UNION CORPORATION (AUSTRALIA) PTY. LIMITED - N.J.W. OCTOBER, 1980

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A. INTRODUCTION

A joint venture agreement between Union Corporation (Australia) Pty. Limited (U.C.A.) and Mineral Holdings Australia Pty. Ltd. was signed on the 28th July, 1980 to explore for minerals in E.L. 11/77 which covers an area of sixty six square kilometres and is situated south east of Branxholm, North East Tasmania. U.C.A. is the operating partner.

The geology, sample localities and mineral leases are shown on Plan 1.

B. SUMMARY OF PREVIOUS EXPLORATION

The major part of exploration work in E.L. 11/77 comprised geological mapping and sampling, percussion and diamond boreholing which was carried out variously by the Mines Department, Tasmania (1962), Groves (1972), Texins Development Pty. Ltd. (1974), and Newmont Pty. Ltd. (1978).

Some specific areas are discussed below.

1. Star of Peace - Mammoth - Bald Hill

Groves (1972) concluded that the cassiterite-bearing greisen veins in this area were found to be too small and discontinuous to be of economic interest where the maximum potential tonnage of each is less than 50,000 tonnes and grades vary erratically well below 1% tin (values range from 0.22 to 0.63% tin.) The adjacent granite contains from 0.01 to 0.05% tin. However, an irregular mass of greisen, situated 1 kilometre west north west of the Star of Peace mine contains a potential 1 million tonnes ore but assayed only 0.12, 0.08 and 0.36% tin.

Texins diamond boreholed, to a maximum inclined depth of 400 feet, the Bald Hill prospect with three holes (D.D.H.s 1 to 3) and an area situated five hundred metres west north west of the Star of Peace mine with one hole (D.D.H.4.) At Bald Hill the two best results were at 278 feet where a 2 feet 4 inch section yielded 0.07% tin, 0.64% copper, 0.05% zinc and 1.9 ozs. silver and, at 20 feet, a 6 feet section contained 0.265% tin. It was concluded that in general the greisen veins continued at depth and remained consistent in width but grades were lower. D.D.H.4 tested two distinct systems of joint controlled greisen veins which, at 145 feet, contained 4.5 feet of 0.45% tin, 0.45% copper, 0.23% zinc and 0.91 ozs. silver. No further work was recommended because the intersection widths were too narrow.

The Rattler lodes were channel sampled by Newmont (1978) the best result of which was from the western costean where '7 bands of greisen total 5.5m over 60m' assayed 5590 ppm. tin. The adjacent granite contains 260 ppm. tin.

2. Bells Plains

Hughes (1966), for Kathleen Investments (Australia) Administration Pty. Limited, showed that an area outlined in Plan 1 contains 1 million cubic yards of alluvial material with an average volume of 3.2 ozs. per cubic yard of 70% concentrate. Richer leads may have been missed during investigations. Upstream the Barnett Mineral lease contains 2 lbs. per cubic yard of 70% concentrate.

3. Ruby Flats -Mullins

This area comprises two parallel greisen vein systems that trend about 110° magnetic adjacent to which sluicing of kaolinised granite has taken place.

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In 1962 the Mines Department diamond boreholed, with three holes, to a maximum inclined depth of 230 feet, the Mullins Prospect to test area of highest tin values in greisen veins as shown by earlier surface sampling.

Assays of the best sections in each hole are shown below.

	Depth	%Tin
D.D.H.1	12' - 14'	0.60
	30' - 31'6"	0.47
	108' - 117'6"	0.35
D.D.H.2	44' - 48'	0.14
	56'6" - 59'	0.80
	80' - 87'6"	0.21
	95' - 102'	0.19
D.D.H.3	84' - 89'	0.12
	92'6" - 98'	0.17

It was concluded that "the results are discouraging, and no tin-bearing veins of economic width or grade were encountered, also the area does not appear to have any potential for low grade bulk mining. There was a marked fall off in both grade and vein width with increasing depth which also makes the prospect less attractive. No further drilling is recommended on this or any other of the geologically similar deposits in the Branxholm district.", Jack R., 1962.

