



**PALM BEACH COUNTY  
WATER UTILITIES DEPARTMENT**

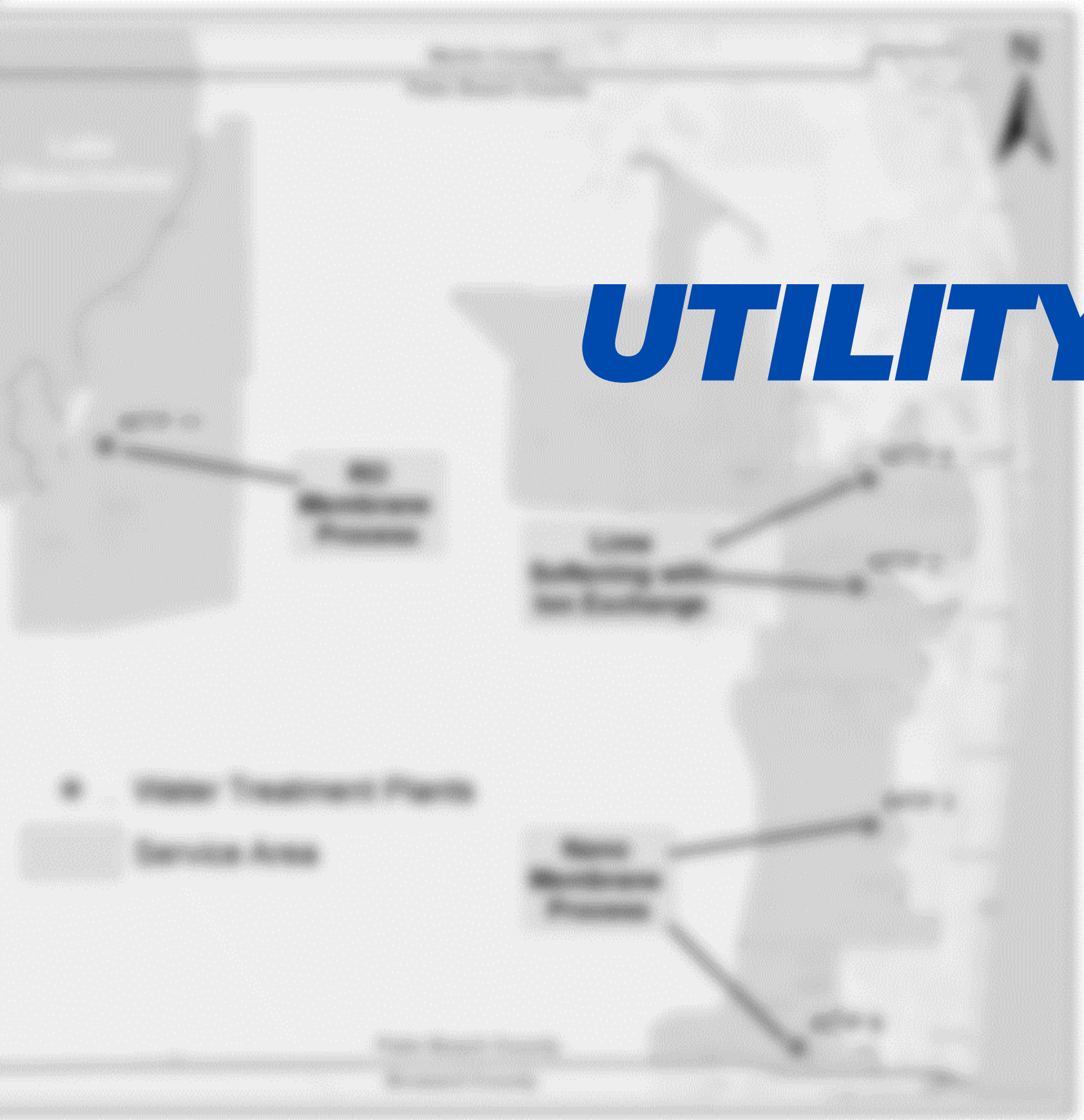
# **UTILITY OVERVIEW AND CONSUMPTIVE USE PERMITS UPDATE**



**Ali Bayat, P.E., PMP**  
Palm Beach County  
Water Utilities  
Department Director



# **PALM BEACH COUNTY WATER UTILITIES DEPARTMENT SERVICE AREA**



## ***UTILITY OVERVIEW***

# PALM BEACH COUNTY LEADERSHIP



**BOARD OF COUNTY COMMISSIONERS**

As seen from left to right:

- Maria Sachs, Vice Mayor
- **Gregg K. Weiss, Mayor**
- Dave Kerner
- Marci Woodward
- Mack Bernard
- Maria G. Marino
- Sara Baxter
- Verdenia C. Baker, County Administrator



**Todd J. Bonlarron**  
Palm Beach County  
Assistant  
Administrator



**PBCWUD**



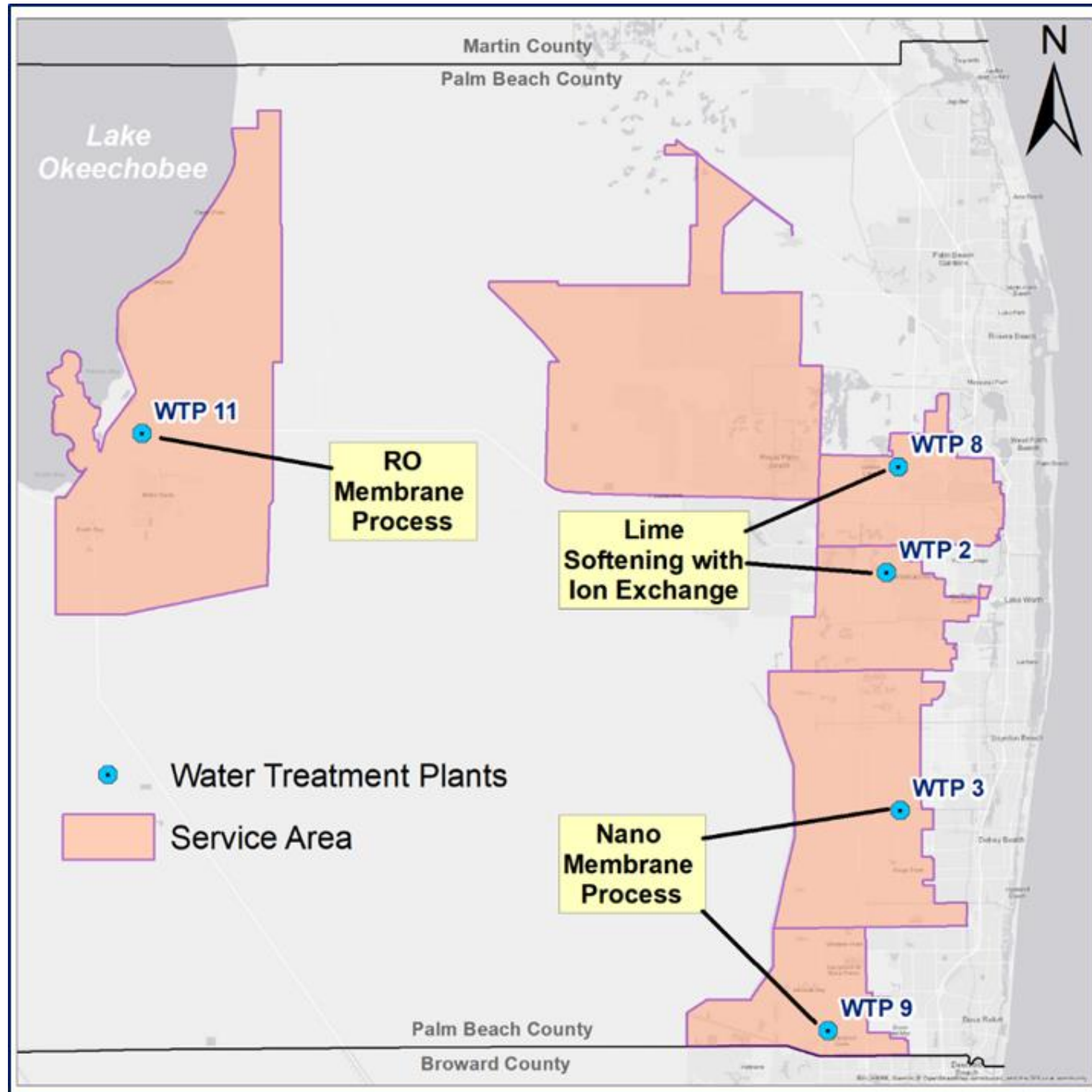
# ***PALM BEACH COUNTY WATER UTILITIES DEPARTMENT***

## **The data behind the utility:**

- PBCWUD is the 3rd largest full-service utility in Florida
- Serves +600,000 residents
- Employees +600 employees
- Owns and operates 9 water, wastewater, reclaimed water plants
- Over +4,000 miles of pipes
- Maintains +1,000 lift stations



# PALM BEACH COUNTY WATER UTILITIES DEPARTMENT SERVICE AREA



# BEST IN CLASS ASSET MANAGEMENT

PBCWUD is the **FIRST WATER UTILITY** in North America to receive the [International Organization for Standardization \(ISO\) 55001 certification](#)





Asset Management System (ISO55001)



