

Name:

Flowchart & Overview of South Cross Bayou Water Reclamation Facility

Directions: Read the overview below and create a flow chart or diagram that represents the wastewater treatment process at South Cross Bayou. Draw your flow chart or diagram in the box below.

Color code ***all*** the processes involved...

... in primary treatment- purple ...in secondary treatment- orange

... in tertiary treatment- blue ...in disinfection- green

... in solids handling- yellow

Do you know what happens to your wastewater after you take a shower, wash dishes, or flush the toilet? Where exactly does it go?

Wastewater is used water. It includes substances such as human waste, food scraps, oils, soaps and chemicals. In homes, this includes water from sinks, showers, bathtubs, toilets, washing machines and dishwashers. Businesses and industries also contribute their share of used water that must be cleaned.

Name:

South Cross Bayou Water Reclamation Facility is an advanced wastewater treatment plant. The facility is designed to process an average flow of 33 million gallons of wastewater a day. The water is cleaned and returned to the community as a valuable and useful resource known as Reclaimed water. It is important to treat our wastewater so that harmful agents are not introduced to humans and the surrounding environment. The organic solids present in the wastewater are removed, processed and converted into fertilizer pellets that are sold commercially for agricultural uses. Methane gas that is produced as a byproduct of the sludge treatment process is captured and used as a fuel source in forming the fertilizer pellets. Through the regulations of various state and federal government agencies and the fifty South Cross Bayou staff members who specialize in chemistry, engineering, mechanics and electronics, this facility exemplifies the applications of science and technology in turning human "waste" into safe, beneficial and useful products.

Where does the wastewater come from?

Wastewater is collected and transported to South Cross Bayou through a 1,400+ mile network of pipes connecting thousands of homes and businesses. The areas of Pinellas County that are serviced by this plant include Boca Ciega, Belleair, Pinellas Park, Madeira Beach and South Cross. Wastewater is also transported to the plant in septic hauling trucks from such sources as private septic tanks, portable toilet facilities, and marine holding tanks.

How is the wastewater cleaned?

The advanced wastewater treatment process used at South Cross Bayou involves multiple steps or phases. It takes approximately 16 hours for one gallon of wastewater to be treated. The four basic phases of wastewater treatment are described below.

- **Primary Treatment**-eliminates large solid organic and inorganic materials.
 - Screening- removes large objects, such as stones or sticks, that could plug lines or block tank inlets.
 - Grit Removal- slows down the flow to allow grit to settle out
 - Sedimentation Tank (Clarifier)- settleable solids settle out and are pumped away, while oils float to the top and are skimmed off
- **Secondary Treatment**-uses microorganisms to breakdown smaller solids
 - Anoxic Tanks- uses anaerobic microorganisms to begin the process of nutrient and nitrogen removal.
 - Aeration Tanks-uses aerobic microorganisms to break down the sludge (solids)
 - Secondary Clarifiers
- **Tertiary Treatment Phase**-eliminates nitrate and nitrite
 - Denitrification- methanol is added as a food source for microorganisms that eliminate nitrogen
- **Disinfection Phase**-uses chlorine to eliminate harmful pathogenic organisms
 - Chlorine Tank
 - UV System

Where do the treated water and solids go?

Part of the treated water goes out as reclaimed water to be used by communities for irrigation purposes. The remainder of the water is released into nearby Joe's Creek. The water that is released into the creek receives additional treatment. The chlorine is removed (neutralized) through the addition of sulfur dioxide. The release water is also re-aerated to enrich it with additional oxygen through the use of a cascade system.

- **Outflow Cascade**-neutralize the chlorine and aerates the water before returning it to Joe's Creek

The sludge, or biosolids, that is removed during the water treatment process undergoes additional stages of treatment and is processed into a very high grade organic fertilizer that is sold on the commercial market.

- **Digesters**- continuous circulation of sludge, decomposition of sludge by anaerobic microorganisms, production of methane gas
- **Pelletizer Facility**- converts the biosolid mixture received from the sludge digesters into fertilizer pellets