

Lowara Pumps help support a unique nickel extraction project

EXECUTIVE SUMMARY

When the Thakadu Nickel Purification Plant needed solutions for chemical and water pumps, Xylem and its family of Lowara Pumps stepped up.

Mining operations create a considerable amount of crude waste streams from their extraction operations. If purified, those streams can yield valuable minerals. Built to take advantage of the opportunity, the Thakadu Nickel Purification Plant produces 2,500 tons per month of high-purity, battery-grade nickel sulphate from a crude nickel sulphate stream.

The Thakadu Nickel Purification Plant utilises a process called Nickel Crystallization. A crude nickel sulfate stream is pumped to the purification plant, where it is heated and evaporated into a vacuum, forming nickel sulfate crystals for harvesting.

Such purification is a highly intensive and precise process requiring the careful balancing of components and energy requirements to accomplish the purification safely and profitably. To help enable the plant's vision, Xylem provided 102 pumps from different brands within its stable and pump selection and engineering services to align the right choices. These include the first chemical pumps of their kind used in an African project.

Xylem assisted in selecting the most suitable pumps for the plant design. Though the initial focus was on pumps for the water process, that scope expanded to include pumps for the plant's chemical processes. Xylem's in-house application engineers collaborated with the project's leaders to consider numerous variables that influence selecting pumps for the site. These included severe space constraints, limited power restrictions, appropriate pricing to ensure the project's profitability, and managing liquids in various aggressive states.



Through utilising Xylem's range of digital tools and 3D models, and supported by Xylem's engineering department, the plant's designers could select and calibrate suitable pump solutions. Xylem Africa provided insight, support and the backing of Xylem's experienced global team.

Xylem is proud to have played its role in establishing the plant. The Thakadu Nickel Purification Plant is one more example of what can happen when the right people, skills, solutions and vision come together.

The Thakadu Nickel Purification Plant is the first Nickel Purification Plant in South Africa and an important contributor to the country's economy. It also highlights the many untapped opportunities for mines and heavy-industrial concerns to gain more from their crude waste. It uses 102 of Xylem's pumps from their globally renowned Lowara brand.

Pumps

42 Lowara Vogel LSB SS316 block pumps: The Lowara Vogel LSB is a horizontal block pump based on hydraulics according to ISO 2858 / EN 22858 with a close-coupled TEFC motor, and suited for moving high volumes of slightly contaminated fluids, hot water and cold water, among many other use cases.

12 Lowara ESHS Centrifugal end-suction pumps: The Lowara e-SH series is a single impeller centrifugal pump made in AISI 316 stainless steel, making it the right pump for moving water and aggressive liquids in a vast number of applications where high chemical resistance is needed.

39 Lowara e-SV Stainless Steel Vertical multistage pumps: The Lowara e-SV vertical multistage pump is a highly reliable and technologically advanced multipurpose pump.

9 Lowara DOC7 submersible pumps: The Lowara DOC pumps are versatile, corrosion-resistant and compact, suited for pumping clean and dirty water, while the pumped liquid cools the motor and thermal overload protection keeps it safe from overheating.

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Pump selection

Xylem provided the best possible pump solution for the aggressive and corrosive liquids at the plant. These pumps operate 24/7 outdoors, with extremely low pH, excessive-high Specific Gravity, and high temperatures. Xylem provided a combined solution to overcome these main challenges, using unique-designed small compact and robust custom-build pumps from our range.

Starting at the pre-feasibility stage, Xylem provided access to desktop- and online-based product application selection tools. These were complemented with in-depth product assistance, knowledge and guidance to select the correct pumps for the different applications.

Engineering Services

Xylem supplied 3D model drawings respectively from the Lowara CAD Centre and R&D department. Xylem's Italy R&D team, as well as Xylem Austria, provided additional support for tailor-made solutions and custom-built pumps from the LSB Lowara series.