EXAMINATION OF MT. RINGWOOD GOLD

PROSPECT (E.L. 3039 and G.M.L.'s 153B, 154B)

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AUGUST 1982
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SUMMARY

A preliminary field appraisal has been made of Exploration Licence No. 3039, and the adjoining leases GML's 153B and 154B. The work done has consisted of airphoto interpretation, geological mapping, geochemical sampling, assaying, magnetic surveys, literature survey and interpretation of results.

The probable association of gold-arsenic-base metals mineralisation with quartz-healed tectonic breccias, has been investigated. It is likely that earlier sampling and diamond drilling has not tested these structures to any degree.

The gold-bearing formations [as outlined by geochemical sampling] appear to coincide with a "magnetic ridge". The zone, whilst large in size (8-10 km long and 2-3 km wide) does not appear to contain any obvious structural features which may be allied to large ore bodies. Trace gold mineralisation is widespread throughout.

Insufficient work has been done to entirely disqualify the Licence as a minerals prospect, but it is not rated as being likely to contain medium to large gold, or base metals deposits.
I. INTRODUCTION

This report describes the work done on EL 3039, Mt. Ringwood, Northern Territory by

Cogar Mining Consultants Pty. Ltd.; and

Weil Geoworks Pty. Ltd.

during the 1981 dry season.

The work was commissioned by Euralba Mining Limited as the Stage I reconnaissance work necessary to evaluate the potential of the Licence for gold (mainly), base metals, and uranium. As part of the evaluation process, instructions were given to identify the "mineralisation style "in GML's 153B and 154B (the old North Ringwood Mine area) just to the north of the Licence, and apply this information within the Licence itself.

Based on the evaluation, the Company asked that recommendations be given for further work in 1982 field season, if appropriate.
II BACKGROUND INFORMATION

A. TITLE

Exploration Licence No. 3039 of 50 sq. kms. was granted to Euralba Mining Limited in September 1981. It is the same area as previously held by the Company as EL 2289.

Prior to this it was held by Occidental Minerals Corp. as EL 1291, until 1979, and as EL 1168 by Secured Loans & Developments Limited, until 1977. Others may have held the area before this but the matter was not researched in depth.

B. LOCATION

The Licence is within the Top End of the Northern Territory, as shown in Figure 1 (taken from "Solid Geology of the Pine Creek Geosyncline"; 1:500,000 scale; BMR 1979). It lies just to the east of Mt. Ringwood and just to the west of the McKinley River.

Access from Darwin is possible by a number of routes but the most direct is the sealed Stuart Highway south to the Tortilla Flats Research Station turn-off, thence past Tortilla Flats over unsealed, graded roads to Mt. Ringwood Station. Station tracks (sometimes graded) are then available to enter the Licence from the north-west or the south-west.

Except in the Wet Season, a 2-wheel drive vehicle can be taken into the North Ringwood Mines vicinity, but would not be suitable for traversing the Licence itself.
C. FACILITIES

There are no reticulated electricity or water supply systems within, or close to EL 3039. Permanent water, and pleasant field camp site, are available at the "Blue Waterhole" on the Margaret River just to the south-west of the Licence. This lies within Mt. Ringwood Station, from whom permission should be obtained prior to use of the camp site.

Fuel supplies (bottled gas, petrol and diesel) are readily available in Adelaide River, together with limited food supplies and dry goods. Darwin is the closest practical supply point for major food and engineering supplies and for repairs and maintenance to plant and equipment. Travelling time by road from Darwin to Mt. Ringwood is approximately 3-4 hours.

D. CLIMATE

This region is in the Tropics and has defined "wet", and "dry" seasons running from December to March, and April to November respectively. Daytime temperatures vary little throughout the year and are typically higher than 30°C in the afternoon. Nighttime temperatures vary from 20°C to 30°C. Rain can occur throughout the year but most rainfalls occur in the wet season. The average yearly rainfall is +2,000mm.

E. PRE-FIELD WORK

Sets of 1:25,000 scale colour prints of aerial photographs of the Licence area were purchased from Department of National Mapping, together with black-and-white prints of the Licence
area were purchased to use as field work-sheets. The Licence boundaries were drawn on the air photos.

