Year 4
Annual Technical Report for
EL 28124 ("Baldwin")

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Date: 10th April 2015
Tenement Holders: Riding Resources Pty Ltd (50%)
                  Bralich Holdings Pty Ltd (50%)
Tenement: EL28124
Prospect Name: Baldwin
Reporting Period: 16 February 2014 – 15 February 2015 (Year 4)
Distribution: Bralich Holdings Pty Ltd (1)
              Riding Resources Pty Ltd (1)
              Geoscience.Info (DME) (1)
Map Sheet: Huckitta 1:250,000 sheet (SF5311)
           Jinka 1:100,000 sheet (6052)
Target Commodity: Copper, Nickel, Gold, Tungsten, Molybdenum, Zinc
Keywords: Geophysical Interpretation, literature review
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Summary

EL28124 lies 250 km north-east of Alice Springs. Previous workers in the area have not been successful in drilling or discovering any economic mineralisation. A literature review and magnetic interpretation of the area suggested an unusual linear zone of magnetic highs between the regional Delny Shear Zone and the Entire Point Shear Zone. Soil samples taken during the first year of exploration revealed minor Ag anomalism. Sampling of quartz-barite veins of the Oorabra reef returned barren assays.

Year 2 work was mostly office based and concentrated on understanding the geology and mineralisation styles in the eastern Arunta area. This was essential to any successful exploration program. One field trip was undertaken with several overseas geologists, with a view to earning a majority interest in this tenement. A number of areas with historic rock chip anomalism (W) were visited using the GPS and outcrops assayed with a portable Niton XRF analyser and hand held scintillometer. No mineralisation was discovered. Resampling of the anomalous Ag area was not undertaken, this was due in part to the general lack of success soil sampling has had in the area, plus absence of supporting anomalism by other metals e.g copper, zinc.

During Year 3, the tenement holders entered into a JV with the Modern Mineral Group Pty Ltd (MMG). MMG commissioned UTS Geophysics to acquire magnetic and radiometric data acquisition on EL28124 and adjacent tenements held by Bralich and Riding. Approximately 1100 line km was flown north/south at 100m traverse spacings on EL28124. Year 4 saw a detailed analysis of the data, with a proposal for an airborne EM survey being established. Several new anomalies and structures were delineated and will be the focus for the year 5 work program.

1.0 Introduction

This report covers the fourth year of exploration conducted at EL28124. EL28124 “Baldwin Prospect”, along with EL27624 and EL28429 forms part of the “Huckitta Project”. It is located 250 km’s directly north-east of Alice Springs, 25km north of the Plenty Highway within the Huckitta 1:250,000 Geological Map Sheet (Fig.1.1). Access from Alice Springs is by way of the Plenty Highway for 220 km, thence going east from Molyhil along the Baikal. Alternative access can be gained from the Jervois station road and driving west towards Mt Thring.

Access within the tenement is by the way of a number of pastoral station and maintenance tracks that service the water bores within the property.

Historically, EL28124 has never yielded economic mineralisation, the closest mine being the Molyhil W-Mo deposit 10km north-west. It is currently on care and maintenance. Molyhil is a magnetite skarn. Previous explorers have mostly focussed on magnetic anomalies in the area.
2.0 Geology and Mineralisation

The Baldwin tenement (EL28124) covers Early Proterozoic rocks with high magnetic relief along and flanking the Delny-Mt Sainthill Fault and Entire Point Sear, a feature developed within a wide west-north-west tectonic zone (Figure 2.1). This structure was active during the 1800Ma Strangways Event, which affected the entire Arunta Orogenic Domain. Faults within this tectonic zone have been periodically reactivated with a major remobilisation during the Carboniferous Alice Springs Orogeny.

The basement rocks in the northern Huckitta sheet are unconformably overlain by Adelaidean and Palaeozoic marine and terrestrial sedimentary sequences of the intracratonic Georgina Basin to the north of EL28124.

Mineralisation is widespread within the Huckitta 1:250,000 sheet with past production from the Jervois deposits (Cu, Pg, Zn, Ag, Bi), the Molyhil “skarn” (Mo, W, Cu) and numerous other small Cu and W vein deposits. Resources of barite-fluorite have also been established within huge quartz (carbonate-haematite) veins (“Oorabra Reefs”) cutting the Jinka Granite and other basement rocks. These veins also appear to penetrate the basal Adelaidean sedimentary sequence.
The area was subjected to deep weathering and laterisation during late Mesozoic to Miocene time. Most of this old surface has been eroded away with small remnants preserved at the top of Mt Sainthill.

