SOCIETE D'ETUDES DE RECHERCHES ET D'EXPLOITATIONS MINIERES

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82/SYD/26

NOVEMBER 1982

EXPLORATION LICENCE 5/77

UPPER FORTH VALLEY, TASMANIA

LAST FINAL REPORT, 12 MONTHS

5. 11. 81 - 4. 11. 82

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MAGNETIC SURVEY ROCK AND

SOIL SAMPLING

COMPILED

BY

C. R. GIBSON

SEREM (AUSTRALIA) PTY. LTD.

MINERAL EXPLORATION

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LIST OF FIGURES

APPENDED

Report by N. J. Winnall for
Union Corporation (Australia) Pty. Ltd.,

titled:

Reconnaissance South of the Oakleigh Creek
Tungsten Mine E.L. 5/77, dated October 1982,
with accompanying plans :

- Plan 1. General Geological & Reconnaissance Map
  - scale 1" = 2½ miles.

- Plan 2. Reconnaissance Traverses
  South of Oakleigh Creek Tungsten Mine
  Scale 1 : 4000.

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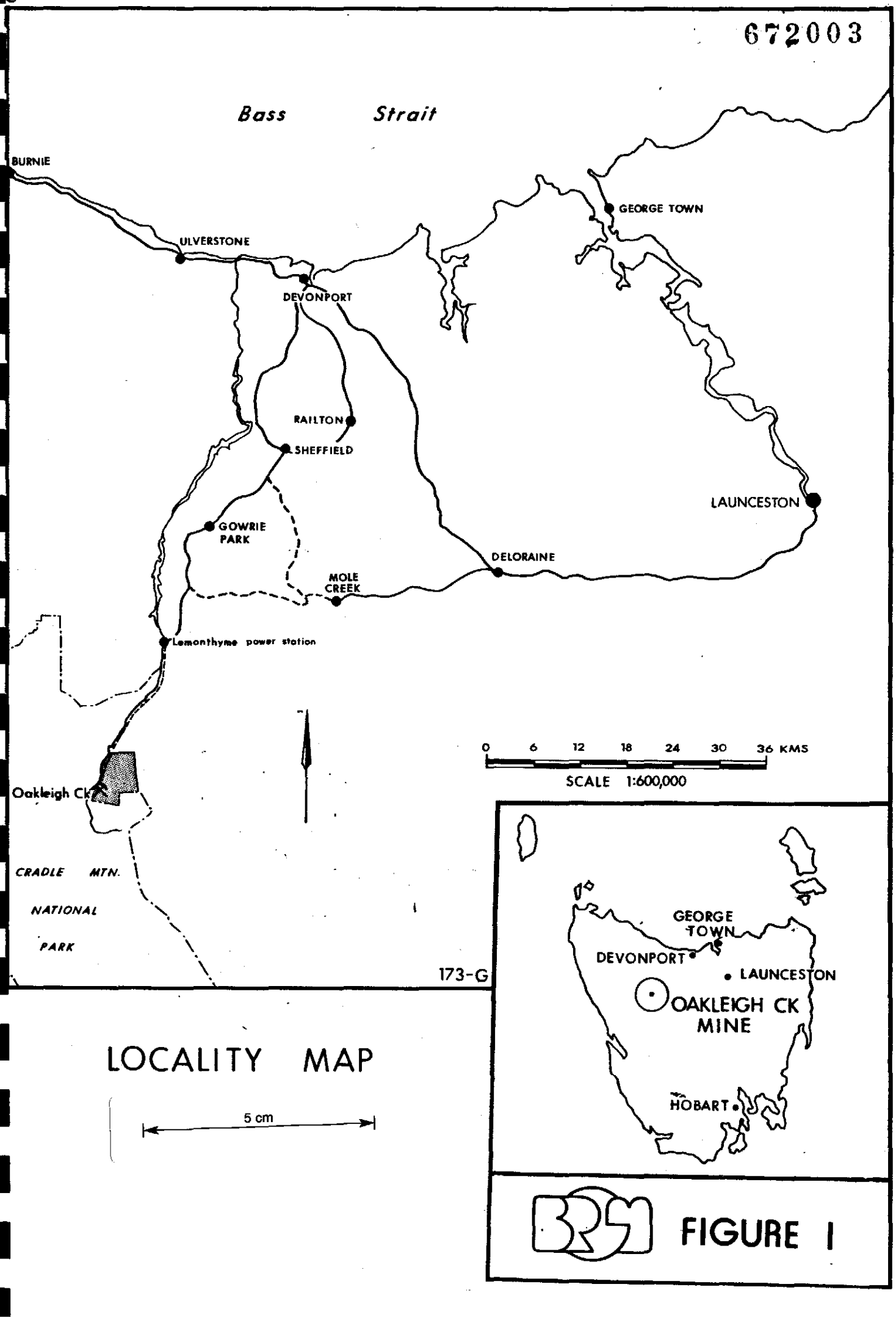
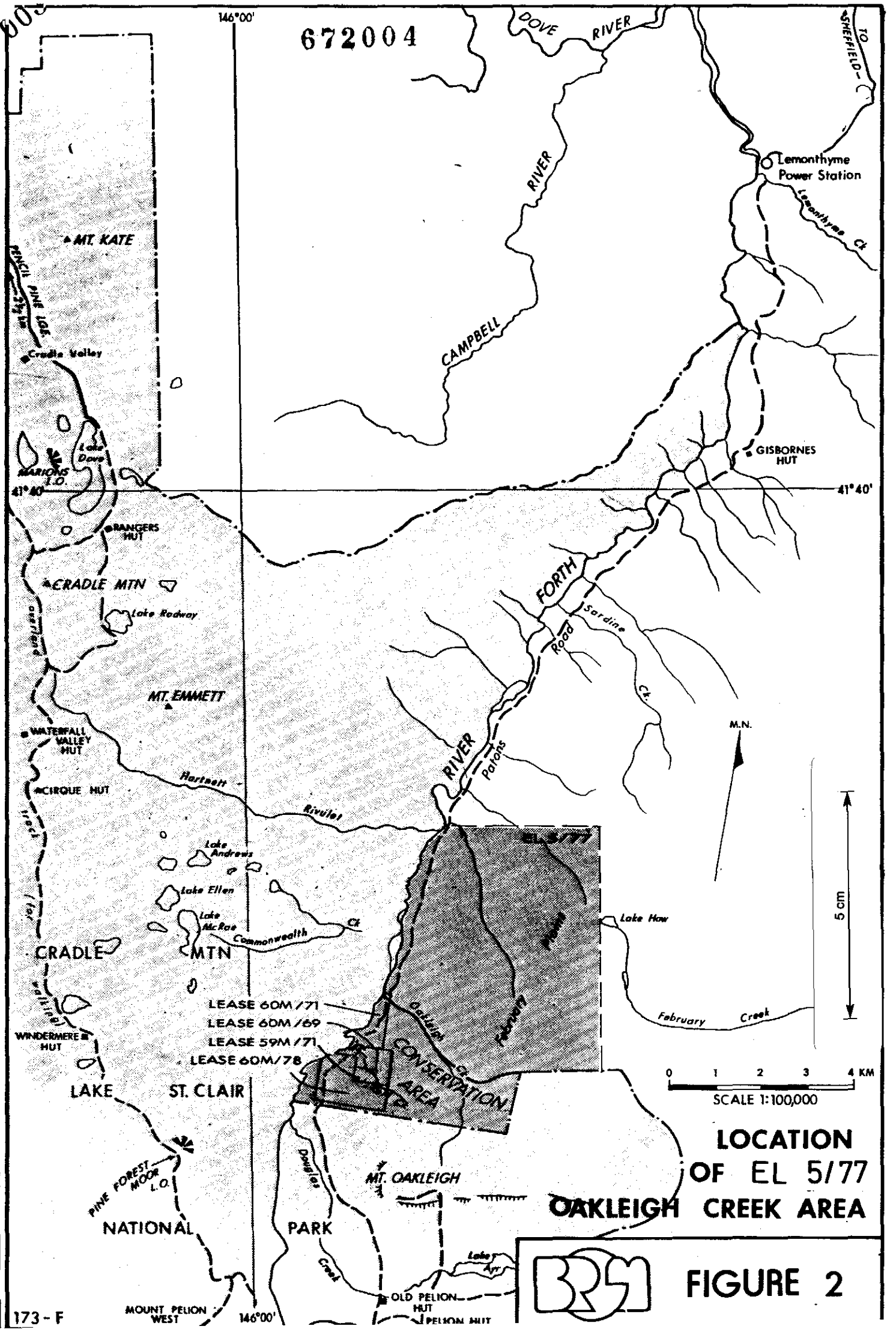


