EXPLORATION LICENCE 8719

MOUNT THEO

MOUNT THEO 1:250,000 map sheet area, SF-52-8

Annual Report for the Period ending 14 JULY, 1996.

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ROCKS PROSPECTING

July, 1996
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FIGURES

FIGURE 1 Tenure Location Map.
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APPENDIX

APPENDIX 1 Rock chip sample descriptions
Fig. 1 Geological map of the Arunta Inlier showing major stratigraphic divisions and tectonic provinces. Large and small dots or dashes indicate known and inferred trends of lithologic layering, respectively. RZ = Redbank Deformed Zone, HZ = Harry Creek Deformed Zone, DZ = Delny-Mount Stainton Fault Zone, WF = Walabamba Fault Zone. Initials in bottom left corners of sheet areas denote names as follows: A, Alice Town; AS, Alice Springs; BC, Barrow Creek; H, Hermannsburg; H1, Highland Rocks; HR, Hay River; HU, Huckittar; IC, Illogna Creek; LM, Lake Mackay; LR, Lander River; McD, MacDonald; MD, Mount Doreen; ML, Mount Liebig; MP, Mount Peake; MR, Mount Rennie; MS, Mount Solitaire; MT, Mount Theo; N, Napperby; T, Tobermory; TG, The Granities; W, Webb.

TENURE LOCATION MAP
1. SUMMARY.

During this year, a scoping field trip was made during which 20 samples were collected and the nature of the transported sand and residual soils observed. Laterite and pisoliths do exist. This medium would be suitable for an orientation geochemical survey to investigate.

This licence is considered prospective for:

1) stratabound gold hosted in a chemical facies BIF environment
2) gold deposited in an interbeded sequence during a brief brittle - ductile phase of a brittle deformation event.
3) gold trapped in favourable structures, associated with granitoid emplacement.

KEYWORDS

Stratabound gold, vein type gold
Lower Proterozoic
Range Group
BIF's, chemical sediments
NNW
anticlinal, faults
Division 2, Reynolds
riifting
2. TENURE

Exploration Licence 8719, Mt Theo, was granted to Mr John Benger on the 15 July, 1995 for a period of six years.

The following graticular blocks have been retained,
Mount THEO Sheet 30/57, 31/57, 32/57,
28/58, 29/58, 30/58, 31/58, 32/58 35/58, 36/58.
33/59, 34/59, 35/59, 37/59 38/59
38/60
37/61

3. REGIONAL GEOLOGY

The Arunta Block is part of a widespread ensialic Proterozoic belt in central Australia. It is thrust fault bounded to the south by the Amadeus Basin and grades without clear boundaries north and west into the Tennant Creek and The Granites - Tanami Blocks.

This early Proterozoic ensialic complex comprises basalt, greywacke, schists, siltstones, BIF's and chemical sediments in which there are both pre metamorphic and post metamorphic basic to intermediate intrusives. Multiple granitoids are both syn tectonic and cogenetic post tectonic granites (1740 - 1680 Ma) eg at Mt Campbell. They have a metamorphic aureole in the sediments at the intruded contact.

The erosion of the basement rocks over time has left the lithologies of the licence deeply weathered and covered by a thin veneer of windblown sand. The Arunta Block is part of the North Australian Orogenic Province, that has been subjected to a similar geological evolution (Plumb 1990).

Widespread immature sedimentation and shallow water platform sediments are intermixed with theoleitic basalts and chemical sediments. They form Cycle 1, the Tanami Complex, and are separated by a major unconformity from later transitional felsic magmatism or flysch sediments of Cycle 2 (Geological Society of Australia, 1971; Blake et al 1979). The "basement" domains are unconformably overlain by Late Proterozoic platform sediments.

