

1 Introduction

“A growing body of evidence suggests that water reuse will play an expanded role in water management in the 21st century, not only in semiarid western states and sunbelt states, but perhaps in all 50 states. Reusing water will be one of the essential tools of the 21st century water utility in ensuring a safe and adequate supply for their customer base.”

G. Wade Miller
Executive Director
Water Reuse Association

The State of Florida has embraced wastewater reuse as an integral part of the development of water management strategies. Florida statutes encourage the conservation of water and reuse of reclaimed water. Reclaimed water is defined as water that has received at least secondary treatment and is reused after flowing out of a wastewater treatment plant. Reuse is the deliberate application of the reclaimed water in compliance with the state and local rules for a beneficial purpose. These beneficial purposes may include uses such as irrigation for urban and agricultural areas, industrial applications for process or cooling water, rehydration of wetlands, recharge of the aquifer directly or indirectly (i.e., canal recharge), and re-injection in coastal areas to prevent saltwater intrusion.

Consideration of reuse in Miami-Dade County is becoming a greater priority given the need to ensure adequate potable water supplies for a growing population and to protect the surrounding sensitive environment. The Miami-Dade Water and Sewer Department (MDWASD) tasked Ecology and Environment, Inc. (E & E) and its subconsultant, Milian Swain & Associates, Inc. (MSA), to update a Wastewater Reuse Feasibility Study that was previously conducted in 1992 and subsequently updated in 1998 by Post, Buckley, Schuh & Jernigan (PBS&J). The work was conducted with the conditions set forth in Miami-Dade County Contract Resolution E-98-699-00 as administered by the Miami-Dade Department of Environmental Resources Management (DERM).

1.1 PURPOSE

The purpose of this study is to assess the feasibility of wastewater reuse in Miami-Dade County, particularly in light of current water supply issues. This study identifies the constraints and opportunities for reuse; establishes the level of treatment and possible infrastructure needed for various reuse scenarios; identifies potential projects and provides estimates of reuse volumes; develops low, medium and high reuse scenarios as

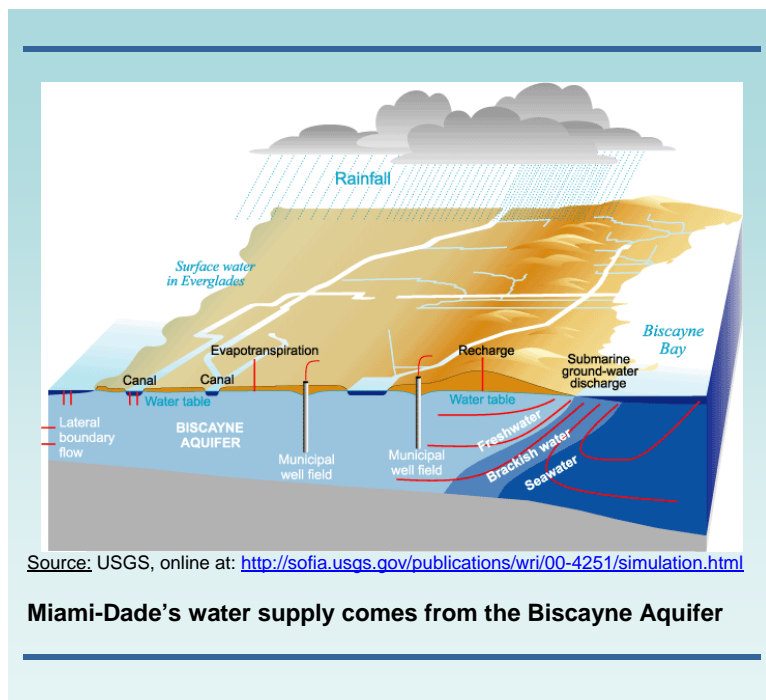
required by the Florida Department of Environmental Protection (FDEP); and provides preliminary costs along with an initial evaluation of the impact those costs could have on rates. Completion of the Reuse Feasibility Study will coincide with renewal efforts for Miami-Dade County's water use permits for the Miami-Dade County wellfields. Future water allocation will be dependent on the projected demand and the water that can be supplied through reuse and other alternative water supplies.

