



UTILI



GRAM

"Providing and Protecting Kenosha's Greatest Natural Resource ... Water"

November–December 2010



The Discovery CHANNEL Comes to the Wastewater Treatment Plant

Lights, camera, action! These words quickly came to mind as the camera crew for the Discovery Channel arrived at the Wastewater Treatment Plant, while being escorted by representatives from Centrisys Systems, Inc. (Centrisys). The purpose of their visit was to capture on film the new centrifuge sludge dewatering unit that was installed earlier this year at the Wastewater Treatment Plant. Centrisys is a locally owned and operated manufacturing plant that repairs and manufactures centrifuge decanting equipment right here in the city of Kenosha.

The new unit itself, operating under full load, was the star of the show. The camera crew deftly maneuvered their equipment around the centrifuge to capture it from a multitude of angles. Onlookers from the Wastewater Treatment Plant and Centrisys stood by to assist the crew in whatever means possible. Some of them were secretly hoping to get into the picture, while others did their best to avoid the camera altogether. The camera crew first climbed the platform surrounding the centrifuge to film the unit in operation. The crew then got a shot of the centrate (water being separated from the sludge) running alongside the activated sludge being fed into the unit for dewatering. There is a stark difference between what goes into the centrifuge and what comes out of it, and the crew was able to capture this difference on film. A Sewage Plant Operator responsible for operating the centrifuge, filled sample bottles with the centrate and activated sludge and then quickly grabbed a sample of the dewatered sludge. All three samples were placed side-by-side for comparison purposes. The crew then travelled downstairs to the area of the centrifuge building where the dewatered sludge is allowed to accumulate before being loaded into a dump truck and hauled to the landfill. Some of the dewatered sludge that had been processed using the older plate and frame filter presses was also stored in the same area; therefore the end results of both processes could be visually compared and captured on film by the camera crew. There is a huge difference between the two sludges. The sludge dewatered by the filter presses is much lighter in color than the sludge dewatered by the centrifuge. This is because it is composed of approximately 50 percent lime, thus giving it its lighter shade of color. The final trek for the camera crew was out to the final clarifiers for a video of the ducks swimming on the water. Earlier in the day, the Director of Operations for the Wastewater Treatment Plant participated in a live filming that was performed at the offices of Centrisys.

So what happens next? Should all of this film footage survive the editing room and get pieced together into a program, it will be aired on an upcoming episode of Discovery Channel's "How Does It Work".

The program is intended to shine a positive light on how centrifuges and the wastewater treatment industry in general are helping to clean up the environment. Stay tuned and we will do our best to let you know when the program will be airing. We extend a "heartfelt thanks" to the many employees who worked diligently to make this event a reality!



Improvements Made at the O. Fred Nelson Water Production Plant



New wrought iron fence installed at the Water Production Plant as part of the security enhancements project.

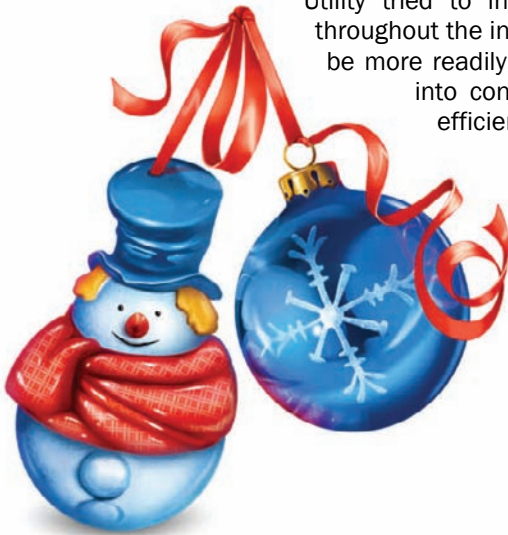
Recently, two major improvements were made to the Water Production Plant. Included in these improvements is a new wrought iron fence installed at the southeast corner of the plant. This new fence is shown in the photograph to the left, and is part of a larger comprehensive project to implement security enhancements at the plant. Earlier this year, the Utility removed existing asphalt paving adjacent to the plant and constructed a new traffic circle and some additional parking spaces along the road leading to the plant. Additionally, several landscaping improvements were made to the area. These included rubblizing the concrete slab along the harbor channel, placing topsoil over it and seeding the entire area with grass. All of this was done in

an attempt to minimize the flow of vehicular traffic in and around the plant and to especially preclude any vehicle from parking right up next to the building itself. The new wrought iron fence serves a major role in this regard. All that remains to do on this particular security enhancements project is to install some bollards and chain in two areas and finish landscaping the beach area behind the plant.

Another major improvement made at the Water Production Plant was to replace all eight existing boilers with two new larger, more efficient boilers. When the plant was first constructed, it utilized eight smaller package boilers to heat water that is circulated throughout the plant to heat the spaces within the plant. This was done as an energy savings measure. As temperatures decreased and the heating load at the plant increased, additional boilers would automatically be brought online as necessary to satisfy the demand for heat. Likewise, as temperatures increased and the heating load decreased, boilers would automatically drop offline to conserve energy. Eight boilers were required because at that time there was no way to modulate the boilers. In other words, they either ran full-on or not at all. Having several smaller boilers that could be turned on and off as the heating demand dictated was an excellent means of conserving energy. Today's modern boilers are able to modulate up and down within a large temperature range; therefore they are able to keep pace with heating requirements, while conserving the maximum amount of energy. For this reason, the decision was made to replace all eight boilers with two new high efficiency boilers with a total combined heating capacity of 2 million BTUs.

