

From: Yoder, L. Douglas (WASD) [<mailto:yoderd@miamidade.gov>]
Sent: Wednesday, November 05, 2014 3:21 PM
To: Klena, Chris M.; Thomasson, Mark; Steve Joseph <SJOSEPH@hollywoodfl.org> (SJOSEPH@hollywoodfl.org); LWilsonDavis@ci.boca-raton.fl.us; bguillory@sfwmd.gov; melsner@sfwmd.gov; CPettit@pbcwater.com; agarcia@broward.org; Brien, Linda; Creech, Jill
Cc: Fernandez, Edgar (WASD); Goldenberg, Bertha M. (WASD); Yoder, L. Douglas (WASD)
Subject: Outfall Reuse White Paper

Pursuant to our September 30 meeting regarding the reuse requirements of the ocean outfall statute, we have prepared the attached white paper which we captures key issues raised at the meeting. The central points are that future water demand projections have changed dramatically since the statute was adopted, mandating a particular quantity and type of alternative water supply (reuse) on selected utilities can lead to projects that are economically infeasible and meet no defined water supply need, and that a joint determination regarding economic feasibility can be the basis under the statute for compliance plans going forward that do not include a 60% reuse application at this time.

From the utility side, we will be available to further discuss the issues as the report to the Legislature is shaped and as DEP and the District have the opportunity to review the white paper. We appreciate the opportunity to continue the discussion.

Douglas Yoder

Deputy Director

Miami-Dade Water and Sewer Department

3071 S.W. 38 Avenue, Suite 508

Miami, Florida 33146

Phone: 786 552-8979

Fax: 786 552-8937

www.miamidade.gov

"Delivering Excellence Every Day"

Miami-Dade County is a public entity subject to Chapter 119 of the Florida Statutes concerning public records. E-mail messages are covered under such laws and thus subject to disclosure. All e-mail sent and received is captured by our servers and kept as a public record.

Ocean Outfall Statute and Reuse Requirements

Introduction

The Ocean Outfall Statute (Chapter 403.086 (9)) was adopted by the Legislature and signed by the Governor in 2008. The two purposes of the statute were to eliminate treated wastewater discharges to the ocean in southeast Florida and to require that a substantial volume of reuse of wastewater occur in that region. The statute was amended in 2013 to provide for limited peak flows to continue to discharge through the outfalls and to provide greater flexibility in meeting the original wastewater reuse requirements.

In the 2008 timeframe, substantial increases in water supply demand were forecast over the next twenty years. The Lower East Coast Water Supply Plan, adopted in 2006 by the South Florida Water Management District, projected public water supply demands of 1197 million gallons per day in Palm Beach, Broward, and Miami-Dade Counties by 2025. The South Florida Water Management District adopted the Water Availability Rule in 2007. This rule requires that all new water demands be met through alternative water supply sources (including, but not limited to wastewater reuse), at least until such time as it is demonstrated that any additional withdrawals from the Biscayne Aquifer can be made without adversely impacting the Everglades system.

The Outfall Statute requires that the equivalent of 60% of the baseline flows (the average annual discharges from the outfalls of each affected utility during the years 2003-2007) be included in wastewater reuse projects by 2025. The 60% requirement was based upon the statewide reuse capacity at the time the statute was drafted, exclusive of southeast Florida, taken as a percentage of the statewide sewage treatment capacity at that time. The vast majority of this reuse is in the form of irrigation, which is a seasonal use. The actual volume of reuse on an annual basis is currently in the range of 43% of total wastewater flows, so there is an important distinction between reuse capacity and actual reuse. There is no explicit connection between the volume of reuse required and the identification of a specific water supply need in the language of the statute. However, there is in the statute a requirement that the wastewater reuse be economically and technically feasible, though specific standards for that determination are not provided.

Several factors have changed or were not apparent when the Outfall Statute was originally adopted. Notably, future water supply needs dropped dramatically. The 2013 update of the Lower East Coast Water Supply Plan forecasts the combined water supply demands of Palm Beach, Broward, and Miami-Dade Counties to be 933 million gallons per day in the year 2030, a reduction of 22% below the previous forecast for the year 2025. This reduction is in part due to effective conservation programs and the imposition of year-around irrigation restrictions by local governments in Southeast Florida. Building code changes mandating ultra-low use plumbing fixtures is part of that effort, but so is the trend to more dense housing (apartments and condominiums) that have lower per capita water demands. The recession of 2008 could be a factor, although there has not yet been a rebound in water demand that parallels the economic rebound.