This Reuse Feasibility Study Update is a high- to mid-level planning study. This study will need to be updated as more information becomes available, regulatory requirements are better defined, and other combinations of projects are considered. Prior to the implementation of the projects identified herein, additional engineering and technical analysis will be required.

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1.2 BACKGROUND

Miami-Dade County has been designated by the South Florida Water Management District (SFWMD) as a "critical water supply problem area." The FDEP requires that domestic wastewater facilities located in these areas use reclaimed water unless such use is not economically, environmentally, or technically feasible. Previous reuse studies for Miami-Dade County recommended limited amounts of reuse due in part to high costs. As will be discussed in more detail, there are a number of factors which make the implementation of reuse in Miami-Dade County a challenge. However, opportunities for reuse do exist.



There are increased concerns that the sole source of potable water from the Biscayne Aquifer in Miami-Dade County will not be able to sustain projected population growth and continued withdrawals without negatively impacting the surrounding natural system, including Biscayne National Park (BNP) and Everglades National Park (ENP). Recent review comments by FDEP concerning Miami-Dade County's Wastewater Master Plan reveal an

increased desire by the State of Florida to see more reuse. It is the SFWMD Governing Board's position that reclaimed water is a resource rather than a waste stream and that efforts should be made to use more of the water for beneficial purposes.

As this report is being prepared, MDWASD is preparing additional information to be submitted to the SFWMD to complete an application for a consumptive use permit (CUP) for the next 20 years. Currently, Miami-Dade County withdraws close to 350 million gallons per day (MGD) from the Biscayne Aquifer for potable water supply purposes, and additional demands of 70 MGD are projected. Due to concerns about continued withdrawals from the Biscayne Aquifer, the SFWMD is requiring that Miami-Dade County identifies alternative water supplies to, at a minimum, offset the 74 MGD of additional demands. Reuse of treated wastewater is one of several alternative water supplies that can be considered to meet future water needs. Another potential option to offset future water demands is extracting water from the Upper Floridan Aquifer, which is below the Biscayne Aquifer, has reasonable yields, but has poorer water quality.

The SFWMD has stated that if reuse is employed to fully or partially offset future water demands, only certain types of projects would qualify. In essence, projects that recharge the wellfields reducing the water demands from the Everglades or Lake Okeechobee and projects that reduce the impact of groundwater withdrawals on Biscayne Bay would be considered. Since both the FDEP and the SFWMD support reuse in Miami-Dade County, projects that do not meet those criteria would still be strongly encouraged.

Currently, Miami-Dade County reuses about 5% of the wastewater it generates. This number may be somewhat misleading since the volume of 5% in Miami-Dade County might be equivalent to nearly 100% in a less-populated county. In fact, the *Water Reuse for Florida* document dated 2003 states that only 12 counties in Florida reused more water by volume than Miami-Dade County. In the 2003 report, Orange County was well ahead of the group with a reuse volume of nearly 90 MGD; at present, Orange County's reuse may be even higher. Regardless, nearly 300 MGD of treated wastewater in Miami-Dade County is being discharged to the Atlantic Ocean or into the Boulder Zone of the Lower Floridan Aquifer.

1.3 SUMMARY OF PREVIOUS REUSE FEASIBILITY STUDIES

1992 Wastewater Reuse Feasibility Study

The first Wastewater Reuse Feasibility Study was prepared by PBS&J in 1992 in part to respond to new or pending regulations. Antidegradation standards were developed by the Florida Department of Environmental Regulation (now called FDEP) that required all utilities proposing new or expanded surface water discharges to evaluate reuse. Also during that time, rules were being developed for reuse requirements in "critical water supply areas;" however, there were no statutory requirements to implement reuse. The resulting report included:

- Discussion of regulatory requirements, existing conditions and major forms of reuse;
- Further assessment of public access reuse and other non-public access reuse including wetlands application, aquifer recharge, power plant reuse and saltwater intrusion barrier reuse;
- Treatment requirements for various forms of reuse;
- Development of four reuse scenarios including no-action, low reuse, medium reuse and high reuse;
- Evaluation of those scenarios including a present value analysis, evaluation of rates and fees, and planning level review of technical and environmental considerations;
- Incorporation of funding and financing alternatives; and
- Development of conclusions and recommendations.

