

This section includes a summary of the stakeholder participation process for the Miami-Dade Water Reuse Feasibility Study Update. A number of meetings, workshops, and teleconferences were held with regulatory agencies, Miami-Dade staff, and public participants. Included herein are summaries and sign-in sheets for those meetings held in a formal fashion and where decisions that ultimately influenced the direction of this study were documented.

A public workshop was held on February 10, 2006, where information was provided during a presentation and public comments were obtained. In addition, public comments were also obtained through the MDWASD internet web-site.

Summary of stakeholder meetings and participation

Meeting	Date	Purpose	Entities
Initial Regulatory Meeting with FDEP	8/18/05	Discuss current and proposed issues, efforts and regulations that may impact this project	WASD E & E MSA FDEP
Initial Regulatory Meeting with SFWMD	9/13/05	Discuss current and proposed issues, efforts and regulations that may impact this project	WASD E & E MSA SFWMD
Reuse Opportunities Meeting	11/10/05	Identify potential reuse opportunities and major users	WASD MDDPZ E & E MSA
Meeting with City of North Miami Beach	11/15/05	Discuss potential reuse opportunities and partnerships with in City of North Miami Beach	WASD E & E
Meeting with SFWMD on Canal Recharge Study Meeting	12/15/06	Discuss ongoing canal recharge study, other potential opportunities and users	WASD E & E MSA SFWMD FDEP
Presentation/Workshop to CDMP Amendments and UDB Applicants Meeting	1/19/06	All applicants for CDMP amendments (UDB changes) were required to meet with WASD and the reuse feasibility study team to coordinate and incorporate reuse into their	WASD UDB Applicants E & E

Notes:

WASD Miami-Dade Water and Sewer Department
MDPZ Miami-Dade County Department of Planning and Zoning
MDPR Miami-Dade County Parks and Recreation
MDCBCC Miami-Dade County Board of County Commissioners
FDEP Florida Department of Environmental Protection
E & E Ecology and Environment, Inc.
MSA Milian, Swain and Associates, Inc.
IFAS University of Florida Institute of Food and Agricultural Sciences

Meeting	Date	Purpose	Entities
		applications	MSA
Meeting with Miami-Dade County Parks	1/25/06	Discuss potential opportunities in existing and future County Park facilities	WASD MSA MDPR
Stakeholder Workshop	1/31/06	Stakeholder workshop to obtain input on opportunities and constraints identified to date, discuss regulatory and other environmental issues, and identify additional opportunities.	WASD DERM MDPZ FDEP SFWMD E & E MSA
Presentation to INLUC Committee	2/03/06	Provide status update of all reuse opportunities identified to date and purpose of the Reuse Feasibility Study to the Infrastructure Committee of the Miami-Dade County Board of Commissioners	WASD MDCBCC E & E MSA
Public Meeting/Open House	2/10/06	Provide information on initiatives to public and solicit public input.	WASD MDPZ Residents Applied Research Center, FIU E & E MSA
Meeting with SFWMD and MDWASD	2/13/06	Continue discussions with SFWMD in the development of alternatives, CUP offsets, and alternative water supply issues.	WASD SFWMD E & E MSA
Modeling Meeting	2/20/06	Discuss modeling as part of MDWASD's 20-year CUP	WASD SFWMD E & E MSA

Notes:

WASD Miami-Dade Water and Sewer Department
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MDCBCC Miami-Dade County Board of County Commissioners
FDEP Florida Department of Environmental Protection
E & E Ecology and Environment, Inc.
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Meeting	Date	Purpose	Entities
Meeting with SFWMD Regional Reuse Feasibility Team	2/21/06	Share information and ideas of potential reuse opportunities throughout the District with SFWMD's contractor, CDM	WASD SFWMD CDM E & E MSA
Meeting with National Parks	2/28/06	Discuss regulatory issues and opportunities regarding reuse in areas close to Biscayne and Everglades National Parks	WASD BNP ENP FDEP SFWMD E & E MSA E & E
Meeting with DERM	3/14/06	Obtain additional feedback on reuse in wellfield protection areas and other regulatory concerns	WASD DERM E & E MSA
Coordination with other local entities		Various meetings and discussions have been held with other stakeholders to discuss reuse opportunities or obtain pertinent information.	WASD MSA E & E IFAS Others: City of Hialeah, Key Biscayne, Crandon Golf Course, City of Homestead, Village of Key Biscayne, Biscayne Landing Development, City of North Miami

Notes:

WASD Miami-Dade Water and Sewer Department
MDPZ Miami-Dade County Department of Planning and Zoning
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FDEP Florida Department of Environmental Protection
E & E Ecology and Environment, Inc.
MSA Milian, Swain and Associates, Inc.
IFAS University of Florida Institute of Food and Agricultural Sciences

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Reuse and Alternative Water Supply Study
August 18, 2005, Meeting with the
Florida Department of Environmental Protection (FDEP)

DATE: September 26, 2005

TO: MDWASD Meeting Attendees

FROM: Jim Bolleter /Ecology and Environment. Inc. Consultant Team

RE: MDWASD Reuse & Alternative Water Supply
Meeting with the Florida Department of Environmental Protection (FDEP)

Those in attendance were:

Bertha Goldenberg- Miami Dade Water and Sewer Dept. (MDWASD)
Donna Fries- MDWASD
Maria Valdez- MDWASD
Bill Pitt- MDWASD
Jim Bolleter- Ecology & Environment, Inc. (E & E)
Monica Perez- E & E
Arsenio Milian – Milian Swain & Associates, Inc (MSA)
Deborah D. Swain– MSA
Linda Horne- Florida Department of Environmental Protection (FDEP)
Patrick Pierson- FDEP
David York (By telephone)

B. Goldenberg stated that the purpose of the meeting was to obtain guidance from FDEP as to the issues required to be considered in our Reuse Program Study, to identify the guidelines to be followed, and any new or pending regulations that may impact the feasibility considerations of different alternatives. B. Goldenberg also stated that E & E with support from MSA would be preparing the update to the Wastewater Reuse Feasibility Study. J. Bolleter stated that the E&E Team would utilize FDEP guidelines for preparing Reuse Feasibility Studies and would look at traditional and non traditional reuse methods.

L. Horne inquired if new DRI's (Providence and Florida City) are being considered for reuse. These two developments may create opportunities to require installation of lines for re-use. She indicated that a number of counties including St. Lucie, Martin and Palm Beach County are considering changes to their comprehensive plans to require new developments to install purple pipe for reuse. This can also be accomplished thru ordinances. passing ordinances to require new developments to include reuse piping and utilize reuse water when available. She also inquired whether Florida Power and Light and the Parks Department would be viable reuse candidates. B. Goldenberg indicated that

there had already been some discussion with Florida Power and Light and the Parks Department. Also B. Goldenberg stated that North Miami Beach is going with RO, (will no longer be bulk water provider) and are interested in installing reuse pipes when they start doing sewer collection rehabilitation.

J. Bolleter stated that E & E is working with Keith & Schnars on the South Miami-Dade Watershed Study which will address sustainability of development and the need to protect Biscayne Bay. The study is anticipated to be completed by the end of year with consideration of future land uses. The group agreed that it would be a good idea to incorporate a recommendation for re-use of wastewater in newly developed areas of south Miami-Dade County.

B. Pitt indicated that a water conservation plan is to be completed by April of next year. The plan considers sewer mining and reuse projects with other municipalities (Miami Springs and North Miami Beach have expressed interest.)

B. Pitt asked about FDEP's position on canal recharge. L. Horne stated that you can do canal recharge as long as you provide high-level disinfection and determine a QBEL. A study is underway by CDM that is reviewing the feasibility of canal recharge to determine if benefits outweigh costs. A draft of the study may be completed by November, which will be followed by a pilot investigation to determine if relaxed standards can be established. L. Horne stated that we would need to work closely with DERM if this option was pursued.

The discussion shifted slightly regarding the regulatory issues associated with using the SFWMD canal rights of way for exfiltrating reuse water into the ground water and then has it seep into the canal (indirect recharge). FDEP indicated that a QBEL was not required but we will have to consider water quality. Provisions of Rule 62-610.850 will apply. D. York indicated that slow rate systems tend to undergo less scrutiny than rapid rate infiltration systems. D. York knew of one utility in Orange County (thought it was Orange Osceola Utilities) that did get a permit for a rapid rate infiltration system (constructed basin with French drains) that was located next to a canal. St Pete has residential re-use irrigating in areas with canals. Utilities, as in Lake Buenaventura, are discharging with rapid infiltration systems near canals. These strategies are permissible and will follow set-back requirements established on 62.610, but setback does not apply to surface water.

All agreed that laying reuse piping along the SFWMD canal Rights of Way would also be a potential option to get the reuse water conveyed to potential reuse customers.

D. York spoke about recent or new potential rule revisions and legislation but indicated there is nothing really of significance for this study. He noted the following:

- 62.610 will be open for rulemaking 8/30 at a public workshop in Orlando but the changes are relatively minor (i.e. refine forms, use of other meters to measure turbidity).
- 403.0 645 F.S.-2004- Directs state agencies, universities, parks, to use reclaimed water to the extent practicable.

Mr. York also mentioned the Water reuse strategies - 16 strategies towards refining water reuse (Water Reuse for Florida: Strategies for Effective Use of Reclaimed Water, prepared by the Reuse

Coordinating Committee and Water Conservation Initiative Water Reuse Work Group, 2003). Strategy 10, encouraging reuse in S.E. Florida should be looked at in detail.

As our study progresses, B. Pitt stated that we will go back to FDEP & SFWMD in approximately nine months to ascertain any changes in rules or regulations.

J. Bolleter if FDEP has any guidance for water offsets or recharge fractions such as in the Water Reuse for Florida document referenced above. D. York stated that FDEP does not have any regulations or guidance related to those issues and they really pertain more to consumptive use which the SFWMD has responsibilities. However, F.S. Section 403.064- encourages metering and users with high offset fractions.

J. Bolleter asked about FDEP's thoughts for utilizing reuse for the Biscayne Bay CERP project. L. Horne and D. York thought that the Biscayne Bay CERP project may take too long since it is currently on the backburner. There may be too much uncertainty when it will occur. D. York did indicate that wetland recharge is workable with FDEP. Wetlands Section 62.611 deals with wetland applications. A good number of projects have already been permitted for re-hydration systems, however, D. York was not aware of any that have been permitted immediately adjacent to well fields. In the Tampa Bay area, the Southwest Florida Water Management District (SFWMD) and local utilities are studying the use of high quality reclaimed water to rehydrate some wetland areas in the general proximity of well fields.

The discussion then focused on aquifer recharge for salt water intrusion and whether or not it was implementable. MDWASD staff indicated that aquifer recharge is not possible in south Dade due to the Park but maybe it could be feasible in north Dade County. While MDWASD does not have well field in the northern part of the county but several other entities do have well fields. Wells could be located upstream of seawater line to prevent movement of salt water to the west. This could be a political issue since some of these entities may not want MDWASD to discharge near their well field. Hollywood looked at injecting reclaimed water to repress salt water intrusion; lacks data. Others looking at it, but it may take long. D. York indicated that FDEP has not seen much interest. B. Pitt stated that reuse injection wells have been installed to prevent salt water intrusion in California-thru recharge of reclaimed water. D. York stated that salinity barrier wells regulation is in 62.610 (part 5). Also 62.610 Part 4 would allow rapid infiltration systems. Higher degree of disinfection is required.

B. Pitt stated that FDEP rules have limitations regarding discharging to water with TDS less than 1000 mg/L (not allow direct injection into groundwater with less than 1000 TDS without full treatment). This creates some constraints since the low TDS water is in close proximity to 3000 mg/L TDS water. Normally the 3000 mg/L TDS water would not require high-level treatment, however due to its close proximity to 1000 mg/L TDS water, more treatment may be required. Currently Miami-Dade allows drainage wells to discharge storm water east of the 1000 mg/L iso-chlor line in aquifers exceeding 10,000 mg/L in Total Dissolved Solids (TDS) which seems to contradict the wastewater requirements or certainly be less strenuous.

J Bolleter asked about FDEP's position on using Aquifer Storage Recovery (ASR) wells for reuse or at least for wet-weather storage. D. York stated that 62.610 Section 466 tracks direct injection rules. A number of ASR projects are planned in the Tampa area and are in the permitting process. Bill Pitt asked if the state has given a permit for a partial aquifer exemption. Can a line be established in Biscayne Aquifer to exempt? FDEP stated that they have not allowed this recently. L. Horne stated that Palm Beach had one but is not going to be signed off. D. York stated that an aquifer exemption (partial or full) really represents a federal charge and while theoretically possible will be very difficult to obtain. However, an exemption to a specific parameter is possible, particularly if it is for a secondary parameter.

The meeting concluded with FDEP saying to call them with any questions since they would like to see as much reuse as possible.

Sign-In Sheet



REUSE FEASIBILITY STUDY MEETING WITH FDEP AUGUST 18, 2005

SIGN IN SHEET

NAME	ORGANIZATION	ADDRESS	E-MAIL/PHONE No.
Donna Fries	MD-WASD		FriesD@miamidade.gov 786-552-8972
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Jim Bolleter	E & E		JBolleter@ene.com (305) 822-9959 / (561) 640-6552
Bill Pitt	WASD		wpitt@miamidade.gov (786) 552-8171
LINDA HORNE	DEP		linda.Horne@dep.state.fl.us (561) 681-6696
Bertha Goldenberg	WASD		bmg@miamidade.gov (786) 552-8120
PATRICK PIERSON	FDEP		patrick.piersen@dep.state.fl.us 561-681-6782

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Alternative Water Supply Meeting
September 13, 2005, Meeting with the
South Florida Water Management District (SFWMD)

DATE: September 13, 2005

TO: MDWASD Meeting Attendees

FROM: Jim Bolleter /Ecology and Environment. Inc. (E&E) Consultant Team

RE: MDWASD Reuse & Alternative Water Supply
Meeting with the SFWMD

Those in attendance were:

Bill Pitt – MDWASD
Bertha Goldenberg - MDWASD
Donna Fries - MDWASD
Maria Valdes - MDWASD
Jim Bolleter - E & E
Mónica Pérez - E & E
Barbara Power - SFWMD
Karin Smith - SFWMD
John Mulliken - SFWMD
William Scott Burns - SFWMD
Mark Elsner – SFWMD
Carlyn Kowalsky - SFWMD
Arsenio Milian - Milian Swain & Associates, Inc (MSA)
Deborah D. Swain - MSA
Drew Campbell - MSA

B. Goldenberg provided a background for the project – the need for the update of the Wastewater Reuse Feasibility Study and Alternative Water Supply Investigation. She stated that MDWASD has applied for a combined water use permit and desires a long-term permit. B. Goldenberg stated that they are looking for opportunities where treated wastewater/reclaimed water reuse implementation could result in potable water use credits for the municipality in the long run. Reuse projects utilizing reclaimed water

could reduce the volume that would need to be withdrawn for potable water needs and reduce the volume of treated wastewater that would need to be deep well injected.