A study of visible geological features [faults, folds, outcrops, and lineaments] was then made using overlays to the colour photography. Drainage patterns were identified for possible later stream sediment sampling. *(Note: This was dropped from the field work programme because of the results given in the reports by Occidental Minerals Corp.)*

Use was made of the BMR geological, radiometric, and magnetic maps, to check photo-features against other data. Based on the "magnetic ridge" feature (discussed later) passing through North Ringwood Mine a decision was taken to use a Scintrex MP-2 Magnetometer for ground traverses over GML's 153B and 154B, and elsewhere in the Licence. *(Note: As a result of the lack of magnetic expression within the Leases, no detailed magnetic traverses were run within the Licence.)*

Whilst the lack of radiometric anomalies on the BMR mapsheet was discouraging, it was still planned to carry a scintillometer during the course of the field work. Two factors mitigated against this, the most critical being that no suitable instrument could be obtained at the time.

The second factor was that Occidental Minerals Corp. had already made a radiometric survey, the results of which became available through the Geological Survey Department in Darwin. Occidental had gone further (with Track Etch) work than was
planned for this appraisal so that a decision was made to accept their work for the purposes of the 1981 programme.

A study was made of the Geological Survey library files, in Darwin, and copies of the reports by Occidental Minerals Corp. obtained. Particular attention was paid to their radiometric and magnetic surveys, and ground follow-up work; together with their stream sediment and geochemical sampling. This work is commented on later.
III GEOLOGY

A. REGIONAL

The Mount Ringwood prospect lies more or less centrally in the main mass of Burrell Ck Formation, which locally features in the Ringwood Ranges.

The Burrell Ck Formation is assigned to the Finnis River Group in the Upper part of the Lower Proterozoic Pine Creek geosynclinal succession (revised Needham et al, 1980). The Finnis River Group is considered to have been deposited in a flysch environment (on basis of turbidity features, for example).

The Finnis River Group is proposed as the topmost unit in the stratigraphy of the Lower Proterozoic geosynclinal pile which, in turn, rests on a granitic/metamorphic late Archaean basement complex.

The geosynclinal pile was regionally deformed and metamorphosed around the close of the Lower Proterozoic. During or immediately following this orogenic period, the metasediments were intruded by granite plutons, which thermally metamorphosed some of the adjacent host rocks (hornfels haloes). Examples of Middle Proterozoic intrusive granites which may have some bearing on the prospect area are the Margaret and Mt. Bundey Granites.

Middle Proterozoic and younger "cover rocks" unconformably overlie the above units in the region. Small isolated residuals
Alluvium, soil, sand and ferruginous gravel.


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Strike of strata showing angle of dip

Unsealed road or track
of these cover rocks occur to the east of the prospect area (Mt. Douglas). It is possible that these rocks originally lapped on to the prospect area which is now completely denuded of them.

The Pine Creek Geosyncline is extensively and variably mineralised. Of particular relevance to the prospect area is the Pine Ck Gold Province.

More detailed regional geology, stratigraphic interpretation, and economic geology can be obtained from the references listed herein.

B. GEOLOGY OF EXPLORATION LICENCE 3039 - MOUNT RINGWOOD

Rocks of the Burrell Ck Formation are extensively exposed over most of the Licence. The generally flat non-outcrop areas, mainly in the east, consist of Cainozoic alluvium and black soils with minor lateritic development.

Within the Licence (Figure 2) the Burrell Ck Formation is comprised of siltstones, shales, mudstones, fine to medium grained sandstones and lithic sandstones, and greywacke. These rock types often have distinctive weathering and outcrop patterns. They generally form low rounded hills, rising up to 50m or so above the plains. Weathering has also resulted in a fine surface skin of silicification.

The siltstones (the predominant rock type), shales and mudstones, are reddish-coloured due to pervasive iron staining. Interbedded
within these finer grained beds are several well laminated horizons of "cherty" red/brown to green/grey hematite shale. These could be potential marker horizons. Narrow sandstone horizons with syngenetic pyrite (cubic crystals up to one centimetre square - now limonite) are occasionally associated with the hematite shale horizons.

The greywackes have a distinctive "dog-tooth" outcrop form and are greenish/grey coloured. The coarser sandstones are often micaceous (lithic).

Throughout the Licence are numerous veins and "blows" of white buck quartz and some cavernous crystalline quartz, occupying structurally controlled positions in the metasediments. The controlling structures include cleavage, shearing, faulting, and contacts between contrasting rock types. Quartz veins appear to be more prevalent near sandstones.

Quartz-healed tectonic breccias with some ironstone/gossan development sometimes occur in prominent structural features (faults, fracture zones).

