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Aberfoyle Resources Limited

EXPLORATION DIVISION
ACN 004 664 108

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FICHE No. 013032-

ANNUAL REPORT 14/91

MOUNT TOR
TASMANIA

Progress Report for the Period
October 1992 to September 1993

Volume 1 of 1

ETA 437.

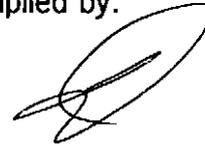
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Internal Report No: Mount Tor 1

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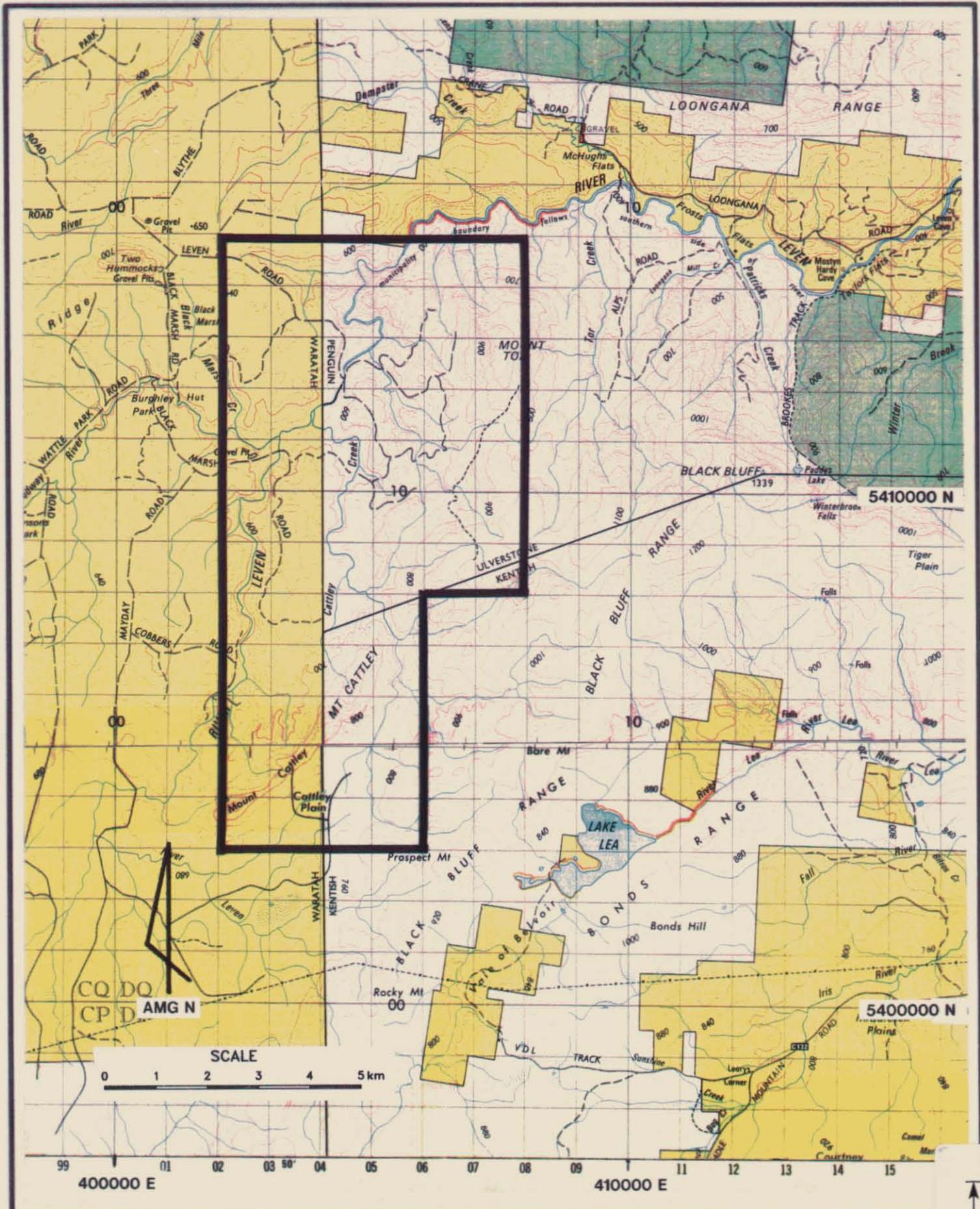
1. EL 14/91 MOUNT TOR LOCALITY PLAN
2. SIMPLIFIED GEOLOGY OF THE CRADLE MOUNTAIN LINK ROAD - MOUNT TOR AREA

1.0 INTRODUCTION

Exploration Licence 14/91, Mount Tor, located approximately 20 km north east of Hellyer (Fig. 1) was granted to Aberfoyle Resources Ltd on 18 October, 1991.

