AUSQUEST LIMITED  
(ABN 35 091 542 451)  

COMBINED FIRST ANNUAL AND RELINQUISHMENT REPORT  
PLENTRY RIVER  
EL 22877  

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October, 2003
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1.0 SUMMARY

This is the combined (first) annual and relinquishment report on AusQuest’s Plenty River tenement, EL 22877.

This tenement was acquired as part of a larger project, searching for Broken Hill Style lead-zinc-silver mineralisation within a major transcurrent fault corridor, extending WNW-ESE through the region. Evaluation of magnetic and recent geological and geochronological data appears to provide little scope for Broken Hill age stratigraphy in the area. Accordingly, EL 22877 was relinquished on 5 August, 2003.

2.0 INTRODUCTION

EL 22877 was granted to AusQuest Limited on 25 July, 2002, for a term of six years. This report is the first and final report on that title.

Along with the adjacent block of AusQuest titles (Figure 1), application for EL 22877 was made on the premise that this area may be prospective for large, high-grade lead-zinc-silver deposits of the Broken Hill Type. The rationale for this interpretation is presented in Section 4, below.

AusQuest’s exploration strategy was to sample and age date, where possible, potential target stratigraphy, thereby establishing its prospectivity (ie. Broken Hill / Cannington age rocks should be represented in zircon ages). Identification of 1.5 to 1.7 Ga rocks would lead to airborne EM over (magnetically extrapolated) target stratigraphy beneath shallow cover, to directly detect any buried massive sulphide deposits.

3.0 TITLE AND ACCESS

EL 22877 is situated on the western margin of the Simpson Desert, and is accessible from the northwest (via the Brahma Bore track), being about 70 km from the Plenty Highway (Figure 1). The area can also be reached from Atula, about 35 km to the northeast, and a further 40 km from the Plenty Highway.

With the moratorium placed on AusQuest title applications to the east, but for the technical reasons discussed below, access negotiations were not entered into with the Traditional Owners. Accordingly the area was not visited.
4.0 EXPLORATION CONCEPT

Due to their typically large size and high grade, Broken Hill Type lead-zinc-silver deposits have been intensively targeted in exploration along the eastern margin of the Precambrian shield in western Queensland and NSW. These heavily explored areas represent the extrapolated geological settings of the type occurrences of Cannington and Broken Hill deposits. From the evidence of discovery, recognition of favourable environments for the formation of such deposits elsewhere in Australia, has been more problematic.

In seeking favourable, less heavily explored terrains in which to seek this valuable deposit type, AusQuest has drawn on research of the model type and its distribution. An eastern continental margin setting is interpreted for both Broken Hill and Cannington. These geophysically prominent margins can be interpolated between Broken Hill and Cannington, into the eastern Arunta Province, along a very broad, trans-continental linear shear belt (Figure 2). This suggests that fault slices of Broken Hill-Cannington age rocks could have been structurally emplaced into the Arunta Province. Recent recognition by researchers of an exotic terrain in the East Arunta (Mawby, 2000; Buick et al., 2001; Maidment et al., 2002), whilst so far showing young (Cambrian) rocks in the shear belt, can be reconciled with the above hypothesis.

As indicated in the Introduction (Section 2), the planned strategy for exploring this terrain, which is known to be only shallowly buried (at least in the north), would rely on airborne EM as a direct method of detecting massive sulphide
Figure 2. Regional geology and magnetics of the eastern Arunta Province
deposits. This would allow rapid, affordable coverage of a large area, but to be effective, is limited to areas where any overburden on the target rocks is thin (~100 m or less) and non-conductive.

An initial phase of exploration, upon which a decision to proceed with the airborne EM survey would be based, is the confirmation of the prospectivity of the rocks to be targeted. This would entail the age dating of the limited exposures of target lithologies available and establishing whether detrital zircon populations reveal any peaks of approximating Broken Hill age (1.5 to 1.7 Ga).

The group of title applications lodged by AusQuest during the year 2000, of which EL 22877 was part, were made on the basis of the above exploration concept and plan.

5.0 PREVIOUS EXPLORATION

A review of NTGS Open File company reports over the Plenty River tenements and in the general area shows that limited previous mineral exploration has been undertaken. Prior title has existed over the northern and northwestern parts of EL 22877, and has also abutted the southern margin of the tenement in the west (Figure 3). The activities conducted by the title holders are summarised as follows (and may be referred by tenement number to Figure 3):

EL3015  Geopeko - Petrocarb Exploration N. L. (CR1984-0181). Area overlaps NW corner of EL22877. Area was targeted for Mo-W mineralisation, but later deemed to lack appropriate skarn environments and relinquished. No significant work reported.

EL7179  BHP Minerals Limited (CR1992-0212). Area overlaps NW corner of EL22877. BHP explored a block of four tenements for Broken Hill Type Pb-Zn-Ag mineralisation using a combination of geological, geochemical and geophysical survey methods. The most significant results to emerge were from the RC drilling of a small magnetic anomaly about 15 km north of EL22877. Anomalous Pt and Pd values of up to 50 ppb were obtained from a probable small mafic (?) to ultramafic) plug.

EL8861  Posgold Limited (CR1996-0178) Area encroaches on northern margin of EL22877. Posgold targeted gold in NW trending structures but also followed up BHP Minerals program (above). Attempted to drill BHP’s Pt-Pd anomaly, without success.

