



A K R O N W A T E R

## AKRON WATER RECLAMATION FACTS

- Treats approximately 75 million gallons per day (MGD) (284,000 cubic meters per day, i.e., m<sup>3</sup>/d) to peak flows of up to 280 MGD (1,060,000 m<sup>3</sup>/d) of wastewater at its Reclamation Facility
- Processes approximately 175,000 gallons per day of biosolids (662 m<sup>3</sup>/d) at its Renewable Energy Facility
- Maintains a sewer system that includes 1,361 miles (2,200 km.) of sewer, 28,991 manholes, 23,112 inlets, 37 pump stations, 34 CSO racks and two combined sewer retention tanks

## AKRON WATER RECLAMATION SERVICES/AKRON WATER SUPPLY KEY ADVANTAGES

A hub of technology, collaboration and innovation, Akron Water Reclamation Services and Akron Water Supply meet the needs of their residential and commercial customers while exploring the latest research and development in the areas of water supply processing, delivery and treatment.

Both foreign and domestic companies have partnered with Akron Water Reclamation Services and Akron Water Supply to develop, test and implement new technological initiatives and innovations, taking advantage of the ability to evaluate

their products and technology in a working system with a 300,000-plus population base.

Akron Water Reclamation Services' and Akron Water Supply's focus on energy independence and environmental stewardship have resulted in projects and best practices that have been adopted by other cities and markets, providing their R&D partners with new opportunities for growth and expansion.



Akron Water Reclamation Services is uniquely positioned to meet both the current needs and future growth requirements of its customer base, as well as provide a superior opportunity for companies seeking to enter the U.S. market with their goods and services.

Not just a utility service provider, Akron Water Reclamation Services also has a successful track record of partnering with foreign and domestic companies to develop, test and implement new technological initiatives and innovations. Its collaborative, results-oriented approach makes it a viable destination for companies that:

- Are seeking an R&D partner with whom to develop their technology
- Have a unique technology that will improve U.S. water services
- Desire to establish themselves in the U.S.
- Want to demonstrate the success of their technology in a practical application.

The following case studies illustrate just a few of the successful collaborations initiated by the City of Akron and undertaken by Akron Water Reclamation Services.

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# WATER RECLAMATION SERVICES



## COLLABORATION WITH GERMAN-BASED SCHMACK BIOGAS GMBH

Goal: To prove high-solids ADS technology using municipal sewage sludge

The Akron Water Reclamation Facility, like most wastewater treatment plants, is a large energy user, with the cost of energy procurement second only to personnel costs. Improving energy conservation and developing alternate energy sources, including self-generation, help reduce the burden of escalating operational expenditures.

Exploring innovative options to address energy costs, in 2003, Akron Mayor Don Plusquellic inspected a facility in Zurich, Switzerland, that was successfully using anaerobic digestion of biosolids to generate electricity. A subsequent trip in 2005 to Germany was undertaken by representatives from the City of Akron and its partner KB BioEnergy, Inc. (KBBI) to view several installations of an Anaerobic Digestion System (ADS) engineered by Schmack Biogas GmbH, one of the leading German suppliers of biogas plants. The Schmack Biogas ADS systems utilized energy-rich vegetation, solid manure and slurry, and organic residues but did not have an installation using municipal sewage sludge as a feedstock.

The City and KBBI then constructed a pilot project using the high-solids ADS technology supplied by Schmack Biogas GmbH. The ADS/Biogas Project was designed to process one-third of the biosolids produced by the City's wastewater

treatment plant, which was large enough to evaluate 100 percent conversion and to accommodate future phases.

The first phase has been operational since April 2008 and generates enough methane gas to power its 335 kilowatt (kW) generator at full power while processing only one-third of the biosolids generated by the wastewater treatment plant. The ADS system produced an average of 220,000 kW hours per month of electricity during 2010, enough electricity to supply approximately 250 homes.

Following the successful three-year demonstration period, the City of Akron began construction of the second phase of the ADS process, which will process all biosolids from the wastewater plant. Once operational, the system is expected to generate more than 10,000 megawatt hours of electricity annually and produce 12,000 cubic yards (9,200 m<sup>3</sup>) of dried, digested solids.

The ADS/Biogas Project, the first of its kind in the U.S., is also the first plant worldwide using Schmack Biogas technology to process municipal sewage sludge. The success of the collaboration has provided Schmack Biogas GmbH with new opportunities to bring its innovative technology to the American market.



## COLLABORATION WITH JAPANESE-BASED EBARA

Goal: To test an alternative disinfection technology for wet-weather applications

Utilities have long been struggling to find effective ways to treat stormwater and combined sewer overflows (CSOs). While high-rate disinfection of CSOs is typically accomplished by well-established technologies such as chlorination and dechlorination, some cities have been exploring alternatives for wet-weather applications.

One option is bromochlorodimethylhydantoin (BCDMH) — a powdered bromine technology that has been implemented successfully in Japan for disinfection of CSOs but its usage in the U.S. is generally confined to swimming pools and hot tubs. Japanese-based EBARA is the only company that currently produces BCDMH for the wastewater industry. It achieves better bacteria kills than a comparable dose of chlorine yet has a longer lifespan and requires a smaller footprint for storage, making it suitable for intermittent

treatment of wastewater, including wet-weather applications.

Interested in exploring this technology, the City of Akron hired Hatch Mott McDonald/Brown and Caldwell to demonstrate EBARA's technology, with the City assisting with assembly, start-up, operation, sampling, and analysis of the pilot unit. Both pilot and bench tests were conducted at a pilot facility at the Akron Water Reclamation Facility, using a full-scale BCDMH unit provided by EBARA. The results demonstrated BCDMH to be an effective disinfectant that achieves comparable kills to sodium hypochlorite in a shorter period of time.

The success of BCDMH tests opens the door for EBARA to explore other wastewater treatment plants seeking to test an effective alternative to current methods.

