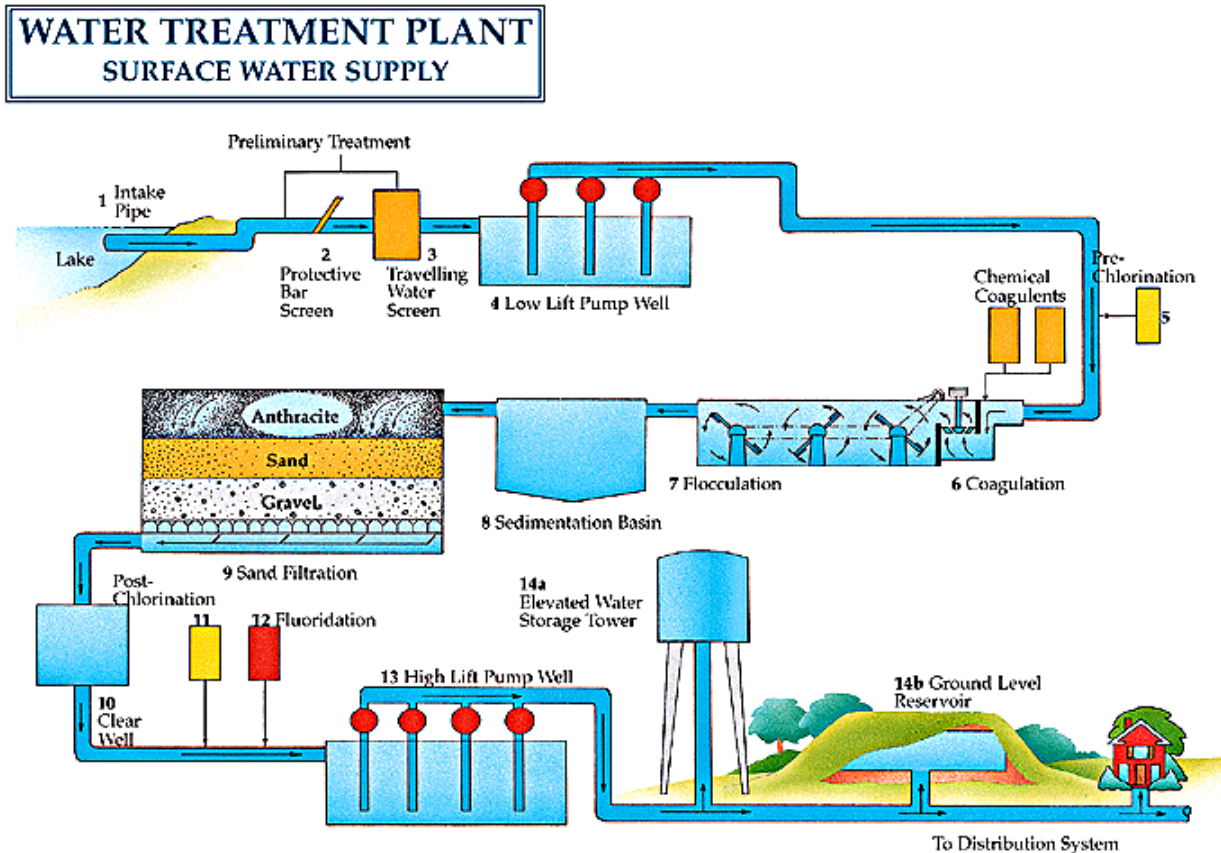


Surface Water Treatment Plant – Flow Diagram



1 Intake Crib

Raw water from a surface water lake or reservoir is drawn into the plant through intake structures. Large debris like logs are prevented from entering and zebra mussel control is performed at the intake.

2 & 3 Screens

Smaller debris like fish, vegetation and garbage are removed from the raw water by protective bar and travelling screens before the water enters the low lift pumps.

4 Low Lift Pump Well

These pumps lift the water to flow through the treatment processes by gravity.

5 Pre-oxidation & Primary Disinfection

Disinfectants or other oxidants are added to disinfect or control tastes and odours. The specific processes used are determined by the chemical and biological raw water characteristics.

6 Coagulation

Coagulants, rapidly add electrochemical charges that attract the small particles in water to clump together as a “floc”. This initial charge neutralization process allows the formed floc to agglomerate but remain suspended.

7 Flocculation

By slower mixing, turbulence causes the flocculated water to form larger floc particles that become cohesive and increase in mass. This visible floc is kept in suspension until large enough to settle under the influence of gravity.

8 Sedimentation

Flocculated water is applied to large volume tanks where the flow speed slows down and the dense floc settles. Settled floc is removed and treated as a waste product that is discharged to the sewer system.

9 Media Gravity Filtration

Relatively floc free, settled water flows through a media filter by gravity. Filter media are made from layers of anthracite or granular activated carbon and sand. Gravel or synthetic materials support the media. Physical straining removes the remaining floc. Filters are periodically backwashed to clean off accumulated floc and other trapped impurities.

10 Clear Well

Filtered water in the clear well is used to backwash filters and kept in storage to ensure that disinfectants are in contact with the water long enough to inactivate disease causing organisms.

11 Secondary Disinfection

Supplemental chlorine is added to maintain disinfection concentrations while the water is pumped through the distribution system. The purpose is to ensure minimum residual disinfectant levels at the farthest points of the system.

12 Fluoridation

A process where silicofluoride compounds are added to treated drinking water to artificially raise the fluoride concentration to within a specified range; for example between 0.5 to 0.8 mg/L (ppm). Fluoridation is an optional public health dental policy.

13 High Lift Pump Well

Treat drinking water is pumped through large pressure pumps to other pumping stations, reservoirs or points of supply within the local distribution system.

14a & 14b Elevated Water Storage Towers and Ground Level Reservoirs

Water distributed to water towers and storage reservoirs ensures stable water pressure. An adequate supply of water is maintained to meet peak water demands or emergencies such as fires, water main breaks, power outages and pump failures.

Distribution System

Distribution systems are comprised of large pipes known as trunk mains to deliver drinking water. Smaller diameter branch mains feed individual streets. Service connections to branch mains deliver water into residences. Pumping stations are used to increase pressure and to maintain adequate supply flows.