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MEMO

Nimrod 300

CONFIDENTIAL

To: RPM
From: KSC
Date: 3 January, 1991
Subject: Longos Gold Mine, Philippines/Gidginbung - Temora Area, NSW

Attached are two file notes relating to the above.

For the Longos property my view is that the mine is 2 years away from achieving 50,000oz. Au p.a. production. Ideally a further \$5-\$10 million dollars should be spent on underground development, capital equipment and trial mining before full-scale mining proceeds. I don't believe UPMC will have enough working faces in place to achieve its objectives in the time-frame proposed.

For Temora you already have my pit reserve calculation which has been supported by DCG. The attached note reviews the prospects surrounding the Gidginbung Mine. A new Gidginbung looks most unlikely in that, like the Charters Towers epithermal deposits, the most obvious anomalous feature, and the first to look for, is topography. They 'stand up', as a direct function of the intense silicification and the surrounding topographic highs have returned negative results. Some potential does exist for additional feed for the plant but without a concerted effort and expenditure on exploration, of about \$500,000, that feed is over a year away. First sources are Cullinga (dealt with by DCG) and Dobroyde, both subject to option payments. The next best potential is at Reefton and this prospect, on old workings, hasn't been drilled yet.



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Longos Gold Mine
Paracale, Camarines Norte
Republic of the Philippines

The Longos gold mine is situated 345km by road, 195km by air, east-south-east from Manila, on the main Philippine island of Luzon. The mine is operated by United Paragon Mining Corporation, a Philippines listed company, 40% owned by Paragon Resources N.L.

GEOLOGY AND MINERALISATION

Mineralisation, comprising gold-silver in association with galena, sphalerite, pyrite + chalcopyrite, is contained within quartz veins (45-90° dip) within both ultramafic rocks and an underlying intrusive granodiorite stock.

The mineralisation is believed to be emplaced into post-orogenic fracturing (Plio-Pleistocene) and was probably synchronous with, and related to, the final stages of granodioritic intrusion.

The character of the quartz veining observed is more mesothermal than epithermal and a single event is proposed for the quartz-gold-silver emplacement. Some data, not detailed, indicates pre-existing base metal + gold/silver mineralisation. Quartz veins vary in thickness from a few centimetres up to 16 metres (the main Longos vein). The vein systems exhibit strike and dip persistence but pinch and swell in both directions. Alteration is intense and varies between the underlying granodiorite (argillic-silicic with variable pyrite) and the ultramafic pyroxenites-peridotites (argillic-propylitic). The alteration is of considerable importance, notably in the ultramafic-host zone in that the alteration selvage can extend for up to 4 metres into the footwall and hanging wall, can carry grades of up to 7g/t Au but also, where highly talcose or clay-rich, results in extremely poor ground conditions. The positive and negative aspects of this are reduced dilution and a potentially larger resource versus the requirement for intensive 15 metre cable bolting. Examination of core and underground workings indicates that the alteration extends outwards from the vein for 4-5 metres in places. My view is that the poor quality of the hanging wall will impact severely on stoping and will add substantially to costs. MJD can offer a more quantitative assessment.

The main Longos vein is curvilinear, but generally strikes north-east, dips at between 45 and 90° to the north-west and plunges south-west. The vein thickness varies from 0.5 to 16 metres and averages 4 to 5 metres. Based on drilling and mining, the strike length is estimated at 600 metres with a down-dip extent of at least 400 metres.

OPEN PIT

Mining from the open pit has exploited the near-surface extension of the Longos vein and portions of a footwall stockwork zone, the Angel vein system. A 54 hole diamond drilling programme completed in 1987 outlined 341,000 tonnes of ore at a grade of 4.0g/t Au. A total of 34,220 ounces of gold was produced between October 1987 and October 1990. Remaining reserves are estimated at 116,025 tonnes at 3.58g/t at a 95% confidence level. Additional material (50,000 to 75,000 tonnes potential) could be proven beneath the Angel vein system by a programme of 10 holes totalling 1,500m.

The remaining reserve is contained above the -70m RL and will require a substantial cut-back on the eastern pit wall. Rock quality in the footwall to the Angel vein has not been determined but face examinations revealed a broadly silicic zone (i.e., brittle rather than talcose), joint intensities of 5 to 8/metre and at least two major faults trending north-east on the southern margin of the Angel vein system. One of these faults played some part in a pit wall failure on the western wall where a wedge of granodiorite failed on the contact with clay altered and talcose ultramafics. This failure has not irretrievably sterilised resources, but did cut crucial pre-wet season pit production and will require the removal of about 50,000m³ of sub-grade material. Adjacent zones have since been grouted and cable-bolted.

