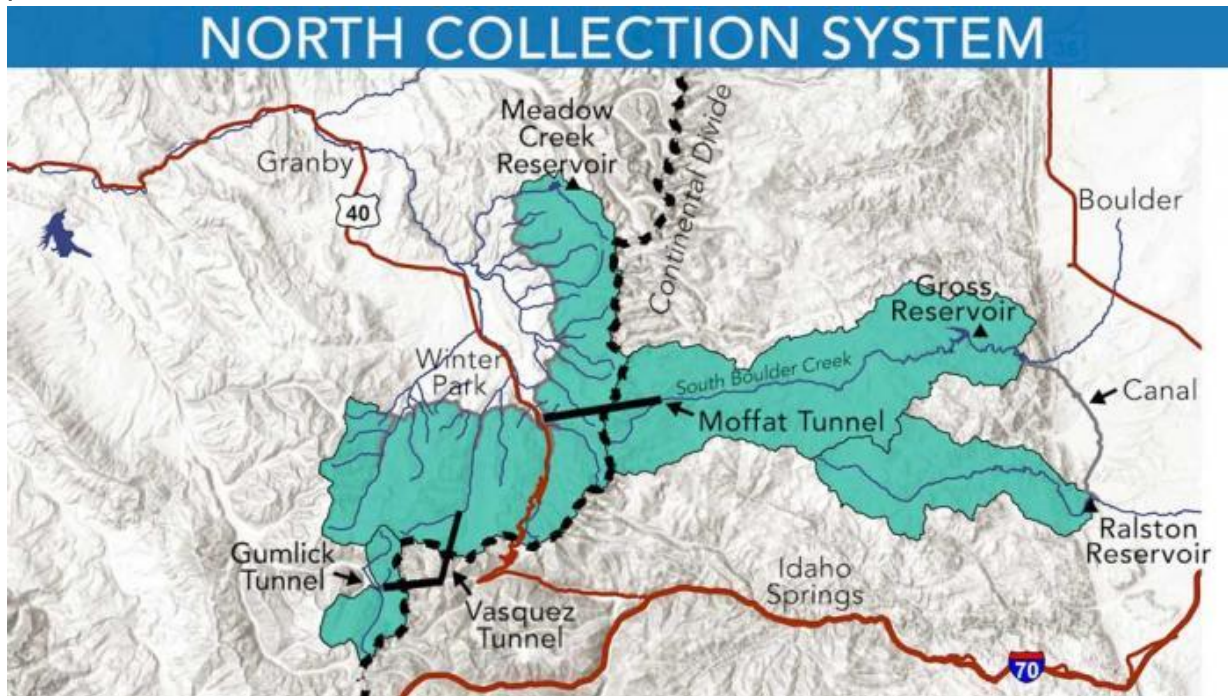




## NORTH TABLE MOUNTAIN REPORT - July 2022

### PART 3- NORTH TABLE MOUNTAINS WATER TREATMENT PROCESS

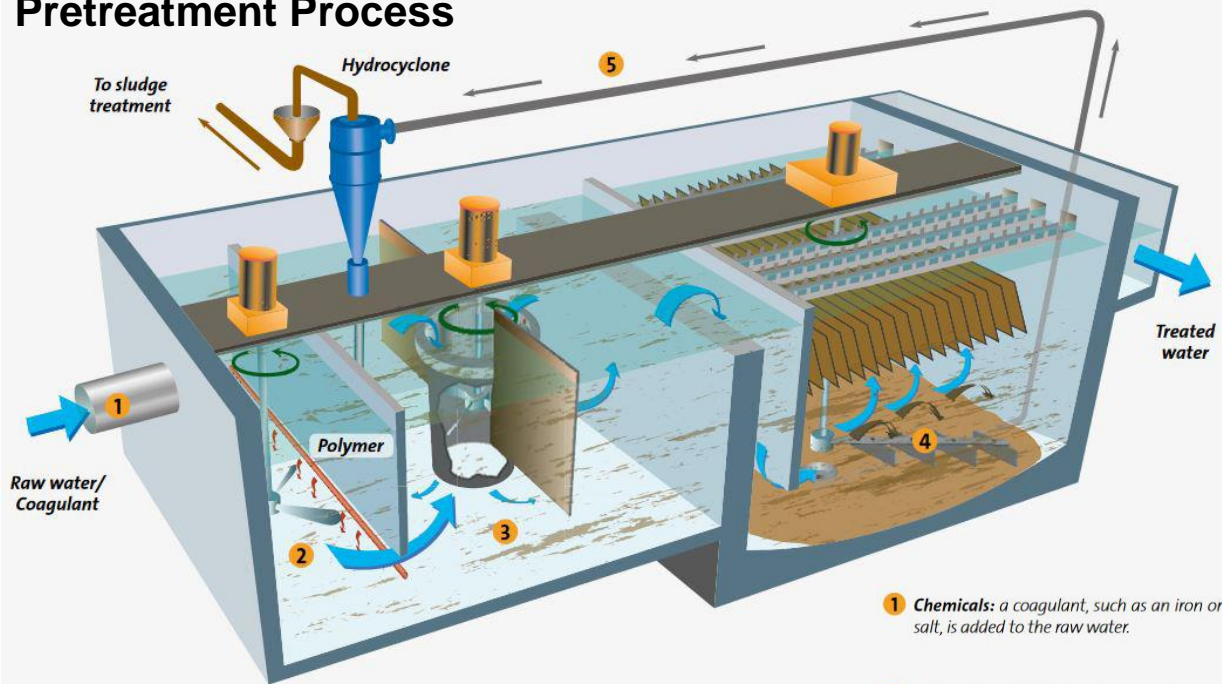
**Raw Water:** North Table Mountains' raw water is purchased from Denver Water out of their northern collection system. The water is diverted from areas including the Frazer Valley watershed near Winter Park and the South Boulder Creek watershed above Gross Reservoir. The water is stored in Gross Reservoir and ultimately moved through a canal system to Ralston Reservoir near 64<sup>th</sup> Avenue and Highway 93. We have pipes that connect to Denver's system at this point where we divert the water to our treatment plant.



**NTM Water Treatment:** Our water treatment process is considered a conventional process which includes pretreatment, filtration and disinfection. Following is a description of these steps.

**Pretreatment:** Our plant uses a coagulation, flocculation and sedimentation process called Actiflo Turbo. NTM can boast that we had the first Actiflo process installed in the United States. As the water enters the plant we inject a polymer coagulant; the coagulant causes the particles to bind together. The Actiflo process is unique in that it also introduces sand particles into the water along with the polymer during the coagulation process. The polymer makes the sand "sticky" and the particles in the water along with the added sand stick together and form large heavy particles called

## Pretreatment Process



- 1 **Chemicals:** a coagulant, such as an iron or aluminium salt, is added to the raw water.
- 2 **Coagulation:** hydroxide flocs are formed during the coagulation phase.
