

Duffin Creek WPCP

Evaluation of Biosolids Management Strategies



Client:
**Regional Municipality of Durham,
Ontario**

The Duffin Creek Water Pollution Control Plant (WPCP) is a conventional activated sludge facility that provides treatment for wastewater from the Regional Municipality of York and Regional Municipality of Durham. The Duffin Creek WPCP has a rated capacity for an average day flow of 364,000 m³/d (80 MIGD). A number of previous studies at the facility have identified that the potential exists for increasing the rated capacity. XCG Consultants, EnviroSim Associates Ltd., and MacViro Consultants Inc. were retained to undertake an Optimization and Capacity Assessment Study of the Duffin Creek WPCP. An evaluation of biosolids management strategies was conducted as part of this study.

Based on a computer simulation model of the Duffin Creek WPCP along with traditional desk-top evaluation tools, incineration was identified as the capacity limiting process in the solids train. With modifications to address the liquid train and solids train capacity limitations, it was estimated that capacity at the Duffin Creek WPCP could be increased to average day flows of 420,000 m³/d (91.5 MIGD), or approximately 15% greater than the current rated capacity.

Biosolids management strategies, involving construction of a biosolids storage facility, retrofitting some of the secondary digesters for sludge storage, occasional operation of both incinerators, and land application of digested biosolids were evaluated to provide solids train treatment capacity for the optimized capacity of 420,000 m³/d. As part of these evaluations, a bench-scale treatability study using different polymers was conducted to assess the dewaterability of digested sludge. Full-scale testing of the dewaterability of anaerobically digested sludge was also conducted on one filter press.

The recommended biosolids management strategy consisted of blending anaerobically digested sludge with raw sludge, dewatering the blended product, and incinerating in one incinerator. During peak sludge production periods, digested biosolids in excess of the incinerator capacity would be stored in retrofitted secondary digesters. Two incinerators would be periodically operated to dispose of the solids accumulated in storage. Land application of the digested biosolids, prior to dewatering, could also be practiced as a contingency to handle peak solids production. While providing greater biosolids treatment flexibility, this strategy requires a lower capital investment and reduced operating costs associated with sludge hauling and polymer dosages, relative to other strategies that were evaluated.

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