

DECENTRALIZED TREATMENT IS BREAKING DOWN BARRIERS

By Grant Beamish and John Matsui, newterra

A year-round trailer park that replaced its failed communal septic system with a decentralized sewage treatment system exemplifies the tremendous potential of modular technology to developers and municipalities. Today's advanced decentralized systems provide the flexibility to overcome extreme environmental challenges as well as lower the cost barrier of infrastructure for sewage treatment and collection.

In the case of Bay Meadows, a year-round RV park located along the shores of Lake Ontario, the facility had relied on subsurface treatment. However, current regulatory requirements eliminated the option of continuing with that approach. In addition to high bedrock, the lack of available area due to design flow values meant a more sophisticated sewage treatment solution would be necessary.

A challenge facing the Bay Meadows RV park is its adjacency to Pleasant Bay – a lagoon that's separated from Lake Ontario by a narrow strip of land. That physical barrier prevents the waters of Pleasant Bay and Lake Ontario from mixing on a regular basis. Without the dilution effect of the lake, Pleasant Bay has little capacity to assimilate the park's discharge. That reality was confirmed by a Surface Water Assessment.

According to Brock Cross, a project manager at Gunnell Engineering, the Surface Water Assessment concluded some of the most restrictive requirements he'd ever seen. For example, total suspended solids (TSS) and carbonaceous biochemical oxygen demand (CBOD5) were set at less than 5.0 milligrams per litre. According to Cross, the standards imposed for treatment were at least twice as stringent as those of other situations he'd dealt with.

"Phosphorus was an especially difficult standard," said Cross. "We had to meet 0.1 milligrams per litre. We've had to



Decentralized systems offer advanced treatment technologies in a very compact footprint. This modular MBR system at an Ontario RV park treats 83 m3 of sewage per day yet requires only 16' x 40' of space.

do 1.0 or 2.0 before. This is an order of magnitude better."

After evaluating several treatment solutions, Cross recommended a self-contained, membrane bioreactor (MBR) system proposed by newterra – a Canadian-based company with a reputation for meeting tough environmental standards and tight deadlines. For this project, both would be required.

The initial order for the turnkey MBR solution was placed in mid-August 2014, and within 20 weeks, newterra had engineered, built, installed and commissioned a modular, self-contained system treating 83 m3/day to the stringent specifications required.

"Bay Meadows is just one of a growing number of developments where advanced wastewater treatment technologies are helping meet and exceed the most demanding quality

requirements for discharge. That means a lot more flexibility with effluent receivers," said Joe Witlox, Business Development Manager at newterra, "And they're doing it with compact, economical and sustainable systems."

The system used for Bay Meadows is based on the same MBR process used by large municipal treatment facilities for more than twenty years. It's proven technology that has been modularized and scaled down to provide a cost-effective option for smaller treatment capacities.

According to Witlox, the genesis of newterra's systems for the development market is the company's history of providing treatment solutions for remote work camps serving the global resource industry. It's a market in which the company has become a world leader. "We cut our teeth developing rugged



With full automation and remote system monitoring and control, modern decentralized systems operate with minimal maintenance or operator involvement.

MBR systems for use in some of the most extreme conditions on the planet – often in environmentally sensitive areas where direct discharge was the only option.”

Not only did the systems have to be extremely reliable, easy to operate and deliver very high quality permeate – they needed to be scalable in order to respond the large population fluctuations at remote work camps.

“Our systems are engineered using a treatment train model that allows us to deploy, integrate and commission additional treatment modules very quickly as the number of people at a remote site increases,” said Witlox.

Those same advantages translate to the needs of land developers and municipalities. Modular, decentralized treatment systems can be phased up as capacity is required, thus helping to eliminate some significant financial

barriers of development projects. For example, deferring the capital costs of treatment infrastructure played an important role in Sheldon Creek Property Developments’ selection of such a system for their five-phase, gated community and business park near Ottawa.

Another barrier that decentralized systems help overcome is the opportunity cost of devoting land to treatment facilities. Traditional processes require four times the physical footprint of advanced, MBR-based systems. In the case of Bay Meadows, the trailer park was able to consolidate its new treatment system into two modular units requiring only 16’ x 40’ of space. Going forward, land where the old septic bed was located can serve additional RV sites.

As with all paradigm shifts, the move to decentralized treatment of potable water and sewage has required the

DID YOU KNOW? Ontario’s Fresh Water Facts

- Ontario’s more than 250,000 lakes contain about one-third of the world’s fresh water
- The Great Lakes Basin covers an area of 750,000 square kilometres: This includes 8 US states, most of southern Ontario and extends into northern Ontario
- More than 98% of Ontario residents live within the Great Lakes and St. Lawrence River Basin
- More than 80% of Ontarians get their drinking water from the lakes
- Manitoulin Island in Georgian Bay is the world’s largest freshwater island, covering 2,766 square kilometres (1,068 square miles)

*SOURCE
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progressive mind set of early adopters to demonstrate its advantages. Combined with the regulatory and fiscal pressures faced by municipalities and developers, those abundant benefits are creating a tipping point in the direction of this cost-effective and sustainable approach.

For more information on the projects outlined in this article, contact Joe Witlox at jwitlox@newterra.com.

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