The area was uplifted during the Late Tertiary and erosion continues to the present day. Extensive outwash fans have developed at the base of hills and obscure the basement rocks. A return to arid conditions during the Pleistocene produced sand plains, and loess was deposited throughout the hilly areas. The combination of the effects of deep weathering and extensive younger sedimentary deposits provide for a difficult environment for effective surface geochemical sampling.

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<th>Tenement</th>
<th>Owner</th>
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<th>Size</th>
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<td>EL 28124</td>
<td>Riding Resources Pty Ltd (50%)</td>
<td>16/2/2011</td>
<td>6 Years</td>
<td>30 sq. blocks</td>
<td>$1477</td>
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4.0 Previous Exploration

The discovery of the Molyhil scheelite-molybdenite deposit in 1977 stimulated an up surge in mineral exploration within the Huckitta area. Prospector Lindsay Johannsen first discovered scheelite in layered calc-silicate rock at Molyhil Pinnacle in 1973. Subsequently Fama Mines Pty Ltd selectively mined some 20 tonnes of scheelite at the site. Later, additional scheelite was discovered 800 metres east of the Pinnacle at the Yacht Club deposit which produced 20,000 tonnes of ore averaging 0.5% scheelite to yield 100 tonnes of 70% WO$_3$ to 1976.

In 1977 the Mines Branch Administration conducted a detailed exploration program over the mine site comprising gridding, ground magnetic surveying and diamond drilling (740 metres). This program led to the discovery of the larger Southern orebody comprising both scheelite and molybdenite.

During 1977 Otter Exploration NL flew regional radiometric survey over the southern half of the Huckitta 1:250,000 map sheet area. The initial airborne reconnaissance survey revealed several high amplitude radiometric anomalies. Traces of uraninite (up to 200ppm uranium) were discovered within mineralised skarn at the Molyhil mine. Airborne radiometric grid surveying of the licence area was completed by August 1977. Significant geochemical results from Otter rock chip and drainage-sampling programs were also noted. Ground follow-up of airborne radiometric anomalies showed they appear to cluster where Adelaidean sediments unconformably overlie Early Proterozoic Arunta Block.

In 1978 Anaconda Australia applied for 78 square kilometres west of EL28124. They erected a 7 x 6 km grid centered on Yam Creek over which they conducted a 100 m line space ground magnetometer survey to see if they could repeat three AMAG anomalies from the AGSO one-mile line space survey. They also collected and analysed 539 soil samples for Cu, Pb, Zn, Ag, Ni, Co, Mn, Cr, V, Fe, Ca, Mg, Al, Ti, Ba, Sr, Mo, U. High silver values obtained from drainage sampling (12ppm) hand auger and soil sampling (5ppm) indicate several anomalous areas within the old Anaconda grid which require following up.

In 1981 Aerodata flew a 150 m line space AMAG survey over Molyhil for Petrocarb Exploration NL. Fourteen additional magnetic features were delineated by the above survey as possible Molyhil analogues. Seven anomalies were tested by fences, of shallow Air track percussion holes.

Using the Molyhil deposits magnetic signature as a model to search for additional Molyhil-type mineralised magnetite skarn deposits Geopeko commissioned Austirex International to fly the Eurobra AMAG and Radiometric survey covering 970km$^2$ centered on the Molyhil mine. The survey delineated 74 Molyhil – lookalike AMAG anomalies (Scorpion series) all of which were ground mag’d, however only 32 were drill tested for disappointing results, i.e. disseminated magnetite in quartz-feldspar-biotite gneiss or granite.

In late 1983 Petrocarb/Nicron, Geopeko consortium farmed out the uranium rights to Uranerz Australia.

Ground radiometry traverses across the Delny-Mt Sainthill shear zone 30 km west of Molyhil delineated two areas of elevated cps readings namely Crystal and Yam Dam prospects. In
January 1984 the Austirex International Halfway Dam AMAG and Radiometric survey was flown.

However because Geopeko were about to withdraw from the Petrocarb/Nicron joint venture and Uranerz were losing interest in the area because most radiometric anomalies appeared to be over Thorium-rich granites only the AMAG data was processed. No ground checking of any AMAG anomalies was carried out by Geopeko nor was any yet to be identified radiometric anomalies by Uranerz!