The area was taken up on the basis that Southwell Sub-Group rocks within the licence, indicated prospectivity for both Hellyer and Rosebery style deposits in covered Que-Hellyer Volcanic equivalents and Rosebery host equivalents respectively.

This report describes exploration to date which has been at a low level while a structural/stratigraphic exploration model for targets below deep EM penetration was developed in the Mackintosh district.



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FIGURE 1

NORTH WEST TASMANIA
E.L. 14/91 MT.TOR
LOCALITY PLAN

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2.0 EXPLORATION HISTORY

Geopeko commenced modern exploration in the licence area in **1974** when as part of EL 10/74 they undertook regional Stream sediment surveys and flew Dighem II.

Several low order stream sediment anomalies and one moderately anomalous Pb anomaly (120 ppm Pb at AMG 5409560mN, 403930mE) were located in addition to one Dighem II anomaly at AMG 5410200mN and 405000mE (Mariner II anomaly).

No ground follow up of these anomalies was recorded in Geopeko reports and the ground was subsequently relinquished.

An INPUT EM survey flown by Shell in **1982** over the adjacent Loongana EL 36/79 located the original Geopeko Dighem II anomaly. Subsequent application and granting of EL 39/83 Cattle Range to Shell on 22 August, **1983**, enabled follow up the anomalies identified by Geopeko.

Shell cut a small grid over the ground located position of the anomaly and the following geophysical methods were employed; VLF, EM, Max-Min and dipole IP. It was concluded from these surveys that the responses were due to conductive layers at the base of the Tertiary Basalt which covers much of the licence.

Follow up work by Shell on the Geopeko stream sediment anomaly included gridding, repeat stream sediment sampling, grid based soil sampling and geological mapping. A low order lithology related geochemical source was identified which did not encourage further testing of the anomaly.

During 1984-85 (Carter and Hungerford, 1985) exploration focussed on geophysical testing of all Cambrian windows within the EL 39/83. Gridding (42 km), EM37 (12 line km) and geological mapping at 1:20,000 scale were carried principally in the northern part of the licence. In addition one line of dipole-dipole IP was completed on line 9800N and 42 km of ground magnetics surveyed. Several low order EM anomalies were recorded in the vicinity of the previously known INPUT, Dighem II and IP anomalies but were not interpreted to be due to bedrock sources.

In the 1985/86 season (Hall and Hungerford, 1986), 28 km of gridding, 15 km of EM surveying and 19 km of ground magnetics completed the coverage of the southern portion of the licence area. The EM survey identified a three line, 600 m bedrock conductor on lines 5600N, 5900N and 6200N. This anomaly was detailed by SIROTEM (3.25 km) which suggested that the source was probably conductive clays beneath Tertiary Basalt.

Other work conducted during 1985/86 comprised additional auger sampling on three lines across the IP anomaly at 9800N the Pb soil anomaly on 9400N. The sampling did not identify any anomalous geochemistry associated with the IP anomaly but did define weak sporadic Pb geochemistry coincident with previous soil sampling on or near line 9400N. Slightly elevated Pb values (240 ppm Pb) are associated with felsic tuffs on line 9600N at 11060E to 11120E.

During 1986/87 (Randell and Hungerford, 1987), the EM anomaly on lines 5600N-6200N surveyed with one line of Max-Min on line 5600N and 129 auger samples collected on lines 5300N, 5600N, 5700N, 5800N, 5900N and 6000N. Detailed grid mapping and rock chip sampling was also conducted on these lines.

Diamond drill hole CRD 86-1 was drilled to 278m to test the EM37 conductor (anomaly 5A). Routines such as logging, petrology, geochemistry and down hole EM were completed on the drill core and hole.

During the **1987/88** season (Randell, 1988) a further 5.6km of grid was established by Shell at the northern end of the licence. A total of 923 C horizon soil samples were collected and analysed for Cu, Pb, Zn, Ag, Au, Ba, and As. In addition three costeans were dug for a total of 330m and 80 samples collected for analysis as for the soils.

A further diamond drill hole (CRD 88-1) was completed at 306m to test a geological-geochemical target. A total of 214 samples were submitted for routine geochemistry and a further 10 for petrological examination.

A detailed compilation of previous exploration results at 1:5000 scale was completed by Billiton.

Exploration during **1988/89** (Randell, 1989) comprised an evaluation of the alteration assemblages by geochemistry, a percussion drilling programme and some geophysics.

A total of 69 drill core and rock chip samples were submitted for whole rock analysis in addition to 6 samples for Pb isotope and 7 samples for Oxygen isotope characterisation.

A three hole percussion drilling programme was attempted to evaluate shallow geophysical-geological targets. A total of 214m was completed in three holes (CRP 88-1,2 and 3) which were all prematurely terminated in post-Cambrian cover due to hole collapse.