The study concluded that it was technically unfeasible to provide public access reuse (urban and agricultural irrigation) greater than 26% of the wastewater volume generated. In the 1992 Reuse Feasibility Study, PBS&J determined that the medium reuse scenario (50% reuse alternative) would provide a balance between technical and economic feasibility, while providing high environmental benefits. This scenario consisted of a combination of public access, canal recharge and a saltwater intrusion barrier or wetland restoration, with the reuse volume at 189 MGD by year 2015. However, the study acknowledged implementation concerns about canal recharge, the intrusion barrier and wetland restoration. The report stated that the recommended plan should be viewed as “flexible and may have to be downsized and/or adjusted as the implementation hurdles are addressed.” Because of costs and the implementation concerns, it was determined that a lower level of reuse might be more realistic. It is noted that no reuse was proposed in wellfield protection areas.

1995 Reuse Implementation Plan

Miami-Dade County contracted Brown & Caldwell to develop a reuse implementation plan for 12.5 MGD of reuse. This effort was in response to a settlement agreement with FDEP that required a 12.5 MGD reuse implementation plan by 1998. Brown & Caldwell also reviewed long-range reuse options and identified potentially viable components that could be incorporated into a 12.5 MGD implementation plan. In a subsequent phase of work, they conceptually developed a public reuse system in North Miami Beach and Miami Beach and onsite reuse at each wastewater treatment plant (WWTP).

1998 Reuse Feasibility Study Update

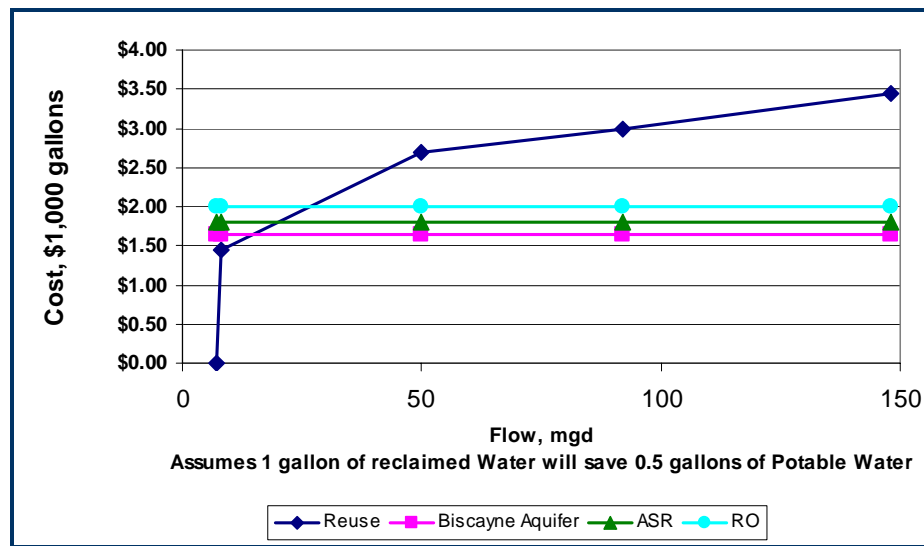
PBS&J was contracted to update the 1992 Reuse Feasibility Study. The primary areas of emphasis in the 1998 update included the following:

- Consistency with the Wastewater Facilities Plan Amendment for existing and projected future conditions, and development of the no action alternative;
- Reevaluation of agricultural reuse potential in South Dade County;
- Reevaluation of the impact to rates and fees of each alternative in light of new sewer system improvements and repairs; and
- Consideration of a new alternative based on less than 25% reuse.

Based on the rate analysis for the no-action alternative, the impact of new expansions, repairs, and replacements for the wastewater system as detailed in the 1995 Wastewater Facilities Plan Amendment, Miami-Dade County's wastewater rates would result in the highest in the state. Therefore, it was deemed important that wastewater reuse pay for itself.

