

MINE OF THE MONTH

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DECLINE BREAKTHROUGH A BOOST FOR GYMPIE

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Mike Syddell revisited the mine after a gap of four years to report on progress.

December 23 marked a red letter day for Gympie Eldorado Gold Mines when at exactly 4pm the \$10m, 4.2km-long Lewis exploration decline broke through into the existing Monkland workings at the 500m from surface level, until now only accessed by a narrow shaft.

The meeting of the two sets of workings will bring a sea change in the way that Gympie Eldorado can work.

Since the re-opening of the historical (1867-1927) field in 1995 to provide cash flow for exploration and development, much of the mining had been done using highly skilled, but

not exactly productive, hand-held mining methods in the narrow high grade Gympie veins and Inglewood feeder structures, and more recently some bulk mining of stockworks.

Bonanza grades in some areas, which have allowed the company to develop a profitable sideline in specimen and quartz-gold jewellery worldwide, have helped keep the hand-held side profitable.

But, says chief geologist, Ron Cunneen, with the years has come an increasingly better understanding of the complex geology at the Gympie goldfields, which cover an area of 10km by 4km and formed the sixth largest

historical goldfield in Australia.

In fact, the complex geology - coupled with a strong focus on exploration to add to the resource base - has meant the need for a close integration of exploration and mining activities.

Cunneen has line accountability for exploration and support accountability for production while the general manager of the mine, Rowan Johnston, has the reverse.

The advances in geology have recognised that as well as the narrow high-grade veins, there are also sizeable areas of Gympie Vein stockworks where the microvein density is sufficient to mine using bulk methods. These stockworks can be up to 100m wide, with grades from 8-12g/t.

However, using old recommissioned shafts up to 1km deep at the Monkland mine has not allowed optimal mechanisation. The cage, which barely fits nine workers, is not the best way to take modern machinery underground.

For a start, tyre size has limited the maximum size of equipment that could be used: five Toro 151 LHDs and a Qasar IL drill rig. The LHDs, for example, had to be cut into 26 separate pieces and reassembled underground.

Nevertheless, the mine is now 90% mechanised rather than using hand-held mining and rail drives as when it started in the mid 1990s. Rail using 5t diesel locos is still the most cost effective way to move most ore to the shaft.

The breakthrough of the Lewis decline will change much, with workers, materials and equipment moving via decline, while the shaft can purely be devoted to ore haulage.

Larger size equipment can also be used, such as Elphinstone 2900 LHDs, for bulk mining of the stockwork areas.

The decline, driven to a production size of 5.5m by 5.0m at



1:7, will also improve underground ventilation to workings that extend at present to 900m below surface.

The decline, largely funded by the profits from the Monkland mine, is being developed and mined by contractor, Roche Bros using four Bell 40t trucks, a Caterpillar Elphinstone 2900 LHD and Atlas Copco jumbos.

Roche is mining the near-vertical N3 ore body on the Inglewood veins, which contains 20,000oz of gold. The ore body, comprising a series of channels, is continuous enough to be mined using long hole benching.

The steady ramp up of production is seeing Gympie coming ever closer to the magical 100,000oz a year production, with a target of more than 60,000oz this year.

Johnston says in the last two years, while the workforce has remained steady at 145, production has risen from 130,000tpa of ore to 240,000tpa, at a constant grade of around 8.5g/t. In consequence, the cost per tonne, including development and supervision, has halved.

Safety has also improved, with the LTIR reduced from 260 when Gympie bought the project seven years ago to 10 today, aided by labour turnover of just 4% in a decade.

The Lewis decline is mainly used as part of an exploration effort, into which Gympie is sinking \$7m this year from a planned \$25m, three-year program. This is one of the largest programs in Australia.



Hand held slot mining produces this specimen stone, which can grade up to 10% gold. Specialists are paid around \$100,000 a year, rather than piecework, to ensure maximum safety. Four-six headings are mined at any one time, with serendipity determining which are profitable at over 15g/t and which lose money at under 8g/t. Average grade of this mining over the past six years is 15g/t.

