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ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

EXPLORATION LICENCE 22/85 - SAVAGE RIVER

FINAL REPORT, SUMMARISING EXPLORATION IN THE 1986-1988 PERIOD

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of Australasia Limited
November 1988

1 INTRODUCTION

EL 22/85 in three parts totalling 175 km² (Fig 1), was granted to the Electrolytic Zinc Company of Australasia Limited on 20 November 1985. The two western blocks (Lucy Creek Block and Badger Plains Block) were previously held by Savage Resources as part of EL 4/61. The eastern portion of the EL (Bronzite Hill Block) was previously held by Comstaff as part of EL 1/68.

The EL was acquired principally to investigate the potential for volcanogenic exhalative or vein style gold associated with the mafic volcanics in the Arthur Lineament. Some potential was also perceived for Besshi-style Cu-Zn mineralization in the mafic volcanic sequence, but this was not regarded as an attractive exploration target due to its characteristic low tonnage and low Cu-Zn ratio. Secondary targets were magnesite bodies similar to the known deposits in the area at Main Creek and Savage River, and also alluvial gold deposits. Further details on these exploration targets are given in Mathison (1986).

The following brief relinquishment report summarizes EZ's exploration in the 1986-1988 period.

2 GEOLOGICAL SETTING

The three parts of EL 22/85 cover portions of the Arthur Lineament, a narrow (8-15 km) NNE-SSW trending belt of strongly deformed metamorphosed Proterozoic sediments and subordinate mafic volcanics, which extends for 115 km from Wynyard on the north coast of Tasmania to the vicinity of Granville Harbour on the west coast. It typically comprises variable pelitic and psammitic schists with interbedded extrusive and intrusive basic and ultrabasic metavolcanics (amphibolites and serpentinites). Within the belt the middle greenschist metamorphic grade serves to distinguish it from the adjacent relatively unmetamorphosed less deformed Proterozoic Sequences of the Rocky Cape Group, of shallow water shelf sediments to the west, and the deep water flyschoid sediments of the Burnie Formation to the east.

Due to its regular linear nature and its position on a hinge line between two contrasting sedimentary environments, the lineament is interpreted here as an epicontinental subsiding basin. Within its confines deep seated faults and high heat flow resulted in extrusion of mafic volcanics (amphibolites), intrusion of ultramafics (serpentinites) and basics (gabbro) and the exhalation of volcanogenic Fe mineralization (Savage River Fe, etc). Overall the geological/tectonic setting resembles that of the Besshi-style Cu-Zn deposits.

3 MINING AND EXPLORATION HISTORY

Apart from minor alluvial gold in the Lucy Creek Block and small Ni and Os workings in the Bronzite Hill Block (Appendix 1), the three portions of EL

22/85 contain no mineral occurrences of note and no history of major mining activity.

Previous exploration of the Lucy Creek and Badger Plains Blocks, undertaken by Savage Resources under EL 4/61, was limited to a programme of helicopter-supported drainage sampling and reconnaissance geological mapping in the 1983/84 field season, followed by some soil sampling in the Badgers Plain Block.

Modern systematic exploration of the Bronzite Hill Block dates from the early seventies when Comstaff conducted reconnaissance sampling and mapping. In 1980 a DIGHEM survey with follow-up geochemistry, Max-Min and GENIE EM outlined several anomalies, two of which were proved to be sourced by geochemically anomalous pyritic graphitic shales by DDHs. Details of the Comstaff exploration are summarized in Appendix 1.

4 EXPLORATION UNDERTAKEN BY ELECTROLYTIC ZINC

EZ field work in EL 22/85 was limited to an investigation of the gold and base metal potential of the Lucy Creek Block (Fig 2) in 1986/87. This work, described in Mathison (1986) and Mathison and Ferguson (1987), comprised the following:

- * cutting of access tracks and 1 km-spaced grid lines, together with clearing of creeks and old tracks, as shown in Fig 3;
- * geological mapping of all cut lines and creeks;
- * collection of 270 rock chip samples at 80-100 m intervals on the grid;
- * collection of 30 stream sediment samples;
- * collection of 29 panned concentrate samples;
- * geochemical analyses of all samples for Cu, Pb, Zn, Fe, Mn, Cr, Ni; in addition selected samples were analysed for Ag, Co, Bi, As and Sb;
- * petrological examination of 35 rock samples;
- * microprobe analysis on tourmaline samples by the University of Tasmania;
- * a ground magnetic survey over five lines of the grid.

As reported in Mathison (1987), the geochemical and petrological results of the widely-spaced sampling traverses indicate some potential for base metal mineralization within the Bowry Member of the Battys Bend Formation in the eastern portion of the grid (Fig 3). Lithologically the sequence is interesting, as there is a spatial association of basic volcanics (amphibolites), ironstones, cherty argillites and pyritic magnesite marble, which suggests exhalative activity related to basic volcanism and potential for Cu-Zn mineralization of the Besshi style. This is supported by the geochemical results, which define a number of coincident rock chip anomalies and other individual rock chip Cu, Pb and Zn anomalies, with Cu

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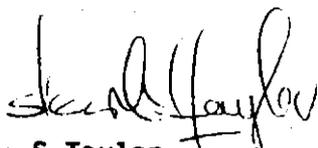
anomalies ranging from 175 to 3,200 ppm, Pb anomalies in the range 75-575 ppm Pb and Zn anomalies 275-525 ppm.

Elsewhere in the western part of the grid a ^{new} member of other Cu, Pb and Zn anomalies were delineated within metasediments and basic volcanics of the Battys Bend formation, but their geological setting appears less prospective than those within the Bowry Member.

The volcanogenic gold potential of the area was, however, downgraded by the general low tenor of the gold rock chip and drainage sample results. The maximum rock chip gold value was only 0.033 ppm, while the stream sediment samples returned a highest value of only 0.025 ppm Au. Among the panned concentrate sample results there were five values between 0.179 and 20.29 ppm Au, but it is suspected that these samples were derived from reworked Tertiary gravel.