The low reuse scenario (24.6% of the projected wastewater volume generated) developed in the 1998 Reuse Feasibility Study Update included the reuse of 102 MGD via urban irrigation, canal recharge, and onsite WWTP process reuse and irrigation. The medium reuse scenario (approximately 49.5% of the projected wastewater volume generated) included additional public access projects along with wetlands application or saltwater intrusion barriers. To achieve the high reuse scenario (reusing 77% of the projected wastewater volume generated), additional volumes for wetland application, canal recharge, saltwater intrusion barrier, and aquifer recharge were added to the medium reuse scenario.

The report concluded that the low, medium, and high reuse scenarios posed significant economic, technical, and environmental concerns that impact their feasibility. The "less than 25%" reuse scenario (8.4% of the projected wastewater volume), was deemed to be economically, technically, and environmentally feasible. The 1998 Reuse Feasibility Update recommended that MDWASD continue to explore other reuse options as they arise and compare those opportunities to the cost and feasibility of using other alternative water supplies. While it was not part of the consultant's scope of work, they did obtain, from MDWASD, a summary of capital costs for alternative water supplies from various sources and compared those costs to the reuse costs (see Figure 1.3-1). Although the costs are now outdated, the figure clearly presents that other alternative water supplies may be less costly at higher volumes.



Source: Post, Buckley, Schuh & Jernigan 1998.

Figure 1.3-1. Cost Comparison of Alternative Water Supplies

1.4 REPORT FORMAT

This report is formatted as an update to the 1992 and 1998 versions of the Reuse Feasibility Study. Applicable information from those studies that is still relevant will be summarized for brevity, incorporated and referenced, or just referenced. The table of contents of this report closely follows FDEP's Guidelines for the Preparation of Reuse Feasibility Studies. The primary differences between the 1998 study and this update include the following:

- Reassessment of reuse options given current and future conditions, policies by FDEP and SFWMD encouraging more reuse implementation, and increased concerns about future water supplies;
- Updated information regarding reuse options based on existing and future conditions and regulatory considerations;
- Assessment of reuse aquifer recharge in close proximity to and outside of wellfield protection areas to obtain offset for future water demands; and
- Reevaluation of the impact to rates and fees.

1.5 REGULATORY REQUIREMENTS

1.5.1 General

Continuous population growth, the restoration of the Everglades, and agricultural expansion have increased the demand for available water, particularly during dry periods, and have forced water management agencies to look for alternative water sources.

Florida Statutes (F.S.) 403.064(1) and 373.250(1) encourage and promote reuse of reclaimed water as a state objective. According to Section 403.021(2), F.S., no wastes are to be discharged to any waters of the state without first being given the degree of treatment necessary to protect the beneficial uses of such water. To this end, the FDEP has promulgated rules governing the reuse of reclaimed water and included them within Chapter 62-610, Florida Administrative Code (F.A.C.).

Regulatory Agencies

The following regulatory agencies have some regulatory authority over existing and proposed wastewater facilities and effluent disposal and utilization.

Environmental Protection Agency

The United States Environmental Protection Agency (EPA) works to develop and enforce regulations that implement environmental laws enacted by Congress. In Florida, most of the regulatory functions have been delegated to the FDEP.

Florida Department of Environmental Regulation

The FDEP is the lead agency in state government for environmental management and stewardship. Most of the regulatory rules concerning wastewater reuse are developed and implemented by FDEP. Chapter 62 contains an extensive array of rules ranging from wastewater treatment and monitoring requirements to the beneficial use of wastewater reuse. FDEP has been delegated authority from the EPA to implement most of the regulatory functions.

Department of Environmental Resources Management

DERM is responsible for protecting, conserving, restoring, enhancing and managing the air, water and land resources of Miami-Dade County. DERM conducts comprehensive monitoring programs to track ambient water quality trends. DERM has been delegated authority from the FDEP to regulate a variety of construction and monitoring projects. Under the Wastewater Treatment Utilities Program, it regulates the operation, design, and maintenance of the public wastewater utilities managed by municipal utilities and MDWASD in Miami-Dade County. In addition, DERM also regulates well construction requirements under Chapter 24-12(2)(V) 17.

Also, in order to protect the public water supply, the Miami-Dade County DERM has designated wellfield protection areas around existing water supply wellfields. The wellfield protection ordinance, under Section 24-43 of the Miami-Dade County Code, restricts the types of land uses and activities within designated wellfield protection areas.