Drill holes CRD 88-1 and CRP 88-3 were surveyed with down hole EM and two short lines of Max-Min EM were completed over previously identified geophysical anomalies.

Billiton relinquished the licence in February 1990 (Randell and Hungerford, 1990).

3.0 GEOLOGY

The geology of the licence area (Fig. 2) is described below and is largely taken from Pemberton et. al., 1991.

The oldest rocks in the licence occur in the north west around the Two Hummocks-Medway River area and comprise a sequence of vitric tuffs with intercalated mass flow breccias, volcanoclastics and greywacke shale lithologies . The sequence known as the **Lower Vitric Tuff Sequence (€ dat)** faces and dips moderately to the north east and is also exposed at Black Harrys Road, north west of Hellyer. Sponge spicules seen in thin section indicate a marine depositional environment.

Mineralisation occurs outside the licence area in this unit in the form of irregular stockwork and lode vein baryte at Two Hummocks.

The **Micaceous Greywacke Sequence (€ da)** is interfingered at its base with the Lower Vitric Sequence and increases its mica and sediment content with stratigraphic height. A number of mass flow breccias and vitric tuffs are interbedded with the greywacke. The unit outcrops as windows through Tertiary Basalt along the Leven River in the west of the licence area and forms a north north east trending syncline with plunges apparent in both directions.

This unit is a correlate of the Animal Creek Greywacke which is basement to the Que-Hellyer Volcanics further south.

East of the greywacke unit is a **Mixed Sequence of Volcanics and Sediments (part € ds)** correlated with the lower and middle parts of the Southwell Sub-Group unit north and west of Hellyer. The sequence comprises felsic volcanoclastics, epiclastics, greywacke, shale and lava. The sequence generally dips and faces east but an anticlinal structure is mapped in the Leven River and bedding dips and faces west on the western side of this structure.

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SIMPLIFIED GEOLOGY OF THE CRADLE MOUNTAIN LINK ROAD - MT. TOR AREA

SIMPLIFIED GEOLOGY OF THE CRADLE MOUNTAIN LINK ROAD - MT TOR AREA

Q	Quaternary deposits	Cev	Feldspar-phyric volcanics
Tb	Tertiary basalt	UNDIFFERENTIATED CAMBRIAN SEQUENCES	
S-D	Siluro-Devonian Eldon Group	Cw	Tuffs, volcanoclastic sandstones and minor lavas of Black Bluff Ra. windows
Og	Ordovician limestone-Gordon Group	Cbp	Back Peak Beds
COd	Ordovician basaltic lava and Ordovician? dolerite intrusives	Csr	Sticht Range Beds
COo	Late Cambrian-early Ordovician Denison Group	INTRUSIVES	
CAMBRIAN MT READ VOLCANICS		Cp	Quartz-felspar porphyry
DUNDAS-TYNDALL GROUP CORRELATES		Cdfbp	Bonds Range quartz-feldspar-biotite porphyry
Cc	Mainly volcanoclastic conglomerate and sandstone	Cm	Ring Road metadolerite
Cds	Southwell Subgroup - tuff, greywackes, siltstone	PRECAMBRIAN	
Cd	Dolerite	Cpc	Quartzite, phyllite, schist
Cs	Que River Shale	— Fault, approximate	
Cquv	Upper basalt and andesite	- - - Fault, inferred	
Cqm	Mixed sequence	— Geological boundary	
Cqvl	Lower andesite, basalt and tuff	— Road	
Ccs	Animal Creek Greywacke and correlates	- - - Track	
Cvt	Tuffaceous sediments and vitric tuff	SCALE	

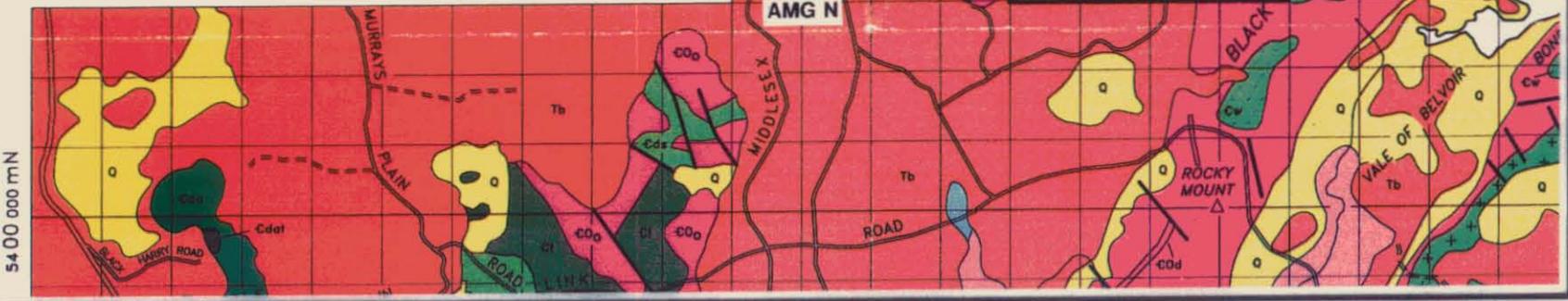
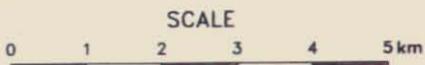


