Water Distribution Services

1. **Transmission Watermain**
   - Transmission watermains are large diameter pipes which carry large volumes of water from the supply (either the Surface Water Treatment Plant or groundwater well) to storage reservoirs or towers.

2. **Booster Pumping**
   - In some areas within the city, booster pumps are required. These types of pumps are designed to move water from a lower elevation to a higher elevation.

3. **Storage**
   - Treated water is stored in reservoirs and towers at different points in the distribution system and it is important to ensure water is available based on community demand and for firefighting purposes.

4. **Secondary Disinfection**
   - Water leaving storage reservoirs or towers is continuously monitored for chlorine residual. A minimum residual is required to ensure harmful pathogens are inactivated. If a minimum residual is not detected, it is re-chlorinated. This process is called secondary disinfection.

5. **Distribution Watermain**
   - Smaller in diameter than transmission watermains, distribution watermains are used to distribute water from the transmission watermains to customers in all areas of the City.

6. **Isolation Valves**
   - Valves are located throughout the distribution watermain network and are used to isolate sections for ongoing maintenance and emergency repairs.

7. **Hydrants**
   - Hydrants are found throughout the distribution system and are used for firefighting needs as well as watermain flushing and swabbing which helps to maintain water quality throughout the City.

8. **Service Line**
   - A water service line connects your home to the distribution watermain for access to potable drinking water.

9. **Curb Stop**
   - Curb stops are valves that isolate individual homes and buildings from the distribution system. This helps to accommodate any maintenance on the distribution system or work that a homeowner may need to complete.
**Groundwater Treatment Process**

1. **Aquifer**
   Groundwater is obtained from a deep sand and gravel layer in the ground at depths ranging from 50 to 100 meters below the surface.

2. **Groundwater Well**
   Wells are structures that bring groundwater from deep underground to the surface and are comprised of a screen, pump, motor and casing.

3. **Screen**
   Water is first drawn through a screen which acts as a barrier, stopping particles from entering the well and causing damage to the equipment.

4. **Casing**
   The water travels to the surface through an unperforated pipe called a casing. The casing provides structural stability to the well and is surrounded by grout to help protect against contamination.

5. **Pump & Motor**
   Vertical turbine pumps are used to move water to the surface in all municipal wells. These pumps consist of an electric motor at the surface connected by a shaft to impellers at the bottom of the well. When the motor is activated it causes a rotation of the shaft and impellers, which pushes the water up to get treated.

6. **Disinfection**
   Before being released to the distribution system the water must be disinfected to inactivate any potential harmful pathogens. Most wells within the City use chlorine and are provided with sufficient contact time for disinfection. One well uses ultraviolet light which provides immediate disinfection.

7. **Iron Sequestering**
   Groundwater in Barrie contains naturally occurring iron and manganese. Sodium silicate is added to the water to keep these particles in suspension. This helps prevent rusty looking water at the tap.

8. **After disinfection, the water is pumped to a water storage reservoir and/or tower for use by the community.**

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Surface Water Treatment Process

1 **Intake**
Surface water is drawn from an intake structure in Kempenfelt Bay nearly 1 km from shore and 26 m deep. The water is gravity fed to a low-lift pumping station close to the shoreline where it is directed through screens to remove large debris and particles. Chlorination is used seasonally at the intake structure for mussel control.

2 **Pumping**
Water is pumped from the low-lift pumping station to the Surface Water Treatment Plant.

3 **Membrane Strainers**
The water goes through pressurized strainers to remove particles larger than 0.5 mm in size; approximately the size of sand particles. This stage is important to prevent damage to the membrane fibers.

4 **Coagulation**
The first chemical process used to treat the water involves adding a coagulant. A coagulant triggers dissolved and suspended particles to clump together.

5 **Flocculation**
The water then goes through a physical process of gentle mixing, allowing smaller particles to collide and slowly form larger particles called floc. This floc remains suspended while moving through the tank.

6 **Membrane Filtration**
The water is then filtered through membrane fibers. Membrane fibers can be thought of as straws with hundreds of tiny holes which are a thousand times smaller than a human hair. This allows for clean water to be drawn through the fibers and all other particles, including the floc, to be left behind.

7 **Activated Carbon Contactors**
The filtered water is then directed to activated carbon contactors, where organic taste and odor compounds are adsorbed and removed.

8 **Disinfection**
The final step in the treatment process is disinfection. This involves the addition of chlorine to the water allowing it to move slowly through baffled tanks. This ensures that enough contact time has been provided to inactivate harmful pathogens.

9 **Storage**
After disinfection, the water is pumped to a water storage reservoir or tower for use by the community.
1 Water Meter
Each property is equipped with a water meter which measures the amount of water used on that property. This ensures customers are only billed for the water delivered to them. A “Smart Point” is a remote reading device that will take a reading from your meter and store the information electronically.

2 Backflow Prevention
The City regulates the installation and maintenance of backflow prevention devices within industrial, commercial, institutional and select residential properties. These devices prevent pollutants and contaminants from entering drinking water systems.

3 Flushing Program
Watermain flushing is a maintenance activity that is performed year-round. It involves running water from two hydrants at the same time. By moving water at a higher-than-normal velocity, scouring occurs inside the watermain essentially cleaning it out.

4 Swabbing Program
The City also conducts swabbing annually to clean watermains which involves scouring the watermain with foam swabs. These swabs are injected and removed at a fire hydrant and are pushed by water pressure through the watermain.

5 Subsurface Locates
The City is part of the Ontario One Call network. Whenever you call before digging, the City will ensure all corporately owned buried infrastructure is marked in the municipal right of way or City easement.

6 Bulk Water Requests
The City assists residents and contractors with obtaining water in bulk supply, whether it’s filling up a pool or getting a temporary water supply for construction work.

Did You Know?
Water quality is monitored and tested at multiple points during the production and distribution of drinking water. This ensures clean and safe drinking water is always available.