South Florida Water Management District

As a regional water management authority, the SFWMD will review any proposed wastewater treatment and disposal facilities and issue permits if consumptive use or surface water detention is required. The SFWMD has required all applicants for Water Use Permits to evaluate the feasibility of implementing a water reuse system. The SFWMD will grant permits with longer terms if reuse is implemented.

Existing Rules Regulating Wastewater Reuse

Chapter 373.250, F.S.

This chapter is related to encouraging water conservation and wastewater reuse.

Chapter 403, F.S.

This chapter provides authority to FDEP to regulate wastewater facilities and to implement the state drinking water program.

Chapter 403.064, F.S.

This section requires utilities to implement wastewater reuse whenever feasible. Feasibility encompasses economical, environmental, and technical feasibility. This chapter also states that wastewater reuse systems operated according to FDEP rules shall be considered environmentally acceptable and not a threat to public safety.

Chapter 403.086, F.S.

This section states that reclaimed water product that has been provided advanced wastewater treatment (5 milligrams per liter [mg/L] of carbonaceous biochemical oxygen demand [CBOD], 5 mg/L of total suspended solids [TSS], 3 mg/L of total nitrogen [N] and 1 mg/L of total phosphorus [P]) and high-level disinfectant (HLD) shall be presumed to be allowable to discharge to surface waters.

Chapter 62-4, F.A.C.

This section deals with procedures to obtain permits including permitting requirements for Outstanding Florida Waters (OFWs), mixing zones for surface waters, and exemptions from water quality criteria.

Chapter 62-302, F.A.C.

This section defines surface water classifications for Florida waters. Section 700 designates OFWs as worthy of special protection due to its natural attributes. Most OFWs are federally or state managed to protect existing water quality.

Chapter 62-600, F.A.C.

This section includes definitions of secondary treatment and disinfection requirements for wastewater treatment. Secondary treatment is defined as treatment achieving an effluent containing less than 20 mg/L five-day carbonaceous biochemical oxygen demand (CBOD₅) and 20 mg/L TSS, or 90% removal of each of these pollutants from the wastewater influent, whichever is more stringent. Secondary treatment also requires appropriate disinfection and pH control of effluents. Basic disinfection requires treatment

resulting in less than 200 fecal coliform values per 100 milliliters (mL) of reclaimed water. HLD requirements include additional TSS control to “maximize disinfection effectiveness” and resulting in a reclaimed water in which fecal coliform values (per 100 mL of sample) are below detectable limit.

Chapter 62-601, F.A.C.

This section includes monitoring requirements.

Chapter 62-610, F.A.C., Reuse of Reclaimed Water and Land Application

This section defines reuse as the deliberate application of reclaimed water, in compliance with FDEP rules, for a beneficial purpose. It also provides a comprehensive and detailed set of requirements for the design and operational criteria of a wide range of reuse and land application systems consistent with EPA’s *Guidelines for Water Reuse* (2004). Water quality requirements for reuse types per F.A.C. 62-610 are summarized in Table 1.5-1.

Table 1.5-1. FDEP Treatment Requirements for Reuse

Type of Reuse	Reuse Activities	Part in Chapter 62-610	Treatment & Disinfection Requirement
Public Access Reuse	Urban irrigation Toilet flushing Fire protection Vehicle washing Decorative water features Construction dust control Commercial laundries Flushing of sewers Cleaning roads and sidewalks	III	Secondary treatment, filtration, and HLD
Agricultural Irrigation	Irrigation of feed fodder and pasture crops	II	Secondary treatment, and basic disinfection
	Irrigation of edible crops	III	Secondary treatment, filtration, and HLD
Industrial Applications	Cooling water, process water	VII	Secondary treatment and basic disinfection (if filtration and HLD are provided, setback distances are not required)
	Wash water	VII	Secondary treatment, and basic disinfection
	Use at wastewater treatment plant	VII	Secondary treatment, and basic disinfection (in some instances, reduced treatment and disinfection requirements apply)

