 of this plan update addresses conservation and potential water savings.

INFO ⓘ

Acronyms and Abbreviations

ASR – aquifer storage and recovery

FAS – Floridan aquifer system

FDEP – Florida Department of Environmental Protection

IAS – intermediate aquifer system

IQ – irrigation quality

mgd – million gallons per day

RIB – rapid infiltration basin

RO – reverse osmosis

SAS – surficial aquifer system

WTP – water treatment plant

WWTF – wastewater treatment facility

SAMPLE UTILITY COMPANY

Service Area: Sample city and portions of unincorporated county.

Bulk Water: If the utility sells or purchases bulk water this information is listed.

Description: This description includes water sources, type of WTPs, and other issues of concern to the utility. If the utility produces reclaimed water, information regarding the quantity and customers may be included.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	100,000	110,000	120,000	130,000
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	100			
Potable Water Demands (daily average annual finished water in mgd)	**10.00**	**11.00**	**12.00**	**13.00**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 12-34567-W (expires 2040)			
Surface Water	2.00			
Surficial Aquifer System	14.00			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.00			
Total Allocation	**16.00**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID# 1234567)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System/Surface Water	18.00	18.00	18.00	18.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	2.00	3.00	3.00
Total Potable Capacity	**18.00**	**20.00**	**21.00**	**21.00**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	1.00	1.00	4.00	4.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
2.00 mgd expansion of Floridan RO treatment plant	FAS	2019	$14.00	2.00	2.00	2.00
Floridan wells and RO treatment plant expansion	FAS	2029	$4.00	0.00	1.00	1.00
Total Potable Water			**$18.00**	**2.00**	**3.00**	**3.00**
Nonpotable Water						
3.00 mgd Reclaimed Water Facility	Reclaimed	2021	$5.00	0.00	3.00	3.00
ASR and Irrigation Supply	Stormwater	2022	$2.00	0.00	1.00	1.00
Total Nonpotable Water			**$7.00**	**0.00**	**4.00**	**4.00**
Total New Water			**$25.00**	**2.00**	**7.00**	**7.00**

1 **Population** – The 2014 populations were determined by assigning 2010 U.S. Census block data to 2014 PWS utility service areas. The 2020 and 2030 population projections were linear interpolations from the 2010 Census. To project 2040 populations, the relative growth rates for PWS utility service areas were developed county population projections (see Appendix B for more information).

2 **Average 2010-2014 Per Capita** (gallons per day [gpd] finished water) – A PWS utility's per capita is calculated by dividing total net (finished) water produced each year (from monthly operating reports submitted by utilities to FDEP) by the utility's permanent population for that year. Each utility's per capita was calculated for 2010 to 2014, then averaged over the 5 years.

3 **Potable Water Demands** (daily average annual finished water in mgd) **–** The 2014 demand was calculated using the PWS utility's average 2010-2014 per capita multiplied by the 2014 service area population. The projected demands for 2020 to 2040 were calculated using the utility's average 2010-2014 per capita multiplied by the utility's projected populations for those years.

4 **Allocation from the Water Use Permit** – The total allocation is composed of gross (raw) surface water and groundwater (from the SAS, IAS, and FAS) allocations as described in the permit. The 2014 allocation is assumed to continue through 2040 unless noted otherwise.

5 **Total Allocation** – The total gross (raw) water allocation in the water use permit. For utilities with multiple sources, total allocation may be less than the sum of the individual source allocations; this is indicated in the appropriate profiles.

6 **FDEP Permitted Capacity** – The total net (finished) water capacity of the WTPs as provided by the FDEP (2015). The capacity is split into the capacity available to process water from surface water as well as the SAS, IAS, and FAS.

7 **Planned Project Capacity** – The net (finished) water volumes created by projects listed in the Project Summary (Item 10). Project capacity to be completed by 2020 is shown in the 2020 column, capacity to be completed between 2021 and 2030 is in the 2030 column, and capacity to be completed between 2031 and 2040 is in the 2040 column.

8 **Total Capacity** – The existing net (finished) water capacity of the WTPs owned/operated by the utility in addition to the volumes of net (finished) water produced by future planned projects.

9 **Reclaimed Water** – The capacity of the WWTF(s) to produce reclaimed water as listed on the FDEP website as of 2014 (FDEP 2015). Additional capacity is from projects planned by the utility. These projects are listed under Item 12.

10 **Project Summary** – A description of the potable water supply projects the utility is proposing to construct. Only projects that produce additional potable water (e.g., wells, WTPs) are included; maintenance or replacement projects are not included. Each project has a water source, anticipated completion date, estimated total capital cost, and projected volume of treatment capacity. Proposed projects have been screened at a planning level but must meet permit issuance criteria.

11 **Total Projected Cumulative Design Capacity for 2020, 2030, or 2040** – The total volume of potable water supply projects expected to be completed by 2020, 2030, and 2040, respectively. The totals are added to the appropriate projected capacities in Item 7.