Crustal geosutures within the block controlled initial rift and graben sedimentation, localised subsequent variable cratonisation and divided the inlier into distinct lithological and tectonic provinces. The tectonic evolution resulted from six cycles of crustal extension and compression. The first, the widespread ensialic Barramundi Orogeny (1900 to 1850 Ma) caused rifting and taphrogenic volcanism. Subsequent events involving multiple folding, thrusting, metamorphic and plutonic intrusion are called:

Strangways Event (1800 - 1750 Ma)
Alleron Event (1700 - 1699 Ma)
Anmatjira Event (1500 - 1400 Ma)
Ormiston Event (1050 - 900 Ma) and the

Alice Springs Orogeny (400 - 300 Ma); (Shaw et al 1984).
LICENSE BOUNDARY

MT CAMPBELL

TURNERS DOME

KEYSER HILL

MT THEO SHEET SF 52-8
SCALE 1:250,000

FIGURE 2
4. LOCAL GEOLOGY,

Rock exposure is poor as shown on the published geological 1:250 000 Mt Theo map. The area of exposure is between Mt. Campbell and Keyser Hill, along a ridge. In this area lithologies are sandstone, ferruginous greywacke and sandstone that is weakly gneissic, and gneiss. These lithologies may belong to the Lower Proterozoic aged Lander Beds, interpreted to belong to Division 2, a flysch like facies deposited in a rift setting, (Stewart et al 1984).

A prominent fault zone, consists of a massive reef quartz that is in part brecciated and fractured with iron oxides and goethite on the joints. Cataclastic brecciation is found with resilification, sometimes jasper, of the fragments. Elsewhere this reef is finely fractured with ferro-oxides and pyrite boxworks on the joints. Many of the samples came from this reef and their descriptions are found in appendix 1. This reef is probably part of a major WNW trending crustal suture, along which syn and post tectonic granites have intruded. At Mount Campbell a non foliated, coarse grained leucocratic granite is exposed.

The overlying cover is dominated by sanddunes or sands with variable pisolith or maghemite content.

5. EXPLORATION MODELS.

Exploration is targeting gold mineralisation similar to that mined at The Granites, Dead Bullock Soak or the Tanami mining centres. Recent exploration has led to finding significant gold projects eg Kookaburra and Minatour away from these minesites. Consequently this area is considered prospective for stratabound gold, hosted in BIF's and / or calc-silicate rich lithologies now metamorphosed to amphibolite grade on the flanks of intruding granites. This is the style of mineralisation at The Granites and Dead Bullock Soak minesites. Here stratabound gold mineralisation is hosted in chemical sediments, 5 to 35m thick of mixed facies BIF's. The Callie deposit is structurally controlled associated with quartz veins within chloritic metapelites. The sequence is deformed by poly phase intense ductile deformation. This includes isoclinal folding, shearing and faulting within an ESE (120') fault wrench corridor. Gold deposits occur in mixed facies BIF where NNE structures intersect this crustal ESE corridor. At The Granites this favourable 9 km BIF horizon supports mining at four open cuts and an underground operation essentially on the fold limbs, whilst at Dead Bullock Soak, six deposits on a similar horizon are found mainly on the fold noses.

During folding and brittle deformation, gold remobilisation has enriched steeply pitching ore shoots parallel to the fold plunges and formed transgressive short narrow high grade quartz veins.

The Tanami Mine is found in a NE trending corridor in the neck constriction of Lower Proterozoic sediments, sandwiched between ovoid granitoid domes. Here gold mineralisation could be found on the contact between basalts and sediments and / or hosted by these lithologies in favourable structural settings. Favourable loci for mineralisation are structurally prepared sites caused by dilation at intersecting faults, and / or stratigraphy in a brittle fracture domain. Consequently auriferous, carbonate and siliceous solutions have been introduced along near vertical structures that often dip east, and have reacted favourably with porous lithologies eg basalts, sericitic sandstones, bedding shear zones and at lithological contacts between epilastics and basalts. This sequence dips 35 to 60' consistently northwest and is undeformed. Minor drag folding is found with faulting and thrusting has displaced the lode horizon often less than 10m.

The third model being sought is shear controlled mineralisation at favourable structural sites in proximity to Mid Proterozoic granites. It is widely believed that gold mineralisation originated with the granite plutons and were introduced into favourable structural sites in the folded and fractured host sediments.

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6. FIELD WORK COMPLETED.

Prospecting and reconnaissance traversing did not locate any significant indications of mineralisation or extensive alteration of lithologies in outcrop. However, the presence of an intruding granite within the fault system at Mt. Campbell does provide geological encouragement. Descriptions of the samples collected between Mt. Campbell and Keyser Hill are found in appendix 1.