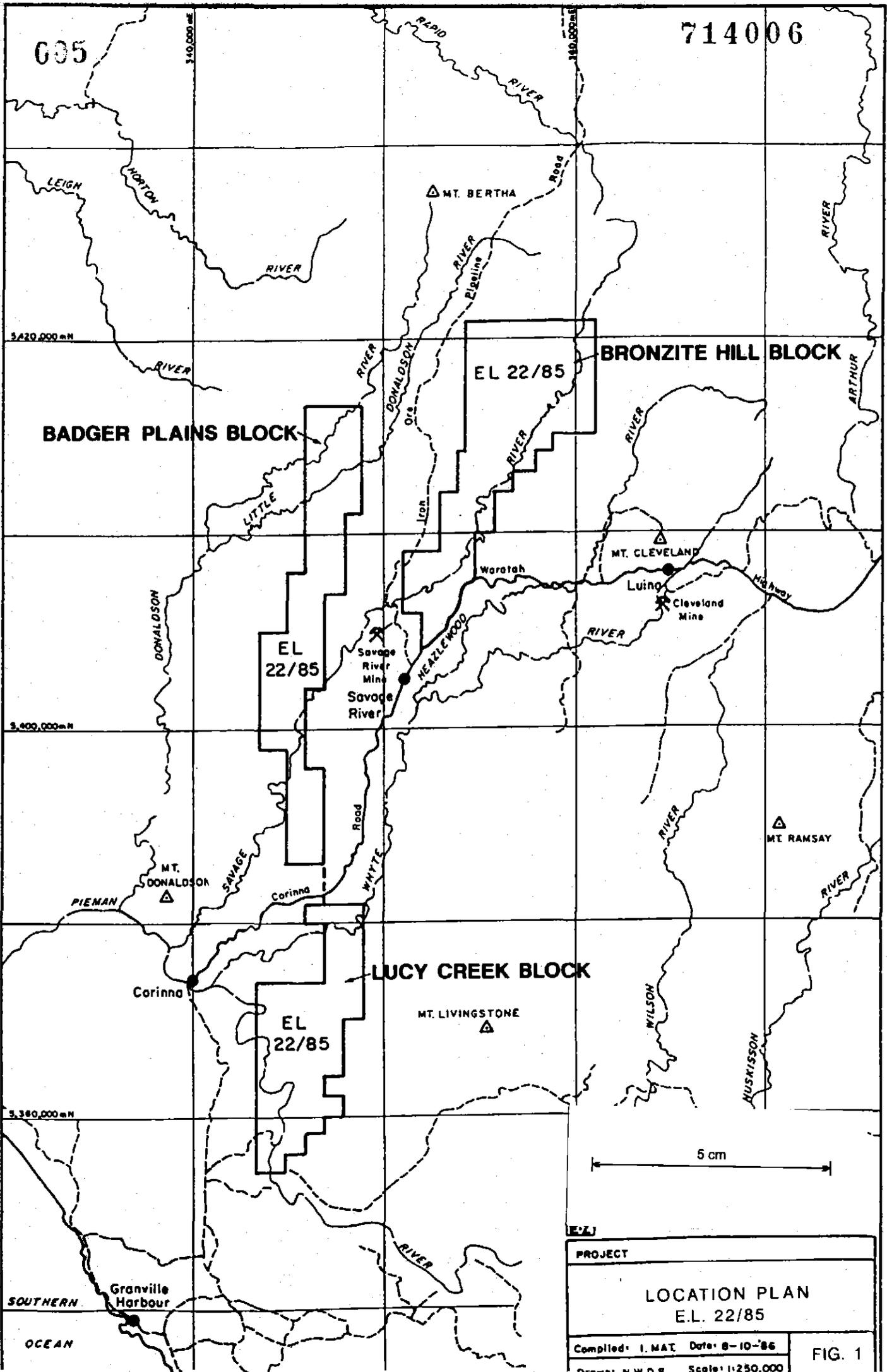
Due to the disappointing gold results, the high exploration costs in this area and the need to divert exploration funds to more promising targets elsewhere, Electrolytic Zinc attempted to attract a farm-in partner to the EL in 1988 to continue exploration for base metals in the Lucy Creek Block and to initiate exploration of the other two blocks.

Following a number of unsuccessful farm-out approaches, and a detailed reassessment of the mineralization potential of the Badgers Plain Block and Bronzite Hill Block (Appendix 1), the decision was taken to relinquish the licence.


S Taylor

REFERENCES

- | | | |
|-------------------------------|------|---|
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| Mathison, I J and Ferguson, N | 1987 | EL 22/85 - Savage River, Annual Report on Exploration Activity, August 1986 to August 1987 |



PROJECT	
LOCATION PLAN E.L. 22/85	
Compiled: I. MAT	Date: 8-10-86
Drawn: N.W.S.	Scale: 1:250,000
FIG. 1	

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340,000m.E.

350,000m.E.

5,400,000m.N.

5,390,000m.N.

5,380,000m.N.

△ The Langbeck

Mount Maradith △

△ Mount Donaldson

Blackguards Hill △

TENTED CAMP

TENTED CAMP

E.L. 22/85

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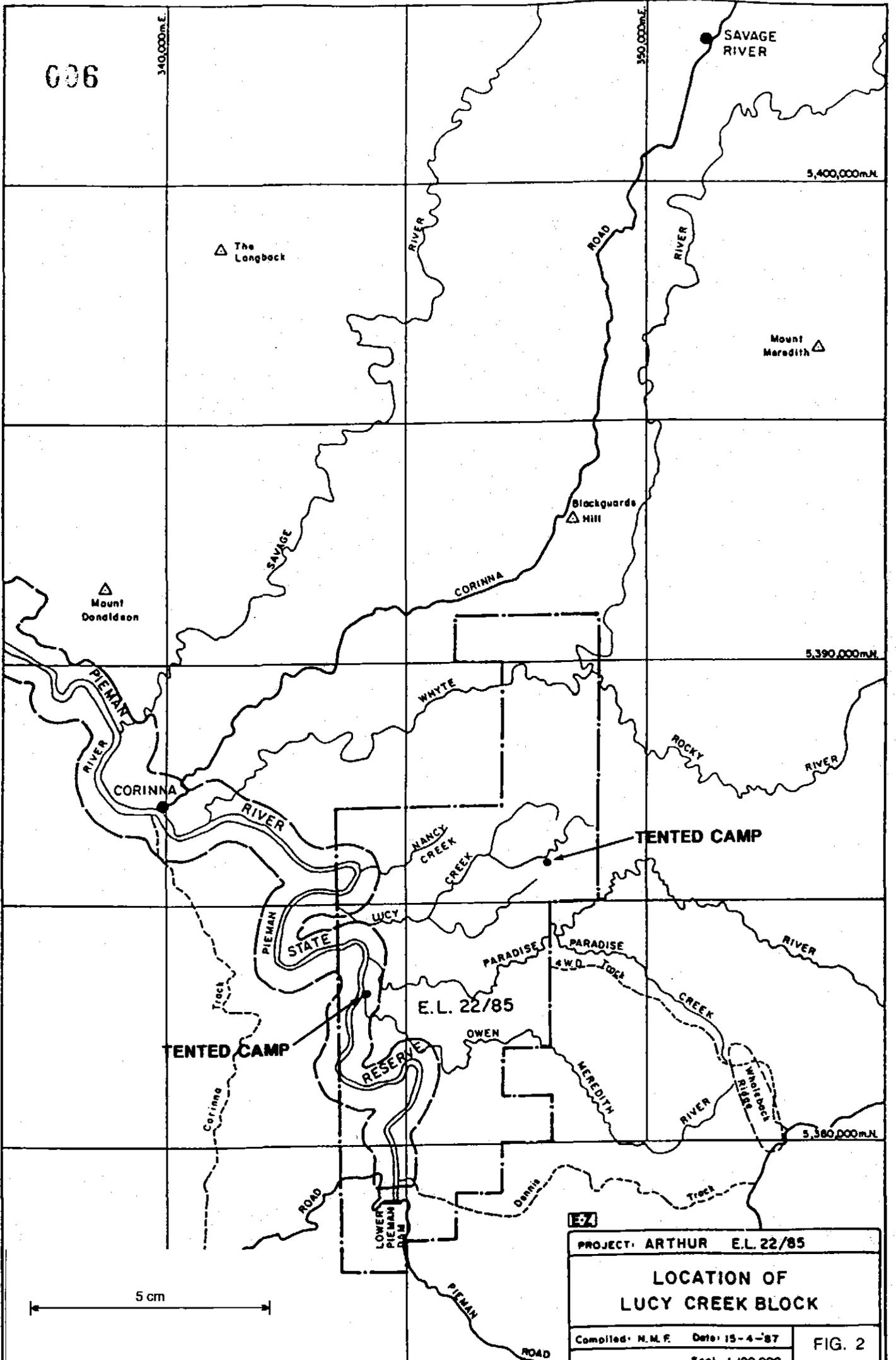
PROJECT: ARTHUR E.L. 22/85