Table 1.5-1. FDEP Treatment Requirements for Reuse

Type of Reuse	Reuse Activities	Part in Chapter 62-610	Treatment & Disinfection Requirement
Groundwater Recharge	Rapid infiltration basins	IV	Secondary treatment, and basic disinfection
	Recharge wetlands		
	Rapid infiltration basins or wetlands in unfavorable conditions (including areas in SE Florida overlying the Biscayne Aquifer)	IV	Secondary treatment, filtration, and HLD TN < 10 mg/L Meet drinking water standards
	Injection to recharge groundwater	V	Secondary treatment, filtration and full treatment disinfection Multiple barriers for control of pathogens and organic TOC and TOX limits Meet drinking water standards TN < 10 mg/L (reduced levels of treatment allowed for injection to high TDS groundwater)
	Canal discharge in SE Florida	V	Secondary treatment, filtration, and HLD TN < 10 mg/L Meet WQBELs Meet groundwater standards Must demonstrate that the discharge is "reuse"
	Create barriers to control saltwater intrusion	V	Similar to requirements for injection for groundwater recharge
	Use of wetlands that percolate to groundwater	---	Secondary treatment and basic disinfection Meet groundwater standards (additional treatment and/or disinfection may be needed)
Indirect Potable Reuse	Augmentation of Class I surface waters	V	Secondary treatment, filtration, and full treatment disinfection TOC limit TN < 10 mg/L Meet WQBELs

Key:

FDEP = Florida Department of Environmental Protection
HLD = high-level disinfection.
mg/L = milligrams per liter.
TDS = total dissolved solids.
TN = total nitrogen.
TOC = total organic carbon.
TOX = total organic halogens.
WQBEL = Water Quality Based Effluent Limits.

Chapter 62-611, F.A.C., Wetlands Application

This section provides state regulations and standards for domestic wastewater discharges to both man-made and natural wetlands. It also establishes frequencies and monitoring criteria for all treatment, receiving and man-made wetlands.

Chapter 62-620, F.A.C.

This section includes basic domestic wastewater permitting requirements as well as Notice of Intent to Use General Permit for Addition of a Major User of Reclaimed Water.

Chapter 62-621, F.A.C., Generic Permits

This section establishes procedures to obtain a generic permit with applicable National Pollutant Discharge Elimination System (NPDES) authorization. It also establishes minimum conditions applicable to all generic permits.

Resource Conservation and Recovery Act/Comprehensive Environmental Response, Compensation, and Liability Act and Other Statutes

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to address the safe management and disposal of the huge volumes of municipal and industrial waste generated nationwide. The RCRA program is administered by EPA's Office of Solid Waste (OSW). RCRA Subtitle C establishes the regulatory structure for managing hazardous waste from the time it is generated until its ultimate disposal.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly referred to as "Superfund," was enacted on December 11, 1980. CERCLA provides EPA's Office of Emergency and Remedial Response (OERR) the authority to respond to releases or threatened releases of hazardous substances, pollutants, or contaminants that may endanger human health or the environment. CERCLA also requires the reporting of releases of hazardous substances, establishes the liability of persons responsible for releases of hazardous substances, and establishes a trust fund to provide for cleanup when no responsible party can be identified.

Within the State of Florida, the FDEP has been delegated the enforcement of RCRA rules.

The other federal statutes that may apply to wastewater reuse and disposal are:

- Clean Water Act (CWA);
- Fish and Wildlife Coordination Act of 1958 (FWCA), as amended (16 United States Code [U.S.C.] 661 *et seq.*);
- National Historic Preservation Act (NHPA), as amended (Public Law [PL] 89-665);
- Archeological and Historic Preservation Act (AHPA), as amended (PL 93-291);

- Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*);
- Coastal Zone Management Act of 1972 (CZMA) (16 U.S.C 1451-1464);
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712);
- Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA);
- Estuary Protection Act (16 U.S.C. 1221-1226);
- Organic Act (OA); and
- Farmlands Protection Policy Act (FPPA).

Other relevant state statutes and regulations include:

- Minimum Flows and Levels (373.0421);
- Compliance with the State Comprehensive Plan (Section 187.201, F.S.);
- State Water Policy (Section 62-40);
- Consumptive Use Impacts (40E-2, F.A.C.); and
- State Water Quality Regulations (Chapter 373).

1.5.2 New Regulations and Legislation

The following legislative changes at the state and federal levels have occurred with respect to rules and regulations related to waste water reuse.

