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EXPLORATION LICENCE 18/80

ARTHUR RIVER, TASMANIA

REPORT FOR THE SIX MONTHS ENDED 31st JULY, 1982

**MICROFILMED**

**OPEN FILE**

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EXPLORATION LICENCE 18/80

ARTHUR RIVER, TASMANIA

REPORT FOR THE SIX MONTHS ENDED 31st JULY, 1982

1. GENERAL

Exploration Licence 18/80 of 1010 square kilometres was granted to The Broken Hill Proprietary Company Limited on 4th August, 1980.

2. EXPLORATION PHILOSOPHY

Our principal target within the licence area is a skarn or massive sulphide hosted tin-tungsten deposit of the Renison/Cleveland style. The area was selected on the following basis:

- 1) its close proximity to a major tin-tungsten belt of mineralisation;
- 2) stream geochemical anomalies for tin and tungsten had previously been recorded from the area;
- 3) dolomite and dolomitic sediments are present; and
- 4) felsic intrusives with associated tin-tungsten mineralisation had been reported in adjacent licence areas.

The possibilities for Carlin style gold, diamonds, Mississippi Valley lead-zinc and sedimentary copper deposits were also taken into consideration.

3. SUMMARY OF WORK COMPLETED

Work completed before the six months under review comprised:

- 1) preliminary literature review;
- 2) stream sampling consisting of 235 minus 40 mesh samples and 150 pan concentrate samples;
- 3) rock chip sampling and petrographic studies;
- 4) orientation gravel sampling for heavy mineral analysis (16 x 20 kg samples);
- 5) photogeological study and preliminary interpretation of landsat image;
- 6) evaluation of existing INPUT E.M. and magnetic data (Esso, 1974). (Rio Tinto, 1956);

- 7) reconnaissance stream sediment, bank and soil sampling in the Black River, Neasey Plains and Lawson Rivulet areas;
- 8) heavy mineral examination of pan concentrate samples from the Arthur River;
- 9) petrological description of chert samples.

Work completed during the six months under review comprised:

- 10) ground location of anomalies from Rio Tinto aeromagnetic survey and Esso INPUT survey;
- 11) petrological description of samples from the Black River and Neasey Plains areas.

4. SUMMARY OF WORK IN PROGRESS

Location of areas for Dighem II surveys based on Rio Tinto aeromagnetic survey and Esso INPUT survey data.

5. RESULTS

5.1 Geophysics

Re-evaluation of the Rio Tinto aeromagnetic survey (1956) and the Esso INPUT survey (1974) located 9 anomalies for follow-up (Figure 3).

Attempts to locate the anomalies on the ground have not been very successful as yet due to poor flight path recovery in the surveys. At present the use of small Dighem II surveys is being investigated for locating and characterising the anomalies.

5.2 Petrology

Five samples from the Neasey Plains and Black River areas were submitted for petrographic examination. Three float samples from the Black River were originally thought to be of possible granitic origin but the petrological examination shows them to be from a more basic suite. The samples from the Neasey Plains anomaly were described as low grade metapelites. The presence of pyrite along bedding planes is believed to be the cause of the INPUT anomaly.

The full petrographic descriptions are given in Appendix 1.

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6. SUMMARY OF WORK PROPOSED

Evaluation of INPUT and aeromagnetic anomalies for possible follow-up with Dighem II surveys.

This report is submitted to the Mines Department as required by Schedule A of Exploration Licence 18/80.

