

MUNICIPAL News



August 2011

WATER, WASTEWATER, TRANSPORTATION AND MUNICIPAL SPECIALISTS

WHAT IS A RAIN GARDEN?

A rain garden is a landscaped, shallow depression that captures rain and snowmelt (stormwater runoff) before it can reach a storm sewer, nearby lake, stream, pond, river or wetland. Rain gardens typically are designed to intercept runoff from impervious surfaces.

HOW DOES A RAIN GARDEN WORK?

During heavy rains, water washes down storm drains from streets, rooftops, lawns, and parking lots. Once in the storm drain it eventually ends up in local waterways. Unseen pollutants such as pesticides, fertilizers, and petrochemicals which may have accumulated on streets and in lawns are often washed into local waterways. A rain garden's depression captures stormwater allowing it to percolate into the ground instead of pouring into the storm drain. As this captured water slowly seeps into the ground, pollutants are filtered out naturally by the plants and soil and recharges the groundwater table.

WHAT ARE THE BENEFITS OF A RAIN GARDEN?

- Reduces pollution to lakes, rivers, and streams
- Reduces flooding and erosion
- Recharges the groundwater
- Improves water quality for fish and other aquatic life
- Attracts birds and butterflies
- Beautifies the landscape
- Is a stormwater BMP that can help communities meet their stormwater permit requirements.

WHERE CAN I GET MORE INFORMATION

Contact Tom Ganfield at 262.763.7834 or visit the University of Wisconsin Cooperative Extension for *Home and Garden Clean Water Practices Fact Sheets*:

Rain Gardens: A Household Way to Improve Water Quality in Your Community <http://bit.ly/nXSIHe>

Rain Gardens: A How-To Manual for Homeowners <http://bit.ly/qMjN80>

Sustainability Takes Root at Baxter & Woodman!



The Baxter & Woodman Sustainability Committee facilitated installation of rain gardens at two B&W office locations. After careful planning, site and plant selection, B&W staff rolled up their sleeves and dug in!

Visit <http://bit.ly/nZJDX1> and <http://bit.ly/ntRh3c> to see videos of the rain garden plantings in action. Ever considered a rain garden in your own community? Sustainable Thinking. Let it grow on you. It is growing here at B&W!



ARTICLES

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Case Study

Pell Lake, WI

Baxter & Woodman
Consulting Engineers

Offices in:

Burlington, Wisconsin

Madison, Wisconsin

Crystal Lake, Illinois

Chicago, Illinois

DeKalb, Illinois

Grayslake, Illinois

Itasca, Illinois

Mokena, Illinois

Plainfield, Illinois

info@baxterwoodman.com

Emergency Response

A quick response in a critical time can make all the difference in the world!

COUNT ON US!

When your community's drinking water supply or wastewater treatment process is jeopardized, minutes count. On July 1, 2011, two Baxter & Woodman clients encountered challenging situations due to weather and equipment failure. B&W responded immediately to help these clients reinstate their services and get processes back up and running as usual. These are their stories....

Waukegan, Illinois

WEATHER REPORT JUNE 30TH, 2011

Severe thunderstorms moved south down Lake Michigan bringing high winds, large hail and heavy rain. Heavy damage was reported along the lake shore in northeast Lake County. A wind gust of 94 mph was reported at Waukegan Harbor.

The Waukegan Water Plant sustained a direct hit from severe storms. When the winds died down, Waukegan public works staff discovered damage to the roof of one of the water plant control buildings and the cover for the clear well. At first light, B&W's John Szwedo (aware of how damaging these storms were to the area since he resides in nearby Kenosha) set out for Waukegan to check on the facility. It was about this time that a call came in to B&W from Waukegan's Director of Public Works requesting operational and control assistance quickly. John was already on the way.

Once at Waukegan, John assessed the damage. The roof was partially torn off one building, and the cover for a clear well was completely torn off as well. Part of the SCADA system didn't work, and the security system was not operational. Waukegan staff temporarily tarped the roof that had been torn off while John dispatched other B&W staff members to assist with repairs to the SCADA system. Once the temporary tarp was put in place to protect the plant from further wind/rain damage, John and the staff built a temporary cover for the clear well.

By noon the SCADA system, along with the security system, was repaired and operational. John assisted staff with the final repairs to the clear well cover and then remained onsite for the rest of the day to ensure everything else was in order.



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"Baxter & Woodman's speedy response helped us **quickly assess the situation** and **formulate a gameplan** to get the plant operational as soon as possible to maintain a safe drinking water supply for our residents."

Tom Hagerty

City of Waukegan

Director of Public Works

Wood Dale, Illinois

The City of Wood Dale's wastewater treatment plant aeration system was not functioning due to pipe breaks. Without aeration feeding their system, it would become non-operational. The timeline below shows how the City, B&W and a local contractor pulled together to fix the pipe breaks and maintain aeration at the plant so the situation did not become critical.

06/30/2011

7:30 AM City staff discover an air line leaking. They divert flow and utilize excess flow tanks while repairs are made. The City uses concrete to repair the hole and completes the repairs by 5:00pm that same day.

