

TREATMENT PROCESS

SEQUENTIAL BATCH REACTORS (SBR's)

The two sequential batch reactors (SBR's) were built by plant personnel in 1998. Each SBR is 30 feet long, 15 feet wide, and 13 feet deep. Working capacity in each SBR is about 33,000 gallons. The SBR's are used to treat the ammonia in the supernatant from the secondary sludge digester. The ammonia ranges from 400-600 mg/L in the supernatant. Normal plant influent ammonia ranges from 10-15 mg/L. Plant discharge limits are sometimes difficult to meet during abnormally cold winter months and months with excess rainfall/snow melt.

Three 25 horsepower motors drive three blowers that provide oxygen and mixing action from the aerators in the bottom of each SBR. Only two of the blowers are used during normal operation.

The ammonia in the supernatant is reduced by primarily two types of nitrifying bacteria- Nitrosomonas (oxidizes ammonia to nitrite) and Nitrobacter (oxidizes nitrite to nitrate), thus reducing the ammonia loading to the wastewater treatment plant process. Alkalinity is removed in this process, soda ash is added to compensate.

The SBR's were designed to operate in an alternating batch process. Fill one SBR with secondary supernatant, mix and add soda ash, once full, allow to treat to reduce ammonia for 24 hours, then discharge 50-60% of its contents. This maintains a population of nitrifying bacteria to treat the next batch. Ideally, while one SBR is filling, the other is reducing the ammonia in its 24 hour cycle.

Another method that has worked for GSD is a continuous flow process. Valving and discharge pipe allows the SBR's to operate in series. Supernatant flows into the north tank, soda ash is added, then supernatant flows to the south tank, soda ash is added (pH is checked on both tanks each shift), then treated supernatant is discharged from the south SBR to the headworks of the wastewater treatment plant.