

CITY OF NORWALK, OHIO

WATER TREATMENT PLANT



The City of Norwalk's primary water source is rainwater runoff from about 8 square miles of land east of the city. The rainwater forms Norwalk Creek, which flows into the city's reservoirs on Old State Road. The capacity of the three-reservoir system is nearly 700 million gallons, about a year's supply. To bolster its supply, the city purchases about 53 million gallons of water annually from Northern Ohio Rural Water. The city also has the ability to pump water from the East Branch of the Huron River into the reservoir system.

The water plant, originally built in 1927 and located at the intersection of Old State Road and Woodlawn Avenue, was rebuilt in 1990-91 and upgraded in 2002 and 2006. The current plant is designed to treat up to 4 million gallons per day. The city currently uses less than 2 million gallons a day.

After water is pumped from Lower Reservoir into the plant, powdered activated carbon is added at the reaction basins to remove organic compounds, which actually adhere to the specs of carbon.

From the reaction basins, the water flows into a rapid mixer, which violently agitates the water as ferric chloride and polymer are added. The chemicals make contaminants sticky so that they can form floc particles.

The water then is split to two circular 380,000-gallon treatment basins. At the center of each basin is the flocculation zone where a mixer gently causes the developing floc particles to stick together. The objective is to build a floc particle heavy enough to settle out of the water in the sedimentation zone, located on the perimeter of the treatment basins. Sodium hydroxide is added at the settling basins to increase the water's pH.

As the water travels from the settling basins to a set of filters, a small amount of sodium hypochlorite is injected to begin disinfection and oxidize some remaining contaminants.

The three filters remove particles not removed in the settling basins. The filter media consists of 15 inches of anthracite coal and 15 inches of sand supported by 12 inches of gravel.

Each filter is periodically cleaned by reversing the flow of water at a high rate through the filter media. Particles and solids retained in the media from normal filter operations are removed.

Water from the filters is chemically treated with additional sodium hypochlorite for disinfection, fluoride to help prevent tooth decay, and polyphosphates to stabilize the water. Finished water flows to two underground storage clearwells that hold up to a million gallons before being pumped into two water towers and the distribution system on its way to customer taps. If water usage warrants, as much as 3,000 gallons per minute of water can be pumped from the plant, while up to 1.15 million gallons can be stored in the water towers.

A large diesel generator at the plant allows the city to continue treating and pumping water during electrical outages.

Dozens of water tests are done daily in the plant's on-site laboratory to ensure the water safely meets all EPA mandates. Numerous additional water samples are sent to outside labs to confirm water quality.