



# St Ives Gold Mine

## Installation of Batch InLine Leach Reactor

<b>Model</b>	ILR2000BA
<b>Purpose</b>	Increase gravity and overall gold recoveries
<b>Place</b>	St Ives Mine, Kambalda Western Australia
<b>Manager Metallurgy</b>	Peter Johnston
<b>Senior Development Metallurgist</b>	Yavuz Atasoy
<b>Date</b>	January 2003
<b>Results</b>	Increased gravity gold recovery from 15% to 23% of total gold recovered, indicated overall gold recovery improvements, plus improved security and handling of concentrates

Gekko recently successfully installed an ILR2000 Batch unit at Goldfields's St Ives Mine in Kambalda, WA, which is one of Australia's largest gold mining operations. The unit has been installed to treat gravity concentrates by replacing a Gemini table. Yavuz Atasoy, Senior Development Metallurgist for St Ives Gold Mine evaluated all available technology and chose the Gekko equipment. Following installation, gravity gold recovery increased by more than 8% of total gold recovered.

Leach recoveries in the ILR in the first three weeks of operation averaged over 99%.



From the left: Mick Speed, Gold Room Foreman, Peter Johnston, Manager Metallurgy, Yavuz Atasoy, Senior Development Metallurgist

CASE STUDY

"The overall outcomes of this exciting project have been very positive and we have achieved our set goals."

Peter Johnston,  
Manager Metallurgy

## Startup Recoveries

Action	Recovery %				
	Day1	Day2	Day3	Day4	Day5
Leach	99.4	99.4	99.7	99.6	98.7
Electrowin	96.8	80.5**	89.7**	96.6	98.8

\*\*EW cycle cut short

Prior to the order, Gekko carried out a comprehensive site audit on the complete gravity system at St Ives. The Gemini table was identified as the key area requiring improvement. High gold losses from the table were significantly affecting the overall gravity recovery in the plant. Also, lab work at Gekko identified very high oxygen consumption levels in the leaches on the gravity concentrate. The unit utilises only oxygen and cyanide to achieve rapid kinetics and high recoveries.

South African based Gold Fields Ltd purchased the St Ives Gold Mine from WMC Resources in 2002. Since then several new projects have been investigated and the ILR intensive leach system has been one of those instigated and completed to date. Work is continuing on the existing gravity circuit to further increase overall gravity gold recovery. Now that the downstream recovery is high (>99% in the ILR), the emphasis is on achieving greater recovery from the primary gravity concentrator devices and will be the focus of further enhancing the plant.

Technical Director Sandy Gray recently visited the installation was extremely impressed with the layout and design of the installation. The St Ives and Gekko staff collaborated together to plan and achieved an excellent outcome. The installation is user friendly and easily accessible. The InLine Leach Reactor's Allen Bradley control system is fully automated and interfaced to the existing site ABB, Distributed Control System.

The excellent installation and engineering is due to the efforts and attention to detail of Yavuz Atasoy and the team at St Ives. Particular attention was given to the safety aspects of circuit tie in, operation and maintenance, with the inclusion of a Hazop study in the design stages.

Item	Units	Before	After
Gravity Recovery	%	15	23
Overall Plant Recovery	%		Indicated increase of 0.5-1.0. Too early to confirm. First month of operation coincided with best recovery month for 12 months.
Kinetics			80%@6hrs, +99%@18hrs
Oxidant	m3/h		Oxygen 8 m3/h
Cyanide Consumption	%		1.5 %
Test work		Site gravity audit, lab test work	Daily survey of ILR solutions and residues
Electrowin Recovery	%		95+ %
Dore Fineness	%Au		+94+%
Dore Quality			Excellent
Pregnant Solution Clarity			Excellent
EW cell sludge build-up			No. Strong attachment to cathodes
Availability	%		>99%

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Peter Johnston, Manager Metallurgy at St Ives Gold Mine, said: *“The overall outcomes of this exciting project have been very positive and we have achieved our set goals. We have enjoyed our business and technical relationship with the Gekko team and look forward to progressing to the next stage of our gravity upgrade project. This will entail a circuit trial to further increase the primary concentrate yield to feed the ILR, with the aim being to maximise our gravity recoverable gold extraction across a range of ore types*

Yavuz Atasoy, Senior Development Metallurgist at St. Ives said: *“The actual performance of the In Line Leach Reactor exceeded what was predicted by the laboratory tests and it will stay as an integral part of the plant in the long term future. We are already seeing the benefits of the installation of ILR in the form of reduced cyclone underflow grades, higher total plant recoveries and lower final plant tailings.”*



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