Reasonable confidence can be placed in the open pit reserve calculations. The data is based on 54 diamond holes, extrapolation from underground workings and mining some 66% of the original pitable reserve. Grade control procedures involve 'dozer cleaning of pit floor, 10m spaced cross-lines ripped by 'dozer to 0.5m depth, cleaned out, 1m channel-samples cut from the trench floor, ore definition then extraction on 2.5metre mining flitches. The open pitable ore is based on a 1.5g/t Au cut-off and a 1m blocking width. Stripping ratio to date has been 2.7:1. Material carrying 0.5g/t - 1.49g/t Au goes to the low grade stockpile, currently holding 17,000 tonnes at 1.26g/t Au.

Some problems and misunderstandings regarding reconciliations of grade occurred. A drop of 20% in grade, between mine head and mill head, was quoted. When details were sought, the following was provided:

From 1987 to early 1989, 80% of the pit grade reported at the mill stockpile, implying dilution (and/or a sampling/analytical problem). Later in 1989 this figure improved to 90% of pit grade. The grade was monitored from ore and stockpile sampling. A further 20% of the gold was lost in the plant, i.e., 80% plant recoveries were achieved.

Basically this means that each 1,000gm of contained gold becomes (at 10% dilution) 900gm at the mill stockpile and 720gm (at 80% recovery) from the mill.

UNDERGROUND

The underground reserves are based on 37 diamond holes from a 42 hole programme drilled by Metals Explorations Australia in 1974-75 and about seven holes drilled by Abcar Paragon (forerunner to United Paragon) in 1988. Additional data has been obtained from re-opening the old workings.

A series of grade/tonnage determinations have been made and are fully documented in I.G. Anderson's report "Review Update of Data Collection Procedures for Open-cut and Underground Resource and Ore Reserve Estimates", 30th September, 1990. This document has been summarised by DCG in his report of 25 October, 1990 although the source of DCG's reserves at 20.9.1990 are uncertain. United Paragon's Probable Ore Reserve, at 10% dilution are:

1,641,000 tonnes @ 10.82g/t Au (4.0g/t Au cut-off)
1,423,000 tonnes @ 11.69g/t Au (5.0g/t Au cut-off)

A number of factors have to be considered when assessing these reserves and would require detailed checking in the event that a full-scale due diligence exercise is required. The factors are discussed below:

- 1) Core loss within the alteration halo and vein system ranged from 35% to 55% in places. IGA's report states (p14) that, "All core loss zones have been allocated a zero value..... to ensure that over-estimation of grade is minimised". This accorded with information provided by James Llorca, the mine geologist. However, on page 26 of IGA's report it is noted that core samples with nil recovery were assigned grades, "contingent on the gold content in recovered core assays by Metals Exploration....". If "original", core assayed > 15g/t Au, "lost" core was assigned a grade of 3.0g/t Au. Clarification of this matter will be sought from IGA if required.
- 2) Assaying procedures and sample preparation techniques appear to have been adequate, however, check assays show variable correlation (IGA's report, pp4 and 6). JL reported a 90% correlation between original core assay and later repeats. IGA covers the topic thoroughly but notes that "additional check assays are required to further investigate variance trends".
- 3) An S.G. of 2.6 was used based on data from 4 core holes (2.5 to 2.7 range) and underground samples.
- 4) All grades exceeding 50g/t Au were cut to this figure.
- 5) Face and stope sampling underground is taken at 1 metre intervals along channels. Distinction is made between vein (quartz) and alteration zones when sampling.

6) No minimum thickness was applied.

General comment: Vein carries 15 - 20g/t Au
F-wall/H-wall 2 - 7 g/t Au

In general, my view is that United paragon has tended to apply conservative factors where possible and tended to caution in assessment. Perhaps this attitude creates the atmosphere of gung-ho confidence when the decision to proceed to mine is taken.

UNDERGROUND MINING

Previous mine closures at Longos have reportedly been related to high water in-flows of up to 2,200 gallons per minute. Recent development work, notably around Water Bearing Fault 1, has led to the grouting of this fault and subsequent reduction in water in-flow. Estimates that this fault carries up to 80% of the water (mostly sea-water) were made by JL. No estimate of how much water the lode and selvage may carry, particularly below 5-level, can be made. In any event, sumps and pump stations to handle ingress of 9,000 gallons per minute are anticipated to be ready by end-April, 1991. Fault grouting, de-watering bores from surface, and drilling ahead of production stoping to test for water-bearing structures is well in hand to prevent problems.

