Secondary Treatment Systems

Q: What is secondary wastewater treatment?
A: Secondary wastewater treatment is a biological treatment process designed to reduce the amount of organic materials in the wastewater before it is discharge to a disposal field for final treatment and dispersal in the soil. Secondary treatment produces a much higher quality of effluent than a septic tank.

Q: What is the difference between primary and secondary treatment?
A: The most common initial treatment component is the septic tank which provides primary treatment. Primary treatment occurs through sedimentation, which involves the removal of floating (scum) and settleable materials (sludge) present in wastewater, together with some anaerobic biological treatment and digestion of accumulated sludge and scum.

Secondary treatment involves the removal of biodegradable organic matter (BOD) and suspended solids (TSS) through the processes of aeration and filtration. Secondary treatment is typically characterized as producing a treated wastewater effluent with a BOD of 25 mg/L or less and TSS of 30 mg/L or less. Secondary treatment can also include disinfection to remove harmful microorganisms using chlorine of ultraviolet light. Tertiary treatment involves the reduction of nutrients (nitrogen, phosphorus) through more advanced treatment processes.

Q: What types of secondary treatment systems are available?
A: There are two main types of secondary treatment systems used in the onsite wastewater industry, aerobic treatment units and biofiltration systems. These systems are commercially available as pre-manufactured units designed to treat domestic wastewater produced by residences and in some cases, non-residential facilities.

<u>Aerobic Treatment Units</u>
Aerobic treatment units, also known as package sewage treatment plants, inject air into the wastewater to create a healthy population of aerobic microorganisms that break down organic wastewater contaminants. Aerobic treatment units typically consist of a three-compartment tank where the first compartment functions like a septic tank and settles out the solids, the middle compartment is where air is injected using a blower or compressor, and the third compartment provides additional removal of solids. A septic tank may be used with an aerobic treatment unit to enhance system performance.

<u>Biofiltration Systems</u>
Biofiltration systems consist of modules containing porous filter media such as peat, foam, sand, and synthetic textile fabrics. The filter media provides a large surface area for the attachment and growth of aerobic microorganisms. Air is supplied to the filter media through vents in the modules. Wastewater effluent from a septic tank is distributed over the filter media and contaminants are removed by microbial activity and filtration as it trickles down through the media. The treated effluent is collected at the bottom of the module(s) and discharged to a disposal field for final treatment and

dispersal. In some cases, effluent is discharged through the bottom of the modules directly into the disposal field.

Q: When are secondary treatment systems used?
A: Secondary treatment systems are used to overcome difficult site conditions such as low permeability soils (clay), high permeability soils (sands), and shallow depth to groundwater and bedrock. In some cases, the use of secondary treatment systems is required under the Onsite Wastewater Management Systems regulation such as when disposal fields are approved for use in provincial parks, crown land cottage subdivisions, and sensitive areas.

Q: Can I get a reduction in the size of my disposal field?
A: Yes, a reduction of up to 25% in the size of a disposal field is allowed when it receives wastewater effluent from a secondary treatment system.

Q: What are the regulatory requirements for secondary treatment systems?
A: Secondary treatment systems must have a treatment capacity equal to or greater than the expected daily wastewater flow produced from a residence or non-residential facility. They must also be certified in accordance with the National Sanitation Foundation (NSF) Standard 40 for *Residential Wastewater Treatment System*s and bear a valid stamp or mark indicating certification in accordance with that standard. Secondary treatment systems certified in accordance with BNQ (Bureau de Normalisation du Quebec) Standard 3680-600 for Onsite Domestic Wastewater Treatment Systems have also been approved in Manitoba.

Q: Who can install secondary treatment systems?
A: Secondary treatment systems must be installed by a certified installer who has been trained and authorized by the supplier or manufacturer of the secondary treatment system.

Q: What about operation and maintenance?
A: Secondary treatment systems must be operated and maintained in accordance with the manufacturer's specifications. Property owner's are required to have a maintenance agreement with the service provider that includes annual inspections and servicing of system components.

Q: How do I know which secondary treatment system to use?
A: There are a wide variety of secondary treatment systems available on the market. Selection of the most appropriate system will depend on the type of development, the characteristics of the wastewater to be treated, operation and maintenance requirements, and costs. Property owners are advised to contact local suppliers and certified installers to determine the type of system that will best suit their needs.

Q: Which secondary treatment systems are approved for use in Manitoba?
A: The following secondary treatment systems have been approved for use in Manitoba (Note: some of these systems may no longer be available or approvals cannot be issued if a service provider is no longer available)

Aerobic Treatment Systems
- Zoeller Fusion Series
- Whitewater ATU
- Pro Flow Aerobic Systems
- Norweco Inc. Singulair Green
- Fast Wastewater Treatment System

Biofiltration Systems
- Waterloo Biofilter
- Puraflo Peat Biofilter
- Orenco Advantex Biofilter
- Ecoflo Biofilter

Combined Treatment/Dispersal Biofiltration Systems
- Enviro-Septic
- Eljen GSF

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