LOCATION OF LUCY CREEK BLOCK

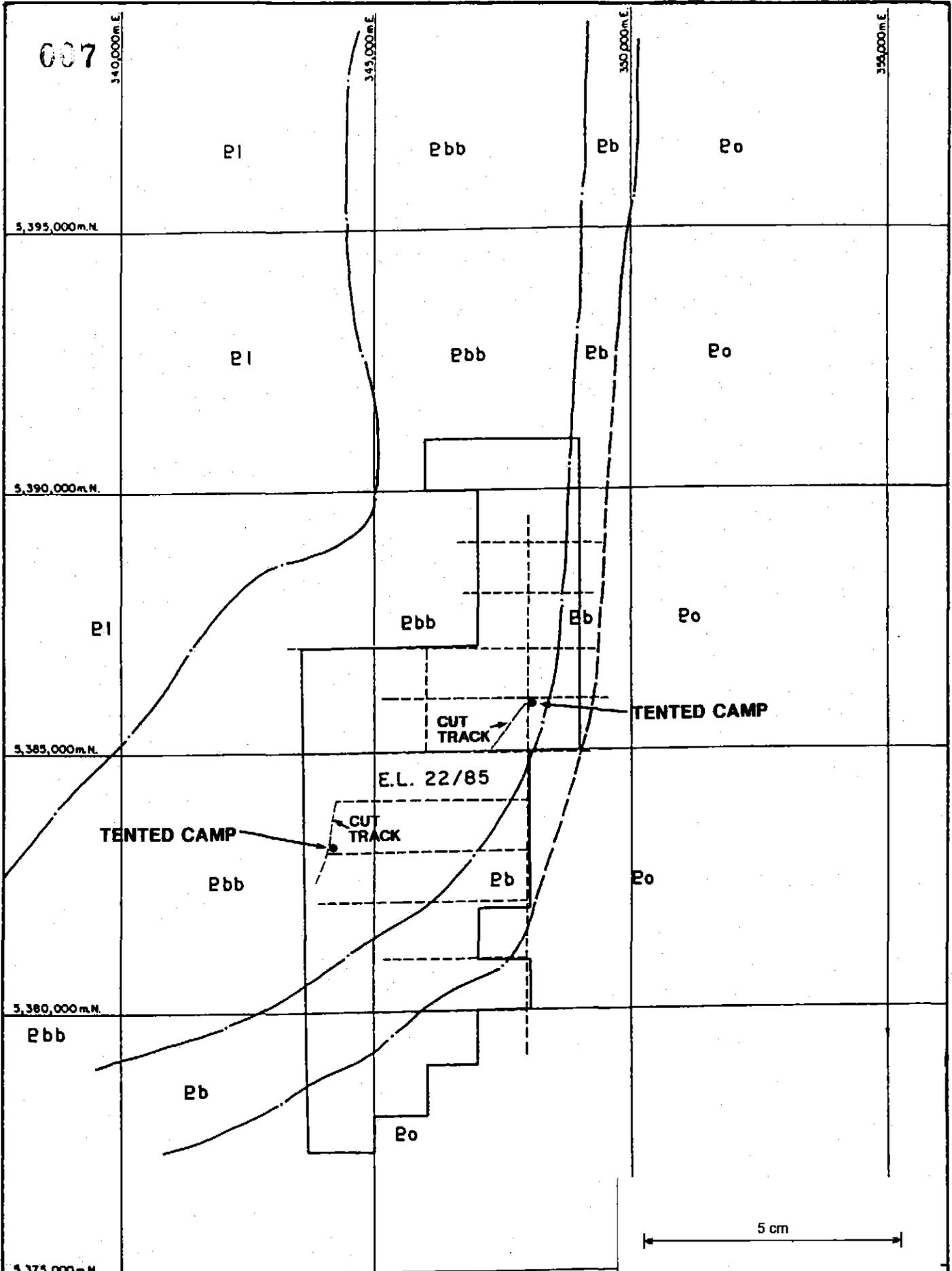
Compiled: N.M.F. Date: 15-4-87

FIG. 2

5 cm



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LEGEND

- Pbb** - Batty Bend Formation.
- Pb** - Bowry Member.
- Eo** - Oonah Formation.
- P1** - Longback Formation.
- Geological Contact.

LUCY CREEK BLOCK

PROJECT: ARTHUR E.L. 22/85

CUT GRID LOCATION & INTERPRETIVE GEOLOGY

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APPENDIX 1

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**SUMMARY OF COMSTAFF EXPLORATION IN
EL 1/68 IN 1968-1985, COVERING
ACTIVITY IN THE BRONZITE HILL
BLOCK OF EL 22/85**

S Taylor

1. INTRODUCTION

E.L.1/68 of 175km² (fig.1) was relinquished by Comstaff on 30.12.84. It was then exempted from the Mining Act on 9.1.85 and became available under the Mines Dept. tender system, the closing date for applications being 1.3.85.

The following report summarises the data on Comstaff's activities in the relinquished ground in the 1968-1985 period. It is based on open file data (table 1) examined at the Tasmanian Mines Dept. on 5th-6th February 1985.

2. E.L. HISTORY

E.L.1/68 originated in February 1968, when it was extracted from Comstaff's E.L.5/63 and declared a separate E.L. with an original area of 570km² (fig. 2). On 4.6.76 it was reduced to its present area of 175km² by the relinquishment of the ground south of the Waratah-Savage River road.

3. GEOLOGY

The geology of E.L.1/68 can be divided into three main components (fig. 3):-

- * Proterozoic metasediments and sediments in the west
- * The Lower Cambrian Crimson Creek Formation of sediments and minor volcanics in the north, central and eastern areas.
- * The Heazlewood Ultramafic Complex in the south.

The salient features of these components are presented below.

Proterozoic

The Proterozoic sediments comprise polyphase folded sequences of quartzose sandstone and siltstone, carbonaceous mudstone, shale and minor dolomite, which outcrop in the central-northern sector of the tenement. To the west these sediments pass gradationally, with increasing metamorphic grade into the Arthur Lineament metasedimentary series, of greenschist facies grade, comprising quartz sericite schists, quartz sericite chlorite schists and minor quartzites and amphibolites.

Lower Cambrian

Unconformably overlying the Proterozoic in the west of the E.L. is the Lower Cambrian Crimson Creek Formation of micaceous sandstone, shale, siliceous mudstone, chert, minor carbonate, spilitic basalt and volcanoclastic lithicwacke.

In the Heazlewood River area Comstaff subdivided this Formation as follows.

* Quartzite-shale Group

Quartzites, siliceous siltstones and shales, representing the early phases of deposition in a geosynclinal trough.

* Mudstone-Greywacke Group

This sequence, which conformably overlies the above group, consists primarily of massive mudstones, fine greywackes and lesser amounts of tuffaceous greywackes and tuffs. Towards its base occurs a laterally discontinuous unit of dolomitic limestone associated with carbonaceous pyritic shales.

In the south-eastern sector of the E.L. and also at the eastern margin of the ultramafic complex, the sequence is dominated by volcanics, comprising massive basalts, pillowed basalts and porphyritic andesites, with subordinate interbedded sandstones, siltstones and cherts.

Heazlewood Ultramafic Complex

The Heazlewood Ultramafic Complex is a partially serpentinised, block faulted, layered and differentiated intrusive, with sheared and deformed marginal zones, comprising a basal tectonised layered dunite sequence, overlain by layered peridotite then pyroxenite-peridotite. Small gabbroic plugs and dyke swarms are common and to the east the ultramafic body is faulted against a large diorite intrusive. The faulted margins of the ultramafic, the absence of a thermal aureole in the surrounding country rocks and the occurrence of ultramafic clasts in Middle Cambrian sediments, suggest that the body is an ophiolite remnant which was tectonically emplaced in Lower to Middle Cambrian times.

4. MINERALIZATION

Within E.L.1/68 the reported occurrences of mineralization are limited to old Ni, Os and Au workings within or adjacent to the Heazlewood Ultramafic Complex. The most significant of these are

* Lord Brassey Workings - Nickel mineralization

(heazlewoodite - pentlandite - zaratite) in NE-trending crush zones and joint planes in the ultrabasics. In the late sixties AMAX failed to locate any significant concentrations at this locality.

* Cowdry's Prospect - sporadically disseminated osmiridium, coated with iron oxide and associated with chromite and magnetite, occurs in a crush zone of talc and serpentinite

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in a trench on the western side of Bald Hill. Some 250 oz Os was produced.

* 19 Mile Creek/Jones Creek - This area contains numerous Os and Au alluvial workings, all of which were of limited volume and were quickly exhausted.

