

SLIPPERY ROCK CREEK RESERVOIR SYSTEM
AND
BROCTON WATER TREATMENT FACILITY

Slippery Rock Creek Reservoir System is comprised of three reservoirs, the Burr, the Risley, and the large new reservoir. The main source of water is run off from the surrounding water shed area with some, but not much help from springs and overflow from Bear Lake during the wetter times of the year.

Of the water shed area itself, about one half of 2400 acres is wooded and the other half is grasslands.

Each inch of rain on the water shed area, given the acreage, yields approximately 65,000,000 gallons of water. During an average year with an average of 36.5 inches of precipitation in the forms of rain, sleet, and snow approximately 2,380,000,000 gallons of water is deposited on the water shed area.

During dry years and dry condition, which seem to occur in about 8 year cycles, the Village of Brocton can pump as much as 1,150,000 gallons a day from Bear Lake using a pumping station on the north end of Bear Lake which discharges into Slippery Rock Creek about 1.8 miles north of Risley Reservoir.

This pump station was constructed between 1936 and 1937 and the contract to pump the water was first negotiated at this time.

The reasoning behind discharging the water into the creek 1.8 miles from the reservoir is due to the poor quality of the water from Bear Lake. Bear Lake is a shallow lake with much organic growth causing the water to be deficient in oxygen and by traveling through Slippery Rock Creek the 1.8 miles to the Risley Reservoir, it becomes oxygenated and somewhat cleared, vastly improving the quality of the water prior to entering the reservoir.

The Risley Reservoir -

This reservoir is formed by an earthened dam with a concrete core and a concrete spill way. The dam is 225 feet in length and 37 feet deep from the bottom of the valley it cuts across, and the spill way itself is 50 feet wide.

Originally, this reservoir had a capacity of 16,000,000 gallons, but due to erosion, sedimentation and other natural factors, its capacity today is probably from 0 to .5 million gallons.

The Burr Reservoir -

This reservoir is formed by an all earthened dam across the valley with the normal flow of the creek being diverted around the west side of the reservoir on a bed of shale rock. This design makes no spill way necessary and greatly reduces the effects of sedimentation.

The rated capacity of the reservoir is 8,000,000 gallons.

The Large New Reservoir - (Shippany Rock Creek Reservoir)

This reservoir is formed by an earthened dam across the valley with a concrete spill way cut into the bedrock. Concrete was also later added to the water side of the dam face to control erosion. The spill way is 60 feet across and the reservoir itself is 43 feet deep to the bottom of the valley the dam cuts across.

The new reservoir covers approximately 18 acres and has a maximum rated capacity of 84 million gallons, *NOW < 60 MG.*

During dry summer conditions the level will fall as much as 4 to 5 feet and this reduces the capacity to ~~40~~ - ~~50~~ million gallons. Over the years sedimentation on the south end of the reservoir has undoubtedly reduced somewhat these figures.

All three reservoirs are tied into a pump house at the base of the dam on the new large reservoir. The water is pumped from here to the plant to be processed

The pump house has two large pumps, one with a pumping rate of 720,000 gallons a day and the other with a rate of 1,000,000 gallons per day.

The plant is about 1-1/2 miles south and above the Village of Brocton in elevation, which means the water is gravity fed to the Village. The change in elevation provides 80 to 90 psi pressure throughout the Village.

The plant was constructed in 1937 and has a rated production capacity of 1,200,000 gallons per day with two storage tanks underground to the north of the plant with 425,000 gallon capacities each.

Water from the pump house at the base of the new reservoir dam is pumped to the plant where first alum and *P. Mg.* are added. The alum makes organic and in-organic matter clump together or flocculate. The potassium permanganate is used as a pre-oxidizer to kill organics and address taste and odor concerns. Unlike chlorine it generates no disinfection by-products and works very well on seasonal algae. As the water leaves the facility, post filtration, a 25 % caustic soda solution is added to adjust the PH and chlorine is then added to complete the disinfection process and meet mandate free residual levels within the distribution system.

After these chemicals are added the water is mixed by pumping air into it. It then travels through a channel with a series of over and under barriers which further mixes it and helps the clumping or flocculation to occur.

The water then enters two large settling basins where this clumped or flocculated material can settle out.

This treated and settled water then passes on to one of two rapid sand filters where the remaining fines are filtered out of the water and it is chlorinated *PER MANDATE* to meet State and Federal standards and complete the disinfection process.

Chlorination is probably the single most important factor in eliminating water born diseases that were prevalent prior to the use of chlorine in America.