07/01/2011

4:00 AM City staff reintroduces air into the line and another section of the line fails. Director of Public Works, John Kramer calls Baxter & Woodman requesting assistance.

6:00 AM B&W immediately contacts a contractor working on another B&W project at the nearby Itasca WWTP. B&W explains the situation at Wood Dale and requests Geoff Stocks of Williams Brothers Construction, Inc. take Jim Wendt from Tobin Brothers (Mechanical Contractor) to the Wood Dale plant and start making plans to install temporary piping above ground. They quickly agree to help.

7:00 AM Baxter & Woodman Resident Project Representative Jeremy Norton arrives on site to find the contractors on site and preparations for repairs underway.

7:00 AM – 11:00 AM The vertical steel pipe in the blower room is cut off and a flange is welded on. The existing air line is uncovered just upstream of the first aeration tank tee. The spigot side of the pipe appears to be in better condition than the bell side of the joint. The south exterior wall of the Blower Room is knocked out for the temporary piping to pass through.

11:00 AM-11:30 AM City staff discusses options with B&W and the contractor. The City hopes to install all new temporary air lines that day, but this approach is not feasible. The best option appears to be installing a new 24" ductile iron pipe above

"The **quick response** by Baxter & Woodman and the contractor was key to avoiding any interruptions to our wastewater services. B&W, the contractor, and the City worked tirelessly from sunup until after sundown to repair the system. **Great teamwork!**"

John Kramer

City of Wood Dale Director of Public Works

ground to where the existing pipe was exposed and connecting to the existing pipe. The rest of the temporary piping would be installed in the coming weeks. The City agrees with this plan and authorizes the work to proceed.

11:30 AM-9:00 PM Material arrives on site throughout the day. Approximately 60' of 24" pipe is run east into a 90° bend and another 60' of pipe is run south from there to a set of 90° bends. The connection to the existing pipe is made using the bottom 90° bend. Air compressors are connected to the tank air lines by way of the blow off lines to keep some air flowing throughout the repair process.

9:00 PM Air is re-introduced to the new and existing lines slowly by starting one of the small blowers first. The existing pipe has small leaks but holds up against the air pressure. An additional blower is started with no problems.

7/1/2011 – 8/1/2011

The City installs new ductile iron temporary piping to all of the tanks. None of the original ductile iron piping remains in use today.





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LEDS OFFER ENERGY AND COST SAVINGS



Night-time illumination of streets, bike paths and parking areas is a universal community need that requires manpower and dollars for installation, maintenance, and operation. Traditionally, high pressure sodium (HPS) and metal halide (MH) streetlights were installed to meet this need. Facing limited maintenance and operation budgets, more and more communities are looking to Light Emitting Diode (LED) technology for their lighting needs.

Advances in LED lighting technology are creating a viable option to HPS and MH streetlights. High-power LED streetlights are becoming available to meet desired street lighting properties. Additionally, LEDs use significantly less wattage than HPS streetlights to produce the same light output. LEDs last longer than HPS fixtures, cost less to operate, and cost less to maintain over their life span.

For more information contact Dan Durig at 608.277.1230. Interested in seeing LEDs in action? Visit <http://bit.ly/ngdaad> to view a YouTube video showing how Hammond, IN installed LEDs to save money and the environment.

See it on
YouTube

PELL LAKE REDUCES ENERGY COSTS

PELL LAKE, WI

The Pell Lake Sanitary District has provided drinking water to its 1600 customers since 1998. Water is pumped from each of two deep aquifer groundwater wells and is treated by ion exchange softening to remove barium. Static water levels in the wells have been steadily falling at the rate of about 5 feet per year, and, by 2008, pumping rates had to be throttled back to prevent the pumps from running dry.

Baxter & Woodman assisted Pell Lake with maintaining an acceptable water level in its wells by lowering the pumps in each well to be submerged and allowing the wells to return to full capacity operation. In anticipation of the continued decline of water levels in the wells, the pumps were lowered even further than originally anticipated. Additional stages were also added to the pumps in order to provide the necessary pumping head to overcome the increasing static levels.

While the pump modifications were being made to Well No. 2, additional improvements of the well were executed, including dynamite blasting, bailing, and compression/decompression exercising of the well. These additional improvements resulted in a 50 percent increase in the production capacity of Well No. 2.

In order to decrease the energy expended to bring the water supply to the service, well pump throttling valves that were previously used to control pumping rates were removed, and adjustable frequency drives (AFDs) were installed to control pumping rates by varying the operating speed of each pump. This modification to the pumping operation eliminated the energy loss suffered through the throttling valves.

RESULTS

The improvements to the wells were completed in December 2009. *Energy usage at the water treatment facility was decreased by nearly 40 percent*, from 427,900 kW-hr in 2009 to only 264,500 kW-hr in 2010, resulting in a savings of almost \$5,600 per year.

The cost to remove the throttling valves and install the AFDs and appurtenances totaled \$46,000. Pell Lake received a \$15,000 grant from Wisconsin's Focus on Energy Program to help offset the cost of these improvements. The grant money reduced the project's total cost to the District to \$31,000 resulting in a payback period of less than 6 years.

