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Progress Report for the period 16 October 1998 to 16
October 1999 - EL 11/98 "Mount Cripps"
Haslam, C.O.; Mineral Strategies
Anon EL11/98

EXPLORATION LICENCE 11/98

"MOUNT CRIPPS"

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Progress Report for the Period
16 October 1998 to 16 October 1999

Prepared by:

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ABSTRACT

EL11/98 abuts the northern and eastern boundaries of the Hellyer Mining Lease; the area is very prospective for base and precious metal deposits within the Mount Read Volcanics. However, the prospective host rocks are partly concealed beneath a substantial thickness of Tertiary basalt. In the past, this basalt cover has proven a severe problem for conventional exploration methods.

During the first year, a program of literature review was followed by regional soil geochemistry, using two leading-edge mobile metal ion methods; a total of 196 samples were collected, at a sampling density of two sites per square kilometre. As the samples must be analysed overseas, a substantial delay is likely before the results are received.

Positive anomalies will be evaluated by more-detailed sampling with the same methods. Proximity to interpreted regional lineament intersections will be a favourable factor in ranking the geochemical anomalies.

CONTENTS

1.	INTRODUCTION	1
1.1	General	1
1.2	Licence Location	1
1.3	Exploration Objective	1
1.4	Exploration Strategy	2
2.	EXPLORATION COMPLETED IN THE REVIEW PERIOD	3
2.1	Literature Review	3
2.2	Regional Exploration Method	3
2.3	Field Exploration Completed	5
2.4	Soil Sample Analysis	6
2.5	Discussion	6
3.	ENVIRONMENTAL ASPECTS	7
4.	EXPENDITURE	7

REFERENCES**KEYWORDS**

- Appendix: Brief report by consultant G. B. Ebsworth**
- Figure 1 Location Map, showing extent of the regional geochemical program**
- Figure 2 Regional Structural Map**

1. INTRODUCTION

1.1 General

The Mount Cripps Exploration Licence (EL11/98), granted on 16 October 1998 for a period of five years, comprises 45 sq. kms.

The Licence holder is Mr. C. O. Haslam.

This Report summarises exploration completed on EL 11/98 for the period 16 October 1998 to 16 October 1999.

1.2 Licence Location

The Licence comprises much of the former EL 106/87; it abuts the northern and eastern boundaries of the Hellyer Mining Lease.

The location of EL11/98 is shown on Figure 1.

1.3 Exploration Objective

The exploration program is designed to locate economic metalliferous deposits within the Mount Read Volcanics sequence, with a particular focus on volcanic hosted massive sulfide base metal deposits.

The area of the Licence is partly covered by Tertiary basalt; this basalt, up to 200m or more in thickness, has proven a severe technological barrier to conventional geophysical and geochemical methods.

Overcoming this constraint has had to await the development of new exploration technology. Mineral Strategies was engaged to apply leading-edge soil geochemistry, in an endeavour to surmount the problem.

1.4 Exploration Strategy

Mineral Strategies staff have applied mobile metal ion soil geochemistry in precious metal exploration over Tertiary basalt covered areas of the Central Victorian Goldfields, and are confident of the effectiveness of the method on EL 11/98. In the first year of the Licence a regional geochemical sampling program was completed.

Aberfoyle Resources Ltd concluded that the network of synvolcanic faults within the Que Hellyer Volcanics basin played an important role in the localisation of the Que River and Hellyer orebodies, particularly where those faults intersected the 'Que Hellyer Trend'.

As a logical extension of this, Mineral Strategies proposes to use regional lineament intersections - favouring those azimuths considered most important by Aberfoyle staff - as a complementary method for ranking mobile metal ion geochemical anomalies defined in the regional program.

Careful consideration is also being given to the published work of Dr. D. E. Leaman (for example : Leaman, 1986) in this regard.

The Que Hellyer Trend, and a number of the major regional lineaments, are shown on Figure 2.

2. EXPLORATION COMPLETED IN THE REVIEW PERIOD

2.1 Literature Review

A considerable amount of time was spent in the first part of the year carefully reading selected parts of the vast amount of published literature on the Mount Read Volcanics, and the archived Progress and Final Reports of previous Exploration Licence holders within the general region. Discussions were also held with geoscientists experienced in the Mount Read Volcanics.

With regard to economic and exploration geology, the Aberfoyle Resources Ltd annual Progress Reports on EL106/87 since 1993 were the most relevant of the available publications.

Consultant G. B. Ebsworth made preliminary enquiries regarding the available data on regional lineaments, and the thickness of Tertiary basalt cover; his brief report is included as an Appendix.