5. COMSTAFF EXPLORATION

Early Comstaff activity in 1968/69 focussed on the ultrabasic nickel potential of the Bald Hill area. In reconnaissance mapping, the ultrabasic was found to be a layered, ESE gently dipping body, comprising pyroxenite overlying serpentinitised dunite with lenses of chromite. To the north the basal layer of the dunite is composed of amphibolite. Exploration comprised the collection of 165 soil samples from 15" depth at intervals of 100' along 4 lines traversing the western slope of Bald Hill to 19 Mile Creek (figs. 4,5). Sampling of the -80 mesh fraction for Cu, Ni, and Co returned anomalous Ni (max. 7000ppm) and Co (max. 1000ppm) over the serpentinitised dunites, but corresponding Cu values were reported to be negligible. Values up to 135ppm Cu were however obtained from samples collected at the base of the hill slope, possibly over the metasediments.

In the 1969/70 field season, follow up work comprised S.P. (line 4 and part of line 3) and magnetometer traverses (line 4), and the collection of six heavy mineral concentrates for assessment of the osmiridium content of the area. On line 3 the SP recorded no anomalies, but over line 4 SP anomalies and non-coincident magnetic anomalies were outlined, some of which corresponded with anomalous Co and Ni values.

The coincident SP/geochemical anomalies were then investigated by trenching in late 1970 with disappointing results. The dunite and serpentinite lithologies uncovered contained Ni values only up to 5900ppm and Co values up to 350ppm, with mean values of 3500ppm Ni and 170ppm Co.

In the late 1970/71 field season, attention turned to a reconnaissance mapping and stream sediment sampling programme in the Savage River and Donaldson River catchment areas (fig. 6), parts of which lie within the adjoining E.L.4/61. Much of this work concentrated on 19 Mile Creek and its tributaries which drain the Bald Hill serpentinite. Throughout these areas, stream sediment samples were collected at 1000' intervals along main streams and 500' intervals along tributaries.

Samples from areas underlain by ultrabasics were analysed for Cu, Ni, Co and Cr, while samples over metasediments were analysed for Ni, Cu, Zn, Ag and Mo. In addition selected samples were analysed for Sn, Pb, As and Hg.

The results of the stream sediment samples are summarised

below

	<u>Range (ppm)</u>	<u>Background (ppm)</u>	<u>Threshold (ppm)</u>
Ni (metasediments)	2-360	10	300
Ni (ultrabasic)	60-3700	500	1000(pyroxenite) 2800(serpentinite)
Co	28-350	100	
Cu	2-100	5	
Cr	Results high with most values >1%		
Ag	<0.2-1.6	<0.2	1.2
Zn	2-230	30	160
Hg	0.02-0.5	0.05	
Pb	2-22		
Sn	6-24		
Mo/As	All samples tested were below the limits of detection.		

Three anomalous areas were outlined (fig. 7) as follows

- * Ag-Zn-Ni, in a north-flowing tributary of the Donaldson River within E.L.4/61 (Group 1)
- * Ni-Co-Cr, in a west flowing tributary of 19 Mile Creek (Group 2)
- * Cu-Co, in a small north-flowing tributary of 19 Mile Creek (Group 3)

In addition panned concentrate samples were taken along the main streams. These samples consisted mainly on iron oxides and rock fragments (chloritic and actinolitic schists and hornfelses) with minor amounts of ilmenite, rutile, zircon and garnet (one sample from the Donaldson River).

In the western part of the "toxic patch" (Fig. 6) 23 soil samples were taken at 100' intervals and subjected to spectrographic scan for several elements. The results, as tabulated below, were disappointing, with no significant values recorded

<u>Element</u>	<u>Range</u>
Ni	5-80
Cu	1-15
Ag	0.1-0.3
Co, W, Mo	below detection limit
Ta, Nb, Be	below detection limit
Zn, Sn, Ag Sb	below detection limit

In the 1971/72 and 1972/73 field seasons, the exploration activity focussed in the eastern half of the E.L., where reconnaissance geological mapping and stream sediment sampling were undertaken in Cambrian sediments of the Heazlewood River area (fig. 8). Overall, 55 stream sediment samples were taken 100' upstream of confluences and at 500'

intervals along streams. The -80 mesh fractions were analysed for Cu, Zn, Ni, Ag and Sn, then any anomalous samples were followed-up by spectrographic scan, as follows

Cu/Zn anomalous	-	Co, Mo, V, W, Au, Pb, Sb, Bi, Cd, As
Ni	"	- Co, P+, Pd, Os, Ir
Sn	"	- V, W, Nb, Ta

Examination of the results showed that metal values of sediments taken from areas of outcrop in the Quartzite/Shale Group (see Geology Section) were of a lower order than values in sediments taken from elsewhere, consequently the samples were divided into two statistical populations as delineated in fig. 9. A summary of these populations is given below

	<u>Element</u>	<u>Range (ppm)</u>	<u>Threshold ppm</u>
Population "A" (274 samples "Quartzite/Shale Group"	(Cu	5-120	30
	(Zn	5-140	75
	(Ni	5-150	55
	(Ag	<1	1
	(Sn	5-15	N.A.
Population "B" (226 samples "Other Rocks"	(Cu	5-160	45
	(Zn	5-310	120
	(Ni	5-400	75
	(Ag	<1	1
	(Sn	0-15	N.A.

The results outlined one major anomaly and several minor anomalies in the Heazlewood area (fig. 9). The major anomaly (Cu-Zn-Ni-Ag-Sn) occurred in two small tributaries into the Heazlewood River near the Lower Heazlewood helipad and in several small tributaries (Tea Creek, Monday Creek etc.) of Friday Creek.

Other smaller scattered anomalies of Cu, Zn and Ni, of lower tenor than the above, were delineated in the eastern, central and north eastern portion of the Heazlewood area.

Two grids, HAB and HAC (fig. 5) were then established over the areas of the most prominent drainage anomalies. In the HAB grid, geological mapping, hand auger sampling and ground magnetics were undertaken, while investigation of the HAC grid involved geological mapping and hand auger sampling.

Geological mapping indicated that the grids consisted of the following

- HAB -
- * Tertiary Basalts in the north
 - * greywackes, mudstones and quartzites in western third of grid, intersected by dunites, serpenites microgabbros and dolerites
 - * andesitic to decitic lavas, volcanic breccias and tuffs overlie the sediments in the central and north-eastern portions

- HAC - * greywackes, mudstones and quartzites occur in the E and SW portion of the grid; they have a higher degree of hornfelsing and silicification than in the HAB grid
- * andesitic to dacitic lavas overlie sediments in the central and western parts of the grid.

In the geochemistry and magnetics no anomalies were outlined. The highest values of Cu, Pb and Zn occurred within the volcanics, while the highest Ni values coincided with the areas of serpentinite.

In 1980 a 1060 line-km DIGHEM survey was flown over the entire E.L. area. From this a total of 15 anomalies were identified for follow-up work, as listed on table 2 and shown on fig. 5. In 1981 to 1983, 13 of these anomalies were investigated by gridding, geological mapping, hand augering, stream sediment sampling, panned concentrates, Max-Min and GENIE EM and ground magnetics, details of which are recorded in Appendix 1. In connection with this work some regional drainage sampling was also undertaken (Appendix 2).

The conclusions of the grid-based work are summarised in table 2. Of the 13 anomalies, 10 were successfully located by ground EM, of which three (19A, 29A and 37B) within the Arthur Lineament were selected for drill testing, based on coincident geochemistry/EM.

Some consideration was also given to drill testing of 57A (within the ultrabasic complex) and 44A (adjacent to the ultrabasic complex in the extreme SE portion of the E.L.), but these were never followed up

Drilling of Anomalies 19A and 29A by HAA-1 (figs. 10,11) and HAA-2 (figs. 12,13), respectively, intersected no significant Cu, Pb, Zn or As values, but succeeded in explaining the EM response as pyritic graphitic slates (HAA-1) and pyritic graphitic phyllite (HAA-2).

As drilling yielded results which could be satisfactorily reconciled with the geophysical/geochemical and geological signatures being tested, and no mineralization nor evidence of mineralizing system existed, no further work was recommended on targets 19A and 29A and plans to drill Anomaly 37B were abandoned.

Following these disappointing results the E.L. was relinquished on 30.12.1984.

APPENDIX 1.