12 **Nonpotable Projects Summary** – A description of the nonpotable water supply projects the utility is proposing to construct. Only projects that produce additional nonpotable water are included; maintenance or replacement projects are not included. Each project has a water source, anticipated completion date, estimated total capital cost, and projected volume of treatment capacity.

13 **Total Projected Cumulative Design Capacity for Nonpotable 2020, 2030, or 2040** – The total volume of nonpotable water projects expected to be completed by 2020, 2030, and 2040, respectively. If the project provides reclaimed water, totals are added to the appropriate projected capacities in Item 9.

14 **Total Projected Cumulative Design Capacity for New Water 2020, 2030, or 2040** – The total projected cost and capacity of potable and nonpotable water supply projects the utility is proposing to construct between 2014 and 2040.

TOWN AND COUNTRY UTILITIES COMPANY

Service Area: Unincorporated Charlotte County in the Babcock Ranch Special Development District.

Description: Potable water supplies will come from wells completed in the Sandstone aquifer and will be treated at a nanofiltration plant. Reject water will be directed to a WWTF, where it will be combined with effluent and converted to reclaimed water as an irrigation source.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	72	5,358	15,929	26,500
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	100			
Potable Water Demands (daily average annual finished water in mgd)	**0.00**	**0.54**	**1.59**	**2.65**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 08-00122-W (expires 2020)
Surficial Aquifer System	0.00
Intermediate Aquifer System	0.78
Floridan Aquifer System	0.00
Total Allocation	**0.78**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5084116)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.25	1.25	4.00	4.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.25**	**1.25**	**4.00**	**4.00**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.20	0.20	3.50	3.50

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
1.00 mgd expansion of WTP from 0.25 to 1.25 mgd	IAS	2018	$7.00	1.00	1.00	1.00
1.25 mgd expansion of WTP from 1.25 to 2.50 mgd	IAS	2021	$1.25	0.00	1.25	1.25
1.50 mgd expansion of WTP from 2.50 to 4.00 mgd	IAS	2026	$1.10	0.00	1.50	1.50
Total Potable Water			**$9.35**	**1.00**	**3.75**	**3.75**
Nonpotable Water						
0.80 mgd expansion of WWTF from 0.20 to 1.00 mgd	Reclaimed	2021	$6.00	0.00	0.80	0.80
1.00 mgd expansion of WWTF from 1.00 to 2.00 mgd	Reclaimed	2026	$8.00	0.00	1.00	1.00
1.50 mgd expansion of WWTF from 2.00 to 3.50 mgd	Reclaimed	2029	$12.00	0.00	1.50	1.50
Total Nonpotable Water			**$26.00**	**0.00**	**3.30**	**3.30**
Total New Water			**$35.35**	**1.00**	**7.05**	**7.05**

AVE MARIA UTILITY COMPANY

Service Area: Portion of unincorporated Collier County.

Description: Potable water supplies come from wells completed in the Lower Tamiami and Sandstone aquifers. Groundwater is treated at a membrane softening plant, which also provides water to the university air conditioning water chiller system. The utility WWTF converts all wastewater flows to reclaimed water that is used for irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	3,532	7,078	13,002	18,710
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	91			
Potable Water Demands (daily average annual finished water in mgd)	**0.32**	**0.64**	**1.18**	**1.70**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 11-02298-W (expires 2020)			
Surficial Aquifer System	0.81			
Intermediated Aquifer System	0.81			
Floridan Aquifer System	0.00			
Total Allocation	**1.16***			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5114154)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	1.00	1.00	1.00	1.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	2.50	2.50
Total Potable Capacity	**1.00**	**1.00**	**3.50**	**3.50**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.90	0.90	3.40	3.40

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Lower Tamiami wells and 2.50 mgd RO treatment plant	SAS	2025	$6.30	0.00	2.50	2.50
Total Potable Water			**$6.30**	**0.00**	**2.50**	**2.50**
Nonpotable Water						
Phased expansion of reclamation plant	Reclaimed	2024	$2.04	0.00	2.50	2.50
Total Nonpotable Water			**$2.04**	**0.00**	**2.50**	**2.50**
Total New Water			**$8.34**	**0.00**	**5.00**	**5.00**

* The total allocation is less than the sum because of the limits on each of the sources.

COLLIER COUNTY WATER-SEWER DISTRICT

Service Area: Portions of unincorporated Collier County, including Goodland, Golden Gate Estates, and Orange Tree areas; and a portion of the City of Naples.

Description: Potable water is obtained from wells completed in the Lower Tamiami, Mid-Hawthorn, and Lower Hawthorn aquifers. Approximately 50 percent of the groundwater supply is fresh and the other 50 percent is brackish. The wells are arrayed into three wellfields that provide water to two WTPs (North County Regional and South County Regional).