FIGURE 2

SIMPLIFIED GEOLOGY OF THE CRADLE MOUNTAIN LINK ROAD - MT. TOR AREA
Pemberton et al. MRVP Rep.4 1991

The west facing and anticlinal structure in the Leven River suggests that the Mixed Sequence underlies the greywacke unit. This is in contrast to the stratigraphic correlation of the Micaceous Greywacke with the Animal Creek Greywacke (as confirmed by diamond drill hole MXRD-1) where the Mixed Sequence overlies Que-Hellyer Volcanics which in turn overlay the Animal Creek Greywacke. Also there are no equivalents of the Que-Hellyer Volcanics or Que River Shale between the greywacke and the mixed sequence volcanics despite these units being well represented in drilling further south.

Two interpretations have been suggested by Pemberton et. al. to resolve these problems.

The first has a major fault with significant west side up displacement along or close to the eastern greywacke contact which juxtaposes Animal Creek Greywacke correlates with the middle part of the Southwell Sub-Group. It has also been suggested that the fault represents the continuation of the Henty Fault system.

The second, suggests that the western part of the Mixed Sequence represents an anticlinal ridge of the Lower Vitric Tuff Sequence, with abrupt changes in facies and thickness across the structure such that most or all of the Animal Creek Greywacke and Que-Hellyer Volcanics have lensed out. This seems possible for the Que-Hellyer Volcanics but is unlikely for a widespread turbidite sequence like the Animal Creek Greywacke.

A large plug like body of altered (chlorite, epidote, carbonate, and sericite) dolerite has intruded the upper part of the sequence. Petrography and geochemistry suggest no relationship to Tertiary or Jurassic mafic volcanism or magmatism.

The **Pumice-Rich Tuff Sequence with Felsic lavas (part ε ds)** comprises pumiceous mass flows which are interbedded with feldspar phyric lavas in its upper half. This unit is correlated with the upper part of the Southwell Sub-Group in the Mackintosh district.

Tyndall Group correlates in this area are known as the **Volcaniclastic Conglomerate Sequence (ε t)** and comprise purple volcaniclastic sediments with minor interbedded tuffs. This sequence appears to conformably overlie the Southwell Sub-Group correlates and consistently dips and faces steeply east.

The Cambrian volcanics and sediments in the Mount Tor licence area are succeeded by **Denison Group Correlates** and comprise conglomerates and sandstones. The stratigraphy can be correlated with units of the Owen Conglomerate though it tends to be dominated by Upper Owen equivalents.

The Denison Group Correlates appear to conformably overlie the Cambrian volcanics and dip and face south east, except in the far north of the licence area where they are north dipping and are disconformable with the east dipping Cambrian rocks.

A large part of the western half of the licence is covered by **Tertiary Basalt** through which windows of Cambrian volcanics are exposed.

4.0 WORK COMPLETED

As described in the introduction, work on this licence has been at a low level pending the development of a conceptual method of exploring below EM penetration. The similarity of the stratigraphy in the Mount Tor licence area with that in the Mackintosh district encourages exploration for blind deposits of the Hellyer and Rosebery type.

Work completed so far has comprised an evaluation of data generated by previous explorers.

Data collected from ground and airborne EM surveys was reassessed and EM effects due to variations in the basalt conductivity and base topography noted.

No responses which could be attributed to massive sulphide accumulations beneath the Tertiary Basalt cover were detected, however the thickness and conductivity of the basalt are such that detection of conductive massive sulphide bodies of about 5 million tonnes or greater would have been possible at depths to 150 metres.

It is apparent from the assessment of the geophysical data that further exploration of the property must be directed toward locating targets beyond the penetration of deep search EM.

The development of a structural model in the Mackintosh district now enables the prediction of Cambrian structures capable of focussing hydrothermal fluid flow. This technique can now be used to define targets in prospective stratigraphy within the Mount Tor licence.

5.0 PROPOSED PROGRAMME

A programme similar to that employed at Mackintosh over the last year is envisaged at Mount Tor. This would comprise;

- A detailed airborne magnetic survey over the licence area to assist mapping of geological units and to assist in the identification of Cambrian structures.
- A detailed ground mapping programme to identify an internal stratigraphy in Southwell Sub-Group rocks.
- Support of volcanological research into the Southwell Sub-Group which will include areas contained in the Mount Tor licence area.

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