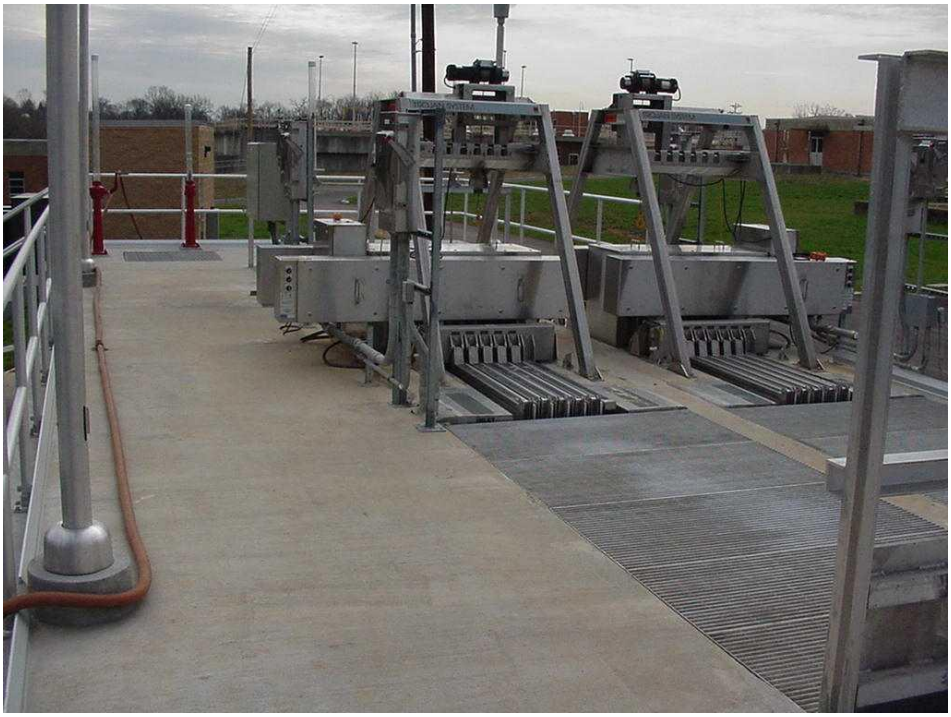

UV Disinfection

This fact sheet has been created to provide information on and address common questions about the **new ultraviolet (UV) disinfection** system that is being incorporated in the proposed Franklin WRF upgrades project.

Purpose and Benefits of Process

Disinfection is one of the final processes in a wastewater treatment plant. This process inactivates or kills pathogens that can cause water-borne diseases – diseases that spread through the consumption of water through swimming, fishing, or other activities that bring humans into contact with surface waters.

Like all of the other publicly owned wastewater treatment plants in the United States, the Franklin WRF has strict limits on the amount of pathogens it can discharge to the Harpeth River. The plant's new UV disinfection system has been designed to enable the Franklin WRF to meet these limits.

Description of Process

In a UV disinfection system, electric lamps produce UV light at the wavelengths in the UV-B and UV-C regions. The light from these lamps damages pathogens' genetic material, inactivating them by preventing them from replicating and killing them. The water to be treated flows past these lamps and is exposed to their light.

The system is designed to deliver a specific dose of UV light to the pathogens in the water flowing past the lamps. This dose is based on the rate at which the water is flowing, the intensity of the UV light, and the exposure time needed to inactivate the target pathogens.

What process modifications will be made?

The Franklin WRF has an existing UV disinfection system that was installed in 1997. This nearly 20-year-old system has served the City well, but it has reached the end of its useful life. Repair parts for the system are increasingly hard to find. Compared to today's energy-efficient, higher-performing UV systems, the existing system is much more costly to operate because it consumes more electricity.

A new UV system has been pre-selected for installation at the Franklin WRF. This new system was selected because it offers the City the best combination of treatment performance, ease of maintenance, and life cycle costs over 20 years of operation.

The new UV system will be housed in a concrete structure to be constructed between existing structures at the site and near the existing UV system structure. The structure will consist of two channels

where the UV lamps will be installed. Additional modifications to the piping around the old and new UV structures will send the water through the new UV channels for treatment.

After the new system has been installed and rigorously tested, the old UV system will be removed.

Is the process a potential odor source? Is the process odor controlled?

The UV disinfection process is not a potential odor source and is not odor controlled. At this stage in the wastewater treatment process, the water is clear and almost ready to be returned to the Harpeth River. The treated water has very little if any odor.

Does the process include equipment that has the potential to create noise? If so, is there any noise control provided?

The major components of the system are the lamp assemblies, which are submerged in the UV structure channels, and power supply and control cabinets in a dry area beside the new channels. The power supply and control cabinets contain small air conditioners that are designed to prevent the electronics inside from overheating, but these air conditioners are not expected to produce a significant amount of noise and will not be heard at the property lines.

Will the process modification change the look and feel of the site?

Construction of the new UV structure will require the demolition of two existing ABW filters. The new structure will be built in their place. The canopy that will provide shelter for the power supply and control cabinets will have a height that is comparable to that of the filters. No changes to the plant roads are required. The new structure is located between existing structures and is not likely to be visible from the property lines.

Will the process modification change the safety of the site?

The UV disinfection system will employ similar, but much more efficient, technology to the existing UV disinfection system and therefore will not introduce any new safety concerns to the site. Neither the existing system nor the new system can cause any offsite safety concerns.