2.2 Regional Exploration Method

Regional soil geochemistry using the new mobile metal ion technique has been completed.

Mineral Strategies uses the original technology developed in Russia; of the alternative sampling methods available, those termed MPF and TMGM were chosen for the EL 11/98 program.

MPF

In this method approximately 100g of soil is collected at the grassroots level, or immediately below leaf litter. At that position in the soil profile mobile ions can be incorporated into organic humates and fulvates.

For analysis, these compounds are extracted into solution, and the solution becomes the "sample". In that manner **a natural concentrate within the soil profile is analysed**, in effect lowering the limit of detection of the analytical procedure.

TMGM

For the second method, approximately 100g of soil is collected by hand auger at the level of natural iron enrichment - this level is usually readily identifiable, certainly when sampling over basalt. During this program, sampling depths were within the range 20 cm to 45 cm below surface.

The TMGM method is based on the tendency of iron and manganese oxides to scavenge metal ions. For analysis, the sample is roasted, enhancing the magnetic susceptibility of the iron oxides present; they are removed magnetically and

become the "sample". Once again a **natural concentrate within the soil profile is analysed.**

Both overseas and in Australia the mobile metal ion method has located anomalies over "blind" metalliferous deposits up to 1000m below surface, including examples beneath younger volcanic sequences.

2.3 Field Exploration Completed

The regional geochemical program was completed, using a sampling density of two sites per square kilometre; both MPF and TMGM samples were collected at each site. Using hand-held GPS, site locations were selected as close as practicable to the one kilometre grid corners, and also the grid centres, on 1:25,000 scale topographic maps.

Two field crews were engaged on the program, and took 196 samples (98 MPF and 98 TMGM). Grid coordinates, sample colour and texture, depth below surface of the TMGM sample, and the rock type of any float (where present) were recorded.

Sample preparation following the field campaign included pulverising, removal of stones and gravel (noting the rock type), and quality control of the field recording of sample number, grid coordinates, sample colour and other parameters.

2.4 Soil Sample Analysis

At present, all samples must be returned for analysis at the Government laboratories of Rudgeofizika, in St. Petersburg, C.I.S.

Based on past experience a turnaround time of about six months is likely.

2.5 Discussion

Results of the regional geochemical survey are not yet available.

The next phase of the field program will involve detailed follow-up soil sampling using the MPF and/or TMGM method(s) over anomalies defined by the regional program. This cannot commence until the results of the regional program are available.

In the interim, further investigations of the regional lineament pattern, and discussions with appropriate consultants, are in progress.

3. ENVIRONMENTAL ASPECTS

The geochemical survey involved taking 100g to 150g of soil at the surface, and also at a depth of about 35 cm using a hand auger. Sample sites were rehabilitated to their previous condition. It was not necessary to cut lines.

Sampling crews operated on foot from vehicles which remained on public roads or North Forests Ltd gravel roads.

4. EXPENDITURE

Expenditure for the twelve months to 16 October 1999 is being finalised and will be notified separately.

REFERENCES

- Aberfoyle Resources Ltd. Annual Progress Reports on EL 106/87.
- Dronseika E. V., 1996. Hellyer TMI Geochemistry (Internal Report TAS 0028-8/96).
- Leaman D. E. 1986. Interpretation and Evaluation Report on the 1981 West Tasmania Aeromagnetic Survey (MRT Geophysical Report No. 1).

KEYWORDS

Mount Read Volcanics, mineral exploration, volcanic hosted massive sulfides, geochemistry, mobile metal ion.

Greg Ebsworth BSc (Hons) M Econ Geol MAIG

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Consultant Geologist

19 May 1999

**Report to Mineral Strategies on discussions held with staff at Mineral Resources
Tasmania, Leaman Geophysics and the University of Tasmania
17-18 May, 1999.**

1 Mineral Resources Tasmania

At Mineral Resources Tasmania (MRT) I met with Dr Bob Richardson and discussed the exploration approach Mineral Strategies is taking and work carried out to date. I enquired about available aeromagnetic and gravity survey databases over the exploration tenements, including surveys by previous exploration companies.

(i) Aeromagnetic Data

Reference maps obtained from MRT are attached which indicate that the area straddles two regional aeromagnetic surveys (1981, *West Tasmania* and 1985, *Devonport, [Mt Read]*) with additional coverage from two smaller detailed surveys carried out by Aberfoyle (1993, *Mackintosh* and 1994, *Mt Tor*). All specifications are given on the sheets. Digital data for the four relevant surveys is available from MRT at a cost of \$75 each.