The next main problem is mining the stopes with an unstable hanging wall. The preferred option at this time is for overhand stoping, accessing 50 metre stopes by back-filled ramps (15-20 metres) from a footwall decline, initially between 4 and 7 levels. Roof support will be by 15 metre cable bolting + meshing as required. Stopes will be back filled with coarse sand (ex-mill) - cement mix (70-75% bulk density) slurried back to the stopes against timber bulkheads.

If problems are encountered, underhand stoping will be employed with operators working beneath fill and the resultant delays waiting for fill to cure and stabilise before the stope can be re-opened.

At the time of Delta's visit most work was involved in the establishment of the sumps and pumping station on 7 level, driving the incline up from 7 level using the jumbo and LHD combination and clearing old workings on 4 level. Bad ground forced abandonment of the decline from the open pit.

Some notes on the development schedule:

- 1) Sumps and pumps operational by April 1991.
- 2) 250m of 3m x 3m development per month is anticipated by May 1991 after the second jumbo arrives.
- 3) Stope/Incline development - 300m of driving (1:9 slope) between levels, 4-5 months including 'retreats'.

Capital Equipment duty free till 1992, Longos Mine
'O-rated' for VAT, normally 10%. This is
charged but is claimed back. Import duty of
20-40% on consumables, such as cyanide?

My view is that the operators have attempted development prematurely, have not monitored the mining operation closely enough and have failed to install competent management at the highest on-site levels.

By proceeding down the current track, United Paragon stands the risk of locking itself into a spiral of production earnings chasing costs with little or nothing left over. Ideally, given time and resources (in particular about \$10 million), the decline between 3 level and 7 level with ventilation raises could be completed with underground drilling stations established as development proceeded. Drilling fans from these would allow additional testing giving increased confidence in the grade, thickness, hanging wall character and water content of the vein structure. In the meantime, trial mining, to optimise the techniques and train the locals could be carried out. To achieve the production goals set it is difficult to imagine any less than 15 operating stopes, with ten being mined and 5 being back-filled. The forward development and confidence required to achieve full production (i.e., +50,000 ounces per annum) is probably two years away for this deposit.

EXPLORATION POTENTIAL

Additional areas are held over virtually the whole Paracale Mineral Belt, an area of some 18km x 10km. Within this area, some three projects have been defined, one to resource status.

Kalaw

This prospect lies 2.5km south-west from Longos and contains a 100m x 150m zone of stockwork quartz veins striking NNE. The veins transgress the ultramafic-granodiorite contact zone.

The prospect has been drilled on 40 metre centres by 8 core holes, 78 RC holes and 16 RAB holes. A measured and indicated resource of 226,000 tonnes at 4.8g/t Au has been defined using a 1 g/t Au cut-off.

'High-graders', local gold miners, have moved onto the project and are probably removing several ounces per day, shared between about 400 people.

Haligoing-Bato

This prospect lies approximately 5km south-south-west from Longos and comprises a single 4 metre-wide 300 metre long, north-south striking quartz vein. The vein has been mined, the 15,000 tonnes taken out carried 2.6g/t Au. Potential exists for a 250,000 - 500,000 tonne deposit but drilling is required to determine the overall grade.

Bantum-Nakulo

This prospect lies 7 km due south from Longos beside the Malaguit River. 3 vein systems have been defined with stockwork quartz zones and intense argillic alteration over 10 metres across. Vein widths reach 2 metres and strike over 100 to 200 metres. Shafts have been sunk on the main, central Bantuin vein but no production records are known. A 300m, 7 hole cove programme has been proposed.

The exploration projects are worthy drill targets but only in the sense of providing additional feed for the Longos will. It is unlikely that any of these could develop into a major deposit.

TEMORA - Exploration Potential

This note is in addition to that relating to ore reserves remaining at Gidginbung and DCG's comments on the Christmas Gift Mine at Cullinga.

At the outset it should be stated that none of the prospects held by PRNL in the area are advanced, and most are emerging from the grass-roots category.

