

# Miami-Dade Water and Sewer Department

# Miami-Dade Consolidated PWS Water Use Permit No. 13-00017-W

# Alternative Water Supply Plan and Reuse Feasibility Plan Annual Progress Report

January 1, 2009 Through December 31, 2009

Miami-Dade Water and Sewer Department P.O. Box 33-0316, Miami, FL 33233-0316

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### **SECTION I INTRODUCTION**

On November 15, 2007, the South Florida Governing Board (SFWMD) approved the Miami-Dade Consolidated PWS Water Use Permit (WUP).

Limiting Condition 37 of the WUP requires that the permittee provide annual updates per limiting condition 47, of the status of all alternative water supply (AWS) projects. The status report shall include work completed to date, expenditures, and any anticipated changes in the timelines.

Limiting Condition 50 of the WUP requires that the Miami-Dade Water & Sewer Department (MDWASD) provide the District with annual updates by March 15<sup>th</sup> of each year, describing the activities associated with the implementation of the approved reuse feasibility plan including the following information: (1) the status of distribution system construction, including location and capacity of a) existing reuse lines; b) proposed reuse lines to be constructed in the next five years; (2) a summary of uncommitted supplies for the next five years; (3) the status of reuse plan implementation including status of pilot projects, plan design construction, volume of reuse available, volume of wastewater disposed of; and (4) the status/copies of any ordinances related to reuse; (5) any proposed changes to the reuse plan set forth in Exhibit 30.

MDWASD hereby submits the third Alternative Water Supply Plan and Reuse Feasibility Plan Annual Progress Report summarizing the County's actions and efforts to comply with Limiting Conditions 37 and 50 of the WUP.

### SECTION II STATUS OF REUSE DISTRIBUTION SYSTEM CONSTRUCTION

The status of distribution system construction, including location and capacity of a) existing reuse lines b) proposed reuse lines to be constructed in the next five years:

#### Existing Reuse Lines

Currently MDWASD has a distribution line to Florida International University's (FIU) Biscayne Bay Campus located at 3000 N.E. 151st Street, North Miami, Florida. The capacity of the existing reuse system for FIU irrigation is 1.5 MGD. MDWASD currently delivers an annual average flow of 0.12 MGD for irrigating 40 acres of landscape.

Installation of reclaimed water piping in the Village of Key Biscayne has been completed. The maximum capacity of the Village of Key Biscayne piping is 3 MGD.

Appendix A contains maps of the existing reuse lines.

#### Proposed Reuse Lines

On May 20, 2008 the Miami-Dade Board of County Commissioners (BCC) approved a Professional Services Agreement to design the pipeline from the Central District Water Reclamation Plant (CDWRP) to the Village of Key Biscayne, with a connection to the Crandon Golf Key Biscayne. The consultant has completed 90% design, and pipe alignment has been selected based on the Basis of Design Report (BODR) recommendations. Construction of the pipeline is currently on hold.

On May 20, 2008, the BCC approved a contract with A&P Consulting Transportation Engineers Corp. to design the pipeline from the South District Water Reclamation Plant (SDWRP) to the Miami Metrozoo, where the reclaimed water will replenish the groundwater. The consultant has prepared the BODR for the pipeline and an alternative for the pipeline route has been selected.

MDWASD's Engineering Division is re-designing the North District reclaimed water pipeline. The capacity of the pipeline is being re-evaluated since the Cities of North Miami and North Miami Beach have informed MDWASD that they are unable to provide the previously agreed upon reclaimed water distribution facilities. The pipeline has been designed to run from the south entrance gate of the North District Wastewater Treatment Plant (NDWWTP), heading south along the FIU Stadium Road, turning west along NE 151<sup>st</sup> Street and continuing west along NE 151<sup>st</sup> Street to the entrance of Biscayne Landing. Construction of the pipeline is currently on hold.

Appendix A contains the maps of the proposed reuse lines for all of the projects.

## SECTION III SUMMARY OF UNCOMMITTED REUSE SUPPLIES

#### Summary of uncommitted supplies for the next five years:

It is not anticipated that MDWASD will have any uncommitted reuse supplies in the next five years.

