APPENDIX C

Ocean Outfall Compliance Report Update 2016

4321-004R1_Final

City of Hollywood, Florida

Southern Regional Wastewater Treatment Plant

Ocean Outfall Compliance Report Update

June 2016

CITY of HOLLYWOOD, FLORIDA

Department of Public Utilities
Utilities Administration • P.O. Box 229045 • Hollywood, Florida 33022-9045
Phone (954) 967-4455 • Fax (954) 967-4450 • www.hollywoodfl.org

Steve Joseph, P.E.
Director

June 28, 2016

Mr. Jonathan P. Steverson
Secretary
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
3900 Commonwealth Boulevard, M.S. 100
Tallahassee, FL 32399-3000

RE: City of Hollywood Southern Regional WWTP
Permit Number FL0026255
Ocean Outfall Compliance Report

Dear Mr. Steverson:

The City of Hollywood is pleased to submit the Ocean Outfall Compliance Report for the Southern Regional Wastewater Treatment Plant (Facility ID FL0026255). This document is intended to satisfy the reporting requirements outlined in Section 403.086(9)(e)(2), Florida Statutes.

Should you have any questions or require additional information, please contact me.

Sincerely,

Steve Joseph, P.E.
Director, Public Utilities

c: Sharon Sawicki, FDEP
Diane Pupa, FDEP
Konstantin Dubov, FDEP
Francois Domond, COH
Coy Mathis, COH

Contents

SRWWTP 2016 Ocean Outfall Compliance Report Update

1.0 Background

The City of Hollywood's (City) Southern Regional Wastewater Treatment Plant (SRWWTP), operated under permit FL0026255-015-DW1P, utilizes an ocean outfall and two, Class I Deep Injection Wells (DIW) as the primary means of treated effluent disposal. Secondary effluent from two sources (brackish and fresh) is additionally reclaimed and utilized for both onsite (brackish process water) and irrigation reuse applications (using fresh effluent supplied from the Town of Davie and Cooper City). Florida Statute 403.086(9), referred to as the Ocean Outfall Legislation (OOL), affects this facility. The OOL requires nutrient reduction, the elimination of effluent discharges to the ocean (with limited exceptions for peak flows), and the implementation of functional reuse of 60 percent of the base condition flow discharged through the ocean outfall by the year 2025. The statute describes a functional reuse system as one that is environmentally, technically and economically feasible and achieves the minimum required level of reuse. The base condition flow was established using outfall flow data from 2003 to 2007, as defined in the OOL.

Through an amendment (in 2013) of the original OOL, provisions have been incorporated into the legislation to provide increased system operational flexibility in how compliance may be achieved. Key provisions incorporated by amendment include allowing utilities impacted by the statute to contract with other systems for implementation of reuse, and to allow for the discharge of peak flows limited to 5% of the base condition flow on a rolling five year average basis.

The City has diligently investigated its options for complying with the requirements of the OOL and has developed a plan for meeting the nutrient reduction, outfall closure and reuse requirements in a manner that is feasible. Due to the high chloride levels of the City's effluent that renders the effluent unsuitable for typical reuse irrigation applications, and stringent local Broward County nutrient limits, both of which would require desalination, the development of a feasible reuse compliance plan was particularly challenging. As the plan was being developed, the City explored options that included implementation of a dual irrigation system at an estimated cost of $1billion, and invested $3 million in a pilot study that assessed the technological requirements to implement recharge of the Floridan Aquifer. These alternatives faced significant challenges that limited their feasibility.

In a status report (mandated by the OOL) to the Governor and State Legislature, the FDEP acknowledged that Hollywood faced unique challenges to its development of a feasible reuse program and indicated its intent to work with the City to ensure that the most feasible reuse options are implemented by December 31, 2025. The City has worked to develop a refined functional reuse compliance plan and has closely coordinated with the FDEP to solicit its input at various stages during the development phase. FDEP, in a letter dated January 13, 2016, documented its evaluation of the City's compliance efforts and identified allowable elements of the City's compliance plan that form the basis for the status report provided herein.