Data Driven Decision-Making



Value Realization, Improved Performance and Increased Efficiency



Reduced Costs, Demonstrating Value for Money



Effective Risk Management and Reduction



## ASSET MANAGEMENT JOURNEY

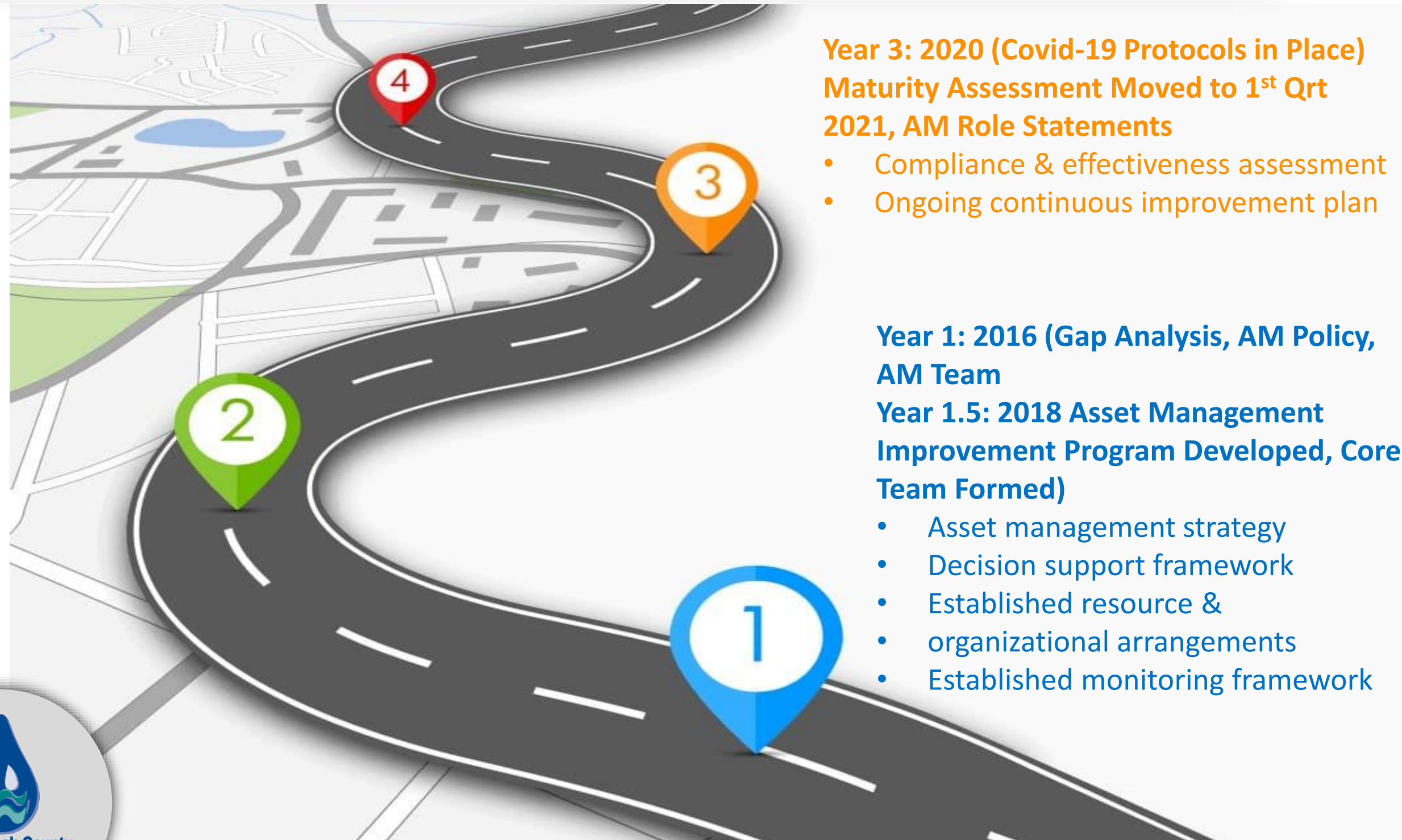


### Year 4: 2021 ISO 55001 Certification

- Ongoing Continuous Improvement Plan,
- Reclassed Position for Internal Auditor

### Year 2019: (Champions Established, WUD Campaign Started, Maturity Assessment)

- Embedded monitoring framework
- Started transformation program
- Asset investment & maintenance planning



### Year 3: 2020 (Covid-19 Protocols in Place) Maturity Assessment Moved to 1<sup>st</sup> Qrt 2021, AM Role Statements

- Compliance & effectiveness assessment
- Ongoing continuous improvement plan

### Year 1: 2016 (Gap Analysis, AM Policy, AM Team)

### Year 1.5: 2018 Asset Management Improvement Program Developed, Core Team Formed)

- Asset management strategy
- Decision support framework
- Established resource & organizational arrangements
- Established monitoring framework





# RECOGNITIONS



Wastewater Collection System of the Year for Large Utility  
Florida Water Environmental Association

Reuse System of The Year - "David W. York Award"  
First Place, Florida Water Environmental Association

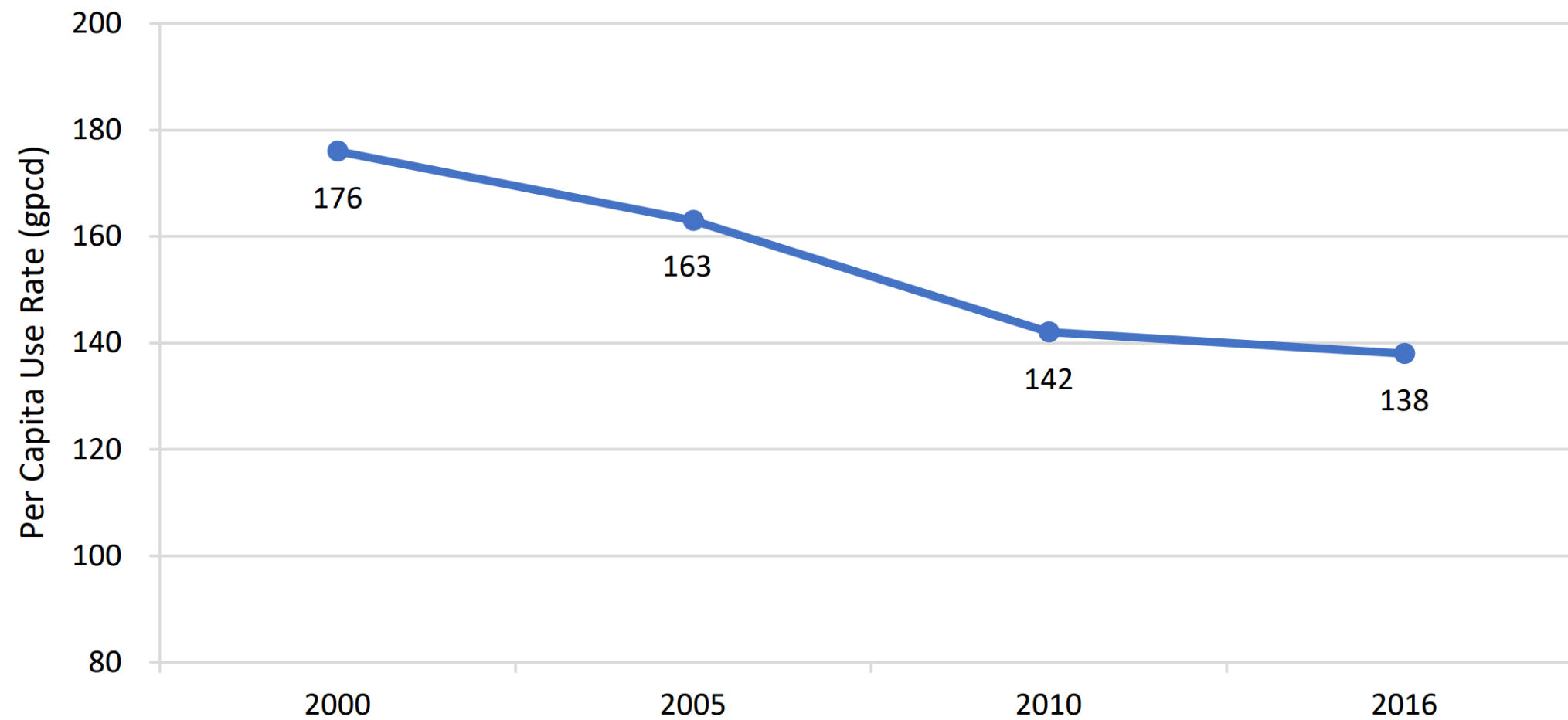
Outstanding Operator Award - South East Desalting  
Association

Project of the Year for Best Overall Water/Wastewater  
Category  
Design Build Institute of America

Honorable Mention Award  
Florida Water Environmental Association



# PER CAPITA USE RATE



FINISHED PUBLIC WATER SUPPLY PER CAPITA USE RATE (IN GALLONS PER CAPITA PER DAY) IN PALM BEACH, BROWARD, MIAMI-DADE, AND MONROE COUNTIES WITHIN THE LEC PLANNING AREA

Source: SFWMD LEC 2018 REPORT

PBCWUD EAST SYSTEM  
FINISHED WATER PER  
CAPITA USE RATE:

**97.5 gpcd**



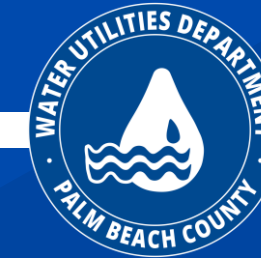
# EAST DISTRIBUTION SYSTEM EFFICIENCY \$\$\$