To ensure commitment to reclaimed water supplies, MDWASD is working with FPL to develop a Joint Participation Agreement for the delivery of reclaimed water to the Turkey Point Plant. Additionally, MDWASD and the Miami-Dade Parks Department have signed a Memorandum of Understanding for the storage and use of reclaimed water at the Crandon Golf Course at Key Biscayne.

MDWASD has also met with retail customers including Biscayne Landings, Miami-Dade Parks and Recreation Department, Miami-Dade General Services Administration, Fisher Island, and the Village of Key Biscayne, to discuss the use of reclaimed water.

Additionally, the consultant selected to design the Central District Water Reclamation Plant will continue to evaluate the feasibility of adding reclaimed water users along the pipeline from the Plant to the Village of Key Biscayne, as well as to Fisher Island. MDWASD is also working on developing service agreements with future customers.

### SECTION IV STATUS OF ALTERNATIVE WATER SUPPLY AND REUSE PLAN IMPLEMENTATION

The status of both the alternative water supply plan, and the reuse plan implementation including status of pilot projects, plan design construction, volume of reuse available, volume of wastewater disposed of, is described below:

On July 14, 2005, MDWASD issued a Notice to Proceed to Ecology & Environment, Inc. to update the Reuse Feasibility Study (RFS). On June 13, 2006, the MDWASD received joint comments from the Florida Department of Environmental Protection (FDEP) and the SFWMD on the draft RFS Update. On September 18, 2006, the MDWASD held a workshop with the regulatory agencies to further discuss their comments and on May 3, 2007, the MDWASD submitted the Final Reuse Feasibility Study Update. On May 10, 2007, MDWASD submitted an Alternative Water Supply (AWS) Plan to the SFWMD and the FDEP. On November 1, 2007, MDWASD submitted the final AWS Plan and schedule to the SFWMD, incorporating comments from FDEP and the SFWMD.

Individual projects are described below:

#### Hialeah Floridan Aquifer Reverse Osmosis (RO) Water Treatment Plant

On July 26, 2007, the Miami-Dade BCC approved a Joint Participation Agreement (JPA) between Miami-Dade County and the City of Hialeah for this project. On October 25, 2007, the City of Hialeah provided MDWASD with a tentative schedule for the construction of the RO plant. Miami-Dade County Mayor Carlos Alvarez and City of Hialeah Mayor Julio Robaina signed the JPA on December 27, 2007.

On February 7 and February 8, 2008, MDWASD attended a workshop hosted by the City of Hialeah's consultant, Parsons, regarding the design and construction of the Hialeah Floridan Aquifer Reverse Osmosis Water Treatment Plant.

On March 26, 2008, the City issued a Request for Proposals (RFP) for the drilling, construction and testing of Floridan aquifer test well systems for the Project. On April 24 and May 13, 2008, the City extended the deadlines for the RFP submittals. Parsons and other City consultants are currently working to obtain a permit for the discharge of drilling, well development and pump test water.

On June 5, 2008, the City of Hialeah held a non-mandatory Pre-Request for Qualifications (Pre-RFQ) meeting for interested firms for the design, construction, start–up, testing, commissioning and operation of the Reverse Osmosis Water Treatment Plant and Wellfield System. On September 3, 2008, the Committee met for the ranking of the companies who responded to the Request for Qualifications. On September 5, 2008, Mayor Julio Robaina recommended that the City Council select three responding companies, American Water-Pridesa, LLC, Inima USA Corp. and Veolia Water North American-South, LLC, as sufficiently qualified to respond to the forthcoming Request for Proposal, when advertised.

On November 19, 2008, the City of Hialeah received the RFPs for Drilling, Construction, and Testing of the Floridan Test Wells. The contract was approved by the City Council on December 23, 2008, and awarded to Diversified Drilling Corporation.

On January 22, 2009, the Miami-Dade Board of County Commissioners (BCC) approved Amendment 1 to the JPA which included the conveyance of the property on which the RO WTP will be constructed from Miami-Dade County to the City of Hialeah.

