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MOUNT BUNDEY PROJECT AREA

EXPLORATION LICENCES 5298, 5311, 5313, 5355,

5489, 5514 AND 5593

REPORT ON AREAS RELINQUISHED

FROM PROJECT AREA

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SUMMARY

Relinquished portions of ELs 5298, 5311, 5313, 5355 and 5514 were examined in reconnaissance geological mapping, steam sediment sampling, rock chip sampling, and in detailed interpretation of aeromagnetic data, to assess their potential for epigenetic, vein-type gold mineralization hosted by quartz veins within the axial zones of anticlinal structures, within the Early Proterozoic Burrell Creek Formation metasediments.

Slightly more detailed mapping and sampling was carried out in the relinquished tenements, EL 5489 and 5593, for similar targets.

An inappropriate structural and magnetic environment in combination with poor geochemical results confirmed low prospectivity in all areas except EL 5489.

In EL 5489 some gold anomalism in quartz veins within an anticlinal axis has led to applications for mineral claims on the relinquishment of the tenement.

INTRODUCTION

The Oceania Exploration & Mining NL, Robert Johnston and Pegasus Gold Australia Ltd Joint Venture in the Mt Bundey area covers the bulk of that area explored by the Oceania Exploration & Mining NL, Robert Johnston and Golden Plateau Joint Venture in 1988. The 1989 project area covered approximately 590 square kilometres. Exploration in 1988, reported in Marshall et al. (1988), was predominantly regional reconnaissance incorporating an aeromagnetic survey, airphoto interpretation, regional geological mapping and regional geochemistry (rock chip, drainage and RAB drilling). First stage follow-up was carried out on selected targets.

Exploration by Oceania Exploration & Mining NL, Robert Johnston and Pegasus Gold Australia Ltd Joint Venture in 1989 was mostly concentrated on the six gold prospects outlined in 1988: Firebomb, Three Rest Hill, Copper Pits, Little Mary and Hallelujah North and South. A programme involving interpretation of aeromagnetic results, ground magnetics, detailed geological mapping, costeaning and drilling was outlined to test these prospects. Further geological mapping and rock chip sampling was also carried out in EL 5489.

At the end of the 1989 exploration programme the total project area was reduced by the relinquishment of 80 blocks, see Figure 1. This report details exploration in 1989 on the relinquished blocks.

GENERAL INFORMATION

Location and Access

The Joint Venture tenement area lies on the Batchelor and Noonamah 1:100,000 sheet areas, between 50 and 100 km SSE of Darwin.

Access is by the Stuart Highway and by station tracks on the Mt Bundey, Mt Ringwood and Ban Ban properties. The area is

inaccessible by vehicle between November and April during the monsoon 'wet.'

TENEMENTS

The Project Area includes the following Exploration Licences:-

EL 5298 granted 17/9/87 for 6 years - 61 blocks
EL 5311 granted 13/8/87 for 3 years - 13 blocks
EL 5313 granted 6/4/87 for 6 years - 29 blocks
EL 5355 granted 5/10/87 for 6 years - 76 blocks
EL 5489 granted 23/10/87 for 2 years - 4 blocks
EL 5514 granted 20/11/87 for 3 years - 3 blocks
EL 5593 granted 20/11/87 for 3 years - 6 blocks

The relinquishment is as follows:

EL 5298 - 21 blocks
EL 5311 - 9 blocks
EL 5313 - 3 blocks
EL 5355 - 36 blocks
EL 5489 - 4 blocks
EL 5514 - 1 block
EL 5593 - 6 blocks

REGIONAL GEOLOGY AND MINERALIZATION

The project area lies within the Early Proterozoic Pine Creek Geosyncline within the central region which is dominated by very low grade metasediments and metavolcanics of the South Alligator and Finniss River Groups. Most of the tenement area is underlain by turbidite sediments of the Burrell Creek Formation of the Finniss River Group. In the southern part of the area the upper units of the South Alligator Group, the Mt Bonnie Formation and the Gerowie Tuff, are exposed marginal to the Burnside Granite pluton. Sills of Zamu Dolerite are found within the sedimentary sequence, particularly in the southern part of the area. See Fig 1.

Throughout the area the Burrell Creek Formation is dominated by greywackes, sandstones, siltstones and mudstones which for

mapping purposes, can be roughly grouped into units which are either predominantly of sandstone/greywacke or predominantly siltstone/mudstone. The siltstones show variable development of bedding plane lamination with more defined lamination in the mudstones. The greywackes and sandstones are moderately to thickly bedded.

