



# Village of Bartlett Wastewater Treatment Plant

From 1996 until July of 2012, Ron Johnson served as the Superintendent of Wastewater for the Village of Bartlett. During his tenure, the village received several awards and accolades including four conservation foundation Clean Water Awards, nomination for the Central States Hatfield Award, and the 2011 Illinois Section Operations Award from Central States WEA.

John Pullia (formerly of Glendale Heights) was appointed Superintendent of Wastewater in July of 2012, following Ron's retirement. John has 12 years of experience in operations and maintenance of treatment facilities. The remaining team members includes four Class I wastewater operators: Mike Wisniewski, Brig Palomo, Mark McCue, and Joe Hartray. These four individuals are responsible for day-to-day operations, laboratory process control and permit compliance as well as rotating

for on-call emergency response.

Maintenance team members include John Jancik, Larry Lynch, Brian Kopolous, Gary Tenut, Jason Schwartz and Mike Wulff. The maintenance team is responsible for 98 miles of collection system, 20 lift stations, and general equipment maintenance throughout the plant, which includes 24/7 response for collection system issues and wet weather events.

### Plant service area and background

The village is divided into three major basins. These three basins are served through an intergovernmental agreement between the village, Chicago Metropolitan Water Reclamation District, and the Fox River Water Reclamation District. The Bartlett Facility receives all flow from village residents that live within DuPage County.

The Bartlett Wastewater Treatment Plant service area includes approximately 8,139 acres. The plant provides treatment for a population equivalent of 29,430 with non-residential areas making up approximately 10%.

The plant was originally constructed in the early 1970s; however, major rehabilitation projects from the early 1980s and 1993 have replaced and improved the majority of the original equipment.

The average daily influent wastewater

**Table 1: Inflow (MGD) and Average Effluent Concentrations (mg/L)**

NPDES Monthly Average Limits (mg/L)		
BOD5	TSS	NH-N
10	12	varies 1.5-4



flow into the treatment plant from 2008-2010 was 2.36 MGD, with each year's average shown in Table 1. The design average flow for the plant is 3.68 MGD. In a wet weather event, the peak wet weather flow for the plant is 15 MGD, with 5.15 MGD of the flow receiving full treatment and 9.85 MGD receiving only excess flow treatment.

**Preliminary treatment**

Wastewater flows into a raw sewage pump system through a 48" interceptor sewer. The pumping system consists of three 125 hp dry pit pumps. A pumping capacity of 9.78 MGD can be achieved with two out of the three pumps running. A project is currently under way to upgrade the capacity of the pumping station to address wet weather flows

which operators have found to exceed 15MGD on occasion.

The raw sewage is then pumped through the headworks which consists of a fine, mechanical screen with capacity of 10,500 gpm and a scraped, Walker Process screw type grit conveyor designed to treat the projected Design Peak Hourly Flow (DPHF) of 5.15 MGD.

**Primary treatment**

From the headworks, wastewater either flows to primary clarifiers or to excess flow treatment.

The plant has four 61-ft by 16-ft rectangular primary settling tanks arranged in pairs. Each clarifier tank uses chain and scraper mechanisms at the bottom that convey settled sludge to the head of the hopper to be withdrawn to a common sludge pit. Under current loading condition, operators only run two out of the four primary clarifiers to provide adequate treatment. Daily monitoring reports indicate removal of 32% BOD5 and 58% Suspended Solids through this process.

**Excess flow treatment**

In a wet weather event, any flow above 5.15 MGD is diverted to the excess flow treatment system. The system includes a flow equalization tank, first flush holding, and an excess flow clarifier. In 2010, the plant received five excess flow events lasting a total of thirteen days. During this time, all effluent characteristics were in compliance with NPDES permit limits.

**Activated sludge**

Bartlett's WWTP utilizes a two-stage process for BOD5 and nitrification. The process includes aeration basins for BOD5 removal followed by intermediate clarifiers and packed towers for nitrification.