2.0 AWT and Management Requirements

2.1 Plan

The Ocean Outfall Legislation requires the effluent discharged through the outfall meet advanced wastewater treatment (AWT) standards by December 31, 2018 or the equivalent cumulative nutrient (nitrogen and phosphorus) loading reduction that would be achieved by the operation of AWT through December 31, 2025. The City's approved compliance approach relies on the equivalent cumulative nutrient reduction method with nutrient reduction being achieved by diverting flows from the ocean outfall to its existing deep injection wells. The City initiated its effluent diversion approach in 2009, shortly after passage of the OOL, and continues to monitor and document diverted flows and phosphorus/nitrogen concentrations discharged to the outfall. From an analysis of baseline condition flows and nutrient concentrations, the City previously established the following maximum cumulative nitrogen and phosphorus loads may be discharged to the outfall between 2009 and 2025:

- Allowable Cumulative Total Nitrogen Load – 21,885,779 lb
- Allowable Cumulative Total Phosphorus Load – 2,404,628 lb

These allowable cumulative loads reflect discharges that would be equivalent to the cumulative loadings that would be achieved through December 2025 if AWT is implemented by December 31, 2018. The City's early action to initiate flow diversion to utilize available injection well capacity has been successful in achieving the necessary nutrient reductions and eliminating the need to implement AWT by 2018.

2.2 Status

In its most recent Cumulative Outfall Loadings Compliance Report (2009 to 2015) to the FDEP, prepared as a requirement of Administrative Order No. 11-006 DW 06 SED, the City updated the status of the actual nitrogen and phosphorus loads discharged through the outfall. This report, the results of which are summarized below in Table 2-1, demonstrate that though 41% of the time has lapsed until compliance must be achieved, the City's actual cumulative nitrogen and phosphorus loads discharged through the outfall amount to 17% and 16%, respectively, of the allowable maximum loadings. Consequently, the City of Hollywood is on track to achieve compliance with the AWT requirements of the Ocean Outfall Legislation.

Table 2-1
City of Hollywood
SRWWTP
Cumulative Outfall
Loadings Compliance
(2009-2015)

Years	Allowable Max Cum. Loading (lb.) (2009 to 2025)	Interim Cum. Loading (lb.) (2009 to 2015)	% of Allowable Max Discharged	% of time Lapsed till 2025
TN	21,885,779	3,799,560	17%	41%
TP	2,404,628	387,311	16%	41%

3.0 Effluent Disposal Compliance

3.1 Plan

Shortly after the OOL was passed, the City conducted an assessment (Southern Regional Wastewater Treatment Plant Ocean Outfall Compliance Report, December 2009) of its effluent disposal alternatives to meet the OOL requirement for the elimination of all effluent disposals through the outfall. The assessment recommended a

sufficient number of Class 1 deep injection wells (DIWs), high-level disinfection (HLD) and associated facilities of sufficient capacity to dispose of the peak hour flows. The requirements of the OOL have subsequently been amended to allow for the disposal of peak flows (typically anticipated to be wet weather flows) through the outfall in an amount up to 5 percent of the outfall baseline flow on a 5-year moving average basis. This reduces the required expanded DIW capacity needed for disposal of peak flows. In addition, the OOL allows the outfall to be used for backup disposal capacity for the City's reuse system. Collectively, these provisions have the impact of reducing the number of HLD and DIWs that would otherwise be required.

The City also has approximately 8 mgd of available disposal capacity in its recently commissioned industrial class concentrate injection well (CIW) that is located at the City's Water Treatment Plant (WTP) and can be interconnected with the effluent disposal system at the SRWWTP. This concentrate injection well (CIW) was designed with the flexibility and available capacity to co-dispose secondary effluent. While it's not the City's objective to rely on this well as a primary means of effluent disposal, it could, at the City's discretion, be utilized for the supplemental disposal of peak flows, thereby further reducing the need to expand HLD/DIW at the SRWWTP.