The boundary with the Mt Bonnie Formation is defined by the appearance of chert and haematitic chert horizons. The Mt Bonnie Formation is predominantly made up of shales, siltstones and mudstones with minor sandstone and volcanogenic tuffs and cherts.

Metamorphic grade is very low in the bulk of the project area (lower greenschist) with some upward gradation towards lower amphibolite facies to the south.

Of three episodes of folding recognised in the region the most prominent in the area are F_1 and F_2. F_1 folds are upright NNW-SSE trending with parallel axial plane cleavage. F_2 folds are upright, N-S trending and refold the cleavage associated with F_1.

Two dominant fault groups were interpreted from airphoto lineaments; NW-SE and NE-SW. These are interpreted as having a conjugate relationship related to the east west compression regime.

Quartz veining, both concordant and discordant is common in the area, associated with areas of folding stress and faulting. Most of these are relatively massive indicating development at deeper levels. Some are more fibrous and brecciated and seem to indicate development at higher crustal levels. A fossil hot spring has been recognised in one fault controlled vein at Old Boiler.

The Pine Creek Geosyncline is a known gold and uranium province. Epigenetic gold derived from magmatic and syngenetic sources, is

most commonly concentrated in quartz veins, particularly those associated with anticlinal structures, and with shearing or faulting.

A number of gold occurrences are known in the general area, close to the tenement block. The most important of these is the Goodall gold deposit, presently being mined by WMC. This is located within an F_1 anticline in a stockwork of gold bearing, sulphide-rich quartz veins within hydrothermally altered greywacke of the Burrell Creek Formation. Other local occurrences such as Great Western, Great Northern, Star of the North and John's Hill are all located on north-south anticlinal structures with, in some cases, associated shearing.

Minor copper occurrences are known in the area. Pits have been excavated on sulphide-rich quartz and quartz breccia veins associated with open fault structures. Some gold is associated with the copper. All are relatively close to Zamu dolerite which may be the source of the copper.

INVESTIGATIONS AND RESULTS - 1989

Aeromagnetic Interpretation

Reprocessing and interpretation of detailed aeromagnetic data from the Mount Bundey Project area was carried out over all tenements.

A large percentage of the project area was not amenable to surface prospecting because of widespread alluvium and 'black soil plain' cover. Definition of magnetic features which could be prospective for precious metal mineralization in areas of limited basement exposure was therefore a priority.

The aeromagnetic survey was flown on east-west oriented lines at 200 metre intervals, and 70 metre ground clearance. Readings of the total magnetic field were recorded at 0.2 second intervals, equivalent to approximately 14 metres, along flight lines.

Radiometric data were also recorded during the survey, but processed data were not available for this assessment. In view of the extensive surficial cover in the area, it is unlikely that the radiometrics would provide any significant information on the basement lithologies.

The magnetic data show generally very low levels of relief over major portions of the project area, particularly in the northern and western areas of Burrell Creek Formation sub-crop. In the south and south-eastern portions of the area, higher levels of relief are associated with inferred sub-crop of the Mt Bonnie Formation and mafic intrusives (Zamu Dolerite). This latter relief is complexly structured by intrusion of the Burnside Granite and Cullen Granite equivalent to the south and east of the project area respectively. A zone of increased magnetic relief is also evident in the south-western corner of the area, inferred to represent concealed equivalent to the Mt Bonnie Formation.

The most prominent magnetic features in the area arise from two sets of mafic dyke intrusion. The first trend is at approximately 320°, sub-parallelling the regional Pine Creek Shear direction, and is marked by two normally magnetized dyke intrusions in the central and north-eastern portions of the area. The second trend is at approximately 300°, and intruded by reversely magnetized material along a single structure in the northern portion of the area.

In areas where linear magnetic horizons are indicative of lithological sources, the dominant strike directions are N-S and NNW. Structural displacements or off-sets of lithological trends are predominantly NS to NE oriented, and a number of relatively continuous structures are apparent. Of particular interest to possible mineralization positions is a well-defined, arcuate magnetic boundary through the central portion of the area, which is inferred to be a possible contact aureole effect due to a

concealed batholith beneath the eastern margin of the project area. A majority of known gold occurrences lie within a zone extending from this position for approximately 4 kilometres to the west.

Target types defined by the data interpretation fell into three types:

a) discrete plug type - comparable to the Goodall anomaly
b) low amplitude isolated linear anomalies possibly representing pyrrhotite concentrations
c) unusual magnetic features located in complex structural settings

Tenement relinquishment took the distribution of these magnetic targets into account. All significant targets are within the retained portions.

Reconnaissance Geological Mapping - 1988

This covered the whole tenement area including the relinquished portions. More detailed mapping in 1989 was carried out only in the relinquished tenements EL 5489 and 5593 (see below).