B. Goldenberg explained that future water use projections had been re-run and are lower than expected. She stated that these results demonstrate that Miami already has the treatment capability to meet its 2025 demand. Regardless, MDWASD is exploring alternatives for water supply, focusing primarily on reuse. The purpose of the meeting was to obtain guidance from the District and to identify potential opportunities.

C. Kowalsky asked if the E & E Team and MDWASD had a specific proposal of what they wanted to do or maps and other information on hand to see what constraints and opportunities exist. J. Bolleter explained that E & E with support from MSA, had just recently been hired by MDWASD, and is in the process of gathering existing information and will begin looking at a variety of reuse alternatives and conducting initial efforts to identify other alternative water supplies. Since it is early in the process the MDWASD and E & E Team wanted initial input from FDEP (met on August 18, 2005) and the SFWMD.

B. Goldenberg stated that a high-level disinfection wastewater treatment plant in South Miami-Dade is currently being designed for up to a 225 mgd capacity (operational capacity of 112.5 mgd with a peaking capacity of 2x), with completion scheduled for April 2009. The plant will be designed with both chlorine disinfection and filtration, as required by the permit. MDWASD prefers this facility as its prime location for water reuse projects. There is a potential to reclaim 112.5 mgd of treated water. The construction permit for this project was applied for on May 30th, 2005. The permit does not establish the type of filtration system proposed. MDWASD is currently testing deep-bed and cloth filtration systems, and at the moment, they are inclined towards the deep-bed filtration system. The consent order schedule indicates construction is supposed to start in one year. The SFWMD asked if these upgrades can still be utilized even if a higher level of treatment is ultimately required for certain types of reuse. The answer was yes.

The consent order also states that an additional 18.5 mgd of treated wastewater must go towards reuse. This volume is based on the existing MDWASD Wastewater Facilities Master Plan which states that the next expansion for the South District Wastewater Treatment Plant would increase capacity from 112.5 mgd to 131 mgd. B. Goldenberg added, however, that based on their new projections, the 131 mgd capacity would not be necessary until after 2025. Regardless, MDWASD is looking for reuse applications that will use the 18.5 mgd as stated in the consent order.

The discussion shifted to issues regarding canal recharge using reclaimed water. J. Bolleter described discussions with FDEP on this matter and felt that FDEP may view canal recharge as a possibility. If the discharge was direct, a QBEL would be needed. As an alternative, an indirect discharge (i.e. infiltration gallery along the canal rights of way) would need to follow FDEP's land application rules and may be easier to permit particularly if slow rate method is to be used. Potential issues regarding indirect canal recharge included the canal right-of-ways (obtaining approval of SFWMD), proximity to the Biscayne Aquifer, nutrient loading, water quality, and water delivery. It was noted that drinking water quality standards do not include nutrients as a regulated constituent. Therefore, any direct or indirect recharge should consider the ultimate receiving water body in determining environmental effects.

CDM has been hired by FDEP to explore both direct and indirect recharge of canals using reclaimed water. Their findings will be summarized in a draft report that should be available in November 2005 and finalized by January 2006. Broward County Water and Sewer Department and the City of Sunrise are interested in starting canal recharge pilot projects.

J. Bolleter asked SFWMD thoughts about reuse as part of CERP. S. Burns stated that the E & E Team would need to talk to SFWMD staff involved with the applicable CERP projects. J. Bolleter stated that FDEP felt that the Biscayne Bay CERP project, which may have the most potential, is too far out and since it is not part of the Acceler 8 Projects, it may lag behind. B. Goldberg pointed out that MDWASD is in a position

where they need to establish reuse projects before CERP, but these projects would reduce water reservations available for CERP

S. Burns stated that currently the Everglades and Biscayne Bay are two natural areas that will be subject to Minimum Flows and Levels (MFLs) and water reservations under CERP. The SFWMD is currently not sure of the implications of additional demands and would need to work with MDWASD in order to evaluate the impact on MFLs and future water reservations. The issues for the Everglades and Biscayne Bay are not addressed with the South District Wastewater Treatment Plant reuse potential and that any increase in potable water demands, subtracted by the reduction in agricultural demands need to be quantified to determine the impacts to these natural areas. It was also noted that the South Miami- Dade wellfields have the smallest withdrawal of all three water treatment systems within Miami-Dade County.

S. Burns pointed out that currently there is a withdrawal of 346 mgd from all three MDWASD potable water systems, with expectation to hit 429 mgd avg. by 2025. The SFWMD would be looking for an offset to that withdrawal, in the location where the impact takes place. However, S. Burns pointed out that it may be difficult to redistribute the water to all other impacted sources within the system.

B. Goldenberg asked what responsibility MDWASD would have to recharge areas that are being impacted by other factors. S. Burns responded that when something similar happened in Broward County, consideration was not given to where the water was coming from. A. Milian pointed out that the Miami-Dade County system is fully interconnected, so the areas where use takes place is not necessarily where the withdrawal takes place. S. Burns stated that reuse in south Miami-Dade County will unlikely offset water withdrawn and used from the Northwest Wellfield, however, the technical means and associated recharge volumes would be considered. MDWASD would need to demonstrate that reuse in the south Miami-Dade area would allow more water from say the Southwest Wellfield to go to the Northwest Wellfield customers using the interconnected system, which would reduce pumping in the Northwest Wellfield. He

stated that a calibrated model needs to be utilized for any credit/offset assessment. The model is calibrated to consumptive use permits based on points of withdrawal and takes into consideration the following elements:

- Withdrawal
- Seepage
- Injection
- Environmental Water (MFLs and Reservations)
- Proposed Recharge
- Location and rate of Increased Pumping

S. Burns recognized that MDWASD needs to meet the needs of two agencies and fulfill water use requirements over the next 20 years at a reasonable price. B. Goldenberg described that the three permits were combined so that the individual requirements could be met by the combined permit locations. S. Burns responded that consolidation of the permits does not imply that there are not geographical considerations. Location of specific offsets will have to be quantified, evaluated and demonstrated. J. Bolleter stated that the E & E Team will work closely with S. Burns as we obtain GIS data to show recharge opportunities compared to withdrawal locations.

S. Burns indicated that water demand for irrigation would be reduced as a result of transferring agricultural land use to urban land use and an agreement needs to be reached as to the impacts in south Miami-Dade. B. Goldenberg stated that benefits across the region are already occurring and that this reuse project would run along the lines of those improvements.

The question was raised, “Is there an opportunity to meet needs from alternative supplies, for example from North Miami Beach?” Bertha answered that E & E has been tasked to evaluate this, but that this quantity is already met by current facilities. It was suggested that working with North Miami Beach may reduce offsets necessary, perhaps distributing treated wastewater north and drinking water south.

S. Burns indicated that the system is constrained because the plants are near the coast and wellfields are farther away. Smaller opportunities may be more effective based on location.

S. Burns will let us know who to work with for modeling and he is one of the key contacts for regulations regarding offset. “Basis of review” SFWMD rules address modeling.

Palm Beach County has reuse projects to offset dry season demand, as well as impacts on secondary canals. Projects in Boynton Beach, Delray Beach and the City of Palm Beach have explored reuse applications for wetland hydration, canal recharge, and irrigation. New urban developments in the Palm Beach area have also incorporated reuse infrastructure into their site plans.

An Alternative Water Supply summit is taking place in North Miami on September 22. Both MDWASD and E & E will try to be there.

C. Kowalsky encouraged the team to incorporate a reuse pilot project into the feasibility study and would like to see a proposal for specific treatment level that can be presented to FDEP as soon as possible that demonstrates no negative impact on canals. She indicated that she would encourage using the canals right-of-way and could see no reason why SFWMD would not allow use of the canal banks. The SFWMD would be interested in assisting financially with this effort. Deadlines for proposed pilot projects that may be eligible for funding is January 2006. She suggested this task be added or substituted to E & E’s current project.

Under Senate Bill #444, the SFWMD is required to submit a revision to the Lower East Coast Water Supply Plan in July 2006. The project plan list is due in January 2006 and is to be presented to the SFWMD Governing Board in July 2006.

C. Kowalsky indicated that the Governing Board is very concerned about additional withdrawals from the Biscayne Aquifer. The SFWMD will likely determine total withdrawals to be allowed from a policy, not a quantitative level.

The group discussed Aquifer Storage Recovery (ASR) wells and use by the MDWASD to support wastewater reuse. B. Goldberg explained that the southwest monitoring well is currently under construction and is scheduled for completion in December 2005.

S. Burns told the team that we need to show how the ASR wells will be utilized in comparison to what is allowable under the current regulations. MDWASD will have to demonstrate the need to remove more volume than injected, including plans to meet drinking water standards through blending. MDWASD will re-evaluate the ASR operating plan. The District will work with MDWASD to evaluate the plan and optimize the use of the ASR. The SFWMD wants to see less demand on the Biscayne Aquifer in the dry season (less demand on the Everglades system) and thus increase usage of ASR during that period. A. Milian expressed that 80-90% recovery is ideal. S. Burns responded that Boynton Beach withdrew 8-9 times as much water as put in, through blending. However, there exists a concern that if water is stored for a long period, that recovery is reduced. Responding to a question by MDWASD, S. Burns said that to the SFWMD there would no difference, from a permitting point of view, between raw water ASR or treated water ASR.

J. Mulliken described the status of various ASR pilot projects, including treatment to primary drinking water standards prior to injection, per EPA requirements. Discussion followed about several successful ASR projects and ASR permits. These included:

- Hillsboro
- Boynton Beach
- Collier County
- Hialeah

Summary:

The Wastewater Reuse Feasibility Study and Alternative Water Supply Investigation will be completed by July 2006. MDWASD will assess the potential to develop a pilot study for consideration by the SFWMD. The E & E Team and MDWASD will work with the SFWMD as the Wastewater Reuse Feasibility Study and Alternative Water Supply Investigation project proceeds. The E & E Team should also talk to Sunrise and other municipalities about their canal recharge efforts and review the City of West Palm Beach's model application to establish water credits/offsets.

MIAMI-DADE W&SD - ALTERNATIVE W.S. MEETING
SEPT. 13, 2005

<u>NAME</u>	<u>AFFILIATION</u>	<u>PHONE NO.</u>
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Bertha Goldenberg	MDWASD	(786) 552-8120
Donna Fries	MDWASD	786-552-8972
Monica Perez	E&E	561-640-6552
Jim Bolleter	E&E	(561) 640-6552
Barbara Powell	SFWMD	(561) 682-2236
Karin Smith	SFWMD	(561) 682-2020
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John MULLIKEN	SFWMD	561/682/6649
Wm Scott Burns	SFWMD	682-6817
MARK ELNER	SFWMD	561-682-6156

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse and Alternative Water Supply Study
November 10, 2005, Reuse Opportunities Meeting

DATE: November 10, 2005

TO: MDWASD Meeting Attendees

FROM: Mónica Pérez/Ecology and Environment. Inc. Consultant Team

RE: MDWASD Reuse Feasibility Study (RFS) & Alternative Water Supply (AWS)
Reuse Opportunities Meeting

Attendees:

Bertha Goldenberg- Miami Dade Water and Sewer Dept. (MDWASD)
Maria Valdez- MDWASD
Bill Pitt- MDWASD
Howard Fallon – MDWASD
Joe Mazzaresse – MDWASD
Steve Kronheim – MDWASD South District Wastewater Treatment Plant (SDWWTP)
Paula Church – Miami-Dade Department of Planning and Zoning
Dan Edwards – MDWASD
Deborah D. Swain– MSA
Monica Perez- E & E

The purpose of this meeting was to provide a status and update of reuse ideas for WASD.

Wastewater Reuse Resolution

Bertha Goldenberg provided a summary of the Wastewater Reuse Resolution and Update to the RFS Completion Date. A new resolution was passed without discussion by the County's Infrastructure and Land Use Committee on 11/8/2005. The Resolution will go to full Commission in the next several weeks. Although a RFS completion date of September 18, 2006 is indicated in the Resolution, a final draft is due mid-March of 2006. This draft will include defined alternatives, associated costs, and rate impact. The draft will be presented to the full Commission on April 2006. Based on the Commission's actions, a final RFS report will be completed by June 2006. The RFS Study recommendations will be incorporated to the Wastewater Facilities Master Plan in July 2005. Although no specific date was given, B. Goldenberg requested that the Alternative Water Supply be expedited.

The Resolution requires the formation of an advisory panel to participate in the development of the reuse study and alternative water supply plan. This panel will include stakeholder representatives

(builders, regulators, environmental organizations, etc). It is recognized that this additional involvement may delay the project.

Wastewater Reuse Opportunities

(The bulleted items present reuse ideas discussed)

Joe Mazzaresse indicated that the main goal is to identify reuse opportunities that would accommodate the treated effluent from SDWWTP in 2009 (construction completion of high-level disinfection). Steve Kronheim stated that there is a concern about pharmaceutical wastes in the wastewater.

Bill Pitt stated that in addition to identifying reuse opportunities in the South District, they need to identify reuse opportunities in the Central and North Districts. The SFWMD is concerned about the location where reuse opportunities will take place. The SFWMD wants to see more reuse occurring from the Central and North Wastewater treatment plants to make up for the potable water coming from the existing wellfields. For WASD, it is important to obtain more credits that offset their water use.

- Black Creek Canal is directly connected to the Biscayne Bay. However, the canal just south of it is blocked off and does not flow into the Biscayne system. This canal may be recharged and pumped up for reuse purposes. In addition, there are various ponds that are not directly connected to the Biscayne system that can also be used.

The conversation shifted to irrigation applications as reuse opportunities. A common question among the group was: What incentive does a private well owner have to switch from irrigation from their private well to irrigation with reuse water? Bill Pitt indicated that in past instances, existing private well owners are not required to abandon their private well and switch to reuse water for irrigation. However, new irrigation may be required to utilize reused water. The SFWMD may be able to help by creating restrictions to new private well applicants.

- Irrigation along the Turnpike: Reused water can be used to irrigate landscaping along the Florida Turnpike.

