

# TROJAN UV™

## CASE STUDIES

### Municipal Wastewater



**Plant Name:** Wastewater Treatment Plant 20  
**Location:** Kansas City, Kansas  
**System:** TrojanUV3000Plus™

## Farewell To An Aging UV System – Kansas Wastewater Treatment Plant Makes a Long-overdue Upgrade

### PROJECT BACKGROUND

The Water Pollution Control Department of the Unified Government of Wyandotte County and Kansas City, KS provides wastewater and stormwater services for more than 150,000 residents. Their top priority is protecting public health and the environment, and they work tirelessly to ensure that both wastewater and stormwater are treated and returned safely to the Missouri River.

All told, Water Pollution Control maintains and operates 1,100 miles of wastewater and stormwater sewers, 76 wastewater pump stations, 9 flood pump stations, 20 miles of flood control levees, and 5 wastewater treatment plants:

- Kaw Point Wastewater Treatment Plant
- Wastewater Treatment Plant 20
- Wolcott Wastewater Treatment Plant
- Wastewater Treatment Plant 14
- Wastewater Treatment Plant 3

Combined, these wastewater treatment plants are designed to treat a flow of up to 70 million gallons of wastewater per day.

The UV disinfection system at the Plant 20 Wastewater Treatment Plant was installed in 2002, but over the years staff continued to struggle with PLC and controls-related issues, ballast failures, and water level management. An overhead crane was needed to operate the water level management device, and water level fluctuations of 12" were common, which contributed to an increase in fouling on the quartz sleeves.

UV lamps are housed within quartz sleeves; over time, without proper water level management and cleaning, the sleeves can become fouled and negatively impact system performance.

Collectively, these issues were continually causing undue grief for plant staff as well as increased time and money spent on maintenance.

So, in 2016 when they were informed that it would take approximately \$150,000 to keep the aging UV system operational, Unified Government and its Water Pollution Control Department decided to look into other UV equipment suppliers and investigate another UV disinfection solution. They were looking for a UV solution that would provide them with a better user experience and be easier to maintain.

### FINDING THE RIGHT UV SYSTEM WASN'T DIFFICULT

Unified Government and its Water Pollution Control Department didn't have to look too hard for the ideal UV solution. In fact, all they had to do was look at their Kaw Point Wastewater Treatment Plant where, just a few years prior, a TrojanUV3000Plus system was installed. The robustness of the system, along with the steadfast support of their local water treatment representative Ray Lindsey Company (RLC), made the decision to upgrade Wastewater Treatment Plant 20 to a TrojanUV3000Plus an easy one.

# CASE STUDIES

The TrojanUV3000Plus incorporates innovative features to reduce operation and maintenance costs, such as variable-output electronic ballasts and the ActiClean™ automatic chemical/ mechanical sleeve wiping system. In addition, the system's Type 6P rating makes it an ideal option for plants – such as Wastewater Treatment Plant 20 – that are prone to flooding events.

After a site-specific review and evaluation, an optimal system design and layout was determined. It consisted of four six-module banks with downward opening weir gates. Installation was completed in December 2017.

## COST-EFFECTIVE INSTALLATION

Unified Government and its Water Pollution Control Department needed a compact system that could be easily installed in the existing effluent channel at their Wastewater Treatment Plant 20. Based on their experience installing the TrojanUV3000Plus at the Kaw Point Wastewater Treatment Plant, they knew that the system's modular design and the fact that it comes pre-tested, pre-assembled and pre-wired would simplify and streamline the process.

**“The UV system installation went well and maintenance is as expected,” says Treatment Plant Manager Rick Bird. “The service has been very good to this point, and I anticipate it continuing in the future. We have had no issues with our permit, and I anticipate this continuing as well.”**

In general, newer UV systems have a smaller footprint and comparable (or lower) head loss vs. older systems. And in many cases, a higher flow rate can be accommodated in the existing disinfection space or only a portion of the available footprint is needed, leaving existing channels to be repurposed or used for water storage or bypass.

## REDUCED OPERATING COSTS + EFFICIENT WATER LEVEL MANAGEMENT

In addition to the downward opening weir gates, the system design included an electrode low water level sensor. If effluent levels fall below defined parameters, an alarm will be activated. This is a marked improvement over the previous system, where plant staff was unable to see alarm statuses.

The plant is also benefiting from significant energy savings of up to 20%. This can be attributed in part to the lamp technology incorporated into the TrojanUV3000Plus. Its long-lasting amalgam lamps and variable-output ballasts optimize UV output to meet wastewater conditions and maximize system efficiency.

## SYSTEM DESIGN PARAMETERS

**AVERAGE DESIGN FLOW:**  
7 MGD (26,498 m<sup>3</sup>/d)

**PEAK DESIGN FLOW:**  
14 MGD (52,996 m<sup>3</sup>/d)

**FUTURE DESIGN FLOW:**  
24 MGD (90, 850 m<sup>3</sup>/d)

**ULTRAVIOLET TRANSMISSION (UVT):**  
65% at 254 nm

**DISINFECTION REQUIREMENT:**  
126 E.coli / 100mL  
(30-day geometric mean)



*The TrojanUV3000Plus has a Type 6P rating, making it an ideal option for plants – such as Wastewater Treatment Plant 20 – that are prone to flooding events.*

## About TrojanUV

TrojanUV designs and manufactures pressurized and open-channel UV disinfection systems for municipal wastewater and drinking water, as well as UV-oxidation systems for environmental contaminant treatment and potable and non-potable reuse applications. We have the largest municipal UV installation base in the world and are proud to play an important role in continually advancing UV disinfection technology. TrojanUV is part of the Trojan Technologies group of businesses.

**Head Office (Canada):** 3020 Gore Road, London, Ontario, N5V 4T7 Canada | Telephone: (519) 457-3400 Fax: (519) 457-3030

**Trojan Technologies Deutschland GmbH:** Aschaffener Str. 72, 63825 Schöllkrippen, Germany | Telephone: +49 6024 6347580 Fax: +49 6024 6347588

[www.trojanuv.com](http://www.trojanuv.com) | For a list of our global offices, please visit [trojanuv.com/contactus](http://trojanuv.com/contactus).

Copyright 2019. Trojan Technologies London, Ontario, Canada. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without the written permission of Trojan Technologies. The products described in this publication may be protected by one or more patents in The United States of America, Canada and/or other countries. For a list of patents owned by Trojan Technologies, go to [www.trojan technologies.com](http://www.trojan technologies.com). (0719)