On March 16, 2009, the City received draft injection well permits from the Florida Department of Environmental Protection (FDEP), for the RO brine disposal. On May 18, 2009, FDEP held a public meeting to receive comments on the permits. On March 12, 2009, final permits were received from the SFWMD for the test and production wells.

On June 1, 2009 Notices to Proceed were issued to the Design/Build/Operate (DBO) teams for pilot testing. The equipment for the pilot testing arrived on-site on June 1, 2009. Three (3) pilot testing agreements are in place to test the membranes. The permit has been issued and pilot testing has been completed. A final Report of the process is to be completed.

On August 17, 2009, the City of Hialeah advertised the RFP for the "Drilling, Construction and Testing of Class 1 Test/Injection Wells and Dual Zone Monitor Well". On October 26, 2009, the City issued a Notice to Proceed to Youngquist.

On October 15, 2009, the City of Hialeah sent out a RFP for the Hialeah RO Water Treatment Plant, Design, Build, Operate. On December 18, 2009, the RFP submittal date was extended to February 5, 2010. It is anticipated that the selection of the contractor will be made in early 2010.

On December 15, 2009, the preliminary geotechnical report was released. As of December 21st 2009, Drilling of Injection Well No. 1 was bored to approximately 42" to 1900' feet below land surface. Drilling on Injection Well No. 2 is bored at 12.25" to approximately 1940' below land surface.

The City of Hialeah is tracking all expenditures.

#### Upper Floridan Aquifer Blending

Starting in 2006, MDWASD began blending water from the Floridan aquifer with Biscayne aquifer water at the Alexander Orr Water Treatment Plant. Concerns about the finished water quality arose during blending. Sodium and chloride levels nearly tripled, and the total dissolved solids (TDS) doubled. This change in water quality impacted the water distribution system that is serviced by 40 to 60 year old, 2" galvanized water mains. The baseline number of water quality complaints rose from an average of 27 complaints per month before blending, to 107 complaints per month during blending of Floridan aquifer water. The number of complaints for the Hialeah/Preston service area, which was not blending, remained unchanged at an average of 17 per month.

Based on the complaints, MDWASD assigned Carollo Engineers to evaluate the water quality impacts of the blending. On November 12, 2008, MDWASD presented the results of the investigation to the SFWMD. Based on the presentation, the SFWMD administratively approved reduction of blending at Alexander Orr.

MDWASD completed the design of the wells for Upper Floridan Aquifer blending at Hialeah/Preston. However this project, if implemented, may result in adverse water quality impacts in the potable water distribution system.

On December 5, 2008, MDWASD requested that the project be postponed. On January 6, 2009, the SFWMD granted a postponement for the completion of milestones associated with the Floridan aquifer blending project. On December 21, 2009 MDWASD submitted a Request for Permit Modification requesting deletion of this project, based on significantly lower Biscayne aquifer water use. MDWASD estimates that with the two-day per week irrigation Ordinance, potable water demand per capita will remain near the current level.

Expenditures for the Upper Floridan Blending project, through December 31, 2009, include \$375,000 for the design and permits of the blending wells, and \$20,000 for the Water Quality Evaluation.

#### South District Water Reclamation Plant

On June 26, 2007, the BCC approved the Request to Advertise for the design and construction management services for the water reclamation project associated with the South District Wastewater Treatment Plant. The award contract for the design of the new South District Water Reclamation Plant (SDWRP) was approved by the BCC on December 4, 2007.

The new SDWRP will be constructed west of the South District Wastewater Treatment Plant. On November 20, 2008 the BCC approved the purchase of the property and approved a resolution authorizing the construction of the SDWRP on the property.

The results of the ammonia model were presented to DERM in January 2009. Based on the model results, DERM is requiring additional treatment for ammonia. Further removal of ammonia will require that an additional treatment process be added to the original treatment design. The final nutrient removal technical memorandum has been issued and lon exchange has been chosen for additional removal of ammonia. The Draft Basis of Design Report (BODR) was completed in December 2009 and submitted to WASD for review.

