Case Study

Automated control reduces cyanide consumption

Darlot Gold Mine, Western Australia

EXPERTISE, ANALYSIS AND SUPPORT

Darlot and Orica's experienced technical personnel worked together to identify the opportunity to significantly reduce cyanide consumption and mitigate excursions above the 300ppm concentration set point limit.

As part of the project Orica installed and calibrated an OCM5000 analyser (see figure 1) to replace their existing manual control process to provide greater control and reporting at the head of the leach circuit. This data enabled the PLC to automatically control the cyanide addition, and tighten the cyanide dosing range thereby significantly reducing cyanide consumption and mitigating excursions above the 300ppm concentration set point limit. This was achieved without compromising mineral recovery rates.

This was carried out in conjunction with the plant's continuous improvement program. Partnering with Orica on the installation, calibration and monitoring of the analyser ensured that the full benefits of the analyser were realised.

Figure 1 – OCM5000 Free Cyanide Analyser

Free CN measurement from 0 to 10,000ppm for leach circuit optimisation.

WHAT WERE THE KEY OUTCOMES?

8% reduction in cyanide consumption

No compromise on mineral recovery

Significant ongoing cost reductions

THE OUTCOME

The implementation of the OCM5000 on-line free cyanide analyser was a key contributor to optimising cyanide use at Darlot. Installed to achieve greater cyanide control by monitoring and reporting concentration readings at the head of the leach circuit, the data enabled the PLC to automatically control the cyanide addition. Since installation of the on-line free cyanide analyser site metallurgists have observed a steadier, tighter control of cyanide concentration in the plant and thus a reduction in cyanide consumption (see figure 2 overleaf).

"The installation of the on-line cyanide analyser in the first tank of the leaching circuit has allowed us more control and efficiency with our cyanide addition. It has allowed us to optimise the cyanide consumption and maintain concentration in the tanks within a smaller range. It has allowed the elimination of human error as is encountered with practising the manual titration as the basis of analysis."

Senior Metallurgist at Darlot

The above quotation is not intended as a verbatim transcript of comments, but as a summary of a discussion which took place.

ORICA

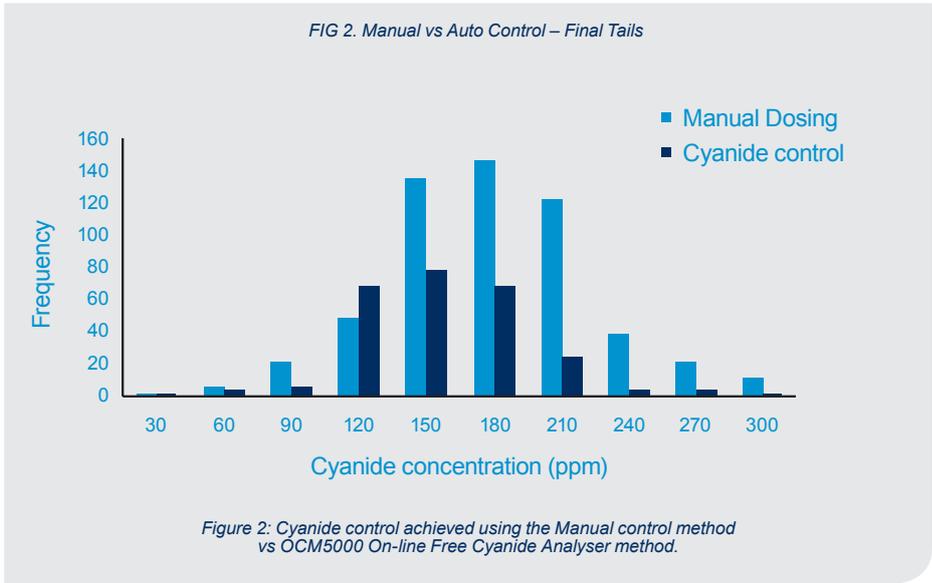# Automated control reduces cyanide consumption

Darlot Gold Mine, Western Australia

ADVANTAGES OF USING ORICA'S TECHNICAL TEAM FOR SITE SUPPORT ARE:

Experience in installing and operating over 60 analysers worldwide

Best practice knowledge transfer due to Orica's wide customer network

Better utilisation of limited on-site resources

FIG 2. Manual vs Auto Control – Final Tails

Figure 2: Cyanide control achieved using the Manual control method vs OCM5000 On-line Free Cyanide Analyser method.

MANUAL VERSUS AUTO CONTROL TRIAL RESULTS

Following the installation of the analyser, mine operations were given access to more regular and accurate data fed into the control systems. This provided a greater ability to reduce response time in making adjustments and eliminated any human error.

WHO WAS THE CLIENT?

The Darlot Gold Mine owned and operated by Barrick Gold Corporation is located in the Yilgarn district of Western Australia approximately 680km north-east of Perth. Barrick is a signatory to the International Cyanide Management Code and as such employs leading practices in cyanide management.

WHAT CHALLENGE DID THEY FACE?

To this end Darlot needed to eliminate manual control of cyanide consumption in the leaching process and replace this with an accurate automated system. Their aim was to operate within a free cyanide target of a 300ppm limit at the head of the leach circuit.

HOW DID ORICA SUPPORT AND HELP?

Orica undertook a customer needs analysis to determine the suitability of their products to meet the mine's needs and how to best implement the program. The OCM5000 analyser was identified as the best solution.

Orica installed and monitored the analyser before training the on-site staff to maintain the equipment. Orica continue to provide ongoing support.