A summary of the ground follow-up work of 13 DIGHEM anomalies is presented below, as follows

- * geology
- * exploration undertaken
- * results
- * Comstaff conclusions/recommendations

ANOMALY 57A

- * Whyte River ultrabasics/basics to S; cherts plus argillaceous sediments in central part of ground; micaceous sandstones and argillites to NW.
- * Gridding; 252 C horizon hand auger samples (every 20m) analysed for Cu, Pb, Zn, Ag, Ni, Sn, 51 stream sediment samples (every 200m) analysed for Cu, Pb, Zn, Ag, Ni, Sn; 3 panned concentrates analysed for Cu, Pb, Zn, Ni, Ag, Cr, As, Au, Sn, W; Max-Min E.M. over whole grid; magnetics over four western lines.
- * No anomalous geochemistry; maximum hand auger values (ppm) were Cu, 124, Pb 23, Zn 216, Ag 0.2, Ni 930, Sn 10; stream sediment peaks were Cu 40, Pb 22, Zn 193, Ag 0.1, Ni 640, Sn 7.

An E.M. conductor was located on the four western lines. This dips steeply (80°) to the south, is of intermediate conductivity and is estimated to be at 20m depth.

A magnetic anomaly of 200nT, possibly reflecting a thin near surface (10m or less) body of near vertical dip, was located 40-70m south of the E.M. conductor.

- * An E.M. conductor is defined within cherts but it is only of intermediate conductivity and does not coincide with a magnetic or geochemical response - Drilling was however recommended. The magnetic anomaly is thought to be related to the contact zone between cherts and basic ultrabasic rocks.

ANOMALY 44A

- * Heazlewood Complex serpentinites, peridotites and gabbros in SE portion; metasediments, basalt and chloritic schist in north of grid at margin of complex.
- * Gridding; 249 hand auger samples (spacing and analysis as in 57A); 26 stream sediment samples (spacing and analysis as in 57A); 4 panned concentrates; Max-Min E.M. and magnetics over whole grid.
- * No anomalous geochemistry; hand auger peaks were Cu 210, Pb 47, Zn 490, Ag 0.3, Ni 5200, Sn 10; max stream sediment values were Cu 49, Pb 23, Zn 870, Ag X, Ni 3400, Sn 5, Au X; very high Cr values (peak 26.5%, mean 15%) occur in the panned concentrates, but no gold was reported.

APPENDIX 1. (Cont.)

Page 2.

An E.M. conductor, of intermediate to good conductivity, was located; it was interpreted to be steeply dipping with its top about 50m below surface.

Large amplitude (300nT) magnetic anomalies occur on the north and south end of all lines.

- * The E.M. conductor, lying within serpentinites, has no supporting magnetic or geochemical anomalism, but as it is thought to lie at 50m depth it may not have produced any surface geochemistry. In the vicinity, ultramafic float carries traces of sulphide (pentlandite) and a concentration of old Os workings occur. Drill-testing was recommended.

The high magnetic trends in the north and south of the grid are attributed to rock layering in the ultrabasics.

ANOMALY 18C

- * Ultrabasics of the Heazlewood Complex.
- * Gridding; 39 stream sediment samples (spacing and analysis as before with additional analysis for gold in 26 samples; 4 panned concentrates; Max-Min E.M.; magnetics.
- * No anomalous geochemistry; Zn assays were generally higher than in other grids but this is thought to reflect higher rock backgrounds; peak stream sediment values were Cu 9, Pb 31, Zn 1020, Ag 0.3, Ni 1400, Sn 5; Cr assays in the panned concentrates were fairly high (peak 9.55%, mean 4.8%).

An E.M. conductor, of low conductivity was outlined, dipping 45°S, within 10m of surface. Another conductor (not detected by DIGHEM) was delineated on the three western lines at a depth of 80m.

- * Soil sampling of the shallow conductor was recommended.
A major magnetic anomaly on the southern end of all lines is thought to be sourced by ultrabasics.

ANOMALY 21G

- * Heazlewood Complex ultrabasics.
- * Gridding; 255 hand auger samples (spacing and analysis as before); 23 stream sediment samples (spacing and analysis as before); 4 panned concentrates; Max-Min E.M.; ground magnetics.
- * No anomalous geochemistry; peak stream values were Cu 25, Pb 23, Zn 780, Ag 0.1, Ni 5000, Sn 25; high Cr values occur in panned concentrates (max. 15.5%, mean 9.9%).

E.M. results do not correlate from line to line due to poor orientation of the grid; one conductor coincides with a (grid) NNE-trending fault which may be the source of the DIGHEM: an E.M. conductor within serpentinitized dunite coincides with DIGHEM ANOMALY 20C.

- * Reorientation of the grid and another Max-Min survey was recommended.

ANOMALY 19C

- * Crimson Creek Formation of cherts, argillites and minor tuffaceous sandstones to the north; Heazlewood Ultramafic Complex to the south.
- * Gridding; hand auger samples/rock chip samples at 20m intervals, analysis for Cu, Pb, Zn, As, Ni, Sn, W; CRONE E.M.; magnetics.
- * A very weak Cu Pb Zn anomaly occurs along the sheared ultramafic/sediment contact; elsewhere results were insignificant.
- * An E.M. conductor was located "at a reasonable depth" but was poorly defined due to noisy C.E.M. and was not supported by significant geochemistry; it occurs within basal sheared dunites of the Heazlewood Ultramafic sequence. No follow-up recommended.

Ground follow-up of Anomalies 19A, 25A, 29A, 37A, 37B, 54A, 59B and 63A involved the following

- * Gridding.
- * Collection of stream sediment samples at 200m intervals along major creeks and tributaries draining the DIGHEM anomalies; analysis for Cu, Pb, Zn, Ag, Ni, As, Sn, W.
- * Collection of panned concentrates upstream from all major stream junctions; analysis for Sn W and Au.
- * Hand auger sampling at 20m intervals; analysis for Cu, Pb, Zn, Ag, Ni, As, Sn and W.
- * GENIE E.M.; readings every 20m on 3 lines 120m apart; coil separation 100m.
- * Ground magnetics.

The results of the grid-based work are summarised below, as follows:

- * Geology.
- * Geochemical/geophysical results.
- * Comstaff conclusions/recommendations.

ANOMALY 19A

- * Lies within a steeply dipping sequence of black slates, siliceous slates and orthoquartzites.
- * An anomalous band of Cu (max. 75 ppm; background 5 ppm), Pb (126; 3), Zn (640; 12), Ag (0.8; X), As (85; 2) and possibly Sn (70; 6) was delineated broadly parallel to strike and coinciding closely with a unit of black carbonaceous pyritic shale.

No magnetic anomalies were located.

APPENDIX 1. (Cont.)

Page 4.

A GENIE conductor was located, of 20m-30m depth and 45°S dip, on all 3 lines coinciding with the anomalous geochemistry.

- * Drill testing was recommended.

ANOMALIES 25A and 29A (Grid 29)

- * Lie within the Arthur Lineament sequence of near-vertical, black carbonaceous pyritic phyllites, siliceous phyllites and amphibolites.
- * No obviously anomalous geochemistry was defined. A strong correlation occurs between high Ni, Cu and Zn values and the mafic units in the grid. Values (ppm) across the phyllites and siltstones are typically Cu (3-4), Pb (3-4), Zn (6-7), Ni (6-8), As (X-1) whereas the mafic units give Cu 20-250, Pb 15-75, Zn 25-250, Ni 20-400, As 4-20.

No prominent magnetic anomalies occur. Irregularities in the magnetic profile can be related to the presence of mafic units.

GENIE defined DIGHEM 29A as a 45°S dipping conductor, parallel to strike, at depth of 33-50m; GENIE did not pick up a response across anomaly 25A.

- * Drill testing was recommended for 29A.

ANOMALIES 37A and 37B (Grid 37)

- * Lie within the Arthur lineament sequence of black phyllites, siliceous phyllites amphibolite and minor siltstone.
- * No anomalous geochemistry; as in 25A and 29A, a strong positive correlation occurs between high Cu Pb Zn and Ni values and the mafic units.