The only other rock type noted in the Licence was lamprophyre (porphritic felspar biotite rock), occurring as deeply weathered, iron stained, discontinuous dykes and pipes. Lamprophyre dykes are generally narrow (metric) and again are structurally controlled.

Appraisal of the Licence was effected through research of
available literature, field traverses, photo-interpretation and sampling.

Figure 2 is a 1:25,000 photogeological map of the Licence (after Occidental), incorporating new data and interpretation.

(i) Structure:

The metasediments in the Licence are tightly folded with north-westerly trending fold axes. Plunges appear to be north-westerly. As a result of the tight folding the beds are mostly steeply dipping, and sometimes overturned.

Vertical or sub-vertical axial plane cleavage is very well developed, also in a north-westerly trend throughout the Licence. Where this is parallel to bedding, a slatey cleavage is produced, while in areas where the cleavage cuts the bedding, "rod" structure has resulted. The finer grained sediments are most prominently cleaved, forming slates and phyllites.

A number of photolineaments were interpreted to trend northerly easterly and north-westerly. Some of these can be related to geological features such as faulting, shearing, cleavage bedding, and lines of quartz reefs and quartz float. Some flexuring of cleavage across the interpreted position of photolineaments has been observed on the ground. No major photolineaments were found within the Licence.

Although a number were seen, sedimentary structures are not
common. It may be that they are often obliterated by the cleavage. Some current bedding, slump structures, convolute bedding, and flute casts, were found to occur and these reinforce the turbidite interpretation and flysch environment.

(ii) **Metamorphism:**

The metasediments have generally reached the metamorphic grade of lower greenschist facies. Most of the rocks are weakly chloritic and siliceous. Some zones exhibit strong silification and weak epidotization. The pervasive iron staining is probably derived from weathering of both the chloritic rocks and hematite/pyrite shales.

Effects of thermal metamorphism of rocks in the Licence by the Margaret Granite were not considered obvious, although Swingler (1979) reports spotted slates (with arsenopyrite) from the South Ringwood Gold Prospect, on the basis of petrographic studies.

(iii) **Mineralization/Alteration:**

Hardrock gold mineralization and eluvial/alluvial gold concentrations are known in several locations within the E.L. The main occurrences are:

(1) North Ringwood Battery Site workings (hardrock, eluvial, alluvial).
(2) South Ringwood Battery Site workings (hardrock, eluvial).
(3) South Ringwood workings (hardrock, eluvial).

In addition, a number of other streams and gullies exhibit
evidence of test pitting and rock packing in the Chinese style.

Mylonite zones (faults), quartz reefs, and minor quartz-healed breccias are seen as the host rocks for the hardrock gold mineralization. Limited chloritic and silicic alteration is associated with these areas.

These and the North Ringwood gold occurrences are considered to be a relatively isolated sub-province (Mount Ringwood Sub-Province) at the northern extremity of the Pine Ck Gold Province.

(iv) **Geochemistry:**

The Licence was previously covered in a regional stream sediment sampling programme by Occidental in 1977. Approximately 80 samples were collected from within the Licence and analysed for lead, copper, zinc, uranium, nickel, cobalt, manganese, arsenic, and molybdenum.

Only two low order anomalies relevant to E.L. 3039 were interpreted - one arsenic anomaly believed to relate to Ringwood Gold prospects, and one uranium anomaly (52) of high background.

During the current appraisal of the Licence, it was decided not to take any further stream sediment samples in view of Occidental's work.

Eleven rock samples were collected during field traverses of
various quartz reefs, including those at South Ringwood and North Ringwood Battery Site, and ferruginous areas (hematite shales). The samples were analysed for gold.

White buck quartz reefs in the western part of the Licence gave values of the order of 0.05 ppm Au, while quartz-hematite-breccia reefs in the eastern part of the E.L. gave weakly anomalous values ranging from 0.14 ppm to 0.5 ppm Au. The higher results came from the North Ringwood Battery Site area.

Weakly anomalous values were also obtained from hematite shales/ferruginous rocks. Values ranged from 0.26 ppm to 0.86 ppm Au. The higher values again came from known auriferous locations (particularly South Ringwood).

Weakly anomalous values then, were found in an arc running from the vicinity of North Ringwood, through South Ringwood, to an area in the central-south of the Licence, related to quartz reefs and hematite shales.