The widespread occurrence of pisolite and maghemite provides confidence to undertake a auger drill geochemical programme sampling this medium.

7. CONCLUSION.

The Mount Theo block is considered prospective for stratabound gold hosted in mixed chemical facies BIF horizon where favourable structures are superimposed. This is a similar setting to The Granites and Dead Bullock Soak mine centres. Alternatively, gold mineralisation can be hosted in brittle fractures caused by oblique compressional forces on an interbedded sequence, such as basalts and sediments. This is the setting at Tanami Mine. The third model being sought is shear controlled mineralisation in proximity to granites. A forward exploration programme to meet these objectives is being sent under separate letter.

8. REFERENCES.

Blake, D.H., Hodgson, I.M. and Muiling, P.C. 1979
Geology of The Granites - Tanami Region, Northern Territory and Western Australia

Geological Society of Australia 1971
Tectonic Map of Australia and New Guinea 1:5 000 000
Geological Society of Australia, Sydney

Plumb, K.A. 1990

Shaw, R.D., Stewart, A.J. and Black, L.P. 1984
The Arunta Inlier, a complex ensialic mobile belt in central Australia. Part 2, Tectonic History.

Stewart, A.J., Shaw R. D. and Black L.P. 1984
The Arunta Inlier, a complex ensialic mobile belt in central Australia. Part 1, Stratigraphy, correlations and origin
K1  21° 49' 44"  131° 57' 27"
    massive white quartz with fine fractures + iron. Quartz breccia.
    silicified with iron cement, red jasper and siliceous sediment.

K2  21° 49' 16"  131° 57' 16"
    massive white quartz with fine fractures + iron. Quartz breccia.

K3  21° 49' 27"  131° 57' 22"
    ferruginous greywacke with goethite, sandstone becoming gneissic.

K4  21° 49' 12"  131° 57' 39"
    massive white quartz, finely fractured with iron oxides. Goethite on joints.

K5  21° 49' 10"  131° 57' 36"
    massive white quartz, finely fractured with iron oxides. Goethite on joints, sandstone with goethite and pyrite boxwork on joints.

K6  21° 49' 20"  131° 56' 21"
    quartz vein, metamorphosed, fine fractures with iron films.

K7  21° 49' 17"  131° 56' 83"
    quartz reef with fine fractures with iron oxides.

K8  21° 49' 00"  131° 56' 62"
    reef quartz with fine fractures with iron oxides.

K9  21° 49' 06"  131° 56' 37"
    laterite pisolite, reef quartz with fine fractures with iron oxides, siliceous siltstone with iron oxides.

K10 21° 49' 09"  131° 56' 32"
    siliceous siltstone with vein quartz.

K11 21° 46' 92"  131° 56' 23"
    grit sands with magnetite or maghemite.

K12 21° 48' 89"  131° 55' 96"
    pisolite in part with maghemite. Reef quartz with micro fractures and iron films.

K13 21° 47' 32"  131° 52' 73"
    reef quartz, microfractured with iron oxides.

K14 21° 47' 19"  131° 52' 40"
    Reef massive reef quartz, microfractured with iron oxides.

K15 21° 47' 19"  131° 52' 40"
    Reef massive reef quartz, microfractured with iron oxides.

K16 21° 47' 16"  131° 52' 07"
    massive reef quartz, cataclastic brecciation and resilicified, thin iron oxides.

K17 21° 47' 92"  131° 54' 70"
    massive reef quartz, cataclastic brecciation and resilicified, thin iron oxides.

K18 21° 49' 34"  131° 57' 72"
    ant's nest with maghemite.

K19 21° 50' 46"  131° 57' 84"
    gneiss, mica orientation.
Proposed exploration work to be carried out in 1996-97 would consist of studies of aeromagnetic, lineament tectonic and Landsat data, followed by shallow auger drilling at selected sites to examine and assay lateritic and pisolitic material for gold potential in the following:-

1. Stratabound gold hosted in a BIF environment.
2. Gold deposited in an interbedded sequence during a brief brittle-ductile phase of a brittle deformation event.
3. Gold trapped in favourable structures, associated with granitoid emplacement.

Minimum expenditure for 1996-97 - $35,000.00.