Geopeko withdrew from the Petrocarb/Nicron joint venture in early 1983. Petrocarb resumed control of the Molyhil tenements until final relinquishment in 1989; however the only exploration activity undertaken during this period of low tungsten and molybdenum prices was a drainage sampling program centred on Molyhil. Three drainage anomalies were delineated namely 11182 (Pb), 11096 (Zn, Cu) and 11212 (W-Mo) none of which have been followed up.

Roebuck Resources NL applied for nearby EL’s 8127 and 8144 in 1989. Roebuck made the following observations with regard to the prospectivity of the area;

1) Molyhil licences are over fundamental intersecting east northeast and west northwest-trending regional fracture zones. The zone of intersection is the site of two or more phases of Proterozoic granite intrusion namely Marshall and Jinka.

2) A long standing thermal source is evidenced by the Oorabra Reefs intruding Jinka Granite during pre-Adelaidean times followed by a later quartz-fluorite-barite-base metal sulfide vein event which again intruded basement as well as all levels of Adelaidean sediments over a strike length of 75 km of the Delny-Mt Sainthill Fault zone.

3) The Molyhil skarn deposit occupies a northeast fracture where it intersects the Delny-Mt Sainthill Fault Zone as indicated by a northeast-trending break in the magnetic contour pattern, which is clearly apparent as a photo linear feature.

4) In the Elyuah Range near Gap Bore a Cambrian dolostone contains megacrysts of barite replacing hyoliths along bedding plans for 300 m over a stratigraphic interval of 2-3 metres thus implying a similar replacement mechanism with the gangue of the Pb-Ba Boxhole Bore mineralisation located 55km north of Gap Bore.

5) Black Ridge prospect is a low temperature epithermal vein system enriched in Au, As, Mo, Cu and Pb occurring at the intersection of a large Oorabra Reef and the east northeast-trending Oomoomilla Fault. There is an underlying small magnetic anomaly at Black Ridge similar to the magnetic highs along the Oomoomilla Fault perhaps indicating more iron-rich vein developments or local concentrations of magnetite within the Oorabra Arkose adjacent to the fault?

6) Several geochemical anomalies are defined north of Mt Sainthill towards Deep Bore and Oorabra Rock Hole. Although underlain by Jinka Granite the area hosts four discrete AMAG anomalies including one, which appears to underlie a quartz-chalcopyrite-barite veined altered granite south of Moppata Water Hole. Note: this area coincides with Anaconda’s 1979 soil grid.

7) An iron formation cropping out near Mt Sainthill requires following up similarly a Cu-Au mineralised ironstone cropping out on the Huckitta track.
In May 1997 Roebuck farmed out EL 8127 to BHP Minerals who identified the Molyhil region as prospective for world-class examples of Iron oxide, copper gold (IOCG) deposits following the completion of AGSO’s “The Metallogenic Potential of Australian Proterozoic Granites” study in 1996 which identified the Alaringela Suite of (1713Ma) granites as being highly prospective for Cu, Pb, Zn and moderately prospective for gold.

The Alaringela Suite includes:

i) Alaringela Igneous Complex on Dneiper 100k sheet
ii) Unca Granite on Jervois Range 100k sheet
iii) Marshall Granite on Jinka 100k sheet.

All these granites are fractionated, oxidised (with red to pink coloration and hematite to magnetite-stable mineralogy) show evidence for a fluid phase, intrude suitable host rocks and appear to be associated with known Cu, Pb, Zn, Ag, Mo & W mineralisation (including the Jervois deposits?).

BHP also believed the Molyhil region to be prospective for world-class examples of Broken Hill Type (BHT) Ag-Pb-Zn (Cu) deposits.

BHP firstly assessed the scope and effectiveness of previous surface geochemical work. Drainage geochemistry is the only technique used extensively on Jinka (the effectiveness of which BHP questioned given the regolith of the area) resulting in a series of minor Cu (Pb-Zn-Ni) drainage anomalies evident in the Mt Sainthill area where Kanandra Granulite gneisses dominate the geology.

