TRINITY RIVER AUTHORITY OF TEXAS

DENTON CREEK
REGIONAL WASTEWATER SYSTEM

INNOVATIVE WASTEWATER TREATMENT

FACILITY TOUR - OCTOBER 25, 2006

Awards

AMSA

Gold	Silver
1997	2000
1998	2002
1999	2003
2001	2004
2005	

Texas Safety Association Award of Merit

1997
1998
2001
2003
2004

Award of Achievement

2002

Bowen, Miclette & Britt, Inc. Excellence In Safety

1999

The Denton Creek Regional Wastewater System (DCRWS) includes 25 miles of interceptor pipelines and a 5.0 MGD wastewater treatment plant located on a 48 acre tract of land north of the City of Roanoke.

Within the City of Fort Worth service area are two major industrial wastewater sources: Alliance Airport and the Texas Motor Speedway.

Alliance Airport is an intermodal industrial facility that was the first of its kind in the nation. It provides commercial air service to many industries, distribution centers and commercial establishments located adjacent to the airport.

The Texas Motor Speedway opened in 1996 and hosts five to six race events per year. During the semi-annual NASCAR race, 250,000 people attend the week-long event. On a race day, the plant will see influent ammonia concentrations above 100 mg/l. The plant provides advanced secondary treatment, effluent filtration and disinfection of the wastewater to meet stringent treatment limits.

The DCRWS plant serves areas of
Fort Worth
Haslet
Roanoke
Southlake
Keller
Northlake
Flower Mound
Westlake
and
Circle T MUD
No. 1 and 3.

INTERCEPTOR SYSTEM

The DCRWS includes 25 miles of interceptor pipelines varying from 15-inch to 36-inch diameter. There are three major interceptors in the system. They are:

- the Denton-Henrietta Creek Interceptor
- the Cade Branch Interceptor
- and the Denton Creek Pressure System.

DCRWS operates two lift stations and 13 meter stations.

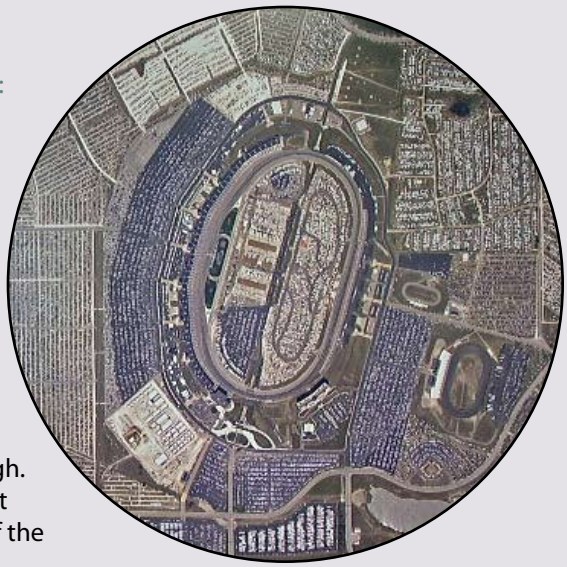
TREATMENT FACILITIES

Denton Creek utilizes three separate activated sludge single-stage nitrification processes followed by effluent filtration and ultraviolet disinfection to treat wastewater. Waste solids are pumped to a sludge holding tank and are dewatered by a belt press.

The facility is designed to achieve effluent limitations of 7 milligrams per liter (mg/l) carbonaceous biochemical oxygen demand (CBOD) from June to November and 10 mg/L CBOD from December to May; 15 mg/l total suspended solids (TSS), 6 mg/l dissolved oxygen (DO), and 2 mg/l ammonia nitrogen in the summer and 5 mg/l in winter.

Raw wastewater flows by gravity from the interceptor systems to two influent pump stations. The influent pump stations lift the incoming wastewater from the interceptors to the Preliminary Treatment Unit for the removal of large objects, plastic material, and rags. These items are removed by the use of two mechanically cleaned fine screens and one manually cleaned overflow screen. Screenings are dewatered in a compactor/conveyor located under the fine screen discharges and deposited in a waste container. Following the fine screens, the flow is directed to two grit removal units. Grit is pumped from the grit units to the grit cyclone and classifier, which discharges the washed grit into the same waste container as the screenings.