Estimates by Solomon (1971) suggest that there about 500,000 cubic yards of greisen to a depth of 100 feet in this area with highly variable sample analyses ranging from 0.18 to 0.93% tin and generally below 0.5% tin. The tin content of the kaolinised granite is low (<0.01% tin) throughout the area.

Groves (1972) discussed the possible value of kaolin and cassiterite where "a reasonable maximum volume of kaolinised granite that could be expected would be 2 million cubic yards with a maximum possible value for kaolinised granite of about ½ lb. tin per cubic yard. It appears very unlikely from present results, that a concentration of tin will be proven which is,itself, an economic proposition without the kaolin".

4. Bells Hills

Numerous costeans were dozed over the cross cutting greisen vein systems. Sampling by Groves (1972) has indicated that the four main lodes may contain in excess of 400,000 tons of greisen to a depth of 200 feet with grades in excess of 0.5% tin. Two costeans were channel sampled to test the prospect as a potential bulk low-grade deposit the most promising of which indicated a zone 140 feet wide which includes the Main Lode and averages 0.25% tin. The other costean contained 109 feet with an average assay of 0.12% tin. The Main Lode can be traced over a surface length of 1500 feet, has an average width of 10 feet and extends to at least 180 feet as indicated by underground workings. Average surface samples are variable (ranging from 0.14 to 1.3% tin) but average out at 0.5% tin over 600 feet strike length.

5. Newmont Pty. Limited (1978)

Exploration consisted of geological mapping and sampling followed by a programme of shallow percussion drilling. Ninety nine holes were bored to test for tin-greisen deposits situated in the 'roof' zones of tin granites below Mathinna Beds sediments. The boreholes were generally stopped at 20 metres depth to comply with stripping ratio requisites. Some check holes were drilled to 40 metres. The highest value in all boreholes was 650 parts per million tin over 4 metres at the Star of Peace area.

No further exploration was carried out.

C. PRESENT INVESTIGATIONS

Two types of primary cassiterite mineralisation are considered that may provide the tonnage and grade potential necessary for economic tin deposits. These are :-

1. Quartz and quartz-muscovite greisen veins the size and distribution of which appears to be controlled by fractures within the host 'tin' granite.

2. 'Cupola' quartz greisen mineralisation in sub-horizontal 'roof' zones of granite an example of which is the Mount Paris deposit where an exposed quartz greisen cupola appears to be related to a structural irregularity in the 'roof' of the granite. A similar style of mineralisation is present in greisenised granite at the granite/sediment contact at the Star of Peace area where shallow (1 to 2 metres) eluvial workings occur.

1. Work Completed

The following work was carried out.

(a) Reconnaissance and detailed geological mapping and sampling.

(b) Soil Sampling.

The results of geological mapping and sampling, where analyses are available, and some specific areas are discussed in Section 2 below.

2. Geology and Mineralisation

The rocks in E.L. 11/77 largely comprise Mathinna Beds sediments (siltstones and arqillaceous sandstones of turbidite sequences) and biotite-muscovite granites and adamellites which are fine to coarse grained and mostly equigranular with some prophyritic types. The latter granite types appear to be confined to the northern parts of E.L.11/77. The relationship between the two granite types is unknown. Minor intrusions of aplite and Tertiary basalt also occur and some streams contain substantial alluvial material.

Cassiterite is the main economic mineral which is presently alluvial mined and 'sluiced' in Pleistocene to Recent alluvium and kaolinised granite respectively. 'Hard rock' mining was implemented on a limited basis and small scale only. Wolframite, chalcopyrite and molybdenum also occur as accessory minerals at some 'hard rock' mines e.g. Bells Hill and Mammoth mines.

All tin deposits, except the Tin Pot and Carnac deposits, are located in a 12 by 2 kilometre corridor that trends 115° magnetic and extends from the Star of Peace to Royal ~~George~~ Gordon Mines and which also transgresses granites and sediments.