Bulk Water: Provides potable water to Marco Shores in the City of Marco Island and receives potable water from Marco Island Utilities for unincorporated Key Marco and Goodland.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	176,560	204,905*	238,694*	268,403*
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	129			
Potable Water Demands (daily average annual finished water in mgd)	**23.31***	**26.43***	**30.79***	**34.62***
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 11-00249-W (expires 2036)			
Surficial Aquifer System	26.50			
Intermediate Aquifer System	16.00			
Floridan Aquifer System	19.52			
Total Allocation	**55.53****			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5114069)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	32.00	32.00	34.50	34.50
Intermediate Aquifer System	0.00	1.00	1.00	1.00
Floridan Aquifer System	20.00	20.00	23.00	23.00
Total Potable Capacity	**52.00**	**53.00**	**58.50**	**58.50**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	40.10	40.10	44.60	44.60

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
NRO Well 109	IAS	2016	$0.40	1.00	1.00	1.00
NE Floridan wells and RO treatment plant	FAS	2033	$60.00	0.00	0.00	3.00
NE traditional source and treatment plant	SAS	2033	$30.00	0.00	0.00	2.50
Total Potable Water			**$90.40**	**1.00**	**1.00**	**6.50**
Nonpotable Water						
Livingston Rd ASR 3-5	Reclaimed	2021	$15.00	0.00	4.50	4.50
SCWRF IQ Supplement	Surface Water	2016	$10.00	2.00	2.00	2.00
Total Nonpotable Water			**$25.00**	**2.00**	**6.50**	**6.50**
Total New Water			**$115.40**	**3.00**	**7.50**	**13.00**

* Collier County Water-Sewer District agreed in January 2017 to incorporate Orange Tree Utility into its utility system. Future populations and demands within the former Orange Tree service area have been added to this utility profile. The 2014 finished demand is based on Collier County Water-Sewer District's 2014 per capita use rate of 132, which does not include Orange Tree Utility's per capita use rate.

** The total allocation is less than the sum because of the limits on each of the sources.

EVERGLADES CITY

Service Area: Everglades City and portions of unincorporated Collier County serving Chokoloskee Island, Plantation Island, and Seaboard Village in Copeland.

Description: Potable water supplies are obtained from wells completed in the SAS and are projected to remain the same in the future. The WTP is in Copeland and consists of chlorination and aeration. Finished water is conveyed 7 miles to the city. The utility reuses its wastewater via RIB.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	989	1,036	1,094	1,134
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	240			
Potable Water Demands (daily average annual finished water in mgd)	**0.24**	**0.25**	**0.26**	**0.27**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 11-00160-W (expires 2017)
Surficial Aquifer System	0.25
Intermediate Aquifer System	0.00
Floridan Aquifer System	0.00
Total Allocation	**0.25**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5110089)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.50	0.50	0.50	0.50
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.50**	**0.50**	**0.50**	**0.50**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.20	0.20	0.20	0.20

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

FLORIDA GOVERNMENTAL UTILITY AUTHORITY – GOLDEN GATE

Service Area: Portion of unincorporated Collier County serving Golden Gate.

Description: Potable water supplies come from wells completed in the Water Table and Lower Tamiami aquifers. Future supplies are anticipated to come from the FAS. The utility uses lime softening and RO processes to treat the groundwater at the WTP. The utility reuses approximately 40 percent of its wastewater through a spray field.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	9,915	10,177	10,405	10,453
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	139			
Potable Water Demands (daily average annual finished water in mgd)	**1.38**	**1.41**	**1.45**	**1.45**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 11-00148-W (expires 2030)			
Surficial Aquifer System	2.49			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.00			
Total Allocation	**2.49**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5110117)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	2.10	2.10	2.10	2.10
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**2.10**	**2.10**	**2.10**	**2.10**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	1.50	1.50	1.50	1.50

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

IMMOKALEE WATER AND SEWER

Service Area: Portions of unincorporated Collier County serving Immokalee.

Description: Potable water supply comes from fresh groundwater obtained from wells completed in the Lower Tamiami aquifer. Three groundwater wellfields provide water to three WTPs that use aeration and chlorination for treatment. Future supplies are anticipated to come from wells completed in the FAS. The utility reuses approximately 30 percent of its wastewater flows; future plans include construction of an expanded reclaimed water system.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	23,906	24,945	26,184	26,971
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	85			
Potable Water Demands (daily average annual finished water in mgd)	**2.03**	**2.12**	**2.23**	**2.29**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 11-00013-W (expires 2031)			
Surficial Aquifer System	3.45			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.70			
Total Allocation	**4.15**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5110142)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	5.60	5.60	5.60	5.60
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	2.50	2.50
Total Potable Capacity	**5.60**	**5.60**	**8.10**	**8.10**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	2.50	5.50	5.50	5.50

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
2.50 mgd reverse osmosis WTP	FAS	2022	$10.00	0.00	2.50	2.50
Total Potable Water			**$10.00**	**0.00**	**2.50**	**2.50**
Nonpotable Water						
3.00 mgd Reclaimed Water Facility	Reclaimed	2020	$2.00	3.00	3.00	3.00
Total Nonpotable Water			**$2.00**	**3.00**	**3.00**	**3.00**
Total New Water			**$12.00**	**3.00**	**5.50**	**5.50**

MARCO ISLAND UTILITIES

Service Area: City of Marco Island and a portion of unincorporated Collier County serving Goodland.

