



*Advancing Water Treatment With  
Responsible Innovation™*

## **Case Study: Wastewater Lagoons, Severe Odors**

### **INTRODUCTION:**

A small city in Illinois had a severe odor problem. The city itself had become known for its odor which could be smelled some days for miles around. A new mayor had in fact been elected based on his promise to get rid of the odors.

### **INVESTIGATION:**

An investigation with United's wastewater specialists found that the primary source of the odors was a series of lagoons that were fed exclusively from a Canning Plant. The combined content of the lagoons was about 22 million gallons.

Having been in service for many years, no one knew the original designed depth of the lagoons. The influent varied from 100,000 GPD to as much as 400,000 GPD. The BOD also varied from 1,000 mg/L to 4,000 mg/L. The variance in influent levels came from the type of product being canned. Depending on what type of product was being canned the pH levels in the wastewater were also affected. Canning of baked beans or tomato sauce could lower the pH to 5. Further complicating the situation is that the lagoons are over one mile from the plant. Enroute to the lagoons, the wastewater flows through a forced main to a 100,000 gallon aeration basin and then directly to the lagoons.

Odors were coming from the end of the forced main and all of the lagoons had gone anaerobic. Sludge levels measured in the lagoons varied from 4 – 6 feet thick. These sludge levels reduced the treatment capacity of the lagoons by an estimated 67%.

### **IMPLEMENTATION:**

Treatment was approached from two angles:

1. BOD/COD strength had to be reduced in the forced main to reduce the high levels of H<sub>2</sub>S and liquidize the waste coming through the main. The following products were put to use:
  - **United 529 OXY ODOR ELIMINATOR** – To control odors and reduce BOD.
  - **United 55 IMPACT Granules Living Bacteria** – To add aerobic and anaerobic bacteria to decompose organic waste.
  - **United 893 KONVERT-A-ZYME Wastewater Control and Degassing Agent** – To reduce odors and catalyze the breakdown of the waste.
2. The sludge and H<sub>2</sub>S levels within the lagoons needed to be reduced, while converting the lagoons from an anaerobic digestion to facultative digestion. The following products were put to use:
  - **United 84 WWTP Freeze-Dried Bacteria with Enzyme Implant** – To increase the biodegradation of the organic waste buildup and increase digestive capacity.
  - **United 484 BIO-MASS BUILDER for WWTP** – To provide a blend of different bacterial cultures to boost performance and the bio-mass.

**RESULTS:**

Within the collection lines, BOD/COD were reduced by as much as 75%. The H<sub>2</sub>S levels here were reduced by as much as 83%.

Within the lagoons, sludge reduction results were between 30% and 60%, depending on the VOC content in the sludge which varied throughout the lagoon system.

The treatment program gained control of the odor issue from the forced main quickly. The lagoon system to a number of months to overcome the massive VOC (BOD/COD) content of the sludge, but it too was vastly improved.

**CONCLUSION:**

While the city was largely concerned with addressing only the lagoons, the investigation with United's specialists provided them with a two-tiered approach that included the forced main directly in town to more quickly address the odors where they first started to develop in the lines. The continued treatment at the forced main directly impacts the capacity and helps to limit the sludge buildup when that wastewater reaches the lagoons.

With that and the balance that has been returned to the lagoons, complaints about odors were drastically reduced.