As currently configured, the ocean outfall, which has historically been utilized as the primary disposal for the WTP concentrate, will now serve as a backup disposal method. In a parallel effort, the City intends to evaluate its long term alternatives for providing backup concentrate disposal following the closure of the outfall to all flows except peak and backup reuse discharges.

3.2 Status

The City will expand its use of injection wells to handle the effluent (and potentially concentrate) disposal requirements resulting from the OOL. The City intends to initiate detailed planning of implementation requirements by 2020 but will initiate consideration of its long term options for backup concentrate disposal sooner in order to develop an integrated strategy for meeting the effluent disposal requirements of the OOL.

4.0 Reuse Compliance

4.1 Plan

Based on an exhaustive assessment of alternatives for meeting the reuse requirements of the OOL, the combination of a brackish secondary effluent and stringent local (Broward County) limits on phosphorus levels limited the range of feasible alternatives for implementing increased wastewater reclamation. FDEP conducted an in-depth evaluation of the City's recommendations and concurred that the City faced unique challenges that impacted the feasibility of implementing conventional reuse applications.

In a letter dated January 13th, 2016, the FDEP documented the results of its evaluation and identified the elements of the City's plan that constitute feasible reuse. The FDEP findings were based on the review of several documents/studies furnished by the City and the outcome of several meetings between the FDEP, the City and its consultant (Brown and Caldwell). Key elements of the City's compliance plan that were determined to constitute feasible reuse and meet the legislative requirements include the following:

- Credit for Existing Onsite Process Reuse – 4 mgd (filtered brackish effluent)
- Additional Reuse within the City – 1.5 mgd (committed customer capacity)
- Contracted Reuse – 4.5 mgd

Based on the aforementioned, these efforts correspond to a total of 10 mgd of feasible reuse to be accomplished by the December 2025 deadline.

4.2 Status

4.2.1 Credit for Existing Onsite Reuse

The existing 4 mgd brackish effluent filtration capacity has been fully utilized based on recent operating history (since 2012). Consequently, no further action or capital investment is required to receive the 4 mgd credit for process water reuse applications.

4.2.2 Additional Actual Reuse within the City

The City is committed to utilizing additional reclaimed water and developing new committed customer demand to satisfy the required 1.5 mgd expanded reuse. Since the OOL was passed, the City has taken steps to expand reuse applications, including system extensions for the irrigation of medians, that correspond to an additional customer demand capacity commitment of approximately 0.207 mgd. Additional reuse

applications implemented since July 1st, 2008, that may be credited to the expansion goal include the following:

1. Rotary Park
2. Lincoln Park
3. David Park
4. Park Road median (11 zones)
5. Hollywood Blvd. median
6. US-1 median
7. McKinley St. median
8. Memorial Hospital
9. West Lake Village
10. Sheridan Station (initial phase)

The City has identified a number of additional conventional reuse applications that may be developed to meet its commitment and continues to seek opportunities to further expand its actual reuse program. Through the City's ongoing efforts, an additional 0.582 mgd of future committed customer demand (TY Park, Sheridan Station and Joe Scavo Park in Hallandale Beach) has been identified for development, together with 0.293 mgd of uncommitted (i.e. applications with relatively small demand potential such as roadway median irrigation) future demand. Collectively, the City has implemented or identified customer commitments that correspond to 1.083 mgd (i.e. 0.207 + 0.583 + 0.293) of the required 1.5 mgd of new reuse commitments.

A constraint to the City's ability to expand actual reuse within its service area is the limited availability of effluent of suitable quality (i.e. fresh/low chlorides secondary effluent). The City currently has agreements with the City of Cooper City and the Town of Davie to supply secondary effluent of suitable quality for treatment and reuse within Hollywood and will require maintenance of adequate supplies to meet increased potential demand.

4.2.3 Contracted Reuse

The City of Hollywood has conducted an extensive review of Contract Reuse (CR) opportunities that served as the basis for the established 4.5 mgd goal. The details of this review are presented in a report entitled Assessment of Contract Reuse Developmental Opportunities for Compliance with Reuse Requirements of the Ocean Outfall Legislation, September 2015. From this review, two systems were identified as

potentially promising candidates for development of a CR reuse program – the City of Miramar and the City of Sunrise. The City has engaged each system to further discussions regarding the interest, scope and terms of a potential CR arrangement, the results of which are summarized below.