A general regulatory meeting with DERM, FDEP, the Miami-Dade Health Department, and the SFWMD was held on November 9, 2009 to discuss issues pertaining to water quality, monitoring, and the groundwater modeling which was performed for the aquifer recharge options. A follow-up meeting on the water budget analysis was held with SFWMD on November 12, 2009. Based on this meeting the consultant CDM compared the modeling results from the three recharge options in more detail to see the impact on the C-1W canal north of structure S-148. It was decided that the injection wells recharge option provided the necessary water budget offset for the regional system,

On May 20, 2008, the BCC approved a contract with A&P Consulting Transportation Engineers Corp. to design the pipeline from the SDWRP to the Miami Metrozoo, where the reclaimed water will replenish the groundwater. The consultant has prepared the BODR for the pipeline and an alternative for the pipeline route has been selected. Use of the SFWMD canal right-of-way, or a portion of the right-a-way for the pipeline route, will result in significant cost savings to MDWASD. This action is scheduled for February 2010. The consultant has completed the 90% design for SW 127 Avenue.

The consultant has completed a Phase 1 Environmental Site Assessment (ESA) for the proposed water reclamation site and the recharge area at Miami Metrozoo. A Phase 2 ESA at the water reclamation plant site has also been completed. A conceptual site plan has been completed by the consultant.

The geotechnical field work and surveying work, which are required to support the preliminary design of the recharge facilities and the groundwater modeling at the Miami Metrozoo site, has concluded. The groundwater flow model and the development of design criteria for the recharge are also finished.

On-site irrigation and in-plant use of reclaimed water resulted in 4.276 MGD of water reclamation at the SDWWTP in FY2009. The estimated capacity of the current SDWWTP reuse system is 4.173 MGD.

Expenditures through December 31, 2009 for the SDWRP Plant and Pilot are \$9,663,338.08. Expenditures through December 31, 2009 for the SDWRP Pipeline are \$855,186.

#### West District Water Reclamation Plant

On January 30 and May 13, 2008, MDWASD met with the District to discuss potential available lands where the West District Water Reclamation Plant (WDWRP) could be located. On July 10, 2008, ERM Southeast, Inc. was selected to assist in the site screening. On July 23, 2008, the consultant was approved to establish evaluation criteria and methodology, and to evaluate and rank potential sites for the West District plant. MDWASD staff and the consultant met with various federal, state and local agencies as part of the site evaluation process.

On November 3, 2009, MDWASD staff and the consultant met and selected Candidate Site (CS) 12 as the preferred site for the construction of the WDWRP. A Phase II Environmental Site Assessment (ESA) is currently being initiated for CS 12. Based upon favorable results of the ESA, the land acquisition process will be started when funding becomes available.

MDWASD staff continues to work on preliminary sizing and design for the proposed WDWRP. Currently various alternatives, including plant capacity associated with reclaimed water opportunities, are being developed in conjunction with system-wide wastewater transmission and treatment facilities planning and the ocean outfall legislation implementation.

Expenditures through this reporting period for the WDWRP were \$252,494.02.

#### North District Wastewater Treatment Plant Reuse Projects

On June 26, 2007, the BCC approved the Request to Advertise, for design and construction management services for the water reclamation project at the North District Wastewater Treatment Plant (NDWWTP). On November 6, 2007 the BCC approved a Professional Services Agreement to design the North District Water Reclamation Plant. A Notice to Proceed was issued to the consultant on December 7, 2007. Survey and geotechnical investigations have been completed.

As part of the planning and design phases of the 7 MGD North District Water Reclamation Plant (NDWRP), several meetings were held with representatives from the cities of North Miami and North Miami Beach. Both Cities have indicated that they are unable to provide the previously agreed upon reclaimed water distribution facilities from MDWASD's proposed point of delivery on the west side of Biscayne Boulevard, even if MDWASD provides reclaimed water at no cost. Additionally, MDWASD is evaluating water reclamation projects for the NDWWTP in light of the recently enacted ocean outfall legislation.

