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### Additional Information:

- **Peatland Ecology Research Group** ([www.gret-perg.ulaval.ca](http://www.gret-perg.ulaval.ca))
- **Canadian Sphagnum Peat Moss Association** ([www.peatmoss.com](http://www.peatmoss.com))
- **Peat-Portal** ([www.peat-portal.net](http://www.peat-portal.net))

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- **The EJLB Foundation**
- **Environment Canada: National Water Research Institute; Ecoaction**
- **Golder Associates Ltd.**

Intervale is a nonprofit organization with the mission to conserve biodiversity, interpret heritage, and protect the integrity of rural livelihoods.

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Cover photo: Peatland, Stephenville Crossing, Newfoundland.



# Peat Filter Wastewater Treatment

All-natural  
Disinfects  
Costs Less



Assessing a peat bog. Intervale is pleased to be working with Golder Associates Ltd. on an all-natural sphagnum peat filter wastewater treatment system that has been applied successfully to municipalities, schools, parks, health clinics, and other facilities across Canada. This brochure explains how you can treat wastewater using peat systems and how this benefits your community and the environment.

## Wastewater Treatment: An urgent need

Wastewater is the water that carries wastes that have been flushed or poured down a drain.

Communities everywhere need effective and affordable wastewater treatment. A high percentage of Canadian municipalities currently discharge raw, untreated sewage into waterways and coastal waters. The problem is more severe in developing countries.

Municipal wastewater often contains contaminants such as disease-causing pathogens and harmful organic wastes. Left untreated, these effluents can have extremely negative effects on the health of humans and ecosystems, including serious illness from contaminated drinking water, loss of aquatic species, and damage to shellfish beds.

Installing a peat filter wastewater treatment system can protect against these problems by discharging wastewater that is safe for humans and living organisms such as fish and wildlife.

Peat is a natural resource that occurs in abundance in Canada and many areas around the world. For more than 30 years, peat has been tested and proven to be highly effective in treating wastewater from municipal and on-site septic systems for homes, schools, and other facilities.

## Peatlands: Nature's Gift

Peatlands occur in about 180 countries. They cover about 400 million hectares worldwide, with the largest peatlands occurring in Canada and Alaska, Europe, and parts of Asia. In Newfoundland and Labrador, peatlands greater than 30 hectares in size cover approximately 19% of the province.



Peat bog near Cartwright, Labrador.



Dr. Line Rochefort, Peatland Ecology Research Group, classifying a sample of peat.

Peatlands are very wet ecosystems in which the vegetation slowly accumulates due to a slow rate of decomposition. Peatlands around the world contain about 10% of the world's freshwater resource.

All peatlands, such as bogs and fens, are composed primarily of peat. Peat is organic matter formed from partly decomposed leaves, roots, and other parts of plants in a water saturated environment. The lack of oxygen available to plants is what causes the decomposition to occur very slowly.

The partial decomposition of plant matter leads to the formation of peat, which accumulates year after year. In an average peat bog, the rate of accumulation is about 0.5 - 1 mm per year. Thus, deep peat deposits are the result of thousands of years of growth.

In peatlands, the dominant form of vegetation is moss, usually Sphagnum mosses. Peat that contains an abundance of Sphagnum is highly effective in treating wastewater.



Sphagnum moss: living (green) and partially decomposed (brown) layers.



Labrador Tea  
*Ledum groenlandicum*



Pitcher Plant  
*Sarracenia purpurea*



Shagnum Moss  
*Sphagnum sp.*

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## Peatlands: A valuable resource



Educating residents about peat classification.

Peatlands perform valuable functions. As distinct ecosystems, they support a diversity of plant species and provide important habitat for a variety of birds and other wildlife. They store approximately one-third of the carbon

found in soils around the world and reduce the impacts of climate change by acting as a carbon sink. Peatlands regulate water flow by storing excess runoff water and acting as a buffer. This helps protect against flooding.

Peat is used for many purposes besides wastewater treatment: agriculture and horticulture, absorbing and containing oil spills and contaminants, disinfection, fuel, and forestry.



## How the peat filter system works



Peatbale system, Forteau, Labrador.

The wastewater enters the system through a pipe from a septic tank, where it is distributed over dried sphagnum peat moss that has been compacted on-site or encased in bales made of all-natural jute. The wastewater is treated as it flows downward and is filtered through the peat. A thriving fungal community performs complex conversions of the contaminants. The long contact time and adsorptive capacity of the peat contribute to the high performance of the treatment.

## Benefits of Using the Sphagnum Peat Filter System to Treat Wastewater



Russell Wall, Intervale, sampling effluent from peat system.

