

# Water management miracle

**TOWNSENDS' PITTSBORO, N.C. PLANT CAN NOW ADD A SECOND PRODUCTION SHIFT BECAUSE OF ITS ABILITY TO RECYCLE ITS WASTEWATER**

**By Joshua Lipsky, senior editor**

**E**ighteen months ago, the Townsends plant in Pittsboro, N.C., was placed in a very difficult position. The plant was severely handicapped from a lack of water and its ability to dispose of its waste process water; therefore, the plant wasn't processing as many birds as Townsends wanted. Many plant employees feared their plant would close.

"It had been an escalating problem, especially since HACCP compliance resulted in us using 30 percent more water," says Chuck Dix, president of the Georgetown, Del.-based chicken processor. "We were using almost 60 percent of the town's water. It wasn't good for the city, and it wasn't good for us."

Faced with a difficult situation, Dix and Bill Baker, the complex engineer for the Pittsboro plant, began looking for solutions to their water situation.



**In a dissolved air flotation machine, particles in the waste water process coagulate and expand. Sludge forms and moves to rendering, and pipes transport the water to the lagoon.**

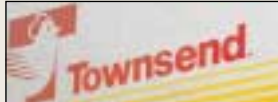




**Water remains in the lagoon for about 60 days. Water is then filtered and ozonated before it is piped through to the plant's 1 million gallon holding tank.**



## AT A glance



**COMPANY:** Townsends

**ANNUAL SALES:**  
\$287.5 million

**PLANT LOCATION:**  
Pittsboro, N.C.

**OPENED:** Plant built in 1950,  
purchased by Townsends  
in 1986

**SIZE:** 90,000 square feet

**PLANT CAPACITY:**  
70,000 chickens daily

**PRODUCTS:** Whole birds,  
cut-up, deboned

water recycling system. USDA participated in the development process and green-lighted the new system.

"USDA was very cooperative throughout the development process," says Baker. "USDA has become much more accepting of wastewater technology because the technology has really come a long way. It was very obvious from the beginning USDA wanted us to succeed."

### The recycling process

Water recycling and management programs had been introduced to the marketplace, but the bulk of those systems would just reclaim water from the chillers, bird washers and scalders. Simply reusing that water would not have been cost-effective, so Baker began looking for a water recycling program that would recycle all the water from the plant.

Plant executives decided to create an off-site water-recycling location, thereby allowing Townsends to build its recycling process more affordably, with a larger scale operation, that would allow the plant to recycle more water. Partnering with Poquoson, Va.-based Zentox, Townsends was able to create the first-ever complete plant

Under the new system, wastewater from all parts of the plant flows through green pipes (USDA requires color-coded pipes to identify those carrying wastewater versus recycled water) into a holding tank. In the holding tank sulfuric acid adjusts the pH. The holding tank also ensures a more consistent flow of water throughout the recycling process.

As with any physical/chemical wastewater treatment system, following the equalization tank, the water goes through a flocculator on its way to the dissolved air flotation (DAF) machine. In the flocculator, ferric sulfate is added as well as anionic polymers so the particles in the water can coagulate and expand. The DAF shoots air through the water so

## **DURING OZONATION AND THE TWO-STEP FILTRATION PROCESS (BAG AND SAND FILTERS), THE PLANT'S WATER DROPS FROM 100 NTU TO 1 NTU.**

solid particles can rise up, form sludge and be scraped off. After separating the liquid from the solids, the water is piped to the lagoon and the sludge goes to rendering.

The water remains in the lagoon for about 60 days, during which its nitrogen and BOD content reduces. Prior to the new recycling process, wastewater was piped directly to the lagoon and subsequently through Townsends' irrigation system where it would water the plant's 146-acre spray field.

From the lagoon, water flows to the recycling plant where the coagulation process begins. The process consists of two stages, the rapid mix and the slow mix zone. During these two stages, more particles in the water expand and join and are removed. Once coagulation ends, the filtration and disinfection process begins. First, the water goes through primary filtration using sand. After the sand, the water flows into bag filters for secondary filtration. After the sand and bag filters, the water goes through an ozonation process for disinfection. It's during these three steps that the water goes from 100 nephelometric turbidity units (NTU—a measure of suspended contaminants in water) to 1 NTU. According to USDA standards, potable water has 1 NTU.

After the water has been filtered and disinfected, chlorine

is added to prevent subsequent contamination before re-entering the plant via a purple pipe line into a 1 million gallon tank.

Townsends' water reuse facility can process about 500 gallons of recycled water per minute and the plant uses 500,000 gallons of recycled water each day.

The recycled water is used primarily before the birds go into the chiller (which also uses recycled water) and during clean up. Per USDA requirements, water from the city supply is used for the final rinse. While the recycled water tests as potable, water from the city supply also is used at all the drinking fountains.

### **Contract recycling**

Townsends decided to hire Zentox as its contracted water recycling manager. Supplier outsourcing is a trend that began in the sanitation area of the plant and has now expanded to include labor and water

management.

"Utilizing Zentox as contract employees to service our water concerns was really a no-brainer," Baker says. "We didn't want to have to train our chicken guys to become water guys. It was much easier to bring in water experts specifically to do this."

### **Looking ahead**

Townsends' decision to recycle its wastewater has proven successful. Other poultry producers have begun to explore using similar systems and Townsends is thinking about incorporating the technology at its other plants in North Carolina and Arkansas.

"It really is remarkable what we've been able to achieve at the Pittsboro plant," Dix boasts. "Eighteen months ago the future of this plant was uncertain, and now we're discussing adding a second shift. There's no way that would have been possible without water recycling."

**Poultry**

## **KEY findings**

- Townsends was forced to search for an alternative to using 60 percent of the city's water supply.
- Partnering with Zentox, Townsends created the first ever complete water recycling process.
- Using a combination of coagulation, sedimentation, ozonation and chlorination, Townsends now recycles 500 gallons of wastewater per minute.