For these reasons MDWASD requested that the SFWMD approve a modification to the NDWRP project. On September 16, 2008, the SFWMD approved the implementation of a 3.5 MGD reclaimed water project at NDWWTP, to be completed by January 1, 2012, and requested that MDWASD submit additional information addressing a larger reuse project at the NDWWTP, to the SFWMD. On March 13, 2009, MDWASD transmitted data to the SFWMD, from the Department's Ocean Outfall Evaluation including the NDWWTP reuse component of the Evaluation.

On November 7, 2009 MDWASD responded to FDEP's Request for Information on the design of the North District WRP. On November 20, 2009, MDWASD met on-site with FDEP and the consultant to discuss the design. The consultant will revise the design in accordance with FDEP's comments and resubmit the plans. On December 3, 2009, MDWASD received the 90% design submittal from the consultant.

Plant Operations staff have performed exploratory excavations around the Chlorination Building to determine possible conflicts between the proposed piping and existing piping on the plant site. The MDWASD Survey Section will obtain elevations and topographical information. On December 14, 2009, MDWASD met with the consultant to review and select a piping route for the 20" filter effluent pipeline.

On December 21, 2009 MDWASD submitted a Request for Permit Modification requesting modification to the schedule for this project.

The NDWWTP currently has a reuse capacity of 4.44 MGD. In FY2009, 2.68 MGD of wastewater was treated and reused for in-plant processes at NDWWTP. Irrigation at Florida International University's Biscayne Bay campus accounted for an additional 0.12 MGD of reuse from the NDWWTP.

Expenditures through December 31, 2009, for the NDWRP Plant are \$1,847,280, and \$86,475 for the NDWRP pipeline.

#### **Central District Wastewater Treatment Plant Reuse Projects**

On June 26, 2007, the BCC approved the Request to Advertise, for design and construction management services of the Water Reclamation Plant at the Central District Wastewater Treatment Plant (CDWWTP). The selected consultant for the design was approved by the BCC on December 4, 2007. The Notice to Proceed was issued on December 28, 2007, and on January 15, 2008, a kick-off meeting with the consultant was held to discuss the initial work order for the project. The consultant has submitted a "Regulatory and Practical Reviews" technical report, along with technical memorandums discussing distribution pipe diameter, plant storage and treatment options. Geotechnical work has been completed. In order to initiate early procurement of the microfiltration membranes, a Request for Information was forwarded to the various membrane manufacturers to determine if equipment complies with design parameters and the membrane procurement process is underway. Design for the WRP is 90% complete

On May 20, 2008, the BCC approved a Professional Services Agreement to design the pipeline from the Central District Water Reclamation Plant (CDWRP) to the Village of Key Biscayne, with a connection to Crandon Golf Key Biscayne. The consultant has completed 95% design, and permitting is 95% complete.

On May 13, 2008, MDWASD gave a presentation to the Village of Key Biscayne Council on the

CDWRP and the associated piping project. Additionally, on May 13, 2008, the Village Council awarded a contract to Conquest Engineering Group, for the construction of the reclaimed water distribution system within the Village, utilizing funding from Miami-Dade County and Alternative Water Supply Funding from the SFWMD. Installation of reclaimed water piping was initiated on June 29, 2007 in the Village of Key Biscayne. The reclaimed water piping in the Village of Key Biscayne has been installed.

On December 21, 2009 MDWASD submitted a Request for Permit Modification requesting modification to the schedule for this project.

In FY2009, the CDWWTP used 6.03 MGD of reclaimed water for in-plant processes. The CDWWTP has an estimated maximum reuse capacity of 7.878 MGD.

Expenditures as of December 31, 2009 for the CDWRP plant were \$2,083,783.81 and for the pipeline were \$940,567.

#### FPL Turkey Point 14 MGD and 70 MGD

MDWASD staff is meeting regularly with representatives from Florida Power and Light (FPL). Four (4) main alternatives were considered for providing reuse water to Turkey Point. MDWASD developed cost estimates for these alternatives, and the selected alternative will provide up to 90 MGD of HLD-treated water from the SDWWTP for FPL use. The construction of the treated water pipeline is scheduled to be completed in 2017.

Expenditures for the FPL Turkey Point Reuse Project, through December 31, 2009, are approximately \$110,060.