Gympie Eldorado

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- Safety has improved, with the LTIR reduced from 260 seven years ago to 10 today.
- The breakthrough of the Lewis decline means workers, materials and equipment will move via decline, while the shaft will be devoted to ore haulage.
- The decline, driven to a production size of 5.5m by 5.0m at 1:7, will improve underground ventilation to workings that extend to 900m below surface.
- The decline is being developed and mined by Roche using four Bell 40t trucks, a Caterpillar Elphinstone 2900 LHD and Atlas Copco jumbos.

Johnston says the decline will allow the conversion to reserves of 800,000t of remnant ore in the old Scottish Gympie workings, as well as drilling into other prospective stockwork areas higher in the mine.

The old timers tended to leave the stockworks in favour of the high-grade veins because, although the quartz microveins are high grade, they represented only 10% of what has to be mined. The other 90% is barren carbonaceous rock.

However, modern thinking

is different. The multitude of quartz veins offers a much larger contact area between quartz and carbonaceous rock to which gold can migrate.

Stockworks areas offer returns of 50-60tpm advance, compared to the 20-25t/m of the Inglewood lode.

The present 6A stockworks stope being mined at up to 14,000tpm is up to 40m wide, 60m long and up to 90m high. It is bogged by the Toro 151 LHDs through four draw points. A further 8000tpm comes from the Inglewood lode.

Further ahead is the possibility of resu mining old-timers' stope fill. This tends to be unwanted stockwork material and grab samples have shown encouraging results, with some early samples with an average grade of 5g/t.

Some 500,000t of material is believed to be available, which requires no mining although not a lot is known from historic records about voids, the activities of tributaries in the 1930s and what other material may have been used for fill.

Gympie geologists are now



General manger Rowan Johnston with area of stockwork veins on 13 level some 600m from surface. Gold-bearing quartz forms only 10% of the total, the carbonaceous shale is barren.

entering old workings as they are encountered for more detailed modern surveying and preparation of computer images to find more remnant ore. One of the old workings entered by *Australian Mining* is in perfect condition, with timber chutes still full of ore after over 100 years.

The timbers are larger than any tree on surface today.

Mined rock passes underground rock breakers at the grizzlies to ensure ore is sized correctly for the mill, which does not have a crusher.

Growth of the present mine capacity of around 260,000tpa at 8g/t is constrained by the processing plant, which will need further capital expenditure to lift gold output further. Work is already under way on gravity recovery, as stockwork ore at present only yields a 90% recovery against 96% for Inglewood ore.

Johnston estimates that an additional \$1m could lift stockwork milling capacity to a steady state 260,000-300,000tpa, while \$3.5m would be need to lift capacity to over 400,000tpa in around six months.

The processing plant mostly runs on water pumped from underground, but the drought in south-east Qld has meant water has had to be trucked in to top up process water. In fact, the Mary River, against which the mine has underground defences in case of severe flooding, actually stopped running recently.

Exploration aims for more repeats

BY MIKE SYDDELL

The \$25m three-year exploration program at Gympie is seen as critical for establishing the long-term life of the operations. Present reserves stand at only 198,000oz, or three years, while resources are 783,000oz.

The aim of the exploration is to find repeats of the entire Gympie system along the 20km north-south corridor of mineralisation, with northwest Inglewood feeder systems cutting across the corridor.

Old timers mined several areas that look structurally analogous to the north and south of the mine but, in between, are large areas that are under the flood plain of the Mary River.

About 350m to the north of the N3 ore body in the Lewis mine, UDD Drilling, using three rigs to drill from surface, has established mineralisation on strike extensions of the Inglewood lode on the Aurelia shoot. This could be accessed from the decline mid next year and pattern drilled using LM75 underground rigs.

Other shoots are likely as exploration heads north along strike. Recent drilling 700m north of present delineated resources returned 1m at 16.1g/t and 1.1m at 18.1g/t on the extended Inglewood structure that has been extensively mined as one single planar ore body with higher grade ore shoots like Aurelia.

The 2km strike length of the Inglewood structure worked to date has yielded 2m oz of gold either from the Inglewood itself or from associated structures it has fed.

Therefore, the company sees the opening up of further Inglewood potential along strike as highly prospective.

In all, 15 prospects will be drilled over the three years, many of them offset by faulting under the Mary River cover.