



Packaged treatment systems: viable solutions for remote locations and harsh conditions

There are many community settings across Canada that are remote or are too small to warrant a conventional water and wastewater system. Barriers such as geographical location, accessibility, climate conditions, operation and maintenance, or even operator training limitations are all challenges for providing stable water services in these locations. There is also an increasing need for new norms and standards in water management processes to address climate change issues in relation to water and energy resources. To achieve an integrated approach to water management in these communities, financial, technological, and operational and maintenance challenges need to be considered, with the goal of enabling communities to be independent and sustainable.

Thinking small

Typically, when a small community's conventional water system approaches the end of its lifespan, the community either has to replace it with a water treatment system in every household (e.g., septic systems), or implement the 'big pipe system' to service the community as a whole. One of the key objectives for decision makers is to put in place a cost effective and



easy-to-operate facility that will meet effluent quality standards, but can also be operated and serviced by the existing staff, to minimize third

party involvement. As such, "communal", "distributed", "decentralized," or "cluster systems" are buzzwords that are gaining popularity among the consultants, engineers, developers, and decision-makers who understand the advantages of these systems.

In the past couple of decades, there has been advancement in the technologies, but the real key to success has been in the development of sophisticated levels of automation within a number of different types of packaged plants. Minimizing the requirements for the operator and the lower cost of HMI and control systems have finally made the use of communal and prepackaged treatment systems practical for small, remote communities. From a design point of view, location and accessibility, availability of energy sources, elevation, and temperature are some of the parameters that need to be considered when designing systems for such communities.

When the Town of Shakespeare—located in the county of Perth East, Ontario and home to



approximately 1,000 people—hired a consulting firm to identify the best solution for delivering future wastewater services, a decentralized approach was recommended. The community's septic systems were reaching the end of their effective life span, compounded by flooding and



a variety of other technical issues which moved council to search for a solution that fit the town's limited capital. "Being an off-grid, small municipality, the options were limited, forcing



people to either replace their existing septic systems or implement the big pipe concept with a pump station connected to another county," said John Donders, project manager at Aslan Technologies."

This was the first wastewater system that the Perth East had considered to meet the effluent standards and accommodate projected growth. All available options were reviewed from technological, financial, operational, maintenance, and site considerations. The decision was made to move ahead with an Aslan Technologies integrated solution that utilized an SBR system as the core treatment, "saving the town approximately \$2.4 million in avoided costs of 9.1 million for the piping extension to connect the town to a larger centralized municipal system," said Wes Kuepfer, manager of Public Works for Perth East.



By installing a local communal system, it also meant that user fees were retained in Perth East.

In 2012, Northwest Territories Power Corporation embarked on a project to replace its Bluefish Hydro dam at the headwaters of the



Yellowknife River. This three-year project was one of the largest construction project in the history of NTPC. The new dam together with the Snare Hydro system supply up to 20% of

Yellowknife's electricity needs using a cost effective, safe, reliable and green hydro power as the source of electricity instead of the initial estimate of 11 million litres a year of diesel to

generate power in these communities in the region.



Prior the commencement of this project, NTPC acquired a membrane-based system from Aslan



technologies in collaboration with other consulting and technology companies, to address the drinking needs for residents and camp personnel.

"Recent stats show that there are close to 300 remote communities across Canada, and most of

these could benefit from simple, turn-key and easy to operate water systems," said Mike Myers, president of Aslan Technologies. "The advantage is that they are designed, built and transferred to the site in an enclosure such as a container, prefabricated structure or made ready to install into an existing building" said Myers.

For the NWT Power Corp, the small system was equipped for colder climates with insulation and heating features, along with remote monitoring sensors that are crucial for minimizing systems outages and site visits, complexities and any unforeseeable challenges resulting from climate and site conditions.

Irene Hassas, Aslan Technologies Inc.

Director, Strategic Planning & Partnerships

ihassas@aslantech.ca