FLORIDA WATER UTILITIES DRIVE INNOVATIVE ALTERNATIVE WATER SUPPLY OPTIONS

28th Annual Environmental Permitting Summer School
Marco Island

Scott Kelly P.E.
Assistant City Administrator
City of West Palm Beach
July 23, 2014
By 2030, demand for fresh water in Florida is estimated to increase by about 1.3 billion gallons per day (bgd) for a total of 7.7 bgd. Traditional sources of fresh groundwater will not be able to meet all of the additional demand.

Water Management District Regional Water Supply Plans have identified shortfalls in traditional groundwater and existing regional surface water supplies.

Ongoing Minimum Flows and Level (MFL) development, pumping drawdowns, CERP and saltwater intrusion are all drivers for alternative water supply projects.

Utilities have been responding with a number of innovative alternative water supply projects.
FDEP REGIONAL WATER SUPPLY PLANNING ANNUAL STATUS REPORTS HAVE IDENTIFIED PUBLIC WATER SUPPLY SHORTFALLS

Northwest Florida Water Management District
2010: 169.57 mgd
2030: 188.78 mgd
18%

Suwannee River Water Management District
2010: 23.30 mgd
2030: 27.27 mgd
17%

Southwest Florida Water Management District
2010: 584.30 mgd
2030: 738.93 mgd
26%

St. Johns River Water Management District
2010: 626.64 mgd
2030: 819.12 mgd
31%

South Florida Water Management District
2010: 1,166.74 mgd
2030: 1,524.86 mgd
31%
UTILITIES ARE RESPONDING WITH A VARIETY OF INNOVATIVE ALTERNATIVE WATER SUPPLY PROJECTS

- Saltwater and Brackish Water - STOPR Group and Hallandale
- Water Reuse - Altamonte Springs, Reedy Creek Improvement District and Broward / Palm Beach County Joint Project
- Surface Water Captured Predominately During Heavy Rainfalls - West Palm Beach
- Sources Made Available Through the Addition of New Storage Capacity - Palm Beach and Broward Counties C-51 Reservoir
- Aquifer Storage and Recovery - Polk County and West Palm Beach
• Lower Floridan brackish groundwater source

• “Water Cooperative of Central Florida” Interlocal Agreement and Charter has been executed with STOPR members including City of St Cloud, Toho Water Authority, Orange County and Polk County

• Permitted 37.5 MGD groundwater withdrawal with 30 MGD of finished water under distribution “water wheeling” scheme for STOPR members

• SFWMD has agreed to provide $465,000 to satisfy a settlement agreement between St. Cloud and Orange County.
The City of Hallandale Beach is planning for future “salty” City wells. The City is designing an RO skid to treat City well water as it becomes “salty”.
WATER REUSE

Altamonte-FDOT Integrated Reuse & Stormwater Treatment
An Integrated Approach to Reuse and Nutrient Reduction

Project Components

- Stormwater from I-4 widening diverted to City’s Cranes Roost reservoir
- 1.5 mgd from Cranes Roost pumped to Reuse Augmentation Facility
- Stormwater and reclaimed water not reused by Altamonte delivered via 5 mile pipeline to City of Apopka for irrigation and groundwater recharge.
Benefits:

- Reduction of nutrients discharged to Wekiva River Basin from stormwater and reclaimed water wet weather flows
- Provides 1.5 MGD of Alternate Water Supply from Cranes Roost stormwater
- Provides 3.0 MGD of Alternate Water Supply from RWRF (previous wet weather discharge)
WATER REUSE

Reedy Creek Improvement District is Driving Innovative Uses for Reuse

- Cooling tower makeup
- Street and sidewalk wash-down
- Fire protection and suppression
- Vehicle washing
- Toilet Flushing
- Process uses (WWTP & Solid Waste Transfer Station)
WATER REUSE