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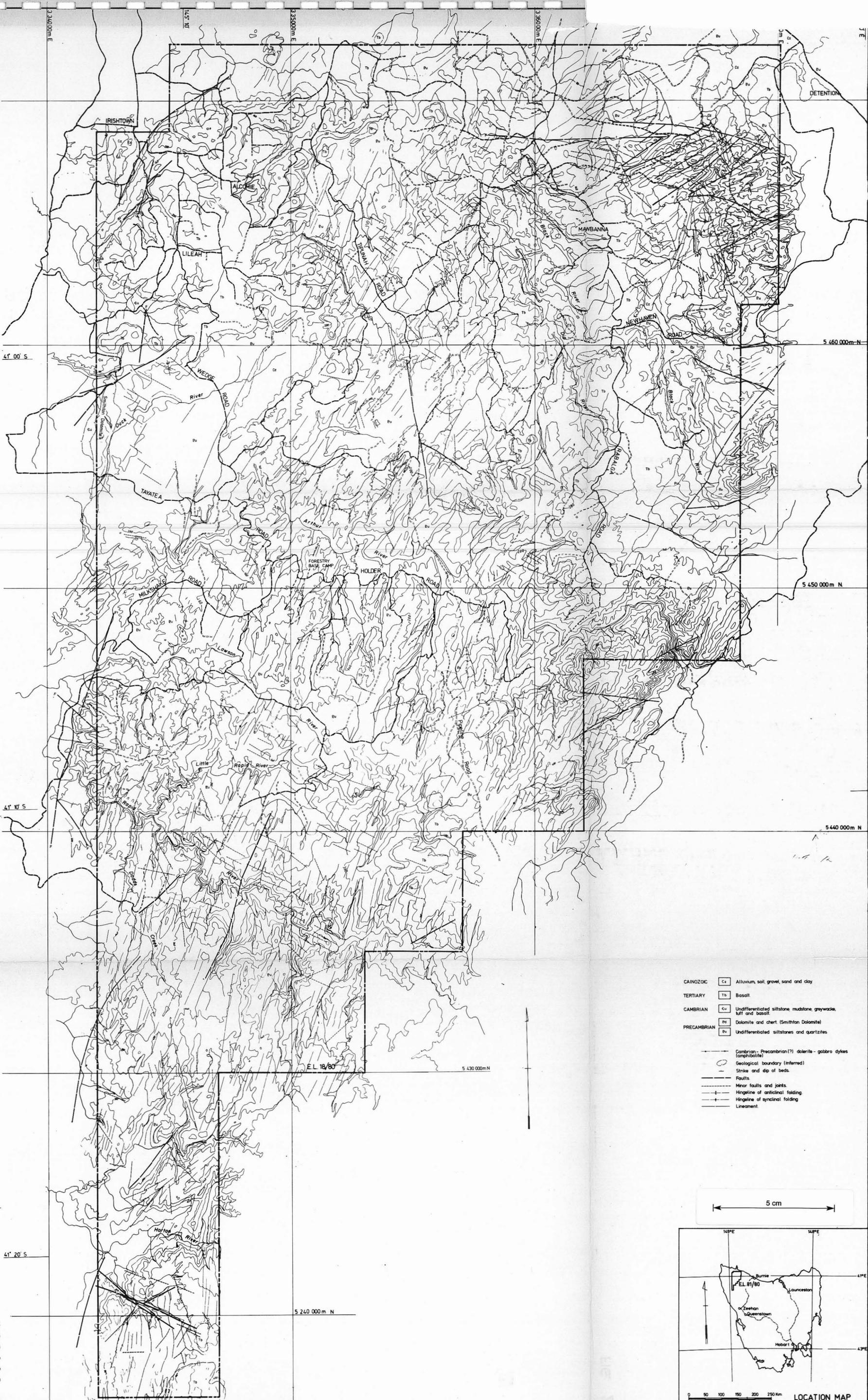
APPENDIX

