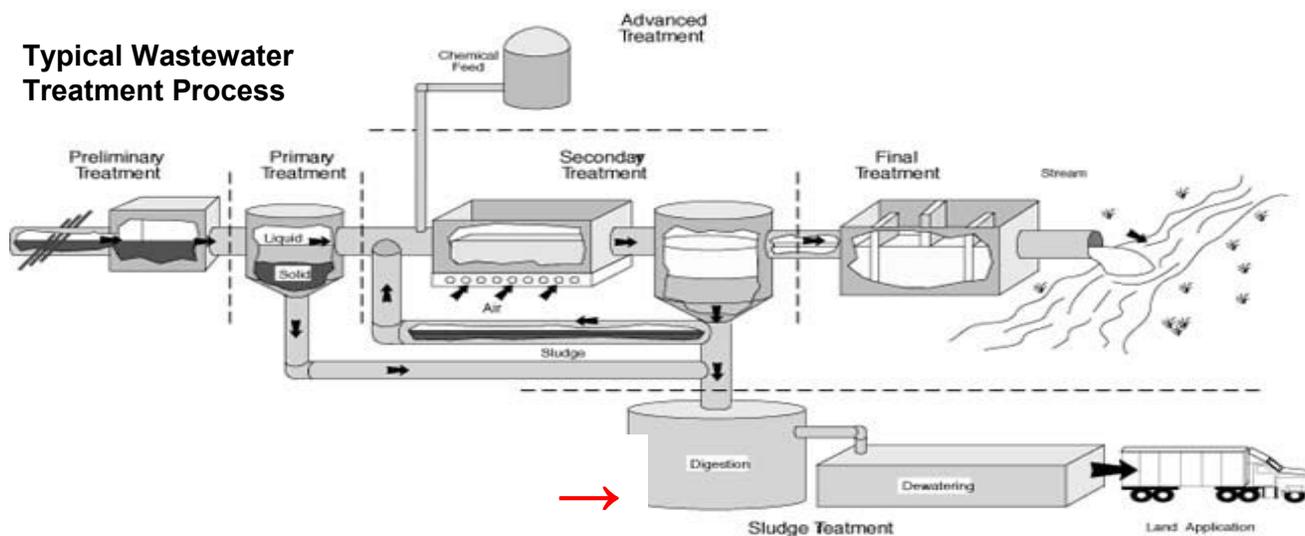


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Urban Wastewater Systems *(continued)*

Sludge Treatment Processes:



Sludges generated through the sewage treatment process must go through **sludge treatment** to stabilize the sludge and reduce odors, remove some of the water and reduce volume, decompose some of the organic matter and reduce volume, kill disease causing organisms, and disinfect the sludge prior to **land application**.

The first of the three main types of sludge treatment in Michigan is **Anaerobic Digestion**.

Anaerobic digestion is a biological process that produces a gas principally composed of methane (CH₄) and carbon dioxide (CO₂) otherwise known as biogas. These gases are produced from organic wastes such as raw sewage sludge, livestock manure, food processing waste, etc. This anaerobic process, in a controlled environment, contains various types of bacteria in an airtight container called a **digester** so the process could occur. Depending on the waste feedstock and the system design, biogas is typically 55 to 75 percent pure methane. State-of-the-art systems report producing biogas that is more than 95 percent pure methane.

The first step is the decomposition (hydrolysis) of plant or animal matter. This step breaks down the organic material to usable-sized molecules such as sugar. The second step is the conversion of decomposed matter to organic acids. And finally, the acids are converted to methane gas.

Process temperature affects the rate of digestion and should be maintained in the mesophilic range (95 to 105 degrees Fahrenheit) with an optimum of 100 degrees F. It is possible to operate in the thermophilic range (135 to 145 degrees F), but the digestion process is subject to upset if not closely monitored.

Next week: Anaerobic Digestion