No magnetic anomalies occur.

A GENIE conductor was located, at a depth of 20m on all three lines, corresponding with DIGHEM 37B; the grid was apparently located too far south to pick up DIGHEM 37A.

- * Drill testing was recommended if drilling results in either 19A or 29A were positive.

ANOMALY 54A

- * Lies within quartzites, slately siltstones and minor mafic units.
- * No anomalous geochemistry.

No magnetic anomalies.

A GENIE E.M. conductor crosses all four lines; at a 60°S dip and depth 10-25m, broadly related to a black slate unit.

- * Regarded as a formational response - no further work recommended.

APPENDIX 1. (Cont.)Page 5.ANOMALY 59B

- * Lies within a sequence of orthoquartzites, siliceous slates and carbonaceous slates.
- * No major geochemical anomalies occur. Slightly enhanced Cu (10-30 ppm) Pb (8-15 ppm), Zn (20-50 ppm) and As (10-25 ppm) are associated with black carbonaceous slates.

No magnetic anomalies.

A GENIE E.M. conductor was located on the two western lines, at 60°N and 10m depth, coinciding with a unit of carbonaceous, pyritic slate.

- * Regarded as a formational response - no further work recommended.

ANOMALY 63A

- * Lies within interbedded quartzites, siltstones and slates.
- * No anomalous geochemistry.

No major magnetic anomaly present.

A GENIE E.M. conductor was located on all three lines; at a depth of 20m and near vertical dip.

- * No follow-up recommended due to lack of encouraging geology/geochemistry.

18th February, 1985.

ST/amd

APPENDIX 2.

Regional geochemical follow-up of the DIGHEM anomalies was undertaken in 1982/83 as follows:

PRECAMBRIAN SEDIMENTS

Stream sediment samples were taken at 200m intervals along major creeks and tributaries draining from DIGHEM anomalies 19A, 25A, 29A, 37A, 37B, 54A, 59B and 63A in the area of Precambrian Sediments in the western portion of the E.L.

In this area typical background values were Cu 4-5 ppm, Pb 2-3, Zn 13-14, Ag BLD, Ni 14-15, As 1-2, Sn 2-3, W BLD.

The few anomalous results obtained are as follows:

Turkey Creek

A single sample base metal anomaly occurred, comprising Cu 64, Pb 840, Zn 1120, As 25. This was attributed by Comstaff to a local small vein and was not followed up.

Saga/Compass Creek

A slightly anomalous geochemical region for Cu (27-50 ppm), Zn (70-200 ppm) and Ni (100-150 ppm) occurred around the headwaters of Saga and Compass Creek. This was thought to be due to drainage off the Tertiary Basalt Plateau.

Halls Creek

A small Pb-Zn anomaly (Pb 88, 225 ppm) Zn (86, 250 ppm) occurred near the beginning of Halls Creek adjacent to the fairly sharp eastern boundary of the Arthur Lineament, a possible zone of dislocation. Further follow-up was recommended.

Heavy concentrate samples taken upstream from all major stream junctions in the Precambrian drainage area were all low in Sn, W and Au, the only three elements analysed.

CAMBRIAN SEDIMENTS

Heavy concentrate samples collected at 200m intervals along 19 Mile Creek and Leo's Creek and at 100m intervals along Jones Creek were all low in Sn, Au, Pt and Pd.

Stream sediment samples collected at 100m intervals in creeks draining west into Savage River gave no anomalous results in Ni, Cu, Zn, Pb, As, Sn and Au.

18th February, 1985

ST/amd

Tas. Dept. of Mines
Open File No.

Title/Author/Date

69-590	E.L. 1/68 Review of Summer Exploration Programme 1968/69/?/?.
70-709	Review of 1969/70 Summer Exploration Programme E.L. 1/68, Tasmania/?/?.
71-721	Espea and Bald Hill Areas, E.L. 1/68, Winter 1970/ H.R. Robison/Jan, 1971
71-803	Mt. Stewart Drilling E.L. 1/68/M.P. Everett/Sept. 1971
71-815	Drill Holes Mt. Jasper Grid/?/?.
71-838	E.L. 1/68 1970-71 Summer Field Season Report/T. Chisholm and D Henry/?.
73-960	E.L. 1/68, E.L. 5/63 Regional Exploration Heazlewood and Arthur River, 1972/73 Summer Field Season Report/ W. Herrmann/June, 1973.
80-1438	E.L. 1/68 Report on grids HAB and HAC in the Heazlewood area/G.F.A. Washausen/Feb. 1980.
80-1500	Report Accompanying Licence Renewal Application for Exploration Licence 1/68, Tasmania/G.F. Pigott/Nov. 1980.
81-1605	Report Accompanying Licence Renewal Application for E.L. 1/68 Tasmania/G.F. Pigott/May, 1981.
83-1907	Interim Report on Heazlewood Grid 19C, E.L. 1/68/ C.M. Jones/Nov. 1982.
83-1908	Progress Report on the Regional Exploration of E.L. 1/68/ G.F. Pigott/Nov. 1982.
83-1909	Annual Report to the Dept. of Mines, Tas, for the period 1 January - 31 December, 1982/G.F. Pigott/?.
83-2060	E.L. 1/68 Interim Report on the Heazlewood Project/ R.H. Roberts/Nov. 1983.
85-2316	Final Report E.L. 1/68 Heazlewood/R.W.L. Shaw/Aug. 1984.

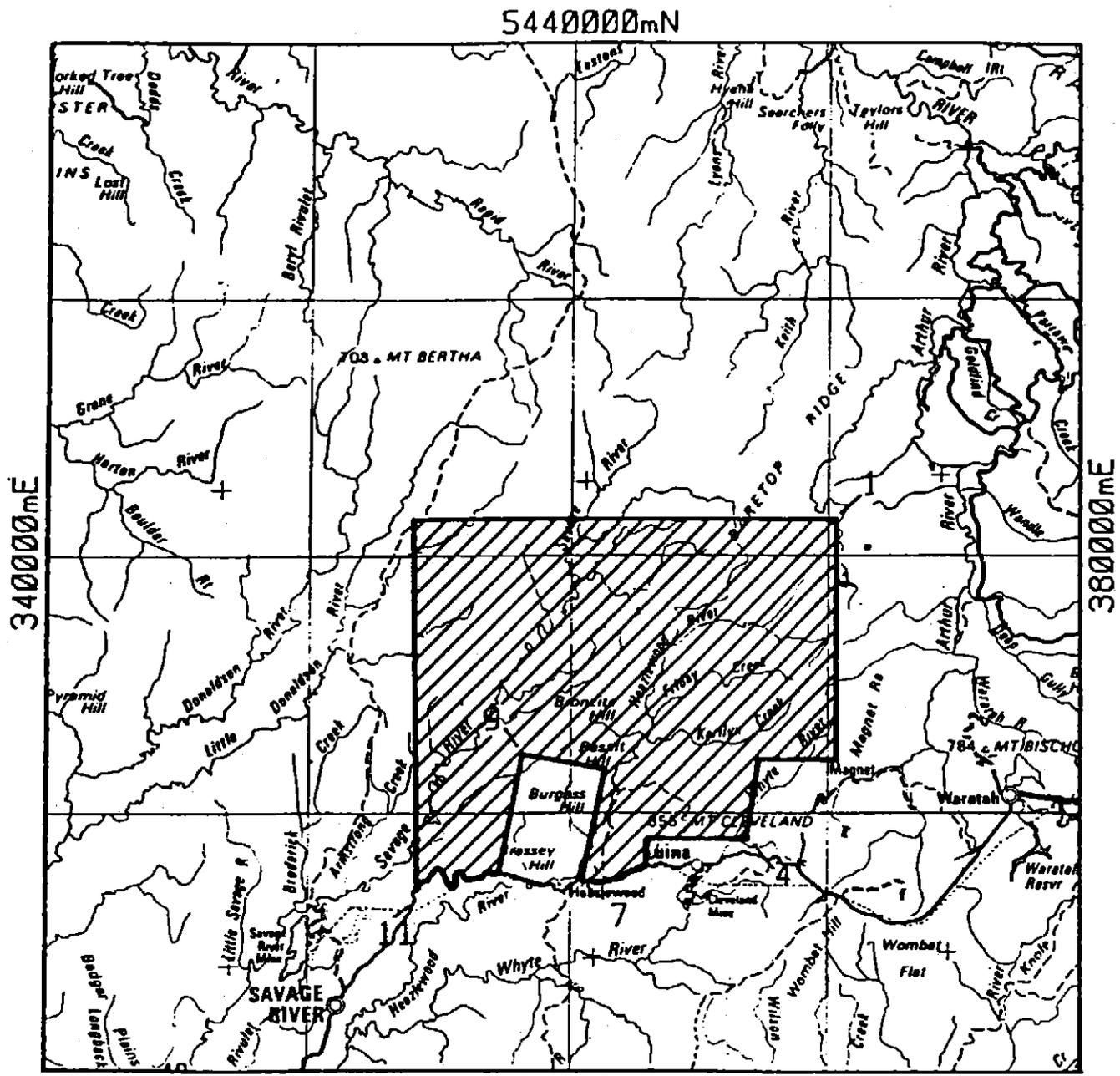
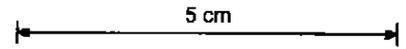
COMSTAFF OPEN-FILE REPORTS EXAMINED AT TASMANIAN MINES DEPT.,
 HOBART ON 5TH - 6TH FEBRUARY, 1985.