LOCALITY MAP

BRGM FIGURE 1



LOCATION OF EL 5/77 OAKLEIGH CREEK AREA

BRS

FIGURE 2

1. INTRODUCTION

During the first six months no work was done in the field but negotiations were carried out by the Joint Venturers with Union Corporation (Australia) Pty Ltd. Union Corporation had indicated an interest in conducting a preliminary reconnaissance campaign on the area. In September 1982, after finalisation of an arrangement of participation with them, their geologist, Mr Winnall, completed his reconnaissance survey. A copy of his Report on this work is appended.

2. SUMMARY OF HIS WORK

The approach was to use a combination of soil and rock sampling together with magnetic survey along traverses running east-west across the contact between the granite outcrops to the east and the sediments to the west. (See Plan 1 of the appended Report.)

The results of this work showed several minor anomalies.

(a) A magnetic anomaly previously identified by B.H.P. by airborne magnetic survey was confirmed by Union Corporation's ground magnetic survey. The anomaly which is just north-north-east of the Lone Pine Granite is thought to be a feeder dolerite pipe. Rock samples taken in the area, however, did not report any mineralisation.

(b) A minor geochemical cum magnetic anomaly approximately 300m south-east of the Oakleigh Creek Mine is thougth to be an extension of the mine reef mineralisation.

(c) A ground magnetic anomaly of 1600nT occurs approximately 2km south of the Oakleigh Creek Mine on the southern boundary of the E.L. This anomaly co-incides with the Big Blow prospect.

Rock samples from the outcrop gave an average of .32% Sn and 1.0% Zinc. Silver and minor gold samples reported from two samples. Explanatory notes from the Du Cane One Mile Geological Map reports silver and gold values in several samples taken from the prospect previously.

The following sections are reproduced from SEREM Report 82/SYD/1 of January 1982 so as to provide background on the location and the general geology of the area.