(WATER SOLD VS. FINISHED WATER)



- TREATMENT IMPROVEMENTS
- SMART DISTRIBUTION SYSTEM WATER QUALITY MANAGEMENT
- ADVANCED METERING

1% IMPROVEMENT=  
**500,000**  
gallons per day



# ***THANK YOU TO OUR STATE AND LOCAL PARTNERS***



 561-493-6000

 [pbcwater.com](http://pbcwater.com)



# CONSUMPTIVE USE PERMIT-EAST

## **CONSUMPTIVE USE PERMITS**

Issue: March 31, 2022

Expires: December 31, 2023

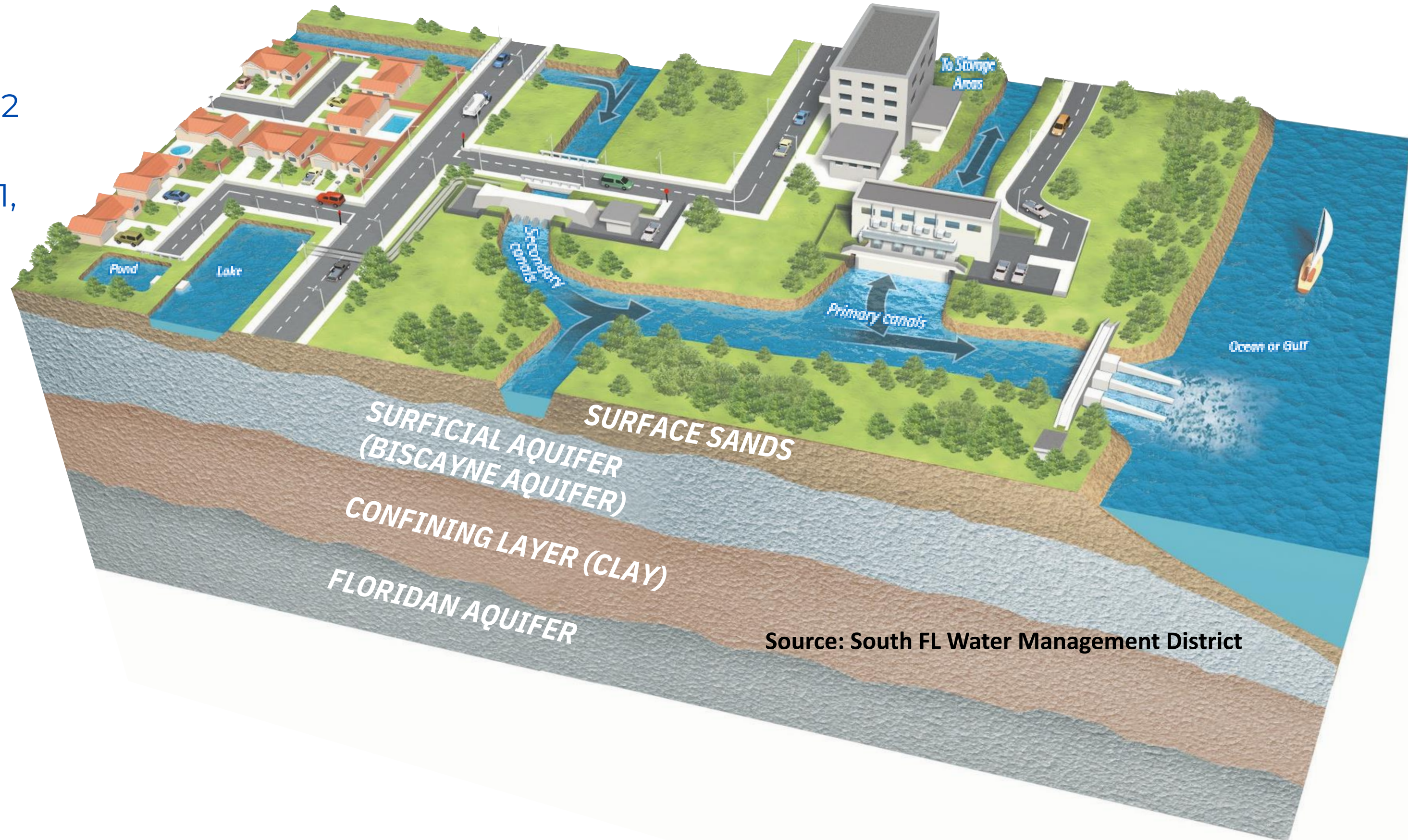
Duration: 30 years  
30 years Surficial  
aquifer systems; 30  
years Upper Floridan  
aquifer)

Annual Allocation:  
14.4 MGD



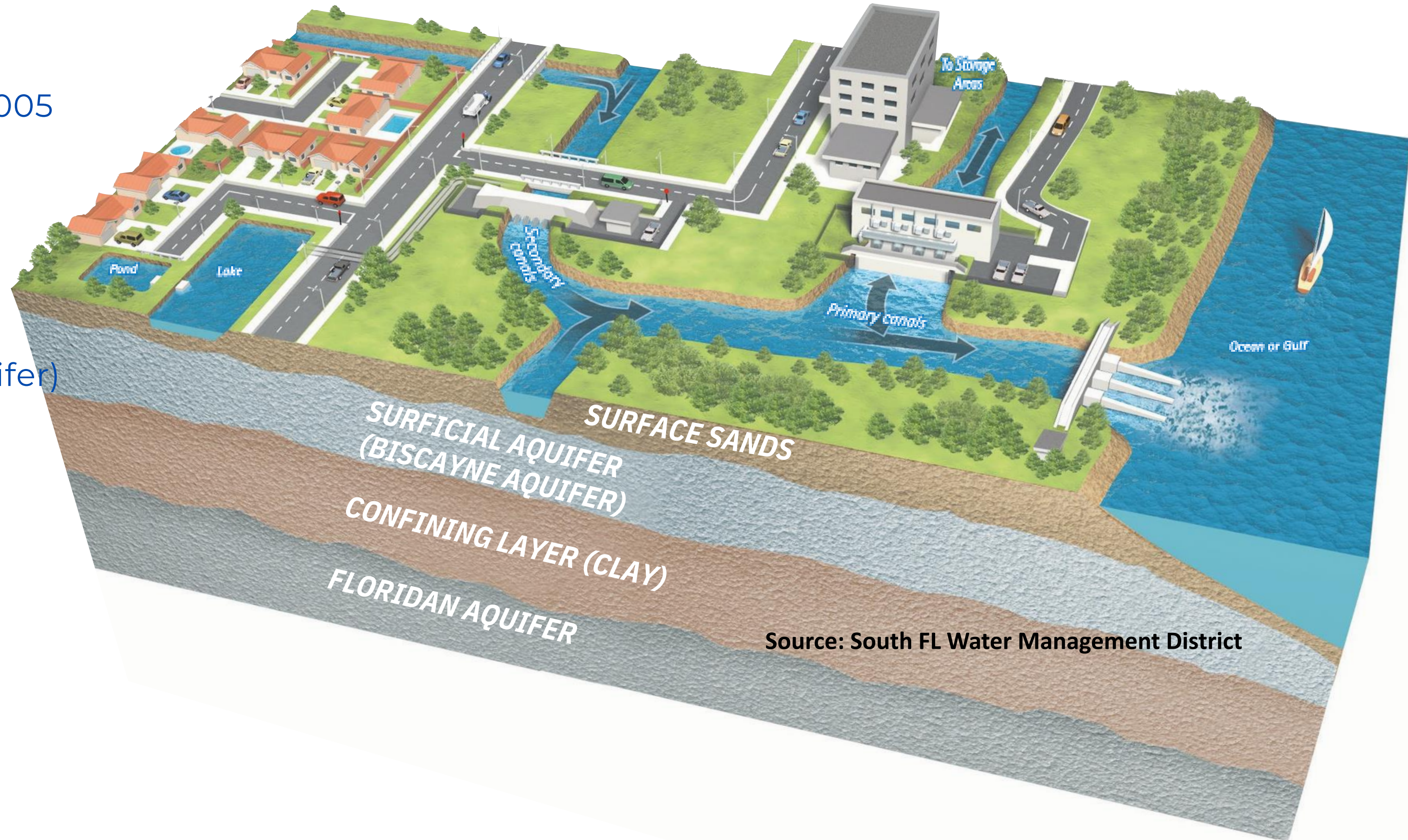
# CONSUMPTIVE USE PERMIT-EAST

- Issued: March 31, 2022
- Expires: December 31, 2053
- Duration: 30 years (20 years Surficial Aquifer System; 30 years Upper Floridan Aquifer)
- Annual Allocation: 104.4 MGD



# CONSUMPTIVE USE PERMIT-WEST

- Issued: October 12, 2005
- Expires: October 12, 2025
- Duration: 20 years  
(Upper Floridan Aquifer)
- Annual Allocation:  
9.4 MGD



# ***WATER CONSERVATION***

- **Mandatory Year-Round Landscape Irrigation Ordinance**
  - Adopted February 24, 2022
  - Allows irrigation 3 days per week (based on address)
  - Prohibits landscape irrigation between the hours of 10:00am and 4:00pm
  - All wasteful and unnecessary water use is prohibited
- **Standard Water Conservation Plan**
  - A water conservation public education program
  - An outdoor water use conservation program
  - The selection of a rate structure designed to promote the efficient use of water
  - A water loss reduction program, if water losses exceed 10%
  - An indoor water conservation program