Bulk Water: Provides potable water to unincorporated Goodland and Key Marco in Collier County. Receives potable water from Collier County Water-Sewer District to serve Marco Shores.

Description: Potable water is obtained from wells constructed on the island, completed in the Mid-Hawthorn aquifer. The groundwater is brackish and treated by RO at two WTPs (North and South). Fresh water is captured on the mainland from Henderson Creek and stored in seven ASR wells completed in the Lower Hawthorn aquifer. Water recovered from the ASR wells is conveyed through a pipeline to the WTPs on the island. The utility reuses approximately 80 percent of its wastewater by public access irrigation and RIBs.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population*	17,157	17,952	18,925	19,571
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	386			
Potable Water Demands (daily average annual finished water in mgd)	**6.62**	**6.93**	**7.31**	**7.55**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 11-00080-W (expires 2037)
Surficial Aquifer System	0.00
Intermediate Aquifer System	3.62
Marco Lakes Service Area – Surface Water	5.39
Marco Lakes Service Area – Floridan Aquifer System ASR Wells	4.15
Total Allocation	**13.16**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5110183)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	6.00	6.00	6.00	6.00
Surface Water	6.67	6.67	6.67	6.67
Total Potable Capacity	**12.67**	**12.67**	**12.67**	**12.67**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	5.22	5.22	5.22	5.22

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

* Does not include seasonal population.

CITY OF NAPLES UTILITY DEPARTMENT

Service Area: City of Naples and a portion of Collier County serving unincorporated East Naples.

Description: Potable water is obtained from the Lower Tamiami and Surficial aquifers by wells arrayed into two wellfields (Coastal Ridge and East Golden Gate). The treatment process is lime softening coupled with chlorination. The utility maintains emergency interconnections with Collier County Water-Sewer District. All wastewater is reclaimed and supplemented by surface water from the Golden Gate Canal. Storage to the reclaimed water system is provided by four ASR wells.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	51,070	55,800	62,692	68,510
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	207*			
Potable Water Demands (daily average annual finished water in mgd)	**14.35**	**15.68**	**17.62**	**19.25**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 11-00017-W (expires 2030)
Surficial Aquifer System	18.42
Intermediate Aquifer System	0.00
Floridan Aquifer System	0.00
Total Allocation	**18.42**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5110198)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	30.00	30.00	30.00	30.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**30.00**	**30.00**	**30.00**	**30.00**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	10.00	10.20	10.20	10.20

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
Phase IV Reclaimed Water System Expansion	Reclaimed	2016	$2.90	0.20	0.20	0.20
Total Nonpotable Water			**$2.90**	**0.20**	**0.20**	**0.20**
Total New Water			**$2.90**	**0.20**	**0.20**	**0.20**

* Estimated per capita rate of the permanent residential population. An operative per capita rate of 281 (including the effect of seasonal fluctuations) was utilized for the future demand projections.

ORANGE TREE UTILITY COMPANY

Service Area: Portion of unincorporated Collier County serving Orange Tree.

Description: Potable water supplies are obtained from the Lower Tamiami aquifer. In January 2017, this utility agreed to be integrated into the Collier County Water-Sewer District service area. All future population projections and demands have been included in Collier County Water Sewer-District's profile.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	6,033	0.00	0.00	0.00
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	57			
Potable Water Demands (daily average annual finished water in mgd)	**0.34**	**0.00**	**0.00**	**0.00**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 11-00419-W (expires 2018)			
Surficial Aquifer System	0.91			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.00			
Total Allocation	**0.91**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5114085)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.75	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.75**	**0.00**	**0.00**	**0.00**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.00	0.00	0.00	0.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

PORT OF THE ISLANDS COMMUNITY IMPROVEMENT DISTRICT

Service Area: Portion of unincorporated Collier County serving the Port of the Islands.

Description: Potable water is obtained by wells completed in the SAS and water treatment is provided by nanofiltration. This utility reuses its wastewater via a reclamation system that provides public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	576	599	626	641
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	142			
Potable Water Demands (daily average annual finished water in mgd)	**0.08**	**0.09**	**0.09**	**0.09**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 11-00372-W (expires 2029)			
Surficial Aquifer System	0.55			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.00			
Total Allocation	**0.55**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5110230)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.44	0.44	0.44	0.44
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.44**	**0.44**	**0.44**	**0.44**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.20	0.20	0.20	0.20

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

MOORE HAVEN UTILITIES

Service Area: City of Moore Haven and unincorporated Glades County.