3. LOCATION AND ACCESS (Figures 1 & 2)

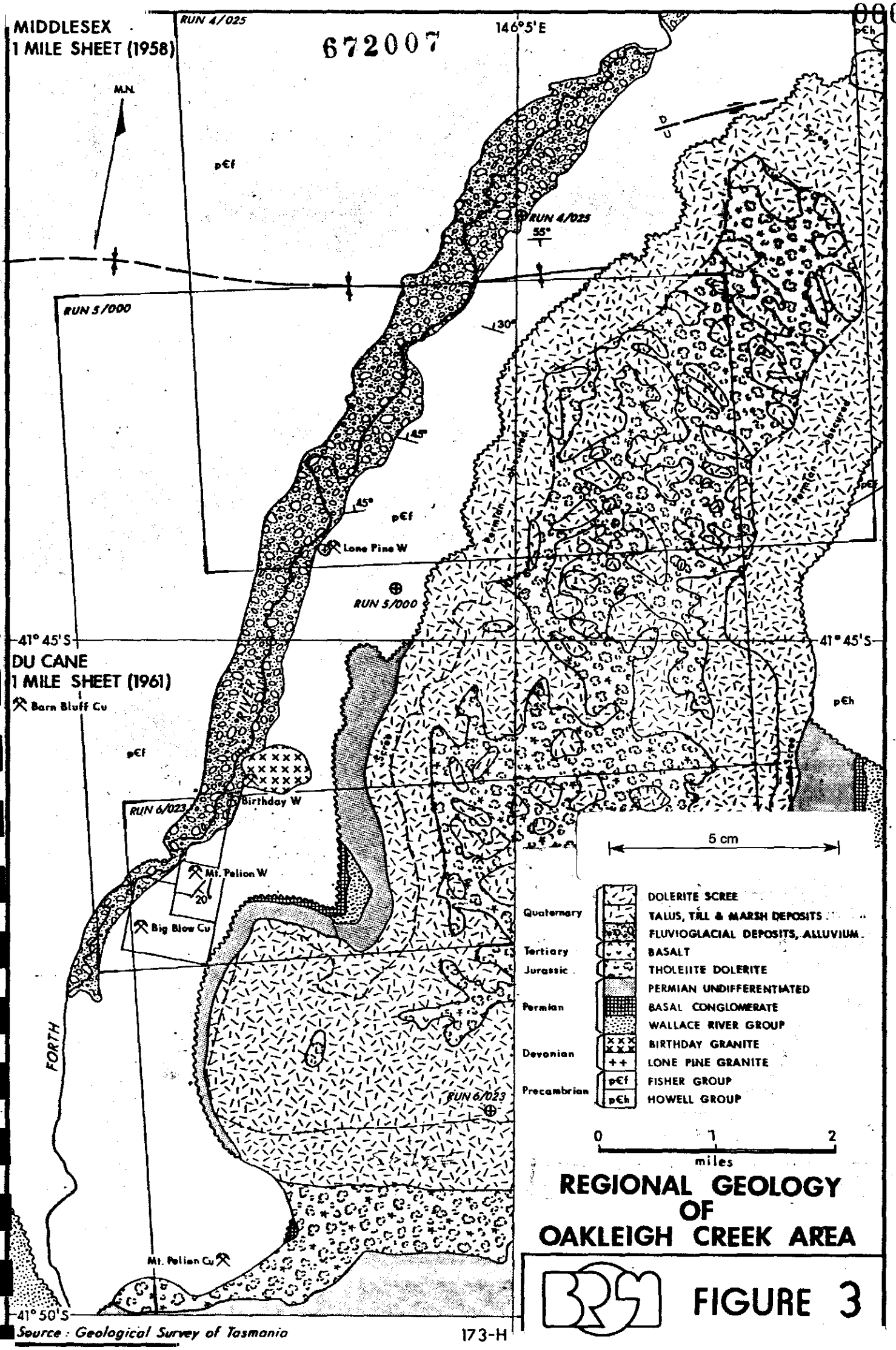
E.L. 5/77 is situated on the eastern side of the Upper Forth River Valley in rugged, mountainous, isolated terrain. To the west, on the opposite side of the Forth River, is located the Cradle Mountain-Lake St. Clair National Park, having the river as its boundary. The Forth River flows north, discharging into the Bass Strait near Devonport.

The E.L. can be reached from Devonport by sealed road as far as the Lemonthyme Power Station, which is 20km from the E.L. via a gravel road.

4. GEOLOGICAL SETTING (Figure 3)

In the Forth Valley the rock types include quartzite, mica schist and quartz mica schist of the Fisher Group with a general strike slightly east of north and dips of between 15^{o} and 30^{o} to the south-east (Macleod, 1961). At the Oakleigh Creek Mine the strike varies from 082^{o} to 108^{o} magnetic and dips from 15^{o} to 27^{o} in a northerly direction. The metasediments are abundantly veined by white quartz and locally sheared along planes trending north-north-west. These shear planes served as structural controls in the localization of copper and Wlfram mineralization in the Forth Valley.

Most of the rocks in the Fisher Group have been derived from orthoquartzite and siltstone and metamorphosed to greenschist facies.



REGIONAL GEOLOGY OF OAKLEIGH CREEK AREA

BRGM FIGURE 3

Source : Geological Survey of Tasmania

173-H

Two small granitic intrusions (adamellite of mid-Devonian age) occur within the E.L., the Birthday and Lone Pine Granites, both of which outcrop on Patons Track. They are the source of the wolfram, tin and copper mineralization in the district. The granite is discordantly intrusive into the Precambrian Fisher Group. The granite contains biotite and muscovite (with the latter predominating in some exposures), pinkish white feldspar and coarse quartz. Tourmaline, molybdenite and arsenopyrite have been noted. Near its contact the granite commonly develops large phenocrysts of feldspar and abundant biotite.

Quartz veins associated with the granites cut both the intrusives and Precambrian sediments. Of the veins observed, only the Birthday Granite Prospect and the Oakleigh Creek Wolfram Prospect are mineralized and they contain wolframite, pyrite, cassiterite and rare molybdenite. The Lone Pine Prospect adjacent to the granite intrusive consists of a single very narrow vein of arsenopyrite with only traces of wolframite. The vein within the Lone Pine granite was barren wherever it outcropped.

On the more gradual slopes encountered on the lower parts of the Valley, there is deep dolerite scree, with little or no outcrop of the Precambrian sediments. The drainage in this area is diffuse, most of it being by seepage through the dolerite scree and into the Glacial gravels filling the valley floor. The major structure in the Precambrian is a series of sub-parallel east-west folds. The folds are open and asymetrical with their axial planes dipping to the north. Minor structure in many places is intense, with the less competent schists being strongly distorted between the more competent quartzites. For more detailed geology of the mine area, see report 79/SYD/20 - Report for 6 months to November 1979.