(ii) Gravity Data

Regional gravity coverage is available for the area at a nominal 1 km station spacing. Scattered areas have more detailed data from surveys carried out by Shell. The latter data had a few glitches but was corrected by Bob Richardson and Dave Leaman and then added to the regional database. The compiled database is available from MRT for \$75.

I spent some time in the MRT library researching previous company reports which could be relevant to the exploration area, particularly geophysical survey reports. The search lists produced (using company name etc) are attached. Most of the reports were for EM and IP surveys with little which was useful. The two most relevant reports are by Shell for Els 7/74 and 1/76 (MRT reports 84-2105 and 84-2123 respectively).

Report 84-2105 includes results of surveys of basalt thickness (mainly using EM soundings), an aeromagnetic survey with a 250m line spacing and regional gravity on a 1-2km station spacing. Report 84-2123 includes aeromagnetic and input anomaly interpretation, a radiometric survey, further basalt sounding and follow-up detailed gravity and ground magnetic surveys. Key maps and some other relevant information for 84-2123 are attached.

Shell's gravity data is in the regional database (as mentioned above) but I don't know if the digital aeromagnetic data is available at MRT. The reports are available on microfiche.

2 Leaman Geophysics

I met with Dr David Leaman of Leaman Geophysics (3 Maluka St, Bellrive, Tasmania, 03 6244 1233) who has worked in the tenement area for previous companies. Dave had compiled a few relevant papers (attached) which include a review of geophysical methods used to determine basalt thickness, work by BHP and a study carried out by Leaman Geophysics (during the MRT Mt Read Project) of the Waratah-Guildford area (which overlaps with the western part of the tenements).

Dave considers the best approach is to first determine basalt thickness using a detailed and relatively meticulous method to interpret available aeromagnetic data. The method is proprietary to Leaman Geophysics (see paper attached) and is likely to be relatively slow and expensive compared to other aeromagnetic data interpretation. The basalt thickness data can then be used to carry out structural interpretation of gravity data. Dave considers that the available MRT gravity database will be quite adequate for the latter task. Structural interpretation of the aeromagnetic data is also carried out.

This approach can obviously be applied to the tenement area as a whole or to smaller target areas generated by the Ionex survey. Dave believes the most important deep-seated crustal structures are ENE-striking features which show a close association with the major mineral deposits in Tasmania (and elsewhere). An example is the feature which runs through Mt Bischoff and extends into the tenement area (Fig 4-E-6 in paper attached). He considers WNW-striking features to possibly be conjugates of the ENE structures whilst the N-S features commonly seen are second order structures and of less importance overall.

3 University of Tasmania

I met with Wally Herrmann at CODES SRC in the University of Tasmania. Wally previously worked in the tenement area for Pancontinental and Outokumpu and has a long association with base metal exploration in Tasmania. We discussed the previous diamond drilling through basalt by both MRT and exploration companies. Wally believes the area to be highly prospective with reasonably convincing sub-basaltic Que-Helleyer Volcanics in the drilling. Despite this he is also realistic about the problems of correlation within the Mt Read Volcanics generally and limitations to some of the extrapolations made by MRT. His main concern is the problem of targetting exploration to find relatively small ore bodies, even after Ionex and/or structural interpretation has got you into the right general area. He is not convinced by Dave Leaman's interpretation that the ENE structures are associated with the big Tasmanian deposits. He sees the N-S structures (eg the Jack fault at Helleyer) as important as they have clearly controlled the long-lived hydrothermal systems which formed the deposits. Wally considers stratigraphic diamond drill holes as the logical way to test to Ionex/structural targets eg every 500 metres, using oriented core.

I also spent some time with Ross Large at CODES. We discussed the Honours student who worked on the deep Aberfoyle drill hole. I was unable to see the thesis (it couldn't be found by the secretary and may still be confidential) but Ross mentioned that the student studied mainly lithofacies and that his interpretation differed from that of Aberfoyle. Ross believed that the hole did not reach the Que-Helleyer Volcanics but did pass through the horizon in the Tyndall Group which hosts the Henty mineralisation. Ross was very interested to hear of Ionex being used but did not offer any other exploration approaches for the basalt-covered area.

The current geophysics lecturer Mike Roach was unavailable when I was at CODES but in our previous phone conversations he said that Dave Leaman was the best person to talk to as

he had specifically addressed the issue of geophysically 'seeing' large structures through basalt.