The subject of sewer mining was discussed. In terms of the proposal for sewer mining that was submitted to FDEP as part of the public access reuse alternatives developed for the Settlement Agreement System-Wide, the FDEP did not accept it because they did not consider it to be an appropriate in-kind use. However, the FDEP was always amiable to the concept.

Paula Church inquired about the consideration of new developments such as Providence, Parkland, and Florida City. Maria Valdes stated that Florida City is outside the urban development boundary (UDB) line. These options for reuse would be viable as long as they are within MDWASD's service area (possibly if the UDB line is changed to incorporate the developments into MDWASD's service area). M. Valdes also pointed out that the "South Miami-Dade Watershed Study" is underway and as part of that, they are expecting to recommend reuse requirements for new developments.

- Require new developments to incorporate infrastructure and applications for reuse (i.e. irrigation).

Howard Fallon pointed out that various locations are planning to install new sewers and WASD should take advantage of that to install reuse lines as well. Two locations noted were the City of North Miami Beach/Biscayne Landings Development along N.E. 151st Street, and Key Biscayne where a sewerage program will begin in the near future for approximately 60% of single family homes. M. Valdes stated that a meeting has been scheduled with the City of North Miami Beach on November 15, 2005 to further discuss reuse opportunities.

Howard Fallon discussed a number of opportunities; these were provided as a separate handout.

North District:

- System upgrades to increase filtered water availability

The system is designed for 5 million gallons per day (mgd) while the current usage is between 2.5 and 3 mgd; however, the allowable filtration water quality limits are exceeded at times. By implementing some system changes, the filtration efficiency may be increased. When the plant was originally built, piping was arranged so that the entire non-potable water system was switched over to filtered water supply, thereby increasing the filtered water demand from approximately 0.1 mgd to 2.5 - 3 mgd. 0.1 mgd of filtered water serves on-site mitigation and Florida International University (FIU). By installing small diameter yard piping, some of the uses of filtered water around the plant can be eliminated, effectively increasing the availability of filtered water for reuse. An additional study would be conducted. Some other system changes that can be implemented include: maximizing loading rates for the different filters so that unbalancing of flows to higher capacity units could be employed; examining flocculation with existing flocculation tanks to enhance filtration during unit outages or backwash cycles; and studying the effect of isolating a number of clarifiers with restricted flows to improve filtration system influent.

J. Mazzaresse noted that rather than investing in studies and new piping, they can use those funds to purchase new filters. However, this may not be cost-effective. Additional evaluation is needed.

- North Miami Stadium Irrigation: An existing high-school stadium is located near the wastewater treatment plant. Mr. Fallon stated that there is a pipe already in place to take reused water to the stadium.
- Swales along reuse piping to FIU. Landscape swales along the reuse pipelines to FIU can be irrigated using reused water.
- Use of existing parallel sludge lines for reused water: Two 16-inch sludge lines run parallel along Virginia Key. One line serves as emergency backup and is alternated every 2 to 3 years. The sludge backup line can be used for reuse irrigation at the Miami Shores Golf Course and other parks along the way to downtown Miami (sludge is directed to a sewer at N.W 36th Street). In case of an emergency, reuse can be shut off to switch the line over for sludge conveyance. Clean-up disinfection procedures will need to be developed to activate reuse lines following emergencies.

- Automated plant at the treated effluent line: An automated plant may be installed at the NDWWTP effluent (treated effluent) at State Road A1A. This water can be used to irrigate areas along A1A including Haulover Park.
- Reuse lines to Surfside, Bal Harbour, and Indian Creek: Re-route wastewater from Surfside, Bal Harbour, and Indian Creek to the NDWWTP and include reuse lines during the force main construction. These cities are interested in wastewater reroute. Potential reuse applications may be available pending wastewater rerouting.

Other opportunities to install reuse line at the same time that force mains are being constructed should be considered. North Miami Beach is in the process of planning for force mains in N.E. 151st Street for a new school.

Central District:

System Upgrades: The system needs controls correction to allow for control of flow into the filters.

- Crandon Park and Key Biscayne: Two force mains are located in Crandon Boulevard to service Key Biscayne, a 12-in and 24-in line. During non-peak wet weather events, the 12-inch line could be used to provide reuse water to the Crandon Park, including the golf course, the Village of Key Biscayne and Bill Baggs State Park.

The Village is undertaking a sewer program in the near future. This is an opportunity to consider installing reuse piping for dual water systems at homes.

- Use of Crandon Park Golf course pond for blending: Potable water is presently discharged to an on-site pond for re-pumping into the golf course irrigation system. This pond could be used for blending reuse water from the CDWWTP with potable water. Blending may be an option as long as wastewater from the east and west can be separated.

Mr. Mazzaresse noted that the existing golf courses along the coast that use private irrigation wells may be using water that is higher in chlorides than the potentially “blended” water. Further investigation is warranted.

- Separate high vs. low chloride containing wastewater: Separate the flow from the west (low chloride concentrations) from that coming from the east (high chloride concentrations) via the two bay crossing lines in the two plants at the CDWWTP (Similar to the NDWWTP).
- Use existing 16-in. sludge line for reuse: The existing 16-inch sludge line that goes from downtown Miami to the plant is not in use. It could be used to carry reuse water from the plant to downtown areas for irrigation (Bayfront and Bicentennial Parks, condominium landscaping).

South District:

- New developments: Consider requiring developments to the west of the plant to install irrigation piping for a dual water system and connection to the new high-level disinfection plant.
- Blending of treated wastewater with potable water: New 60-in. force main from the South Miami Heights WTP (SMH WTP) to the SDWWTP. Reject water can be pumped from the SMH WTP to the SDWWTP for possible blending for distribution west of the treatment plant. Since the new piping is needed for peak wet weather events, the existing lines can be used for reuse conveyance during dry weather and wastewater flow during wet weather. If a new reuse line is preferred, this element can be incorporated into the construction contract for the new force main.



Wastewater Reuse Feasibility Study Update
Meeting November 9, 2005

SIGN IN SHEET

NAME	ORGANIZATION	ADDRESS	E-MAIL/PHONE No.
Howard Fillin	MDWASD	Douglas	HJFALO1@miamidade.gov 786-552-0225
MARIA VALDES	MDWASD	DOUGLAS BLDG.	mauval@miamidade.gov
Bill Pitt	MDWASD	" "	WPITTE@miamidade.gov
JOE MAZZARISE	" "	" "	JMAZZ@ " "
Debbie Swain	MSA	Miami 33145 2025 NW 32 Ave	dsuain@ miamimayor.com SKRONE 258-8500
STEVE KUNHEIM	MDWASD	SDWUTP	MIAMI-DADE.GOV bmg@miamidade.gov
Bertha Goldenberg	WASD	Douglas	
Paula H. Church	DP&Z	SACC	Churchp@miamidade.gov
DAN EDWARDS	MDWASD	DOUGLAS Rm 3054	diedw@e.miamidade.gov
Monica Perez	ENE	1445 14451 Commerce Wy. Miami Lakes	561-640-6552 mperez@enc.com

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Reuse Feasibility Study
January 25, 2006, Meeting with
Miami-Dade County Parks and Recreation (MDPR) and
Miami-Dade Water and Sewer Department (MDWASD)

DATE: January 25, 2006

TO: MDWASD Meeting Attendees

FROM: Deborah Swain, Milian, Swain & Associates, Inc., Consultant Team

RE: MDWASD Reuse & Alternative Water Supply
Meeting with MDPR

Those in attendance were:

Donna Fries- MDWASD
Maria Valdez- MDWASD
Bill Pitt- MDWASD
Kevin Asher, MDPR
Howard Gregg, MDPR
Arsenio Milian – MSA
Deborah D. Swain– MSA

B. Pitt described the projects. He stated the largest opportunity for re-use is irrigation.

H. Gregg discussed irrigation potential for golf courses (Crandon) and parks. D. Fries had concern about reuse so near the surface water (Biscayne Bay). H. Gregg indicated that the current potable water cost is \$300,000 . H. Gregg said FPL has talked to MDPR about providing reuse to parks.

B. Pitt said the North, Central and South Districts wastewater treatment is currently under a consent order which entails extensive treatment.

K. Archer mentioned the following parks as potential reuse consumers:

- Homestead Air Force Base has 215 acres, and schools
- * Lakes by the Bay has 40 acres of athletic fields. Metrozoo has 700 acres on wells.
- Park Rehydration
- (120 acres total/ 40 acres irrigated)
- Three Lake Park
- Tree Island Park
- * Ives Estates is about 100 acres, and has potable water
- * Haulover Golf Course plus the new lawn area

- West Kendall (120 St.)
- Greenways - 87 acres at the SDWWTP (too close to Bay)
- Large areas in the West
- Ludlam Rails-to-Trails
- * Amelia Earhart - new athletic fields

Other golf courses mentioned as potential users of reuse water are:

- Country Club of Miami (all wells), 210 acres, currently 36 holes. Will be adding 18 holes
- Greynolds - 9 hole course on a well
- Haulover - removing golf course, installing lawn
- Briar Bay
- Palmetto
- Homestead Air Force Base - the golf course will become athletic fields
- Kendall Indian Hammocks
- McArthur Senior High School

H. Gregg indicated that approximately \$500 million of General Obligation Bonds are for Parks

H. Gregg is to furnish a list of CUPs

**Miami-Dade Waste and Sewer Department
Wastewater Reuse Feasibility Study Workshop
January 31, 2006 @ 12:30 p.m.
Training Room – Douglas Building**

DATE: January 31, 2006

TO: MDWASD Meeting Attendees

FROM: Mónica Pérez/Ecology and Environment, Inc. Consultant Team

RE: MDWASD Reuse Feasibility Study (RFS) Workshop

Attendees:

Bertha Goldenberg- Miami Dade Water and Sewer Dept. (MDWASD)
Donna Fries - MDWASD
Bill Pitt- MDWASD
Howard Fallon – MDWASD
John Cuorlog - MDWASD
Rafael Terrero - MDWASD
Carlos Espinosa - Miami-Dade County Dept. of Environmental Resources
Management (DERM)
Susan Markley (DERM)
Paula Church – Miami-Dade Department of Planning and Zoning
Arsenio Milian – MSA
Tim Powell - Florida Department of Environmental Protection (FDEP)
Mark Elsner - South Florida Water Management District (SFWMD)
David York - FDEP
Doug Yoder - MDWASD
Scott Burns - SFWMD
Carolyn Kowalsky - SFWMD
Linda Horne - FDEP-Water Facilities

The following comments were generated by the participants during the presentation. When possible, participant names were recorded with the topic in case additional follow up of the topic is required.

Tim Powell (FDEP) indicated there is probably an I & I issue in the sewer lines which increases the salinity water volume that will need to be processed through the plant and

treated by Reverse Osmosis (RO). Arsenio Millian recognized that MDWASD has been working to address I & I issues.

Howard Fallon (MDWASD) indicated it may be possible to separate wastewater with low chlorides from high chloride streams before it reaches the Central Plant. He said it would take some engineering, but that it's being done at the North Plant and should be considered at the Central Plant. John Cuorlog (MDWASD) agreed that the separation is a possibility that should be considered.

Mark Elsner (SFWMD) indicated the need for understanding of definition of "Gray Water" as used in the presentation and in discussions of reuse issues in Florida.

David York (FDEP) indicated no gray water is currently reused in the state of Florida.

Mark Elsner (SFWMD) wanted to discuss DERM versus DEP regulations for treatment criteria needed before discharging reuse water.

Carlos Espinosa (DERM) indicated the Biscayne Bay has the highest criteria of treatment needed before discharging reuse water due to its "outstanding water body" designation.

Bertha Goldenberg (MDWASD) asked Scott Burns for a list of all irrigation wells permitted by SFWMD in the county.

Scott Burns (SFWMD) would like to discuss the offset/recharge more after the presentation.

Bill Pitt (MDWASD) indicated the majority of areas for agricultural irrigation are not near any well fields so irrigation in these locations would not be directly recharging the well fields.

Doug Yoder (MWASD) asked would there be any incentives for the farms to reuse water for irrigation. Group discussed that SFWMD might need to place restrictions on withdrawals from permitted wells. Also suggested that chlorides may not need to be treated to 250 ppm for some agricultural uses.

Linda Horne (FDEP-Water Facilities) suggested you could maybe trade with the farms by trading reuse water for well sites on the farmers land in outlying areas - not charging them for reuse of the water for a contract period of time. A kind of bargaining tool.

Rafael Terrero (MDWASD) asking about the requirement for operator attendance for Satellite Mining facilities in outlying areas. Linda Horne (FDEP) indicated that FDEP would be willing to work with MDWASD on that issue. At the Palm Beach plant, an automatic system shutdown ensures that water not meeting the treatment requirements cannot be used for irrigation. However, the Palm Beach plant is small scale reuse compared to the scale being considered by MDWASD.

Mark Elsner (SFWMD) indicated the requirements for agricultural irrigation include indirect application of reuse water for edible crops. Drip irrigation vs. spray irrigation.

Carolyn Kowalsky (SFWMD) said farms apply water for irrigation in different ways to their crops some use drip or spray so there may be trouble with restricting withdrawals and mandating that the farmers use reuse water and the same application style for agricultural irrigation. Suggested that RO might be needed to meet the requirements for all the farmers.

Carolyn Kowalsky (SFWMD) was interested in the water quality needed at Florida Power and Light for their cooling towers. Debate is whether the plant should treat reuse water to FPL standards for reuse or just to regulation standards and then make FPL do localized treatment so it can be reused in their plant. Carolyn seemed to believe that it was a cost issue for FPL and that negotiations could result in a positive outcome.

Bertha Goldenberg (MDWASD) indicated that the FPL ammonia requirement was quite low and that they had indicated it needed to be that low so that they could run the water through multiple times instead of once through like they do now. Bertha maintained that they asked for water quality better than drinking water.

Scott Burns (SFWMD) said the water should be processed so that the water quality conditions are met so that our users can use the reuse water. FPL has already begun construction on their plant because they couldn't wait on reuse to be viable. Scott seemed to feel that the burden lies with MDWASD. However, he did indicate that the SFWMD would be willing to help with the quality issue if the pipeline is installed.

Arsenio Milian (MSA) said FPL must already have onsite treatment for water that is taken out of the aquifer which includes high levels of solids that is used at their facility.

John Cuorlog (MDWASD) indicated that the FPL reuse that was being discussed was for their cooling towers and that they also make-up water for the steamers. He thought that water might be from the potable supply. He also said he could give us a POC for the MD Recovery Recycling Facility. FPL is about 8 miles from the SWWTP.