5. CONCLUSION

The reconnaissance survey has confirmed previously known information on the Big Blow Prospect. It has, however, demonstrated that the subsurface anomaly is approximately 300 metres in length whereas on the surface the mineralization can only be traced over 100 metres. Another anomalous occurrence, the "discovery gossan" of Winnal's Report could possibly be a boulder shed from the Big Blow or from some other "concealed source".

The Big Blow anomaly outlined by the reconnaissance survey is not of sufficient intensity to be of interest to warrant further investigation by the Joint Venturers. It could, however, meet the potential requirement of a company looking for a smaller ore body for development and exploration.

APPENDIX

REPORT

BY

N. J. WINNALL

OCTOBER 1982

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UNION CORPORATION (AUSTRALIA) PTY. LIMITED

RECONNAISSANCE SOUTH OF THE OAKLEIGH CREEK TUNGSTEN MINE E.L. 5/77

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N.J. WINNALL

October 1982

UNION CORPORATION (AUSTRALIA) PTY. LIMITED N.J.W. October 1982

RECONNAISSANCE SOUTH OF THE OAKLEIGH CREEK TUNGSTEN MINE E.L. 5/77

1. ATTACHED

Appendix 1	Extract from the Du Cane One Mile Geological Map Series Explanatory Notes
Appendix 2	Table 1, Analytical Data
Plan 1	General geological features - Southern area - E.L.5/77
Plan 2	Reconnaissance traverses south of the Oakleigh Creek Mine
Figure 1	Magnetic Traverse A
Figure 2	Traverse E - Soil profiles.

2. INTRODUCTION

Magnetic and geological traverses were carried out north of the Lone Pine Granite (Traverse A) and south of the Oakleigh Creek mine as far as the southern boundary of the licence (Plan 1).

3. TRAVERSE A

A 100 gamma airborne magnetic anomaly located by BHP during previous survey, was located on the ground (Plan 1). The profile (Figure 1) shows a high degree of peakedness suggesting that the anomaly sources are close to, or at, surface.

The anomalous area comprises abundant magnetically responsive dolerite boulders which may be the source of the anomaly. However there is some build up of values to a peak of 400 nT above background, which suggests that the source may be more substantial than large boulders, for example a feeder pipe.

Numerous grab samples of float which may have been shed from this area do not suggest the existence of mineralisation.

4. RECONNAISSANCE TRAVERSES SOUTH OF THE OAKLEIGH CREEK MINE

The polymetallic Big Blow lode has a ground anomaly of 1600 nT (Plan 2). It was not located by airborne magnetics (one line passed 500 metres north of the lode and the line spacings varied between 400 and 1200 metres). The anomaly becomes less marked north and south, where it can be traced with confidence over approximately 300 metres. The "discovery gossan" does not give a consistent, traceable response. Other magnetic profiles in general tend to be 'spikey' which is probably due to magnetically responsive dolerite scree shed from a Jurassic dolerite plateau area 3 kilometres to the east.

The Big Blow gossan dips steeply west and intrudes metaquartzite which dips 22°E. The lode has a maximum width of 2.5 metres at the shallow open-cut. The quartzite displays saccharoidal textures close to the vein and often shows banding of iron oxides near fractures. The outcrops of lode occur sporadically up to 70 metres south suggesting an unpredictable 'punch and swell' nature. Mineralisation comprises mainly sphalerite, pyrite, galena, magnetite and other iron oxides. The sulphides occur largely as disseminated grains and blebs, although some massive sulphides are present. Minor quartz veining is evident.

Analytical data are shown on Plan 2 and Table 1. Significant values are highlighted, most occurring at the Big Blow Lode. Tin values drop off rapidly away from the main vein (UCT 2164 and 2165). Big Blow gave an average of 0.32% Sn from 4 samples, and 1% Zn. It can be traced over about 100 metres.

On Line J there is an increase in magnetic response in the east, where there is some enrichment of Sn and Zn in one sample (UCT 2151 - 660 ppm Sn and 890 ppm Zn).

A single sample on Line C (UCT 2171 - 0.23% Sn) is considered to be scree from the Oakleigh Creek mine which had minor tin.

5. TRAVERSE E - SOIL PROFILE (see Figure 2)

There is a build up of Zn and Sn over the 'discovery gossan' suggesting that it may not be an isolated boulder of gossan, transported by ice as was originally thought. It may be in-situ, and correspond to the northern edge of a 40 nT magnetic anomaly which extends over three lines down to the western edges of Line G - an area of no outcrop.

A fairly broad zinc anomaly (500 ppm) coincides with a negative magnetic anomaly in the east. There is little geochemical response in grab samples from this area.

6. CONCLUSIONS

1. Tin-bearing gossanous float (the "discovery gossan") may be shed from the Big Blow Lode or a similar, concealed source.

N.J. WINNALL
Regional Geologist

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RECONNAISSANCE SOUTH OF THE OAKLEIGH CREEK TUNGSTEN MINE E.L. 5/77

APPENDIX 1

on E-W axes. Intersecting the Precambrian structures is a system of shears and brecciated faults with a general southerly trend, and these shears provide the structural control for the mineralization. The main drive, 220 feet long, was driven on a brecciated normal fault which forms the east wall. The lode is eight to 12 inches wide and contains pyrite, chalcopyrite, sphalerite and galena.

The Barn Bluff copper mines are situated in the extreme north-western corner of the quadrangle in the valley of Commonwealth Creek at an altitude of nearly 3000 feet. The lodes were discovered in 1898 by H. Andrews and the main development work was undertaken by the Barn Bluff Options Development Mining Company between January, 1901 and April, 1903. During this period the main tunnel was driven 448 feet, Nos. 2 and 3 tunnels 25 and 30 feet respectively, and the orebody was exposed at surface in 18 open cuts over a length of 600 feet and a width of 450 feet. No further development work has been carried out since.

