

**Client**

Broward County Water and  
Wastewater Services  
MBC Subconsultant to Prime  
Consultant

**Scope of Services**

Completion of bench-top  
water quality and treatability  
study, preliminary and final  
design, bidding, construction  
administration and system  
start-up, and preparation and  
submittal of the  
Demonstration of Four-Log  
Virus Treatment.

**Contact**

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Wastewater Services  
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**Start Date**

04/2015

**Completion Date**

12/2018

**Construction Cost**

\$1.59 million

**Key MBC Staff**

Frank A. Brinson, P.E.  
Audra McCafferty, P.E.

**Key Features**

Project includes design and  
construction of a four-log virus  
treatment system at the  
facility.

## WTP 3A Treatability Study, Four-Log Virus Treatment System, and Demonstration

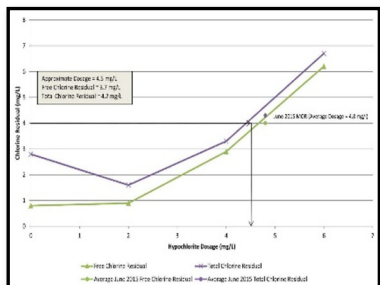
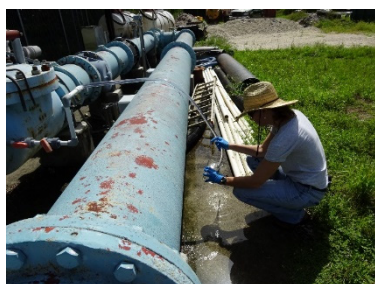
Broward County Water and Wastewater Services



### Background

The Broward County Water and Wastewater Services (BCWWS) District 3A service area obtains its water supply from the City of Hollywood through a bulk purchase agreement between BCWWS and the City of Hollywood. The 3A system is a critical system because it provides the drinking water supply to the Fort Lauderdale – Hollywood International Airport. The City of Hollywood water treatment plant has not yet demonstrated four-log virus treatment of the finished water as defined under the Federal Ground Water Rule (GWR). To reduce the risk of potential regulatory violations and related actions such as public notifications and “boil water” orders, BCWWS wished to provide an upgraded level of disinfection for the water supply provided to the District 3A service area by providing a four-log virus treatment system with disinfection of the Hollywood water supply at the BCWWS 3A water storage and pumping station, prior to distribution to BCWWS customers in the District 3A service area.

Pursuing the four-log virus treatment certification for the 3A service area represented an unusual challenge in that the 3A service area is a “consecutive system” with the City of Hollywood, which presents several unique challenges. First, BCWWS has no control over the “incoming” water quality from the City of Hollywood. Therefore, the



treatment approach and proposed compliance conditions had to account for potentially widely varying water quality parameters, (e.g., pH, ammonia, and free and total chlorine residual levels). Second, the BCWWS was proposing to “re-treat” a previously treated potable water supply using breakpoint chlorination to develop a free chlorine residual, followed by ammonia addition to develop a total combined chloramine residual consistent with the County’s final goal of approximately 4 mg/L. To achieve BCWWS’s overall project goals, MBC needed to demonstrate that all four-log virus treatment compliance parameters could consistently be met, while achieving BCWWS’s final finished water quality goals. Finally, BCWWS needed the concurrence and approval from the Broward County Health Department of the proposed treatment approach for the unique situation of providing upgraded treatment of a previously treated potable water supply to a consecutive system.

## The Project

In April 2015, BCWWS issued the first work authorization to MBC to prepare the Demonstration of Four-Log Virus Treatment of Groundwater package for submittal to the Florida Department of Health in Broward County (FDHBC) and Florida Department of Environmental Protection (FDEP), and to conduct a water quality study in support of the design concept. Subsequent work authorizations were issued for final design, permitting, and bidding services, as well as construction-phase engineering services. MBC’s engineering services for the project included the following:

- **Treatability and Water Quality Study.** The objectives of the Treatability Study were to verify that BCWWS could provide four-log virus treatment of the water supply delivered to the WTP 3A facility from the City of Hollywood, and to confirm that the proposed four-log virus treatment protocol would not adversely impact compliance with the D/DBP Rule or other water quality parameters. MBC found that BCWWS could implement four-log virus treatment by utilizing free chlorine disinfection in a newly constructed section of large-diameter pipe in the storage tank fill piping, and then apply ammonia to develop a combined chloramine residual. DBP levels in prepared water samples representing the proposed four-log virus treatment protocol were evaluated relative to compliance with the D/DBP Rule. It was determined that continued compliance with the County’s goals for DBPs would not be compromised by the conversion to free chlorine disinfection of the process stream.
- **Design and Construction of Treatment Process Modifications.** Following completion of the Treatability and Water Quality Study, MBC provided design and construction services to implement the recommended process modifications. The modifications to the treatment process included:

- [illegible]

- Preparation of the “Demonstration of Four-Log Virus Treatment of Groundwater” submittal. The FDEP issued the final Determination letter certifying the BCWWS WTP 3A as a four-log virus treatment facility on April 10, 2018.