The South Florida Water Management District's Water Availability Rule has now basically required that all additional demands in public water supplies in the region come from alternative sources, including reclaimed wastewater, stormwater, brackish water, or saltwater, in addition to conservation. Utilities have the discretion to propose those alternative water supplies that are best suited and most cost-effective to meet their needs. The Outfall Statute, however, singles out certain utilities and mandates a single source and volume of alternative water supply utilization, thereby bypassing the quantity and location of actual water supply needs and the analysis of all potential alternative water supply sources to meet those needs in the most environmentally appropriate and cost-effective manner. Such a mandate runs counter to a market based approach that can more efficiently match up supply and demand. Such a mandate also risks the selection of a less environmentally sound alternative water supply approach.

Another issue of concern is that local water standards are more stringent than State standards for certain receiving waters. This has a direct impact on the economic and technical feasibility of wastewater reuse options in southeast Florida. Of the five utilities required to comply with the Outfall Statute, three (Delray Beach, Boca Raton, Broward County) have complied or have plans to comply in terms of the reuse requirements (largely due to the availability of slow rate land application reuse opportunities and existing infrastructure). Hollywood and Miami-Dade County have remaining challenges arising from cost-effective options to achieve compliance in the absence of additional future water supply demands and local limitations impacting potential aquifer replenishment reuse strategies. It is important to note that all of these treatment facilities are located on the coast and far from potential reclaimed water irrigation areas and that the influent wastewater is already quite salty as a result of saline ground water infiltration into the collection systems, further limiting reuse options that would require much more costly and energy intensive treatment such as reverse osmosis. It is also worth noting that southeast Florida is particularly vulnerable to the effects of sea level rise as a result of climate change. Utilizing high energy/high carbon systems to meet a requirement that does not satisfy a water supply should be carefully considered.

The total compliance capital costs to the utilities responding to the Outfall Statute requirements are currently estimated to approach four billion dollars. Much of that falls to Miami-Dade County, which operates the largest outfalls by a wide margin. Recently the South Florida Water Management District has created a framework to incentivize financially the utilization of alternative water supplies to meet future needs. That is an approach that can reflect local conditions much more effectively than a volume based mandate for a specific type of alternative water supply.

Specific Issues and Resolution Options

1. Qualifying reuse volumes should be based upon treatment and delivery capacity for a defined need. Such need can be in the form of estimated use per customer for a given number of customers (as would be the case for irrigation with reclaimed water), or in the form of a reuse agreement (as in the case of an electric utility utilizing reclaimed water for cooling purposes). The statute explicitly recognizes that reuse for various purposes may involve fluctuation in demands over time by authorizing the discharge of unneeded reclaimed water through an

outfall when demand is inadequate to absorb the total supply. Thus, there is no expectation that a 100% reuse system will actually reuse 100% of the plant effluent all of the time, but compliance with the statute is based on the fact that 100% capacity for reuse exists.

Specific example: Miami-Dade has an agreement with Florida Power and Light to provide reclaimed water up to a rate of 90 million gallons per day. The treatment capacity and transmission line capacity will accommodate this rate. The Department has indicated a reuse credit to 75 MGD based upon the day to day estimated cooling consumption of the generating system. In this instance and consistent with standard practice for characterizing reuse capacity, a 90 MGD credit should be recognized.

Specific example: The demand for reclaimed water in the City of Boca Raton is almost exclusively for irrigation to residential and commercial properties. This demand has extreme fluctuations due to seasonal rainfall in southeast Florida. The 100% reuse compliance standard must be based on plant capacity, distribution capacity, and existing potential demands, thus ensuring that the City can meet the demands.

2. The Department should concur with individual utility findings that reuse projects that do not fulfill a *specific water supply need* more cost-effectively than other alternative water supply opportunities are *economically unfeasible* under the statute. The outfall statute was adopted at a time when all indications were that water supply demands were increasing substantially with time. In combination with the Water Availability Rule, it was not necessarily unreasonable to expect a substantial demand for reclaimed water was going to occur. This has clearly not been the case and creates a situation in which resources are being committed to projects that are unrelated to public water supply needs, serving only to achieve a narrow reading of compliance with the statute. While reuse feasibility has historically been a determination made by utilities, Department concurrence is important prior to finalization of compliance plans and investment of significant resources.

