



Case Study

Solving Sludge Pumping Problems

Ashbridges Bay Main TP, Toronto, Canada

The Challenge

Sludge is viscous and abrasive

Downtime-critical applications

Lobe pumps prone to excessive wear and breakdown

The Discflo Solution

No close tolerances in Discflo pumps prevent clogging

Non-impingement pumping reduces wear in abrasive service

Quick ROI due to reduces repair and maintenance



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A novel design of industrial pump is being used at the Ashbridges Bay Main Treatment Plant in Toronto, Canada, to solve some tough sludge pumping problems. Norrie Macdonald, Chief Works Supervisor Mechanical at the plant for two years, discuss the benefits the plant has reaped by installing Discflo pumps.

The Main Treatment plant has a design capacity of 818,000 cubic meters per day and serves an estimated population of 1,250,000 people. It provides complete wastewater treatment, including removal of suspended and biological solids, phosphorus removal, disinfection and incineration.

Sludge from the wastewater treatment process is both viscous and abrasive, leading to high pump wear rates and a potentially high incidence of downtime. Also, depending on where it is in the treatment process, the sludge can have a high solids content and possibly contain high volumes of entrained air or gas.

One of the areas of concern at the Ashbridges Plant was the digested sludge disposal area. The sludge contains approximately 3% solids and has to pass through a grinder prior to being pumped to the centrifuges. It is a critical application, which operates 24 hours a day, 365 days a year, at a flow of 12-16 liters/second to each centrifuge.

Up until 1995, Metro Works was using lobe pumps in this application. Because these types of pump need close tolerances to operate at optimum efficiency, they were prone to excessive wear and breakdown in abrasive and high solids service applications, such as sludge disposal. "The lobe pumps were costing us too much to maintain," says Norrie Macdonald, Chief Works Supervisor Mechanical at the plant. "As the lobes wore down, we had to speed the pumps up to maintain feed rate." The lobe pumps required complete overhaul after 3000 running hours, which in continuous operation all year round, means 2 to 3 times a year. Each overhaul is estimated to cost CAN \$10,000.

The second problem area at the Main Treatment Plant was pumping the thickened waste activated sludge from the Dissolved Air Flotation tanks to the digestion tanks. Here, the sludge is thickened from less than 1% to approximately 5% solids in a process that separates solids from liquid using dissolved air in water and a polymer coagulant. Originally the plant was using 10 progressing cavity type pumps to handle some 25 dry tonnes/day of this sludge. Although these pumps could handle the thickened sludge, they required overhaul about once every three years - at a cost of between CAN\$15,000 and CAN\$20,000 per overhaul.

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The solution to both sludge pumping problems was to replace the existing pumps with Discflo disc pumps. The first pump of this type was installed in the sludge disposal facility in May 1995, and since then, another five pumps have been installed there. One Discflo pump was installed in the sludge thickening facility to replace a progressing cavity pump in April of 1996.

"I first saw the Discflo pump demonstrated in 1993 at Highland Creek Treatment Plant in Metro Toronto" comments Norrie Macdonald, . "Then when I transferred to the Main Plant in 1995, they were installing a trial pump to replace a lobe pump. I was intrigued by its simplicity. This first pump gave us no problems, so it was an easy decision to replace the others. Provided the Discpac continues to operate trouble-free, these pumps should run easily on a five year maintenance check."

In both the sludge thickening and sludge disposal operations, the Discflo pumps have been trouble free since start-up. No repairs have been required to date on any of the pumps, and downtime in the critical area of sludge disposal has been negligible, with only routine preventative maintenance needed.

"The cost savings by replacing the lobe pumps has been noticeable" says Norrie Macdonald. "When you consider it costs almost CAN\$10,000 to completely overhaul a lobe pump after 3000 running hour and CAN\$15,000-\$20,000 for a progressing cavity pump, it will not take long to recoup our investment." The plant has also benefited by reducing the time spent on maintenance and gaining better control over preventive maintenance.

"As the plant continues to expand in the future, we expect the Discflo technology to be a part of that expansion." The Main Treatment Plant has requested another four Discflo pumps for its new centrifuges, which will be installed in 1998. In the meantime, three more disc pumps are being purchased to replace progressing cavity pumps in the waste activated sludge area.



Call Discflo now to find out how our pumps can solve your problems.

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