Hematite shales may become target areas for mineral concentration where affected by structural deformation.

The positions from which the samples were collected are shown in Figures 2 and 4, and the assay results are tabulated in Tables I and II.

(v) Radiometry:

Occidental concluded, from detailed field follow-up of an
airborne radiometric survey and track-etch surveys, in the area, that the weak anomalous values obtained in a few locations were explainable in terms of background variations. A radiometric survey was not included in the present appraisal.

(vi) Magnetometry:

Full interpretation of an airborne magnetic survey by Occidental, which included the area of the present Licence, was not available or attempted. A brief appraisal of the Residual Magnetic Intensity showed a discontinuous ± 100 gamma broad arcuate magnetic high running from the vicinity of North Ringwood Prospect south-easterly and southward to the vicinity of the South Ringwood workings, and on south to the Licence boundary (Figure 3).

The weak high may be related to:

- Regional zonation around the Margaret Granite.
- The cumulative effect of the lamprophyre dyke swarm occurring in the same general area, or the structural zone they occupy along with the mineral occurrences.
- The numerous bands of hematite shale in the general area of the anomaly.
- The eastern edge of the main outcrop block, where it contrasts with the black soil plains, or
- A combination of some of the above.

The Licence is divided into two districts with distinctly
different magnetic signatures. The western district is virtually flat and featureless, while the eastern district is characterised by weak broad ridges and highs, rarely in excess of 100 gammas.

The break is again in the form of an arc running from North Ringwood south-easterly and southerly through the centre of the Licence (west of South Ringwood).

The magnetic trends and the weakly anomalous gold trend are more or less coincident. Yet, there is no apparent change in the geology across this magnetic "structure". The explanation may be related to a deeper-seated phenomenon, poorly expressed at the surface.

Within the magnetic ridge is a broad multi-peaked high immediately west of South Ringwood. Again this feature cannot be matched with marked variations in surface geology. The highest peak is of the order of 150 gammas.

C. GEOLOGY OF NORTH RINGWOOD PROSPECT

GML's 153B and 154B cover the main North Ringwood Gold Prospect, lying immediately north of the northern boundary of E.L. 3039. A 1:2,500 geological map of the main prospect area was produced off a north-south baseline pegged at 50m intervals. See Figure 4.

Local geology is generally the same as that described for the
Licence except that here there is a much more significant development of quartz veining and quartz-healed breccia reef systems. In at least four zones (numbered I - IV), mainly on GML 153B, the quartz reefs and vein networks are of sufficient density to be referred to as stockworks.

Interconnecting reefs of greatly varying thickness, continuity, attitude, and form, occur in these zones, although the prominent trend of the main reef is still north-westerly. At the surface, the zones are typically ± 100m in length and 20 to 100m in width. The stockwork systems are separated by lesser distances.

Vein thicknesses are decimetric to metric. Many flat-lying quartz veins occur both within these zones and as isolated occurrences in the metasediments.

The most extensive and deepest (maximum 18m) old workings are in one of the stockwork zones (I) and along the only prominent reef outside the stockwork system (at 220N/60E), subsequently referred to as the "Main Reef". Numerous shallow workings are noted elsewhere on the GML's.

In the dumps from the main old workings, arsenopyrite is readily observed. Detailed mapping has also revealed secondary lead minerals, and possibly arsenic, in the eastern margin of Stockwork II, and possibly in the South Western Fault Zone.

Several attempts at sampling the quartz reef at surface have
apparently resulted in consistently disappointing results, though no quantitative results are to hand (W.J. Fisher, 1981, personal advice). Six further samples were taken on the basis of the newly mapped geology. Samples came from hematite shale and ironstone; quartz network adjacent to a lamprophyre dyke; Stockwork I with secondary lead minerals; the South-Western Fault Zone; and old workings with quartz network and altered country rock.

One sample of eluvial material was also taken for analysis.

Several hematite shale horizons (which may be fold repetitions) occur in the north-east portion of the GML block. Some of these have developed incipient ironstone caps.

Numerous narrow and discontinuous/sinuous lamprophyre dykes cut through the GML's on a relatively consistent north-westerly trend, obviously controlled by the overall structure. These dykes are observed both following bedding and cutting through the bedding.

Folding and fault disruption occur in the area of the GML's.

The reference to "Saddle reefs" by Newton (Drilling Report) was noted, but this style of mineralization was not verified by the mapping.