- contains all natural, sphagnum peat moss, with no artificial or chemical ingredients, and is safe for the environment;
- uses local resources, which contributes to local economies;
- requires little or no maintenance;
- employs local labour during construction;
- requires less space than a conventional disposal field;
- provides complete disinfection of harmful bacteria;

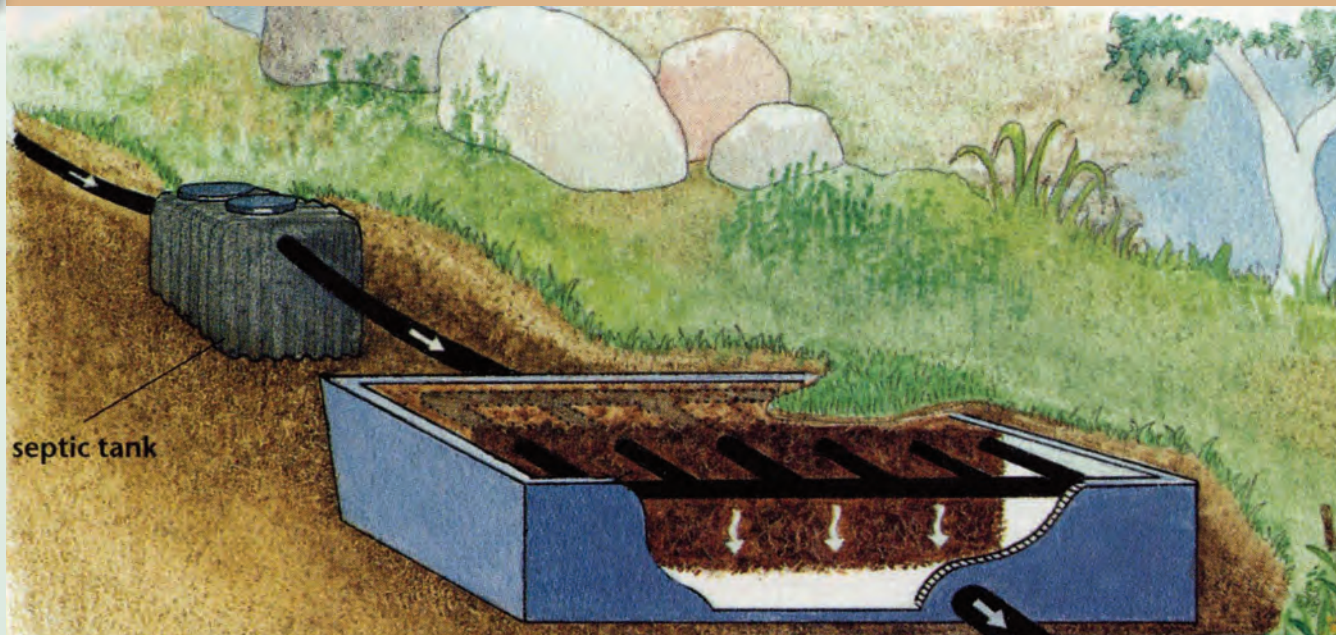


Peat harvesting, Bishop's Falls, Newfoundland.

- treated effluent can be discharged into lake or stream;
- performs very well in cold climates, due to fungal communities that thrive under cold conditions;
- allows for easy expansion as a community grows; and
- surface plantings of grasses or sod blend easily with natural landscaping.



Spreading (above) and compacting (below) the peat, Gros Morne National Park, Newfoundland.



Typical peat filter wastewater system for a home, school, or other facility. A pipe carries wastewater from a septic tank to the peat system, after which it is discharged into the ground or a receiving water body such as a wetland.

Illustration by John Mantha

## Low Cost

Peat systems can cost much less than conventional sewer systems because they may eliminate the need for extensive sewer piping. They also require little or no maintenance and their expected life span is greater than typical treatment systems.



Completed peat system, Forteau, Labrador.

## Peat Systems Promote "Green" Communities:

- \* 'Green' your community and promote healthy, sustainable living.
- \* Use the peat system as a marketing tool to attract environmentally conscious businesses, tourists, and other visitors to your area.
- \* Invite teachers to use the peat system as a teaching tool for an environmental curriculum or field trip.
- \* Start a citizens' water quality monitoring program in your town.
- \* Become involved in wetlands protection and restoration.

## Habitat Restoration

Peatlands, once they are harvested for peat, do not return rapidly to their original state. However, studies have shown that it is possible to accelerate the re-growth of native vegetation on the upper layers of peat, thus restoring the natural habitat for plants and wildlife and encouraging the peat to accumulate again. Harvesting companies are now urged to engage in restoration procedures when the harvesting of a bog has been completed.



Peatland, Gros Morne National Park, Newfoundland.

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Collecting mosses from a donor site for habitat re-vegetation along the TransLabrador Highway, a project with Bryophyta Technologies.