BHP decided to complete a regolith interpretation of the area prior to commencing any geochemical sampling program. The regolith is dominated by transported alluvial and fluvial material primarily related to the Plenty and Marshall River systems. These deposits comprise a polymictic lag of numerous types of lithic fragments dominated by vein quartz, quartzite, granitoid, mafics and felsic gneiss set within a silt-sand matrix. BHP decided that systematic 1 km x 1 km regional lag sampling would be the best technique to apply across the entire area given the diversity of regolith environments. The emphasis of the lag sampling was on;

i) areas of residual Tertiary laterite
ii) areas of eroding Arunta outcrop/subcrop and
iii) intervening areas where abundant lag deposits occur.

Spatial analysis of comprehensive regional lag data sets identified two priority anomalies;

i) a cluster of Cu-Pb-Zn-Ag anomalies occurring near Mt Sainthill.
ii) One coherent Ag anomaly east of Mt Sainthill.

A 45 sample infill lag sampling follow up program failed to upgrade the anomalies resulting in BHP withdrawing from the joint venture in 1998.
More recent work from 2004 till 2012 by TNG Ltd and Thor Mining PLC has concentrated on the Molyhil deposit. This has included resource drilling, underground bulk sampling, detailed metallurgy and scoping studies.

### 5.0 Year 4 Work Summary & Discussion

Touching on some of the previous work undertaken by Bralich and Riding, 2 rock chips and 20 soil samples (B horizon 30cm deep) were taken on EL28124 in 2011. The most significant rock chip assay was 469 ppm Cu, while the soils highlighted a maximum value of 0.08 ppm Ag (equivalent to 80 ppb Ag) against a background of <0.02 ppm Ag. The anomalies occur on the edges of the magnetic anomalies. Other metals such as zinc, copper, nickel and lead gave no significant response. Given the soil there was sandy and lack of supporting multi-element geochemistry, the Ag anomaly was considered tentative.

![Figure 5.2 Rock Chip and Soil Contours over TMI Background](image)

The area was again revisited during October 2012 with 4 overseas geologists. The idea was to familiarise the potential JV partners with the local geology as well test some of the outcroppings with purported historic mineralisation (W, Mo, Zn) with a portable XRF analyser. These locations are shown on figure 5.2. No anomalous values were observed. It’s suspected that some of the historic locations were erroneous.

Local radiometric highs were observed near granites whilst driving around upto 625 cps (U, Th, K). This is typical of the Jinka granite which has a recorded history of elevated
radiometrics. In fact Thor Mining report that the concentrate produced at Molyhil has elevated levels of uranium in the scheelite product.

Additional work included a review of the Aster data recently released by the NTGS and literature reviews of high grade Proterozoic terrains.

During Year 3, the tenement holders entered into a JV with the Modern Mineral Group Pty Ltd (MMG). MMG commissioned UTS Geophysics to acquire magnetic and radiometric data acquisition on EL28124 and the adjacent tenements held by Bralich and Riding (Figure 5.3). Approximately 1100 line km was flown north/south at 100m traverse spacings on EL28124.

![Figure 5.3 UTS survey lines](image)

A couple of images from the survey are shown below. Clearly there is a much higher level of resolution than the regional NTGS data. In particular several anomalies around 592000E, 7476000N can be seen. These occur in a more felsic host, and possible represent higher concentrations of magnetite and iron minerals in the probably gneissic rock. This is consistent with the host being the metamorphosed equivalent of a mafic intrusive (e.g. Gabbro). There are similarities to Mithril's Blackadder Ni-Cu project near Indiana Station.

To the south of this anomaly the magnetics tend to pinch inwards, the reason is a bit unclear at the moment, but this remains an interesting structure. There doesn’t appear to be any isolated bullseye style anomalies, however within the magnetic image, some potential dipole anomalies can be seen.

Several proposals for an EM survey were compiled during 2014, the flight lines were over key structures identified by the magnetic survey. However due to funding issues, no surveying was commissioned and will be put on hold pending adequate funds can be raised.
Figure 5.4 EL28124 Magnetic Image

Figure 5.5 EL28124 1 Vertical Derivative Image
6.0 Rehabilitation

There were no earth disturbing activities on the tenement. No rehabilitation was required.

7.0 Year 5 (2015/2016) Proposed Work

During year 5, the tenement owners propose to fly a detailed airborne or ground EM survey over specific targets as delineated by the new magnetic survey. Ideally any anomaly uncovered would be followed up by preliminary soil or lag sampling or drilling.