

## PLANTPROFILE

### NAME:

Romeoville South Treatment Plant

### LOCATION:

Romeoville, Ill.

### PLANT SIZE:

4.5 mgd

### INFRASTRUCTURE:

In addition to the room housing the grit removal system, the plant has a pretreatment room, screening, four aeration tanks, four clarifiers, a seasonal disinfection system and monitoring composite samplers.



**TOP:** The village of Romeoville's grit building houses the Eutek HeadCell.

**MIDDLE:** The HeadCell is a modular, multiple-tray settleable solids concentrator that removes grit. The Romeoville installation consists of 14 stacked conical trays.

**BOTTOM:** Romeoville's Eutek SlurryCup and Grit Snail grit washing and dewatering system removes up to 4 cu yards of grit per day in periods of heavy rain.

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By Rebecca Wilhelm

# Protecting an Investment

*The village of Romeoville, Ill., modernizes wastewater treatment plants and installs system to keep grit from fouling new equipment*

Romeoville, Ill., a southwestern suburb of Chicago, is one of the fastest-growing communities in the state. Two wastewater treatment plants, the North and South plants, have operated since the 1950s to serve the community, now with a population of almost 37,000.

### Consolidation & Improvement

With the population continually growing, officials recently began an effort to improve operations. The ambitious improvement project called for approximately \$25 million of upgrades. The North plant would handle solids treatment while the South plant was designated for wastewater treatment.

New equipment installed at the South plant included: a new influent screen building, a raw sewage pump station with two new clarifiers, four new aeration basins, UV disinfection processes, new blowers for the aeration system, a new generator and a new RAS/WAS lift station, returning sludge from the clarifiers to the aeration tanks.

As part of the improvement project, the South plant also implemented grit removal, a new process for Romeoville.

Since the project called for the installation of so much new equipment, it made sense to remove grit to increase the system's life and maintain the full capacity of the aeration tanks and digester, according to Robyn Doescher of Baxter & Woodman Consulting Engineers of Crystal Lake, Ill., which consulted with Romeoville on the consolidation project. "We saw this as an important piece of the project," Doescher said.

The ideal solution would separate grit from the waste stream, then wash and dewater it to make disposal easy.

Baxter & Woodman heard positive feedback from others in the Chicago area about the combination system of the Eutek HeadCell, Eutek SlurryCup and Eutek Grit Snail from Hydro International's wastewater business in Hillsboro, Ore., and settled on this. The Eutek HeadCell is a modular, multiple-tray settleable solids concentrator that removes coarse and fine grit with minimal headloss.

"We talked with several operators, and they were all very happy with the removal they were getting," Doescher said. "They said the organics were being separated from the inorganics very efficiently, the systems were functioning properly and the downstream process equipment was being protected."

### Comprehensive System

The high-efficiency flow distribution header in the Romeoville installation evenly distributes influent over 14 stacked conical trays. Tangential feed establishes a vortex flow pattern where solids settle into a boundary layer on each tray and are swept down to the center underflow collection chamber.

The system captures very fine particles due to the large surface area and short settling distances. Evenly split flow eliminates thermal short-circuiting,

which can reduce the performance of conventional grit basins. It is designed to handle a maximum flow of 20 million gal per day (mgd) with a maximum headloss of no more than 12 in.

Settled solids are continuously pumped to the SlurryCup and Grit Snail grit washing and dewatering system. The SlurryCup uses a combination of an open free vortex and the boundary layer effect to capture, classify and remove fine grit, sugar sand, snail shells and high-density fixed solids from grit slurries and both primary and secondary sludge. It separates organic content from grit and returns it to the plant process stream for treatment, which reduces objectionable odor and reduces the volume of grit hauled to the landfill.

Grit and fine abrasives are then discharged into the Grit Snail dewatering device, where particles settle onto a slow-moving escalator belt of stepped cleats, and are quiescently raised from the clarifier pool so that fine grit is retained. Degritted water flows out of the clarifier via an overflow weir, and dewatered abrasives are carried to the top of the Grit Snail, where they are discharged into a disposal container for landfilling.

### Performance

The HeadCell is designed to remove 95% of grit down to 100 microns in size at peak hourly flows of 15 million gal per day with a maximum headloss of no more than 8 in.

"The HeadCell removes even more grit at lower flow rates," said Carl Fisher, P.E., wastewater department manager with Baxter and Woodman. "In other words, the HeadCell's performance stays at or above its rated grit removal at all flow rates, which was a key selling point."

The SlurryCup and Grit Snail also provide superior performance, according to Fisher. "At the installations we visited for our due diligence, we found clean, dry grit with little odor," he said. "Other manufacturers' units produced wetter grit with a heavy organic content and much odor."

Since installation in late 2007, the system has been removing grit at a steady pace, taking out 2 to 3 cu yards per day in dry weather and up to 4 cu yards per day in periods of heavy rain. The removed grit is clean and dry, without a high amount of foul organics attached.

"It does a good job," said Doescher, who still works closely with plant operators. "You get a cleaner, dryer product than you get with most grit-removal systems. It makes handling easier and reduces odors. The odors can be strong in some grit buildings, but this appears to be doing an excellent job." WWD

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