



# Penjom Gold Mine

## Installation of InLine Pressure Jigs and InLine Leach Reactor

<b>Models</b>	6 x IPJ1500 1 x first ILR1000 prototype Continuous (1 tph treated)
<b>Purpose</b>	Replace CIP circuit and increase overall recovery of gravity concentrate in highly carbonaceous preg-robbing gold ore.
<b>Place</b>	Penjom Gold Mine Kuala Lipis, Malaysia
<b>General Manager</b>	Eric Vesel (previously, Gordon Lewis)
<b>Date</b>	13th June 1998
<b>Results</b>	Gravity recovery in a highly carbonaceous gold ore. Increased overall recovery by 15%. Increased overall gravity gold recovery from 10 to 50% at time of installation

Gekko Systems installed six InLine Pressure Jigs (IPJ1500) to recover both free and sulphide associated gold from the grinding circuit. The significance of this recovery was considerable due to the extremely low gold recovery in the downstream CIP leach circuit at that time. The Penjom ore carries varying amounts of aggressive naturally occurring fine organic carbon. This fine carbon then carries gold to tail where it is lost. Penjom was Gekko's first ILR Installation and involved significant development.



From the left: Eric Vesel, General Manager and Sandy Gray, Technical Director Gekko Systems

*"The very low capital investment combined with the very high return has proved an attractive investment and a critical plant process".*

Eric Vesel  
General Manager

The InLine Pressure Jigs recover gold into a concentrate that is low in fine carbon. This concentrate is then cleaned in a further concentration step to produce a feed grade of ~ 600 - 800 ppm Au which reports to an InLine Leach Reactor. The final concentrate is then leached to in excess of 90% recovery (highest recovery device in plant). The solution is continuously separated from the solid by settling the solid in a cone and further dewatering on an inclined vibrating screen to produce a solid filter cake of approx. 85% solids by weight. The pregnant solution is passed through selective carbon absorption columns to recover the gold in solution. The carbon is stripped occasionally in a conventional carbon strip circuit. Typical gold loadings on the carbon are around 10,000 ppmAu.



Penjom staff, in conjunction with Gekko, carried out all the associated test work for this installation on site. The Penjom laboratory staff were instrumental in the good work achieved in the development phase and should be entitled to a royalty for their contribution. The leach kinetics achieved on the concentrates was very rapid, resulting in a relatively small reactor volume running at high capacity. The ILR residence time is approximately 60 minutes.

The overall gold recovery at Penjom is now in excess of 90%. For this ore type, with such an aggressive preg robbing index, is a world first using hydrometallurgical processes and a spectacular achievement. Site staff have continued their innovation to optimise all aspects of the operation with extraordinary success. The very low capital cost with very high return of this installation has proved an attractive investment and a critical plant process.

The Penjom team successfully converted a conventional CIL plant to operate on selective resin. The use of "resin in leach" for the full downstream leach circuit has been successfully and recovers approximately 30% of the total gold recovered in the plant.



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