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## Water Pollution Control Plant

The City of Davis Water Pollution Control Plant, originally constructed in 1970, provides primary and secondary treatment by oxidation ponds and overland flow. The plant was modified in 1980 by the addition of an overland flow treatment step and again in 1989, with a new chlorination/dechlorination system. The plant is now designed to treat an average dry weather flow of 7.5 M.G.D. (million gallons per day) and a peak wet weather flow of 12.6 M.G.D.

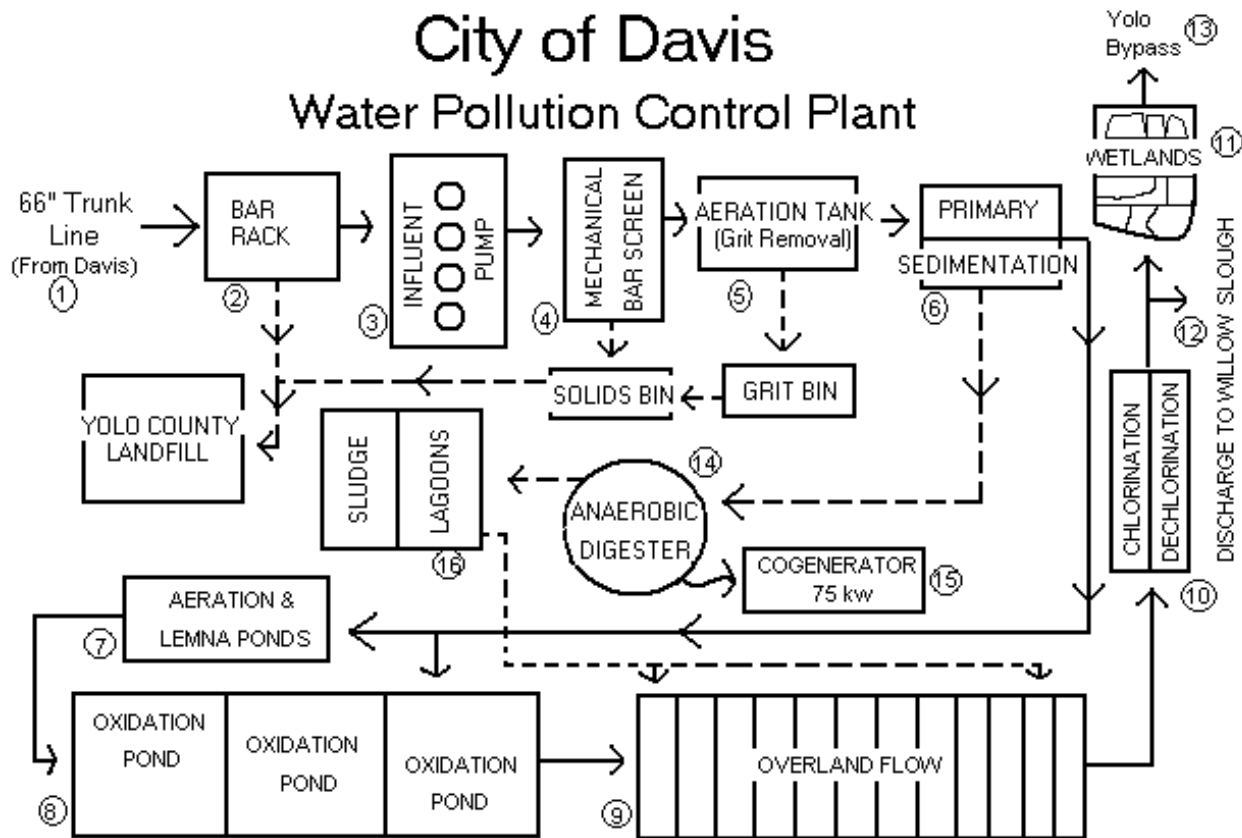
With 320 acres of vegetation and ponds, the site has become a habitat for many forms of wildlife. The City has posted the treatment site as a wildlife refuge.

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### 66-Inch Trunk Line (1)

Raw sewage from the Davis area is collected by a 42 and 48 inch trunk sewer. It is then increased to 66 inches and terminates 3 stories below the influent pumping station structure.

### Bar Rack / Wet Well (2)

A galvanized steel bar screen, with bars spaced six inches apart, extends on an angle from the influent channel floor to the wet well floor elevation. The screen is to prevent the passage of large objects into the pump suction piping.

### Influent Pumping (3)

Wastewater from the wet well influent channel flows through the suction piping to the bottom inlet of the raw sewage pumps. The pumps discharge to a force main which passes through the motor room, control room, and ends in a 36-inch circular weir at the mechanical barscreen channel. The influent pumping station utilizes four 75-horsepower pumps, with a pumping capacity of 6 million gallons per day per pump.

