Keswick Water Pollution Control Plant Expansion

CLIENT

Regional Municipality of York

LOCATION

Keswick, Ontario

PROJECT DESCRIPTION

The Regional Municipality of York stretches north from the City of Toronto to Lake Simcoe and includes many hectares of protected greenbelt. York Region's diversity is evident in its nine local municipalities, geography, economic development and population. York Region provides residents and businesses of Aurora, East Gwillimbury, Georgina, King City, Markham, Newmarket, Richmond Hill, Vaughan and Whitchurch-Stouffville access to a broad selection of services and resources.

The Keswick Water Pollution Control Plant (WPCP) helps protect the waters of Lake Simcoe by treating sanitary wastewater generated around the town of Georgina, where Keswick is located.

B&M SCOPE OF WORK

The project to boost plant capacity began when the plant was operating at 85 percent. The plant uses an extended aeration process to achieve regulatory discharge limits, and is a critical factor in protecting the ecology of the watershed.

Black & McDonald's (B&M) scope of work included electrical, instrumentation, PLC and Supervisory Control and Data Acquisition (SCADA) implementation and commissioning work as part of the plant's expansion its treatment capacity. The capacity was increased by approximately 50 percent from the current 12,070 m³/day, up to an average day flow of 18,000 m³/ day to service approximately 49,300 people.

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Overall the project involved 8 km of trunk 750 mm feeder main from an existing trunk water main on Woodbine Avenue to the Keswick Reservoir, and 7 km of twin 500 mm diameter force mains from the Joe Dales PS to the WPCP Plant, along with upgrades to the Joe Dales PS and 5 km of road reconstruction on Woodbine Avenue in Georgina. B&M also installed a self-supporting 103 ft. SCADA radio communication tower in compliance with CAN/CSA-S37-01 used for monitoring and controlling process parameters including temperature, pressure and flow rate, complete with a gated and locked fence and lighting protection.

This project involved complex civil and electrical work. It was recognized by the American Public Works Association with a 2014 excellence award, and was the 2015 Project of the Year recipient from the Ontario Public Works Association.

Key construction metrics

During construction, the facility remained in full operation. Working with the municipality to co-ordinate shutdowns and tie-ins of new electrical/process equipment, B&M's procedures were submitted and followed to maintain high safety standards throughout the construction.

Objectives

- Increase in the rated capacity of the plant by 50 percent while reducing its phosphorus output by half from 1,300 kg per year to 650 kg
- Meeting the region's primary goal to protect Lake Simcoe and area by providing innovative wastewater treatment solutions

Complexity

An important feature of the project was the upgrade and expansion of the SCADA system.

The existing plant remained in operation during the entire expansion. The following process systems were constructed:

New Headworks Building - Electrical/I&C

- Build/FAT/new RPU panel
- Install/commission all instrumentation related to the raw sewage process
- Provide programming based on IFC PCN
- FAT programming with client
- Perform PRE/SAT and final acceptance SAT
- Provide updated PCN as per final SAT

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New RAS/WAS Facility - Electrical/I&C

- Build/FAT/new RPU panel
- · Install/commission instrumentation related to the sludge processing facility
- Provide programming based on IFC PCN
- FAT programming with client
- · Perform PRE/SAT and final acceptance SAT
- Provide updated PCN as per final SAT

New UV / Membrane Facility

- Build/FAT/new RPU panel
- Install/commission Instrumentation related to UV/Membrane facility
- Provide programming based on IFC PCN
- FAT programming with client
- · Perform PRE/SAT and final acceptance SAT
- Provide updated PCN as per final SAT

BENEFITS TO CLIENT OR PROBLEM(S) SOLVED

When the Regional Municipality of York needed to expand its waste water treatment plant in Keswick, it called on us. Black & McDonald's expertise in electrical and general construction projects ensured that the plant was able to transform the plant to address the growing infrastructure demands on one of the Greater Toronto Area's fastest growing communities.