Description: Potable water supplies are obtained from wells completed in the Lower Tamiami aquifer. Water treatment is provided by the enhanced coagulation and chloramine processes.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	3,202	3,243	3,274	3,251
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	153			
Potable Water Demands (daily average annual finished water in mgd)	**0.49**	**0.50**	**0.50**	**0.50**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 22-00045-W (expires 2028)
Surficial Aquifer System	0.89
Intermediate Aquifer System	0.00
Floridan Aquifer System	0.00
Total Allocation	**0.89**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5220192)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.96	0.96	0.96	0.96
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.96**	**0.96**	**0.96**	**0.96**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.20	0.20	0.20	0.20

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

SILVER LAKE UTILITIES, INC.

Service Area: Unincorporated Glades County.

Description: The water treatment system has not been constructed yet. Potable water supplies will be obtained from wells completed in the IAS. Water treatment will be provided by RO.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population (based on water use permit)	0	527	1,449	1,449
Anticipated Per Capita (gallons per day [gpd] finished water)	147			
Potable Water Demands (daily average annual finished water in mgd)	**0.00**	**0.08**	**0.21**	**0.21**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 22-00497-W (expires 2021)
Surficial Aquifer System	0.00
Intermediate Aquifer System	0.10
Floridan Aquifer System	0.00
Total Allocation	**0.10**

FDEP Potable Water Treatment Capacity (mgd)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.00	0.00	0.00	0.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CLEWISTON UTILITIES

Service Area: City of Clewiston and portions of unincorporated Hendry and Glades counties.

Bulk Water: Provides water to South Shore Water Association.

Description: Potable water is provided from wells completed in the FAS. Water treatment is through RO. The utility reuses approximately 90 percent of its wastewater through spray irrigation and RIBs.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	14,417	14,574	14,696	14,634
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	106			
Potable Water Demands (daily average annual finished water in mgd)	**1.53**	**1.54**	**1.56**	**1.55**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 26-00769-W (expires 2025)			
Surficial Aquifer System	0.00			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	2.58			
Total Allocation	**2.58**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5260053)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	3.00	3.00	3.00	3.00
Total Potable Capacity	**3.00**	**3.00**	**3.00**	**3.00**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	1.50	1.50	1.50	1.50

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF LABELLE DEPARTMENT OF PUBLIC WORKS

Service Area: City of LaBelle and a portion of unincorporated Hendry County.

Description: Potable water is obtained from wells completed in the Water Table aquifer and the FAS. Fresh groundwater is treated using nanofiltration, and brackish groundwater is treated using RO. The utility reuses all of its wastewater through RIBs.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	6,248	6,322	6,386	6,371
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	87			
Potable Water Demands (daily average annual finished water in mgd)	**0.54**	**0.55**	**0.56**	**0.55**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 26-00105-W (expires 2031)			
Surficial Aquifer System	0.13			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.92			
Total Allocation	**1.06**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5260050)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	1.00	1.00	1.00	1.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	1.50	1.50	1.50	1.50
Total Potable Capacity	**2.50**	**2.50**	**2.50**	**2.50**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.75	1.50	1.50	1.50

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
WWTF Expansion	Reclaimed	2016	$1.80	0.75	0.75	0.75
Total Nonpotable Water			**$1.80**	**0.75**	**0.75**	**0.75**
Total New Water			**$1.80**	**0.75**	**0.75**	**0.75**

PORT LABELLE UTILITY SYSTEM

Service Area: Portions of unincorporated Hendry and Glades counties.

Description: Potable water is obtained from wells completed in the Sandstone aquifer. The fresh groundwater is treated through nanofiltration. The utility's wastewater is reclaimed through an RIB.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	3,682	3,640	3,532	3,379
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	108			
Potable Water Demands (daily average annual finished water in mgd)	**0.40**	**0.39**	**0.38**	**0.36**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 26-00096-W (expires 2036)			
Surficial Aquifer System	0.00			
Intermediate Aquifer System	0.53			
Floridan Aquifer System	0.00			
Total Allocation	**0.53**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5260226)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.90	0.90	0.90	0.90
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.90**	**0.90**	**0.90**	**0.90**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.50	0.50	0.50	0.50

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.0**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.0**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.0**	**0.00**	**0.00**	**0.00**

BONITA SPRINGS UTILITIES

Service Area: City of Bonita Springs, Village of Estero, and a portion of unincorporated Lee County.