Within the GML's there are also several gullies draining
westerly, north-easterly, and south-easterly from the known mineralized zone. The eluvial and alluvial wash in and on the slopes adjacent to these gullies appears to have been extensively worked by the Chinese (dry blowing, rock stacking, channelling, and damming).

In the case of the easterly drainage, the workings extend off the GML onto the adjacent ground (currently held by or under application by other parties).

Panning of the eluvial/alluvial workings on the GML's has shown the occasional colour of gold (personal advice, W.J. Fisher, 1981).

(i) Results of Sampling:

The quartz stockwork areas gave weakly anomalous values ranging from 0.4 ppm to 0.7 ppm Au, the highest value in the South Western Fault. Associated with the gold are high values of As (0.38% to 6.2%), Pb (up to 5.1%), and anomalous Zn (up to 0.2%). Weakly anomalous Cu (up to 317ppm), Mo (up to 36 ppm) and Hg (up to 13.5 ppm) are present, while Bi was not anomalous.

One hematite shale sample gave a weakly anomalous value of 0.34 ppm Au. Other elements were not anomalous.

The gold values from this sampling are lower than those obtained from the richest drill intersections in the earlier drilling programme. This may be attributable to surface leaching, although
this phenomenon was not obvious from surface mapping.

Assay results are tabulated in Table II.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Au</td>
</tr>
<tr>
<td>MR001</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>0.04</td>
</tr>
<tr>
<td>3</td>
<td>0.04</td>
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</tr>
<tr>
<td>16</td>
<td>0.26</td>
</tr>
<tr>
<td>18</td>
<td>0.33</td>
</tr>
</tbody>
</table>

**TABLE I - E.L. 3039**

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results ppm (unless otherwise noted)</th>
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<tbody>
<tr>
<td></td>
<td>Au</td>
</tr>
<tr>
<td>MR004</td>
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</tr>
<tr>
<td>5</td>
<td>0.37</td>
</tr>
<tr>
<td>6</td>
<td>0.55</td>
</tr>
<tr>
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<tr>
<td>11</td>
<td>0.70</td>
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<tr>
<td>15</td>
<td>0.42</td>
</tr>
<tr>
<td>17</td>
<td>0.40</td>
</tr>
</tbody>
</table>

**TABLE II - GML's 153B, 154B.**
(ii) **Review of the 1978 NTGS Drilling Programme on the North Ringwood Prospect**

Diamond drilling located two zones of significant gold mineralization at vertical depths up to 35m below old workings. These zones of interest were (a) under the Main Reef, and (b) at the northern extremity of Stockwork I. It was concluded that "gold was confined to discontinuous quartz reefs of limited dimensions" (Newton, 1978).

Drilling results were as follows:

<table>
<thead>
<tr>
<th>Hole No.</th>
<th>Depth Below Surface (m)</th>
<th>Mineralized Zone</th>
<th>Grade x Drill Width g/t Au x m</th>
<th>Other Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDH1</td>
<td>± 40</td>
<td>SW Fault</td>
<td>Tr x 0.5</td>
<td></td>
</tr>
<tr>
<td>DDH2</td>
<td>± 30</td>
<td>Main Reef</td>
<td>Tr x 0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>± 35</td>
<td>Main Reef</td>
<td>30.3 x 1.0</td>
<td>8 g/t Ag x 1.0m + Bi</td>
</tr>
<tr>
<td></td>
<td>± 75</td>
<td>Main Reef</td>
<td>Tr x 0.5</td>
<td>4 g/t Ag x 0.5m</td>
</tr>
<tr>
<td>DDH3</td>
<td>± 10</td>
<td>Stockwork I</td>
<td>Tr x 0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>± 15</td>
<td>Stockwork I</td>
<td>Tr x 0.5</td>
<td>10 g/t Ag x 0.5m</td>
</tr>
<tr>
<td></td>
<td>± 30</td>
<td>Stockwork I</td>
<td>3.1 x 2.5</td>
<td>2 g/t Ag x 2.5m</td>
</tr>
<tr>
<td>-</td>
<td>± 35</td>
<td>Stockwork I</td>
<td>Tr x 1.0</td>
<td></td>
</tr>
<tr>
<td>DDH4</td>
<td>± 15</td>
<td>Stockwork I</td>
<td>8.0 x 0.5</td>
<td>8 g/t Ag x 0.5m</td>
</tr>
<tr>
<td></td>
<td>± 30</td>
<td>Stockwork I</td>
<td>Tr x 0.5</td>
<td></td>
</tr>
</tbody>
</table>
The following points should be noted:-

(a) In holes 2, 3 and 4, assays did not clearly define grade limits. In all these cases, the stored core should be considered further for additional processing.