You can well imagine that replacing eight boilers with two would eliminate a whole lot of piping and other appurtenances. You can see from the photograph to the right how clean and less cluttered the new installation turned out to be. Where there once stood eight pairs of hot water supply and return pipes and eight pairs of intake and exhaust air pipes, now there are only two pairs of each.

The major driving force behind the Utility's decision to replace the boilers at this time was the fact that only five of the eight existing boilers continued to be functional. The boilers themselves are no longer manufactured and there are limited replacement parts available for making repairs. When selecting the replacement boilers, the Utility tried to identify boilers that are commonly used throughout the industry; therefore replacement parts should be more readily available. Of course, the Utility also took into consideration factors such as overall energy efficiency and reliability when selecting the replacement boilers. With winter now in its full throw, operators at the Water Production Plant can rest easier knowing that they have a reliable heating system with plenty of heating capacity.



We congratulate the Director of Water Production, for performing the necessary engineering work to design the aforementioned projects and for being the driving force behind their successful accomplishment!



Two new boilers replace eight existing boilers at the Water Production Plant.



1. Newly installed centrifuge in operation dewatering sludge.



3. Finished product—dewatered sludge ready to be hauled to the landfill.

2. Totes containing polymer—a key ingredient in the dewatering process.

Wastewater Treatment Plant Gives New Centrifuge a Whirl

Following a very tedious and time consuming installation process, the new centrifuge at the Wastewater Treatment Plant was finally placed into operation in November of this year. The centrifuge is being used in lieu of the existing plate and frame filter presses to dewater the sludge before it is transported to the landfill. In fact, a single centrifuge will easily do the work of three filter presses. One of the existing filter presses was removed earlier this year to make room for the new centrifuge. The Utility plans to keep the two remaining filter presses for the time being; however they will not be used nearly as much in the future.

Unlike filter presses, which utilize lime and ferric chloride to condition the sludge prior to dewatering it, the centrifuge uses an ingredient known as polymer to assist in the dewatering process. The polymer is specially formulated to separate the liquids and solids contained in the sludge. Centrifuges have an advantage over filter

presses in that they consume lesser amounts of chemicals to dewater the sludge. More than 50 percent by weight of the sludge that is dewatered by the filter presses is made up of lime and ferric chloride. With the absence of lime and ferric chloride in the dewatered sludge, nearly twice as much sludge can be hauled away to the landfill in a single truckload.

The new centrifuge was manufactured by Centrisys Centrifuge Systems (Centrisys), a Kenosha-based manufacturing company. It was installed at the Wastewater Treatment Plant as a joint effort between the Utility and Centrisys. Workers hired by Centrisys set the unit in place, while mechanics and electricians from the plant performed the necessary plumbing and electrical installations. Unit start up was performed primarily by technicians from Centrisys with some assistance from operators at the plant. Now that the unit is up and running, it will take some time to optimize its performance and determine the most efficient manner in which to

operate it. The Utility is also working with the landfill to ensure that new sludge being produced by the centrifuge will satisfy their requirements for land filling. Although it is still being put through its paces, the Utility is extremely pleased with the performance of the centrifuge thus far. If it lives up to expectations, it could save the Utility nearly \$500,000 per year in chemical, hauling and other expenses.

Once this centrifuge is fully operational, the Utility plans to install a smaller centrifuge in the Sludge Thickening Building to thicken the sludge prior to the dewatering process. This particular unit will replace four Dissolved Air Flootation (DAF) units that are currently being used to thicken the sludge. Centrisys hopes to perfect the process of using a centrifuge to thicken sludge with very little or no polymer required, and then market this technology on a large scale basis. Only time will tell, but the Utility is delighted to help out with the research and discovery process.



Specially designed dumpster removes sand and other debris from the aeration basins during cleaning.

This specially designed trailer was used by the Wastewater Treatment Plant to separate sand from water during the recent cleaning of the aeration basins. It is estimated that several hundred tons of sand were removed in the process. In years past, the sand would have been pumped back to the front of the plant only to return again.



Happy Holidays!

KWU

Out for a Joy Ride or Serious Business?

The Utility has miles of water and sanitary sewer mains that wind their way through acres of undeveloped properties on easements maintained by the Utility. Farmland comprises much of this acreage containing the water and sanitary sewer mains. In as much as water mains in these areas are buried beneath the surface of the ground and are out of sight and out of mind, they don't normally present any major challenges to the Utility. However the story is quite different for sanitary sewer mains buried in these areas.

Like the water mains, sanitary sewer mains are also buried beneath the surface of the ground; however they must be connected to manholes that rise above the surface at intervals of approximately 400 feet. These manholes are protected by heavy covers; however these covers can get dislodged, or even the manholes themselves can get damaged by farmers planting and harvesting their crops in these areas. The manholes can even get damaged by off-road vehicles navigating through these areas. When the manhole cover gets dislodged or the manhole itself gets damaged, it creates an opportunity for storm water to enter into the sanitary sewer system. This is especially true in situations where manholes are located in low areas where large

amounts of surface water typically pond during heavy rain events. If the amount of water flowing into the sanitary sewer becomes excessive, it can overwhelm the collection system, thereby causing it to surcharge and in some cases back up into nearby basements.

To preclude this undesirable situation, the Utility's Engineering Division performs routine inspections on the sewers that traverse these undeveloped properties to make sure that all of the manholes and their covers are still intact. Manholes found to be damaged or to have missing covers are remedied as soon as possible.

To save an awful lot of walking and lugging around heavy tools and equipment, the Utility opted to borrow a "Gator" from Parks Division to make this tedious and time consuming task a lot less difficult. Even though it may look like the Engineering Division employees were out for a joy ride, the truth is that what they were doing is serious business for the Utility. A little time spent in happy hunting for damaged manholes when the weather is still nice can give great peace of mind to many at the Utility in the time of a storm.