The Precambrian metasediments in this area consist of folded, intercalated quartzite and mica schist with a general E-W strike. The sediments are traversed by a large chloritized dyke, 250 feet wide, with a NW trend. On the western side the dyke appears as a chlorite schist, while on the eastern side, near the mine workings, it is a dense, dark green rock, partly chloritized and impregnated with chlorite and a little chalcopyrite. On the south-western side of the chlorite dyke, large masses of white, opaque quartz containing pyrite outcrop at several points over a distance of 30 chains. On the north side of Commonwealth Creek and the eastern side of the chlorite belt are the actinolite ore bodies.

Mineralization occurs in both the chloritized basic rock and the actinolite-bearing zones of the quartzite. The ore in the chlorite zones consists of dense pyrite, arsenopyrite, specularite and pyrrhotite with subordinate chalcopyrite, silver and gold. The values are too low to be of economic grade. The actinolite ore-bodies consist of alternating bands of actinolite and quartzite, heavily impregnated with pyrrhotite, pyrite, specularite, arsenopyrite and, in a lesser degree, with chalcopyrite, galena and sphalerite. Cassiterite has been detected and gold and silver are constant, though erratic, components. Assay of the ore from various localities gave the following results:—

Locality	Copper (%)	Tin (%)	Gold (oz./ton)	Silver (oz./ton)
No. 1 Tunnel	0.16		Tr.	1.2
Crosscut, No. 1 Tunnel	0.40		Tr.	0.8
Open Cut, North Bank	0.10		Tr.	0.8
Open Cut, No. 7	2.32	0.22	0.05	2.3
Open Cut, No. 8	1.65	0.27	Tr.	3.6

WOLFRAM AND CASSITERITE

Wolfram-bearing quartz veins occur on the eastern side of the Forth Valley, between a point about two miles north of Mt. Oakleigh and the northern boundary of the quadrangle. These were discovered in 1916 and most of the development was done shortly afterwards by the Mt. Pelion Mining Co. and other operators.

The Mt. Pelion Wolfram Mine. This is the largest and best developed mine in the district and was initially operated by the Mt. Pelion Mining Co. from which it takes its name. It was re-examined by J. Elliston in 1951 when the lease was held by Messrs. Bloomfield, Knight and Martin. The veins occur on the steep hillside above the narrow flood-plain of the Forth River and consist of wolfram-bearing quartz veins with a general N-S trend filling fissures in the enclosing quartzite and mica schist which themselves are strongly folded on E-W trending axes. The veins dip to the east at angles between 60 and 70 degrees. The principal ore mineral is wolfram with which is associated cassiterite, molybdenite, arsenopyrite, chalcopyrite and pyrite. The minerals are erratically distributed through the quartz gangue and the highest grades are confined to shoots within the veins or on the walls.

The main vein has been opened by an adit about 130 feet long and is exposed by about 50 feet of trenching on the surface. Its continuity has been established for 500 feet laterally and 300 feet in depth, and it shows no sign of diminution at the extremities of exposure. The lode channel branches and anastomoses but the total width of the mineralized zone remains fairly constant at about 12 inches.

The average grade of ore is difficult to determine accurately. Assayed samples collected by Reid gave values of 4.6 per cent WO_3 and 0.3 per cent Sn. The limited and unreliable production figures that are available suggest that the grade of the ore is much lower: between 1.0 and 1.5 per cent. Elliston calculated that about 5000 tons of ore are available with average grade of 1.7 per cent WO_3.

The Cliff Lodes lie about 350 to 400 feet east of the main lode with which they are parallel in strike and identical in dip. This lode system consists of a number of veins from one to four inches wide with others between eight to 12 inches. The veins can be seen to occupy sharply defined fissures in the valley of Reid Creek. Arsenopyrite is the principal sulphide mineral with appreciable amounts of wolfram and cassiterite which are relatively more abundant in the narrower veins.

The Big Blow Lode. This lode is exposed in open cuts at a point about 50 chains south of the tunnel of the main wolfram veins described above. The lode is up to 10 feet wide with a meridional trend cutting across the enclosing metasediments which here have a NW trend. The dominant metallic components are sphalerite, pyrite, hematite and galena with subordinate amounts of chalcopyrite, cassiterite, ferromanganese and arsenopyrite. Accessory mineral constituents are actinolite, epidote, calcite and fluorite with minor amounts of feldspar and quartz. Assays of a number of samples revealed a small, but fairly consistent, silver content of between 3 to 12 dwt. per ton while the content of gold rarely exceeds 3 dwt. per ton. The tin content of the lode ranges between a trace and 1.20 per cent, and a zinc content as high as 5.43 per cent was recorded.

The Birthday Mine. This mine is situated about three-quarters of a mile north of the Mt. Pelion wolfram mine on the exposed area of the Devonian granite. Mineralized quartz veins occur in

