

# Dairy Collective Uses Anaerobic Wastewater Technology for Environmental Benefits

One of the United States' newest dairy processing plants features advanced wastewater treatment technology that not only improves biomass recovery and effluent quality but also harnesses green energy from waste streams to drive production processes and reduce its carbon footprint. The Cayuga Milk



CMI's SUPERFLOT-BIOGAS™ unit, developed by Global Water & Energy, is shown here. The system is used for high-efficiency removal of anaerobic biomass from the effluent of an anaerobic treatment system.

Ingredients (CMI) plant in Auburn, N.Y., manufactures dairy products such as pasteurized cream, whole milk powder, liquid permeate, condensed milk, skim milk powder, nonfat dry milk, and milk proteins.

Cayuga Marketing LLC—a collective of dairy farmers in the Finger Lakes region of New York—decided to construct its local processing plant to reduce milk-hauling costs while also reducing transport emissions and its carbon footprint as a result of shorter transportation distances. To achieve optimum environmental and efficiency benefits, CMI further decided to implement an anaerobic treatment process for its wastewater treatment facility,

seeking to simultaneously achieve the most environmentally effective, energy-efficient, and cost-efficient solution.

CMI selected Global Water & Energy (GW&E) as the engineering, procurement, and construction contractor to design, build, and activate the new wastewater treatment facility, specified to achieve outstanding effluent discharge qualities while producing biogas (methane) initially for future use and electricity production. GW&E is the US branch of Global Water Engineering (GWE) and results from a joint venture with Western Water Constructors Inc.

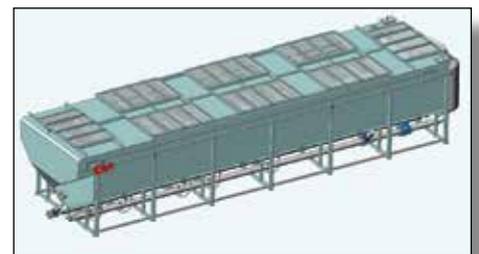
GWE's FLOTAMET™ system was used for CMI's wastewater treatment; it offers high-rate anaerobic treatment with GWE's completely mixed, continuous-flow stirred tank reactor, followed by biomass recovery in a combined sludge-separation system, then followed by GWE's dissolved biogas flotation unit (SUPERFLOT-BIOGAS™) that is used for high-efficiency removal of anaerobic biomass from the effluent of an anaerobic treatment system.

The anaerobic biomass is returned to the anaerobic system, thus increasing the sludge retention time. Such systems allow anaerobic reactors to be greatly reduced in size. The biomass is separated through flotation. After injection into the lower part of the flotation tank, the pressure release results in formation of fine biogas bubbles.

Because biogas is used instead of air, the system has a completely enclosed design. The biogas is used partly to heat the wastewater in order to ensure optimal anaerobic digestion. As such, the anaerobic

treatment plant does not create an additional energy demand on the factory for heating purposes. In a second phase it uses the remaining biogas to generate electricity.

Anaerobic digestion facilities have been recognized by the United Nations development program as one of the most useful decentralized sources of energy supply because they are less capital-intensive than are large power plants. Modern anaerobic processes concentrate the process in environmentally harmonious closed reactors, operated under ideal temperature and process control to optimize waste degradation and, in the process, generate large quantities of methane from the organic materials in the wastewater. Savings quickly repay the cost of an anaerobic plant—typically within two years—while achieving permanent environmental benefits by replacing fossil fuel. Anaerobic plants can also benefit local communities by providing local energy supplies while eliminating the need for large and often odorous and environmentally challenging aerobic and anaerobic lagoons commonly used outside the United States.



The Cayuga Milk Ingredients (CMI) plant in Auburn, N.Y., uses advanced wastewater treatment technology. This illustration shows the completely enclosed dissolved biogas flotation unit.

Information in Industry News may describe products offered by companies in the water industry. AWWA does not endorse these products, nor is it responsible for any claims made by the companies concerned.

## USEPA Funds Urban Waters and Innovative Small-Business Practice

The US Environmental Protection Agency (USEPA) is awarding \$2.1 million to 37 organizations in 17 states and Puerto Rico to help protect and restore urban waters, improve water quality, and support community revitalization and other local priorities. The funding is through USEPA's Urban Waters program, which supports communities in their efforts to access, improve, and benefit from their urban waters and the surrounding land. Urban waters include canals, rivers, lakes, wetlands, aquifers, estuaries, bays, and oceans in urbanized areas.

USEPA is awarding grants ranging from \$40,000 to \$60,000 for projects taking place in areas that align with the 18 designated Urban Waters Federal Partnership locations. The partnership comprises 13 federal agencies working to reconnect urban communities with their waterways by improving coordination among federal agencies and collaborating with community-led revitalization efforts. All funded projects work to advance environmental justice in their communities and focus on one of the following three categories: community greening

and green infrastructure, communities and water quality data, and integration of water quality and community development in planning.

In addition, USEPA is providing funding to 21 small businesses in 15 states to develop and commercialize innovative, sustainable technologies to address current environmental issues. The agency's Small Business Innovation Research (SBIR) program is providing \$2 million in funds to advance products and research.