Description: Potable water is obtained from wells completed in the Lower Tamiami and Floridan aquifers. The wells are arrayed in two wellfields (East and West). The groundwater is treated through lime softening and RO. The utility maintains interconnections with Lee and Collier counties, and reuses all of its wastewater via public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population*	52,527	61,482	76,095	88,662
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	151			
Potable Water Demands (daily average annual finished water in mgd)	**7.93**	**9.28**	**11.49**	**13.39**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Numbers 36-00008-W, 36-04062-W (expires 2027, 2021)			
Surficial Aquifer System	5.74			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	13.07			
Total Allocation	**18.81**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360025)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	9.00	9.00	9.00	9.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	6.60	8.60	8.60	8.60
Total Potable Capacity	**15.60**	**17.60**	**17.60**	**17.60**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water**	11.00	11.00	11.00	11.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
RO Treatment Plant Phase 2	FAS	2018	$15.00	2.00	2.00	2.00
RO Treatment Plant Expansion and Wellfield	FAS	2022	$40.00	0.00	5.00	5.00
Total Potable Water			**$55.00**	**2.00**	**7.00**	**7.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$55.00**	**2.00**	**7.00**	**7.00**

* Does not include seasonal population.

** All reclaimed water is supplied to Resource Conservation Systems.

CAPE CORAL UTILITIES

Service Area: City of Cape Coral

Bulk Water: Provides potable water to Greater Pine Island Water Association and Lee County Utilities as needed.

Description: Potable water is obtained from wells completed in the FAS. The groundwater wells are arrayed into two wellfields (South and North). Water treatment is provided through RO at two WTPs. The utility maintains two interconnections with Lee County Utilities and one interconnection with Greater Pine Island Water Association. The utility provides residential irrigation water via reclaimed water from the city's two WWTFs and is supplemented by withdrawals from freshwater canals.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	121,416	153,454	206,832	254,866
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	87			
Potable Water Demands (daily average annual finished water in mgd)	**10.56**	**13.35**	**17.99**	**22.17**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 36-00046-W (expires 2029)			
Surficial Aquifer System	0.00			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	39.25			
Total Allocation	**39.25**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360325)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	30.00	32.00	50.00	50.00
Total Potable Capacity	**30.00**	**32.00**	**50.00**	**50.00**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water*	28.40	34.40	34.40	34.40

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Palm Tree Pumping Station	FAS	2016	$2.00	2.00	2.00	2.00
South RO WTP – Plant #2 Replacement	FAS	2022	$20.00	0.00	18.00	18.00
Total Potable Water			**$22.00**	**2.00**	**20.00**	**20.00**
Nonpotable Water						
Canal Weir Improvements	Stormwater	2017	$2.00	0.00	1.80	1.80
Reuse Interconnect City of Cape Coral & City of Fort Myers	Reclaimed	2020	$11.80	6.00	6.00	6.00
ADM-47 ASR & Irrigation Supply	Stormwater	2016	$2.00	1.00	1.00	1.00
Total Nonpotable Water			**$15.80**	**7.00**	**8.80**	**8.80**
Total New Water			**$37.80**	**9.00**	**28.80**	**28.80**

* The Cape Coral irrigation system combines reclaimed water and surface water (Consumptive Use Permit #36-00998-W).

CITRUS PARK RV RESORT

Service Area: Citrus Park, located within the City of Bonita Springs.

Description: Potable water is provided by wells completed in the Water Table and Lower Tamiami aquifers. Water treatment is through RO. The utility reuses all of its wastewater via RIB.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	1,688	1,739	1,799	1,807
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	114			
Potable Water Demands (daily average annual finished water in mgd)	**0.19**	**0.20**	**0.20**	**0.21**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 36-00208-W (expires 2019)			
Surficial Aquifer System	0.23			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	0.00			
Total Allocation	**0.23**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360048)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.54	0.54	0.54	0.54
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.54**	**0.54**	**0.54**	**0.54**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.20	0.20	0.20	0.20

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

FLORIDA GOVERNMENTAL UTILITY AUTHORITY – LAKE FAIRWAYS

Service Area: A portion of Lee County serving unincorporated North Fort Myers.

Description: Potable water is obtained from wells completed in the Mid-Hawthorn aquifer. The utility reuses 50 percent of its wastewater through public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	2,057	2,124	2,205	2,222
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	43			
Potable Water Demands (daily average annual finished water in mgd)	**0.09**	**0.09**	**0.09**	**0.10**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 36-00081-W (expires 2025)
Surficial Aquifer System	0.00
Intermediate Aquifer System	0.10
Floridan Aquifer System	0.00
Total Allocation	**0.10**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5364040)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.20	0.20	0.20	0.20
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.20**	**0.20**	**0.20**	**0.20**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.30	0.30	0.30	0.30

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

FLORIDA GOVERNMENTAL UTILITY AUTHORITY – LEHIGH ACRES

Service Area: A portion of unincorporated Lee County serving Lehigh Acres.

Bulk Water: Has an interlocal agreement with the City of Fort Myers to purchase up to 2 mgd of finished water.

