

WWC News



Level 2 Wastewater Treatment Systems— an overview

Level 2 Wastewater Treatment Systems

- Determining Factors
- How levels measure up
- Level 2 systems
- Conclusion

What is Level 2 SWTS?

If you are planning a new development or replacing an existing Subsurface Wastewater Treatment System (SWTS), the question arises - what type of SWTS should you install? In this quarter's newsletter we will be taking a closer look at Level 2 wastewater systems.

The determining Factors:

The type of system chosen depends on a few things, the first being water quality and degradation - the lowering of high water quality to a lower quality. In accordance with the Water Quality Act, The Department of Environmental Quality (DEQ) has set up nondegradation rules for ensuring water quality. The effect that effluents from a SWTS have on the existing water quality is considered, and maintaining the highest water quality possible is strived for. Non-degradation tests to determine the existing water quality, soil types and nitrogen levels are conducted on the area to be developed. Next, the effluent quantity (e.g. 2 bedroom vs. 5 bedroom home) and strength (residential vs. commercial) are considered, thus determining the proposed amount of nitrogen added into the water table. From this the level SWTS you will need is determined.

How the levels measure up?

There are three levels of SWTS in the state

of Montana; each of these levels is determined by the amount of nitrates they remove from septic effluents. Level 1a must remove at least 50% but less than 60% of the total nitrogen as measured from raw sewage, Level 1b must remove at least 34% but less than 50% of the total nitrogen as measured from raw sewage, and Level 2 must remove at least 60% of the total nitrogen as measured from the raw sewage. The DEQ constantly re-evaluates treatment systems assigned to each level, taking into consideration data provided by the manufacturer and collected by operators to ensure that the qualifications for each level are met. As of January 24, 2007 there are seven different Level 2 systems to consider. Below you will find a brief overview of each system.

A closer look at Level 2 systems

A Recirculating Sand Filter (RSF) system is constructed on-site using a watertight PVC liner, sand fill, drain rock and washed gravel. RSF's are typically used for larger systems and treats effluent from the septic tank after solids have been removed. Advanced treatment is accomplished by passing the effluent through the filter multiple times. Recirculating Trickling Systems (Orengo - Advantex, & Fluidyne - Eliminite) are prepackaged modular systems that can be used on both residential and commercial developments, as they are added to a typi-

(Continued on page 2)



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Level 2 Wastewater Treatment

(Continued from page 1)

cal septic that removes solids. These systems use a permeable medium to which a biofilm adheres. The wastewater is applied to the top of the bed and trickles through the media. A valve sends some effluent to final discharge, with the remainder recirculating back into the trickling filter. Aerobic Treatment Systems such as the IWS Model 6000 is a prepackaged aerobic treatment unit. International Wastewater Systems (IWS) Model 6000 sequencing batch reactor uses an equalization tank, sequencing batch reactor, holding tank, coagulation injection system, a gravity sand filtration system and an ultraviolet disinfection system. This system is only for larger effluent flows of 5,000 gallons per day or more and requires maintenance to remove sludge and to service components, adding to the overall cost. Santec - Extended Aeration is also a prepackaged system using an equalization tank with submersible pumps, displacement blowers, and supply bubble diffusers. Using underflow baffles effluent travels to a clarifier and is then recycled back into the aeration tank. Effluent is then pressure-dosed to subsurface drain fields. This system will also require ongoing maintenance. Bio-Microbics manufactures

modular prepackaged systems that use both fixed film and activated sludge. Micro FAST utilizes a fixed media, upon which bacteria will grow, submerged in an aeration tank; Retro FAST uses self-expanding chambers that are attached to an all weather air compressor. The aeration raises the dissolved oxygen level and accelerates the breakdown of pollutants. Finally, we have HDR Engineering Activated Sludge/Biological Nutrient Reduction Systems. HDR Engineering will custom design a system for you, however their level 2 systems are limited to design flows of 5,000 gallons per day or more and requires consistent wastewater flow.

In Conclusion

Keep in mind no matter which system you choose, all will require an Operation & Maintenance contract in perpetuity with the manufacturer, approved vendor or qualified personnel. Also, all systems are required to have a visual or audible warning alarm that indicates a hydraulic malfunction. Even with a Level 2 wastewater system in place, there may still arise a need to monitor water quality once the system is running to assure the highest water quality is maintained.