

## President St. Water Reclamation #2 Thickener



The President St. Water Reclamation facility treats wastewater from the greater Savannah area. The treatment process consists of headworks treatment systems, primary treatment system, secondary treatment systems (biological treatment), and disinfection.

In order for the facility to maintain its biological treatment systems, several components work in unison.

1. The biological system needs food. The food source is the incoming wastewater. The incoming wastewater contains items such as sand and plastics that do not benefit the biological system. Therefore, they must be removed. This occurs at the headworks system of the plant by screening and grit removal.
2. The biological system needs air. This is accomplished by blowers that take ambient air, compress it and diffuse it in the secondary treatment system.
3. The population of the bacterium must be maintained. Through process control calculations, Mean Cell Residence Time, it is determined how much bacterium must be maintained in the process to achieve adequate treatment. As a side stream treatment process the excess bacterium is wasted to the solids handling system.

### **Solids Handling System**

The solids handling system is a critical component to the overall process control of the President St. Water Reclamation Facility, as it is at any biological facility in operation.

Once calculations are made to determine the amount of bacterium to “Waste” from the system, adjustments are made to direct the excess flow to the facility’s Gravity Thickeners.

### **Gravity Thickeners**

Gravity thickeners are tanks that are designed to slow the flow of the bacterium in suspension. This allows settling to occur. As the bacterium settle they become more compressed “thicker” and are ready for conditioning. The thickener mechanism design incorporates “pickets” which slowly travel through the compressed material and release excess nitrogen which inhibits the settability of the organisms.

Gravity thickeners also receive flow from the primary treatment process. Once the incoming flow passes through the head works it travels to the “Primary Treatment” system. This system removes any readily settleable solids and floatable solids (Fats, Oils, and Grease). The settleable solids generally have no benefit the biological treatment process and are pumped to the Gravity Thickeners.

### **President St. Thickener Condition**

Both thickeners in use at the President St. Water Reclamation Facility were designed and installed in the mid 1970’s. Both units were maintained and operated by Water Reclamation Department. Most equipment in a wastewater treatment facility operates under the most extreme conditions. As a result structural and mechanical equipment have a finite life expectancy.

In 2017 the center column of the #1 thickener collapsed. This caused a catastrophic



failure of the entire mechanism. Parts were ordered and the #1 thickener mechanical mechanism was replaced. However, parts for these units are not readily available. Parts are placed into production once the order has been place. Therefore, the # 1 thickener was out of service for roughly 9 months. President St. operations was able to meet permitted parameters as outlined by the Georgia Environmental Protection Division during the outage. However, the

performance of the plant suffered. Another adverse effect of the limited thickening ability was the efficiency of the solids handling system.

After the failure of the #1 thickener plant staff performed a thorough evaluation of the #2 thickener system as both units were placed in service in the mid 1970's. Similar issues were noted with the #2 thickener as found to cause the failure in the #1. Operations staff began the process of procuring the components for the #2 thickener **before** the unit catastrophically failed.

