Miami-Dade Water and Sewer Department

Water Supply Planning

April 18, 2012
MDWASD Overview

• Largest water and sewer utility in Florida, serving more than 2.2 million residents

• Water System:
  - 3 large regional and 5 small water treatment plants
  - Supplying an average of 306 million gallons per day (MGD)
  - 90% of the County’s public water supply
  - Per capita water use 134 gpcd
  - 15 wholesale customers
  - 422,016 retail customers
  - 100 water supply wells
  - 7,739 miles of pipes (from 2” to 96”)
  - 38,331 fire hydrants
  - 124,000 valves (from 2” to 96”)

MIAMI-DADE COUNTY
MDWASD Overview (continued)

- **Wastewater System:**

  - 3 wastewater treatment plants
  - 2 ocean outfalls and 21 deep injection wells
  - Collecting, treating, and disposing 288 MGD
  - 339,927 retail customers
  - 12 wholesale customers
  - 6,271 miles of mains and laterals
  - 1,039 sewer pumps stations (operated)
  - Reusing 10.2 MGD of wastewater
  - System Wide I/I Program
MDWASD Water & Wastewater Treatment Facilities

MDWASD - Water and Wastewater Treatment Plant Locations

Figure 1
Water Use Permit

• Permit Approved by South Florida Water Management District Governing Board on November 15, 2007 and modified November 1, 2010
• Permit Expiration 2030
• Biscayne Aquifer Baseline Allocation Complies with Regional Water Availability Rule
• 52 Limiting Conditions
WUP continued

• Water Supply Sources:
  - Biscayne Aquifer
  - Floridan Aquifer
  - Reclaimed Water
  - Aquifer Storage and Recovery (ASR)

• Implementation of:
  - Conservation
  - Alternative Water Supplies
  - Reuse Projects
  - Water Loss Reduction Program
WUP AWS Projects

- Floridan Aquifer as an alternative water supply
- Hialeah Reverse Osmosis plant
WUP Reclaimed Water Projects

- Biscayne Bay Coastal Wetlands Rehydration Pilot
- Power Plant Cooling
- Groundwater replenishment
BBCW Rehydration Pilot Project

- Pilot required by WUP
- Pilot planning started in 2007
- Run pilot units from Nov 2010 to April 2011
- Submitted final report to SFWMD, FDEP and BNP on October 2011
Reclaimed Water to FPL

• Entered in Join Participation Agreement with FPL in July 2010
• Up to 90 MGD of HLD water delivered to Turkey Point
• Current anticipated implementation dates: 2022 and 2023
• County pays for pipeline construction materials and labor
South District Water Reclamation Plant and Groundwater Replenishment
SDWWTP FDEP CO

• Implement High Level Disinfection prior to deep well injection (285 MGD)
Water Use Efficiency Plan

- A five year Plan approved by the Board of County Commissioners in April 2006
- In March 2007 expanded the Plan to 20-year as part of the Water Use Permit (WUP) application
- Plan includes:
  - Implementation of BMPs
  - Water Loss Reduction Program
  - Legislative Initiatives
  - Public Outreach
Water Savings Achieved Through BMPs

<table>
<thead>
<tr>
<th>Year</th>
<th>Water Savings (MGD)</th>
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<tbody>
<tr>
<td></td>
<td>Planned</td>
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<tr>
<td>2007</td>
<td>1.085854</td>
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<tr>
<td>2008</td>
<td>2.243228</td>
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<td>2009</td>
<td>3.529212</td>
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<td>2010</td>
<td>4.815196</td>
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<td>2011</td>
<td>6.10118</td>
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<td>2016</td>
<td>11.69942</td>
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<tr>
<td>2021</td>
<td>15.66834</td>
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<tr>
<td>2026</td>
<td>19.62226</td>
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</table>
## 2011 Water Savings BMPs

<table>
<thead>
<tr>
<th>Category</th>
<th>Actual Gal. Of Water Saved Per Day</th>
<th>Actual Number of Applications</th>
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<tbody>
<tr>
<td>HET Rebate</td>
<td>74,414</td>
<td>2566</td>
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<tr>
<td>Senior &amp; Low Income Retrofit</td>
<td>45,184</td>
<td>706</td>
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<tr>
<td>Single Family Showerhead</td>
<td>67,760</td>
<td>1936</td>
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<td>Water Conservation Kits (Single Family)</td>
<td>17,004</td>
<td>1417</td>
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<td>Multifamily Showerhead</td>
<td>99,995</td>
<td>2857</td>
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<td>Water Conservation Kits (Multifamily)</td>
<td>31,416</td>
<td>2618</td>
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<td>Green Lodging</td>
<td>4,851</td>
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<td>Single Family Irrigation Evaluation</td>
<td>33,785</td>
<td>145</td>
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<td>HOA Irrigation Evaluation</td>
<td>1,540,000</td>
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<tr>
<td>County Landscape Evaluations</td>
<td>7,500</td>
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</tbody>
</table>

**Total:** 1,921,909.00
Policy Measures

Ordinances:

• Water Use Efficiency Standards for new developments and renovations (Effective January 2009)

• Permanent Landscape Irrigation Ordinance (Ord. 09-25)