(a) Star of Peace - Mammoth - Bald Hill

At the Star of Peace mine small scale, shallow (1 to 2 metres) eluvial mining was carried out in greisenised granite in the 'roof' zones of the Mount Paris Mass granite below a thin pegmatite layer. It appears that where the granite/sediment contact strikes north easterley the dips of that contact are shallowest. The granite at this contact is finer grained at it's margins (grain size generally <3mm.), the apparent thickness of which suggests that where it is thicker the contact is shallower. Here, however, Newmont concluded that, as a result of percussion drilling the contact dips (ranging from 8 to 20 degrees) are too great for an economic open cut mining operation.

One kilometre east north east of the Star of Peace mine at a north east trending contact numerous samples of greisenised granite, with mica selvedges, in contact with Mathinna Beds sediments, yielded a maximum value of 345 ppm. tin and commonly 180 ppm. tin. Pegmatites here contain 20 to 25 ppm. tin. Where the contact steepens and trends south east greisen and

greisenised granite do not appear to occur although a sample of quartz vein material with clusters of fine mica contains 25 ppm. tin.

The Mammoth quartz-sulphide-cassiterite 2 metre wide vein contains 0.52% tin but is small in strike length (<50 metres). 500 metres north west of the Mammoth mine numerous sulphide-bearing greisen veins contain up to a maximum of 0.15% tin.

(b) Bells Hill - Cox

Analyses of samples of greisen veins at Bells Hill varied from 710 ppm to 3.26% tin with an arithmetic average value of 0.76% tin. One sample, from the 'Wolfram Lode', contained 20 ppm tungsten and 0.24% tin. No continuous channel samples were collected but along strike of a zone sampled by Groves in 1972 (140 feet wide at 0.25% tin) and adjacent to the Main Lode a one metre wide greisen vein analysed 3.26% tin. Numerous smaller veins also occur here. A sample of quartz greisen which probably represents the eastern extension of the Main Lode analysed 0.65% tin which gives the Main Lode a potential strike length of 500 metres.

A continuous chip sample from a steeply dipping, 4.4 metre wide vein at Cox's Wolfram prospect contained 0.11% tin and 130 ppm. tungsten.

(c) Ruby Flat - Mullins

Quartz and quartz-muscovite greisen veins can be traced for approximately 2 kilometres from Ruby Flats to Mullins area analyses of samples from which vary considerably from 165 ppm. to 0.48% tin. The area of highest values was drilled by the Mines Department (see section B3). The remainder of samples generally contain less than 0.1% tin except a float sample collected between Royal Gordon and Ruby Flats which yielded 0.17% tin. A sample of granite from this area analysed 210 ppm. tin.

Where the trace of greisen veins intersects the granite/sediment contact south east of the Mullins area, and probably within Mathinna Beds sediments, numerous samples of quartz-muscovite greisen yielded up to 710 ppm. tin and 20 ppm. tungsten. Tin values were more commonly 180 ppm. Tourmalinisation has occurred here.

(d) Mount Paris - Dead Horse Hill - Newhope No.2

Here numerous samples were collected in order to define areas where greisens may have developed under Mathinna Beds. The occurrence of sulphides in quartz veins and stringers at Hill Top suggests that this is an area where such greisen development may occur. A soil sample traverse was conducted over the veins. All analyses are awaited.

D. FUTURE WORK

It is envisaged that the following programme will be carried out.

1. Continue geological mapping and sampling.

2. Upon receipt of all analyses define prority areas which require more detailed work.

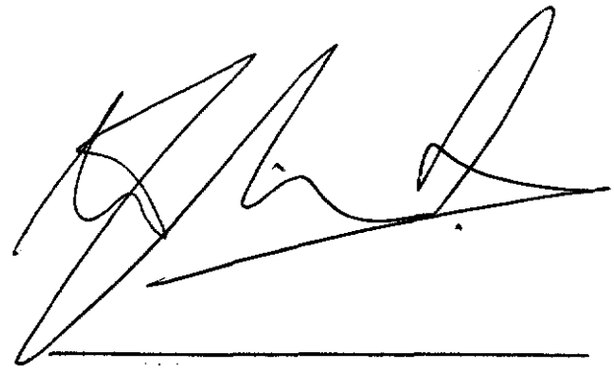
3. Costeaning, percussion drillhole and possible diamond drilling in selected areas.