Through each of these steps the water is tested according to State and federal mandates to ensure the highest possible quality product.

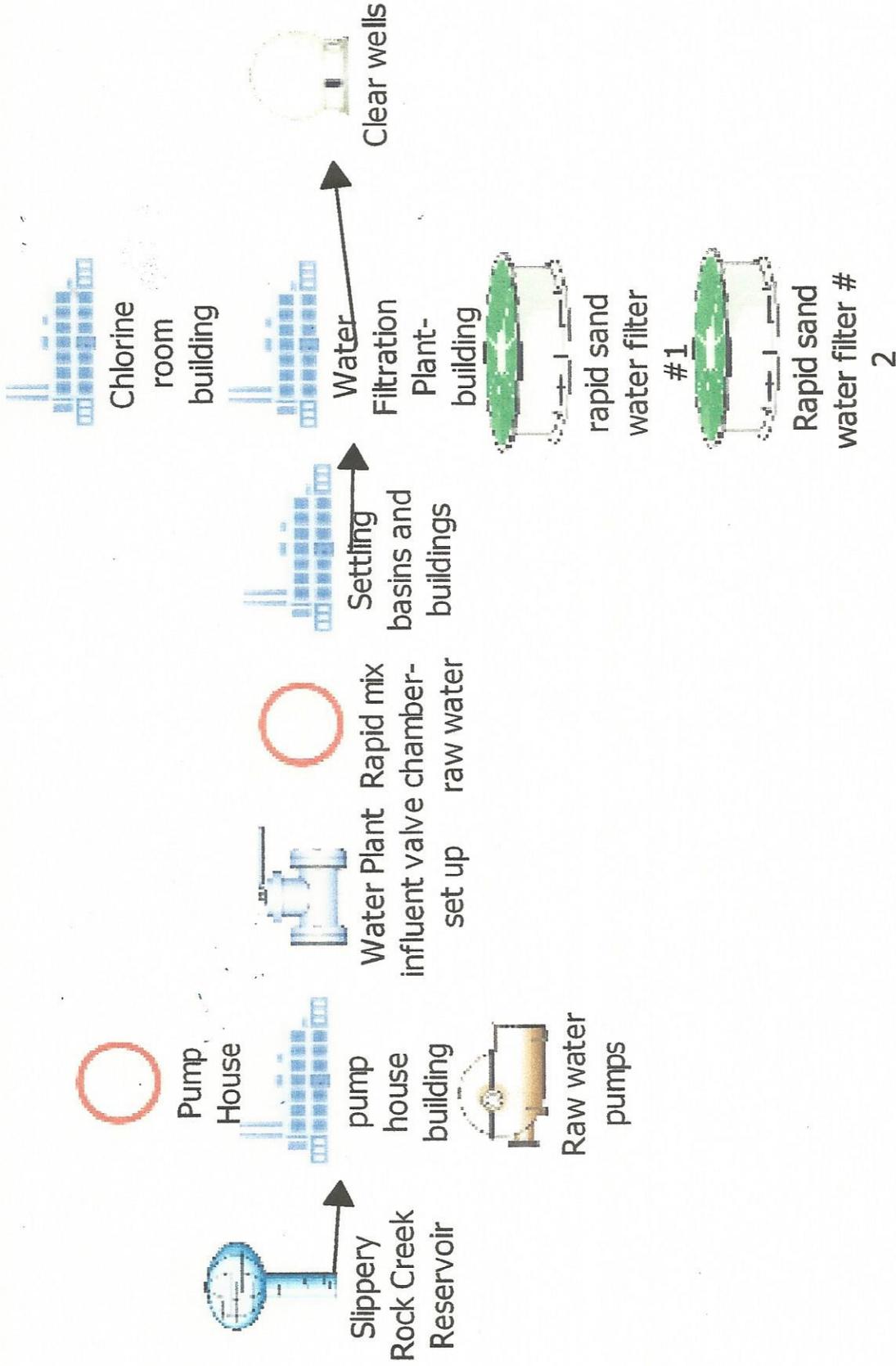
On an average day, depending on the length of the work shift, the plant produces 300,000 to 600,000 gallons of finished product.

We at the Village of Brocton Water Treatment Plant work hard to ensure you the highest possible quality drinking water from what we deem as a both adequate, clean and well maintained watershed system.

The watershed area is a very beautiful natural resource of the Village of Brocton and we encourage you to stop in for a tour of the facility and surrounding watershed area.

Greg Borst
Head Operator
Water Treatment Plant
Village of Brocton

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Village of Brocton Fresh Water Treatment Plant

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