



## PLANT PROFILE:

# Downers Grove Sanitary District

The Downers Grove Sanitary District (DGSD) was organized in 1921 under the *State of Illinois Sanitary District Act of 1917* when properties in the Village of Westmont were connected to the Village of Downers Grove sanitary sewers. Upon its formation, ownership of the Village of Downers Grove sanitary sewer system and disposal plant, which were constructed in 1904, were transferred to the District. In addition to the Village of Downers Grove and part of the Village of Westmont, the District's service area eventually expanded to include portions of Woodridge, Lisle, Darien, Oak Brook, and Lombard – all located in DuPage County, IL. Today, the District serves approximately 64,000 people which includes 20,000 residential, commercial, industrial, and institutional customers.

### COLLECTION SYSTEM

The District owns, operates and maintains all the sanitary sewers in its service area. The collection system consists of nine lift stations and approximately 250 miles of sewer, some of which are the original 1904 sewers. As identified in the District's Capacity, Management, Operation and Maintenance Plan or CMOM, the District cleans one fourth of the sewers annually, televises the sewers on a 13-year cycle, and invests at least 0.75% of the replacement value of the sewers back into the collection system annually in order to ensure the long-term sustainability of this asset.

Infiltration and inflow (I/I) is a chronic operational issue that is actively managed. The District's flow monitoring program provides information used to prioritize where I/I removal





The Staff of Downers Grove Sanitary District.

efforts should be concentrated. Early efforts to remove I/I were focused on public sewers. Through these efforts, which were not successful, the District determined that I/I removal from private property was necessary in order to guarantee success. In the early 2000s, the District updated its ordinances to provide the following customer assistance programs, which benefit the District by allowing access to private property to identify and eliminate sources of I/I:

1. The Cost Reimbursement Program for the Installation of Overhead Sewers or Backflow Prevention Devices offers financial assistance to the building owner by cost sharing with the owner to upgrade their plumbing to current requirements that will protect their building in the event of surcharging in the public main caused by a blockage or extreme weather. The program also benefits the District by eliminating the potential cost to the District from a damage claim by the owner due to a public sewer backup.

2. The Building Sanitary Service Repair Assistance Program is designed to allow the District to conduct repairs to defective service lines. Since the program's inception 21 years ago, 4,097 repairs have been completed, which represents approximately 20% of the connected buildings. Customer feedback on this program has been very positive.
3. The Private Property I/I Removal Program allows the District to perform corrective work on private property. Grouting, lining or replacing portions of the building service are measures that are performed by the District's contractors to meet its I/I removal objectives. I/I reduction projects which have included rehabilitation to both public and private sewers have successfully removed up to 65% of the I/I in comparison to previous projects which were focused on public sewers only and resulted in no I/I reduction.

## WASTEWATER TREATMENT CENTER

In 1922, the District constructed a new treatment plant and decommissioned the Village's plant. Construction began on the current Wastewater Treatment Center (WWTC) in 1954. Almost immediately after construction was completed, plans to expand were underway so that the 1922 plant could also be decommissioned. The WWTC underwent several major expansions through the early 1990s until it reached its current design average capacity of 11 MGD. Flows up to 22 MGD receive full treatment. With excess flow treatment, the WWTC has a peak capacity of 110 MGD.

Wastewater receiving full treatment is processed through bar screens, raw sewage pumping, aerated grit tanks, primary clarifiers, a single stage nitrification activated sludge plant with secondary clarifiers, intermediate clarifiers, sand filters, seasonal disinfection using sodium hypochlorite followed by dechlorination. Fully treated effluent is discharged to the East Branch of the DuPage River.

# PLANT PROFILE:



Biosolids distribution center.



DGSD's exceptional quality biosolids

Excess flow passes through the bar screens before being pumped to excess flow clarifiers, where it receives primary treatment and is disinfected before discharging to either the East Branch of the DuPage River or the St. Joseph Creek.

Primary sludge from the primary clarifiers is treated in a dedicated set of anaerobic digesters. Waste activated sludge (WAS) is thickened in a volute thickener and co-digested with grease in its own anaerobic digestion system. Anaerobically digested sludge is dewatered either in gravity sludge drying beds, by a belt filter press (BFP) or reed beds in lagoons.

A portion of the BFP cake is stockpiled in the drying beds while the rest is land applied on farms field as Class B biosolids. Sludge is aged in the drying beds for at least two years before being spread on a pad and dried further by turning it over with an auger for a few days. The resulting biosolids product is screened.

### BIOSOLIDS DISTRIBUTION PROGRAM

In 1981, the Illinois EPA permitted the District's Sludge Management Plan. The District's plan was unique for the time. Under the Plan, the District gave its sludge away for free to residents and landscapers for use as a soil

supplement in flowerbeds, on lawns, shrubs, hedges and other landscaping areas. The aged and screened biosolids meet the Class A pathogen requirement of the US EPA Part 503 regulations through testing for *Salmonella*, enteric viruses and viable helminth ova. In conjunction with the pathogen testing, the biosolids are also tested for metals to demonstrate that the District's biosolids are Exceptional Quality biosolids. Biosolids may be picked up by customers at the District's pickup station on Curtiss Street in Downers Grove. For orders three cubic yards or larger, the District will deliver biosolids within a reasonable distance from the WWTC.