The anticipated timing of the work programme is :-

October to December - complete programme for selection of priority areas with some work on these completed.

December to March - detailed geological mapping and sampling, soil sampling and costeaning, percussion drilling and possible diamond drilling of selected targets.

March onward - programme hereon is dependent on progress and results to date.



N.J. WINNALL

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APPENDIX A

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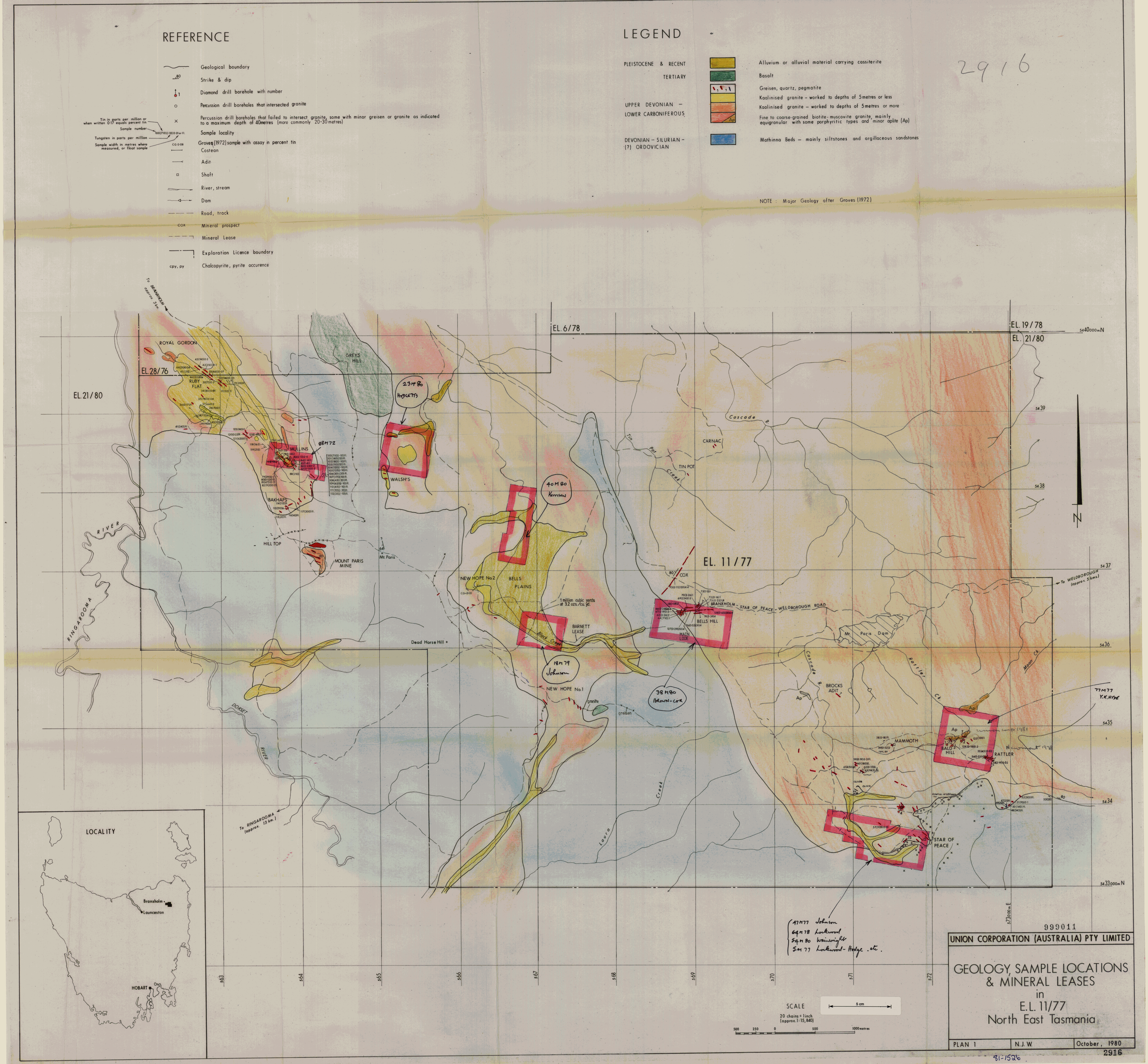
EXPENDITURE TO 30TH SEPTEMBER 1980