# ALTERNATIVE WATER SUPPLY



## Floridan Wells

- West system: 11 wells
- East system: 2 wells

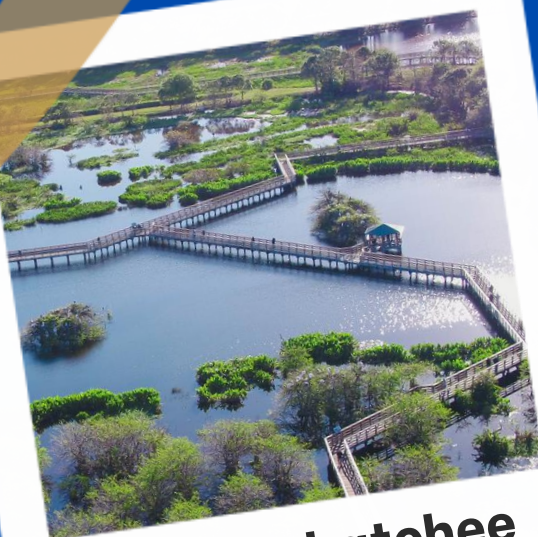


## Reclaimed Water

- Current Total Capacity is 55 MGD
- Used in Wetlands, Golf Courses, HOAs, and at Florida Power and Light



**Southern Region Water Reclamation Facility**



**Wakodahatchee Wetlands**



**Green Cay Phase 1**

# GREEN CAY NATURE CENTER & WETLANDS

(PHASE 1)



**#1 Tripadvisor**

Nature & Wildlife  
Area Attraction

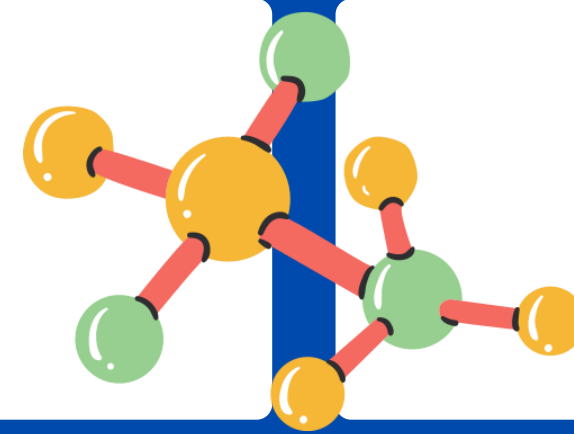


**11 Billion Gallons**

of Water Purified Since 2004

**75% Nitrogen**

Removed



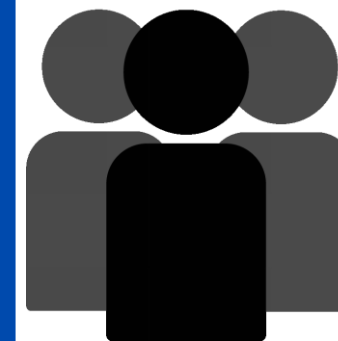
**50% Phosphorus**

Removed



**1.5 Miles**

Raised Boardwalks



**1.3 Million**

Annual Visitors

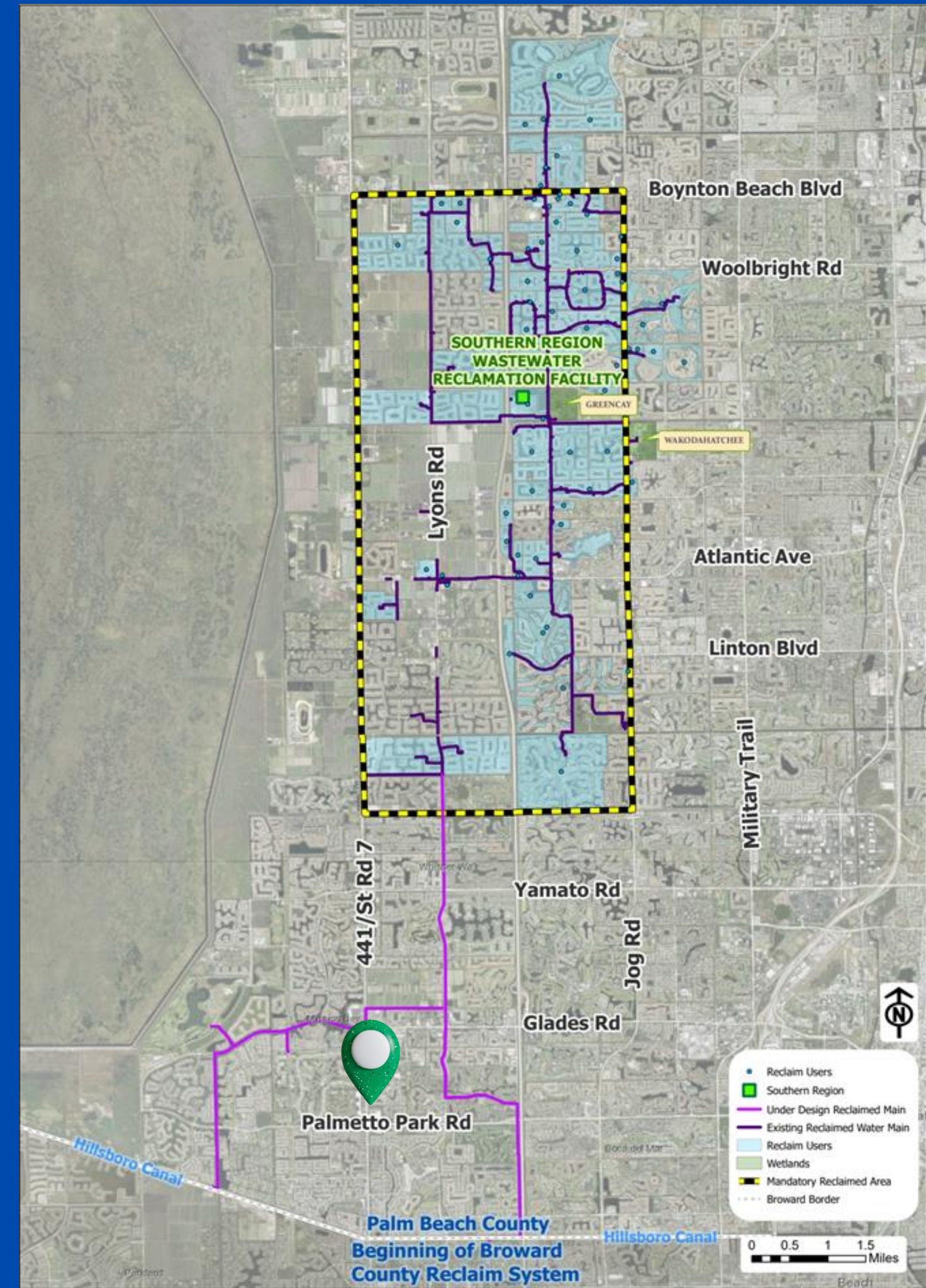
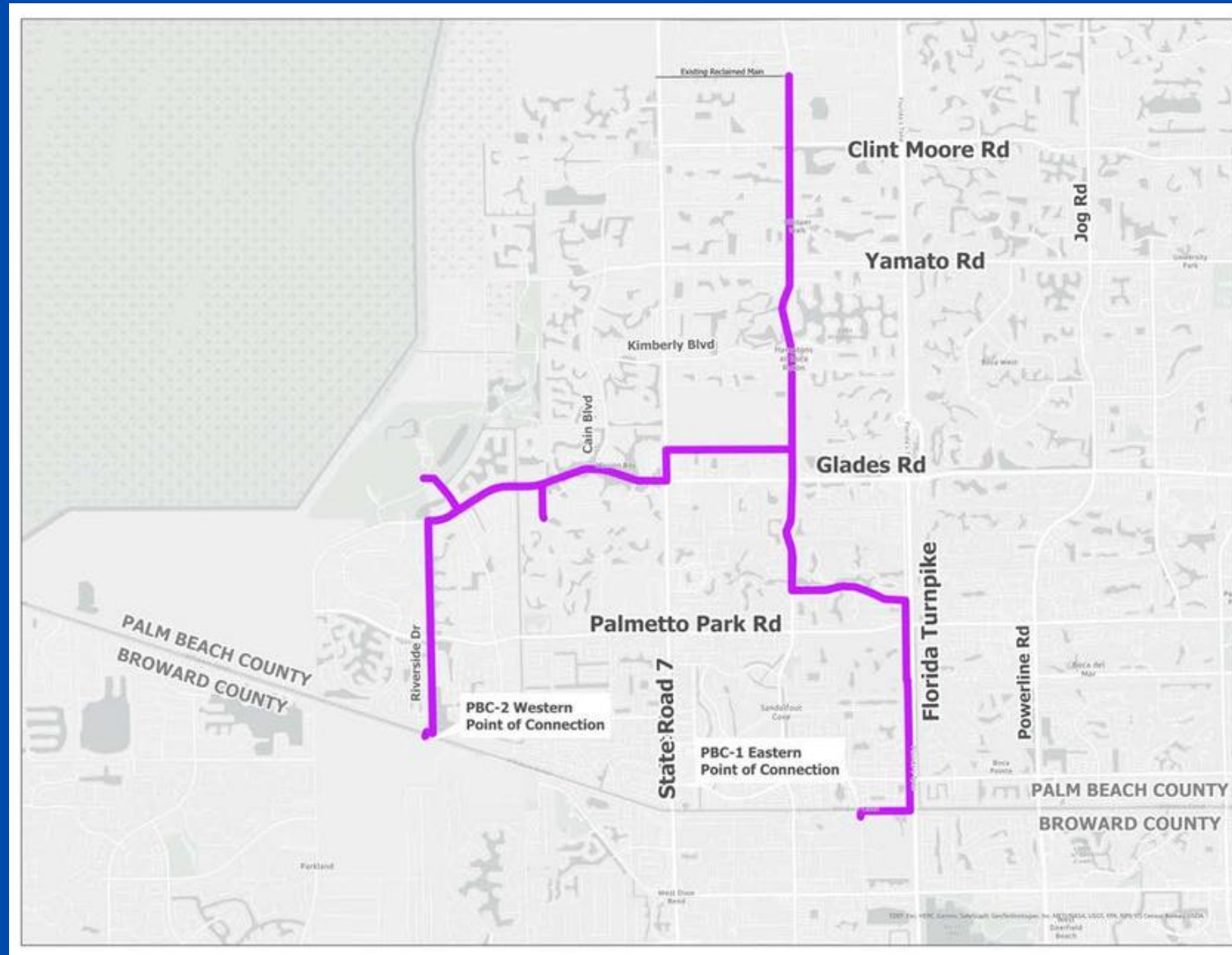
# ALTERNATIVE WATER SUPPLY