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RECONNAISSANCE SOUTH OF THE OAKLEIGH CREEK TUNGSTEN MINE E.L. 5/77

APPENDIX 2

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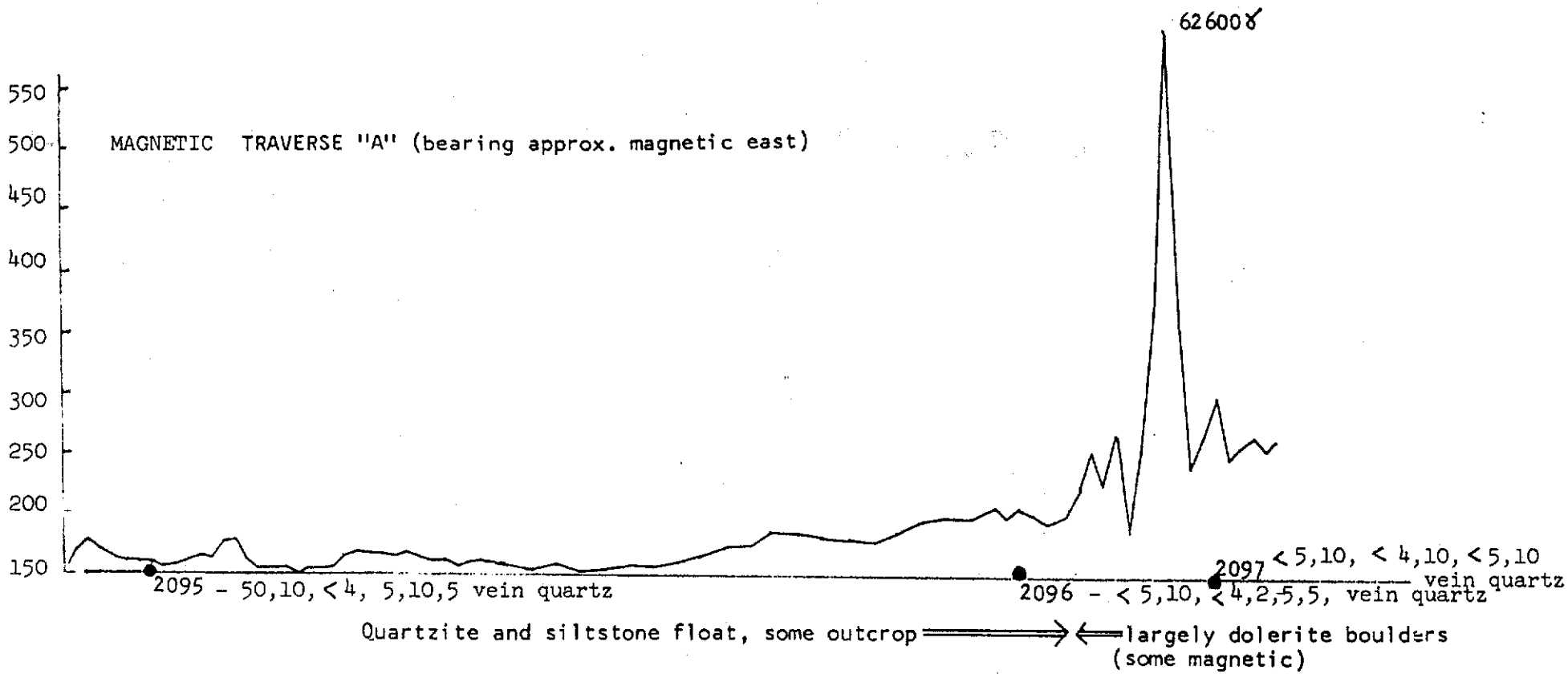
TABLE 1 ANALYTICAL DATA

Sample No.	Sn	W	Mo	Cu	Pb	Zn	Mn	F	Ag	Au	Remarks
UCT profile				(ppm unless otherwise stated)							
2095	50	10	< 4	5	10	5					Vein quartz (float)
2096	< 5	10	< 4	2	5	5					Vein quartz (float)
2097	< 5	10	< 4	10	5	10					Vein quartz (float)
2124	< 5	10	< 4	45	20	70					Dolerite (float)
2125	20	10	4	20	30	40					Quartzite, Micaceous (float)
2126	< 5	10	< 4	40	20	20					Dolerite (float)
2127	5	< 10	< 4	35	20	80					Quartz muscovite (float)
2128	< 5	10	< 4	< 2	20	125					" "
2129	< 5	< 10	< 4	5	15	70					Dolerite (float)
2130	< 5	< 10	< 4	< 2	10	5					Quartz muscovite (float)
2131	235	10	< 4	5	50	45					Vein quartz (float), minor Fe oxides
2132	< 5	10	< 4	2	10	10					Vein quartz-muscovite (float)
2133	380	20	4	10	35	780					Quartzite + euhedral Fe oxides, ? banded (float)
2134	400	70	8	40	35	470					" " " " "
2144	0.29%	70	20	70	80	0.34%					Muscovite quartz, black and red (float), magnetic
2145	30	10	< 4	2	15	20					Vein quartz (float)
2146	< 5	10	< 4	2	5	5					Vein quartz (float)
2147	< 5	< 10	< 4	2	5	20					" "
2148	< 5	10	< 4	< 2	5	5					" "
2149	< 5	< 10	< 4	< 2	5	5					" "
2150	< 5	10	< 4	< 2	5	5					" "
2151	660	30	4	50	140	890					Vein quartz (float), gossanous
2152	< 5	10	< 4	< 2	15	20					" " "
2153	30	10	16	2	10	30					Vein quartz (float), minor fe oxides
2154	< 5	10	< 4	2	5	15					" "
2155	< 5	< 10	4	< 2	5	10					Sandstone + vein quartz (float)
2156	< 5	10	< 4	2	5	5					Vain quartz (float)
2157	< 5	10	4	20	5	15					Metaquartzite (float)
2158	50	0	< 4	10	10	25					Quartzite (saccharoidal), minor fe oxides (float)
2159	10	10	< 4	5	15	30					" " (float)
2160	< 5	10	< 4	2	15	10					Vein quartz (float)
2161	< 5	0	4	< 2	10	5					" "
2162	10	< 10	< 4	< 2	20	15					Quartzite (saccharoidal), Fe oxides ? banded
2163	0.43%	190	16	110	0.16%	> 1%		6	0.2		Big Blow Lode, sulphides, metaquartzite (1.95m)
2164	160	210	8	290	540	> 1%		6.5	0.2		" " " " " (1.5 m)
2165	< 5	10	< 4	< 2	5	95					Sandstone
2166	0.35%	< 10	12	65	390	1%					Lode, sulphides, Fe oxides, 20 m S Big Blow
2167	0.19%	90	12	105	120	0.76%					Lode, " " " 70 m S Big Blow
2168	300	< 10	< 4	2	5	25					Vein quartz (float)
2169	240	20	< 4	10	15	25					" "
2170	10	10	< 4	50	10	25					Quartz mica schist (float)
2171	0.23%	20	< 4	5	5	10					Vein quartz, boxworks, Fe stained (float)
2172	740	30	< 4	2	5	10					" " Fe stained, muscovite (float)