The relinquished portions of the other tenements (ELs 5298, 5311, 5355 and 5514) are all underlain by low lying outcrop of Burrell Creek Formation greywacke/sandstones and siltstones. Cherts and siltstones of the Mt Bonnie Formation are exposed only in the SE corner of EL 5298 and in the relinquished portion of EL 5313. Much of the geology in these areas is masked by alluvium and 'black soil plain,' and information is limited and often confined to air photo interpretation.

The Burrell Creek Formation is a complex turbidite succession. On a regional scale it appears to have coarsened westward, while within the tenement block it coarsens upward and possibly northward. Transport directions appear to be from the north and east.

The metamorphic grade over most of the tenement area is low (probably lower greenschist facies), with a southward grade increment towards the Burnside Granite dome.

The essential lithological, metamorphic and structural features recognized in these areas are summarized in the Regional Geology and Mineralization section above.

Reconnaissance Geochemistry

Mapping was accompanied by regional rock chip sampling, usually concentrating on quartz vein systems. Stream sediment sampling was also carried out on a regional scale.

All areas of anomalism recognized in these geochemical surveys are within the retained portions of the tenements.

More Detailed Exploration - 1989

EL 5489

Due to the proximity of tenement relinquishment, geological mapping and rock chip sampling were carried out in this area to follow up the 1988 reconnaissance work.

The tenement is totally underlain by sediments of the Burrell Creek Formation. It lies directly south of the Goodall gold mine and is between 1 and 5 km NW of the Three Rest Hill prospect on EL 5313. The anticline hosting the Cosmo Howley mineralization runs just west of the tenement and the anticline which runs through the Hallelujah South prospect on EL 5313 lies just east of the tenement.

In 1988 exploration indicated alternating sandstones and siltstones trending SW-NE. Rock chip samples gave only background levels of gold.

Mapping in 1989 indicated a number of N-S trending anticline and synclines in the southern portion of the tenement. One of these

anticlines located in the SW part of the tenement was associated with axis-parallel, gossanous quartz veining. Rock samples from this gave 1 and 12.4 ppm Au.

Due to time constraints no further work was done in 1989 to follow up this result.

This licence has now been replaced by mineral claim applications.

EL 5593
This tenement was mapped in some detail in 1989.

It is underlain by folded sediments of the Burrell Creek Formation in a well exposed portion of the Ringwood Range.

The Burrell Creek Formation is typified by interbedded intervals of greywacke-sandstone, and sometimes quartzite intervals are from 1 metre to tens of metres thick. They contain fine to coarse, angular to sub angular feldspathic sandstone with rare thin (up to several metres) horizons of dominantly fine grained and well rounded lenses of conglomerates. The intervals of pelitic and psephitic dominant rocks are from 1 metre to tens or occasionally hundreds of metres thick and are defined as siltstone with minor lenses of slate, claystone and schist. They are massive to banded with bedding planes defined by regular periodically of psammitic and pelitic fractions. Very occasionally there are thin horizons of mudstone with concentrations of haematite.

The Burrell Creek Formation has been sub-divided within the Licence area into two lithologies units on the basis of fraction proportions:

- psammitic and,
- pelitic and psephitic

There is no continuity in horizontal propagation of units.

The major structural elements in EL 5593 are moderate, tight F_1 folds with bedding surfaces steeply dipping.

The major structure of the Ringwood Range forms a small synclinorium of several minor folds with axes trending from north-northwest to northwest. Axes of the folds plunge to the south.

Cleavage is sub-parallel to bedding except in fold axes.

Some faulting occurs in fold hinges. Two sets of later faults trend NE to ENE and SE to ESE.

Quartz veins of five main types have been recognized. They are occupying apparently different structural sites.

1. Conformable veins, evident both on fold limbs and along axial zones where they include small saddle reefs. These appear to have been emplaced in interlayer dilational zones developed during folding and late F_1 faulting.
2. Discordant veins associated with fractures of an axial plane type (cleavage and faults) of the F_1 stage. These are most numerous.
3. Discordant veins, consisting of brecciated quartz and country rock, which appear to represent faults. Randomly oriented stockwork sometimes associated with the faults suggest hydrostatic loading with intense fracturing.
4. Discordant veins of milky quartz which may fill fractures associated with faulting. The fractures can be of the Riedal, tensile or D type. The tensile fractures are always infilled by massive quartz.
5. Discordant veins which infill fold associated fractures of the joint.

Results from rock chip samples are low. The two highest results (0.34 and 0.23 ppm Au) occur in a single anticlinal axis but associated with other lower results.