Specific Examples: Hollywood has no identified water supply need in the next 20 years that is not already fulfilled with its present water supply plan. They have evaluated replenishment of the Floridan aquifer as a potentially qualifying reuse activity under the statute, even though there is no determination that withdrawals from the Floridan aquifer are constrained at this time, and replenishment would therefore meet no additional need. Broward County standards for discharge to groundwater (including the Floridan) would require reverse osmosis and advanced oxidation treatment, making this an extremely expensive option. Similarly, Miami-Dade County has identified sufficient water supply to meet all projected needs in its water use permit extending out to 2035. It, too, has evaluated replenishing the Floridan aquifer with between 27 MGD and 42 MGD (depending on credit for the FPL cooling water project) of High Level Disinfection quality reclaimed water. This is also an expensive and energy-intensive option due to the number of injection wells required and the high pressure under which these injection wells must operate.

Specific Example: The City of Boca Raton has already implemented reuse projects that provide additional waters that surpass the City's 2030 projected demands; however, the City has not received credit for additional waters because there is no actual identified need. Therefore, if at any time the City was to realize demands for additional water, the City would be required to implement additional projects and incur additional costs. A mechanism must be created to ensure utility investments for additional water supplies are completely accounted.

3. To the extent that economically feasible reuse projects to meet identified future water needs are not sufficient in volume for an affected utility to meet the 60% reuse requirement by 2025, DEP and the District should work collaboratively with the outfall utilities to require any new water supply permittee to evaluate the feasibility of meeting that need with reclaimed water as well as other alternative water supply sources such as brackish water and stormwater. It is important that there be consistency in the evaluation of economic feasibility for the use of reclaimed water by permittees, and economic factors other than the cost of reclaimed water (available ground water is free) should be considered in making that determination. Improved technology may lead to more cost-effective ways to reduce any public health and environmental concerns regarding the reuse of wastewater for a broader array of purposes over time. Two potential examples of such applications are salt intrusion barriers and coastal wetlands rehydration, both currently constrained by level of treatment uncertainties, among other factors. By virtue of the requirement that High Level Disinfection must be provided to wastewater disposed to the Boulder Zone through deep well injection (for injection wells constructed after 2005 or evidencing migration), all of the affected plants will be producing irrigation and cooling water quality effluent, even in the absence of defined reuse projects at the present time. Deep wells must be provided as an alternative disposal system even if reclaimed water projects are identified, because there must always be a disposal option if reuse demands fluctuate or are interrupted for some reason. Therefore, a substantial portion of the requirements for future reuse projects will already be in place by 2025, even if specific water supply needs have not emerged by that time to utilize this alternative water supply resource.

Exhibit 1 presents specific challenges faced by the City of Hollywood, suggested Department actions to consider, and the supporting basis for this consideration under existing statutes. The exhibit further demonstrates that, though the full scope of these challenges were not fully evident and understood at the time the Outfall Statute was adopted, there is adequate discretion available to the Department to concur with plans that recognize these challenges.

Conclusions

The Department should recognize the substantial change in circumstances that has occurred since the Outfall Statute was originally adopted in 2008 and concur that reuse projects implemented solely to satisfy the 60% reuse requirement by 2025 are not economically feasible in the absence of serving an

actual water supply need. As additional needs are identified, reuse as an alternative water supply option can be considered. The alternative to this approach is to amend the statute to recognize the decline in future predicted water supply demands and to reinforce the Water Availability Rule by requiring that future water supply needs be met through a cost-effective use of alternative water supplies. Mandating a specific alternative water supply source from specific utilities is not always going to yield an optimal result.