Description: Potable water is obtained from wells completed in the Sandstone aquifer, which yields fresh groundwater. Additional water (up to 2 mgd) is provided through an interlocal agreement with the City of Fort Myers. Water treatment is provided by two lime softening plants. Future supplies are anticipated to come from the FAS. The utility reuses approximately 80 percent of its wastewater through public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	25,141	27,761	31,876	35,101
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	94			
Potable Water Demands (daily average annual finished water in mgd)	**2.36**	**2.61**	**3.00**	**3.30**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 36-00166-W (expires 2035)			
Surficial Aquifer System	0.00			
Intermediate Aquifer System	3.15			
Floridan Aquifer System	0.00			
Total Allocation	**3.15**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360172)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	3.10	3.10	3.10	3.10
Floridan Aquifer System	0.00	0.00	0.00	0.00
Total Potable Capacity	**3.10**	**3.10**	**3.10**	**3.10**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	3.00	3.00	3.00	3.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF FORT MYERS UTILITY

Service Area: City of Fort Myers and portions of unincorporated Lee County.

Bulk Water: Has an interlocal agreement to sell up to 2 mgd of finished water to Florida Governmental Utility Authority – Lehigh Acres.

Description: Potable water is obtained from wells completed in the brackish FAS. The utility reuses approximately 50 percent of its wastewater through public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	62,825	73,746	91,587	106,969
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	101			
Potable Water Demands (daily average annual finished water in mgd)	**6.35**	**7.45**	**9.25**	**10.80**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 36-00035-W (expires 2020)
Surficial Aquifer System	0.00
Intermediate Aquifer System	0.00
Floridan Aquifer System	11.95
Total Allocation	**11.95**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360102)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	13.00	13.00	13.00	13.00
Total Potable Capacity	**13.00**	**13.00**	**13.00**	**13.00**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	11.00	22.00	34.00	34.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
12.0 mgd Reclamation Plant – South AWWT Facility	Reclaimed	2021	$18.60	0.00	12.00	12.00
WWTF Upgrades – Central AWWT Facility	Reclaimed	2020	$8.50	11.00	11.00	11.00
Total Nonpotable Water			**$27.10**	**11.00**	**23.00**	**23.00**
Total New Water			**$27.10**	**11.00**	**23.00**	**23.00**

GREATER PINE ISLAND WATER ASSOCIATION

Service Area: A portion of unincorporated Lee County serving Pine Island and Matlacha as well as a portion of Cape Coral.

Bulk Water: Receives potable water from Cape Coral as needed.

Description: Potable water is obtained from existing wells completed in the brackish Lower Hawthorn aquifer. Water treatment is provided by RO, with a recovery efficiency of 87 percent. Concentrate is disposed of via deep well disposal. The utility maintains an interconnection with the City of Cape Coral. The utility reuses all of its wastewater via spray field and RIBs.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	10,709	12,061	14,220	15,988
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	120			
Potable Water Demands (daily average annual finished water in mgd)	**1.29**	**1.45**	**1.71**	**1.92**

SFWMD Consumptive Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 36-00045-W (expires 2035)
Surficial Aquifer System	0.00
Intermediate Aquifer System	0.00
Floridan Aquifer System	2.49
Total Allocation	**2.49**

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360322)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	3.29	3.29	3.29	3.29
Total Potable Capacity	**3.29**	**3.29**	**3.29**	**3.29**

FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.25	0.25	0.25	0.25

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

ISLAND WATER ASSOCIATION

Service Area: Sanibel and a portion of unincorporated Lee County serving Captiva.

Description: Potable water is obtained from wells completed in the FAS. Brackish groundwater is treated by RO, and the reject water is discharged to the Gulf of Mexico. The City of Sanibel WWTF processes the wastewater from Island Water Association's service area. Approximately 80 percent of the wastewater is reused through public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	6,878	7,185	7,602	7,798
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	488			
Potable Water Demands (daily average annual finished water in mgd)	**3.36**	**3.51**	**3.71**	**3.81**
SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 36-00034-W (expires 2037)			
Surficial Aquifer System	0.00			
Intermediate Aquifer System	0.00			
Floridan Aquifer System	5.22			
Total Allocation	**5.22**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5360146)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System	0.00	0.00	0.00	0.00
Intermediate Aquifer System	0.00	0.00	0.00	0.00
Floridan Aquifer System	5.99	5.99	5.99	5.99
Total Potable Capacity	**5.99**	**5.99**	**5.99**	**5.99**
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	2.38*	2.38*	2.38*	2.38*

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

* The City of Sanibel provides the reclaimed water.

LEE COUNTY UTILITIES

Service Area: Unincorporated Lee County, Village of Estero, and a portion of the City of Fort Myers.

Bulk Water: Receives potable water from Cape Coral as needed. Provides potable water to the Town of Fort Myers Beach.

Description: Potable water is obtained from wells completed within the SAS, IAS, and FAS. The wells are arrayed into four wellfields (North, Pinewoods, Corkscrew, and Green Meadows). Additionally, approximately 15 percent of the water supply comes from the C-43 Canal (Olga WTP), which includes two ASR wells. The utility reuses all of its wastewater through public access irrigation.