CONCLUSIONS

ELs 5298, 5311, 5313, 5355 and 5514

The blocks being relinquished from these tenements show low prospectivity in terms of structure, style of veining and geochemical results from stream sediments and rock chips. Interpretation of aeromagnetic data does not suggest possible targets obscured by overburden.

No further work is justified.

EL 5489

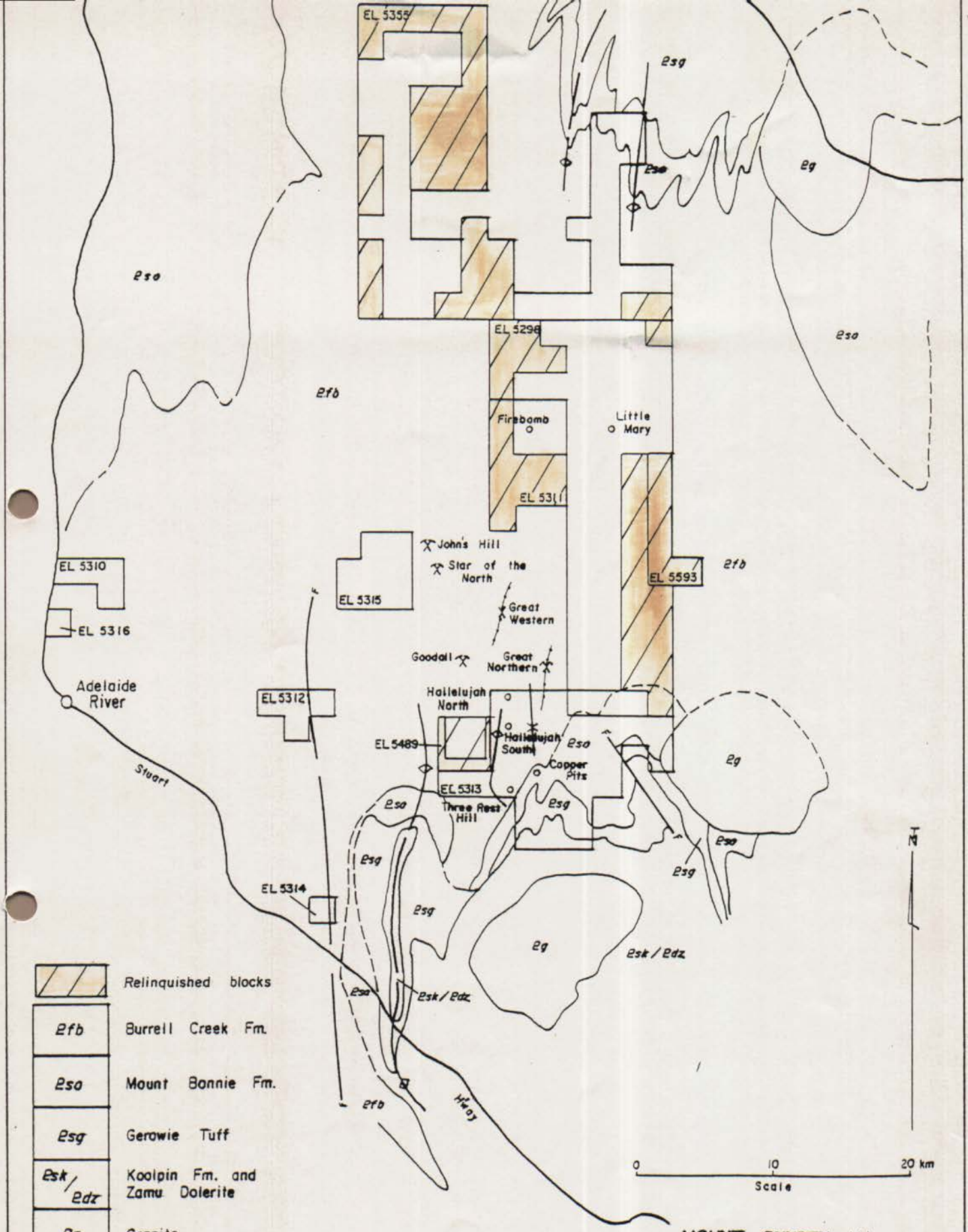
Reconnaissance in this tenement suggests some potential for gold mineralization in axis-parallel quartz veins in a N-S trending anticline.

The licence has been replaced by mineral claim applications.

EL 5593

The synclinal nature of the Ringwood Range structure is probably responsible for the weak gold mineralization in associated quartz veining. Only minor gold was found in association with minor anticlines.

It is considered that there is no justification for further exploration.



MOUNT BUNDEY J.V.

REGIONAL GEOLOGY – LOCATION – TENEMENTS

FIGURE 1