The Gidginbung deposit is hosted by intensely brecciated and highly silicified Ordovician-Silurian andesitic volcanics/sediments lying within the broad (\pm 10km) Gilmore Suture. The latter is a major regional lineament striking north-north-west from south of Adelong-Temora in southern NSW to possibly as far as Cobar in the central west of the state. Gold, and to a lesser extent base metal, mineralisation is related to the Gilmore Suture. The structure frequently marks the divide between dominantly flysch-style sedimentation to the west and the onset of andesitic volcanism to the east. During, or in the waning stages of volcanism, dioritic intrusives were emplaced, and current thinking relates these directly with gold mineralisation. (Good solid geological empiricism). The diorites show up as very subtle, broad, high magnetic anomalies and, near Temora, have sharp peaks related to quartz monzonite plugs. Related alteration zones, such as at Temora and Gidginbung, beyond the intense silicification extend to argillic (clay-sericite-montmorillinite) to propylitic beyond (500 wide and 2-3km along strike).

These features provide a number of geological and geophysical means of targeting prospects, some of which have been used by PRNL. Limitations on soil and stream geochemistry are set by the long established agricultural land-use with flat country cleared and intensively grazed, and cropped, for at least 60 years.

About 18 to 20 prospect areas have been defined by PRNL based on geology, magnetics/resistivities and stream (bulk cyanide leach) sampling. A budget for 1990 of \$470,000 was directed to soil sampling and RAB drilling, with RC drilling to be followed-up by core drilling. Apart from proximal pit drilling, no drilling results for more distant projects have been reported and at the time of our visit, wet weather prevented drill access away from the mine area.

Prospect Summary

South Pit

Extensions of the Gidginbung mineralisation, up to 500m south of the pit, are being tested by RC drilling. Pit sampling indicates continuity of high grade zones extending south. On line 9080N an intersection of 30m carrying 2g/t Au was made and on 8880N an intersection of 6m at 4g/t Au. Seven holes were planned totalling 1,500 metres between 9010N and 8800N.

North Hill

Testing - 80 mesh soil samples yielded low order anomalies (0.1-0.2ppm Au), reflecting silicified zones from the north end of the pit. In an area 100-200m west (Dusty Scrub prospect), similar discouraging results were obtained. The Haul Road Anomaly, a further 200m south west was defined by a 40-50m wide magnetic low with sporadic soil results to 0.5ppm Au extending NNE from the north pit mineralisation. Little hope is held for any of the above anomalies.

The Cedars

This prospect, defined by a zone of UTEM anomalism (conductive zones) striking S and SW (on projected strike from the pit), lies about 2km SW from the pit. Two other conductive zones, parallel to the Gilmore Suture strike direction, have also been defined. A float sample, carrying 2g/t Au, was located. Detailed soil sampling and RAB drilling is required.

Rosevale

Lies approximately 2.5km NW from the pit along Gilmore Suture strike. A 20 ppb Au-in-soil-anomaly has been defined over 480 x 100m with a semi-coincident zone of Cu up to 50ppm (hardly anomalous!) Five holes were drilled; the best gave 2m at 13g/t Au from surface. The area is magnetically low but lies in a north-south cross structure at the northern limit of propylitic alteration. Gypsiferous soils have been noted, but this association cannot be related to known mineralisation and may be of no consequence.

MAG-H1

This prospect lies between the pit and Rosevale and consists of several zones of high magnetic response with associated, weakly anomalous zones of soil geochemistry of 0.1-0.2ppm Au. Detailed work is required, perhaps EM and RAB drilling.

General Area

Regional bulk leach soil programmes and RAB road traverses have been proposed. Low order stream anomalies require follow-up. Old workings such as Gold Ridge (8km SW) and Valley View (15km WNW) are being investigated as are a small pod of cherty silicification 4km SW of the mine and a higher metamorphic grade zone of tourmalinised biotite schist 'to the west' of the mine

The Reefton quartz veins, between 9 and 12km N of the mine were being mapped and sampled at the time of the visit. This old goldfield comprises multiple NNW striking vein systems and has not been drill tested. The area represents a reasonable target but bear in mind the Reefton veins, as mined, were narrow (< 0.5m) and discontinuous.

PRNL have an option agreement with Little River Goldfields over the Dobroyde epithermal gold deposit 35km S of Temora. Total mineable reserves are quoted at 926,000 tonnes at 2.1g/t Au. The mineralisation is steeply dipping and pipe-like. A cursory view suggests the grade is too low generally with insufficient high grade to make extraction worthwhile at current gold prices. It's one to keep an eye on for the long term.