Fees (U.C.A)	6280-00
Travelling	487-40
Food & Accommodation	561-95
Freight & Postage	-
Maps, Films, Drafting	18-28
Telecommunications	33-48
Field Expenses	7-99
Motor Vehicle Expenses	528-05
Sample Treatment Fees	-
Title Fees	273-90
Wages	759-00
Aerial Surveys	-
Consultant Fees	-
Printing & Stationery	1-72
Legal Fees	75-00
	$9026-77



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REFERENCE
Geological boundary
Strike & dip
Diamond drill borehole with number
Percussion drill boreholes that intersected granite
Percussion drill boreholes that failed to intersect granite, some with minor greisen or granite as indicated to a maximum depth of 40metres (more commonly 20-30 metres)
Tin in parts per million or when written 0.17 equals percent tin
Sample number
Tungsten in parts per million
Sample width in metres where measured, or float sample
Sample locality
Groves (1972) sample with assay in percent tin
Costean
Adit
Shaft
River, stream
Dam
Road, track
Mineral prospect
Mineral Lease
Exploration Licence boundary
Chalcopyrite, pyrite occurence
LEGEND
PLEISTOCENE & RECENT
Alluvium or alluvial material carrying cassiterite
TERTIARY
Basalt
UPPER DEVONIAN – LOWER CARBONIFEROUS
Greisen, quartz, pegmatite
Kaolinised granite – worked to depths of 5metres or less
Kaolinised granite – worked to depths of 5metres or more
Fine to coarse-grained biotite-muscovite granite, mainly equigranular with some porphyritic types and minor aplite (Ap)
DEVONIAN – SILURIAN – (?) ORDOVICIAN
Mathinna Beds – mainly siltstones and argillaceous sandstones
NOTE : Major Geology after Graves (1972)
ROYAL GORDON
RUBY FLAT
EL. 28/76
EL. 21/80
EL. 6/78
EL. 19/78
EL. 11/77
GREYS HILLS
23M80 Haggetts
MULLINS
68M72
WALSH'S
BAXHAPS
HILL TOP
MOUNT PARIS MINE
Mt Paris
40M80 Kerrison
NEW HOPE No.2
BELLS PLAINS
1 million cubic yards at 3.2 ozs./cu. yd.
BARNETT LEASE
18M79 Johnson
NEW HOPE No.1
38M80 Brown-Cox
CARNAC
TIN POT
Tin Pot Creek
Cascade R.
COX
BRANXHOLM – STAR OF PEACE – WELDBOROUGH ROAD
BELLS HILL
MAIN LODE
Mt Paris Dam
Dead Horse Hill
To WELDBOROUGH (approx. 5 km)
BROCKS ADIT
MAMMOTH
BALD HILL
RATTLER
Rattler Ck
Moon Ck
77M77 Y.K. Hyde
STAR OF PEACE
RINGAROOMA RIVER
DORSET RIVER
To RINGAROOMA (approx. 13 km)
To BRANXHOLM
Laura Creek
47M77 Johnson
69M78 Lockwood
54M80 Wainwright
5M77 Lockwood-Hodge etc.
LOCALITY
Branxholm
Launceston
HOBART
SCALE
20 chains = 1 inch (approx. 1:15,840)
5 cm
500 250 0 500 1000 metres
5440000 m N
5433000 m N
573000 m E
999011
UNION CORPORATION (AUSTRALIA) PTY LIMITED
GEOLOGY, SAMPLE LOCATIONS & MINERAL LEASES in E.L. 11/77 North East Tasmania
PLAN 1
N.J.W.
October, 1980
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