PROVIDING QUALITY IN EVERY DROP

The Water and Wastewater treatment process

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AMERICAN WATER

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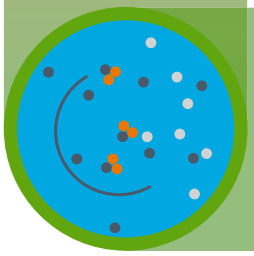
SOURCE TO TAP

How do we make water safe to drink?

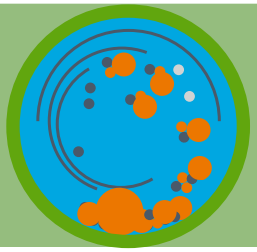
SOURCE WATER

SOURCE WATER
Water supply serving the area. In this case, it is a surface water supply, such as a river, lake or stream.

WATER TREATMENT



COAGULATION
Coagulation uses iron or aluminum-based chemicals to form “sticky” particles that bind with dirt and organic matter in the water.



FLOCCULATION
Slow mixing is used to cause the coagulated dirt and organic particulates to collide and clump together to form larger “floc” particles that can settle out of the water during clarification/ sedimentation.

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FILTRATION

The clarified water passes through filters made of layers of sand, coal, or activated carbon, which help remove smaller particles, including potentially harmful bacteria. Some plants have begun using membranes for filtration in lieu of granular media.

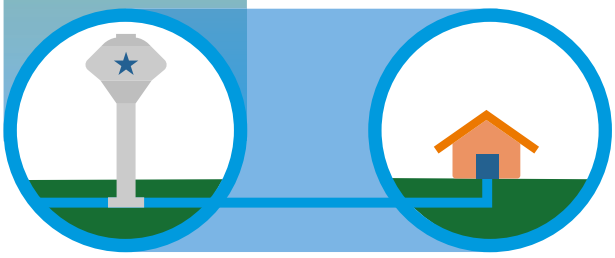
DISINFECTION

During the final step of treatment, a small amount of chlorine is added to kill any potentially harmful pathogens that may remain in the water following the prior treatment stages. The water is stored temporarily in a clearwell to give the chlorine time for the disinfection process to occur. Some plants use UV light in addition to chlorine to aid in disinfection.

CLARIFICATION/SEDIMENTATION

The heavy particles (floc) settle out and the clear water flows to filtration. The settled solids removed from the process often possess exceptional nutrient and water-retaining properties that allow them to be recycled and used to improve the quality of topsoils.

DISTRIBUTION



STORAGE

Pumps are typically used to "push" the water through pipes to homes and businesses in the community. Tanks are often used to provide storage around the distribution system to help maintain pressure and enhance reliability of water service and fire protection.

WANT TO KNOW MORE ABOUT WATER?

For more information about water and the water industry—including fascinating facts you may not know, visit our online Learning Center at **westvirginiaamwater.com**.

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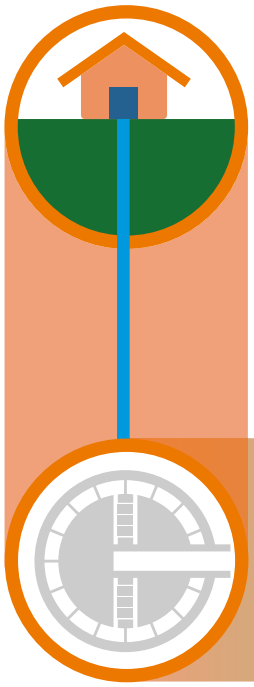
FLUSH TO FINISH

How do we process wastewater?

COLLECTION



WASTEWATER ENTERS THE COLLECTION SYSTEM...
If your home is connected to a public sewer system (versus a septic tank), your wastewater line is connected to a sewer pipe. This is just the beginning of a complex collection system that can transport thousands or even millions of gallons of wastewater every day.

PROCESSING

STEP 2: GRIT REMOVAL
Sand and grit that can damage pumps and other equipment in the treatment system are removed by allowing these heavier solids to settle.

STEP 1: SCREENING
All kinds of objects can be washed or flushed into sewer systems. As the wastewater enters the treatment plant, it passes through screens that remove untreatables like plastic, trash, rags and other large debris.

...THEN, IT'S DELIVERED TO A WASTEWATER TREATMENT PLANT
The job of the treatment plant is to remove contaminants and harmful substances from wastewater so that it can be safely returned to the environment. There are six major steps commonly used in this process.

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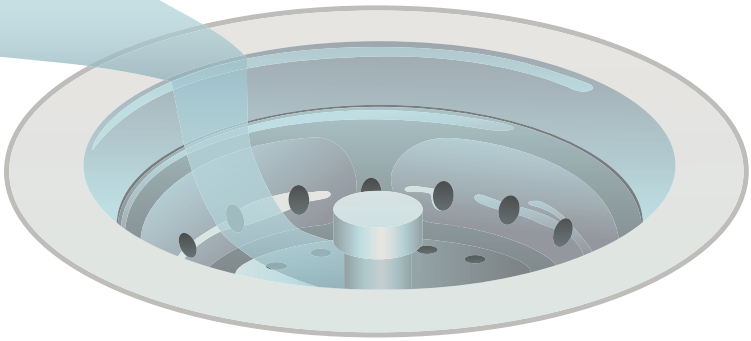

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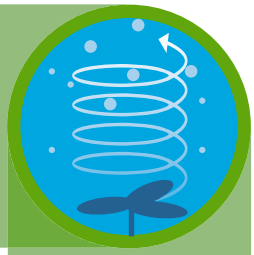
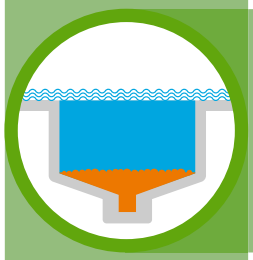


STEP 3: BIOLOGICAL TREATMENT

Biological treatment is one of the major unit processes used in wastewater treatment. The process uses bacteria to breakdown and remove organic wastes and grow new bacteria to sustain the process.

STEP 4: CLARIFICATION

Bacteria and other solids are removed from the liquid stream in clarifiers, and the clear liquid flows to the next stage for further treatment. Most of the settled bacteria are recycled to the biological treatment basin to breakdown more incoming wastes. The remaining biosolids are removed from the process.



DISCHARGE

STEP 5: DISINFECTION

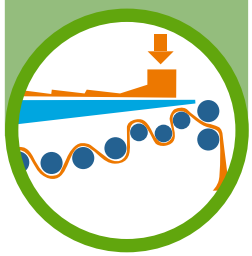
Any harmful or disease causing bacteria or micro-organisms that have survived the previous steps are disinfected by adding chlorine to the water or exposing it to ultra-violet light.

EFFLUENT DISCHARGE

With the water cleansed and purified to meet state and federal standards, it is recycled back into the environment — typically a natural body of surface water like a stream, river, or lake; or into the ground through subsurface groundwater recharge fields.

STEP 6: DEWATERING

Excess solids from the clarifiers may receive further treatment to inactivate pathogens before being dewatered. High quality biosolids have excellent nutrient qualities that can allow them to be beneficially reused as fertilizer for crops and landscaping.



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