(b) Drill widths are not true widths. In this situation, true widths might be around 60% of drill widths.

(c) A reference in the NTGS Report indicates that core recoveries were often particularly poor in the quartz zones (in one case complete loss over nearly one metre was sustained). Poor recovery has a direct bearing on accurate assessment of the mineralised zones.

(d) Although many of the remaining samples analysed were in quartz, and turned out to be barren, it should be noted that the particular zones drilled were generally outside the newly defined (from the author's geological mapping) stockwork.

i.e. it is thought that this drilling did not actually test Stockwork 1.

D. GROUND MAGNETIC SURVEY

The results of the ground magnetic survey of GML's 153B and 154B, are given in Figure 6. The range of magnetic variation over the leases is small, approximately ± 30 gammas around the mean of 47,000 gammas.

The spot high, at 400 N on the Baseline, represents a reading taken directly on top of one of the ironstone caps to the hematite shale horizons. A number of these were found to be markedly magnetic, but a significant reading would only occur
if taken directly on the outcrop. Approximately 5m away the magnetometer reading would return to "background".

The breccia zones do not exhibit any particular magnetic "signal", unless a larger survey would show that they are a small low zone. This is conjecture only but is borne out to some degree by the fact that the magnetic intensity appears to increase as you go away from the breccias. The degree of increase is not large.

Because of the results of this test it was considered the magnetometer was not a suitable tool to use in searching for further breccia zones within EL 3039. Examinations in this regard were then confined to air photo study and foot traverses of selected parts of the Licence.
IV POTENTIAL

A. DISCUSSION OF RESULTS

(i) E.L. 3039:

On the basis of the comprehensive work programme conducted by Occidental and our follow-up geological field assessment, the area of E.L. 3039 is considered to be of only a poor-to-fair gold prospect. There is a possibility it may be a better base metals prospect and the potential of the E.L. may be upgraded through further investigation of certain encouraging features.

These are:-

1) The potential of North Ringwood prospect (GML's).

2) The striking arcuate magnetic "structure" and related ridge running the entire meidianal length (± 8km) of the Licence in the central/central-eastern sector.

3) The arcuate (interpreted) line of weakly anomalous gold values which roughly coincides with the magnetic structure, and could well be related to it.

The east and west magnetic districts do not seem to be reflected in the surface geology, and are therefore likely to be due to deeper-seated influences. The break between the districts is sharp and can be interpreted as a structural feature (contact fault, etc.).

The fact that mineralization (even though weak) occurs along the general surface projection of a postulated structure, and
may be related to it, is considered to be encouraging.

Enormous thickness of sediments are involved in the Burrell Ck Formation. These rocks could be significant providers of minerals, which could be concentrated in major structural locations (as interpreted for F.L. 3039) or be mobilized and concentrated by intrusions, such as are known in the immediate vicinity.

No granitoids were observed in the Licence, but reported spotted slates from the South Ringwood area could indicate a blind igneous intrusion at relatively shallow depth. Such blind intrusion, if present, may be showing up in the magnetics.

The Licence also serves a purpose in protecting the area south of North Ringwood prospect until that prospect has been evaluated, and the implications for the Licence further assessed. Because of this the potential of the North Ringwood prospect also has a bearing on the Licence.

Gold, shedding from the known Ringwood prospect areas over time, may have concentrated in palaeochannels downstream from the source areas, and be now covered by black soil flats. This is a highly speculative target, but worth reconnaissance testing if the opportunity arises, when equipment is in the area to test the North Ringwood prospect. The testing of these areas could be treated as an extension of the testing of the larger previously productive (Chinese) eluvial/alluvial areas on the Licence.
(ii) GML's 153B and 154B

A number of conclusions can be drawn from the geological mapping of the GML's.

Mineralization appears to be bounded by a fault zone in the south-west (termed the South-Western Fault Zone) and a postulated shear zone in the north-east. The distance between these structures is about 250m. The intervening zone is also thought to be extensively sheared.

The South-Western Fault can only be traced definitely over about 200m. To the north-west it disappears under alluvium. To the south-east it fades out near the southern boundary of the GML's. The fault dips steeply north, about 80°. Widths of quartz breccia (up to 3m) are exposed in the fault zone, and appear mineralized.