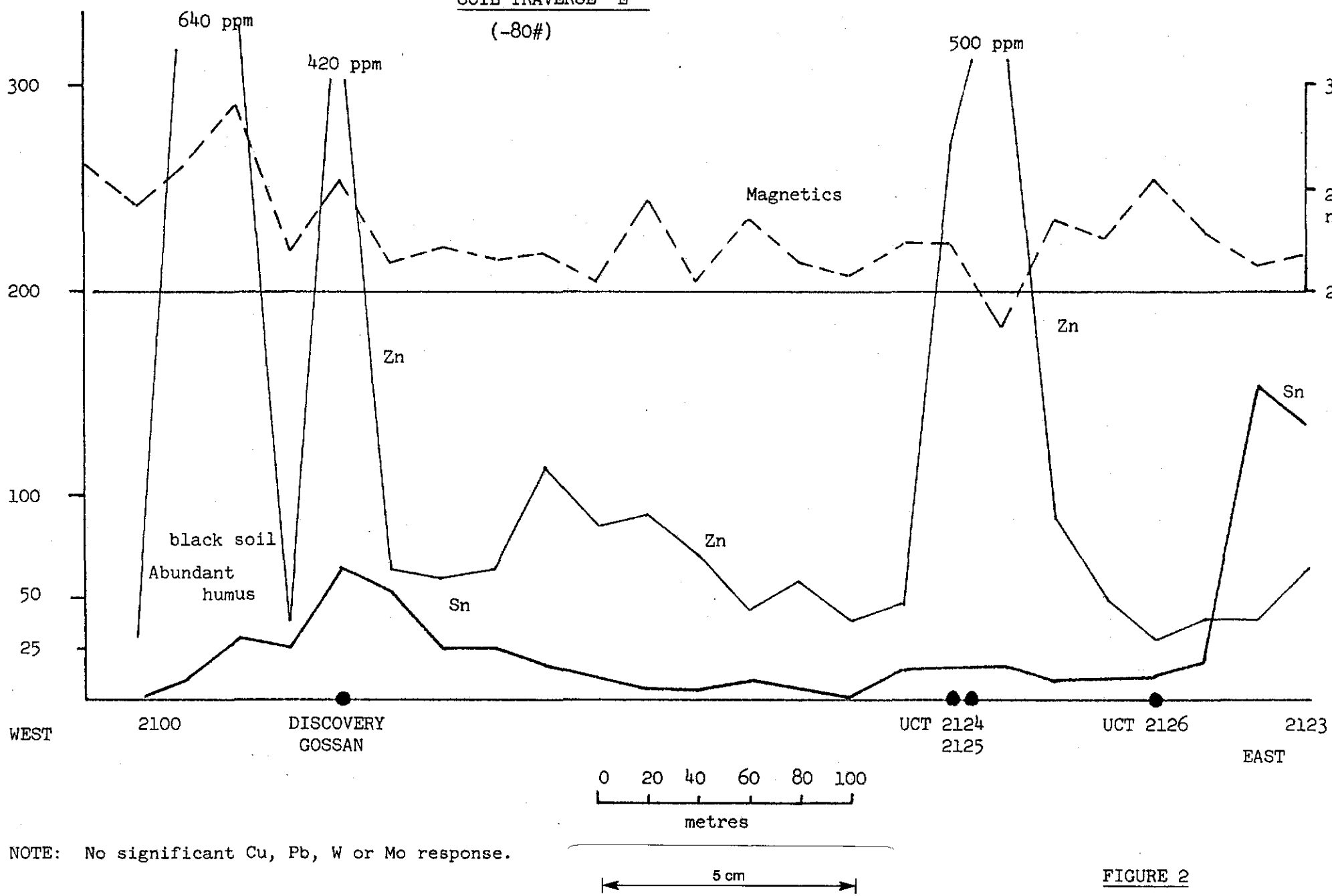


Scale (approx.)
0 100metres

5 cm

KEY ppm
2084- 5,20, 4,2,10,2,quartzite
sample number/Sn W Mo Cu Pb Zn description

FIGURE 1



NOTE: No significant Cu, Pb, W or Mo response.

FIGURE 2

2084 - <10, <10, <4, 10, 10, 2 quartzite
2085 - <5, 20, <4, 2, 10, 2 vein quartz
2086 - <5, <10, <4, 2, 10, 2 vein quartz
2087 - <5, 20, <4, 2, 10, 2 quartzite

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2082 - 25, 20, <4, 10, 10, 2 vein quartz
2081 - 5, 30, <4, 10, 20, 45 vein quartz
2080 - 35, 20, <4, 10, 15, 30 quartzite & muscovite
2079 - <5, 10, <4, 5, 5, 5 vein quartz
2083 - 20, 20, <4, 10, 30, 20 granite

Lane Pine granite

MAGNETIC ANOMALY

Traverse 'A' - see Fig. 1

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RIVER

2078 - 60, 20, <4, 5, 15, 30 granite

Birthday granite

Permian Sediments
Jurassic Dolerite

CRADLE MT - LAKE ST. CLAIR NATIONAL PARK

2077 - 15, 30, <4, 20, 20, 30 granite

2076 - 10, 20, <4, 10, 10, 10 muscovite

FOURTH Track

2066 - <5, <10, <4, 20, 20, 30 dolerite

MAGNETIC ANOMALY

2067 - 0·11%, 40, 20, 10, 230, 0·1% gossan
2068 - 800, 40, 20, 15, 500, 0·1% gossan

OAKLEIGH CREEK TUNGSTEN MINE

2075 - <5, 20, <4, 5, 15, 30 muscovite

2074 - 25, 10, <4, 10, 20, 25 vein quartz & muscovite

2069 - 105, 20, <4, 15, 10, 20 vein quartz & muscovite

2073 - 0·49%, 580, 12, 360, 60, 150 pyritic metaquartzite

2070 - 5, <10, <4, 65, 25, 35 dolerite

UPPER

2072 - 20, 20, <4, 20, 10, 15 vein qtz.

