AUSQUEST LIMITED
(ABN 35 091 542 451)

COMBINED FIRST ANNUAL
AND RELINQUISHMENT REPORT
PLENTY RIVER
EL 22874

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1.0 SUMMARY

This is the combined (first) annual and relinquishment report on AusQuest’s Plenty River tenement, EL 22874.

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. A recent NT Government aeromagnetics survey, flown in late 2001, provided for east-southeastward extrapolation of this corridor, apparently extending through the southwestern corner of EL 22874. However, southward deepening cover sediments of the Eromanga Basin, indicated by water bore holes, greatly limit the potential effectiveness of rapid (airborne) methods geophysical exploration (principally electromagnetics).

In the absence of cost-effective exploration methodologies, and following a comprehensive evaluation of available data, EL 22874 was relinquished in November, 2006.

2.0 INTRODUCTION

EL 22874 was granted to AusQuest Limited on 22 December, 2005, 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 22874 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 22874 is situated in a remote area of the Simpson Desert, accessible by track along Field River from the north (Figure 1) and by east-west track from Plenty River. EL 22874 and the Field and Plenty River access tracks lie within Attnetye aboriginal freehold land.

With the moratorium placed on AusQuest title applications to the west until November 2005 (and the continuation of an exclusion zone along the Plenty River, now ELA 25008), and for the technical reasons discussed below, access negotiations were not entered into with the Traditional Owners. Accordingly the area was not visited.
Figure 1
Plenty River Project
EL 22874
Location Plan

Scale: 1:2,500,000
MGA zone 53 GD94
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 (the Larapinta structural corridor of 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 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 22874 was part, were made on the basis of the above exploration concept and plan.

5.0 PREVIOUS EXPLORATION

A review of previous exploration over the Plenty River tenements and in the general area shows that little previous mineral exploration has been undertaken. The only mineral exploration activity documented in Open File reports within a ~15 km radius of EL 22874 is shown in Figure 3.

Geopeko undertook an airborne radiometric survey (2 km line spacing) over an area to the northeast of EL 22874, but with slight overlap (Geopeko, 1979). Two subtle uranium anomalies were not confirmed by ground follow up
Figure 2  Regional geology and magnetics of the eastern Arunta Province
Late Proterozoic - sedimentary rocks
Early Proterozoic - Mount Dobbie Granite
Relinquished Tenement
Other AusQuest tenements
Tertiary - sedimentary rocks
Mesozoic - sedimentary rocks
Historical Tenement
Quaternary
drainage
track

Figure 3
Plenty River
Previous Exploration
EL 22874

Scale: 1:500,000
MGA zone 53 (GDA94)
To the northwest of EL 22874, Afmeco Pty Ltd (1981) targeted ‘redox front’ uranium (EL 2561; Figure 3). Six aircore drill holes yielded no sign of mineralisation.

BHP flew an airborne magnetics and radiometrics survey at 300 m line spacing over an area at Field River to the east of EL 22874 (Figure 3; The Broken Hill Proprietary Company Limited, 1982). Ground magnetics follow up confirmed five small discrete magnetic targets for drill testing for possible diamondiferous kimberlite/lamproite pipes. Five holes (273 m total) did not intersect any potential magmatic pipes. Whilst minor magnetic fragments (possibly ironstone) were recorded in drill logs, the source of the magnetic anomalies was not specifically addressed in the report.

Jones Mining and BHP Minerals undertook geophysical (ground gravity and magnetics) traverses on EL’s 4320, about 15 km to the east of EL 22874 (Jones Mining N.L. and BHP Minerals Joint Venture, 1985) in search of Iron-oxide - Copper - Gold related anomalies. Several coincident or near- coincident gravity/magnetic anomalies were defined, but all were interpreted to be of the wrong size, shape or intensity to be representative of likely Iron Oxide - Copper - Gold targets.

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 Neoproterozoic toCambrian metamorphic rocks of the Irindina package, structurally emplaced between Palaeoproterozoic basement rocks (Mawby, 2000; Buick et al., 2001; Pietsch, 2001, Maidment et al. 2002). 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. 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 22874 is dominated by Quaternary longitudinal (NNW-SSE) sand dune and alluvial cover, with the Hay River in the northwest and the Georgina Basin (Neoproterozoic) Batt Hills inlier in the northeast (Figure 4; Hay River and Hay
River - Mount Whelan 1:250 000 sheets). Whilst no Mesozoic Eromanga Basin rocks are mapped in the area, logs from water bores just west and east of EL 22874 (Figure 4) indicate their presence beneath dune and alluvial cover. Just 2.5 km west of the tenement, 194 m of mainly grey siltstone with lesser limestone and sandstone overlies biotite gneiss basement (Bore RN011353). In the Field River channel, 29 km east of the tenement, grey siltstone was also logged over the basal 30m of water bore RN010115.

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, Hay River, Hay River - Mount Whelan Special, Hale River and Simpson Desert North 1:250 000 scale sheets) and airborne magnetic 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).

The recent (2001) Eromanga survey of the NTGS provided detailed aeromagnetics coverage all but a thin northern strip of EL 22874, which was previously covered by the Huckitta East Survey (1983). These surveys provided a limited basis for both extrapolating and interpreting geology. Uncertainties about the age and affinities of the limited outcrops to the northwest notwithstanding, 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 southwest through the southwestern margin of the area (Figure 5). A similarly smooth area lies to the north straddling two en-echelon (left-stepping) magnetically active belts, both of which contain extensive areas of (?) weakly magnetic granitoid. The northern area of smooth magnetics is continuous with Georgina Basin rocks further north, with open folded linear anomalies, possibly from heavy mineral detrital layers.

However, the water bore logs described above (holes RN RN010115 and 011353; see Figure 4 for locations) indicate Eromanga Basin (and younger) cover nearly 200m in the northwest, which from the evidence of the Hay River water bores to the west and seismic sections to the south, can be expected to thicken southward. With such thickness of overburden, airborne EM is most unlikely to be an effective tool with which to identify massive sulphide deposits. Other available geophysical prospecting techniques are considered either too costly for regional application (eg. Ground EM), or too ambiguous to interpret (airborne gravity gradiometer).

The Eromanga aeromagnetics survey, which revealed a field of dipolar aeromagnetic anomalies to the west, does not suggest any persistence of that field into EL 22874.
Figure 4
Plenty River
Geology & Water Bores
EL 22874

0-75m Mudstone with limestone and sandstone
75-194m Mudstone with grey siltstone
194-196m EQH Biotite-rich gneiss

Relinquished Tenement
Other AusQuest tenements
Quaternary
Tertiary - sedimentary rocks
Mesozoic - sedimentary rocks
Late Proterozoic - sedimentary rocks
Early Proterozoic - Mount Dobbie Granit
Figure 5
Plenty River
Aeromagnetics Image
EL 22874

Relinquished Tenement
Other AusQuest tenements

AQ_07038
8.0 REHABILITATION

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

9.0 CONCLUSIONS AND RECOMMENDATIONS

The likely southward deepening overburden of the Eromanga Basin and Tertiary/Quarternary cover sediments beyond the 194 m of the water bore just northwest of EL 22874, indicates that airborne EM is unlikely to be a useful survey tool. This leaves any potential target stratigraphy without a method of efficient, relatively unambiguous testing for massive sulphide. EL 22874 also lies outside (south of) the field of dipolar aeromagnetic anomalies, which may be prospective for kimberlite/lamproite hosted diamond. For these reasons the title has been relinquished.
10.0 REFERENCES