It can now be seen that DDH1 only tested the narrow, north-western extremity of this fault reef. This means the main reef itself is virtually untested, and could explain the poor results of DDH1.

The postulated shear zone in the north-east is indicated by tightly folded, axial plane cleaved/sheared, and disrupted hematite shale horizons, and small quartz breccia reefs.

The best known mineralization appears to be related to the Main Reef, tested by DDH2. The Main Reef follows and folds with the bedding. It also appears to connect Stockworks III and IV.
Consequently, it appears that mineralization is concentrated in the fold areas, particularly where disrupted. The prominent sandstone bed which separates the main stockwork zones is apparently not receptive to mineralization.

From a study of the drilling programme relative to the geology it can now be seen that holes 2, 3 and 4 barely tested the main Stockwork areas. It is therefore concluded that Stockworks I, II, III and IV all have more or less untested potential for gold mineralization. The potential for a volume of ore sufficient for a small scale mining operation exists. DDH3 has indicated a bulk grade of 3.1 g Au/tonne over a drill width of 2.5m. It is believed that portions at least of the stockwork areas have the potential to carry bulk grades of this order.

Table II presents the assay results in the prospect area, mainly from surface outcrops of Stockworks. The grades are consistently anomalous, but obviously lower than some of the drill intersections. This variation may be explained by surface effects, such as leaching. It should also be remembered that the drilling tested (at best) only the extremities of some of the stockworks, and it may not be valid to compare the surface results with the drill results.

The extent of other elements in substantial (As, Pb) or anomalous (Ag, Mo and Hg) amounts is considered encouraging for gold-associated sulphide stockworks at depth.

Arsenopyrite, galena, and pyrite have been identified from the
old workings and in drill core. The limited depths of the main workings may have been a reflection of the increasing presence of sulphides (which constituted a problem in those days).

The likely depth extent of possible mineralization is difficult to determine. Drilling has already confirmed gold at depths of 30 to 40m, and even a trace at a vertical depth of 75m. It seems reasonable to assume a potential depth of at least 100m in view of the strong vertical dip of the main vein systems.

A greater depth potential for the stockworks might be suggested by the presence of the lamprophyre dykes. These are possibly related to the Middle Proterozoic granite intrusions, and may indicate such a body at depth somewhere in the vicinity of the GML's. Further, the Margaret and Mount Bundey intrusions may lie more or less connected beneath the present surface, thus providing another opportunity for interpreting a deep seated granite pluton below or to the west of the GML's.

It is also possible, that the lamprophyre dykes are later stage intrusives, and may be related to the Zamu complex.

B. CONCLUSIONS
1. At North Ringwood there are several quartz stockworks of sufficient size and grade expectation to constitute a viable target for testing.

2. Nothing equivalent to or approaching the size (or potential) of the North Ringwood prospect was recognised elsewhere within EL 3039. No further work on the Licence is recommended
until the North Ringwood prospect has been tested and evaluated.

3. Small tonnages of eluvial/alluvial wash are available both on the GML's and the Licence. Testing of these areas is recommended to be done at the same time as equipment is in the area to test North Ringwood.

4. Possible channels, hidden under the black soil flats immediately downstream from previously productive gullies, constitute a speculative target for alluvial gold on the Licence.
V RECOMMENDATIONS FOR FURTHER WORK

A. SUGGESTED WORK PROGRAMME

Before incurring further exploration costs for EL 3039, our recommendation is to carry out a specific programme on North Ringwood (GML's) only.

Recommended programme specifications are as follows:-

1. A thorough re-examination of stored core in the NTGS Core Library, and submission of further portions of the core for assay (gold, silver, and other elements on the basis of current scan results).

2. Hire a powerful tracked excavator with narrow bucket to cut trenches across the quartz stockworks (I - IV). Say two to three trenches per stockwork. The ground is relatively hard, and a powerful machine is needed. If a Jackhammer and explosives prove to be necessary then the drilling alternative may be substituted. A tracked excavator should avoid the need for a bulldozer initially, but a dozer would eventually be needed for access tracks and drill site preparation if trenching results are encouraging.

