RECYCLED WATER CASE STUDY

Biogen Idec

Use of Recycled Water in Cooling Towers

Biogen uses recycled water on landscape and in cooling towers, and nonpotable for water features.

Founded in 1978, Biogen Idec is a global leader in the discovery, development, manufacturing, and commercialization of innovative therapies. Patients in more than 90 countries benefit from Biogen Idec's significant products that address diseases such as lymphoma, multiple sclerosis, and rheumatoid arthritis. In 2008, Biogen Idec's total revenues grew 29 percent over 2007 to $4.1 billion. The company has approximately 400 employees at its San Diego campus and 4,700 employees worldwide.

"Potable water use is a huge concern at our San Diego site, especially during our third straight year of drought conditions, so Biogen Idec has actively sought ways to reduce our corporate water usage. Cooling towers, which provide cooling for heating and ventilation systems, are one of the largest single users of water at our facility," stated Jerry Vaddgo, Senior Engineer, Biogen Idec.

Biogen Idec's San Diego campus receives recycled water from San Diego's North City Reclamation Plant. The company has used recycled water for irrigation of its 42-acre campus since its inception in August 2004. Recycled water has been used in its cooling towers since November 2006.

The Connection Process

Since Biogen Idec was one of the first companies to employ the use of recycled water from the North City Water Reclamation Plant, there were a few "hiccups" in the plan check and permit approval process through the City. "Despite early procedural challenges and a few interruptions in service, we've been very pleased with customer service from the City of San Diego. We hope that

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our earlier experiences make it easier for future commercial customers to convert to recycled water," stated Jerry Yaddgo.

The basic steps needed to connect in the City of San Diego are:

- Obtain a work order number for plan check supporting the use of recycled water.
- Prepare design drawings and an engineering report.
- Complete design review and plan check.
- Complete required mechanical, electrical, plumbing retrofits and cross-connection testing of your system.
- Execute a user agreement with the City of San Diego.
- Install recycled water meter to establish service.

Yaddgo offered further lessons learned from his experiences working with the recycled water process, "Advance planning is crucial, so whether your facility is under construction or already exists, you need to consider several things."

Yaddgo pointed to the following key elements:

- Ensure that the cooling towers shell and water basin are made of stainless steel.
- Upgrade your chillers' condenser end bells to be epoxy-coated.
- Install dual water supplies for recycled / potable water blending for the cooling towers.
- Install potable water bypass connections at each building for ease of cross-connection testing.

Cooling Tower Operations

Biogen Idec staff found that blending potable and recycled water, especially during the early stages of conversion, helped avoid disruption to the system. They keep all potable water connections outside of the cooling tower unit which allows clear visibility to the required air gap. Biogen Idec utilizes advanced monitoring systems that allow real time water quality data acquisition, but anyone can manually monitor their water blend using very simple methods.

"We also have a bypass to each building so there is no need to completely shut the entire building down during cross-connection testing. Instead an above-ground hose from a fire hydrant is connected to the building in order to provide uninterrupted water service while the cross-connection testing is done," stated Yaddgo.

Water Usage

Two-thirds of every gallon of water used at the site is recycled. The cooling tower is currently blending 75% recycled and 25% potable. Biogen Idec will continue to look for opportunities to increase the recycled blend ratio in the cooling towers. For now, the company has been able to reduce its potable water usage by approximately 3 million gallons a year. The potable water cost per unit (748 gallons) is $2.91 and recycled water cost per unit (748 gallons) is $.80. "The cost savings is huge for Biogen Idec, and we know we have a reliable drought-proof water supply that is essential to our operations," stated Yaddgo. Biogen Idec's efforts in conserving potable water have led the company to qualify for the City of San Diego's Guaranteed Water Program during the Stage 2 drought restrictions.

Employee Acceptance

Biogen Idec employees are aware that recycled water is used on site with signage that is posted throughout the facility and at major building entrances. There are currently three staff members who have completed the required Recycled Water Site Supervisor training. All other employees working on water usage at the site have been trained and educated about recycled water use. Employees at the site have embraced the use of recycled water for irrigation and cooling towers to save natural resources and reduce the impact on the environment.

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