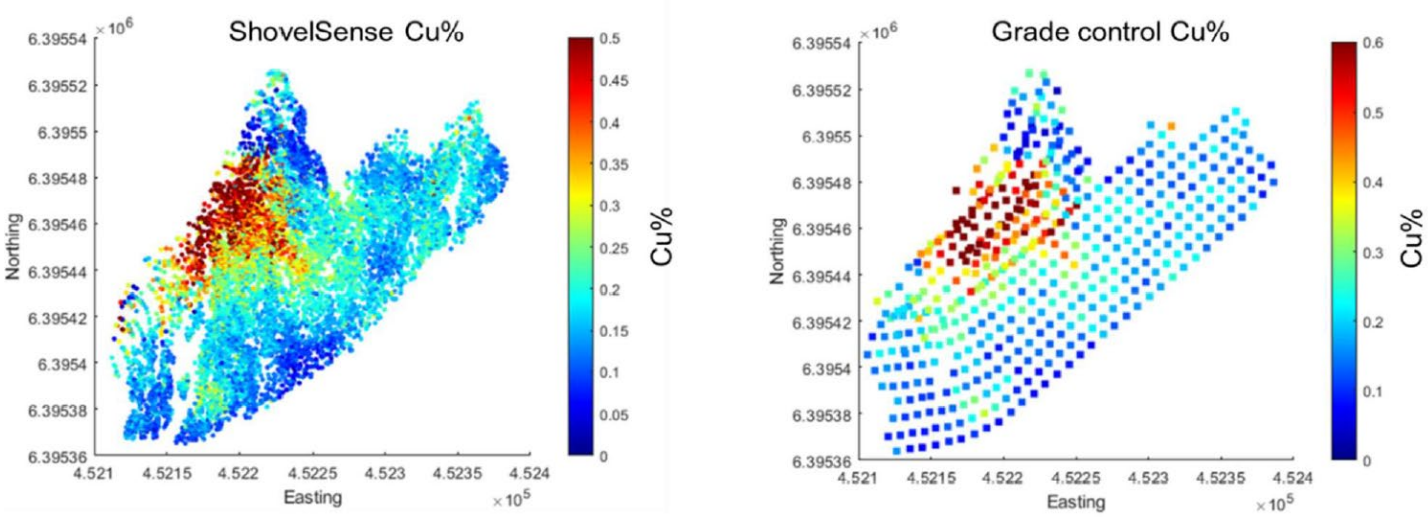
Redefining the Battery Limits of Processing Plants

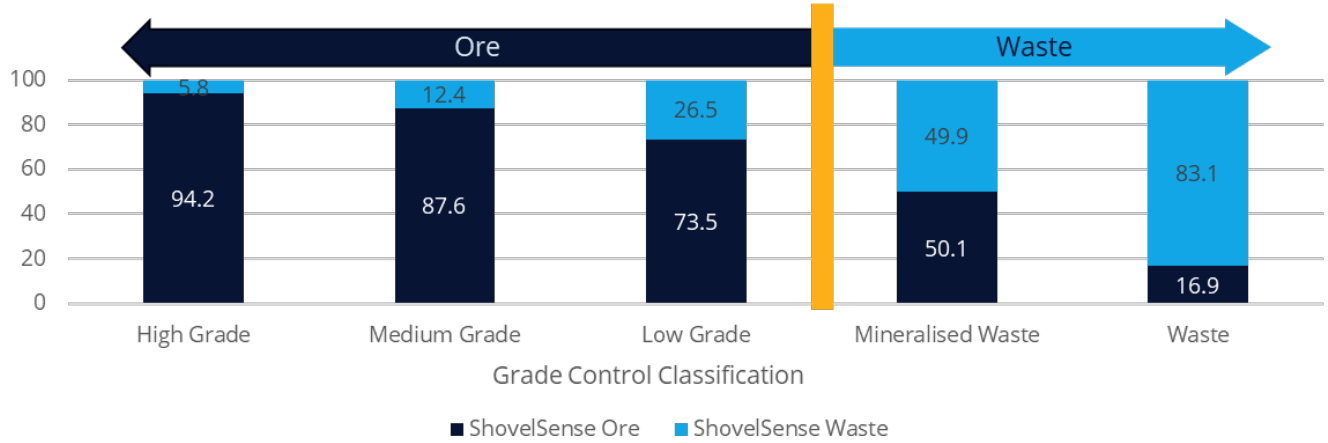
SHOVELSENSE™ TECHNOLOGY

At Red Chris Mine, Newmont has integrated the ShovelSense system which employs XRF (X-ray Fluorescence) technology mounted on shovels operating in the open pit. This innovative system allows for real-time grade estimation of every scoop of material, enabling immediate separation of ore and waste. This technology provides a much higher resolution of measurement (approximately 16-25 times) than conventional grade-control systems.

The system accumulates the grade loaded into each truck. If the resulting material classification is different to that expected from grade control, the truck is diverted to a new destination.



Viewing a side-by-side comparison over a mined bench clearly shows the high-level agreement between the systems along with the impact of the high level of precision provided by ShovelSense.



The greatest opportunity to redirect trucks has been found on the ore/waste boundaries, with up to 50% of mineralised waste (MW) redirected to ore.

BELT SCANNING

Newmont has installed belt scanning technology equipped with Prompt Gamma Neutron Activation Analysis on the conveyor system after crushing at three operations.

This technology measures key ore properties before ore reaches the mill, providing vital data such as estimated ore hardness and tailings neutralization potential. Integration with the process plant control system allows for feed-forward control and optimisation.

In block caving, the scanners can be used to track drawpoint grades and enable bulk ore sorting methods.

THE BENEFITS – 12 MONTHS OF OPERATION AT RED CHRIS MINE

DIVERSIONS FROM WASTE

1.6MT Ore

recovered from material classed as waste in traditional grade control

DIVERSIONS FROM ORE

825kT

of waste removed from the ore stream

STRIP RATIO REDUCTION

0.40

reduction in tonnes of waste per tonne of ore recovered

XRF SERVICE LIFE

800 hours

Most heads reaching the expected service life before failure

Read more in the proceedings

Futcher, W., Seaman, D. and Kelin, B. (2024) *Redefining the Battery Limits of Processing Plants – Improving Sustainability through the Deployment of Sensing Technologies.* 16th AUSIMM Mill Operators' Conference, Perth Australia, 21-23 October 2024.