Broward County will provide Reclaimed Water to Palm Beach County

- Broward County - Ocean Outfall compliance
- Palm Beach County – Alternative Water Supply
- 6.5 mgd designated to southern Palm Beach County customers
- 12.3 mgd reserved for other/future Palm Beach County customers
- 4.8 mgd will be delivered to northern Broward County customers en route to Palm Beach County
SURFACE WATER CAPTURED PREDOMINATELY DURING HEAVY RAINFALLS

City of West Palm Beach C-17 Tidal Capture Project Description

- Re-captures seepage from lake system and water catchment area otherwise lost to tide
- Capacity to capture up to 60 mgd
- Proven: City captured 2.3 billion gallons from October 2011 to June 2012 (dry season)
- Low cost: Capital cost $0.07 / 1,000 gallons
- Annual O&M cost $0.04 / 1,000 gallons
- Companion to Renaissance C-51 Tidal Capture Project
SURFACE WATER CAPTURED PREDOMINATELY DURING HEAVY RAINFALLS

City of West Palm Beach C-17 Tidal Capture Project Benefits

- Maximizes potential to capture rainfall 24/7 including during droughts – water historically available 88% of time during typical dry season
- Water captured is over and above consumptive use permit allocation
- Reduces harmful water discharges to Lake Worth Lagoon

Shaded area represents the dry season for each year.
SOURCES MADE AVAILABLE THROUGH THE ADDITION OF NEW STORAGE CAPACITY

Stormwater from C-51 Canal stored to recharge aquifer providing water supply to multiple utilities

- Partnership among south Florida utilities, Palm Beach Aggregates and SFWMD - Public-Private Partnership (P3)
- Land areas with slow seepage characteristics provide rare water storage opportunity.
- Water routed through SFWMD’s Regional System
- Utilities from Palm Beach to Miami-Dade counties may potentially benefit
SOURCES MADE AVAILABLE THROUGH THE ADDITION OF NEW STORAGE CAPACITY

C-51 Reservoir Addresses Florida’s Unique Water Supply and Storage Challenges

- Cost-effective - existing groundwater wells and treatment plants made used and useful by permit offsets
- Current design can provide 132.5 mgd during dry season
- Project beneficially uses rock-mined land.
- Project ties need for additional water supply with ecosystem restoration.
  - Can mitigate salt water intrusion from sea level rise;
  - Will reduce harmful water discharges to Lake Worth Lagoon by 17%
AQUIFER STORAGE AND RECOVERY

2011 to 2014
What a Difference Three Years Makes

- EPA letter supporting FDEP’s position on the arsenic issue
- Storage of reclaimed water is expanding in Southwest and Central Florida
- Untreated surface water ASR is moving forward in South Florida
- New storage zones are being explored, particularly in the lower Floridan aquifer
- Several projects previously “shelved” have been re-activated
AQUIFER STORAGE AND RECOVERY

Reclaimed Water ASR

- Used to store public access reclaimed water and provide dry season supplemental supply
- Most practical and economically feasible in aquifers containing greater than 1,000 mg/L TDS
- Can minimize surface water discharges, nutrient limits, and TMDL reductions
- Polk County Recently Constructed the Deepest ASR Well Worldwide
- First ASR well to utilize the lower Floridan aquifer (LFA)
- Others, such as St. Cloud, are pursuing similar opportunities
AQUIFER STORAGE AND RECOVERY

Untreated Surface Water or Stormwater ASR

- Most cost-effective storage option
- Greenest option with lowest carbon footprint
- Requires Water Quality Criteria Exemption (WQCE) or other relief mechanism
- Drainage wells (Orlando, Gainesville) provide good historical dataset
- The City of West Palm Beach is pursuing a WQCE to allow total coliform to enter well

- Preliminary feedback from FDEP is encouraging
FLORIDA WATER UTILITIES DRIVE INNOVATIVE ALTERNATIVE WATER SUPPLY OPTIONS

28th Annual Environmental Permitting Summer School
Marco Island

Questions?