4 Recommendations

Identification of major structures is the best low-cost exploration method at this stage of the project, as both massive sulphide deposits and lode gold deposits in the Mt Read Volcanics show an association with such features. In the case of massive sulphide deposits both E-W and N-S features may represent growth faults which controlled basin development and focused hydrothermal systems.

I believe that Leaman Geophysics offers the best scope for identifying deep crustal features in the tenement area. Using their proprietary interpretation method, the available aeromagnetic and gravity databases should be adequate to enable determination of basalt thickness and subsequent structural interpretation of both data sets.

A proposal should be sought from Dave Leaman to carry out this interpretation for the tenement area. The results of this study could then be integrated with Dave's previously interpreted area to the west. If the cost of the proposal is prohibitive, smaller areas could be targetted after the Ionex results are in. This is less desirable, however, as a 'big picture' approach to structure is desirable at this stage. As the geophysical study is likely to take several weeks (?), it should probably be carried out whilst the Ionex samples are being processed.



Greg Ebsworth

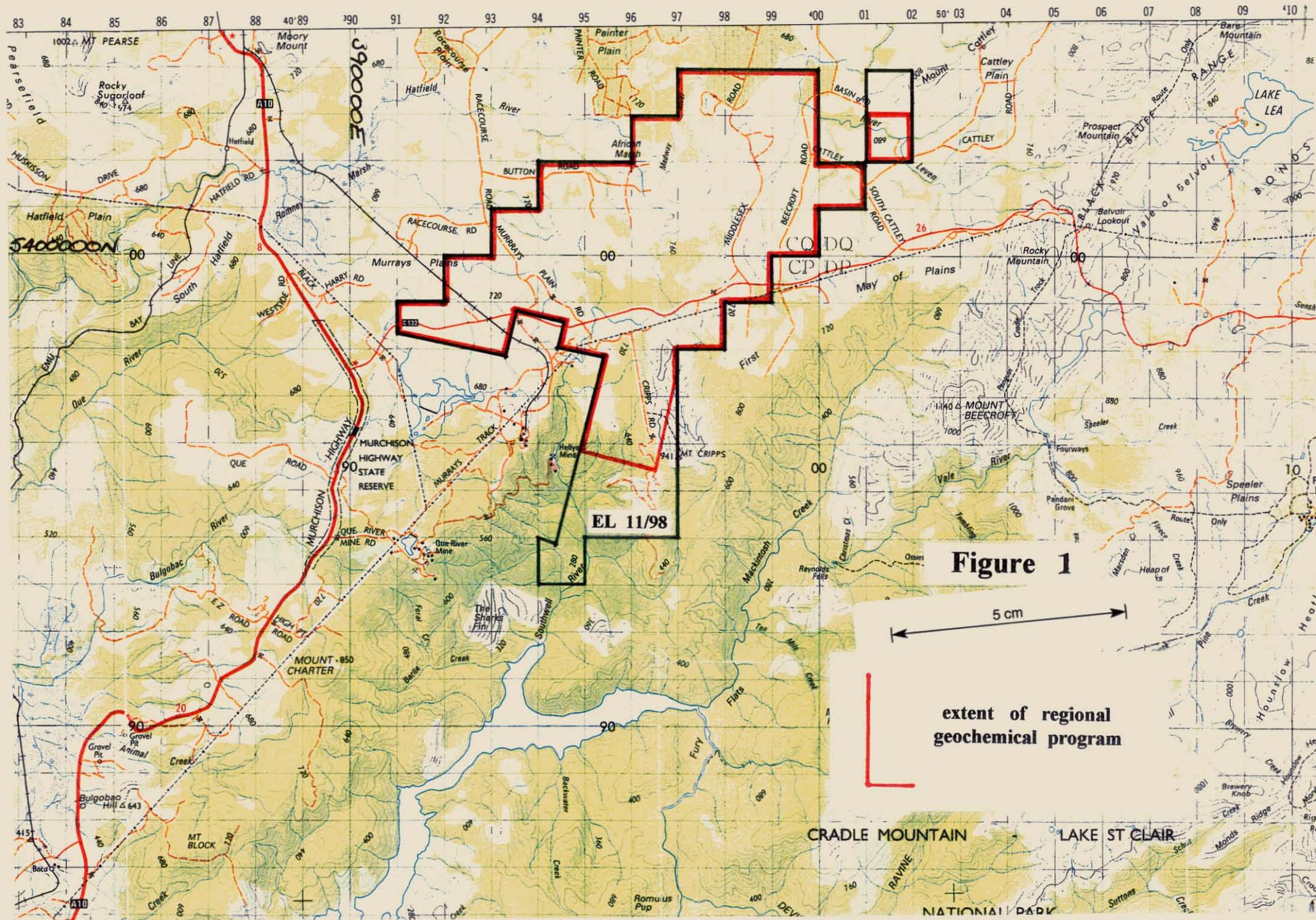


Figure 1

5 cm

extent of regional
geochemical program

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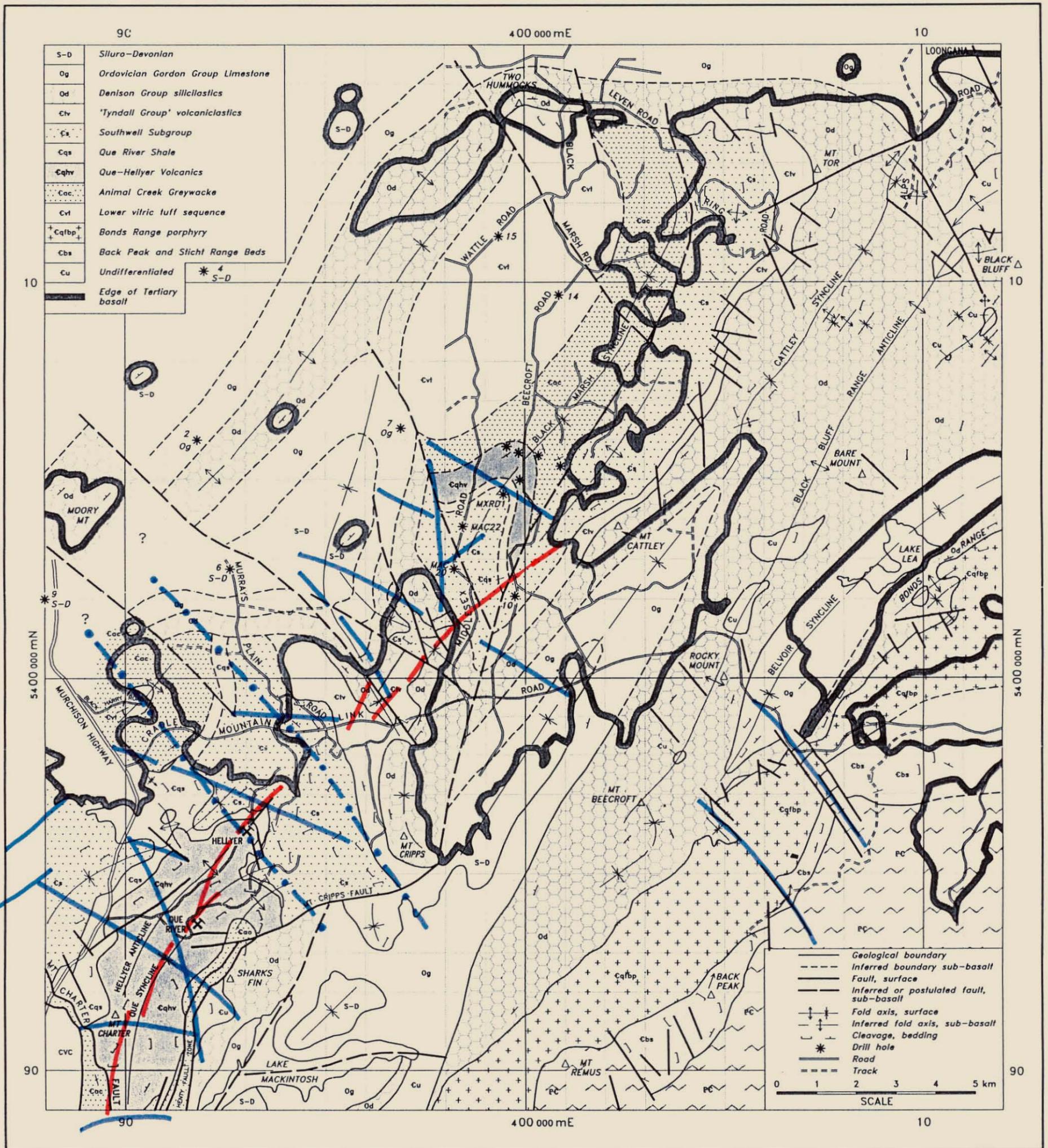


FIGURE 19. SUB-BASALT MAP AND STRUCTURAL MAP OF THE HELLYER - TWO HUMMOCKS - BLACK BLUFF RANGE AREA
 Pemberton et al. MRVP Geol. Rep.4 1991.

Figure 2

5 cm

- Que Hellyer Trend
- Major Linears
- Gravity Break

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