Scott Burns (SFWMD) said FPL had a timing issue for building the plant so the plant is capable of processing high salinity water since that was the only water available at time of construction. He also indicated that FPL has a condition in their permit that states that if reuse water comes available, they are required to take it.

Carolyn Kowalsky (SFWMD) asked about other power plants' water quality requirements. Do other WWTP treat the quality of water to the power plants standards or just to the regulatory standards? She specifically mentioned the power plant in Orlando.

Bertha Goldenberg (MDWASD) asked about the Time Frame on the Canal Recharge Study that was already conducted.

Mark Elsner (SFWMD) indicated the canal recharge feasibility study was due today (end of the month) however the consultant that is working on it has not even submitted the draft report yet. Hopefully they will be able to see it next month. No preliminary results to discuss with group.

Tim Powell (FDEP) indicated there are a few large cement plants in the area for industrial use. Amy Mixon (E&E) informed him that phone calls have been made to the cement plants, however we are still waiting for them to return our calls. Donna Fries (MDWASD) supplied a contact name and number.

Carlos Espinosa (DERM) had indicated it is only possible to recharge the well fields during the dry season. Flooding is an issue during the wet season.

Susan Markley (DERM) discussed the water quality issue. All water ultimately discharges to the Biscayne Aquifer which is a sole source aquifer so very low nutrient levels will likely be required. The option to discharge only during the dry season when the gate is closed may mean less stringent treatment requirements...however, much more intensive planning will be needed for this possibility

Mark Elsner (SFWMD) indicated we may be looking at higher standards than tertiary treatment.

Carlos Espinosa (DERM) informed E&E there is a Drainage Master Plan available which show all the existing drainage patterns and basins in the county. The drainage in is the groundwater or French Drains and not much surface water is available since the ground is so permeable. It is available if E&E wants it. Everything is in GIS and all canals are labeled.

Rafael Terrero (MDWASD) asked have there been any issues with environmental groups.

Scott Burns (SFWMD) indicated that the district takes about 200 MGD of groundwater from the Everglades during the dry season and drains them into the canals to recharge the well fields. He suggested taking the high quality treatment water and putting it back into the canals to limit the amount of water drawn from the Everglades during the dry season. He implied that this would offset some of the additional supply requested.

Need to have quantity cable of the dry season levels so there is no flooding potential. He would like to recharge the Biscayne Coastal Wetlands with RO treated water in the south area and maybe create a small scale pilot project which would be similar to what has been done out in San Diego. Then the high quality reuse water could be used for the canals instead of Everglade water.

Bertha Goldenberg (MDWASD) had concerns about timing issues.

Susan Markley (DERM) indicated on the slides the Biscayne Bay Project is not associated with the Everglades Project. They are two different ones.

Carlos Espinosa (DERM) had concerns about quality, quantity and timing of discharging water to the wetlands during the wet season. He suggested that we look at the Drainage Master Plan. Possibly an indirect recharge of the canals by going to groundwater first might be a better option. Look at slow infiltration along the canal right of ways.

Susan Markley (DERM) thought the constraints of discharging to the wetlands are that most of them are not publicly owned and the opportunities are somewhat limited. There are EPOC concerns in the Biscayne Wetlands versus the Bird Drive Area which may not be as restrictive. E&E may need to speak with the National Parks Service about the Bird Drive area.

Scott Burns (SFWMD) indicated that the Bird Drive Project does not have much of a chance since the land use plans have changed and made land acquisition in the area impossible. However, we may be able to take a smaller portion of the area and do a small pilot study. Scott indicated that this area offers lots of opportunities for replenishing the well fields (Lake systems, L-31N).

Scott Burns (SFWMD) reiterated that there are two issues for offsetting future water consumption:

- 1.) Currently, about 200 MGD is taken from the Everglades to recharge the canals. The canals provide some recharge to the aquifers (Snapper Creek, Hialeah). He suggested a recharge of the wellfield using the existing canal infrastructure by treating reuse water with RO. He indicated this would be viewed as a 100% offset during the dry season.
- 2.) The harmful impacts need to be mitigated by interceptions of flow to Biscayne Bay. He suggested that reactivating co-sponsorship of the Biscayne Bay rehydration pilot project using treatment similar to that used by the City of San Diego and Orange Co. (in the article passed out by Carlyn). He suggested that discharging distilled water into the canals should be permissible.

Rafael Terrero (MDWASD) suggested that instead of spending all this money to treat the wastewater with RO, he could just build an RO plant to treat brackish water from the Floridan rather than try to offset future demand with wastewater reuse.

Scott Burns (SFWMD) indicated that Miami-Dade County is one of the largest areas in the US with the cheapest utility rates. So when it is necessary to upgrade the systems per the EPA Regulations this area is capable of absorbing the additional cost of upgrades.

Paula Church (MD Planning and Zoning) there is about 950 acres of land that could be used for storage of reuse water during the dry season along canal C-4 at 157th Avenue.

John Cuorlog (MDWASD) had concerns about EPOC, shouldn't EPOCs be treated before reuse water is used for canal recharge.

Susan Markley (DERM) indicated compounds should be treated to ambient levels if no standards exist.

Donna Fries (WASD) could identify an area that could be used for aquifer recharge which is currently owned by others which includes FPL's easements.

Linda Horne (FDEP – Water Facilities) indicated Class V Well for Salt Water Barriers Class III recharge needs to meet Drinking Water Standards because the Biscayne Aquifer is a sole-source aquifer.

Scott Burns (SFWMD) gave a two thumbs up to the saltwater intrusion barrier reuse option. Would need to determine where the water ultimately goes in order to determine the treatment levels required.

Mark Elsner (SFWMD) indicated he was part of the group that created the Offset/Recharge numbers. He said the only people with experience in determining what would be appropriate offset numbers was the SWWMD which came up with really general numbers. He said all Offset/recharge numbers should be site specific.

Carolyn Kowalsky (SFWMD) indicated everyone will need to sit down with SFWMD and FDEP to go through site by site to determine correct offsets.

Susan Markley (DERM) indicated there are a few Golf Courses that she thinks need to be identified for irrigation on the main list of potential users and also identified other golf courses on the list that will not be feasible to discharge irrigation too.

Also need to check with DOT for any new projects incase their projects have large medians that could use reuse water for irrigation.

Donna Fries (WASD) will supply E&E with the Rinker POC and phone number since they will use the potable water for all their different cement plant sites and their kiln.

Linda Horne (FDEP – Water Facilities) indicated the biggest bang for your buck would be providing reuse water for irrigation at Amelia Earhart Park.

John Cuorlog (MDWASD) said E&E may want to talk with Post Buckley about Biscayne Landing a large land development area in the north about irrigation. He said they didn't get very far last year with discussion and may want to try again this year.

Howard Fallon (MDWASD) don't forget to include Beggs Park near Crandon Park for reuse irrigation. However, further discussion indicated that Beggs Park is likely planted with native vegetation that doesn't require irrigation.

Donna Fries (MDWASD) indicated Linens of the Week may not be a good industrial user of reuse water since the water quality may be more stringent since they do all the laundry for the hospitals and medical industry.

Scott Burns (SFWMD) had issues with the column including the offset/recharge values on the 75% reuse scenario handout. Needs to reference the source where the offset/recharge numbers come from. Also should not use "credit" since it is so misleading.

Paula Church (MD Planning and Zoning) indicated right next to Miami Links there is new construction which may be able to use reuse water.

Susan Markley (DERM) indicated may be able to use reuse water for the landscape areas along the airport roadway ramps.

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse and Alternative Water Supply Study
February 13, 2006, Reuse Meeting with
South Florida Water Management District (SFWMD)

DATE: February 13, 2006

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment. Inc. Consultant Team

RE: MDWASD Reuse Feasibility Study (RFS) & Alternative Water Supply
Reuse Meeting with SFWMD

Attendees:

Carolyn Kowalsky, SFWMD
Karin Smith, SFWMD
Mark Elsner, SFWMD
Keith Smith, SFWMD
Scott Burns, SFWMD
Bill Pitt, MDWASD
Bertha Goldenberg, MDWASD
Rafael Terrero, MDWASD
Donna Fries, MDWASD
Maria Valdes, MDWASD
Arsenio Milian, MSA
Debbie Swain, MSA
Jim Bolleter, E & E
Mónica Pérez, E & E

Notes:

The purpose of this meeting was to continue discussions with the SFWMD in the development of alternatives for the Reuse Feasibility Study.

B. Goldenberg stated that during the public meeting, a representative from the Audubon Society commented on the need for water for the Biscayne Bay Coastal Wetlands. In light of this comment and other similar comments, MDWASD would like direction from the SFWMD on what to do with projects like this because any water committed to irrigation or other reuse applications will not be available for Biscayne Bay Coastal Wetlands or other environmental projects. D. Fries added that ACCELER8 will not incorporate reuse into their program. The Shoma flow way, in particular, is a priority

area because if the SFWMD does not construct there within the next 5 years, the property reverts back to its original owner. C. Kowalsky suggested that a separate meeting be conducted with SFWMD CERP staff to address the Biscayne Bay Coastal Wetlands project.

B. Goldenberg suggested identifying “low-hanging fruit” projects that can be implemented in the short-term. A. Milian added that Key Biscayne uses potable water and that this is one of those projects that can be easily implemented. Further, they can take advantage of irrigating areas along Key Biscayne. D. Swain added that there are a number of other opportunities in the North District. However, B. Goldenberg noted that any project outside of the South District will take longer to implement due to the upgrades necessary for the respective treatment plants.

S. Burns clarified that credit to offset consumptive water use (CUP) would be given to the water that would reduce reliance on the regional system. DBHydro could be used to determine how much water is being delivered into the canal system. The key component is to conduct a pilot study(ies) as soon as possible to evaluate reuse in Biscayne Bay and canals (C-2, Miami Canal or C-6, Black Creek Canal or C-1).

S. Burns added that MDWASD should look at how much water is taken out of the wellfield and propose a project that puts it back in. The topic of wellfield protection zones was discussed because DERM has a County Ordinance that restricts activities within these protection zones. Additional discussions with DERM will be necessary to clarify this issue.

B. Pitt suggested three golf courses that can be irrigated and are within the saltwater intrusion zone: Riviera, Biltmore, and Granada.

S. Burns stated that basically, MDWASD should look at how much water is taken out of the Everglades and interception of flows into Biscayne Bay. MDWASD should address these in their projects. The projects may be categorized as: benefit to Biscayne Aquifer, benefit to Everglades, and benefit to Biscayne Bay. Regarding saltwater intrusion, if MDWASD can demonstrate that regional deliveries to maintain stages in the canals for saltwater intrusion is reduced by installation of saltwater barriers, then credit would be given for that application.

D. Swain inquired about projects such as Crandon Park - which is currently under MDWASD for irrigation - where current potable water use will be completely replaced with reclaimed water. S. Burns noted that if the demand is reduced, then this would be a good project.

S. Burns added that it should be made clear to the Miami-Dade County Board of County Commissioners (BCC) that projects identified as part of the Reuse Feasibility Study should address the 20-yr Consumptive Use Permitting (CUP). In order to do this, however, pilot projects will have to be implemented to address public health concerns

and to obtain real-time data for the site. A. Milian asked if this would be a collaborative/partnering effort with the SFWMD; SFWMD agreed.

J. Bolleter added that as part of this study, we would identify reuse projects that would provide high CUP offset as well as others that may not. S. Burns suggested that the list of projects considered include a number of projects that would have high benefit for CUP offset even if they offer a lower level of reuse as well as projects that offer a high level of reuse and low level of CUP offset.

K. Smith noted that there will also be projects offering low level (volume) of reuse and low level of CUP offset, such as irrigation outside the well field protection zone, but would be perceived very positively by the public. These projects should not be taken out of consideration.

S. Burns pointed out specific projects that would address the CUP offset. Specifically, he noted neighborhood lakes for residential areas, which are typically dry. He pointed out locations within the northwest well field protection zone including Miami Spring Lakes. These lakes may serve as pilot projects. Other projects noted included: Milton E. Thompson Park, Kendall Indian Hammocks Park, Tropical Park, and other soccer fields located in the well field protection zone. He also pointed out areas south of Bird Recharge Basin and the C-4 detention basin as potential pilot projects. In addition, pilot projects can be proposed for wetlands, in particular those in the area of the Biscayne Bay Coastal Wetlands.

Following discussion of potential pilot projects, SFWMD (C. Kowalsky, S. Burns) suggested that the BCC be advised by MDWASD that the purpose of this Reuse Feasibility Study is not to address the CUP issue and may be considered as Phase 1 of a dual-phased approach to address reuse and CUP offset for Miami-Dade County.

B. Goldenberg stated that by December 2006, they need to submit projects for the 10-year water supply plan. This deadline will occur prior to any modeling effort. S. Burns suggested they pay close attention to that deadline and if necessary, they can follow in the steps of Homestead and the Florida Keys, where they submitted a specific project schedule and plan and by compliance with the schedule, they were able to “borrow” water from the Biscayne Aquifer. However, C. Kowalsky warned that this is a very strict schedule and that they will have to hold fast to it. The SFWMD has been very rigorous in adhering to the schedule and plan.

J. Bolleter asked about the SFWMD’s position on alternative water supplies other than reuse, because Miami-Dade may opt to offset their consumptive water usage from the Floridan or other sources without relying on reuse. S. Burns stated that the SFWMD Governing Board’s position is that water should be used more than once, and they expect more reuse to be implemented throughout the SFWMD.

B. Goldenberg inquired about the Lower East Coast Water Supply Plan (Plan) and potential funding options. In particular, if MDWASD proposes a project prior to the completion of the Reuse Feasibility Study, and their proposed project has to be modified once the study is completed, would MDWASD still qualify for funding? S. Burns stated that the SFWMD understands that the Plan may have to be appended and no utility will be taken out of consideration for funding because they are committed to providing funds through Bill 444. C. Kowalsky added that funding is available for construction only, but not to discard any ideas yet. Once a full evaluation of the project is done, there may be other opportunities. If a plan is laid out, they may be able to work out a long-term funding plan, the key is to get a plan together.

MDWASD inquired about CUP credit for reuse at Florida Power and Light (FPL) Turkey Point Plant. S. Burns stated that this project would not qualify for credit because FPL's water is from the Floridan Aquifer, so reuse would not replace Biscayne Aquifer water.

B. Goldenberg also asked about aquifer storage and recovery systems (ASR). S. Burns stated that blending or ASR would work. From a historical perspective, when the west well field was permitted, it was originally for blending. This would work as an option as long as it is treated to drinking water standards.

