CASE STUDY: Odor Control

- Knoxville, TN -

Preventing Odors & Corrosion through Super-Oxygenation

COLLECTION SYSTEMS

HEADWORKS

PRIMARY CLARIFIERS

POST-AERATION

INDUSTRIAL

ECO OXYGEN TECHNOLOGIES, LLC

www.eco2tech.com

Forks of the River Force Main

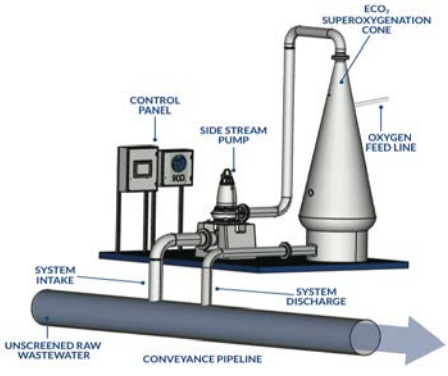
The Knoxville Utilities Board (KUB) provides energy and water utilities to over 67,000 people, with four wastewater treatment plants and 61 pump stations in the 248 square mile area covered.

Photo of picturesque Knoxville, TN

For many years, the KUB had received numerous odor complaints each year from the area surrounding one of the WWTPs and a nearby daycare facility. The source of the odor was hydrogen sulfide (H_2S) created in a long force main, called the Forks of the River Force Main.

Odor Control System Selection

In 2005 Knoxville initiated a project to stop odors and protect system infrastructure. KUB considered all available alternatives for controlling the H_2S odor, including multiple liquid phase and vapor phase solutions. The KUB also has a long history of making the environment a top priority. This lead them to investigate and ultimately select the environmentally-friendly ECO_2 SuperOxygenation System for its cost-effective, non-chemical solution for preventing the formation of H_2S in the force main. This solution would stop odors and corrosion, as well as save costs and reduce maintenance requirements.



Above, left: One of two Installed ECO_2 systems at KUB. Equipment includes oxygen transfer reactor (Speece Cone), controls, sidestream pump, and liquid oxygen tank with evaporator. Above, right: ECO_2 System Diagram.

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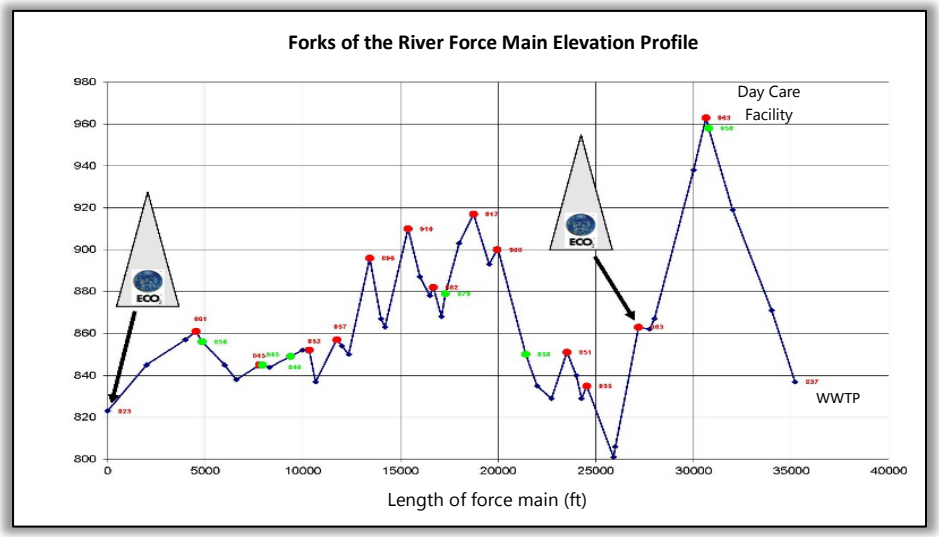
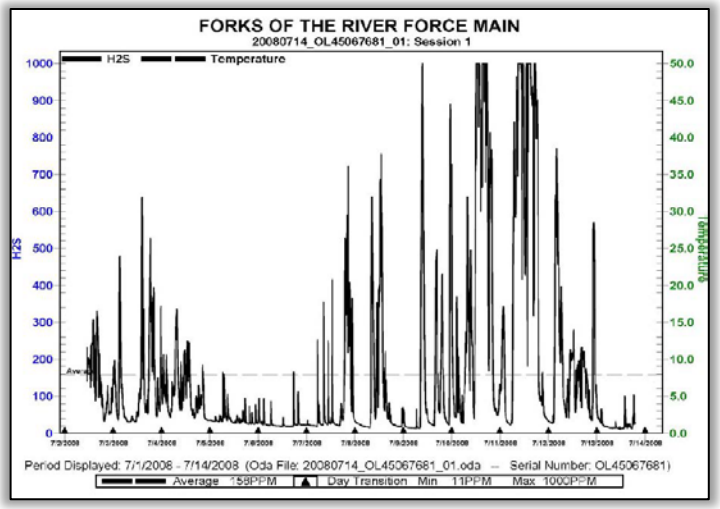
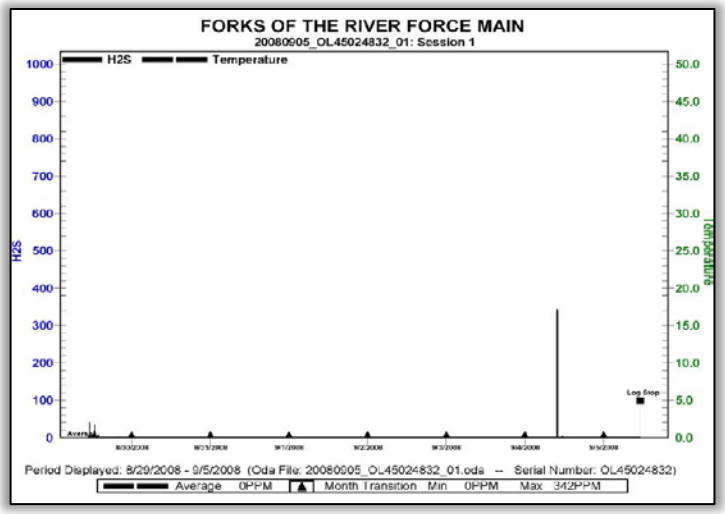
ECO_2 SuperOxygenation System Design and Results

The 24" diameter "Forks in the River Force Main" transports just over 1 MGD of wastewater approximately 6.4 miles, with a hydraulic retention time (HRT) of 24 hours before discharging at the WWTP. In this case, two SuperOxygenation systems were required to provide enough dissolved oxygen to satisfy the demand in the entire length of the force main – one at the beginning of the force main, and one at the midpoint as shown below.





At left:
*H_2S Levels **Before** ECO_2 System (Untreated)*
Average = 158 ppm
Spikes > 1000ppm



At left:
*H_2S Levels **After** ECO_2 System*
Average < 1 ppm