PROJECTS IN PROGRESS

**Broward/Palm Beach Partnership**

**Final completion 2027**

**10.51 MGD**



# ALTERNATIVE WATER SUPPLY

PROJECTS IN PROGRESS

## Broward/Palm Beach Partnership

10.51 MGD

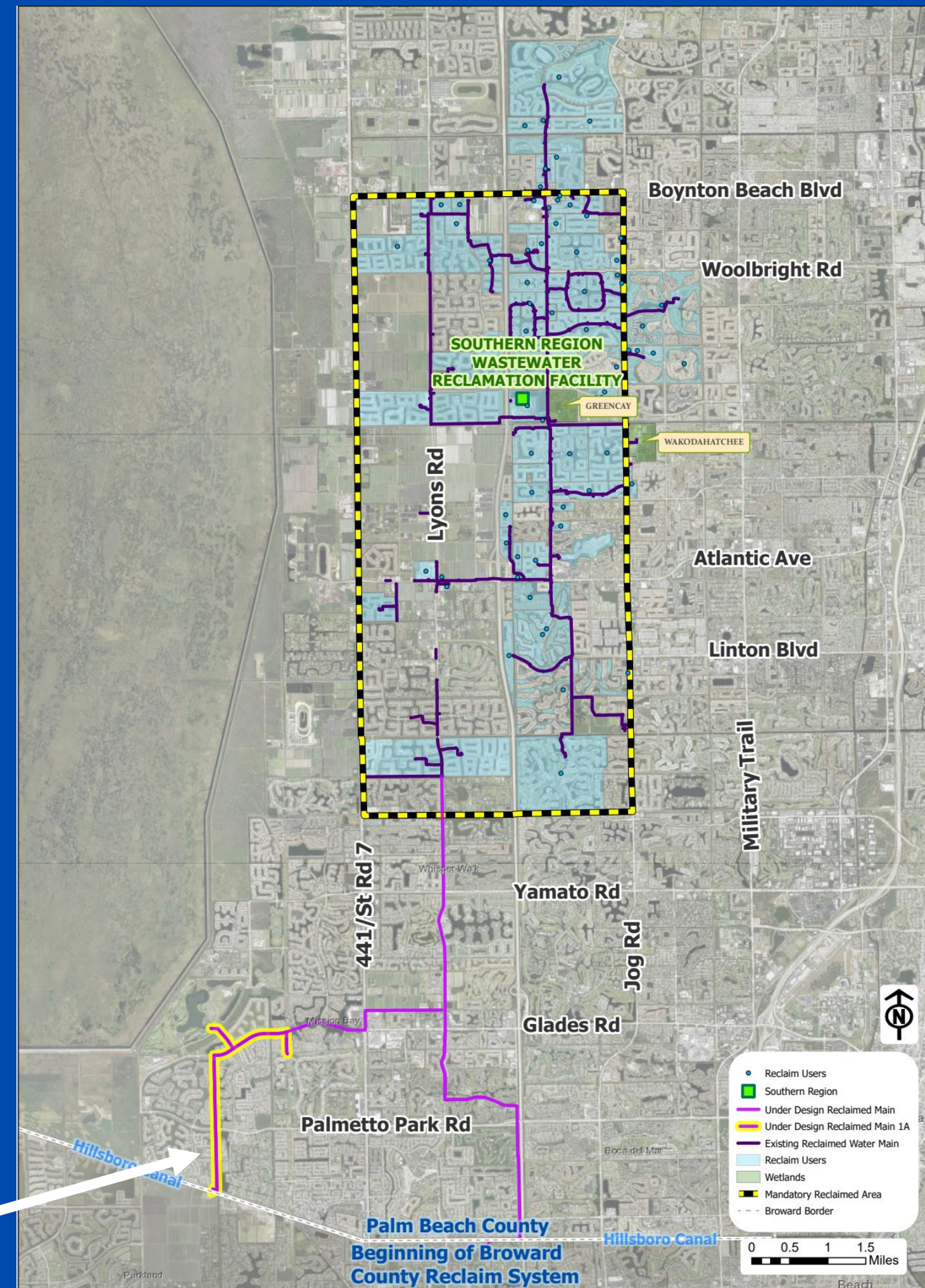
**Demand Priority:**

**1 - Unserved/Underserved existing customers in mandatory zone**

**2 - Golf Courses, County Parks and new developments in South County**

**3 - Existing communities in South County area**

phase 1 in construction

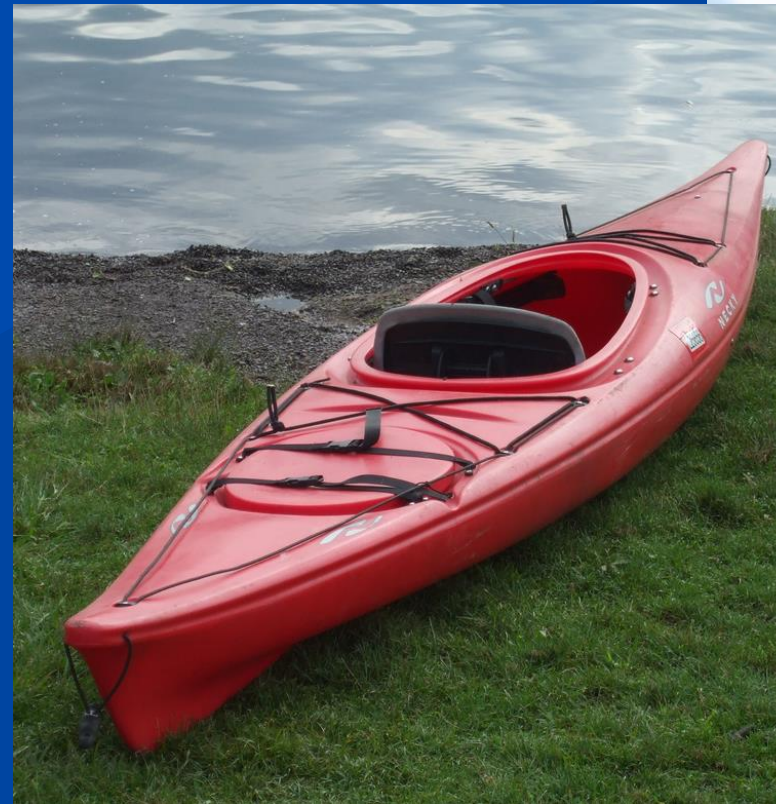
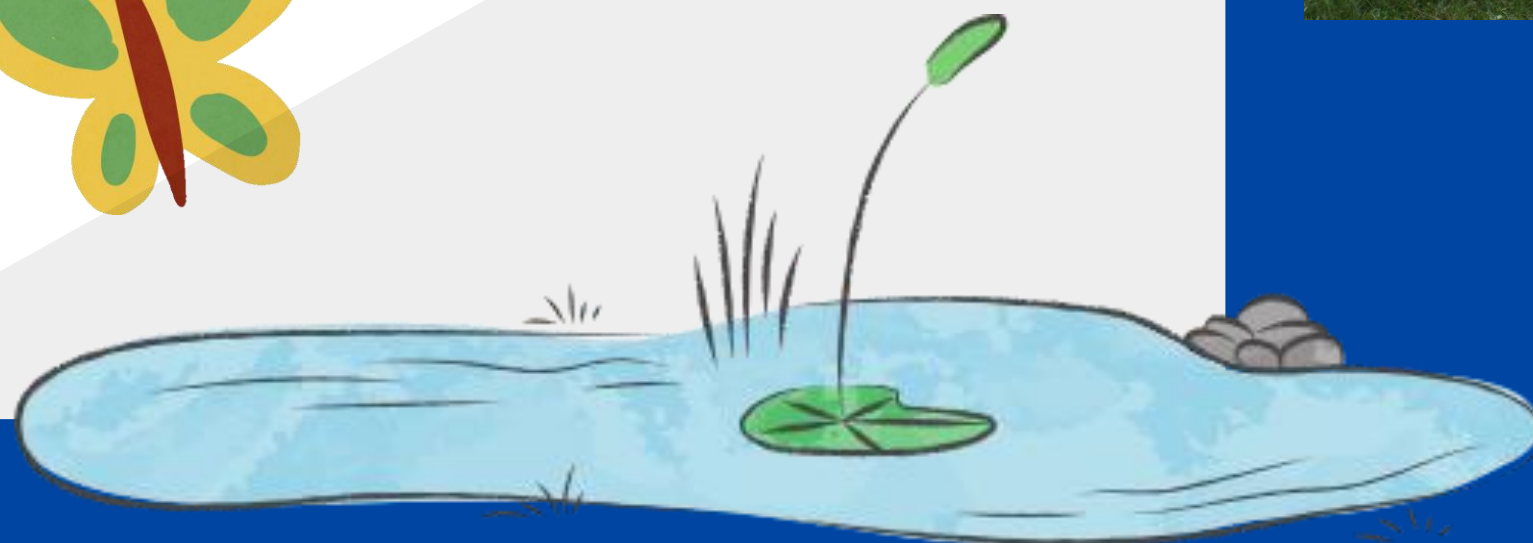


