Our Waste Water Processing System

This article describes, in simple terms, the Sanitary District's wastewater processing system and the rejuvenation work that is being done or needs to be done. The intent is to foster appreciation for the sophistication of the system.

How the system works (you can follow the flow using the picture below)

Our wastewater treatment plant is called an Activated Sludge Membrane Bioreactor (MBR) . From a 10,000 ft level, it combines biological treatment (using microorganisms to break down organic matter) with membrane filtration (separating out the treated water) and ultraviolet technology (killing any remaining bacteria and virus microorganisms).

From your house to the treatment plant on Shingle Mill Lane, the wastewater collection system takes a circuitous route through a number of sewer pipes and, depending upon where you live, up to four sequential pumping stations. Each pump station pumps it to a higher elevation where it flows to the next pump station via gravity until it reaches the final pump station (Webb Lift Station) on Shingle Mill. All wastewater across the district goes through this final pump station which pumps it all to the sanitary plant through a pressure main.

This pressure main from the Webb Lift Station ends at the "Headworks" where the wastewater goes through a screen to remove plastics, hygiene products, rags, sticks and other large objects. The remaining raw sewage flows into a large basin called the "Anoxic Zone". A Mixer in the Anoxic Zone blends the raw sewage with activated sludge that has been returned from the membrane filters (see next step) and with the right amount of microorganisms (managed and balanced by Staff) to create an active treatment environment.

This raw sewage now combined with the returned activated sludge (RAS) is then pumped into the Membrane Bioreactors (MBRs 1 & 2) where it is infused with the right amount of air to complete the biological treatment. This infusion of sludge with oxygen is called "Mixed Liquor". The high oxygen level supports the growth of microorganisms and other beneficial bacteria within the sludge which then breaks down and metabolizes the organic pollutants (like food, oils, and waste) into simpler substances like carbon dioxide, water, and new biomass.

The next step is membrane filtration. Two large pumps pull the mixed liquor through a set of 0.4 micron filters (membranes) in order to separate out the finished water (effluent). This Microfiltration process keep solids, all bacteria, and some viruses on one side of the membranes while drawing the "clean" treated water through the filter to the other side. The filtered water (permeate) then flows around Ultraviolet (UV) light bulbs that inactivate any remaining organisms.

The finished water is discharged into Arch Cape Creek in winter or reused as irrigation on Sanitary District property reserved for this purpose in the summer. The sludge separated by the MBR filters flows back into the Anoxic Zone as the return activated sludge to start the process over again. Some biosolids go through the process again and some are wasted into sludge

drying beds. Once dried, the biosolids are either spread across District property reserved for this purpose or shipped off to an incinerator in Seaside.

This process, which is computer controlled and monitored, is never ending.