Table 1.

<u>Anomaly</u>	<u>Lithology</u>	<u>Located by Ground E.M. -Depth</u>	<u>Anomalous Geochemistry</u>	<u>Comstaff Conclusion</u>
5A	Not followed-up			
18C	Ultrabasics	/ 10m	Nil	Soil sampling recommended
19A	Slates quartzites of Arthur Lineament	/ 20-30m	Cu,Pn,Zn,Ag, As	Tested by DDH HAA-1; response due to pyritic, graphitic slates.
19C	Ultrabasic/sed. contact	/ "reasonable depth"	Weak Cu,Pb,Zn at contact	No follow-up
21G	Ultrabasics	No - grid poorly orientated	Nil	Reorientation of grid & new Max-Min survey recommended
25A	Phyllites, amphibolites of Arthur Lineament	No	Nil	No follow-up
29A	Phyllites, amphibolites of Arthur Lineament	/ 33-50m	Nil	Tested by DDH HAA-2; response due to pyritic, graphitic phyllite
37A	Phyllites, amphibolites of Arthur Lineament	No - grid too far south	Nil	No follow-up
37B	Phyllites, amphibolites of Arthur Lineament	/ 20m	Nil	Drill testing recommended if 19A or 29A positive
44A	Serpentinite	/ 50m		Drilling recommended
45	Not followed-up			
54A	Proterozoic quartzites, siltstones	/ 10-25m	Nil	Regarded as form- ational response due to black slate
57A	Ultrabasic/seds.	/ 10m	Nil	Drilling recommended
59B	Proterozoic quartzite, slates	/ 10m	Nil	Regarded as a formational response due to black slate.
63A	Quartzites, siltstones, slates	/ 20m	Nil	No follow-up recommended due to weak geochemistry.

SUMMARY OF DIGHEM FOLLOW-UP RESULTS

Table 2.

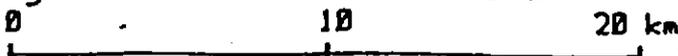


1.	370215mE	5421530mN	2.	370215mE	5412125mN
3.	367215mE	5412125mN	4.	366800mE	5409000mN
5.	363000mE	5409000mN	6.	363000mE	5407920mN
7.	360620mE	5407350mN	8.	361450mE	5411730mN
9.	358280mE	5412320mN	10.	357410mE	5407640mN

BRONZITE HILL EXEMPT AREA - 175 SKM.

(Formerly E.L. 1/68 - Minerals)

