

## Demonstration and Verification of Leading-Edge Wastewater Treatment Technologies

**Jerry Leonard, Edmonton Waste Management Centre of Excellence**

The Edmonton Waste Management Centre of Excellence (EWMCE) is a non-profit joint venture between public, private sector and academic members. The Centre promotes research, technology demonstration and knowledge sharing to enhance scientific and applied knowledge in many areas of waste management. The EWMCE's Technology Development business unit was formed to leverage the Centre's leading-edge research facilities and access to expertise, in order to provide technology demonstration and verification services for the wastewater and solid waste sectors. The unit has been involved with a number of innovative technologies in the areas of advanced wastewater treatment, water reuse, nutrient recovery and biosolids drying.

The paper will discuss the mechanics of technology development projects, including some of the key partnerships that support the program. Many of the projects that come to the EWMCE have funding from the NRC's Industrial Research Assistance Program (IRAP) or Alberta Advanced Education and Technology's Innovation Voucher Program. These programs support the commercialization of technologies developed in Canada and Alberta. Another program the EWMCE has close ties to is Environment Canada's Environmental Technology Verification (ETV Canada) Program. This program offers a rigorous assessment process for verifying the environmental performance claims associated with technologies and technological processes.

Finally, this paper will highlight several of the innovative technologies that the EWMCE has been involved with.

These projects include:

- Upcoming study of co-digestion of municipal wastewater solids with fats, oils and greases (FOGs) and glycerine waste. In conjunction with this project, the EWMCE is developing a methane oxidizing biofilter to manage the gas stream from the digesters;
- Use of micro-bubble diffusion as an alternative aeration source in wastewater treatment processes;
- Validation of a wastewater nutrient recovery (struvite crystallization) process;
- ETV Canada verification of a chemical treatment system to supplement aerated lagoon treatment;
- Upcoming ETV Canada verification of a novel, energy-efficient biosolids drying technology.

### **Dr. Jerry Leonard**

Dr. Jerry Leonard is the founding and current Executive Manager of the Edmonton Waste Management Centre of Excellence. He was the driving force in the creation of the Centre, including its incorporation in 2003, and has guided its development in the years since then. Under his leadership, it has grown to a full-time staff of 13, including 2 full-time employees seconded to the Centre by EPCOR. He has been seconded to the Centre from the University, where he is a Professor of Bioresource Engineering. An agricultural engineer by training, his teaching and research interests evolved from instrumentation and control systems for machinery and intensive animal production systems to waste management and composting. It was through his composting research that he became involved with the City of Edmonton's Waste Management Branch in 1996, and to setting up the EWMCE as a non-profit corporation in 2003, and fostering its development since then.