Chapter 373.250, Reuse of Reclaimed Water

This section is a modification of Chapter 373, covering the use of reclaimed water.

1. The encouragement and promotion of water conservation and reuse of reclaimed water, as defined by the department, are state objectives and considered to be in the public's interest. The Legislature finds that the use of reclaimed water provided by domestic wastewater treatment plants permitted and operated under a reuse program approved by the department is environmentally acceptable and not a threat to public health and safety.
2. A water management district may require the use of reclaimed water in lieu of surface water or groundwater when the use of uncommitted reclaimed water is environmentally, economically, and technically feasible and of such quality and reliability as is necessary to the user. However, this paragraph does not authorize a water management district to require a provider of reclaimed water to redirect reclaimed water from one user to another or to provide

uncommitted water to a specific user if such water is anticipated to be used by the provider, or a different user selected by the provider, within a reasonable amount of time.

3. The water management district shall, in consultation with the department, adopt rules to implement this section. Such rules shall include, but not be limited to:
 - a. Provisions to permit use of water from other sources in emergency situations or if reclaimed water becomes unavailable, for the duration of the emergency or the unavailability of reclaimed water. These provisions shall also specify the method for establishing the quantity of water to be set aside for use in emergencies or when reclaimed water becomes unavailable. The amount set aside is subject to periodic review and revision. The methodology shall take into account the risk that reclaimed water may not be available in the future, the risk that other sources may be fully allocated to other uses in the future, the nature of the uses served with reclaimed water, the extent to which the applicant intends to rely upon reclaimed water and the extent of economic harm which may result if other sources are not available to replace the reclaimed water. It is the intent of this paragraph to ensure that users of reclaimed water have the same access to ground or surface water and will otherwise be treated in the same manner as other users of the same class not relying on reclaimed water.
 - b. A water management district shall not adopt any rule which gives preference to users within any class of use established under Section 373.246 who do not use reclaimed water over users within the same class who use reclaimed water. Nothing in this section shall impair a water management district's authority to plan for and regulate consumptive uses of water under this chapter. This section applies to new consumptive use permits and renewals of existing consumptive use permits.

FDEP New Modifications to Chapter 62-610 (effective March 9, 2006)

Creation of Rule 62-610.320(6)(g), F.A.C., to enable use of “other” meters (like the so-called “TSS meters”) in lieu of turbidity meters in monitoring reclaimed water. Utilities wanting to employ the so-called “TSS meters” in lieu of turbidity meters no longer will need to pursue a variance.

Creation of Rule 62-610.300(4)(c), F.A.C., to clarify reporting requirements for the annual reclaimed water scans required by Rule 62-601.300(4), F.A.C.

Refinements to the Annual Reuse Report Form adopted by reference in Rule 62-610.300(4)(a)2, F.A.C. This included the addition of requirements for reporting of plans and activities related to metering of reclaimed water use, per statutory requirements, which were added to Section 403.064, F.S., in 2004.

Other minor changes include: Refinements to the Pathogen Monitoring Form adopted by reference in Rule 62-610.300(4)(a)4, F.A.C. and requirements for use of certified labs and approved methods and for re-testing.

EPA New Rule on Underground Injection (effective November 22, 2005)

The EPA has signed a new rule revising the requirements for disposal of treated municipal wastewater below underground sources of drinking water (USDWs) in certain counties in Florida, including Miami-Dade County. The new rule provides a regulatory alternative to owners and operators to continue to operate their wells, provided they meet additional wastewater treatment requirements.

For more than 20 years, some municipalities in Florida have been using underground injection as an alternative to surface disposal of treated domestic wastewater. There are more than 125 active Class I wells in Florida. The majority of the Class I injection facilities in Florida dispose of non-hazardous, secondary-treated effluent from domestic wastewater treatment plants. At locations where hydrogeologic conditions are suitable and where other disposal methods are not possible or may cause contamination, subsurface injection below all USDWs is considered a viable and lawful disposal method. There are favorable hydrogeologic conditions in Florida where the underground formations have the natural ability to accept and confine the waste. Recent evidence suggests that, at several of these facilities, the injected fluids are migrating upward into USDWs. Operation of Class I wells with fluid movement into a USDW was prohibited by the federal underground injection control (UIC) regulations because of health and environmental risks. In the new UIC rule, the EPA amended the existing federal UIC regulations to allow owners and operators of Class I municipal disposal wells in specific areas of Florida to continue using their wells, even if they have caused or may have caused movement of fluid into a USDW, provided they meet new requirements to treat their municipal wastewater with pretreatment, secondary treatment, and HLD prior to injection.

