

UV Disinfection and Solar Project

Construction is slated to begin this fall at Greater Cincinnati Water Works' (GCWW) Richard Miller Treatment Plant to install Ultraviolet (UV) Disinfection treatment technology - one of the most significant advancements in water treatment technology since Granular Activated Carbon (GAC) became the standard in the 90's.

UV disinfection has been identified by the US Environmental Protection Agency as one of the best technologies to inactivate pathogenic microorganisms, such as cryptosporidium (crypto) in drinking water. With the addition of UV, GCWW will be the only water utility in the nation to use sand filtration followed by GAC and UV creating a true multi-barrier treatment approach for protecting public health.

To reduce GCWW's carbon footprint, a component of the UV project includes installation of solar panels atop the new facility and a second installation on existing Water Works facilities. The entire project (UV and solar) is designed to protect public health with advanced water treatment technology and protect the environment by advancing the use of solar energy. As currently designed, this solar project will represent one of the largest solar-generated electric supply installations in Ohio.

Why Do We Need UV Disinfection Treatment?

UV disinfection uses UV light, in low doses, to inactivate disease-causing protozoa such as Cryptosporidium and Giardia. No chemicals are added, and there is no residual effect once the water leaves the UV reactor.

There are many serious concerns about the vulnerability of the Ohio River watershed to contamination, including microbial and viral contamination from emerging microorganisms that are resistant to chlorine disinfection, as well as future contamination issues that will need to be addressed. Since 2000 GCWW has been conducting research with national and international groups on technologies available to address these concerns.

In 1993 a deadly waterborne disease outbreak from Cryptosporidium occurred in Milwaukee, Wisconsin. Nearly 400,000 people became ill and over 100 deaths were reported. Chlorine, which is a commonly used disinfectant at water treatment plants, is ineffective in killing Cryptosporidium. UV disinfection at water treatment plants is a proven and effective technology for addressing this contaminant.

Wastewater treatment plants release discharges of municipal wastewater into the Ohio

River. Although discharges are regulated, several contaminants of concern, including Crypto, are found in wastewater effluents. Municipal and residential wastewater systems and wastewater treatment plants are known to have incidents of raw sewage discharge or treatment malfunctions

GCWW and the City of Cincinnati have consistently expressed concerns regarding a wastewater treatment plant located near Alexandria, Kentucky, discharging just 11 miles upstream of our drinking water intakes.

New or unexpected contaminants are sure to be discovered in our source water in the future. UV disinfection, combined with GCWW's current treatment processes, provides an extra layer of protection against those contaminants. This is an important step in insuring public health now and for future generations.

These issues remind us how precious our source waters are and how important it is to protect them from harmful substances. The best way to insure safe water at the tap is to keep our source waters clean.

Rising to Meet Increasing Drinking Water Regulations

Recent advancements in water science analysis and health studies have resulted in increasing federal and state drinking water regulations. Clearly more regulations are on the horizon. As a leader in the water utility industry, GCWW continues to study the most effective options for protecting the public health while meeting existing and future regulations. Today's research shows that UV disinfection is an optimum technology to address our concerns in an economical way. In fact, the US EPA has identified UV disinfection as one of the Best Available Technologies against Cryptosporidium and Giardia.

The GCWW Advisory Committee on Quality of Drinking Water is a group of local scientists and engineers who volunteer their expertise regarding drinking water treatment. Edna S. Kaneshiro, Ph.D., Distinguished Research Professor, Department of Biological Sciences at the University of Cincinnati, has served on the Committee for many years. She encourages the use of UV disinfection treatment and states, "We know that UV disinfection treatment is effective against pathogens including Crypto and possible future contaminants of concern such as microsporidia. UV disinfection treatment adds an additional level of protection to ensure public health. One reason we need this additional level of protection is because we have sources of contamination, including wastewater treatment plants, upstream of our intakes, and we don't know what is being dumped into the Ohio River."

Cincinnati set the standard in drinking water treatment when they chose to implement GAC treatment. Cincinnati is setting the standard again with the implementation of UV disinfection treatment following sand filtration and GAC treatment.

Solar Energy

Environmentally sound design principles are incorporated into the UV project design. Solar panels will help offset the increased energy demand of the UV treatment process in an environmentally friendly manner.

The roof of the UV building has 7,200 square feet of available space for solar panels which can support a solar array with a generating capacity of 72 KW. Currently, GCWW has a solar array on the roof of its Spring Grove facility that generates 42 KW of energy. Plans are under way to add an additional 279 KW solar array to this installation, creating nearly 12% of the facility's total electrical usage on an annual average. This installation, combined with the UV project installation, will give GCWW a solar electric generating capacity of 394 KW.

As early as 1937, Water Works was generating its own energy by using water wheels. These water wheels are still in operation today. Now GCWW is moving to the newest cost-effective and environmentally friendly energy source. The planned solar arrays represent one of the largest in the State of Ohio.

The UV disinfection treatment project is slated to be completed by the end of 2012. GCWW did receive rebates of approximately \$150,000 from the State of Ohio for solar energy initiatives. In addition, the amount of energy provided by the solar panels will save on electricity and have a positive impact on the environment.

Preserving Public Health and Trust

The Greater Cincinnati Survey was conducted by the Institute for Policy Research at the University of Cincinnati in spring 2008. Ninety-one percent (91%) of customers say that the water provided by GCWW is safe to drink, a slight increase from 2006. The same survey results show that, similar to 2004 and 2006, most customers (75%) are interested in additional environmental protections, knowing that costs would be passed on to them.

GCWW recognizes the critical role it plays in public health in the community. GCWW's customers trust that, when they turn on the tap, the water will be of the highest quality. Over the years, City Councils have supported and encouraged efforts to protect public health and meet the public's expectations. This has allowed GCWW to continue to be involved in research on both national and international levels to identify and implement the most effective treatment technologies.

UV Facility Rendering



Rendering of Inside the UV Facility