Miramar Contract Reuse Status

The Cities of Hollywood and Miramar have engaged in discussions regarding the prospect for entering into a CR agreement and have exchanged pertinent information regarding the requirements and opportunity. Miramar has expressed interest in CR and has been forthcoming with pertinent information. They have developed plans to expand their reclaimed system in two phases – Phase 1 would be an expansion of the treatment facilities from 4 to 6 mgd and Phase 2 would be an expansion to a maximum of 8 mgd. Additionally, the City of Miramar recently committed 1.0 mgd of reclaimed capacity that would be credited to Cooper City in order to meet its requirement under the OOL. This parallel transaction will reduce the available amount of contracted reuse that may be credited to Hollywood. However, it is noted that the City of Hollywood is interested in also exploring, with the FDEP, the feasibility of being credited for a previous reuse system expansion that was implemented by the City of Miramar after passage of the OOL.

Under the City of Miramar's current plan, Phase 1 reuse distribution system improvements would include potential connections to communities such as Silver Shores among others, across the I-75. The Phase 2 distribution system improvements would include potential connections to other communities including Silver Lakes. Discussions are ongoing to determine the amount of available committed reuse capacity and conditions of joint participation.

Sunrise Contract Reuse Status

The City of Sunrise has not responded to recent attempts by Hollywood to engage in discussions regarding the prospect of collaborating in a CR program. Consequently, it does not appear that the City of Sunrise timing will allow for the City of Hollywood to develop a CR that can be integrated into ongoing compliance planning. However, Hollywood intends to continue pursuing engagement with the intention of identifying potential opportunities to collaborate on a CR program.

5.0 Compliance Reporting

As an outfall utility, the City of Hollywood is required to provide detailed plans and updates. The City continues to be on track with its reporting including:

- City of Hollywood, Florida, Southern Regional Wastewater Treatment Plant Ocean Outfall Compliance Report, December 2009 (403.086(9f) FS)
- City of Hollywood, Florida, Outfall Rule Compliance Plan, June 2013 (403.086(9e) FS)
- City of Hollywood, Florida, Southern Regional Wastewater Treatment Plant Ocean Outfall Compliance Report Update, December 2014 (403.086(9f) FS)
- City of Hollywood, Florida, Assessment of Contract Reuse Developmental Opportunities for Compliance with Reuse Requirements of the Ocean Outfall Legislation, September 2015
- City of Hollywood, Florida, Southern Regional Wastewater Treatment Plant Ocean Outfall Compliance Report Update, June 2016 (403.086(9f) FS)

6.0 Compliance Schedule and Financing

The City of Hollywood is on track to meet the OOL compliance schedule and intends to appropriately fund the required improvements.

References

Broward County, Florida, Regional Reuse Master Plan, January 2014.

City of Hollywood, Florida, Cumulative Outfall Loadings Compliance Report (2009 to 2015), January 2016

City of Hollywood, Florida, Assessment of Contract Reuse Developmental Opportunities for Compliance with Reuse Requirements of the Ocean Outfall Legislation, September 2015

City of Hollywood, Florida, Cumulative Outfall Loadings Compliance Report (2009 to 2014), February 2015

City of Hollywood, Florida, Outfall Legislation Challenges faced by the City of Hollywood

and
Recommended Resolution, December 2014.

City of Hollywood, Florida, Southern Regional Wastewater Treatment Plant Ocean Outfall Compliance Report Update, December 2014.

City of Hollywood, Florida, Effluent Recharge Treatment Pilot Study: Final Report, March 2014.

City of Hollywood, Florida, Outfall Rule Compliance Plan, June 2013.

City of Hollywood, Florida, South Regional Wastewater Treatment Plant Ocean Outfall Compliance Report, December 2009.

South Florida Water Management District, Lower East Coast Water Supply Plan Update, Final, October 2013.