Exhibit 1

Outfall Legislation Challenges faced by the City of Hollywood and Recommended Resolution

Summary of Key Challenges

The following is a list of challenges faced by the City of Hollywood in developing a feasible strategy for complying with the Ocean Outfall Statute:

1. The City of Hollywood's effluent is characterized by a chloride level that exceeds 1000 mg/L. This elevated chloride level exceeds threshold levels that can be tolerated by most vegetation and thereby renders the effluent unsuitable for irrigation applications. The elevated chloride level of Hollywood's effluent also increases its corrosive property which limits its applicability to cooling water uses.
2. The coastal area of Hollywood's service area is characterized by low ground elevation and high brackish groundwater elevation. An analysis of the City's system indicates less than 10% of the collection system east of US1 (Federal Highway) is positioned at an elevation above the tidally-influenced brackish ground water level. This results in the City's buried infrastructure operating under submerged conditions on a yearlong basis and significant chloride impacts (from tidally-influenced brackish ground water surcharging of the collection system) resulting from integrity breaches. For example, on the City's barrier island, the impact of this tidal groundwater surcharging is evident from chloride levels in the collection system that range from under 150 mg/L to over 7000 mg/L in locations where breaches occur. While this brackish ground water significantly contributes to the total effluent flow, and thus the base flow through the outfall, it is not derived from a source of water supply that is intended to be conserved under the Outfall Statute. In addition to being of a source that is not a water supply that is intended to be conserved under the Outfall Statute, the rule defines the base condition in terms of "domestic wastewater," which by its regulatory definition appears to exclude sources such as tidally influenced brackish ground water.
3. The City has invested in reuse infrastructure (4 mgd treatment capacity) that utilizes effluent that is imported from Davie/Cooper City in order to produce a product of acceptable quality. This existing reclaimed water (approximately 2.6 mgd) is used to irrigate golf courses within the City. This existing capacity or actual use is not credited under the 60% reuse requirement. Furthermore – it is unclear how increased reuse application above the average utilized during development of the City's base condition may be credited against its 60% reuse requirement.

4. Since the base flow condition of the Outfall Statute has been established, the City has implemented conservation measures and infrastructure improvements that have significantly impacted water supply withdrawals and effluent flows – outcomes that are central objectives of the Outfall Statute. It is unclear what the process is under the existing rule for obtaining reuse equivalency credit for these proactive efforts. The net result is equivalent to a reuse requirement that exceeds the 60% mandate. Furthermore, with the reduction in surficial withdrawals, the opportunities for reuse applications are further diminished. It should be noted that conservation and demand management have been demonstrated to successfully reduce per capita demands in a sustainable manner that is not subject to seasonal variability as is the case with irrigation reuse.

5. In response to the Water Availability Rule that capped surficial aquifer withdrawals and required the development of alternative water supplies (AWS), of which reuse and brackish water Floridan Aquifer (FA) supplies are options, the City embarked on a FA/reverse osmosis expansion program (4 mgd) to satisfy its projected future water demands above the capped surficial withdrawals. This brings the City's total available brackish water reverse osmosis capacity to 8 mgd, a level that is adequate to meet its projected growth demands beyond the year 2035. With this significant investment in place – there is no unmet capacity demand that may be satisfied by reclaimed water.

6. Hollywood has given some consideration to developing a Floridan Aquifer recharge program. As noted earlier, the City permitted and expanded its Floridan supply with the intent of it becoming an alternative water supply that would not be subjected to recharge/offset requirements that apply to the surficial aquifer. Furthermore, based on projected growth, the City forecasts Floridan withdrawals of less than 2 mgd by the year 2025. While not required under existing rules, if an offset is provided for this projected withdrawal, this would be less than 10% of the City's existing reuse goal. Hollywood is supportive of an FA recharge strategy only to the extent commensurate with increased withdrawals needed to support demand growth beyond its permitted allocation. Throughout the region, Floridan Aquifer use is minimal and is not expected to increase significantly by 2025 due to lowered growth forecasts and competing alternative water supplies, such as the potential C-51 reservoir project that is proposed to capture stormwater that would be used to offset expanded surficial withdrawals.

7. The Outfall Statute requires implementation of reuse of 60% of the base condition flow where reuse is technically, environmentally and economically feasible. No guidance is given on the determination of feasibility. In Hollywood, development of conventional reuse applications (e.g. irrigation, cooling water, etc.) would require desalination technology that would render the application environmentally and economically infeasible.

8. The Outfall Statute sets a reuse requirement/flow that must be achieved on an annual average basis. Conventional irrigation reclaimed water demand is seasonally variable. Consequently, to meet the required demand on an annual average basis – the City would in essence be required to significantly increase the maximum reuse treatment/delivery capacity well beyond what can be supported by available flow or customer demand. A more practical approach that recognizes the seasonality of reuse demand would be to establish a compliance requirement that is measured based on a three month moving average that must be achieved during the peak demand period each year.

