

Biosolids Processing at the Wastewater Treatment Plant

When sewage enters the Wastewater Treatment Plant, liquids and solids are separated at the headworks, and the treatment process begins. Untreatable solids, such as plastics, etc, are removed for disposal at a landfill.

From the headworks, wastewater then flows by gravity into two primary clarifiers, where heavier solids settle to the bottom. The heavier solids are pumped from the clarifier into two aerobic digesters, where they are mixed and aerated. Microorganisms consume the organic waste, which with time and treatment becomes a stabilized product known as Biosolids. This beneficial use product is applied to agricultural land as a soil amendment and fertilizer.

The clarified wastewater flows to two aeration basins where air is bubbled through it. Microorganisms thrive in this oxygen and food rich environment, consuming the organic material present in the wastewater.

“We monitor the food to microorganism ratio very closely,” said Utilities Manager Monica Anderson. “We don’t want to overfeed or underfeed the microorganisms. We are constantly taking measurements to quantify whether we are maintaining a balance.”

The flow then passes into two secondary clarifiers, which mimics the primary clarifiers; heavier solids settle to the bottom and are collected and either pumped back to the aeration basin to continue the treatment process or removed from the process, thickened and added to Biosolids. In the summer months, the wastewater then flows through sand filters, which remove even more tiny solid material from the clarified water.

The clarified water then is disinfected with ultraviolet (UV) light before being discharged the Willamette River.

After spending about 15 days in the digester, Biosolids end up in one of five storage tanks for up to 10 days. The larger tanks hold 60,000 gallons. Under the appropriate weather conditions, and after Federal EPA, and Oregon DEQ standards are met, trucks take the Biosolids to the fields, either as a liquid product, or as a dry “cake” product created by further processing of the liquid Biosolids through a centrifuge. Liquid is applied locally, and the “cake” is hauled to Eastern Oregon for agricultural application.

“We deliver it to the farmer’s fields where the majority of what we supply is used for hay,” said Mark Flint, truck driver and operator. “The nitrogen that comes from our biosolids is fantastic for growing hay. It helps them triple their overall tonnage.”

This is a real benefit for farmers especially in today’s economy, with the high cost of fertilizer, and an increase in the price of hay. Mark said they have provided nitrogen to some fields for almost 20 years and word of mouth is their best advertising. They can supply 110 pounds of nitrogen per acre, and have averaged 750 truck loads a year over the past three years.

“The longer the bio-solids stay in the storage basins, the fewer odors it has,” added Mark. “We try not to haul when we have any odor, in consideration of neighbors.”

There are two types of Biosolids, Class A and Class B. Class A Biosolids contain very small amounts of pathogens and can be applied to gardens, lawns, rose bushes, city parks, and crops that are grown for human consumption. Class B Biosolids are used exclusively for grass seed and animal crops, such as hay.

With the planned upgrade and expansion of the Wastewater Treatment Plant, the city plans to move to the production of a Class A Biosolids product, moving away from Class B and liquid application. This would save the City money and provide more options and locations for applying the nutrients.