MUNCIE WASTEWATER TREATMENT FACILITY

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The water we drink today has been here since the dinosaurs roamed the earth. We always have had about the same amount of water on the earth. Water is evaporated into the clouds by the sun and returned to earth when it rains. The water then filters through soil which helps to naturally purify it.

Just think 70% of the earth is water, yet only 3% is fresh water and of that 3%, 2% is locked up in ice caps and glaciers. That leaves about 0.0001% for rivers and 0.0007% for lakes, the rest is ground water, moisture and vapor. But with so much water being used Nature is having a problem keeping the water cleaned. So man has to help clean up the water.

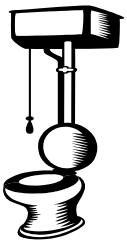
Each household uses about 176 gallons of water per day. If you think about just the people in your house, that is a lot of water. With the amount of people on earth increasing, we need to think about "Water Conservation."

This means you need to think about the amount of water you use and the waste everyday. When you take long showers or let the kitchen faucet run to let the water get cold. Small things like this can make a big difference if enough people think about it. Today many people need to “re-use” water. This means cleaning wastewater for the next person to use.

The water you drink if you live in Muncie comes from the White River. White River starts as a bubbling stream out of the ground about 40 to 50 miles north of Muncie. It flows past the reservoir and is pumped from the river to the Water Treatment Plant.

In Muncie the Water Treatment Plant is called Indiana – American Water Company. It is located on Burlington Drive. They clean the water using settling tanks, sand filters, and add chlorine to kill bacteria that can harm humans. The water is then pumped to homes, stores, schools and industries to use.

Indiana-American Water Company, Inc.



When the water goes down the drain it becomes "wastewater." The wastewater flows through a series of pipes to a main "sewer." Most of the wastewater can flow by gravity, but if it can no longer flow by gravity a "lift station" is built. This is a place where pumps lift the water to a point where it can again flow by gravity. If you live in Delaware County and have a septic system the wastewater will be pumped out by a Septic Service and driven to the Muncie Wastewater Treatment Facility.

In Muncie all wastewater ends up at the Muncie Wastewater Treatment Facility at an average of 16.5 million gallons per day. (One gallon of water weighs 8.34 pounds). White River has an average flow of 1.2 million gallons per day.

The industries in Muncie must clean their used water before it can be released to the sewers. They have small treatment plants where chemicals and settling tanks are used to take out metals and other harmful items. They are inspected regularly by the Muncie Bureau of Water Quality (located at the Muncie Wastewater Treatment Facility).

Once the wastewater reaches the treatment facility two trash rakes (bar screens) remove large objects that could plug or harm pumps and equipment. Then it flows to the raw sewage pumps. These pumps lift the flow to a higher point so it can then flow by gravity. Sand, grit and other heavy material settle to the bottom of the two grit chambers by slowing down the flow. The grit is dewatered and hauled to the landfill.

From the detritor (the entire grit area – this word comes from the Greek word detritus meaning grit) the wastewater flows to two primary settling tanks. The solids settle to the bottom and the scum is skimmed from the surface. The solids that settle is called “sludge.” The sludge is then pumped to the digester for further treatment.

The liquid flow goes to six “aeration tanks.” Three large blowers provide air to the tanks, causing the water to bubble and mix. The air is needed for the “good bacteria” to grow and “eat” the remaining solids in the wastewater that didn’t settle in the primaries. These bacteria are microscopic size bugs.

Following the aeration, the “solids,” now made up of “bacteria and sludge” (webbed together to form a “floc”) are settling in four circular and two rectangular settling tanks. Some of the solids from the bottom is sent back to the aeration tanks, some is sent to the centrifuge (a centrifuge works like a washing machine in the spin cycle). The centrifuge thickens (by removing some of the water) the sludge to save room in the digester where it is pumped to. The clean liquid on top flows to 3 submersible pumps. The pumps lift the flow to multi-media filters. Here the water is filtered through different layers of sand, anthracite coal, garnet and different sizes of rock. This helps the final “cleaning” of the wastewater. Chlorine is added from April 1 to October 31 to help kill the remaining “bad bacteria,” that can cause illness. These are called “pathogenic.” Sulfur dioxide is then added to take away the chlorine.

The primary and secondary sludge is pumped to the 2 “primary digesters.” Here the sludge is mixed and heated to allow a different kind of bacteria to grow that “eats” the sludge and help to stabilize it. The bacteria breaks down the sludge particles and some of the by-products are water, methane, hydrogen sulfide and other products. These digesters are mixed to keep the bacteria in contact with new incoming sludge. This heated sludge is then pumped to one of the 4 “secondary” digesters where it can just rest with no heating or mixing. In the secondary digesters the solids again settle to the bottom and the liquid goes to the top. The liquid (supernatant) is sent back “to the plant” via pipes to be reprocessed. The solids are dewatered by 4 filter belt presses. Filter belt presses dewater the sludge by filtration on the top belt and squeezing or compacting in the middle. The end product is a “cake” the consistency of a dryer mud pie.

The “cleaned wastewater” then flows back into the White River where it resumes its journey.

List ways to conserve water around your home, school or where ever you go:

1.

2.

3.

List questions you have about the wastewater treatment process:

1.

2.

3.

The Muncie Wastewater Treatment Facility would like to invite you out to tour the facility.

The Muncie Sanitary District invites you to visit our web site to learn more about the different departments within the district. You can learn more about the Bureau of Water Quality, Sewer Maintenance, Sanitation, Engineering and even how the billing system works for the sewer bills sent to the customers of the Muncie Sanitary District. There is very useful information the Recycling section including the Recycling Program itself.

You may visit the site at:

munciesanitary.com
munciesanitary.org
munciesanitary.net

To find out more about the City of Muncie you might want to visit their web site at:

cityofmuncie.com