Petrological Report

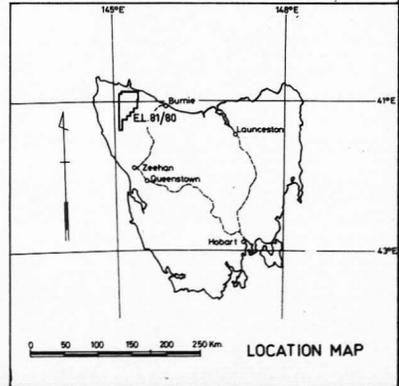
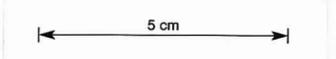
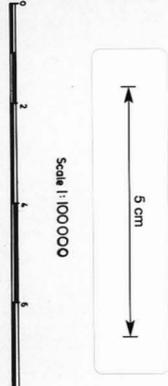
Sample No.	Classification - Composition	Fabric	Accessories	Central Mineralogical Services Comments
NPA 7 MRL 3.597	<u>Metapelite</u> . Fine to semi-sericitic muscovite with subordinate closely intergrown quartz, vague but pervasive sericitic spotting; minor weathered/ferruginised biotite.	Strongly spotted hornfelsic with vague relict pelitic bedding.	Disseminated leucoxenic semi-opaques. Isolated vague corroded relics cordierite.	Marginal albite-epidote hornfels facies contact-metapelite. No tangible metasomatic features (e.g. tourmalinisation). "Retrograde" sericitisation cordierite.
NPA 14 MRL 3.598	<u>Carbonaceous Pelite</u> . Sericitic, weakly carbonaceous, weakly pyritic, weakly (quartz, muscovite) silty shale flanked by beds of relatively strongly carbonaceous/pyritic shale.	Massive to weakly laminated. Relatively carbonaceous units, shale breccia in part. Incipiently sheared.	Quartz and chlorite as pressure shadows on pyrite.	Non-calcareous. Weakly metamorphosed with "metablastic" growth of syngenetic pyrite, formation of pressure shadows along incipient discordant slaty cleavage.
GR 5A MRL 13.594	<u>"Granophyre"</u> . Saussuritised/albitised plagioclase, subordinate extensively uraltised pigeonitic clinopyroxene, minor partly uraltised hornblende laths with pervasive quartz-orthoclase mesostasis.	Essentially dioritic with micrographic ("granophyric") mesostasis.	Disseminated leucoxenic opaques, traces pyrrhotite. Patchy chlorite, traces zoisite (after uralite)	Medium-grained minor or marginal intrusive. Compositionally quartz-orthoclase dioritic/trend monzonitic, but of differentiated basic character.
GR 5B MRL 13.595	<u>Uralitised Microgabbro</u> . Saussuritised/albitised plagioclase laths, subordinate extensively uraltised pyroxene, minor uraltic hornblende laths with pervasive quartz/minor alkali feldspar mesostasis.	Essentially doleritic (subophitic) with weakly granophyric mesostasis.	Disseminated leucoxenic opaques, traces pyrite. Patchy late chlorite, traces epidote, garnet	Close affinities with 13.594, slightly relatively basic (less differentiated) in comparison; similarly altered. Late microscopic hydrogarnet in chloritised uraltite
NPA 4 MRL 13.596	<u>Saussuritised Microgabbro</u> . Saussuritised/albitised plagioclase laths, fresh to weakly uraltised pigeonitic clinopyroxene with sparse chlorite-alkali feldspar mesostasis. Sporadic veinlets zoisite.	Coarsely ophitic, doleritic.	Disseminated leucoxenic opaques, traces pyrrhotite, chalcopyrite.	Affinities with 13.594, 13.595, but with relatively orthodox "doleritic" composition, fabric. Selective replacement of feldspar by saussuritic prehnite.

Samples MRL 13.597, and 13.598 are low-grade metapelites, marginally hornfelsed (13.597) to incipiently sheared (13.598).

Samples MRL 13.594, 13.595, and 13.596 represent a differentiated basic to intermediate intrusive, ranging compositionally from quartz-gabbroic to quartz-orthoclase-dioritic. Fabrics are slightly variable, but compositional affinities are consistent and identify the three rocks as closely related.



- |             |    |  |
|-------------|----|--|
| CAINOZOIC   | Cs | Alluvium, soil, gravel, sand and clay                            |
| TERTIARY    | Tb | Basalt   |
| CAMBRIAN    | Cu | Undifferentiated siltstone, mudstone, greywacke, tuff and basalt |
|             | Ca | Dolomite and chert (Smithton Dolomite)                           |
| PRECAMBRIAN | Pu | Undifferentiated siltstones and quartzites                       |
- 
- Cambrian - Precambrian (?) dolerite - gabbro dykes (amphibolite)
  - - - Geological boundary (inferred)
  - - - Strike and dip of beds
  - - - Faults
  - - - Minor faults and joints
  - - - Hingeline of anticlinal folding
  - - - Hingeline of syndinal folding
  - - - Lineament

