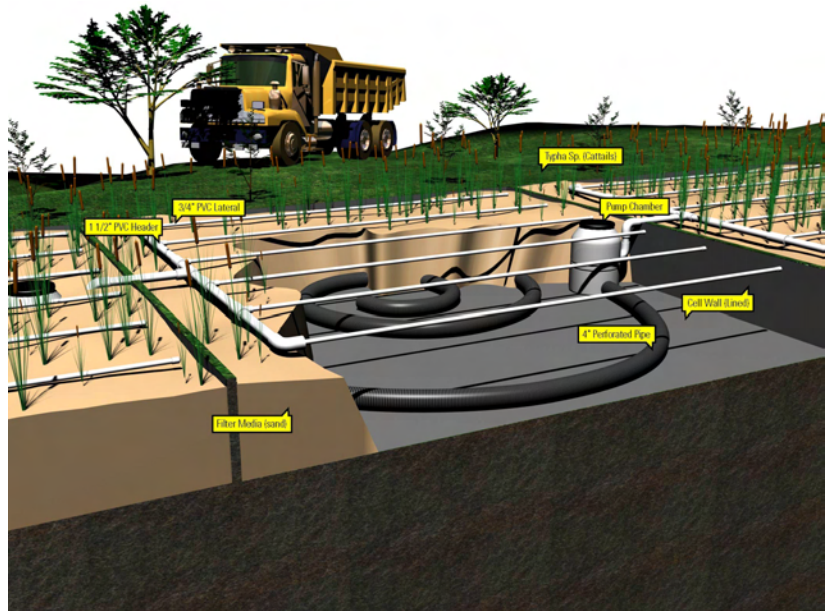




### Operating principle

The AQUA Wetland System (AWS) consists of three cells, each lined with an impermeable synthetic liner. Each cell contains a sand/gravel medium and cattail plants (typha sp.). Septic tank effluent (or equivalent) is applied to the top of the first cell in series via buried 'summer' and 'winter' distribution manifolds. Water from the bottom of cell # 1 is collected and then applied to cell # 2 in the same manner. Likewise, water from cell # 2 is applied to the top of cell # 3. The treated water is then discharged from the system. During winter this is accomplished via 'winter' dosing manifolds and in summer via 'summer' dosing manifolds.



### Treatment process

Physical, chemical, and biological processes combine within the AWS to remove contaminants from wastewater. Treatment of wastewater within the AWS occurs as the wastewater passes through the AWS sand medium and the plant rhizosphere. A thin aerobic film around each root hair is aerobic due to the leakage of oxygen from the rhizomes, roots, and rootlets of the cattail plants. Decomposition of organic matter is facilitated by aerobic and anaerobic micro-organisms present. Microbial nitrification and subsequent denitrification releases nitrogen as gas to the atmosphere. Phosphorus is co-precipitated with iron, aluminum, and calcium compounds located in the root-bed medium. Suspended solids are filtered out by the sand medium of the AWS and subsequently decomposed. Harmful bacteria and viruses are reduced by filtration and adsorption by biological films on the sand media.