In summary, the following action items were identified for follow-up:

- MDWASD will schedule a meeting with DERM to address the well field protection zone requirements
- MDWASD will schedule a meeting with National Parks, SFWMD, FDEP
- C. Kowalsky will schedule a meeting with the CERP Biscayne Bay Coastal Wetlands Team
- Following the modeling meeting, MDWASD will put together an outline or "skeleton" of the modeling approach
- Recommend to J. Renfrow to report to the BCC that this study will not provide all the solutions for addressing the CUP and that the Reuse Projects are separate from the projects addressing the CUP
- Team to meet every other Monday. Next meeting will be on Tuesday, February 28th due to scheduling conflict. Meetings following will be held every other Monday: March 13th, March 27th.

Sign-In Sheet

2/13/06
MDWASD Reuse Feasibility
Study
Meeting with SFWMD

Name	Organization	Telephone/E-mail
Arsenio Milim	MSA, INC	305-441-0123
Debbie Surin	MSA	305/441-0123
RAFAEL TERRERO	WASD	786/552-8112
Karin Smith	SFWMD	561-682-2026
MARK ECKNER	SFWMD	(561)682-6156
Keith Smith	SFWMD	561/682-6620
Caryn Kovachy	SFWMD	682-6240
Bertha Goldenberg	MDWASD	bmgs@miamidade.gov 786-552-8120
Donna Fries	MDWASD	786-552-8972
MARIA VALDES	MDWASD	786-552-8198/ mvaldes@miamidade.gov JBolleter@ene.com
Jim Bolleter	E&E	(561) 640-6552
Bill Pitt	MDWASD	(786) 552-8121/bpitt@ miamidade.gov
Monica Perez	E&E	561-640-6552 mperez@ene.com
Scott Burns	SFWMD	

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse and Alternative Water Supply Study
February 17, 2006, Modeling Meeting with
South Florida Water Management District (SFWMD) and
Ecology and Environment, Inc. (E & E)

DATE: February 17, 2006

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment, Inc. Consultant Team

RE: MDWASD Reuse Feasibility Study (RFS) & Alternative Water Supply
Modeling Meeting with SFWMD, MDWASD, and E & E

Attendees:

Peter Kwiatkowski, SFWMD
Jeff Giddings, SFWMD
Karin Smith, SFWMD
Laura Kuebler, SFWMD
Keith Smith, SFWMD
Scott Burns, SFWMD (via phone)
Siqing Liu, E & E
Jennifer Xie, E & E
Mónica Pérez, E & E

Via Telephone:

Virginia Walsh, MDWASD
Bill Pitt, MDWASD
Donna Fries, MDWASD
Maria Valdes, MDWASD
Bertha Goldenberg, MDWASD
Jim Bolleter, E & E

Notes:

The purpose of this meeting was to discuss the modeling options for the MDWASD for modeling based on the SFWMD's requirements for the 20-yr consumptive use permit (CUP), specifically the SFWMD's request for information and for quantifying the effects of implementing reuse throughout Miami-Dade County (County).

V. Walsh began the discussion summarizing the requirements that SFWMD stated in the request for information (RFI), which included a fully integrated surface water/ground-

water model to quantify potential impacts to Biscayne Bay (Bay), Florida Bay and the Everglades. At this moment, three models have been mentioned: the Lower East Coast Simulation Model (LECsR), the Jacksonville District's PDM (MODBRANCH) model and the USGS's SEAWAT model

J. Giddings stated that there are about four models available to address these issues. Karin Smith specified that the models they had considered were: LECsR, USGS SEAWAT, North and South Miami-Dade county models, and MODBRANCH. The LECsR extends all the way north from Stuart and may have to be cut into the relevant areas. This may not be as efficient as using two smaller MODFLOW models. V. Walsh stated that the MDWASD understood that North and South MODFLOW models were not accepted as part of the RFI. Karin Smith stated that as long as they are calibrated and included monthly steps, they should be acceptable. V. Walsh stated that this wouldn't include the groundwater/surface water interface and that one condition of the RFI was that they needed to look at surface water and groundwater flows into Biscayne Bay and Florida Bay. In addition, Scott Burns had stated in an earlier meeting that canal budgets would not be accepted as a way to calculate surface water flows into the Bay and that there were only two possibilities to achieve that: LECsR and USGS' SEAWAT. Karin Smith said that the LECsR only has a diversion package.

J. Bolleter suggested that a piece of the whole LECsR model could be taken out to represent just Miami-Dade County. J. Giddings stated that in order to simulate the regional water supply deliveries, the whole model would have to be run and additional packages such as the river package would need to be added.

J. Giddings suggested that MDWASD use a water budget for the canals and calculate seepage; any loss would be considered a regional system impact. V. Walsh said that a proxy for surface water would be needed. Keith Smith said that the RFI requires groundwater and surface water discharges to Biscayne Bay. Karin Smith advised that USGS uses a river package to simulate surface water flows. V. Walsh asked if this will meet the RFI requirements of a groundwater/surface water interface model. Karin Smith stated that S. Burns had her put this requirement in the RFI.

J. Giddings said that the LECsR has a wetlands diversion package, but it has not been completed for Miami-Dade County. P. Kwiatkowski stated that it will require a fair amount of time and effort in order to develop the model that is required by the RFI. V. Walsh said that this is the dilemma that MDWASD faces. She added that there is a disconnect between the RFI and the capabilities of available models.

P. Kwiatkowski stated that we should follow what is strictly in the RFI and explore what tools may be available to accomplish that. He said that S. Burns will need to respond to the issue of the RFI questions versus model capabilities.

J. Giddings added that the North model had a UNET component associated but the south did not, so that would have to be added. V. Walsh clarified that the 2X2 model was ruled out by S. Burns earlier because that is a planning stage model rather than a permitting model. V. Walsh added that they were also told that they could not use proxies like they do for performance measures.

D. Fries also stated that another issue is timeframe in which SFWMD is expecting completion of the modeling effort; the effort may possibly last over a year. J. Giddings clarified that they intend to have a version of the LECsR model released by March but he could not address the surface water component. He added that the LECsR will need additional work for the surface water components.

J. Bolleter noted that in addition to modeling the wellfield withdrawals, they also need to evaluate the impact/offset of recharging the wellfields and how this impacts the demands on the regional system and interception of flow to the Bays. J. Giddings expressed concern that you can't look at overall water budgets in the LECsR.

J. Xie stated that there is an example from Palm Beach County using MODFLOW, but K Smith clarified that the Palm Beach permit was evaluated prior to the new rules passed in 2003 and it no longer applies.

B. Goldenberg stated that MDWASD needed to accurately estimate the time it would take to complete the modeling task because of the conditions of the RFI. L. Kuebler stated that there is an Army Corps of Engineers (USACE) MODBRANCH that covers the southern area to C-4 and it should be available by April.

S. Burns joined the meeting. P. Kwiatkowski advised him that the group had been discussing the stern language in the RFI versus the onerous approach that would be needed to simulate groundwater/surface water flows. Karin Smith asked S. Burns to tell MDWASD what he means by groundwater/surface water interaction. S. Burns stated that in the RFI, he was referring to the Basis of Review where it states that whenever there is a surface water/groundwater interrelationship, a calibrated model simulating the groundwater/surface water interaction is necessary. In addition, he added that the SFWMD spoke to the MDWASD about modeling the area county-wide or by wellfield and what other options they would have available, but the decision of which tool to use was up to MDWASD. S. Burns said that the model must quantify flows out of the canal system. He said that he had advised that the SFWMD would make any tools and /or data available to MDWASD.

P. Kwiatkowski asked if modeling the impacts to canals was possible. J. Giddings noted that if the canals need to be well-simulated, and this could not be done with LECsR as it stands unless they add a canal package. S. Burns stated that they are looking to quantify how much water is taken out of the canal when the wellfield is on and how much of the

pumpage comes from the canal. This could be done cell by cell and the quantity removed needs to be quantified. J. Bolleter asked if there is a trigger, such as canal stage, that activates deliveries from the regional system through the canals. If so, there may be a way to incorporate that trigger into the model. S. Burns said that it is not for the SFWMD to calibrate a model or add-on a package for MDWASD.

P. Kwiatkowski said that MDWASD is trying to find out what is needed to be able to choose a tool. S. Burns pointed out that in the Basis of Review, the criteria are in the rule. It is between the applicant and the reviewer to deal with addressing these issues. The SFWMD provides a list of tools that are available, and MDWASD chooses which tool(s) to use.

Karin Smith asked if the SFWMD was going to accept the river package or water budgets. S. Burns stated that the river packages would be acceptable as long as they are calibrated and flows could be demonstrated. In terms of the water budgets, they would be acceptable as long as the MDWASD demonstrates that they can quantify and address the impacts. The SFWMD would have to meet with the MDWASD to evaluate their strategy to quantify the impacts and deem it acceptable or not. S. Burns stated that he would not rule out the mass balance approach.

J. Bolleter stated that it is they hope to work with the SFWMD as a team in clarifying details about the models available and about specifics regarding the model they choose, especially if it is something like the LECsR, where there are many details with which only SFWMD staff is familiar. S. Burns said that it is not the SFWMD's job to choose a tool or to provide technical assistance. He cautioned the SFWMD staff against providing any guidance to MDWASD.

B. Goldenberg noted that MDWASD needs to submit a schedule to the SFWMD by March 2nd, so is there a way to issue a permit with the condition that a schedule will follow at a later date? S. Burns stated that they would need to look at what the MDWASD's modeling approach is and discuss the details. He added that the interim allocation would have some flexibility and the SFWMD would not set an unachievable time frame. He will work with them to determine a realistic date once the approach is determined. In addition, he stated that this is a priority for him and his team, and they will make room to schedule a meeting when needed. B. Goldenberg asked when the meeting could occur. S. Burns replied when the MDWASD was ready.

J. Giddings clarified that the draft documentation for the LECsR model will not be available until March. S. Burn clarified that the SFWMD does not intend to provide MDWASD with a finished product. MDWASD may choose a portion of it and concentrate on monthly time steps, but it is not incumbent for the SFWMD to provide a finished calibrated model and this should not delay the process. The model may end up being a modified version of what is available.

K. Smith asked about the possibility of using the North and South models. S. Burns stated that a countywide model is needed.

P. Kwiatkowski asked if the Basis of Review and RFI are in agreement. S. Burns said that there is a nomenclature issue. He noted that MDWASD's withdrawals affect the surface water flows, so they would have to use either a fully integrated model or a "hybrid" that incorporated surface water and groundwater. J. Bolleter noted that they can focus on the areas of concern. J. Xie added that they could run the whole model and focus only on the Miami-Dade County area.

B. Pitt inquired about impacts to Florida Bay. Specifically, that these flows are mainly affected by agricultural uses. Would the MDWASD model have to account for those impacts as well? K. Smith stated that the LECsR incorporates municipal and private withdrawals based on the permitted allocation.

L. Kuebler asked if the MDWASD model would have to incorporate features from the ACCELER8 program that would come online in 2010. S. Burn stated that these would not be necessary, the model would only take into account the conditions when the permit is issued.

K. Smith noted that J. Giddings and she put together a list of models that were available and what features each model has to answer the questions they need to address. She will forward that to MDWASD and E & E. She will also add the number of model runs that need to be completed (at least an 18-month calibration run; monthly time steps starting with a minimum of 3 months average annual demand and rainfall, followed by 12 months of 1 in 10 year drought conditions, followed by minimum of 6 months average annual demand and rainfall). MDWASD will have to determine how they will model canals. Also, the saltwater intrusion would need to be quantified if needed because it is not density dependant, so it only shows the vectors directed outward.

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Reuse Feasibility Study
February 28, 2006, Meeting with Biscayne National Park (BNP),
Everglades National Park (ENP), Florida Department of Environmental
Protection (FDEP) and South Florida Water Management District
(SFWMD)

DATE: February 28, 2006

TO: MDWASD Meeting Attendees

FROM: Jim Bolleter /Ecology and Environment, Inc. Consultant Team

RE: MDWASD Reuse & Alternative Water Supply
Meeting with BNP, ENP, FDEP, and SFWMD

Those in attendance were:

Bertha Goldenberg- Miami Dade Water and Sewer Dept. (MDWASD)
Donna Fries- MDWASD
Maria Valdez- MDWASD
Bill Pitt- MDWASD
Doug Yoder- MDWASD
R. Terrero- MDWASD
Jim Bolleter- Ecology & Environment, Inc. (E & E)
Monica Perez- E & E (via telephone)
Arsenio Milian – Milian Swain & Associates, Inc (MSA)
Deborah D. Swain– MSA
Linda Horne- Florida Department of Environmental Protection (FDEP)
Tim Powell- FDEP
David York (by telephone)
Scott Burns- SFWMD (by telephone)
Kevin Kotum- ENP
Riveria- ENP
Mark Lewis- BNP
Sarah Bellmund- BNP
Richard Curry- BNP

B. Goldenberg stated that the purpose of the meeting was to obtain input from both parks regarding reuse. ENP indicated that they generally support reuse but are concerned about special and temporal distribution and water quality. B. Goldenberg stated that a pilot project is being proposed for the Biscayne Coastal Wetlands (evaluating the treatment effectiveness and impacts of a 1 MGD state of

the art reclaimed water treatment facility using the Lennar flow way). S. Burns stated that a 1 MGD pilot plant would not help much with offsets and B. Goldenberg stated that was just one of a number of projects that will be proposed but a pilot study is needed if a larger scale project is ever to be implemented for the Biscayne Bay coastal wetlands. BNP suggested careful consideration be made regarding the amount of reclaimed water discharged into the Lennar flow way due to flooding issues. The group acknowledged that a significant amount of upfront work had been done as part of initial CERP efforts and this information has been and will continue to be tapped into as the pilot effort is initiated.

Discussion focus on distribution of reclaimed water to Biscayne Bay via surface sheet flow or groundwater via shallow infiltration gallery or deeper injection wells. BNP preferred surface application of highly treated reclaimed water to the freshwater wetlands. An infiltration gallery may be a backup option. There was acknowledgement that some phosphorus could be up taken by the calcium carbonate soils; however, it is not clear how much uptake would occur. This may be of interest since the anti-degradation phosphorus target set for Biscayne Bay is very low (5 ppb). BNP did not think deeper injection wells would help the bay.

Some discussion was held regarding the City of West Palm Beach pilot project that involves the discharge of reclaimed water to wetlands and then the water is ultimately routed to recharge wellfields. Emergent pollutants of concern (EPOCs) are not a major concern for that project.