#### Aquifer Recharge Pilot Project

The Aquifer Recharge Pilot project at the former US Coast Guard's Richmond Heights Complex, was evaluated for its possible use for the full scale South District Water Reclamation Plant (SDWRP), however it was decided it would best to conduct the pilot at the South District Wastewater Treatment Plant (SDWWTP).

Permits for the pilot plant at the SDWWTP, have been received, and construction has started. Preparations are underway for pilot testing the treatment technology. On October 23, 2008, MDWASD requested that the FDEP waive the pilot testing requirements for the Aquifer Recharge Pilot. On December 31, 2008, FDEP responded to MDWASD's request. FDEP asked that MDWASD complete a plan of study for the pilot testing, and submit the plan to FDEP for permitting evaluation.

Pilot testing of the different processes began at the end of February and has been completed. The pilot testing and water quality analyses have been completed.

Expenditures for the original Aquifer Recharge Pilot Plant, for design and permitting, totaled \$486,409.28. Costs associated with the pilot at SDWWTP are included in the SDWRP costs.

#### Biscayne Bay Coastal Wetlands Rehydration Pilot Project

On November 10, 2007, MDWASD submitted a conceptual plan and basis of design for the revised project to the SFWMD. The Notice to Professional Consultants requesting project proposals was advertised on May 12, 2008. On May 22, 2008, MDWASD received comments on the Conceptual Plan from the SFWMD. On May 27, 2008 Miami-Dade County held a RFP Pre-Submittal Project Briefing for the Project.

The recommendation for consultant selection for this project was approved by the BCC on January 22, 2009 and the first Task Authorization was issued on February 2, 2009. A kick-off meeting was held with the consultant on February 19, 2009.

The Agreement with Florida International University (FIU) for ecological and aquatic toxicity testing was approved by the BCC on March 3, 2009. On March 5, 2009, MDWASD sent letters to FDEP, Biscayne National Park (BNP), the SFWMD, and the Miami-Dade Department of Environmental Resources Management (DERM), requesting appointment of staff members to the BBCWRP project stakeholder's leadership team. The designated Leadership Team met on April 28, 2009. On June 16, 2009 a public meeting of all stakeholders was held at MDWASD. The second stakeholder meeting was held on July 21, 2009.

On June 29, 2009, the consultant submitted a Water Quality Evaluation and a Process Technology Assessment report. The consultant has also submitted a draft ecological monitoring plan and a draft preliminary engineering report.

On August 25, 2009, a stakeholders' workshop was held to review treatment efficiencies of the proposed pilot plant treatment trains. On November 4, 2009, a public meeting was held to update stakeholders on the progress of the pilot. On December 4, 2009, a stakeholder workshop was held to discuss the draft literature review and the draft report on monitoring data sources.

Expenditures through December 31, 2009, for the BBCWRP were \$1,840,830.57.

## SECTION V STATUS OF REUSE ORDINANCES

MDWASD is currently evaluating reuse rates for both wholesale and retail customers.

## **SECTION VI PROPOSED CHANGES TO EXHIBIT 29 AND 30**

On December 21, 2009 MDWASD submitted an application for a permit modification to the SFWMD. As a result of lower demands and updated population projections, MDWASD has reevaluated the water demand projections originally submitted for the WUP, and the AWS projects and project schedules. The application for the permit modification reflects changes to the AWS plan.

The following changes to exhibit 29 and 30 have been requested:

- Eliminating blending of native Floridan aquifer well water with existing and proposed sources due to water quality issues and using the existing Floridan Aquifer Storage and Recovery (ASR) facilities to reduce dry season pumpage as originally intended.
- Deferring the implementation of the North and Central District Wastewater Treatment Plants' reuse projects to the compliance date in the Ocean Outfall legislation, adopted in 2008, to facilitate a comprehensive and cost-effective reuse plan that is completely integrated with the Outfall compliance plan.

MDWASD is preparing a response to the SFWMD's Request for Additional Information, dated January 27, 2010.

# **APPENDIX A EXISTING & PROPOSED REUSE LINES**













# **APPENDIX B ANNUAL REUSE REPORTS**