- 3 **Turbomix™ flocculation:** the flocs formed during the coagulation phase are ballasted with microsand with the help of polymer.
- 4 **Clarification:** the ballasted flocs settle quickly thanks to the specific weight of the microsand.
- 5 **Recirculation:** the sludge and microsand slurry is pumped to a hydrocyclone where the sludge is separated from the microsand via centrifugal force. The clean microsand is recycled back to the flocculation tank while the sludge is continuously discharged.

floc. The next step is to move the water into a basin where the heavy sand ballasted floc is able to quickly settle out of the water in a process called sedimentation. This process works so well that the Actiflo system detention time is 21 minutes as compared to 2-3 hours in a conventional system. The efficiency of this system saves a lot of energy. Above is a graphical representation of the pretreatment process.

**Disinfection:** Following the initial clarification process, a liquid sodium hypochlorite chlorine solution is added to the water to begin the disinfection process. The disinfection process ensures that any microorganisms in the water are deactivated.

**Filtration:** From this point the pretreated water is piped to our mixed media filters. The filters are made up of layers of anthracite and sand. The filters remove additional suspended particulates that did not settle out in the pretreatment process.

**Storage and Distribution:** Following filtration, the water moves through a series of water storage tanks where the water is allowed time to be in contact with the chlorine disinfectant. Our operators then deliver the water out into our water distribution system to our customers.