• Landscape Ordinance Amendments (Section 18-A)
Water Supply Planning

Exhibit A
MDWASD Finished Water Demand and Water Supply Projections

Notes:
1. Finished Water AADD accounts for water conservation projects and includes implementation of the following projects: North District Reuse (4 MGD overall; 2 MGD VASD) by 2011 ($28.8M) and Central District Reuse (1 MGD) by 2011 ($15.3M). Demand decreases in 2009 due to a discontinued wholesale water purchase by City of North Miami Beach.
2. Other projects to be implemented that do not increase water supply capacity, but that are needed for treatment and pilot studies. Include High Level Disinfection at South District WWT (265 MGD) by 2012 ($50.0M); Biscayne Bay Coastal Wetlands Re-hydration Project (78 MGD) by 2021 ($321.0M), South Miami Heights WTRP Program (20 MGD) by 2011 ($195.2M), Aquifer Recharge Plans Study (8.00 MGD) by 2009 ($14.5M), and Coastal Wetlands Re-hydration Demonstration Pilot Project (0.25 MGD) by 2009 ($19.2M).

Funding Sources:
3. Water Connection Charges and Building Better Communities GO Bond Program; Project 4 - Wastewater Connection Charges, Future Wastewater Revenue Bonds, and Wastewater Revenue Bonds Series 1999; Projects 5 and 8 - Future Revenue Bonds, Project 6 and 7 Funding - Future Wastewater Revenue Bonds.

Project Names:
1. Florida Aquifer Blending at Alex-Orr WTP (7.2 MGD, $6.4M)
2. Florida Aquifer Blending West at Hialeah/Coventry (4.7 MGD, $10.3M)
3. New Upper Florida RO WTP Phase 1 (6.5 MGD, $93.0M) (WTP Capacity = 10 MGD)
4. SDWWTP Groundwater Recharge, Phase 1 (900 GPD WTP) (16 MGD, $857.5M)
5. New Upper Florida RO WTP Phase 2 (4.5 MGD, $24.0M) (WTP Capacity = 15.0 MGD)
6. WDWRP Canal Recharge, Phase 2 (Alex-Orr WTP) (20 MGD, $268.0M)
7. WDWRP Canal Recharge, Phase 3 (Alex-Orr WTP) (15 MGD, $217.5M)
8. New Upper Florida RO WTP Phase 3 (2.0 MGD, $5.7M) (WTP Capacity = 17.5 MGD)
Water Supply Planning

![Graph showing water supply planning with marked years and projects.](image-url)
WUP and LECWSP Projections

MDWASD Alternative Water Supply (AWS) Projects

- Available Water Supply
- Projected Finished Water Annual Average Daily Demand (AADD)
- Historical Finished Water AADD
- Proposed LECWSP Projections

AWS Projects:
1. Hialeah Floridan Aquifer R.O. W.T.P. Phase 1 (Capacity 10.0 MGD, Operational 12/31/12)
2. South Miami Heights Biscayne/Floridan Aquifer R.O. W.T.P. (Capacity 20 MGD)
3. West District W.R.P. Canal Recharge Ph 1 (21 MGD)
4. Hialeah Floridan Aquifer R.O. W.T.P. Phase 2 (5.0 MGD)
5. West District W.R.P. Canal Recharge Ph 2 (16 MGD)
6. Hialeah Floridan Aquifer R.O. W.T.P. Phase 3 (2.5 MGD)

Biscayne Aquifer Base Condition Water Use
(Raw Water = 347.0 MGD)

Year
2005 2010 2015 2020 2025 2030
Average Annual Daily Demand and Available Water Supply Projections

- 2005: 280 MGD
- 2010: 290 MGD
- 2015: 300 MGD
- 2020: 310 MGD
- 2025: 320 MGD
- 2030: 330 MGD

Projected AADD:
- 2015: 358.61 MGD
- 2020: 345.08 MGD
- 2025: 345.08 MGD
- 2030: 393.1 MGD

Historical AADD:
- 2015: 305.7 MGD
- 2020: 302.57 MGD
- 2025: 305.7 MGD
- 2030: 305.7 MGD
WUP Modification Request

• Submitted application May 9, 2011
• Request based on:
  - Present water use reductions (finished water demands 35 MGD lower than anticipated in 2007)
  - Cost of groundwater replenishment project
• Proposed replacement of reclaimed water groundwater replenishment with Floridan aquifer water, at the South Miami Heights Water Treatment Plant (avoided cost $300 M)
Ocean Outfalls

- On July 1, 2008, Senate Bill 1302 became effective
- The Bill requires:
  - July 1, 2013, submit implementation plan to FDEP
  - December 31, 2018, implement AWT for the North and Central District WWTPs’ discharges, or equivalent nutrient load reduction
  - December 31, 2025, implement 60% reuse and stop discharging out the outfall, except as “backup discharge” to the functioning reuse system
OOL Implementation

- Need to implement 117 MGD of reuse
  - First were considering recharging Biscayne aquifer with reclaimed water (MF, RO, UV, Pex, & IE)
  - Currently evaluating the technical feasibility of recharging the Florida aquifer with reclaimed water (HLD), preferable all at the Central District WWTP (Virginia Key)
- Complete Plan by July 2013
Next Steps

• Prepare new water demand projections when Miami-Dade County Planning completes its 2030 projections by TAZs
• Reevaluate alternative water supply projects based on need, technical feasibility, and cost
• Utilize new Biscayne aquifer model (USGS) to optimize water withdrawals
• Submit 3rd WUP Modification
• Update water master plan, addressing climate change concerns