

# SUMMARY



a few hours to several days, and is characterized by a lack of obnoxious odors.

The anaerobic degradation process, on the other hand, utilizes a different group of microorganisms that thrive where no free oxygen exists. The anaerobic organisms also utilize the organic portion of the sewage as a food source but the degradation of the organic particles will require at least several days, possibly years. Furthermore, this process is characterized by unpleasant odors.

The disadvantage of allowing nature to treat wastewater on its own is that man has a tendency to discharge more sewage into a lake, stream, or river than it can treat aerobically. Nature is continuously dissolving free oxygen from the atmosphere into a body of water with the help of waves or turbulence. The living animals in the water, such as fish or microorganisms, must be able to utilize the oxygen in order to live. If too much sewage is discharged into a stream, then the



microorganisms will use the dissolved oxygen faster than nature is able to replenish it. When all the dissolved oxygen is gone, then the anaerobic organisms will take over. The aerobic organisms, as well as fish and other aquatic life that depend on free oxygen, will die and the body of water will turn black and emit a foul odor.

To avoid this type of stream deterioration, a treatment facility must maintain a controlled aerobic or anaerobic degradation process that will remove almost all of the organic matter from the wastewater before it is discharged into a stream. The Stiles Facility employs aerobic biological degradation as its primary method of removing pollutants in the wastewater. The total amount of time required to complete this treatment process is about six hours.



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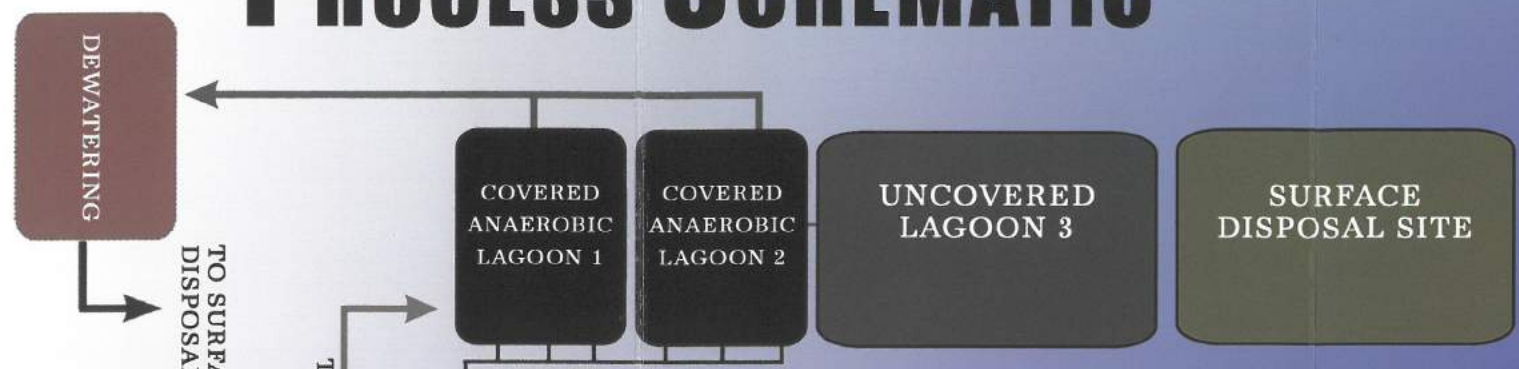


M.C. Stiles  
Wastewater  
Treatment  
Facility



# PROCESS SCHEMATIC

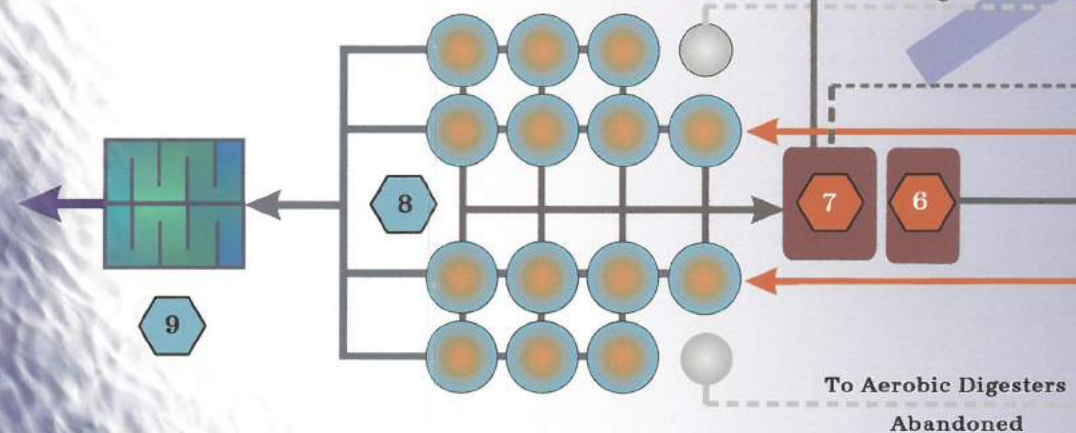
- 1 Coarse Bar Screens
- 2 (4) 1500 hp Raw Sewage Pumps
- 3 Fine Bar Screen & Grit Removal
- 4 Contact Basin
- 5 Reration Basin
- 6 (4) 5000 hp Blowers
- 7 RAS & WAS Pump Building
- 8 Secondary Clarifiers
- 9 Chlorine Contact Basin



