

Jacobs Engineering's Carol Stream Water Reclamation Center, Carol Stream, IL



Serving Carol Stream since 1997, we take pride in the projects we deliver and are excited about taking the wastewater operations into the future. Jacobs leadership and dedication to quality service is evident by specific accomplishments and community involvement in Carol Stream.

WRC HISTORY

The Carol Stream Water Reclamation Center (WRC) is a conventional activated sludge plant permitted by the Illinois Environmental Protection Agency (IEPA) to treat a design average flow of 6.5 million gallons per day (mgd). The average daily

flow is currently 4.87 mgd, or 74 percent of the permitted capacity. The designed maximum flow of the plant is 13 mgd.

The plant was originally designed as a package plant in 1958 and has undergone major improvements in the 1990s and in 2002. The WRC provides wastewater treatment for approximately 40,000 residents and commercial industries within the Village of Carol Stream.

TREATMENT PROCESS

Influent wastewater enters the bottom of three primary screw pumps from the four interceptor lines and lifts the raw sewage

29 feet into the aerated grit tank. Each screw pump can pump 9,725 gallons per minute or 10 mgd. The grit removal system is aerated to provide for settling of heavy particles such as rocks, sand, pebbles, and coffee ground. The grit tank is 24 x 24 x 14 with a capacity of 60,000 gallons. Wastewater is sent through a finer screening process consisting of three rotating Hycor drum screens. These drum screens remove rags and floatable debris that remain suspended. These screenings are discharged to a dumpster and disposed of at a landfill.

Secondary screw pumps lift the wastewater an additional 14 feet to flow through aeration basins. The plant has

six aeration basins: three measure 40 x 130 x 22 with a capacity of 840,000 gallons each, and three measure 40 x 200 x 22 with a capacity of 1,300,000 gallons each. This is where the activated sludge process occurs.

Multi-stage centrifugal and high-efficiency turbo blowers force air through piping and membrane-type diffusers resulting in fine air bubbles at the bottom of the tanks. This provides mixing and oxygen to the biological process.

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Following aeration, the water flows into any of four secondary clarifiers. Each clarifier is 85 feet in diameter and 12 feet deep holding 500,000 gallons. The clarifiers allow the suspended solids from the aeration basins to settle to the bottom by gravity. The clear effluent on the top leaves the clarifiers over the weirs, and proceeds to tertiary sand filters. The solids on the bottom are removed by pumping to the digester for further treatment, or back to the aeration basin to keep the organism population strong for treating the wastewater that is always entering the plant.

The solids that go to the digester concentrate and thicken – the organisms keep feeding off any nutrients and each other until the sludge is stable.

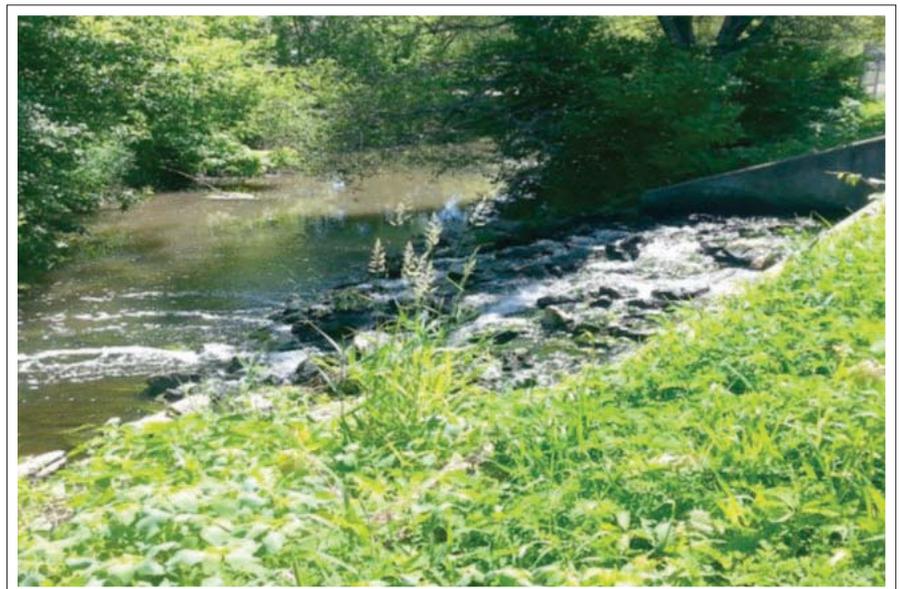
This is then pumped to the belt presses. A polymer is added to the mixture to enhance separation of the remaining water from the solids. The sludge-polymer mixture then enters one of two belt presses which dewater the sludge and return the water back to the head of the plant to go through treatment again. The sludge that has been pressed resembles soil, and is removed daily to offsite landfill for disposal. The belt presses operate 3-5 days per week.