SECONDARY TREATMENT



The raw wastewater is then sent to one of the three possible treatment streams: conventional activated sludge, sequential batch reactors or to the detention basin.

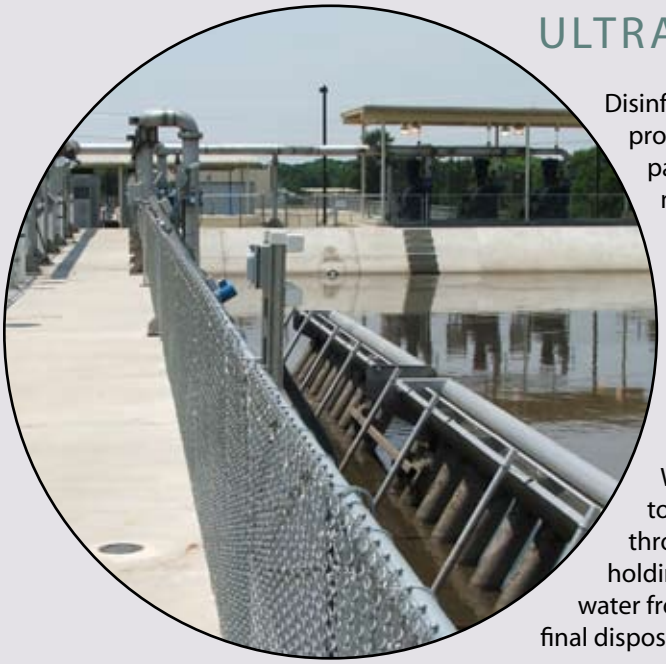
The original plant consisted of the conventional system, which includes two secondary treatment structures. Each secondary treatment structure includes two aeration basins and two rectangular final clarifiers. In the aeration basins, the incoming wastewater is mixed with the activated sludge organisms and aerated to achieve nitrification. Aeration is accomplished using fine bubble ceramic diffusers and multistage centrifugal blowers. In the final clarifiers, the activated sludge settles to the bottom and the clarified effluent overflows the weirs to the filtration system. Floating sludge collectors siphon the sludge from the bottom of the clarifiers and discharge it to the return activated sludge trough. Air lift pumps transfer the return activated sludge to the aeration basins influent where it is mixed with incoming raw influent. Waste sludge is pumped to one of the two sludge holding tanks.

The detention basin was constructed in 1995 to treat wastewater from the Texas Motor Speedway. The basin is designed to treat the daily race event flows and discharge overnight. This system is a modified SBR with a one day cycle time. Flows to this unit can be treated and released from the basin to either the effluent filters or to the aeration basins for additional treatment. The detention basin also provides peak flow storage.

Two traditional SBRs were added in the next expansion to 5.0 MGD. The SBRs are responsible for treating one half of the flow at the facility. The treatment units are a self-contained activated sludge system with aeration and clarification occurring in one basin. An equalization basin and relift pump station was provided to dampen the discharge flows from the SBRs to improve the treatment performance of the downstream units.

EFFLUENT FILTRATION

Effluent from the three secondary treatment processes are sent to the effluent filters to remove fine suspended particles. Two types of filtration equipment are utilized: traveling bridge automatic backwash filters and cloth-media disk filters. The traveling bridge filters include two-single media filters and two dual-media filters. The fine solids are trapped in the media and removed in by the traveling backwash mechanism. The cloth filter unit utilizes twelve rotating discs covered by a fine cloth that traps the suspended particles and allows the filtered water to flow through the unit. The particles are removed in a backwash process that effectively vacuums the solids from the cloth using submersible pumps. The effluent from the filters flows to the disinfection process.



ULTRAVIOLET DISINFECTION

Disinfection by ultraviolet radiation (UV) is the final step in the treatment process. There are four banks of lights for achieving the required pathogen kill. Each bank contains twelve modules with eight lights per module. The lights are low pressure, high intensity bulbs. By disrupting the DNA structure of the microorganisms, the UV accomplishes disinfection without altering the physical or chemical properties of the treated water. Effluent flow is measured by a Parshall flume prior to discharge to Cade Branch and then Denton Creek.