Both parks have concerns about water quality particularly nutrients and EPOCs. They would want to review any projects that could have an impact on them. As an example, A. Milian brought up the idea of irrigating Crandon Park and Key Biscayne residential area (approximately 800 homes) since new sewer lines will be installed in the near term. BNP stated that they have some reservations (subject to further evaluation) since the water would only be treated to public access reuse standards and not sure if EPOCs or nutrients would cause a problem. A. Milian noted that the area is currently on septic tanks and this project would eliminate the septic tanks and provide an overall net benefit. T. Powell (FDEP) stated that FDEP did not think that EPOCs are an issue for public access irrigation and this would be a good project. L. Horne thought that some background evaluation of EPOCs in Biscayne Bay is needed.

Additional discussion was held on other projects. While no specific comments were made, it was noted that any project in close proximity to BNP or ENP would required further input. It was decided that this group would need to meet on a regular basis once the feasibility study is prepared to further discuss the issues, identify the most viable projects and resolve concerns that may arise.

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Alternative Water Supply Meeting
Open House, February 10, 2006

DATE: February 10, 2006

TO: MDWASD Meeting Attendees

FROM: Mónica Pérez /Ecology and Environment, Inc. (E&E) Consultant Team

RE: MDWASD Reuse & Alternative Water Supply
Open House, MDWASD, 3071 SW 38th St., 1st Floor, Miami, Florida,
10:00 am - 12:00 pm / Reuse Feasibility Study
2:00 pm - 4:00 pm / Water Use Efficiency Five-Year Plan

In addition to the public, those in attendance were:

John Renfrow, MDWASD
Bertha Goldenberg, MDWASD
Bill Pitt, MDWASD
Maria Valdes, MDWASD
Donna Fries, MDWASD
Maribel Balbin, MDWASD
Britton Wilson, Miami-Dade County Planning & Zoning (MDPZ)
Debbie Swain, MSA
Jim Bolleter, E & E
Mónica Pérez, E & E

Summary:

The public was invited to this Open House to learn about MDWASD's Reuse Feasibility Study and Water Use Efficiency Five-Year Plan, and to solicit comments from the public regarding these initiatives. A website where public comments could be submitted between February 6 and 17, 2006 was listed on the public invitation.

J. Renfrow, MDWASD, welcomed the public to the Open House. B. Goldenberg, MDWASD, gave an introduction about the Reuse Feasibility Study Update. Ms. Goldenberg stated that there has been very low water reuse in the past, and that Miami-Dade County is currently operating at a higher level of water reuse. She stated that the purpose of today's meeting was to provide an overview of the initiatives, and to solicit public input.

Jim Bolleter, Ecology and Environment, Inc., prepared and delivered a presentation which covered the following topics:

- Development and environmental considerations;
- Regulatory drivers;
- Wastewater Reuse Feasibility Study;
- Alternative water supply investigation;
- Reuse options;
- Existing/future conditions;
- Reuse scenarios; and
- Water Reuse Feasibility Study Schedule.

Mr. Bolleter then fielded questions from the audience. There was an opportunity for the participants to review the information presented on the boards and maps, and submit comments either during the Open House, or via the temporary website.

Comments and questions offered during this meeting included the following:

- Flood protection
- Concern State of Florida is pressuring Miami-Dade County into action
- Progress regarding consent order
- Injected treated wastewater leaking into drinking water source; how large is plume moving into the Florida Aquifer?
- Emergent pollutants of concern (EPOCs) which are going into drinking water supply
- What is sewer mining?
- Any specific reason for not considering reuse for direct potable water?
- What determines feasibility of reuse?
- Once scenario selected, what would be follow-up for implementation?
- Is the State of Florida going to accept the adopted plan?
- Is it a coincidence that this study is presented to the Board of County Commissioners in April and that there are UDB applications going through the system?
- James Humble, a tropical fruit grower, stated that 80% of the land is state owned. If all the UDB applications were approved, it would be a minor impact in the grand scheme of things
- What is the expected volume of water demand from the already permitted developments?
- Satellite treatment plants
- Audubon commented about the interconnection between environmental conservation and development
- How much of water ____ is agricultural, development, etc.?

Attachments



MEETING NOTICE

Miami-Dade Water & Sewer Department

The public is invited to an open house meeting to learn about the Department's two new initiatives:

Reuse Feasibility Study and Water Use Efficiency Five-Year Plan

Date: Friday, February 10, 2006

Place: Miami-Dade Water & Sewer Department
3071 S.W. 38 Street First Floor
(at the Douglas Road Metro Rail Station)

Time: **Reuse Feasibility Study**
10:00 a.m. – 12:00 noon

Water Use Efficiency Five-Year Plan
2:00 p.m. – 4:00 p.m.

This meeting is to solicit comments from the public regarding these initiatives.

Comments may also be submitted from February 6 to February 17, 2006 at:

http://www.miamidade.gov/wasd/efficiency_strategy.asp

For additional information please contact:

Reuse Feasibility Study
Maria Valdes (786) 552-8198
www.mavaldd@miamidade.gov

Water Use Efficiency Five-Year Plan
Maribel Balbin (786) 552-8149
www.balbin@miamidade.gov



AGENDA

Wastewater Reuse Feasibility Study Update Meeting November 9, 2005

<u>TOPIC</u>	<u>SPEAKER</u>
Wastewater Reuse Resolution & Update to Study Completion Date	Bertha Goldenberg, MDWASD
Wastewater Reuse Opportunities	Monica Perez, Ecology & Environment, Inc.
Wastewater Reuse Opportunities	H. Fallon, J. Mazzaresse, S. Kronheim, MDWASD

OPEN TO DISCUSSION

Comment Card

MDWASD Reuse Feasibility Study Public Meeting

Name Jeff Berrow			
Company Berrow + Radell			
Address		City	State Zip code
Phone	Fax	Email	
		jberrow@	
Firm Represented brzomnykw.com			
Comments about information contained in this presentation			
Where will purple pipes connect?			
What type of "alternative water supply plan" will be required of UDB applicants?			
What legal recourse does the County have against SFWMD regarding the apparent denial of the consumptive use permit application?			



Comment Card

MDWASD Reuse Feasibility Study Public Meeting

Name JAY SCHAPIRO			
Company BROWN DEVELOPMENT GROUP			
Address		City	State Zip code
5901 SW 74 St. Suite 205		MIAMI	FL 33143
Phone	Fax	Email	
305-665-8885	305-665-3224		
Firm Represented BROWN DEVELOPMENT GROUP			
Comments about information contained in this presentation			
Will impact fees be for all new developments county wide?			



Comment Card

MDWASD Reuse Feasibility Study Public Meeting

Name <i>James Swamen</i>				
Company <i>homeowner</i>				
<i>1145 ne 92</i>				
Address <i>Miami Sh</i>		City <i>FL</i>	State <i>33138</i>	Zip code
Phone <i>305</i>	Fax <i>759</i>	Email <i>-8591</i>		
Firm Represented				
Comments about information contained in this presentation				
<p><i>I would like to be kept up to date on issues of aquifer recharge as pertains to sustainable development. Carrying capacity issues of S Florida are lost in line after Everglades recharge on depletion are</i></p>				

crowded out in development area of palm beach dunes

Questions

Can your studies justify expansion of developments west of I-75 - 826 without drawing water out of depleted lower aquifer or satellite desalination from East coastal areas.

Is aquifer recovery of H₂O and salt sewer eventually going to create toxicity, unless use is curtailed and carrying capacity limited?

Comment Card

MDWASD Reuse Feasibility Study Public Meeting

Name			
MAUNY ECHEZARRETA			
Company			
FORD ENGINEERS, INC			
Address	City	State	Zip code
1450 NW 74 AVE	DOCK	FL	33172
Phone	Fax	Email	
305-477-0472	305-477-8054	maunye@fordco.com	
Firm Represented			
APP. 17.			
Comments about information contained in this presentation			
1. ANY IDEA ON PROPOSED IMPACT FEE STRUCTURE.			
2. DOES WWSO HAVE EXCESS WITHDRAWAL/TREATMENT CAPACITY ABOVE CURRENT DEMAND.			
3. WHAT NO. WILL SPURD PERMIT, ARIAL CAPACITY OR DEMAND?			



Comment Card

MDWASD Reuse Feasibility Study Public Meeting

Name			
Ashie Akpogi			
Company			
S FURY			
Address	City	State	Zip code
5301 Gnn Club Rd,	West Palm B		
Phone	Fax	Email	
		AAKPOJI@sfury.com	
Firm Represented			
Comments about information contained in this presentation			
Are you considering SEAWATER DESALINATION AS AN OPTION			
• Co-located with Power Plants			
• Stand-alone			
• Co-located with plant wells			



MIAMI-DADE WATER AND SEWER DEPARTMENT
WASTEWATER REUSE FEASIBILITY STUDY UPDATE AND
ALTERNATIVE WATER SUPPLY INVESTIGATION

Survey

As defined by the Florida Department of Environmental Protection (FDEP), "water reuse involves taking domestic wastewater, giving it a high degree of treatment, and using the resulting high-quality reclaimed water for a new, beneficial purpose. Extensive treatment and disinfection ensure that public health and environmental quality are protected". The Miami-Dade County Water and Sewer Department (WASD) is updating the County's reuse feasibility study. This study is updated approximately every 5 years. FDEP requires that three alternatives be developed: 25%, 50%, and 75% reuse of the wastewater volume generated in Miami-Dade County. Reuse options include, but are not limited to, watering public areas, golf courses and lawns; irrigating agricultural lands; providing cooling or process water for industrial needs; recharging the aquifer or canals in select locations; and re-hydrating wetlands. Each type of reuse involves different levels of treatment, distribution networks, and costs to get the reuse water to proposed end-users. As part of the study, a rate analysis will be conducted before a recommendation is selected.

The FDEP and the South Florida Water Management District (SFWMD) are encouraging that greater efforts be taken to implement reuse in Miami-Dade County to reduce demands on water supply and hydrologic stress to the Biscayne Aquifer. WASD is also studying alternative water supplies that will complement the water from the Biscayne Aquifer. Reuse is one of those alternatives. Others include blending water from the Floridan Aquifer with water from the Biscayne Aquifer; use of brackish water through desalination; and use of surface water.

We are interested in your comments on reuse. Please answer our reuse survey below:

1. Do you think wastewater reuse projects are needed in Miami-Dade County?
☐ Yes ☒ No
2. Do you favor wastewater reuse projects for irrigation of residential areas?
☐ Yes ☒ No
3. Do you favor wastewater reuse projects for irrigation of public areas such as parks, schools, and universities?
☒ Yes ☐ No
4. Do you have both water and sewer service from WASD?
☐ Yes ☒ No
5. If no, do you have:
☒ Water service only ☐ Sewer service only

[continued on reverse side]

6. Do you own a private well for irrigation?
☐ Yes ☒ No
7. What percentage of your water use do you estimate is used for irrigation?
☒ < 1% ☐ Not sure
8. Please provide any additional comments:

- ① THERE ARE SEVERAL ALTERNATIVES THAT OFFER ALTERNATIVES TO REUSING TREATED WASTEWATER, INCLUDING DROUGHT-TOLERANT LANDSCAPING, WATER CONSERVATION MEASURES, REDUCING DISTRIBUTION SYSTEM PRESSURES, ETC.
- ② REUSE REQUIRES A SIGNIFICANT INFRASTRUCTURE INVESTMENT BECAUSE ~~BECAUSE~~ OUR PLANTS ARE NOT WHERE OUR DEMANDS ARE AND PIPING THE REUSE WATER IS VERY EXPENSIVE, REQUIRING ROADWAYS RECONSTRUCTION. THE FUTURE DEMAND IS NOT GUARANTEED, SINCE THE AGRICULTURAL LANDS ARE SUBJECT TO BOTH NATURAL AND HUMAN ENCRoACHMENT IMPACTS.
- ③ MIAMI-DADE COUNTY IS PROBABLY THE SINGLE ^{LEAST ASLE} ~~WASD~~ COMMUNITY IN THE STATE TO AFFORD REUSE SYSTEMS, BECAUSE (1) THE EXCESSIVELY HIGH COST OF INSTALLING PIPE NETWORKS, AND (2) BECAUSE OF DADE'S SOCIO-ECONOMIC STATUS, THE FACT THAT THESE COSTS ARE TYPICALLY REFLECTED IN THE CUSTOMERS' WATER/SEWER BILLS. A LARGE PROPORTION OF OUR POPULATION ALREADY HAS DIFFICULTIES PAYING THESE BILLS, AND THAT WOULD WORSEN IF THE COST OF REUSE WERE TO BE INCLUDED.
- ④ THE FEASIBILITY STUDY SHOULD BE EXPANDED TO INCLUDE AN ANALYSIS OF THE FISCAL IMPACTS OF THE COST OF REUSE IMPLEMENTATION. IT SHOULD LOOK AT THE PERCENTAGE THAT BILLS FOR WATER, SEWER (AND REUSE) REPRESENT ON THE HOMEOWNER OR RENTER — AND NOT LIMIT ITSELF TO THE "AVERAGE," BUT FOCUS ON THE LOWER ECONOMIC SECTORS OF OUR COMMUNITY.

MIAMI-DADE WATER AND SEWER DEPARTMENT
WASTEWATER REUSE FEASIBILITY STUDY UPDATE AND
ALTERNATIVE WATER SUPPLY INVESTIGATION

Survey

As defined by the Florida Department of Environmental Protection (FDEP), "water reuse involves taking domestic wastewater, giving it a high degree of treatment, and using the resulting high-quality reclaimed water for a new, beneficial purpose. Extensive treatment and disinfection ensure that public health and environmental quality are protected". The Miami-Dade County Water and Sewer Department (WASD) is updating the County's reuse feasibility study. This study is updated approximately every 5 years. FDEP requires that three alternatives be developed: 25%, 50%, and 75% reuse of the wastewater volume generated in Miami-Dade County. Reuse options include, but are not limited to, watering public areas, golf courses and lawns; irrigating agricultural lands; providing cooling or process water for industrial needs; recharging the aquifer or canals in select locations; and re-hydrating wetlands. Each type of reuse involves different levels of treatment, distribution networks, and costs to get the reuse water to proposed end-users. As part of the study, a rate analysis will be conducted before a recommendation is selected.

The FDEP and the South Florida Water Management District (SFWMD) are encouraging that greater efforts be taken to implement reuse in Miami-Dade County to reduce demands on water supply and hydrologic stress to the Biscayne Aquifer. WASD is also studying alternative water supplies that will complement the water from the Biscayne Aquifer. Reuse is one of those alternatives. Others include blending water from the Floridan Aquifer with water from the Biscayne Aquifer; use of brackish water through desalination; and use of surface water.