Each year, USEPA provides a solicitation and funding opportunity for small businesses in a competitive two-phase process. In phase 1, small businesses can receive up to \$100,000 for "proof of concept" of their technology, and successful phase 1 companies can apply to develop and commercialize their technology with phase 2 funding totaling up to \$300,000. This year's recipients of USEPA's phase 1 SBIR contracts are in Arizona, California, Connecticut, Massachusetts, Maryland, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New Mexico, Ohio, Pennsylvania, Virginia, and Washington.

## Farm Bill Includes Rehabilitation of US Dams

Communities across the United States will benefit from a \$262 million investment to rehabilitate dams that provide critical infrastructure and protect public health and safety. The 2014 Farm Bill, signed into law by President Obama earlier this year, increased the typical annual investment in watershed rehabilitation by almost 21-fold, recognizing the critical role of these structures in flood management, water supply, and agricultural productivity.

From the 1940s through the 1970s, local communities using Natural Resources Conservation Service (NRCS) assistance constructed more than 11,800 dams in 47 states. These watershed management projects provide an estimated \$2.2 billion in annual benefits in reduced flooding and erosion damages, as well as improved recreation and water supply for an estimated 47 million Americans, and improved wildlife habitat.

The new funding will provide rehabilitation assistance for 150 dams in 26 states. Funds will be used for planning, design, or construction. In addition, 500 dam

sites will be assessed for safety through NRCS' Watershed Rehabilitation Program. The projects were identified on the basis of recent rehabilitation investments and the potential risks to life and property if a dam failure occurred. Overall, an estimated 250,000 people will benefit as a result of improved flood protection made possible by these rehabilitated dams.

For example, Watershed Dam No. 62 in the Upper Black Bear Creek Watershed of Noble County, Okla., will be included in a rehabilitation partnership project funded by the US Department of Agriculture. Currently awaiting rehabilitation design, the dam provides protection against flooding to about 550 Oklahomans who live and work downstream. Additionally, the dam protects seven county roads, one state highway, two US highways, and an interstate highway that, together, support about 16,200 vehicles daily. The dam also protects power lines and railroad tracks. The rehabilitation project is expected to provide about \$7.5 million in benefits including flood damage reduction, water supply, and recreation.

## USGS Study: Large US Rivers Are Becoming Less Acidic

Several large rivers in the United States have become less acidic as a result of decreasing acidic inputs such as industrial waste, acid mine drainage, and atmospheric deposition. A study from the US Geological Survey (USGS) showed that alkalinity, a measurement of a river's capacity to neutralize acid inputs, has increased over the past 65 years in 14 of the 23 rivers assessed in the United States. Reduced acidity levels were especially common in rivers in the Northeast, such as the Delaware and Schuylkill rivers; in the Midwest, such as the Illinois and Ohio rivers; and in the Missouri River in the Great Plains.

Acidification of US rivers in the early part of the 20th century was mostly associated with these acid inputs, which reduced the alkalinity of some rivers and caused them to become more acidic.

Increased alkalinity concentrations in large rivers draining a variety of climate and land-use types in the United States are an indicator of recovery from

acidification. By looking at changes in multiple chemicals, scientists conducting the study found that the alkalinity increases were due to decreasing acidic inputs. The reasons for decreased acidic inputs have been diverse and include greater regulation of industrial emissions and waste treatment and increased use of agricultural lime.

"This study shows us that our cumulative management actions over the last half century have reduced acidity levels in US rivers," said the study's lead author Edward Stets, research ecologist at the USGS. "Acidification of rivers that empty into estuaries can adversely impact shell-bearing organisms such as oysters and crabs."

The study was published in the journal *Science for the Total Environment*. Information on USGS long-term water-quality monitoring can be accessed at the National Water-Quality Assessment Program page (<http://water.usgs.gov/nawqa/>).

---

## BUSINESS BRIEFS

**MWH Global** has been awarded a contract to provide construction management and engineering services during construction by Reclamation District (RD) 2035 for the Joint Intake and Fish Screen Project in California. RD 2035 diverts water from the Sacramento River to irrigate about 15,000 acres of crops. The existing intake is more than 100 years old; the Department of the Interior, Bureau of Reclamation, is providing more than \$16 million in grant funding to construct a new, state-of-the-art fish screen. The facility will draw water in from the Sacramento River through perforated metal screens, which will ensure that offspring of migrating salmon, steelhead, and other fish species will not be injured as they pass by the structure. Large pumps located inside the screens will pressurize water, thus enabling it to travel through a pipeline to a regional water treatment facility. A

separate set of pumps will provide pressurized water to scour the floor of the intake facility to help remove settled silt and sand normally present in the river. The dual-purpose intake will provide environmental benefits and water quality benefits, and will improve water supply reliability in the region. Construction is expected to be completed by 2017.