Area of reconnaissance traverses south of the Oakleigh Ck. Tungsten Mine (see Plan 2)

2071 - 80, 20, <4, 20, 10, 25 vein qtz.

E.L. 5/77

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REFERENCE

- Permian - Jurassic cover
- Devonian granite
- Precambrian - quartzite, shales
- 2084 - <5, 20, 4, 2, 10, 2, quartzite — Reconnaissance rock chip samples (Sn, W, Mo, Cu, Pb, Zn) description
- 20 — Dip and strike

5 cm

0 5 MILES

UNION CORPORATION (AUSTRALIA) PTY LIMITED

E.L. 5/77
OAKLEIGH CREEK AREA, TASMANIA

GENERAL GEOLOGICAL AND RECONNAISSANCE MAP

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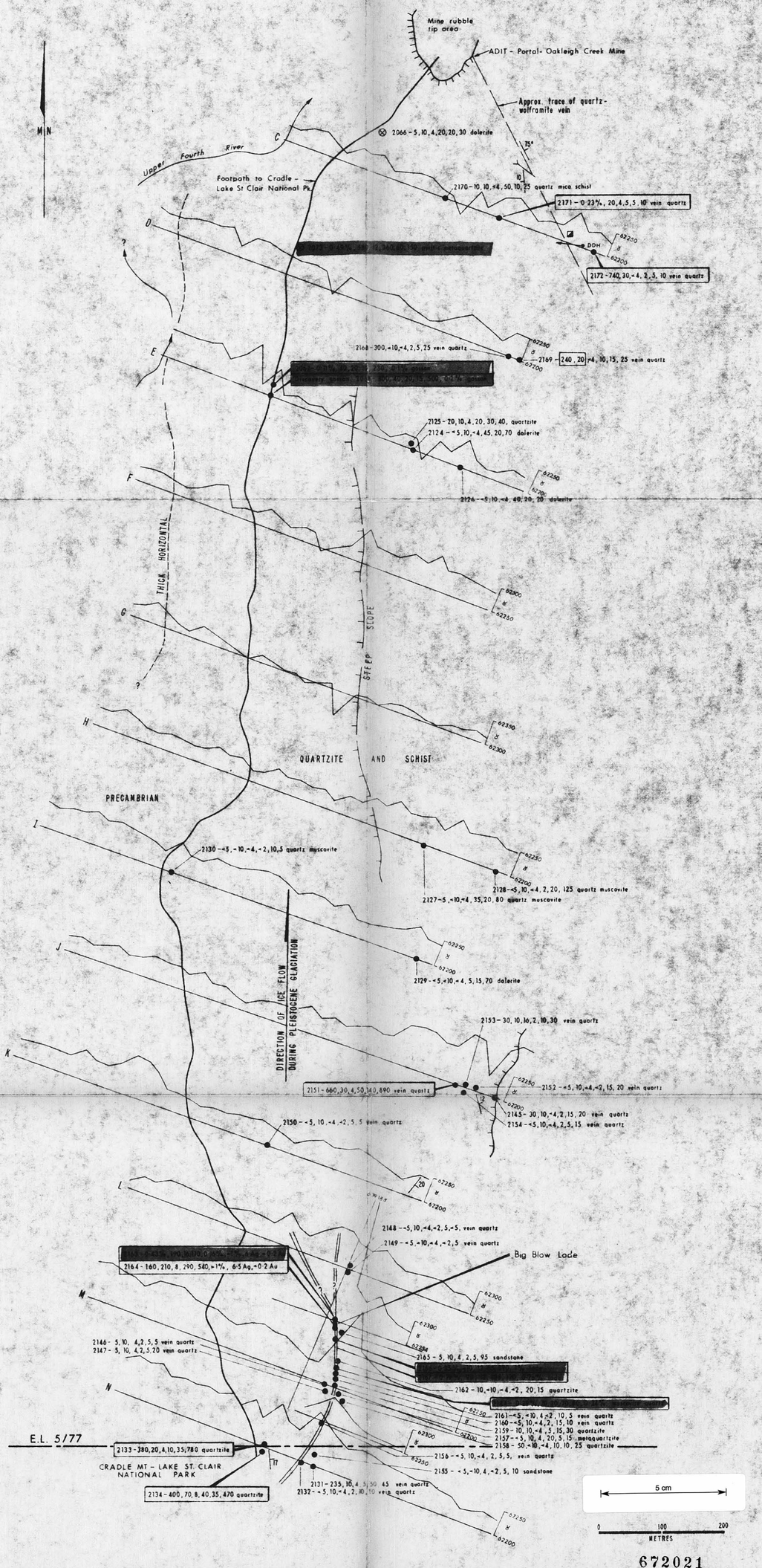
PLAN 1	Author: N.J.W.	October, 1982

82-1873



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Magnetic profile (on traverse E)

Trend of magnetic anomaly

Sample locality with number, analysis (Sn, W, Mo, Cu, Pb, Zn & others), description

2067 - ·11%, 40, 20, 10, 230, 0·1%, gossan

Footpath

Dip and strike

Sample locality - position approximate

UNION CORPORATION (AUSTRALIA) PTY LIMITED

E.L. 5/77
OAKLEIGH CREEK AREA, TASMANIA

RECONNAISSANCE TRAVERSES SOUTH OF OAKLEIGH CREEK TUNGSTEN MINE

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PLAN 2	Author: N.J.W.	October, 1982

82-1873