We are interested in your comments on reuse. Please answer our reuse survey below:

1. Do you think wastewater reuse projects are needed in Miami-Dade County?
☒ Yes ☐ No
2. Do you favor wastewater reuse projects for irrigation of residential areas?
☒ Yes ☐ No
3. Do you favor wastewater reuse projects for irrigation of public areas such as parks, schools, and universities?
☒ Yes ☐ No
4. Do you have both water and sewer service from WASD?
☒ Yes ☐ No
5. If no, do you have:
☐ Water service only ☐ Sewer service only

[continued on reverse side]

6. Do you own a private well for irrigation?
☐ Yes ☒ No
7. What percentage of your water use do you estimate is used for irrigation?
40 % ☐ Not sure
8. Please provide any additional comments:

Satellite Treatment plants - excellent!
DORAL Has 7 golf courses, all Homeowner
Associations are enclosed with one central
irrigation system, a perfect location on
NW 58st at county-owned property is available,
Resource Recovery Facility also in same area —
Satellite Treatment Plants must be equipped
with the in-vessel aerobic composters from the
South Dade Soil & Water Conservation District (SDSWCD)
To compost the sludge in only 3 days on site,
Producing a valuable soil amendment that
can be marketed by the SDSWCD.

Morgenheym, Administrator
SDSWCD

(305) 242-1288

Water Conservation —
Fund Three Mobile Irrigation Labs
for the South Dade Soil & Water Conservation
District to cover the entire county.

Valdes, Maria A. (WASD)

From: WASD
Sent: Wednesday, February 08, 2006 2:59 PM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **no**

If no, do you have: **Sewer services only**

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **2%**

Comments: **This is testing of the page live from Joe**

Valdes, Maria A. (WASD)

From: WASD
Sent: Wednesday, February 08, 2006 2:01 PM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **no**

If no, do you have: **Water services only**

Do you own a private well for irrigation: **yes**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **35%**

Comments: **Testing Form**

Valdes, Maria A. (WASD)

From: WASD

Sent: Thursday, February 09, 2006 9:11 PM

To: Valdes, Maria A. (WASD)

Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation:

Estimate used for irrigation: **30 ?**

Comments:

Valdes, Maria A. (WASD)

From: WASD
Sent: Wednesday, February 08, 2006 3:44 PM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **no**

If no, do you have: **Water services only**

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation:

Estimate used for irrigation: **1%**

Comments:

Valdes, Maria A. (WASD)

From: WASD

Sent: Wednesday, February 08, 2006 7:19 PM

To: Valdes, Maria A. (WASD)

Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **no**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **yes**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **20**

Comments:

Valdes, Maria A. (WASD)

From: WASD

Sent: Thursday, February 09, 2006 2:33 PM

To: Valdes, Maria A. (WASD)

Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **no**

Do you favor wastewater reuse projects for irrigations of residential areas: **no**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **no**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **not sure**

Estimate used for irrigation:

Comments:

Valdes, Maria A. (WASD)

From: WASD
Sent: Thursday, February 09, 2006 5:26 PM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **no**

Do you favor wastewater reuse projects for irrigations of residential areas: **no**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **no**

Do you have both water and sewer services from WASD: **no**

If no, do you have: **Water services only**

Do you own a private well for irrigation: **yes**

What percentage of your water use do you estimate is used for irrigation:

Estimate used for irrigation: **10%**

Comments: **We do not need all this if we'd stop the rampant building practices. I do not want ANYTHING that will make it possible for more people to be packed into this County!!!**

Valdes, Maria A. (WASD)

From: WASD
Sent: Saturday, February 11, 2006 9:48 AM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **not sure**

Estimate used for irrigation:

Comments: **Our community needs to be educated on this issue. A informative education/information campaign is necessary.**

Valdes, Maria A. (WASD)

From: WASD
Sent: Monday, February 13, 2006 11:55 AM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **10%**

Comments: **I have seen the reuse of water option in practice in another Florida city, and it seems to work really well and save money to the homeowner.**

Valdes, Maria A. (WASD)

From: WASD
Sent: Thursday, February 16, 2006 8:29 PM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **no**

If no, do you have: **Water services only**

Do you own a private well for irrigation: **yes**

What percentage of your water use do you estimate is used for irrigation:

Estimate used for irrigation: **50%**

Comments: **I am curious about an experiment that was to be conducted at the north campus of F.I.U., using waste waters to irrigate the campus grounds. Has the experiment been run and what were the results? dhipple@mdc.edu**

Valdes, Maria A. (WASD)

From: WASD
Sent: Monday, March 06, 2006 8:17 AM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **no**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **the minority percentage**

Comments: **I enjoy birding and dislike driving all the way to Wakodahatchee park in Palm Beach county which is a reclaimed water/wetlands restoration project with an elevated walk way. But There are many different birds there including yesterday I saw a Bald Eagle! Every time I visit there I wish that MD had a similar park/project.**

Valdes, Maria A. (WASD)

From: WASD

Sent: Wednesday, March 22, 2006 10:41 AM

To: Valdes, Maria A. (WASD)

Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **not sure**

Estimate used for irrigation:

Comments:

Valdes, Maria A. (WASD)

From: WASD
Sent: Friday, March 17, 2006 10:42 PM
To: Valdes, Maria A. (WASD)
Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **yes**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **yes**

Do you have both water and sewer services from WASD: **yes**

If no, do you have: **Water services only**

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **777-777-1911form@value777.com**

Comments: **777-777-1911form@value777.com**

Valdes, Maria A. (WASD)

From: WASD

Sent: Thursday, April 06, 2006 1:34 PM

To: Valdes, Maria A. (WASD)

Subject: WASD Survey

Survey Results

Do you think reuse is needed in Miami-Dade County: **yes**

Do you favor wastewater reuse projects for irrigations of residential areas: **no**

Do you favor reuse projects for irrigation areas such as parks, schools, and universities: **no**

Do you have both water and sewer services from WASD: **yes**

If no, do you have:

Do you own a private well for irrigation: **no**

What percentage of your water use do you estimate is used for irrigation: **see below**

Estimate used for irrigation: **None**

Comments:

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse Feasibility Study
July 14, 2006, Conference Call with SFWMD, FDEP

DATE: July 24, 2006

TO: MDWASD

FROM: Monica Perez /Ecology and Environment, Inc.

RE: MDWASD Reuse Feasibility Study (RFS) Meeting with SFWMD, FDEP

Attendees:

Carlyn Kowalski, SFWMD
Scott Burns, SFWMD
Elsa Potts, FDEP
Richard Drew, FDEP
Geof Mansfield, FDEP
Mike Sole, FDEP
Sharon Sawicki, FDEP
Linda Horne, FDEP
Tim Powell, FDEP
Jose Calas, FDEP
Bertha Goldenberg, MDWASD
Bill Pitt, MDWASD
Ralph Terrero, MDWASD
Maria Valdes, MDWASD
Donna Fries, MDWASD
Debbie Swain, MSA
Arsenio Milian, MSA
Monica Perez, E & E

Summary:

The purpose of this meeting was to discuss SFWMD's and FDEP's comments on the draft version of the Reuse Feasibility Study. Bertha Goldenberg provided an introduction and requested direction on comments to the Reuse Feasibility Study. Before comment discussion, clarification was provided as to the Water Master Plan/ Water use agreements meeting scheduled on July 31, 2006. SFWMD agreed that this meeting would serve as the meeting required in the water use agreement.

Debbie Swain reviewed SFWMD and FDEP comments per FDEP's Memorandum dated June 13, 2006, and provided MDWASD's/Consultant Team responses. Major comments and/or areas of concern discussed included:

Specific Comments on Reuse Feasibility Study Report

- FDEP/SFWMD Comment: *Despite generating more than about one-fifth of Florida's wastewater, however, Miami Dade County reuses a mere seven percent.* MDWASD/Consultant team suggested deleting this statement from the report, if there was added confusion. FDEP indicated that there is no need to delete this from the report, just note that more reuse should be implemented in Miami-Dade County.
- FDEP Comment: *the DEP appreciates the consultant's discussion of reverse osmosis with ultraviolet/advanced oxidation treatment...the County may also want to consider substituting ozonation for UV/oxidation as recent work has demonstrated significant benefits associated with the use of ozone.* MDWASD and their Consultant team indicated that with the exceptions of 20,000 gpd, all other projects identified include both UV and ozonation. FDEP requested that a clarification statement be added stating that ozonation was considered for all treatment alternatives proposed.
- Satellite Plants: The FDEP and SFWMD feel that this was not discussed in more depth. The Reuse Feasibility Study should provide text that describes the considerations for satellite treatment, the analysis conducted, and outcome (whether feasible or not). For satellite facilities, FDEP indicated that the operator staffing rules state the type of requirements needed for staffing of satellite facilities.
- General Assumptions: In general, FDEP is concerned that there are overall assumptions in the Reuse Feasibility Study that were not mentioned in the text. This comment was noted and will be addressed in the publication of the revised Reuse Feasibility Study.

General Comments on Reuse and Recommendations

- Pilot Studies:
Carlyn Kowalski indicated that John Renfro and Chip Miriam discussed this topic and the direction was to move away from the pilot studies. Bertha Goldenberg inquired about which direction to take with respect to the Reuse Feasibility Study. The FDEP and SFWMD both believe that pilot efforts would not serve the purpose of reuse for Miami-Dade County. The FDEP stated that the concept of pilot studies is not defined under their ruled. Bertha Goldenberg stated that one of the proposed pilot studies includes a 20,000 gpd plant and that FDEP rules make reference to a pilot testing program. The 20,000 gpd pilot project was an attempt to develop a similar pilot testing program as Orange County. The FDEP clarified that under F.S.S. 62-610.500, the 20,000 gpd pilot plant pilot testing would be covered, however, other pilot projects such as the Biscayne Bay Coastal Wetlands Demonstration Project would not.

FDEP stated that the wetland program considers full scale design, develop baseline conditions, and look at the treatment achieved. FDEP and SFWMD's concern with a pilot project/small scale effort is that it may not accurately reflect the full scale wetland. The full scale project would be defined as the having the capacity to handle the anticipated flow.

CERP defined the Biscayne Bay Coastal Wetlands Rehydration demonstration project as 1MGD project, with a design goal of Fall 2008. The original CERP project was intended for a reuse volume of 112 MGD, from MDWASD. Based on latest demand figures, MDWASD will achieve 112 MGD capacity by 2013. At this time, the 1 MGD CERP project is on hold until 2015, and the full scale project has been delayed until 2025. MDWASD feels they can get this project online faster than CERP. Currently, MDWASD plans on having the 90% design and permits for the 1 MGD Biscayne Bay Coastal Wetlands project complete by Fall 2007.

There are a number of concerns regarding a full scale project for Biscayne Bay Coastal Wetlands. Biscayne Bay National Park is concerned with water quality and potential effects to the coastal wetlands and Biscayne Bay. In addition, the CERP pilot project technical report concluded that current technology has not proven to consistently meet the necessary water quality. Note, the technology report did not define water quantity. Scott Burns stated that this project should no longer be considered in the CERP context, and should now be considered as way to address MDWASD's water needs based on the existing agreements. Therefore, individual interests should not drive the project, only the regulatory concerns from the permitting agencies such as FDEP's Outstanding Florida Waters Rule. Nevertheless, even if the National Park is not issuing a permit, stakeholders' concerns and lack of consensus may significantly delay reuse implementation.

FDEP and SFWMD will refine the water quantity figures and permitting requirements for this project for the August 4, 2006 meeting.

Bertha Goldenberg also clarified that the recommended plan was not a final recommendation. It will serve as a base and will be expanded to other projects based on the findings from the pilot efforts.

- **Economic Analysis:**

The Reuse Feasibility Study will be revised to include future capital costs associated with the entire wastewater system, as well as related expenses. Note, there were a number of costs that were omitted because they remain constant throughout the analysis. These include costs associated with capacity expansions, and regulatory requirements that would have to be incurred regardless of reuse implementation. Debbie Swain pointed out that based on discussions with FDEP personnel in Tallahassee, these assumptions seemed reasonable.

FDEP and SFWMD stated that the Reuse Study was largely based on economics but did not provide any comparisons to other alternative water supplies. FDEP and SFWMD

would like to see costs for other Alternative Water Supplies to create a framework for comparison. Geof Mansfield stated that the report is not only addressing the reuse feasibility study, but it is also addressing reuse in the context of MDWASD's water use agreement, and should be approached as such. FDEP and SFWMD suggested developing feasibility level planning costs to create a frame of reference for reuse costs, and to establish a complete representation of costs. Mike Sole reiterated that they need to have cost accounting of reuse as it relates water supply augmentation. Richard Drew suggested that general costs of alternative water supplies should be generated and rendered for comparison. An Alternative Water Supply Investigation was originally planned as part of the Reuse Feasibility Study. This task will now be completed as part of the Water Facilities Master Plan and is planned to be completed by 2007. Also, a 20-year water supply plan needs to be completed by the December 2006, and a preliminary alternative water supply investigation will be conducted by then.

MDWASD and the Consultant Team clarified that the feasibility of reuse was not defined in terms of economics. The study found that there were other issues that limited the implementation of reuse and that reuse did not appear to be cost prohibitive. These issues include stakeholders' concerns, local ordinances, and treatment of EPOCs, among others. FDEP requested that this point be made clearer in the report text. These issues may be local issues but consensus is necessary in order to avoid future delays in the implementation of reuse. Further discussion will be conducted during the August 4, 2006 workshop.

Ralph Terrero stated that it is important to identify the FDEP technical reviewers for the economic analysis so they are in communication with MDWASD and the Reuse Team. Mike Sole added that this will help in the consensus of which costs will be included, which costs may be omitted, and what will be the avoided costs due to reuse.

Follow-Up Action Items

1. SFWMD and FDEP will refine water quantity and permitting requirements for the Biscayne Bay Coastal Wetlands Rehydration Project for August 4, 2006 meeting
2. MDWASD to coordinate with DERM to provide a review of local ordinances at the August 4, 2006 meeting
3. MDWASD and Consultant Team to develop a plan to address FDEP's cost analysis comments for August 4, 2006 meeting

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse Feasibility Study Update
September 14, 2006, Meeting with City of North Miami Beach

DATE: September 22, 2006

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment. Inc.