Population and Finished Water Demand				
	Existing	Projected		
	2014	2020	2030	2040
Population	229,263	259,659	308,419	348,714
Average 2010-2014 Per Capita (gallons per day [gpd] finished water)	104			
Potable Water Demands (daily average annual finished water in mgd)	**23.84**	**27.00**	**32.08**	**36.27**

SFWMD Consumptive Use Permitted Allocation (mgd)				
Potable Water Source	Permit 36-00152-W (expires 2032)	Permit 36-00003-W (expires 2031)	Permit 36-00122-W (expires 2034)	Total
Surface Water (C-43 Canal)	0.00	4.43	0.00	4.43
Surficial Aquifer System	0.09	7.84	1.85	9.78
Intermediate Aquifer System	0.46	13.81	0.60	14.87
Floridan Aquifer System	16.13	14.21	4.91	32.25
Total Allocation per Permit	**16.68**	**40.29**	**7.36**	**64.33**
Total Allocation	**64.33**			

FDEP Potable Water Treatment Capacity (mgd) (PWS ID # 5364048)				
Permitted Capacity by Source	Existing	Projected		
	2014	2020	2030	2040
Surficial Aquifer System/Surface Water	29.00	29.00	29.00	29.00
Intermediate Aquifer System	0.00	0.00	3.40	3.40
Floridan Aquifer System	16.90	30.90	35.90	35.90
Total Potable Capacity	**45.90**	**59.90**	**68.30**	**68.30**

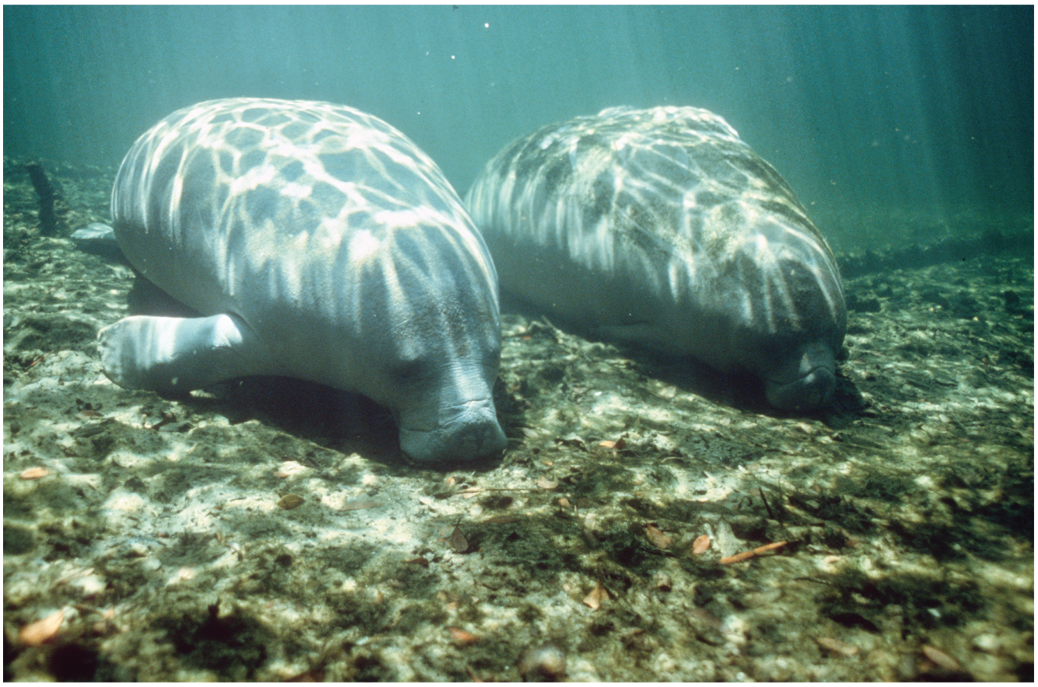
FDEP Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	20.55	20.55	22.55	22.55

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Green Meadows RO Treatment Plant Expansion and Floridan Wells	FAS	2017	$88.70	14.00	14.00	14.00
North Lee County WTP and Wellfield Expansion	FAS	2022	$38.88	0.00	5.00	5.00
Corkscrew Groundwater ASR Wells for Potable Water	IAS	2025	$21.97	0.00	3.40	3.40
Total Potable Water			**$149.55**	**14.00**	**22.40**	**22.40**
Nonpotable Water						
Three Oaks IQ Water Supplemental Supply	SAS	2015	$2.70	2.60	2.60	2.60
West ASR Wells for Reclaimed Water	Reclaimed	2025	$6.36	0.00	2.00	2.00
Total Nonpotable Water			**$9.06**	**2.60**	**4.60**	**4.60**
Total New Water			**$158.61**	**16.60**	**27.00**	**27.00**

REFERENCES

FDEP. 2015. Water Resource Protection Programs. Florida Department of Environmental Protection, Tallahassee, FL. Available from: http://www.dep.state.fl.us/water/.

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

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