#### **Mechanical Barscreen (4)**

The raw sewage from the force main is discharged into the screening channel. Screening is accomplished through a mechanically cleaned barscreen, which removes rags, plastics, and other sewage solids.

#### **Aeration Tank and Grit Removal (5)**

The pre-aeration tank provides the space and conditions for grit separation and for raw sewage conditioning for more efficient sedimentation.

#### **Primary Sedimentation Tanks (6)**

Floating and dense suspended solids are removed from the raw sewage during primary sedimentation by decreasing the velocity of the liquid to a point below which it cannot transport the suspended material. The dense suspended solids settle to the floor of the tank and are removed from the floor by a collector system. These solids, called raw sludge, are removed from the tank by raw sludge pumps which pump the sludge to the digester.

#### **Oxidation, Aeration, and Lemna Ponds (7 and 8)**

Six ponds are available, with a total area of 120 acres and an average depth of five feet. The ponds provide a minimum detention time of 40 days at average dry weather flow. The biological secondary treatment facilities include the oxidation ponds and a circulating pump station.

#### **Overland Flow (9)**

Overland flow is essentially a biological treatment process in which wastewater is applied over the upper reaches of sloped terraces and allowed to flow across the vegetated surface to run off collection ditches. Actual treatment of the wastewater is accomplished by tiny organisms and plant life in and on the surface mat of the overland flow terraces. The process consists of the pond effluent being pumped to 15 overland flow zones via two 60-horsepower Peerless mixed flow pumps. These pumps are designed to pump 4,400 G.P.M. Each of the 15 zones has two terraces. Wastewater is evenly distributed over each terrace using spray heads. Each terrace is 150 feet wide with a two percent slope from top to bottom. The hydraulic loading rate is 37,000 gallons per acre per day over the 170-acre field of 15 zones.



#### **Chlorination / Dechlorination System (10)**

The purpose of the system is to disinfect with chlorination, and dechlorinate with sulfur dioxide, the final effluent prior to discharge to Willow Slough Bypass or Davis Wetlands. Flow to the chlorine contact tank is provided by two 60-horsepower Flygt submersible pumps. Each pump is designed to pump 4,400 G.P.M. The chlorine contact tank is an open structure. It has a volume of 43,400 cubic feet and provides a 60-minute contact time at average dry weather flow.



### **Davis Wetlands (11)**

Wastewater leaving the treatment plant can be discharged into Willow Slough Bypass or used to support the Davis Wetlands. Water leaving the plant is completely compatible with the Wetland's environment. The biological processes started at the Plant continue in the Wetlands tracts, where fine suspended solids and organics settle out of the water or are absorbed by plants and micro-organisms. This "polished" effluent may then be discharged into the Yolo Bypass.



### **Willow Slough Bypass (12)**

After wastewater is disinfected in the chlorination system, it is ready for discharge. Effluent is discharged at one of two locations. Immediately south of the Wastewater Treatment lies the first discharge point into Willow Slough Bypass.

### **Yolo Bypass (13)**

The second discharge point for wastewater effluent is located at the end of the Wetlands system. Water that has been run through the Wetlands can be discharged into the Yolo Bypass.



### **Anaerobic Digester (14)**

Raw sludge from the primary sedimentation tanks is pumped to the two digesters. Sludge digestion takes place in a microbiological environment in which anaerobic bacteria and other microorganisms break down complex organic materials present in the raw sludge. The object of sludge digestion is two-fold; first is the

production of an inoffensive, easily dried sludge accompanied by a large reduction in volume; second is the production of a maximum quantity of sludge gas. The digesters are 55 feet in diameter by 33 feet side water depth, and have a volume of 78,500 cubic feet. The digesters have a detention time of 53 days.

### 75 KW Cogenerator (15)

Gas produced in the sludge digestion process is collected and used as fuel either for the hot water boiler, or for the 75 kilowatt generator. Sludge gas contains about 30 percent carbon dioxide and 70 percent methane. The digesters are producing an average of 26,000 cubic feet of gas per day, with an average savings in electrical costs of \$100 to \$140 dollars per day.



### Sludge Lagoons (16)

Well digested sludge is discharged to the sludge basins where it is allowed to de-water by evaporation. There are three sludge basins with a total area of three acres. Dried solids are deep disked into the overland flow terraces.

### Davis Wetlands

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The Davis Wetlands

The 400 acre Davis Wetlands Project is part of a growing effort throughout the Central Valley to preserve and restore native habitats and the wildlife they support. The Wetlands ... [more](#)

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