Other exploration near but outside the area of EL22877 was undertaken in the northwest by Roebuck Resources (EL 8094) and Pasminco (EL 9519), the former searching for BIF-associated gold and base metals and the latter exploring for base metals. The only notable results were from Pasminco’s sampling which revealed weakly anomalous Cu-As values in soils associated
Proterozoic to Cambrian

Relinquished tenement EL 22876

Other AusQuest tenements

Jurassic to Cretaceous

Tertiary undifferentiated

Quaternary

Previous Exploration

Figure 3

Plenty River

EL 22877

Gredelle Pty Ltd

EL 5184

Geopeko - Petrocarb Exploration NL

E3015

Posgold Ltd

E8861

BHP Minerals Ltd

E7179

Roebuck Resources

E8094

Roebuck Resources

E8094

Scale: 1:250,000

AQ_03207
with slightly As-Au enriched magnetite pods. Just southwest of EL 22877, Gredelle Pty Ltd (EL 5184) and Roebuck Resources (EL 8093) conducted limited gold and base metal exploration programs without significant results.

The main relevance of the above exploration to AusQuest’s targeting of Broken Hill Type mineralisation is in confirming a broad resemblance of lithogies in the general area to those of the Broken Hill district.

6.0 PLENTY RIVER GEOLOGY

Regionally, AusQuest’s block of titles and applications at Plenty River, straddles a prominent WNW-ESE structural corridor (the Larapinta corridor of Figure 2) as defined in aeromagnetic and gravity data. The exposed part of this corridor mainly comprises supracrustal Cambrian metamorphic rocks of the Irindina package, structurally emplaced between Palaeoproterozoic basement rocks (Mawby, 2000; Buick et al., 2001; Pietch, 2001). The high temperature - high pressure metamorphic event which affected the Irindina rocks in this region is of Ordovician age (Mawby et al., 1999), and the rocks include pelitic, psammitic and calc-silicate metasediments and mafic lithologies. This rock assemblage is somewhat similar in (compositional) character to the Cambrian rocks to the northeast of Broken Hill.

Stratigraphy of the Irindina package is well exposed in the Harts Range, and extends eastward into areas of poor exposure to the west of AusQuest’s block of titles (Figures 2 and 4). Current mapping (Illogwa Creek 1:250 000 sheet), however, does not correlate outcrop in and at the margins of AusQuest’s western titles with recognised Irindina stratigraphy. Further southeast, flat-lying sedimentary cover sequences blanket the metamorphic and igneous rocks of the Arunta Province to increasing depths. The thickest component of these cover sequences belongs to the Eromanga Basin, spanning an age bracket of Late Jurassic to Cretaceous. Thin remnants of a Tertiary sedimentary stratigraphy are patchily developed (or preserved) and Quaternary fluvio-aeolian unconsolidated sediment forms a veneer of dune-dominated cover in the Simpson Desert.

The local geology of EL 22877 is dominated by Quaternary aeolian sand which is cut by a broad alluvial (sandy) channel of Huckitta Creek (Figure 4). A low dissected plateau surface in the southeast is capped by Tertiary siltstone and limestone with a locally preserved laterite surface. Scarce, isolated exposures of crystalline basement poke through the sand plain. Whilst these gneissic and schistose rocks are mapped on the Illogwa Creek (1:250 000) sheet as undifferentiated Proterozoic rocks, newly defined young ages for the Harts Range rocks (Mawby, 2000, Buick et al., 2001) led Peitch (2001) to include these exposures with the Cambrian Irindina rock package. However, as indicated above, the non-correlation of these exposures with stratigraphy at Harts Range, leaves considerable doubt as to the true age and affinities of these rocks. Fault bounded slices of Broken Hill age rocks could lie unrecognised within these basement exposures.
Proterozoic to Cambrian
Relinquished tenement EL 22876
Other AusQuest tenements
Jurassic to Cretaceous
Tertiary undifferentiated
Quaternary
drainage
track

Figure 4
Plenty River
Tenement Geology
EL 22877

Scale: 1:250,000
EL 22877 appears from water bore logs and mapping to lie north of the preserved margin of the Eromanga Basin, with the only flat lying cover rocks and sediments being of Tertiary age and younger.

7.0 EXPLORATION RESULTS

The only exploration activity carried out was a desk-top evaluation of available geological and geophysical and data. This brought together the geological mapping (Illogwa Creek 1:250 000 scale sheet) and airborne magnetics and ground gravity surveys of the Northern Territory Geological Survey (NTGS) and Geoscience Australia (and its predecessors), and geological logs of water bores (from the Database of the Natural Resources Division, NT Department of Infrastructure, Planning and Environment).

Uncertainties about the age and affinities of the limited ‘basement’ outcrops to the northwest notwithstanding (Section 6), areas with similar magnetic character to Broken Hill can be identified (Figure 2). A belt of subdued (smooth) magnetic character containing some linear anomalies (perhaps representing mafic layers, BIF, or refolded thin shear zones) as at Broken Hill (Stevens, 1999, Maidment et al., 2000) does appear to extend from the northwest to southeast across the northeastern corner of the tenement (Figure 5). However, this very marginal coverage of the zone of interest is considered insufficient to warrant tenement retention, and certainly exploration in its own right.

8.0 REHABILITATION

No rehabilitation was required as no field work was undertaken on EL 22876.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The definition of a magnetically-delineated target belt, with a magnetic (and regional gravity) character resembling that of Broken Hill, suggests that the main area of interest lies to the north of and barely encroaches on EL 22877. Accordingly this title has been relinquished.

10.0 REFERENCES


Figure 5
Plenty River
Aeromagnetics Compilation
EL 22877

Relinquished tenement EL 22877
Other AusQuest tenements

Scale: 1:250,000

Gredelle Pty Ltd.  1988.  Field work and research for the period 21.4.87 to 21.4.88;  ELs 5180 to 5185 in the Illogwa Creek region.  CR1988-0326.


