

Water Treatment Process at the Fremont Water Treatment Plant

Raw Water Storage

Raw water is pumped from the Sandusky River through a screening chamber into the Fremont Reservoir. Flowing by gravity, the raw water is conveyed to the treatment plant (WTP) through a pipe from the Fremont Reservoir. At the WTP, the raw water flows through a flow meter and a butterfly valve which is automatically adjusted to maintain the desired flow of water.

Rapid Mixing

Raw water first flows through the south rapid mix basin. Here ferric chloride is added to begin the coagulation process. A high-speed mixer agitates the water and ferric chloride to assure complete blending.

Flocculation

Following rapid mixing, water flows into the two southern flocculation basins. Three sets of horizontal paddles, each rotating in opposite directions, continue the mixing action at a slower speed to allow the formation of "floc" particles. These particles begin to form larger "floc" particles which are kept in suspension by the gentle movement of the paddles.

Sedimentation

Next, water flows into the two southern sedimentation basins where the heavier "floc" particles begin to settle to the bottom of the tank as sludge. A scraper system, which extends the entire length of each tank, moves the sludge into a sump. At regular intervals, the sludge is withdrawn from this sump and piped into a sludge well. Two pumps convey this sludge to the Sludge Dewatering Building or one of three sludge lagoons.

Reactor Basins

After the water reaches the end of the two southern basins, it then flows back to the reactor basins at the head of the plant where potassium permanganate is injected to reduce contaminants in the water.

Rapid Mixing

From the reactor basins, water flows to the northern rapid mix basin. Here, a lime slurry is fed to reduce carbonate hardness and sodium hydroxide (caustic soda) is fed to reduce noncarbonate hardness. Also, ferric chloride is added to aid the coagulation process. A high speed mixer agitates the water and chemicals to assure complete blending.

Sedimentation

Following rapid mixing in the north rapid mix basin, water flows into the two northern flocculation and sedimentation basins. Mixing and settling occurs in the same way as described for the southern flocculation and sedimentation basins.

Recarbonation

After the water reaches the end of the northern pair of sedimentation basins, it then flows into the Recarbonation basin where carbon dioxide gas is bubbled up through the water to reduce the pH and to stabilize the water.

Filtration

Fluoride, chlorine and sequestering agents are injected prior to filtration. Next, the water flows into the Filter Building where sixteen filters provide final filtering to remove any remaining particles. The water filters through granular activated carbon and filter sand.

Disinfection and Finished Water Storage

After filtration, water is chlorinated for disinfection and then stored in two underground storage tanks prior to pumping into the city's distribution system.

All of the chemical feed systems are monitored by a computer system for proper operation, and feed the correct amount of chemical based on the flow of raw water. All sludge generated at the plant is thickened and

then dewatered with a diaphragm filter press in the Sludge Dewatering Building or pumped to one of three sludge lagoons.