RE: MDWASD Reuse Feasibility Study (RFS) Update Meeting with North Miami Beach

Attendees:

Kelvin Baker, City of North Miami Beach (NMB)
Karl Thompson, NMB
Karim Rossy, NMB
Marty King, NMB
Dana Kelly, NMB
Bertha Goldenberg, MDWASD
Bill Pitt, MDWASD
Vincent Arrebola, MDWASD
Donna Fries, MDWASD
Monica Perez, E &E

Meeting Summary:

The purpose of this meeting was to discuss the status of the MDWASD RFS and revisit reuse opportunities with the city of NMB. Bertha Goldernberg provided an overview of the RFS. The RFS has been reviewed by Florida Department of Environmental Protection (FDEP), South Florida Water Management District (SFWMD), and Miami-Dade Department of Environmental Resource Management (DERM) and comments from these agencies are being addressed.

Kelvin Baker stated that NMB's consumptive use permit (CUP) permit will soon be evaluated for renewal and the SFWMD has been strongly recommending alternative water supply (AWS) projects to augment future water supply. As a response, NMB has been implementing a number of "rain harvesting" pilot efforts and is one month away from implementing their first project. These projects would not replace previous reuse demand projections. In fact, as part of the AWS evaluation, NMB has identified a higher demand for reuse totaling approximately 5 MGD. This includes the previously identified projects (vehicle wash, medians, schools, etc) as well as new customers such as cooling towers for high-rise condominiums and industrial redevelopment.

The County has a commitment to implement reuse and has allocated funds in their capital plan for this purpose. The projects in North Miami Beach have been identified in all the reuse alternatives, and the MDWASD would like to refine the reuse volumes in order to procure the work for the filter improvements and transmission main at the North District Wastewater Treatment Plant (NDWWTP).

While there is a great interest for NMB to implement reuse, there is a concern that the timeline for MDWASD to supply reclaimed water is not in sync with their needs. NMB suggested connecting to the existing Florida International University (FIU) reuse line to start their reuse service. MDWASD clarified that this line is dedicated to the volume allocated for FIU and their intent is to increase the treatment capacity at the NDWWTP in order to provide reclaimed water to NMB along with other project identified in the reuse study. To achieve this, the main focus is determining the projected reuse demand so the filters can be designed and installed. NMB stated that their design and construction process for the transmission line can be completed within 18 months. However, due to Miami-Dade County's procurement process, MDWASD may not be ready to provide the reclaimed water until three to 5 years. With this in mind, both parties can come into a partnering agreement that would demonstrate the commitment of implementing 5 MGD of reuse. A reasonable connection point would be located at 152nd and Biscayne Blvd.

Also, Marty King inquired about the status of a proposed 36-inch line that was planned to run through the City of NMB. MDWASD was not aware of this plan, and will look into it further.

Follow-up items:

- Bertha Goldenberg/Vincent Arrebola to verify status of a proposed 36-inch pipe through NMB
- MDWASD will schedule a follow-up meeting with NMB to develop a cooperative agreement for reuse implementation

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse Feasibility Study Update
September 14, 2006, Meeting with Miami-Dade County Parks and
Recreation (MDPR)

DATE: September 25, 2006

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment. Inc.

RE: MDWASD Reuse Feasibility Study (RFS) Update Meeting with MDPR

Attendees:

Howard Gregg, MDPR
Maria I. Nardi, MDPR
Kevin Asher, MDPR
Bill Pitt, MDWASD
Donna Fries, MDWASD
Steven Shroedinger, Parsons
Peter Hardy, Parsons
Ivelisse Rodriguez, Parsons
Tom Nogaj, Carollo
Arsenio Milian, MSA
Debbie Swain, MSA
Jim Bolleter, E & E
Monica Perez, E &E

Meeting Summary:

The purpose of this meeting was to discuss the status of the MDWASD RFS and revisit reuse opportunities with the MDPR. Bill Pitt provided an overview of the RFS and identified the two pilot efforts identified (aquifer recharge and Biscayne Bay Coastal Wetlands rehydration demonstration). The RFS has been reviewed by Florida Department of Environmental Protection (FDEP), South Florida Water Management District (SFWMD), and Miami-Dade Department of Environmental Resource Management (DERM) and comments from these agencies are being addressed.

A number of projects within Miami-Dade County properties were identified as a starting point of the reuse feasibility study. Many of these projects are located within county parks and include irrigation projects, aquifer recharge through rapid infiltration galleries or trenches, and recharge of lakes. MDWASD has a commitment to implement reuse projects and Donna Fries indicated that MDWASD has allocated funds in their capital plan for such projects. The bulk financial burden would not fall on MDPR. Fries also

indicated that the County Manager has made a commitment to reuse and that the Department has been authorized to implement it as part of the future water use permit requirements.

Howard Gregg indicated that aside from the financial concerns, there is also concern for public health and safety, in particular in existing playing fields where children are exposed to reclaimed water. The MDWASD assured that the level of treatment being considered for reuse meets FDEP standards and in many cases, exceeds the minimum state standards. For projects recharging the aquifer and for the pilot efforts, very high levels of treatment, typically used for drinking water, are being considered. If MDPR's concerns are addressed, reuse is a management practice that they are amenable to.

Kevin Asher stated that a number of neighborhood parks that have not been identified in the study would greatly benefit from irrigation, but were not included in the RFS list. identifies projects with large areas and yielding high reuse volumes, other opportunities along transmission routes and nearby reuse projects were not eliminated from reuse consideration and would be considered once further along design. It will be important to coordinate with MDPR's Master Schedule during planning efforts and make sure the reuse study and MDPR's construction plans are in synch.

Bill Pitt provided an overview of the County's consumptive use permit renewal process and the need to identify alternative water supplies (AWS). One of the purposes of the reuse study is to identify reuse opportunities that also serve as AWS. Currently, the MDWASD has as pilot effort to identify locations for a small scale treatment unit that will connect to an existing sewer line and treat the wastewater through biological and advanced treatment. This pilot unit will be a skid mounted set-up located within County-owned property. Three of the four locations are within county parks: Amelia Earhart Park, Florida International University/Tamiami Park Site and the Metro Zoo. The other location is a parcel owned by MDWASD in Medley. Kevin Asher indicated that Amelia Earhart would benefit from irrigation, infiltration galleries, and recharge of lakes. It was noted that the Metro Zoo is under regulations from the USDA and contains protected pine rockland forests, both in Metro Zoo and at the adjacent Larry and Penny Thompson Park. Additionally raising the water table through infiltration may not be desirable for the type of vegetation there. These issues should be considered when focusing on the Metro Zoo as a future reuse site.

Other projects that are being considered for reuse in the near future include Homestead Air Reserve Park and the Key Biscayne Golf Course. MDPR had no concerns with these areas and added that Palmetto Golf Course and Tree Island Park would be good candidates for reuse. However, Castellow Hammock may have an adverse impact due to environmentally sensitive lands.

MDPR is supportive of MDWASD's reuse plan and will support collaborative efforts to implement reuse projects throughout the County.

Follow-up items:

- Ongoing coordination with MDPR once projects have been identified

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse Feasibility Study Update
September 28, 2006, Meeting with Village of Key Biscayne

DATE: October 5, 2006

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment. Inc.

RE: MDWASD Reuse Feasibility Study (RFS) Update Meeting with Village of Key Biscayne

Attendees:

Armando Nuñez, Village of Key Biscayne (Key Biscayne)

Patricia Carney, PBSJ

Bill Pitt, MDWASD

Vicente Arrebola, MDWASD

Rafael Terrero, MDWASD

Arsenio Milian, MSA

Debbie Swain, MSA

Monica Perez, E &E

Meeting Summary:

The purpose of this meeting was to discuss the status of the MDWASD RFS and revisit reuse opportunities with the Village of Key Biscayne. Vicente Arrebola provided an overview of the RFS. Key Biscayne was identified in the RFS as one of the priority areas for reuse implementation. Current efforts for sewer line installation provide the opportunity to install “purple pipes” within those areas as well, to deliver reclaimed water for users. The types of projects identified in the RFS for public access reuse included irrigation and aquifer recharge via rapid infiltration trenches. These two types of reuse practices may be able to be implemented in Key Biscayne. Ralph Terrero stated that MDWASD would like to coordinate schedules and plan accordingly so the projects can be implemented concurrently and expeditiously.

Armando Nuñez indicated that the Crandon Park beautification master plan has been completed and they welcome reclaimed water for their irrigation and inquired about the extent of the project. Ralph Terrero added that by taking advantage of the sewer lines that are going in, they can install the transmission lines even if water is not yet available and this would serve residential customers for irrigation.

Patricia Carney noted that it is important to take measures in order to avoid interconnections or connections by mistake from individuals who are trying to tap into

the water lines. MDWASD agrees that an education and public outreach program will be implemented to educate the public about purple pipes, address health and safety concerns, and develop awareness among workers and other contractors who conduct the work. In addition, Vincent Arrebola noted that any connection has to be done by MDWASD staff, so they will be aware of the purple pipes.

In terms of cost of reclaimed water to customers, Ralph Terrero indicated that MDWASD is considering various alternatives to provide this service at a discounted rate as compared to potable water. As for the construction costs, capital investments, and expectation from the Key Biscayne, MDWASD would like to discuss it further once the design plans showing the purple pipes are completed. Note, MDWASD wants to invest in the infrastructure (purple pipes) and will coordinate efforts with the Village of Key Biscayne's consultant to expedite approval of the engineering plans and get this project to bid.

Patricia Carney provided an overview of their plans and phasing. It was agreed that the drawings would incorporate the purple pipes along all the three designated zones and along Crandon Park.

Follow-up Items

- The Key Biscayne's consultant will prepare a proposal for additional funds to incorporate purple pipes into the sewer design
- Key Biscayne's Public Works to present the request for additional funds at the October 24th Council Meeting (Tuesday, Oct 24th, 7:00 pm). MDWASD is requested to attend this meeting and provide an overview of the reuse efforts and answer any questions. Questions on health and safety concerns are expected.

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse Feasibility Study Update
February 7, 2007, Meeting with Biscayne Landing Development

DATE: February 20, 2007

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment (E & E)

RE: MDWASD Reuse Feasibility Study (RFS) Update Meeting with Biscayne Landings Development

Attendees:

Cliff Shulman, GT

Amanda Stage, Biscayne Landing

Herb Tillman, Biscayne Landing

Tony Clemente, PBSJ

Bertha Goldenberg, Miami-Dade Water and Sewer Department (MDWASD)

Vicente Arrebola, MDWASD

Debbie Swain, Milian Swain Associates, MSA

Monica Perez, E &E

On teleconference:

Doug Yoder, MDWASD

Meeting Summary:

The purpose of this meeting was to discuss the status of the MDWASD RFS explore reuse opportunities with Biscayne Landing development. Doug Yoder provided an overview of the RFS. Biscayne Landing was identified in the RFS as one of the priority areas for reuse implementation. A total of 1.5 MGD of public access irrigation was identified for Biscayne Landing.

Tony Clemente stated that two years ago, the development approached MDWASD for this purpose and that there was window of opportunity at that time. Biscayne Landing is concerned with the cost to install purple pipes now that some infrastructure has been constructed and some of the roads have already been built. Cliff Schulman added that the site is currently under a closure plan with DERM to remediate an ammonia leachate plume. DERM approved the full scale system to be installed. Discussions are still taking place with DERM regarding irrigation at the site due to the contamination issues. DERM has imposed very strict standards on ammonia and Biscayne Landing has to treat all the water that would leave the site. This presents the greatest challenge for irrigation at the site. Biscayne Landing requested MDWASD's assistance in discussions with DERM.

Bertha Goldenberg stated that DERM has not brought up the issue of ammonia regarding public access irrigation reuse. Doug Yoder stated that MDWASD will meet with DERM to discuss the reuse projects at Biscayne Landing given the ammonia standard.

Cliff Shulman also stated that during previous discussions, MDWASD indicated that what water quality and quantity could be guaranteed if they provided reuse from their North District Wastewater Treatment Plant (NDWWTP). Bertha Goldenberg clarified that MDWASD is procuring a consultant to design new filters for the NDWWTP. The old filters will be decommissioned and new ones will be installed. MDWASD is trying to clearly identify the capacity of reuse projects at the NDWWTP in order to install appropriate size filters. Once projects are identified, there is a guarantee on the quantity and quality of the reclaimed water. Biscayne Landing had also provided irrigation estimated to MDWASD during these discussions. MDWASD will obtain these files for reference and comparison with the recent irrigation estimates.

Follow-up Items

- Doug Yoder and MDWASD to discuss with DERM and determine if reuse at Biscayne Landing is viable
- MDWASD to meet with City of North Miami and discuss Biscayne Landing as well

Meeting Summary
Miami-Dade Water and Sewer Department (MDWASD)
Wastewater Reuse Feasibility Study Update
March 12, 2007, Meeting with City of North Miami Beach

DATE: March 21, 2007

TO: Meeting Attendees

FROM: Monica Perez /Ecology and Environment (E & E)

RE: MDWASD Reuse Feasibility Study (RFS) Update Meeting with City of North Miami Beach

Attendees:

Aleem Ghany, City of North Miami (CNM)

Michael Falestra, CNM

Mark E. Collins, CNM

Gary Demarest, CNM

Doug Yoder, Miami-Dade Water and Sewer Department (MDWASD)

Vicente Arrebola, MDWASD

Maria Valdes, MDWASD

Bill Pitt, MDWASD

Monica Perez, E &E

Meeting Summary:

The purpose of this meeting was to discuss the status of the MDWASD RFS explore reuse opportunities with city of North Miami. Doug Yoder provided an overview of the RFS. North Miami Stadium and Biscayne Landing Development were identified in the RFS as priority areas for reuse implementation. D. Yoder spoke to DERM regarding the potential to use reclaimed water for irrigation at Biscayne Landing. DERM determined that it would be feasible as long as they implemented measures to prevent runoff from the site. Mark Collins stated that Biscayne Lending's consultant was interested in implementing reuse.

Mr. Collins also noted that North Miami Stadium is an area where the City would like to use reclaimed water. The City is also building a new school which can use reclaimed water as well as the existing high school. The City is currently exploring funding opportunities for infrastructure and to upgrade their existing water treatment plant, so reuse is not in their short term plans at the moment. However, id MDWASD is moving ahead with their reuse plan, the City will work with them. As a first project, they run a line along 135th St. from the North District Waster Treatment Plant (WWTP) to supply North Miami Stadium and others.

The city expressed concern with public heath and safety. They would like to ensure that the quality of they water is safe and that they will not be liable for any mishaps.

The city has hired a new City Engineer, which will work with Biscayne Landing and with WASD to refine the irrigation numbers, and further develop plans for irrigation of North Miami Stadium.

Follow-up Items

- MDWASD will contact the new city engineer to refine reuse estimates