ALTERNATIVELY, hire an airtrac or similar drill rig to drill series of shallow (± 25m) holes across the quartz stockworks. Say 10 holes per stockwork, plus additional meterage for rapid testing of other mineralisation and geological features. A rig of this type will overcome ground hardness problems likely to hamper trenching, and will enable deeper sampling (but less continuous) in a
similar cost range. Again a bulldozer may not be required initially.

3. Systematically sample the trenches. Bulk sampling would be best, if possible. Married to processing at Mt. Wells or other local battery? AMDEL, in Adelaide might be an alternative to local treatment of the bulk samples. Failing that, channel samples cut in trench walls would be acceptable. If the airtrac is used, collect samples of cuttings at 1m intervals.

4. Use professional supervision; for these sampling programmes.

5. In view of the possibility of more extensive sulphide mineralisation at depth, consideration might be given to the application of geophysical methods for target delineation at depth. The method recommended as best applicable in this case is RRMIP*.

6. Additional reconnaissance trenches should be cut with the excavator for the purposes of testing eluvial/alluvial wash both on the GML's and at two locations within EL 3039, possibly North Ringwood Battery Site area and one black soil flat.

7. Diamond drilling of the main Stockworks (I - III) and the South-Western Fault. Use at least NQ diameter core barrels. Plan the drilling on the basis of encouraging trench results having been previously obtained, and other target indicators. In any case testing should go to a depth suitable to indicate a sufficient volume for open-cut mining (vertical depth between 50-100m). The required meterage cannot yet be estimated. It is suggested a budget allowance

*Rapid Reconnaisance Magnetic Induced Polarisation.
of 800m. be made. Note that it is difficult to mobilise a drilling company to isolated areas for small programmes and it may become necessary to tie in with other projects or even other companies.

B. TIMING

The programme could commence after the wet season (May–June) in 1982. If each stage is successful then allow for diamond drilling to be completed before the end of 1982. The terms of the E.L. will also affect this timing.

COGAR MINING CONSULTANTS PTY. LTD.

WEIL GEOWORKS PTY. LTD.

January 1982
REFERENCES


* Cogar, Brennan 1980: A Summary and Interpretation of the Available Reports on Northern Territory Mining and Exploration Tenements held by Secured Loans and Developments Ltd.


* 1:50,000 Woolwonga Geological Sheet.

APPENDIX I

COSTS INCURRED

The costs incurred in the exploration programme, to the end of July, 1982 are:-

<table>
<thead>
<tr>
<th>ITEM</th>
<th>AMOUNT ($)</th>
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<td>Maps, air photos</td>
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<td>Travelling expenses, air fares, accommodation</td>
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<td>Vehicle hire, petrol, oil</td>
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<td>Instrument hire, consumables, freight and field expenses</td>
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<td>Hired labour, consultants fees and services</td>
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<td>Statutory rentals, insurances, legal and accountancy fees, overheads</td>
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EURALBA MINING LIMITED
GEOLGY OF E.L. 3039
MT. RINGWOOD AREA

Photointerpretation supported by field traverses (and previous data by Occidental Minerals).
NOTE:
Individual old workings not shown, only areas of old workings. North boundary E.L. 5039 approximately 200m south of origin.

ASSAY DATA

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<th>SAMPLE NUMBER</th>
<th>Au ppm</th>
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<th>Mo ppm</th>
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Euralba Mining Limited is active in the search for energy resources. In this field its special interest is uranium. But in addition to its uranium interests it is exploring areas prospective for tin, copper, lead, zinc, gold and diamonds.

Effective exploration of the company's areas has been enhanced by formation of joint ventures with major Australian and international mineral companies each of which has acknowledged expertise in our target minerals.

The eighties is the energy decade. Euralba's objective throughout this decade is to play its part in carrying Australian energy and mineral resources from prospect to production.
Euralba Mining Limited
incorporated in NSW on 23 January 1970
and registered under the Companies Act
of the Northern Territory.

Registered Office in N.S.W.
28th Level, The Exchange Centre
20 Bond Street, Sydney NSW 2000
Telephone (02) 279044 Telex AA 78048

Registered Office in the Northern Territory
6 Searcy Street, Darwin, N.T. 5790
Telex AA85244

Northern Territory Administration Office
19 Kirkland Crescent, Kailin N.T. 5790
Telephone (08) 819381

Bankers
Australia and New Zealand Banking Group Limited
7 Macquarie Place, Sydney N.S.W. 2000

Share Registrars
Priestley and Morris, Chartered Accountants
37 Pitt Street, Sydney N.S.W. 2000