# ALTERNATIVE WATER SUPPLY

PROJECTS IN PROGRESS

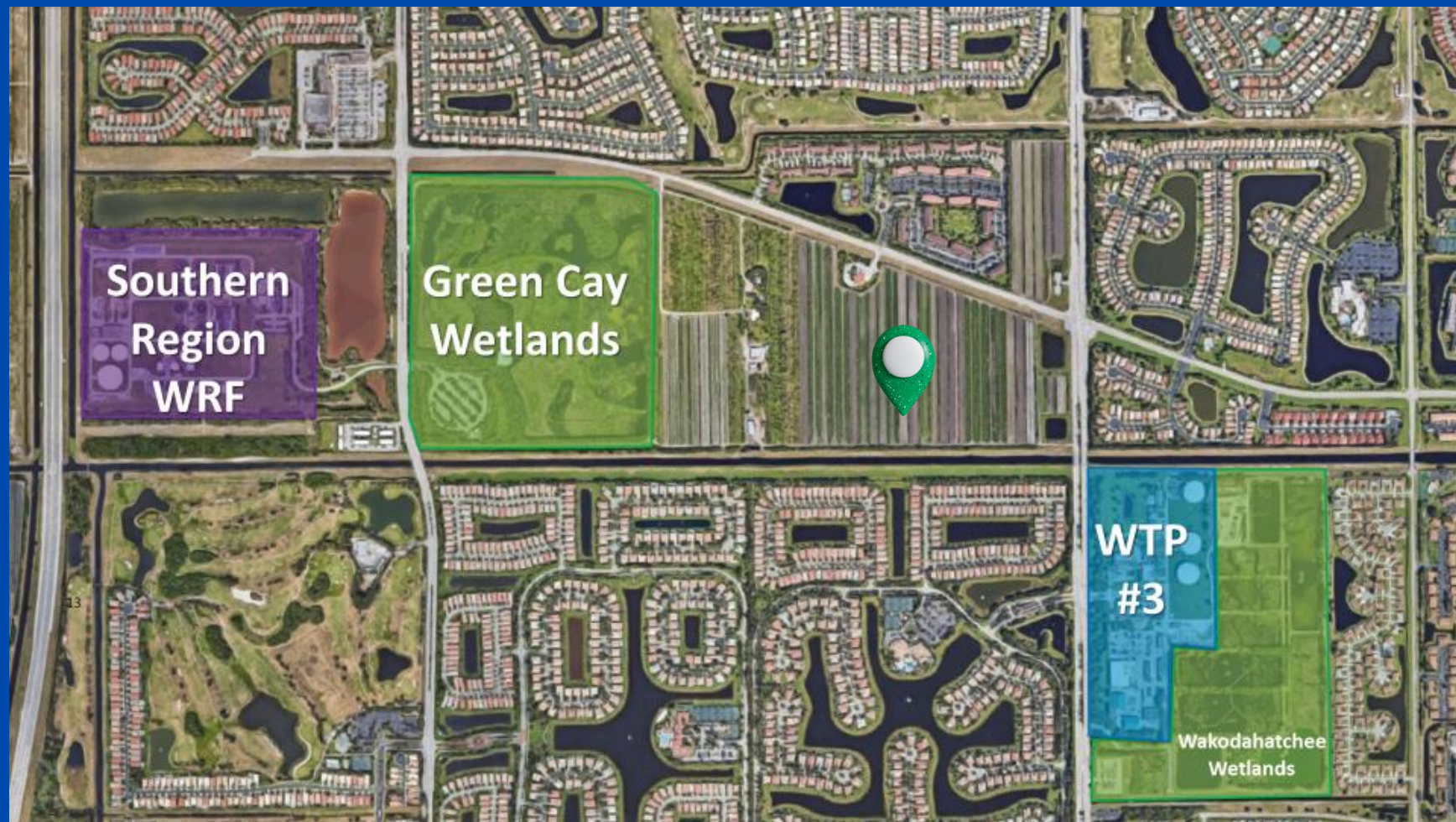
## GREEN CAY PHASE 2

Create New Experiences for  
Public to Connect with  
Water Environments



# ALTERNATIVE WATER SUPPLY

## PROJECTS IN PROGRESS



## Green Cay Phase II

- Purification facility 2 MGD
- Park and production wells
- Education center

# ***SOUTHERN REGION WATER RECLAMATION FACILITY***

- *Sewershed*: Domestic without industrial water
- *Treatment Process*: 35 MGD Step Aeration Conventional Activated Sludge (Non-Nitrified)
- *Current Reuse or Disposal Options*:
  - Public access reuse (irrigation)
  - Constructed wetlands
  - 3 underground disposal wells

