

TOWN OF CLAYTON OPERATIONS CENTER

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September 16, 2016

To: Nancy Medlin, Interim Town Manager

From: James Warren, Wastewater Operations Superintendent 

Copy: Tim Simpson, Public Works and Utilities Director

Re: Recommendation to Sole Source UV System

With this memo I recommend the Clayton Town Council consider adopting a resolution to sole source the equipment for the upcoming Ultra Violet Disinfection System Replacement Project. The Engineering Report completed in November 2014 evaluated five alternative disinfection systems by three different suppliers (Trojan, Wedeco, and Aquionics). This project is necessary to replace the current unit due to the obsolescence of the current system.

The Engineer and Town staff recommend using the Trojan 3000 Plus system due to cost, constructability and reliably reasons.

The Trojan 3000 UV 3000 Plus system using a dosing rate of 26 mJ/cm³ was the lowest cost option to include construction and operational costs.

The installation of the Trojan UV 3000 Plus system will require the least amount of channel modification and does not require another channel to be built. This will result in the least amount of disruption of the current site and construction time. The reduce construction time will also help to limit liabilities in regards to compliance.

The Trojan systems have been in production for the longest time period. The current facility has a Trojan unit on line since 1999. Plant staff will benefit from prior experience when it comes to system operation and maintenance.

See attached letter form Shankar Mistry P.E..

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August 2, 2016

Mr. James O. Warren
Wastewater Operations Superintendent
Post Office Box 879
Clayton, North Carolina 27528

Subject: Sole Sourcing of the UV Disinfection System Replacement Project
2.5 MGD Little Creek Water Reclamation Facility

The sole sourcing of replacement of the existing Trojan UV 3000 disinfection system with a new Trojan UV 3000 Plus disinfection system is justified for the following reasons:

1. In the year 1998, the existing Trojan UV 3000 disinfection system was originally permitted to comply with the monthly and weekly Geometric Mean Fecal Coliform limits of 200/100 mL and 400/100 mL, respectively, at the monthly average daily flow of 1.9 MGD and peak hourly flow of 4.75 MGD. In the year 2001, the system was rerated to comply with the stated Fecal Coliform limits at the permitted monthly average daily flow of 2.5 MGD and peak hourly flow of 6.25 MGD. It should be noted that during the originally and the rerated permitted flows, the existing system was designed to comply with the stated Fecal Coliform limits with no redundancy, as required by the State regulation existed at that time. However, the current State regulation (15A NCAC 02H .0124) requires that the UV disinfection system must be designed to provide adequate disinfection at the peak hourly flow with one bank out of service to ensure reliability.
2. In November 2014, the Engineering Report entitled "Replacement of the Existing Trojan UV 3000 Disinfection System with a New UV Disinfection System at the 2.5 MGD Little Creek Water Reclamation Facility" was prepared. The report evaluated five alternative UV disinfection systems, supplied by three major

manufacturers (Trojan, Wedeco, and Aquionics) for compliance with the NPDES Permit's limits on Fecal Coliform and the above mentioned State regulations. Based upon the alternatives evaluation, the Alternative No. 1 which considers replacing the existing Trojan UV 3000 disinfection system with a new Trojan UV 3000 Plus disinfection system (using UV dose of 26 mJ/cm²/ UV bank) in the existing UV channel provides the most cost-effective solution for the UV disinfection system replacement need of the Town.

3. Considering the factors such as: (a) the existing UV disinfection system is obsolete by reaching its useful life and undersized to comply with the current State regulations on reliability, (b) findings of the Engineering Report that replacing the existing Trojan UV 3000 disinfection system with a new Trojan UV 3000 Plus disinfection system provides the most cost-effective solution for the Town of Clayton, (c) the Trojan UV 3000 Plus disinfection requires insignificant UV channel modifications when compared with the other alternatives considering Wedeco and Aquionics UV disinfection systems, meaning lesser time and cost require for installation and commissioning of the UV disinfection system, (d) Trojan provides lifetime performance guarantee as standard. This guarantee is not dependant on maximum influent count of Fecal Coliform, upstream of the UV disinfection system, (e) in order to ensure proper sizing and system performance, the Trojan UV 3000 Plus disinfection system is sized based on bioassay validation by third party while the Trojan UV 3000 disinfection system is sized using theoretical UV dose equation which was the industry standard from 1980's through the mid 1990's, (f) for the Trojan UV 3000 Plus disinfection system, the UV lamps can be turn down to 60 percent where as the Trojan UV 3000 disinfection system the UV lamps are ON or OFF meaning more power savings during the low flow situation at the LCWRF with the use of Trojan UV 3000 Plus disinfection system, (g) the end of lamp life for the Trojan UV 3000 Plus disinfection system is 12,000 hours when compared with the lamp life of 9,000 hours for the Trojan UV 3000 disinfection system meaning maintenance cost savings with the use of Trojan UV 3000 Plus disinfection system, (h) the Trojan UV 3000 Plus disinfection system is equipped with the ActiClean automatic

mechanical/chemical cleaning system with a sleeve cleanliness fouling factor of 0.98 for performance reliability while the Trojan UV 3000 disinfection system does not have an automatic cleaning system so the UV modules must be removed periodically for manual cleaning to achieve sleeve cleanliness fouling factor of 0.80 which attribute to higher labor cost and exposure of the plant personnel to the chemicals involved in sleeves cleaning, it is requested that the Town Council approve the sole sourcing for replacement of the existing Trojan UV3000 disinfection system with a new Trojan UV 3000 Plus disinfection system in the existing UV channel so that the Town can move forward with the project in timely manner.

Hope the above information should be helpful for the Town Council in approval of sole sourcing for the replacement of the existing Trojan UV 3000 disinfection system with a new Trojan UV 3000 Plus disinfection system project.

Sincerely,

Shankar R. Mistry

Shankar R. Mistry, Ph.D., P.E.