Primary clarifier effluent is blended with RAS to form mixed liquor where it is then

Table 2: Inflow (MGD) and Average Effluent Concentrations (mg/L)

Inflow (MGD) and Average Effluent Concentrations (mg/L)				
Year	Inflow	BOD5	TSS	NH-N
2008	2.40	3.2	2.2	0.13
2009	2.46	3.8	1.7	0.11
2010	2.26	4.8	2.0	0.06
2011	2.44	5.7	2.4	0.04

Over the past decade, effluent concentration samples of BOD5, TSS, and NH-N have all held continuous compliance with their monthly average permit limits.

NEENAH, WI  
920.751.4200

MACHESNEY PARK, IL  
815.636.9590

VALPARAISO, IN  
219.462.7743

Innovation & Trust

SINCE 1909

**McMAHON**  
ENGINEERS ARCHITECTS

WWW.MCMGRP.COM

distributed to four aeration basins. These aeration basins provide 80-90 percent of the BOD5 removal with a detention time at 3.68MGD of 7.5 hours.

There are two 85-ft diameter intermediate clarifiers with a hydraulic differential design. The design includes center feed and peripheral take-off, with an Envirex To-Bro mechanism that rakes bio solids to a center hopper.

The effluent flow is then pumped by submersible pumps from a wet well through a five-chamber diversion structure to two nitrification reactors or to by-pass pipes. The nitrification towers are of a Fixed Synthetic Media design with a 61.5-ft diameter and 16-ft media depth.

Under typical loading conditions, the aeration basins have been sufficient in removing the ammonia and nitrogen from the effluent wastewater, thereby rendering the nitrification towers unnecessary. However, as the plant reaches design loading, the use of these towers is required to meet NPDES effluent standards.

### Final clarifiers and tertiary filters

The effluent coming from the nitrification towers then flows to two final clarifiers where material which has sloughed off of the filter media is settled out.

Prior to disinfection, effluent from the final clarifiers is directed to four tertiary filters. These filters contain 30 inches of anthracite, which further polishes the wastewater.

### Chlorine contact tank

NPDES regulations require seasonal disinfection from May 1 through October 31. This process utilizes a sodium-hypochlorite solution which destroys any remaining harmful bacteria in the effluent. Sodium thiosulfate is then added for de-chlorination to meet permit limits.



Rob Johnson (R) passing on the torch to John Pullia

### Sludge stabilization

Raw sludge from the primary clarifiers and waste activated sludge are pumped to a system of eight aerobic digesters. In 2004, fabric covers were installed to increase heat retention allowing for improved digestion in cold weather months.

Once laboratory tests have determined the sludge has met volatile suspended solids standards, the sludge is pressed in a one-meter filter press. The resulting cake sludge is hauled away by an outside

contractor for land application.

The addition of a centrifuge is currently under way to improve efficiency of the plant's sludge removal process.

### Meeting permit limits

The Village of Bartlett's WWTP has consistently met NPDES standards regulating the quality of their effluent wastewater. Table 2 shows the plant's consistently low averages for significant effluent parameters. [CS](#)

A large graphic for Trotter and Associates, Inc. The top section features the company logo, which includes a stylized 'T' and 'A' forming a cross-like shape, with the text 'TROTTER and ASSOCIATES, INC. ENGINEERS AND SURVEYORS' below it. To the right of the logo, the text reads 'Planning, Design and Construction Engineering Services for Municipal Infrastructure' and 'Experienced Professionals - Better Solutions'. Below this, two columns of services are listed: 'Wastewater Engineering', 'Street and Parking Improvements', 'Municipal Buildings', 'Capital Improvements Planning', 'Utility Mapping/ GIS Data Collection', 'Topographic Surveys', and 'Construction Engineering' on the left; and 'Water Engineering', 'Stormwater Management', 'Public Works Facilities', 'Subdivision/ Development Review', 'Land and Route Surveying', 'Construction Layout', and 'Subdivision/ Development Review' on the right. The background of the graphic is a photograph of a wastewater treatment plant with several large rectangular aeration basins and walkways. At the bottom of the graphic, a dark blue box contains the contact information: '40W201 Wasco Road, Suite D', 'St. Charles, IL 60175', 'Phone (630) 587-0470', 'Fax (630) 587-0475', and 'www.trotterandassociates.com'.