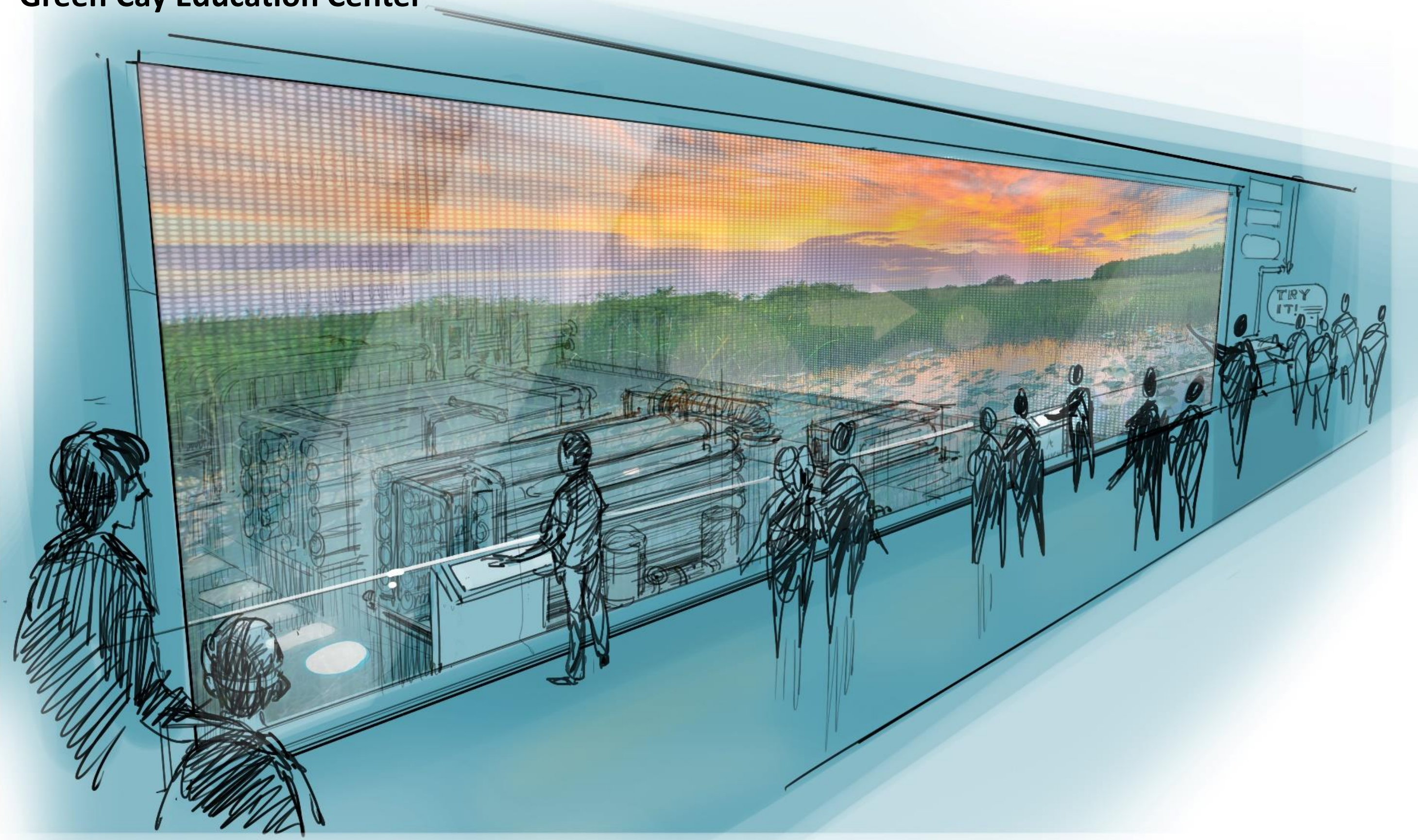


# Green Cay Education Center



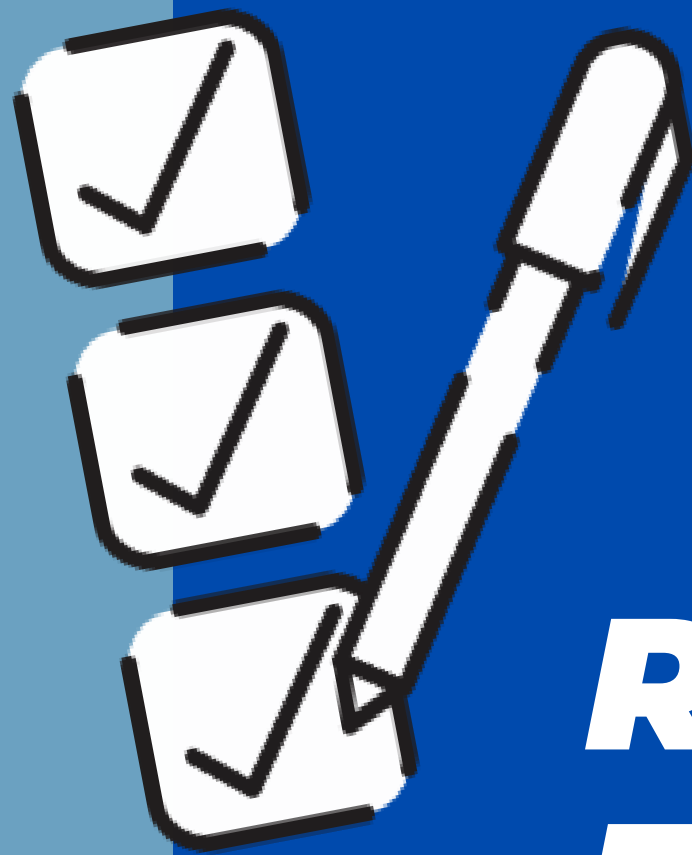


Green Cay Education Center





- Treat to Florida's Full Treatment & Disinfection Requirements for Surface Water Augmentation



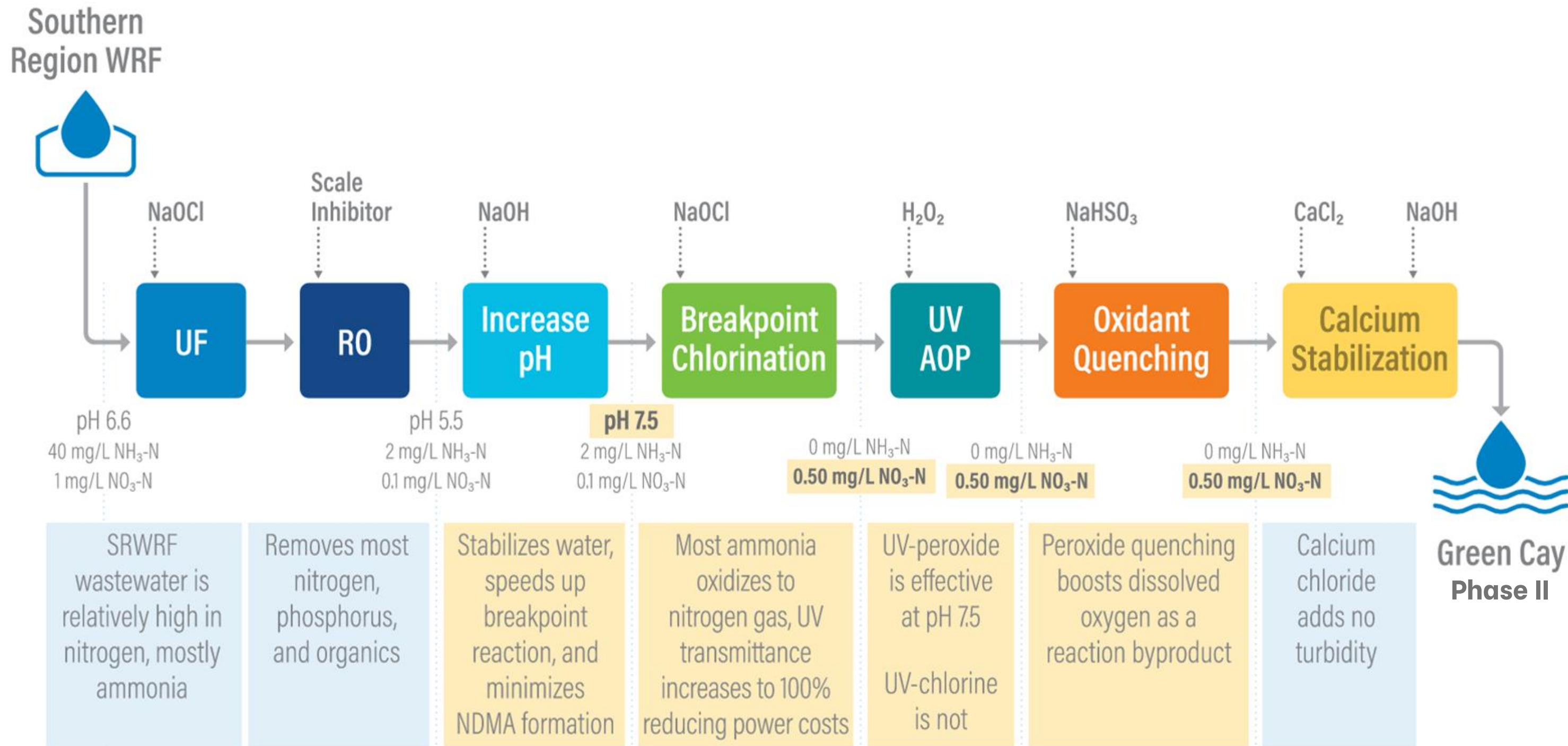
## ***REGULATORY FRAMEWORK***

### ***PBC CHOSE 2 KEY GUIDING PROJECT PRINCIPLES***

- Treat to Meet Florida's Class III Surface Water Quality Standards

- Florida's existing reuse regulations are undergoing major changes
- Assumed FDEP Reuse Regulatory Updates, May 2021 Draft, will be implemented

# WATER PURIFICATION TREATMENT TRAIN



# ***PILOT STUDY COMPLETED***

## ***AUGUST 2022***



# 70+ CECs SAMPLED DURING THE PILOT STUDY

11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid  
17a-Ethinylestradiol  
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)  
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)  
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)  
2,4-D  
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)  
4-Nonylphenol  
4-tert-Octylphenol  
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid  
Acesulfame K  
Azinphos-methyl  
Bendroflumethiazide  
BPA  
Butalbital  
Butylbenzylphthalate  
Butylparaben  
Carbaryl  
Chloramphenicol  
Chlorpyrifos  
Clofibric Acid  
Demeton-O  
Demeton-S  
Di (2-ethylhexyl)phthalate

Diazinon  
Diclofenac acid  
Diethylphthalate  
Dimethyl phthalate  
Di-n-butyl phthalate  
Di-n-octyl phthalate  
Estradiol  
Estriol  
Estrone  
Ethylparaben  
Gemfibrozil  
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)  
Ibuprofen  
Iohexol  
Iopromide  
Isobutylparaben  
Malathion  
Methylparaben  
Mirex  
Naproxen  
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)  
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)  
Parathion

Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)  
Perfluoro-3-methoxypropanoic acid (PFMPA)  
Perfluoro-4-methoxybutanoic acid (PFMBA)  
Perfluorobutanesulfonic acid (PFBS)  
Perfluorobutanoic acid (PFBA)  
Perfluorodecanoic acid (PFDA)  
Perfluorododecanoic acid (PFDoA)  
Perfluoroheptanesulfonic acid (PFHpS)  
Perfluoroheptanoic acid (PFHpA)  
Perfluorohexanesulfonic acid (PFHxS)  
Perfluorohexanoic acid (PFHxA)  
Perfluorononanoic acid (PFNA)  
Perfluorooctanesulfonic acid (PFOS)  
Perfluorooctanoic acid (PFOA)  
Perfluoropentanesulfonic acid (PFPeS)  
Perfluoropentanoic acid (PFPeA)  
Perfluorotetradecanoic acid (PFTeDA)  
Perfluorotridecanoic acid (PFTTrDA)  
Perfluoroundecanoic acid (PFUnA)  
Propylparaben  
Salicylic Acid  
Sucralose  
Triclocarban  
Triclosan  
Warfarin

# 17 CECs DETECTED IN RECLAIMED WATER

11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid  
17a-Ethinylestradiol  
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)  
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)  
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)  
2,4-D  
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)  
**4-Nonylphenol**  
**4-tert-Octylphenol**  
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid  
**Acesulfame K**  
Azinphos-methyl  
Bendroflumethiazide  
BPA  
**Butalbital**  
Butylbenzylphthalate  
Butylparaben  
Carbaryl  
Chloramphenicol  
Chlorpyrifos  
Clofibric Acid  
Demeton-O  
Demeton-S  
Di (2-ethylhexyl)phthalate

Diazinon  
Diclofenac acid  
Diethylphthalate  
Dimethyl phthalate  
Di-n-butyl phthalate  
Di-n-octyl phthalate  
**Estradiol**  
Estrinol  
**Estrone**  
Ethylparaben  
Gemfibrozil  
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)  
**Ibuprofen**  
**Iohexol**  
Iopromide  
Isobutylparaben  
Malathion  
Methylparaben  
Mirex  
**Naproxen**  
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)  
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)  
Parathion

Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)  
Perfluoro-3-methoxypropanoic acid (PFMPA)  
Perfluoro-4-methoxybutanoic acid (PFMBA)  
**Perfluorobutanesulfonic acid (PFBS)**  
Perfluorobutanoic acid (PFBA)  
Perfluorodecanoic acid (PFDA)  
Perfluorododecanoic acid (PFDoA)  
Perfluoroheptanesulfonic acid (PFHpS)  
**Perfluoroheptanoic acid (PFHpA)**  
**Perfluorohexanesulfonic acid (PFHxS)**  
**Perfluorohexanoic acid (PFHxA)**  
Perfluorononanoic acid (PFNA)  
**Perfluorooctanesulfonic acid (PFOS)**  
**Perfluorooctanoic acid (PFOA)**  
Perfluoropentanesulfonic acid (PFPeS)  
**Perfluoropentanoic acid (PFPeA)**  
Perfluorotetradecanoic acid (PFTeDA)  
Perfluorotridecanoic acid (PFTTrDA)  
Perfluoroundecanoic acid (PFUnA)  
Propylparaben  
**Salicylic Acid**  
Sucralose  
Triclocarban  
Triclosan  
Warfarin

# ONLY 1 CEC DETECTED IN PURIFIED WATER







11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid  
17a-Ethinylestradiol  
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)  
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)  
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)  
2,4-D  
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)  
4-Nonylphenol  
4-tert-Octylphenol  
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid  
Acesulfame K  
Azinphos-methyl  
Bendroflumethiazide  
BPA  
Butalbital  
Butylbenzylphthalate  
Butylparaben  
Carbaryl  
Chloramphenicol  
Chlorpyrifos  
Clofibric Acid  
Demeton-O  
Demeton-S  
Di (2-ethylhexyl)phthalate

Diazinon  
Diclofenac acid  
Diethylphthalate  
Dimethyl phthalate  
Di-n-butyl phthalate  
Di-n-octyl phthalate  
Estradiol  
Estriol  
Estrone  
Ethylparaben  
Gemfibrozil  
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)  
Ibuprofen  
Iohexol  
Iopromide  
Isobutylparaben  
Malathion  
Methylparaben  
Mirex  
Naproxen  
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)  
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)  
Parathion

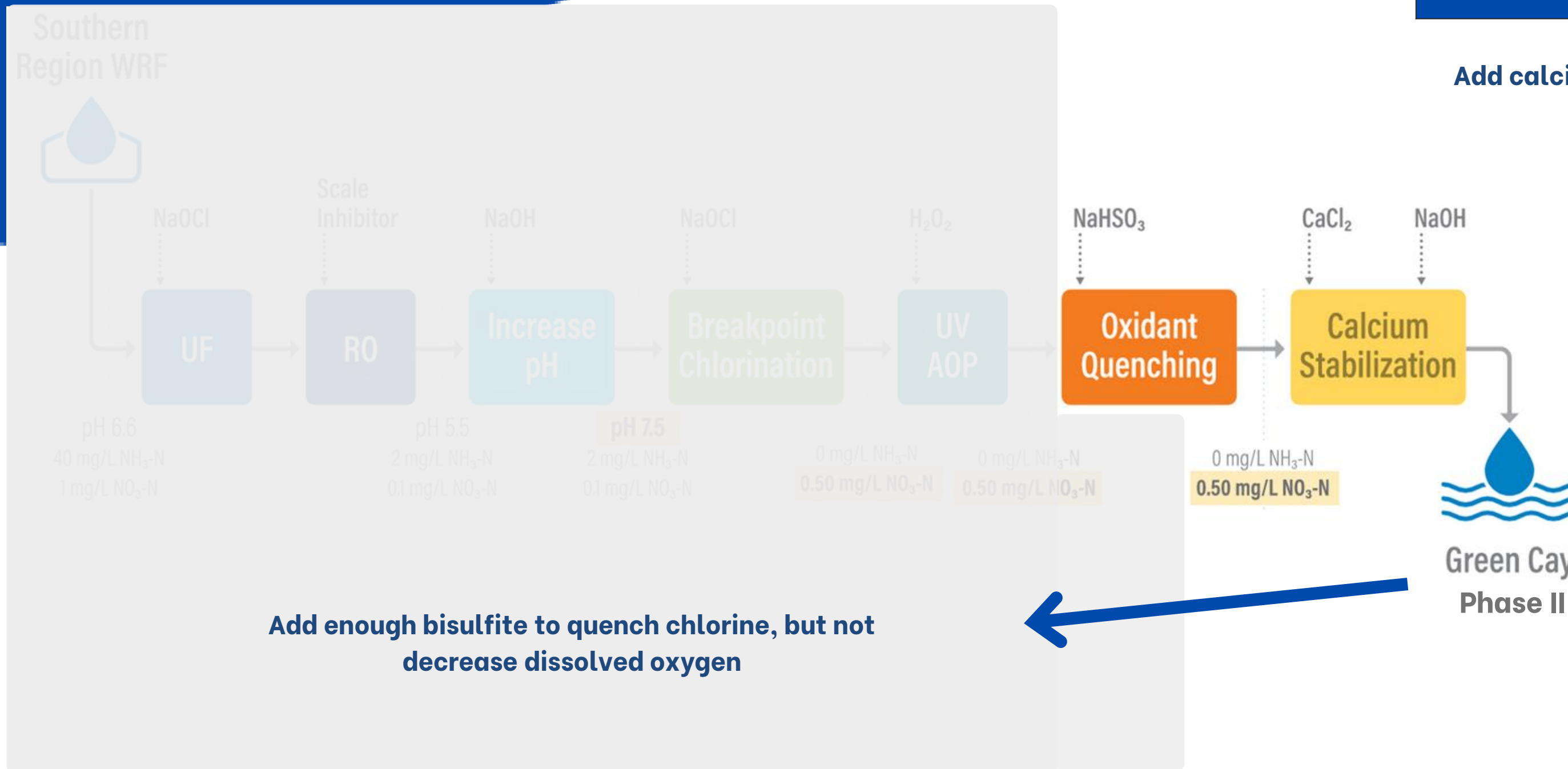
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)  
Perfluoro-3-methoxypropanoic acid (PFMPA)  
Perfluoro-4-methoxybutanoic acid (PFMBA)  
Perfluorobutanesulfonic acid (PFBS)  
Perfluorobutanoic acid (PFBA)  
Perfluorodecanoic acid (PFDA)  
Perfluorododecanoic acid (PFDoA)  
Perfluoroheptanesulfonic acid (PFHpS)  
Perfluoroheptanoic acid (PFHpA)  
Perfluorohexanesulfonic acid (PFHxS)  
Perfluorohexanoic acid (PFHxA)  
Perfluorononanoic acid (PFNA)  
Perfluorooctanesulfonic acid (PFOS)  
Perfluorooctanoic acid (PFOA)  
Perfluoropentanesulfonic acid (PFPeS)  
Perfluoropentanoic acid (PFPeA)  
Perfluorotetradecanoic acid (PFTeDA)  
Perfluorotridecanoic acid (PFTTrDA)  
Perfluoroundecanoic acid (PFUnA)  
Propylparaben  
**Salicylic Acid**  
Sucralose  
Triclocarban  
Triclosan  
Warfarin



# PURIFIED WATER PASSED TOXICITY TESTS

| Type of Toxicity |  Fathead Minnow |  Water Flea |
|------------------|---|---|
| Acute            |                |            |
| Chronic          |                |            |

Add calcium to avoid toxicity, caustic to balance

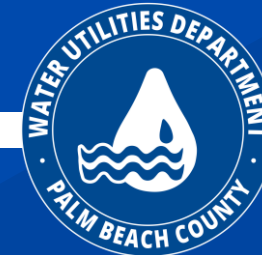


# TREATMENT TRAIN WILL PROVIDE AMPLE PATHOGEN REMOVAL CREDITS

| Critical Control Point   | Pathogen               |                        |                        | Basis   |
|--------------------------|------------------------|------------------------|------------------------|---|
|                          | Virus                  | <i>Giardia</i>         | <i>Crypto</i>          |   |
| Ultrafiltration          | 2                      | 4                      | 4                      | Turbidity Monitoring and Pressure Decay Tests |
| Reverse Osmosis          | 1.5                    | 1.5                    | 1.5                    | Conductivity Monitoring                       |
| Breakpoint Chlorination  | 6                      | 0                      | 0                      | Free Chlorine CT                              |
| UV Advanced Oxidation    | 6                      | 6                      | 6                      | UV Dose                                       |
| Total LRV Anticipated    | <b>15.5</b>            | <b>11.5</b>            | <b>11.5</b>            | Sum of Credits                                |
| Expected LRV Requirement | 8                      | 6                      | 5.5                    | Proposed                                      |
| Assessment               | Would meet requirement | Would meet requirement | Would meet requirement |   |

Note: Assumes Treatment Credits Calculated with Reclaimed Water as Starting Point





*AT PALM BEACH COUNTY WATER UTILITIES; TWO THINGS NEVER STOP,*

# MAKING WATER MAKING IMPROVEMENTS

## *Thank You!*

 561-493-6000

 [pbcwater.com](http://pbcwater.com)