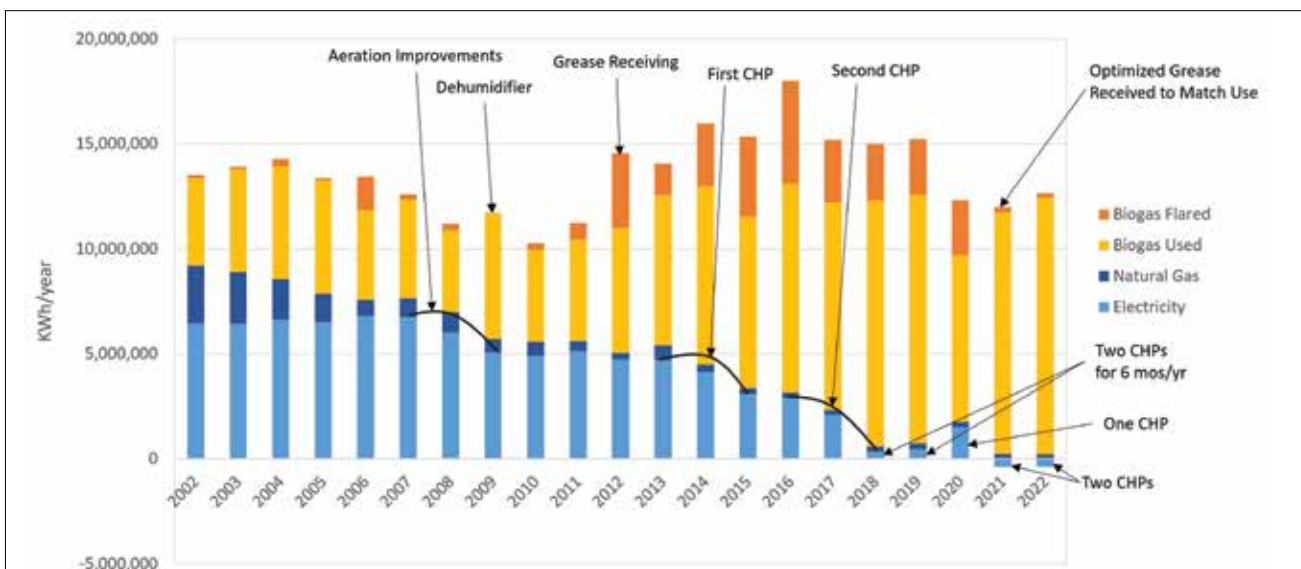


Figure 1: History of Energy Use at the DGSD WWTC.

## BECOMING A NET ZERO ENERGY FACILITY

The Downers Grove Sanitary District began its journey to make the WWTC a net zero energy facility in 2007, when projects to reduce energy consumption were identified. The first project focused on reducing the energy used for aeration of the activated sludge plant. The District installed fine bubble diffusers in the aeration tanks, a high efficiency turbo-blower and a dissolved oxygen (DO) control system. This provided a significant reduction in electricity consumption as shown by the drop-in electricity between 2007 and 2009 in Figure 1. Subsequent energy efficiency projects included lighting upgrades, geothermal/effluent water heat pumps for building HVAC, replacement of the natural gas fired desiccant dehumidifier with one that uses biogas, and replacement of the grit blower with a high efficiency blower.

In 2010, the District piloted co-digestion of restaurant grease trap waste in the anaerobic digester where the WAS is stabilized. The pilot was successful, and the District began co-digestion of WAS with grease trap waste and commercial food waste (collective called "grease") permanently in 2012. The WWTC digester gas or biogas production has more than doubled since it began co-digestion, as seen in Figure 1.

With the excess biogas being produced from the grease, the District was able to install its first combined heat and power (CHP) engine generator in 2014. The 280-kWe CHP used biogas to generate electricity, and waste heat from the CHP was recovered to heat the digesters. In 2016, the District's Board of Trustees passed a resolution to achieve and sustain the WWTC as a net zero energy facility. In order to realize this goal, the District installed a second CHP engine rated for 375-kWe in 2017. The WWTC successfully operated as a net zero energy facility for twelve months before the older CHP engine failed. The first CHP engine was replaced with a 375-kWe CHP in late 2020. The WWTC was a net zero energy facility for all of 2021 and 2022. As shown in Figure 1, the WWTC produced more electricity in 2021 and 2022 than it used. Excess electricity is purchased by the utility.

## DUPAGE RIVER SALT CREEK WORKGROUP

The District is a founding member and active participant in the DuPage River Salt Creek Workgroup (DRSCW), which is dedicated to managing the valuable stream resources of the East and West Branches of the DuPage River

and Salt Creek. While other wastewater treatment plants in IL have received phosphorus limits in their NPDES permits, the District was able to negotiate with IL EPA a schedule that provides additional time before implementation of phosphorus limits in exchange for active participation in the DRSCW to better understand the impacts of nutrients in the watershed and to help fund restoration projects in the receiving stream, with the goal of achieving the most cost-effective environmental improvements with limited available resources.

## DGSD COMMITMENT

For over 100 years, the Downers Grove Sanitary District has been committed to providing a better environment for the communities it serves. Today, the District has 39 employees across operations, maintenance, sewer system, laboratory, and administration. The District staff continues to be committed to providing the best possible service to its customers in an open and honest manner while protecting the environment and doing so as cost effectively as possible. [CS](#)

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