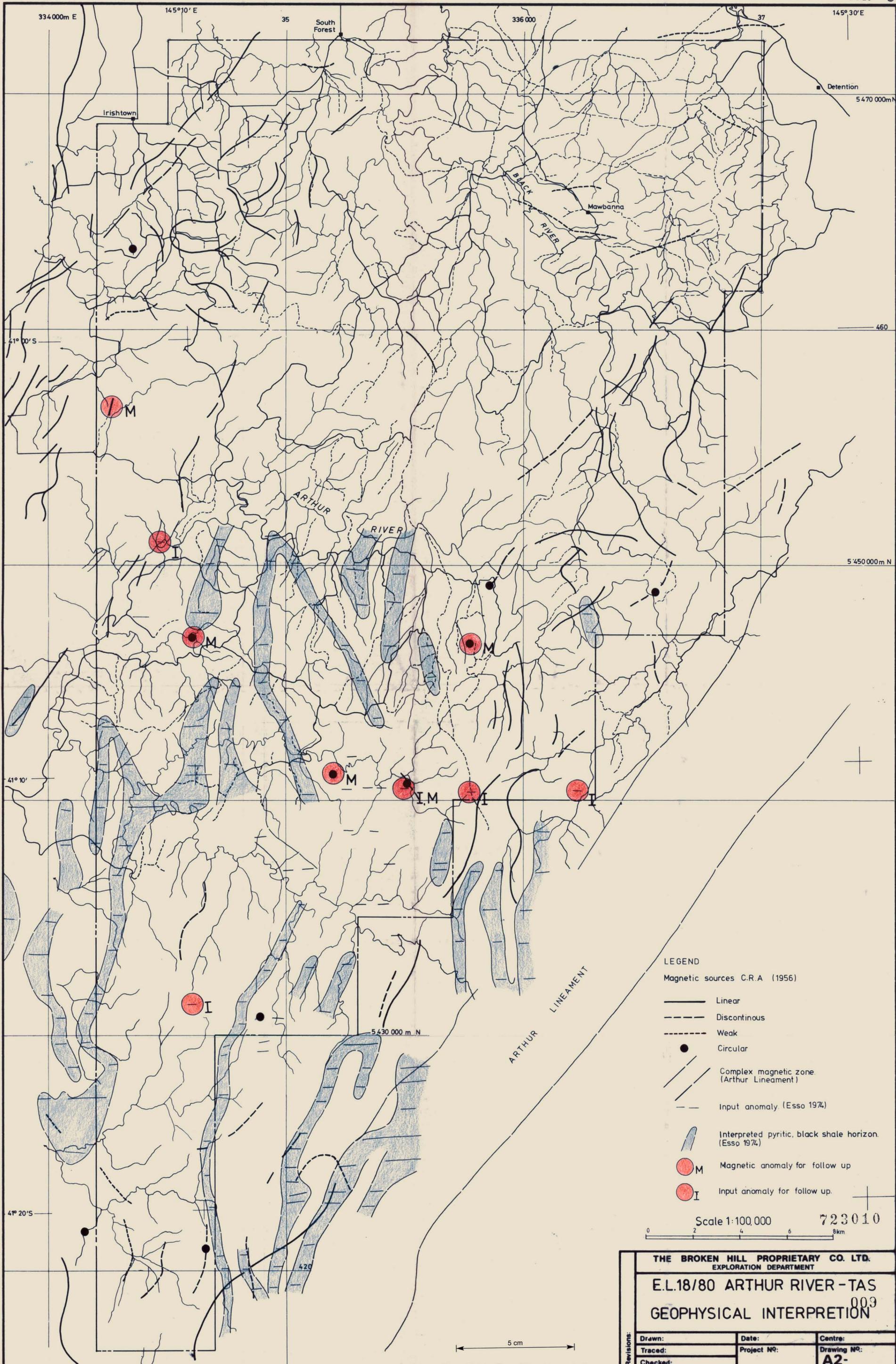


Revisions:

DATE	BY	REVISION
15/0	AO	Project Approval

THE BROKEN HILL PROPRIETARY CO LTD  
 EXPLORATION DEPARTMENT  
 EL 18/80 ARTHUR RIVER T.A.S.  
 INTERPRETED GEOLOGY 008

723009



**LEGEND**  
 Magnetic sources C.R.A (1956)

- Linear
- - - Discontinuous
- · - · Weak
- Circular
- /// Complex magnetic zone (Arthur Lineament)
- · - · Input anomaly (Esso 1974)
- /// Interpreted pyritic, black shale horizon (Esso 1974)
- M Magnetic anomaly for follow up
- I Input anomaly for follow up.

Scale 1:100,000 723010

0 2 4 6 8 km

<b>THE BROKEN HILL PROPRIETARY CO. LTD.</b> EXPLORATION DEPARTMENT		
<b>E.L.18/80 ARTHUR RIVER - TAS</b>		
<b>GEOPHYSICAL INTERPRETION</b>		
<b>Drawn:</b>	<b>Date:</b>	<b>Centre:</b>
<b>Traced:</b>	<b>Project No:</b>	<b>Drawing No:</b>
<b>Checked:</b>		<b>A2-</b>

5 cm