The EPA believes this requirement will address viruses and bacteria (i.e., pathogens) which the agency's 2002 *Relative Risk Assessment of Management Options for Treated Wastewater in South Florida* (<http://www.epa.gov/region4/water/uic/ra.htm>) identified as the contaminant in municipal wastewater that presents the greatest risk to USDWs. HLD of this municipal wastewater is an effective method to inactivate pathogens.

The EPA has also found that pretreatment programs and prohibitions on wastewater from significant industrial users have prevented contaminants from getting into wastewater, and that secondary treatment is a critical step in wastewater treatment prior to HLD.

The FDEP oversees the UIC program in the State of Florida. FDEP adopted the new federal UIC rule. The State of Florida already requires this level of treatment for reclaimed water used on lawns and parks. Facilities in the City of St. Petersburg already meet this standard, and improvements to meet the standard at the Miami-Dade South District facility are underway.

Senate Bill 444

During the 2005 State Legislative Session, a bill creating the Water Protection and Sustainability Program, or Senate Bill 444, was enacted, providing significant state funding for Alternative Water Supply Projects that are identified in the Water Management Districts' Regional Water Supply Plans.

Alternative water supply projects were identified in the bill as potential qualified projects for state funding. The potential qualified projects involved the storage and use of:

- Saltwater and brackish water;
- Surface water captured predominately during wet-weather flows;
- Sources made available through the addition of new storage capacity;
- Reclaimed water (wastewater reuse);
- Stormwater (for use by a consumptive use permittee); and
- Any other source designated as nontraditional in a regional water supply plan.

The state funding in Year 1 is \$30 million, and a minimum of \$18 million will be made available in following years. The SFWMD is required to match 100% of the state funds. The SFWMD match can be used for both alternative water supply construction projects and water resource development that supports alternative water supplies. Several funding conditions apply, including the following:

- State funds may only be used for alternative water supply construction.
- Construction must be completed within the grant period (one year) or be constructed in phases, with a phase of the construction completed within the grant period.

At least 80% of the alternative water supply funding must be awarded to projects that are listed in the Regional Water Supply Plan.

SFWMD Proposed Rule Development

SFWMD staff have recently asked the Governing Board to consider rulemaking to address future uncertainties in allocating water from the regional system. The staff has recommended that the SFWMD undertake rule development that would allow only a temporary increase in allocation from the regional system. Future allocations from the regional system would be restricted until alternative water supplies are operational. District staff has asked the Governing Board to consider the adoption of regulatory incentives, in addition to the existing financial incentives, to encourage the use of alternative water supplies.

1.5.3 Other State Rules and Reuse Trends

The EPA reports that “as of November 2002, 25 states had adopted regulations regarding the reuse of reclaimed water, 16 states had guidelines or design standards, and 9 states had no regulations or guidelines.” There is a wide variation between states. Water reuse and water conservation go hand-in-hand in some states’ water management strategies. States such as: Arizona, California, Colorado, Florida, Georgia, Hawaii, Massachusetts, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oregon, Texas, Utah, Washington, and Wyoming have developed design specifications and water quality requirements based on the concept of reclaimed water as a resource. On the other hand, other states have developed water reuse guidance or regulations as a means of disposing reclaimed water.

Florida and California maintain an inventory of reuse activities summarizing reuse throughout their state. The EPA Guidelines for Water Reuse indicated that in 2000, 48% of the reuse activities in California were for agricultural irrigation while 20% were for irrigation of landscape and public areas. Conversely, in Florida, for the year 2002, 44% of the reuse activities were for agricultural irrigation and 19% were for public access irrigation. Other uses included industrial reuse, groundwater recharge, and wetland recharge and habitat restoration. California also reported 3% of their groundwater for 2000 was used for salinity barriers.