WASTEWATER TREATMENT PLANT 101

The Wastewater Treatment Plant (WWTP) on Stewart road serves the entire Town of Gibsons.

We take all the flow from Gibsons' businesses and residences, which includes flow from your home washing machines, dishwashers, toilets, showers, sinks, and baths. Through a series of piping networks, the wastewater flows through our collection system to the WWTP or to the Prowse Road lift station, where it is pumped up to the treatment plant through a force main.

The Wastewater Treatment Plant receives a flow of ~1,200 – 2,200 m^3/day!

The wastewater is treated to an extremely high standard regulated by the provincial and federal government before we discharge it to the ocean.

Our permit requires the effluent to be less than: 30 mg/L in Total Suspended Solids (TSS) 30 mg/L Biochemical Oxygen Demand (BOD), 5 mg/L Total Ammonia and < 200 CFU/100 mL Fecal Coliform.

We achieve this level of wastewater treatment by using the following process:

1. **Fine Screen –** a screw conveyor removes the rags and debris in the wastewater we are not able to treat (i.e., "flushable" wipes, feminine hygiene products, condoms, vegetable waste). These we collect in a bin and send to the landfill. This protects our downstream equipment from excessive wear and tear.
2. **Grit Cyclone** – there is a lot of sand and small rocks in the sewer that we are not able to treat and is extremely hard on pumps and downstream mechanical equipment. The grit cyclone uses a velocity concept to separate and remove the heavy inert particles—the grit waste is also sent to the landfill weekly.
3. **Sequencing Batch Reactor (SBR)** – we have two SBRs. They are large open tanks, which are our simple yet effective method of treating wastewater. These tanks each have a volume of 1450 m^3 and contain a series of air piping and diffusers at the bottom, which deliver fine air bubbles for a set time to encourage the microorganisms to "work"! The microorganisms are naturally found in wastewater, but in the SBR we can control their concentration and manipulate their effectiveness by creating their perfect environment. We waste and recycle the microorganism sludge to maintain a specific concentration. The microorganisms that we like to have the most inventory of are stalked ciliates and rotifers. These two organisms are particularly excellent at breaking down wastewater. To keep the microorganisms happy and working we manipulate their cycle to give them their best environment with oxygen and food!

   The SBR runs on a four-hour cycle: where the wastewater is aerated and rested multiple times and then allowed to settle before decanting. During the decanting, we remove the top treated level of clear effluent for disinfection and discharge. An understandable SBR sequence analogy is how we treat our stomachs: we give our stomachs water, food, and rest and magically it gives our body growth, energy and supports our organs! The SBR is similar, we give it a specific amount of air and food (influent) and the microorganisms work away at breaking down the waste.

4. **UV Disinfection** – disinfects and deactivates disease causing organisms. The effluent from the SBRs flows through 2 banks of 64 UV bulbs each.
5. **Solids Handling** – the sludge is removed from the bottom of the SBR during the settling cycle. The solids are thickened, digested, and centrifuged to make a ~ 18% bio solid. We work in partnership with Salish Soils to use the bio solids at their composting facility.

Example of our weekly test results from the Influent and Effluent of our Wastewater Treatment Plant:

Date: December 1st 2020	**Influent**	**Effluent**	**% Removal**
Total Suspended Solids (mg/L)	170	5.2	97
Biochemical Oxygen Demand (mg/L)	240	12	95
Total Ammonia (mg/L)	26	1.1	96
Fecal Coliform (CFU/100 mL)	Not analyzed	20	-