The **Santa Clara Valley Water District**, in partnership with the cities of San José and Santa Clara, Calif., recently opened the Silicon Valley Advanced Water Purification Center, a locally controlled, drought-proof water source for Silicon Valley. The new facility is using advanced technologies to purify water that has already undergone two levels of quality wastewater treatment, sourced from the San José-Santa Clara Regional Wastewater Facility. At the new purification center, the

water goes through three additional high-tech processes—microfiltration, reverse osmosis, and ultraviolet light—to produce water that is so pure that it is expected to match drinking water quality. Recycled water makes up about 5% of the county's total water demands; the water district hopes to double that number by 2025.

**American Water** announced the recipients of its 2014 Environmental Grant Program awards. A total of 45 projects throughout American Water's service areas in 11 states will be supported by grants totaling more than \$185,000. Established in 2005, the program offers funds for innovative, community-based environmental projects that improve, restore, or protect watersheds and surface water and/or groundwater supplies in the communities served by American Water. The 2014 grant recipients are in California, Illinois,

Indiana, Iowa, Kentucky, Missouri, New Jersey, New York, Pennsylvania, Tennessee, Virginia, and West Virginia.

In other company news, American Water has been recognized as a Platinum-Level Fit-Friendly Worksite by the American Heart Association (AHA) for helping employees eat better and move more. American Water has been recognized for its employee health and wellness program, Healthy Solutions. According to the AHA, American employers are losing an estimated \$225.8 billion annually because of healthcare expenses and health-related losses in productivity, and those numbers are rising.

**American Water Chemicals** (AWC) has made its first full-scale delivery of AWC A-110 antiscalant to the **Orange County Water District** (OCWD) in Florida. The district had experienced numerous silica scaling incidents that forced it to resort to the use of hazardous ammonium bifluoride as a membrane cleaner. AWC started a series of research experiments that found a link between phosphate scale and silica formation. Further lab experimentation also determined that variations in iron coagulant carryover had a direct impact on antiscalant demand. A comparison of OCWD feed water and operational history confirmed a correlation between surges in ferric ion levels and silica scaling events.

**Reading Area Water Authority** (RAWA; Reading, Pa.) is celebrating its 20th anniversary with a theme of “Good Water. Good Jobs. Good Neighbors.” RAWA has budgeted \$150,000 to donate for a new Hardship Fund program that it is rolling out with the City of Reading. It will provide short-term assistance with water bills for qualified homeowners. In addition, RAWA employees are giving their time to lead community-based projects that

promote conservation and pollution prevention. RAWA also has a contest for children as part of the anniversary commemoration.

**Clariant** completed the sale of its water treatment business in Africa to **AECI**, an explosives and specialty chemicals group domiciled in South Africa. Clariant’s former water treatment business provides chemicals, services, and engineering solutions to a range of industries. It also serves municipalities to supply drinking water in many African communities.

**IDModeling Inc.** announced that **Consolidated Waterworks District No. 1** of Terrebonne Parish, La., has deployed IDModeling’s Sedaru® service to connect and optimize the district’s water operations. Sedaru enables users to be connected to system status and performance, predict the outcome of actions before they make decisions, and respond within a real-time, mobile, and social platform. Sedaru allows water industry professionals to understand impacts and optimize operations for energy, quality, water loss, and asset management initiatives.

**GE** has agreed to acquire **Monsal**, a private, UK-based water, waste, advanced anaerobic digestion, and integrated biogas-to-energy business. With Monsal’s advanced anaerobic digestion technology and industry knowledge, GE will be able to help municipalities and industrial manufacturers shift from disposing wastewater treatment by-products to generating renewable energy and other value from their streams. The acquisition of Monsal will enhance GE’s wastewater treatment product offerings and advance GE’s commitment to energy reduction in wastewater treatment.

**Verify Markets** has completed market research for the water

softener markets in China, Mexico, and India. This analysis details the emerging residential and commercial water-softening-equipment market. The study includes market sizing, market share by competitor, market share by end-user group, drivers, restraints, distribution trends, pricing trends, and quotes from industry participants. The base year of the study is 2013, and revenue forecasts are provided up to 2020. A copy of the research report, *Water Softeners Market: China, India and Mexico*, can be obtained at [www.verifymarkets.com](http://www.verifymarkets.com).

**Hatch Mott MacDonald** has been selected by the New York City Department of Homeless Services to provide services for renovation projects at adult and family residential shelters in Manhattan and the Bronx. Typical projects will include assessments of existing conditions, compliance with regulatory requirements, and compliance with environmental and land use requirements. Other projects will involve design of new heating, ventilating, and air conditioning systems; plumbing, fire protection, electrical distribution, and lighting systems; storm drainage systems; and landscape design.

**Horner & Shifrin** will provide design, bidding, and construction services for rehabilitation of the Rock Creek Public Sewer System in Imperial, Mo. The \$300,000 project will involve the lining of approximately 3,100 feet of existing 8-inch sanitary sewer lines with cured-in-place pipe (CIPP). CIPP is a trenchless technology that does not require excavation to rehabilitate a pipeline that is either leaking or structurally unsound. This allows urban and residential areas to remain undisturbed throughout the rehabilitation process. The project also calls for installation of 25 CIPP lateral connection seals and the interior lining of 31 sanitary personnel access covers.