

# Xylem's Holistic Solution of Mixers and Pumps Supports Efficient Mine Slime Transport - From Sump to Surface Disposal

## Challenge

Canada, and specifically Ontario, is considered the mining center of the world with more mining companies based in the North American country than anywhere else<sup>1</sup>. With deep expertise in smart mine water management, Xylem supports many mining customers in Canada, and around the world, to maximize production, ensure reliability of infrastructure and optimize a mine's sustainability. One customer, operating a hard rock nickel mine in Ontario needed an efficient and reliable solution to transport its mine slime from an underground sump back to the surface while ensuring continuity in production and minimizing downtime.

Terry Cormier, Technical Sales Representative, "Xylem's mine water management expertise extends across the entire mining operation from sourcing to dewatering to treatment and reuse. From pumps that transport mine slurry to mixers that agitate slime to smart, and analytical technologies that support pipeline integrity, our team can engineer solutions that increase productivity, reduce costs and turn mining water management from an expense to a strategic advantage."

The mine slime generated from drilling and blasting at the nickel mine site in Ontario was a heavy slurry mixture that gathered in the mine sump, 4,000 feet below the surface. The customer needed a solution to transport this residual slurry up to a surface sump from where it could be correctly disposed of. The challenge was to develop an efficient means of doing so that could operate consistently with minimum maintenance or intervention, maximizing production at the mine. The heavy, viscous nature of the mine slime, combined with the cramped location of the sump thousands of feet underground, added to this challenge.

To ensure the mine slime could be efficiently pumped to above ground levels, the slurry needed to be continuously agitated to prevent heavier elements from settling at the bottom of the sump and clogging the dewatering pump. Agitating the slurry also prevents the slime from becoming too viscous to pump. Due to the location deep underground, air agitation was not a feasible option.



Mine slimes had built up in the sump before Flygt mixers and pump were installed.

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## PROJECT HIGHLIGHTS:

- Consistent, clog-free pumping of mine slime from sump to the surface for disposal
- No downtime for unplanned servicing or maintenance
- Cost effective, low capital investment solution involving just two mixers and two dewatering pumps
- Enhanced availability of manpower to focus on maximizing nickel extraction
- Improved safety on site - no need to pull up mixers or pumps to fix problems

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## SOLUTIONS:

- Two Flygt 4650 hard iron mixers
- Two Flygt 2140 HT dewatering pumps

<sup>1</sup> <https://www.nrcan.gc.ca/mining-materials/exploration/8296>

## Solution

Drawing on its broad portfolio and in-depth expertise, Terry and his team developed and engineered a solution incorporating Flygt 4650 hard iron mixers and Flygt 2140 HT pumps. Two Flygt mixers were installed on masts on diagonal corners of the sump and two pumps were installed to pump the slurry to the second sump at the surface. Flygt 2140 HT pumps were selected as they can easily handle chemically aggressive, mechanically abrasive, and highly viscous fluids laden with particles.

“Designed to generate maximum thrust with minimal use of energy, the propeller blades, with their backswept design, allow highly fibrous material to pass through, while the wide-hub design deflects fibrous material.”

Flygt compact mixers have been engineered for reliable operation and efficient mixing. Designed to generate maximum thrust with minimal use of energy, the propeller blades, with their backswept design, allow highly fibrous material to pass through, while the wide-hub design deflects fibrous material. Rigid guide bars at appropriate depths optimize mixing efficiency and help the mixer to withstand fatigue from strongly fluctuating forces within the sump. Used together with Flygt lifting equipment, guide bar systems enable easy access for mixer inspection and service.

## Result

The solution has operated consistently and efficiently since installation.

**The mixers have kept the slime liquid moving and agitated, supporting the Flygt dewatering pump to operate continuously without any need for maintenance or de-clogging 12 months since being commissioned.**

The benefits of this mine slime management solution for the nickel mine operation include zero downtime to date - there has been no need to bring the pumps up to the surface for servicing - which has also meant that man power and labor has been saved and allowed the mine team to focus on other tasks on site. This has also increase safety on site by reducing asset failures and associated maintenance requirements.



Mine slime is efficiently pumped away thanks to Xylem's broad portfolio of mixer and pumping solutions that combines agitating and transporting liquid out of the sump.