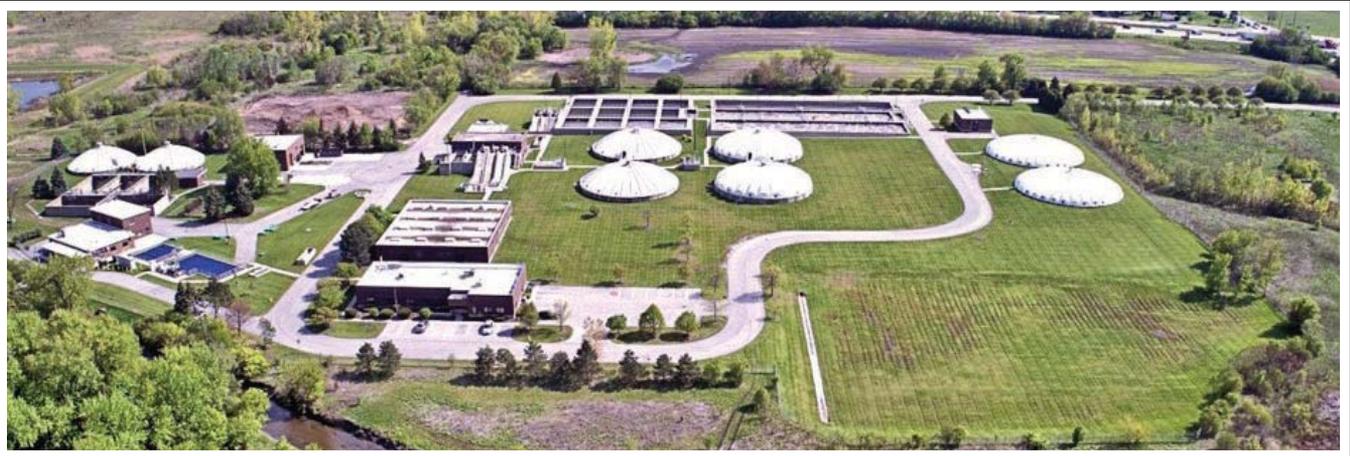
The water from the clarifiers flow into sand filters for the removal of remaining floatable solids. The sand filters were installed in 1991 and are a traveling bridge type with approximately 11 inches of sand media supported on a plate-type underdrain system. The water is injected with a 15 percent solution of sodium hypochlorite (chlorine bleach) and enters the filters where it drains through the sand and flows to the contact basins.

MAINTENANCE

Maintenance is performed on all equipment within the plant by the

Carol Stream team. We pride ourselves on our preventive maintenance as well as ability to perform corrective maintenance when necessary to keep equipment operating properly.





An extensive Condition Assessment was performed by the maintenance staff. This included using infrared thermography, vibration analyzers, temperature probes, and power/ampere meters. This data is tracked to aid the prediction of possible equipment problems and to help identify projects for upcoming capital improvement.

By taking a proactive maintenance approach, we can prevent breakdowns

or the loss of major components. For example, infrared scanners allow us to detect hot spots in electrical equipment that can result from frayed wiring, loose connections, corroded connections, or failing parts. Detecting and repairing these problems, usually at a slight cost, can prevent the total failure of an expensive electrical device. Vibration analyzers allow us to detect and record vibration histories for high speed pumps and motors.

This condition assessment process provides a picture (a snapshot in time) of asset health, provides asset remaining life values, and helps determine maintenance priority.

Coupled with the condition assessment procedure, is a risk analysis. This helps determine asset criticality and is a basis for selecting maintenance strategies and for determining condition assessment focus and frequencies.

COMMUNITY INVOLVEMENT

Our goal is to continue our growth in the Village of Carol Stream as a civic-minded organization, sensitive to the needs of our community. Our concept is to support local projects and embrace the community as it has so graciously embraced us. Our activities include:

- Annual Open House in October for residents. The open house includes guided plant tours, hay rides, touch-a-truck, exhibits from the Conservation Foundation and the Carol Stream Public Library, and free pumpkins for children.
- Teaching our future generations the importance of our valuable resource, water. Students learn about the WRC with tours, Earth Day activities, and stream water testing. [CS](#)

CONTACT US

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