

YMCA Camp Seymour

Gig Harbor, Washington



The YMCA Camp Seymour is a unique environmental education center and residential camp located within a small inlet on Puget Sound in Washington State.

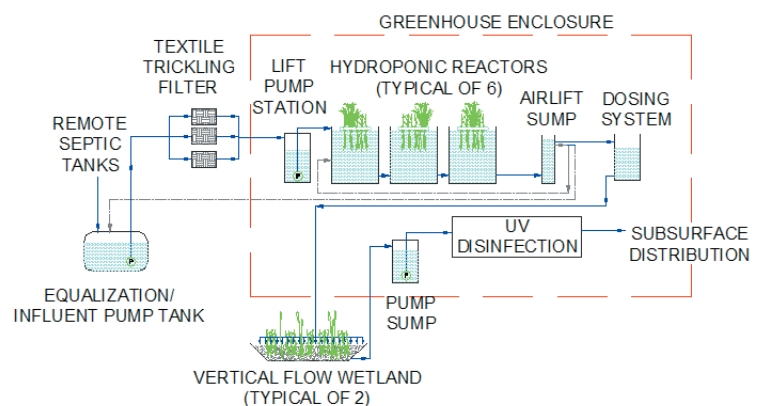
Background

As part of a plan to accommodate an increase in the number of annual visitors to this year-round residential camp, a great deal of consideration was given to preserving natural resources and minimizing environmental impacts within the Camp's local environment. Consequently, in keeping with the Camp's underlying philosophy of promoting and teaching environmental stewardship, Camp Seymour's Board of Directors selected a Living Machine[®] system to address wastewater treatment needs. This system essentially eliminated potential impacts to the environmentally sensitive Puget Sound, and also proved to be a beneficial asset to the Camp's environmental curriculum.

The Camp Seymour Living Machine[®] system was designed to achieve advanced quality effluent suitable for re-use for an average flow of 10,000 gallons per day and future plans to expand the system to accommodate up to 14,000 gallons per day. Indoor waste treatment components within a beautiful and inspiring greenhouse allow the Living Machine[®] system to become an integral part of the educational experience and environmental curriculum at the Camp.



LIVING MACHINE SCHEMATIC DIAGRAM,
YMCA CAMP SEYMOUR



Process

Septic wastes from a variety of sources including staff housing, cabins, common bath facilities and the Camp kitchen, flow by gravity to a network of septic tanks where the coarse solids are removed. From the septic tanks, the effluent is pumped to an equalization tank/dosing tank where denitrification of the waste occurs. Next the waste is pumped to textile trickling filters in doses and the conversion of ammonia to nitrate (nitrification) begins.

From the textile filters, the waste is pumped indoors to a series of six open Hydroponic Reactor tanks, each hosting a diverse population of aquatic plants and organisms. In this oxygenated environment the communities of macro and microorganisms work to further break down the waste and remove any remaining dissolved organic matter.

From the reactors, the effluent flows outdoors to two constructed wetlands; and, finally is disinfected with an ultraviolet light.

Treated effluent is stored for reuse on-site to irrigate a playing field. The school also plans to reuse this treated effluent for toilet flushing in any buildings added to the campus in the future.

Benefits

The Living Machine[®] system at Camp Seymour allowed the Camp to expand its facilities with little or no additional impact resulting from an increase in wastewater generated. Furthermore, this unique assembly of ecologically engineered subsystems does not require processing or disposal of secondary biosolids. In addition, the Living Machine[®] system provides classroom space and has become an important component of the Camp's environmental curriculum.

Living Machine[®] systems are innovative, ecologically engineered wastewater reclamation systems capable of reaching advanced wastewater treatment standards suitable for many levels of re-use. In addition to producing really clean water, a Living Machine[®] system can provide a practical and beautiful green space suitable for a variety of applications. For these and other reasons, Living Machine[®] systems are ideal for many industrial, educational, institutional, commercial, residential and community environments.

Living Machine[®] systems are designed and supported by the engineers and scientists who comprise Living Machines Inc. (LMI). Added resources are available to LMI through its sister company, Dharma Living Systems (DLS), a consulting and design group of architects, engineers and ecologists who specialize in the design and integration of sustainable water, energy and green building systems.



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