## BIOSOLIDS HANDLING

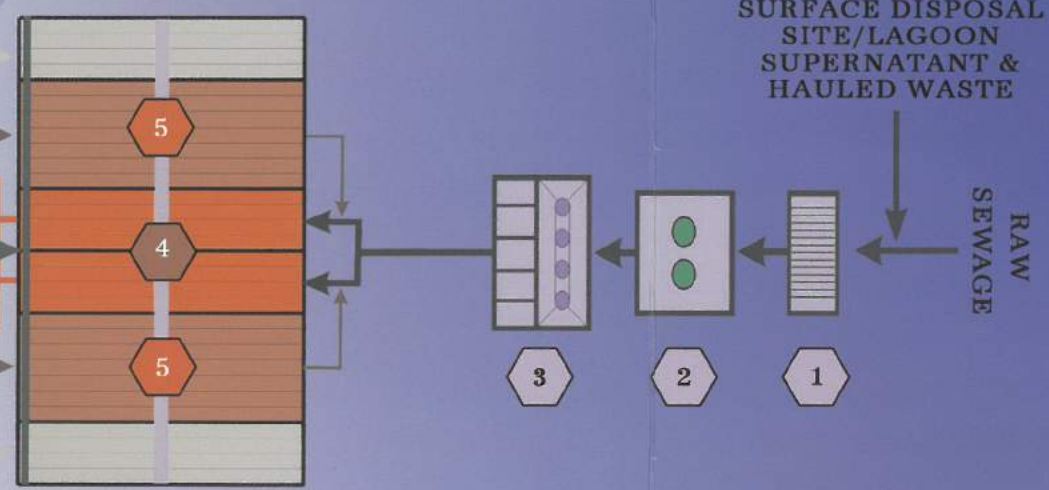
Covered anaerobic lagoons further treat the excess biological solids generated in the secondary treatment process. In the process, over about a year, the biological solids continue to digest producing biogas, which is made up of carbon dioxide and methane. The remaining well-digested solids are dewatered using mechanical presses and placed on a surface disposal site for further drying. The goal is to produce a stabilized product suitable for reuse. The biogas is sold to a local industry and/or flared as necessary.

DISCHARGE TO MISSISSIPPI RIVER



## SECONDARY TREATMENT

Here the wastewater is combined with a controlled population of bacteria and an ample supply of oxygen in an aeration or contact basin. The bacteria use the soluble organic and finely suspended materials as food, thereby removing them from the wastewater. In this process of digestion, more bacteria are produced. Once the organics have been consumed, the liquid, known as mixed liquor, is transferred to clarifiers. In the clarifiers, the biological solids and the liquids are separated. In order to maintain the controlled population of bacteria, some of the bacteria laden solids are sent back to the contact basin while the excesses are sent to anaerobic lagoons. The treated and clarified water is then disinfected and released into the Mississippi River.



## PRELIMINARY TREATMENT

A vast network of gravity sewers collects the wastewater which comes to the Stiles Facility. Many types of debris find their way into the sewer system along with the wastewater. Much of this debris could cause damage to the pumps and piping in the treatment facility. The wastewater passes through bar screens which remove the larger debris such as rags, sticks, cans, and even tires. Smaller inorganic debris, such as sand and gravel, is removed in the grit system. The lighter organic solids remain suspended in the wastewater and flow into the secondary treatment system.

SURFACE DISPOSAL SITE/LAGOON SUPERNATANT & HAULED WASTE

RAW SEWAGE