SOLIDS HANDLING

Waste activated sludge from the secondary treatment units is pumped to two sludge holding tanks for storage, aeration, and thickening through decanting. The concentrated sludge is pumped from the sludge holding tank to a one-meter belt press that squeezes the majority of the water from the sludge. The dewatered sludge is stored on a concrete pad for final disposal at a municipal landfill.

For more information, contact:

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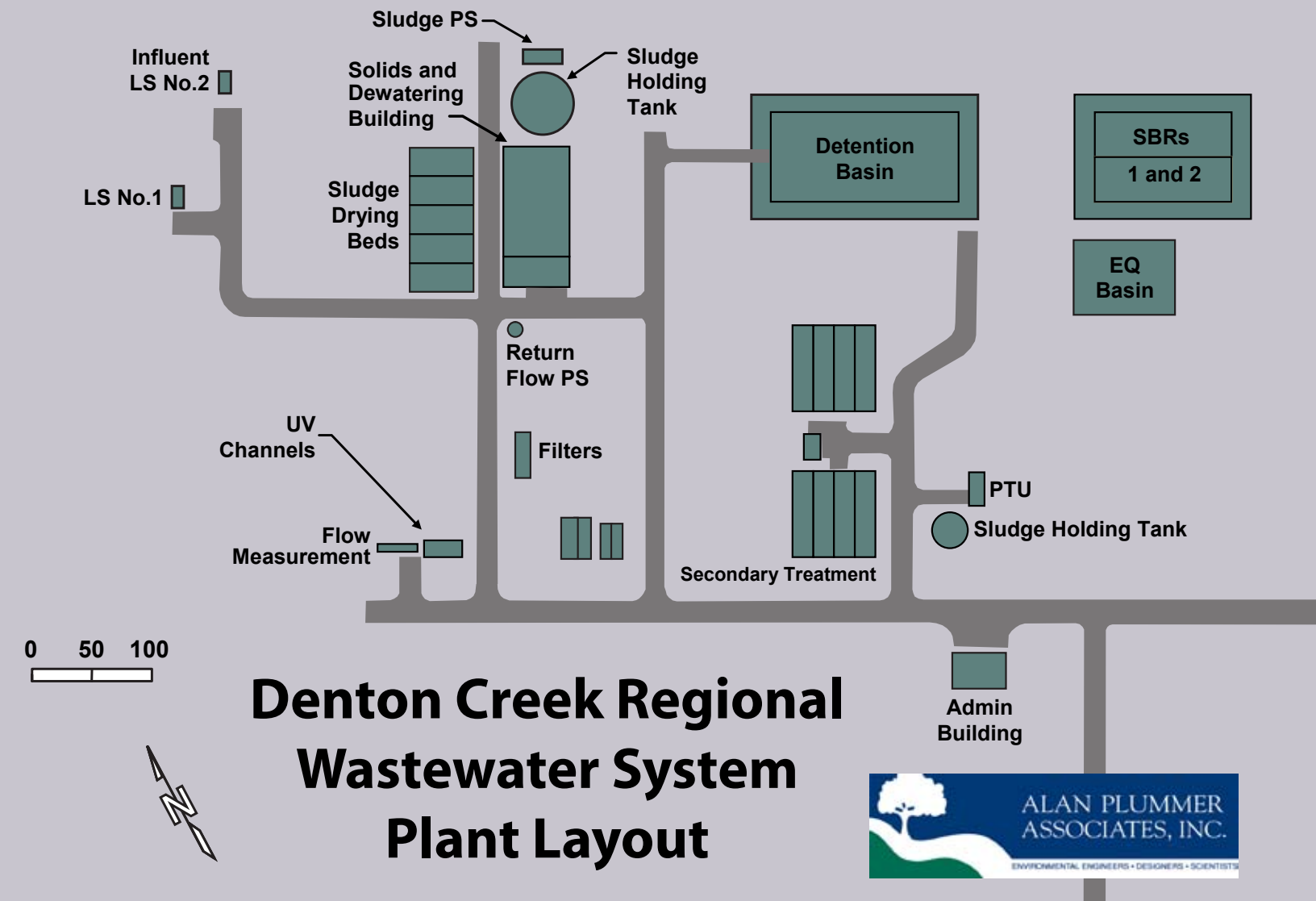

Denton Creek Regional Wastewater System Plant Layout

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