

## TREATMENT PROCESS

### ANAEROBIC SLUDGE DIGESTION

The settleable solids and floatable material in wastewater, known as sludge, is pumped to anaerobic digesters. Anaerobic (absence of dissolved oxygen) digestion reduces wastewater solids from an objectionable, odorous mixture to a mixture that is essentially odor free, dewaterable, and capable of being disposed without causing a nuisance. During the digestion process organic solids are liquefied, solids volume is reduced, and methane (sewer gas) is produced by two groups of bacteria coexisting in the same anaerobic digester. One group is the “acid formers” and the second is the “methane formers”. The acid formers break down raw sludge composed of carbohydrates, fats, and proteins yielding carbon dioxide, water, and organic acids. The methane formers breakdown the organic acids producing methane, carbon dioxide, water, hydrogen sulfide, and other end products. Digesters are mixed thoroughly to maintain a balance of both types of bacteria and to bring the bacteria in contact with the sludge.

The anaerobic digestion process is similar to a human being’s digestion system. The temperature of the digester is maintained between 95-100 degrees F. Methane gas is produced from the decomposition and reduction of the volatile solids in the sludge. The methane gas is used as fuel in equipment to heat the sludge and to fuel two specialized Waukesha engines which power raw sewage pumps at the Treatment Plant.

Detention time of the sludge in the digesters is between 50-60 days. Volatile solids are reduced 50-60%. The digestion process changes the sludge content from approximately 3% solids to 6% solids.

Digested sludge is a liquid product (5-7% total solids) that is pumped from the bottom of the secondary digester to two Huber Screw Presses for sludge dewatering. Just before sludge enters the Screw Press, it is mixed with a polymer/water solution, which flocculates the solid matter in the sludge. As the sludge travels through the Screw Press, the water is forced out of the sludge and the drier solids bind together. A drier, solidified product known as “cake” is formed with a soil-like appearance. The cake is stockpiled and stored under cover to prevent rain and snow from re-wetting it.

The wastewater plant generates about 400-600 dry tons of sludge per year. The dried sludge contains nutrients that are valuable to crop production. For this reason, most of the sludge is applied to agricultural land as fertilizer. The remainder is sent to the local Landfill.