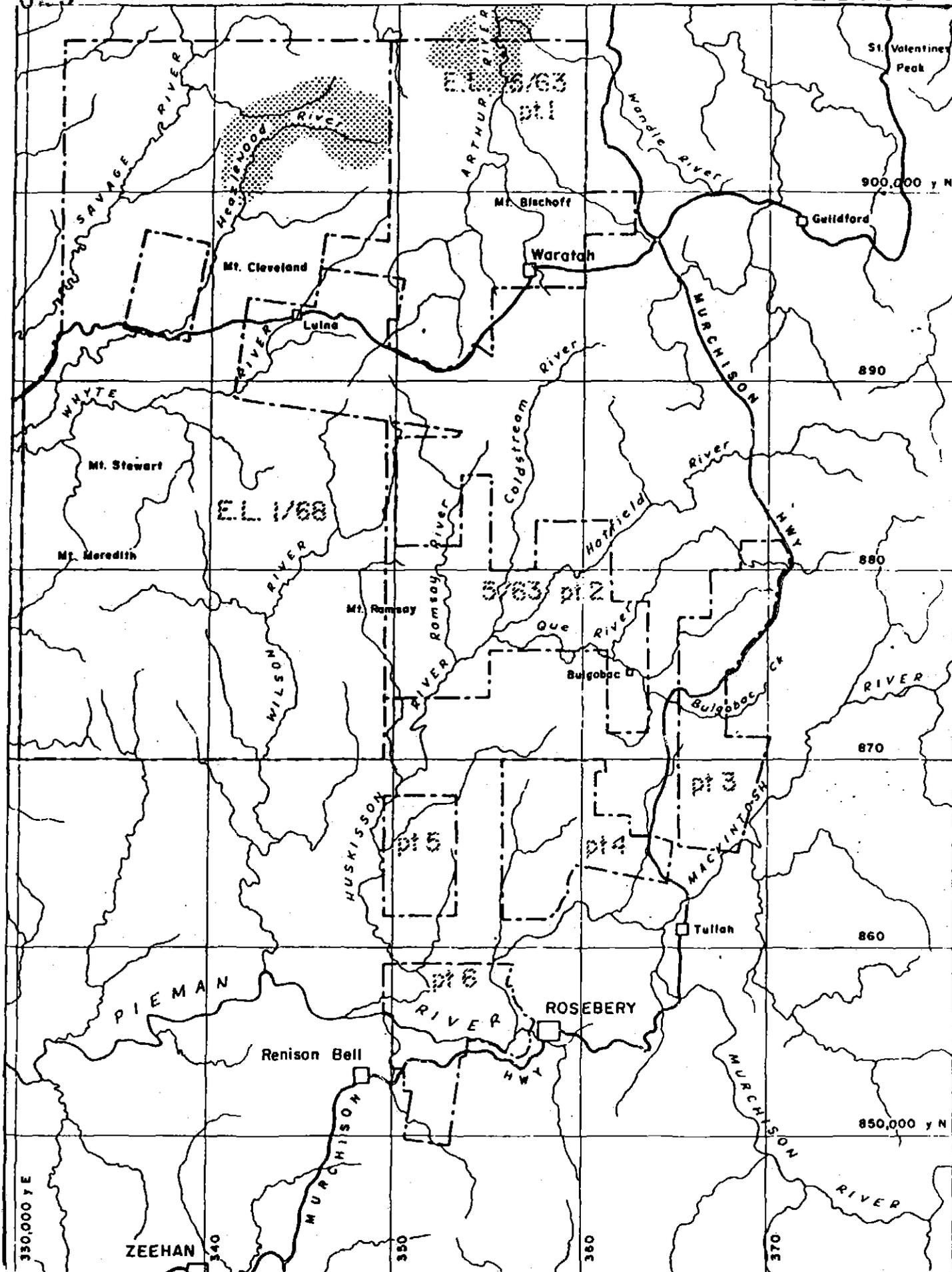
Scale 1:250000



DEPARTMENT OF MINES TASMANIA

07-01-1985

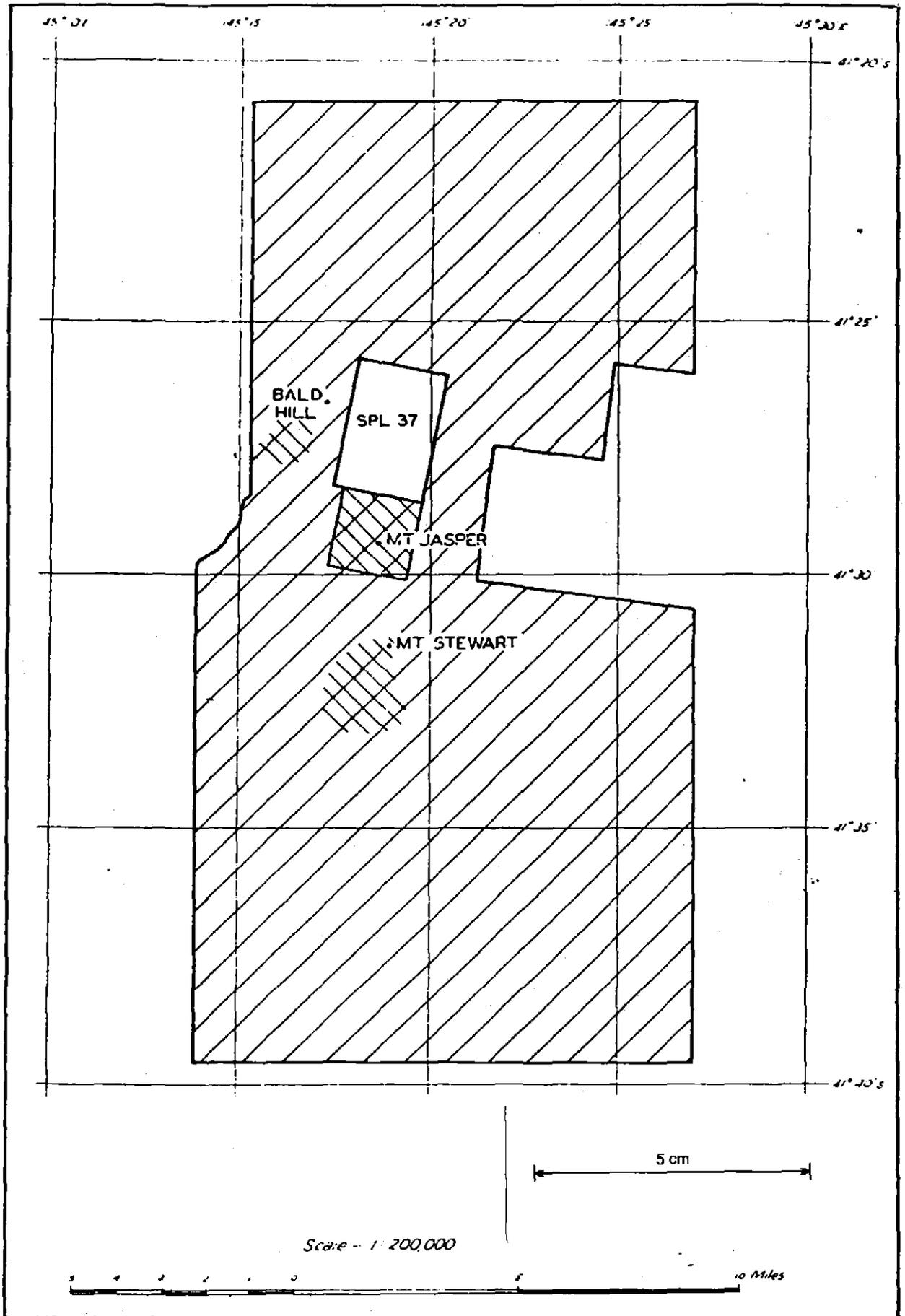
P. 414



LOCATION OF ORIGINAL E.L. 1/68 OF 175km²

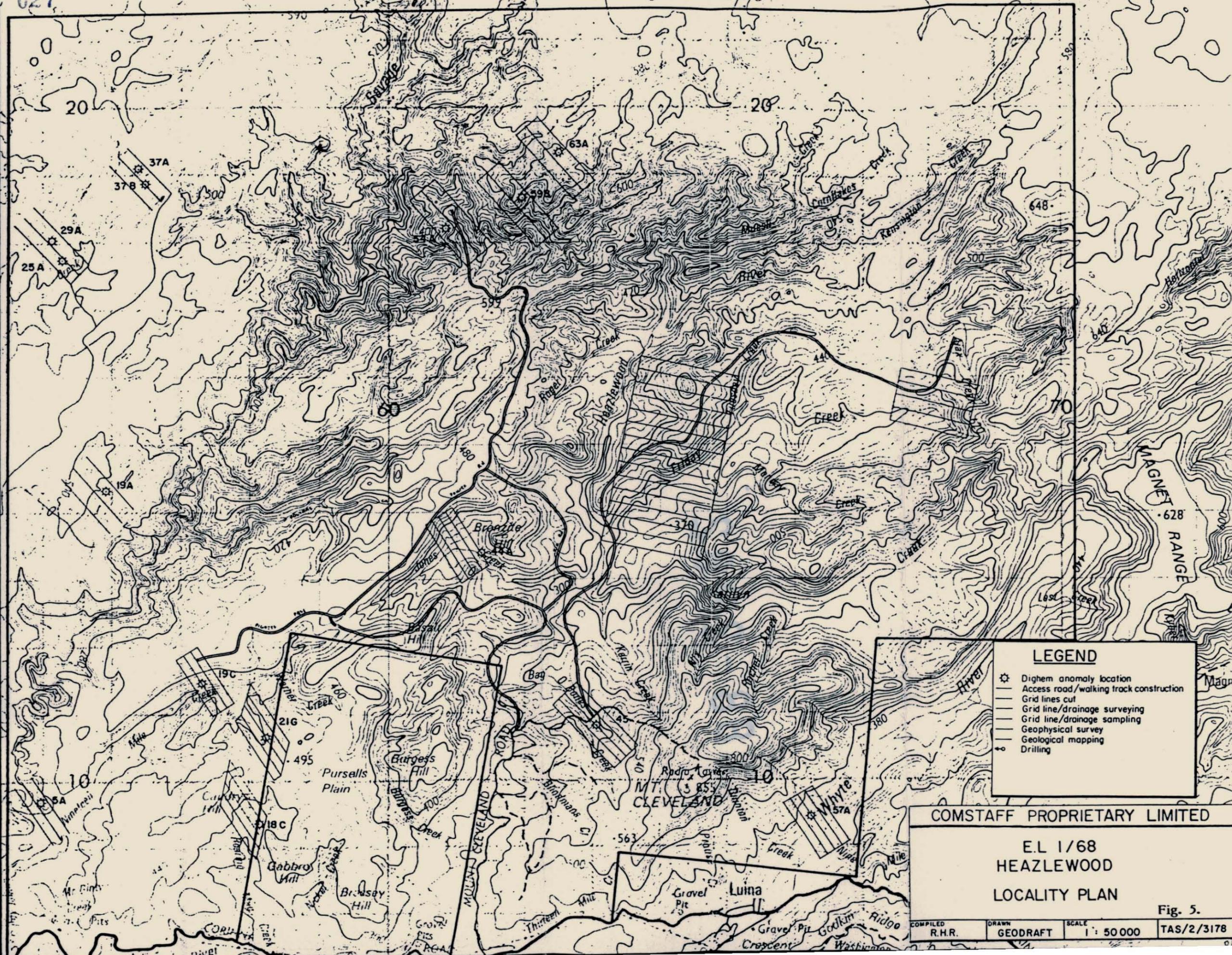
Fig. 2.

026



LOCATION OF BALD HILL GRID

Fig. 4.



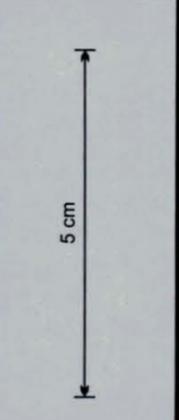
LEGEND

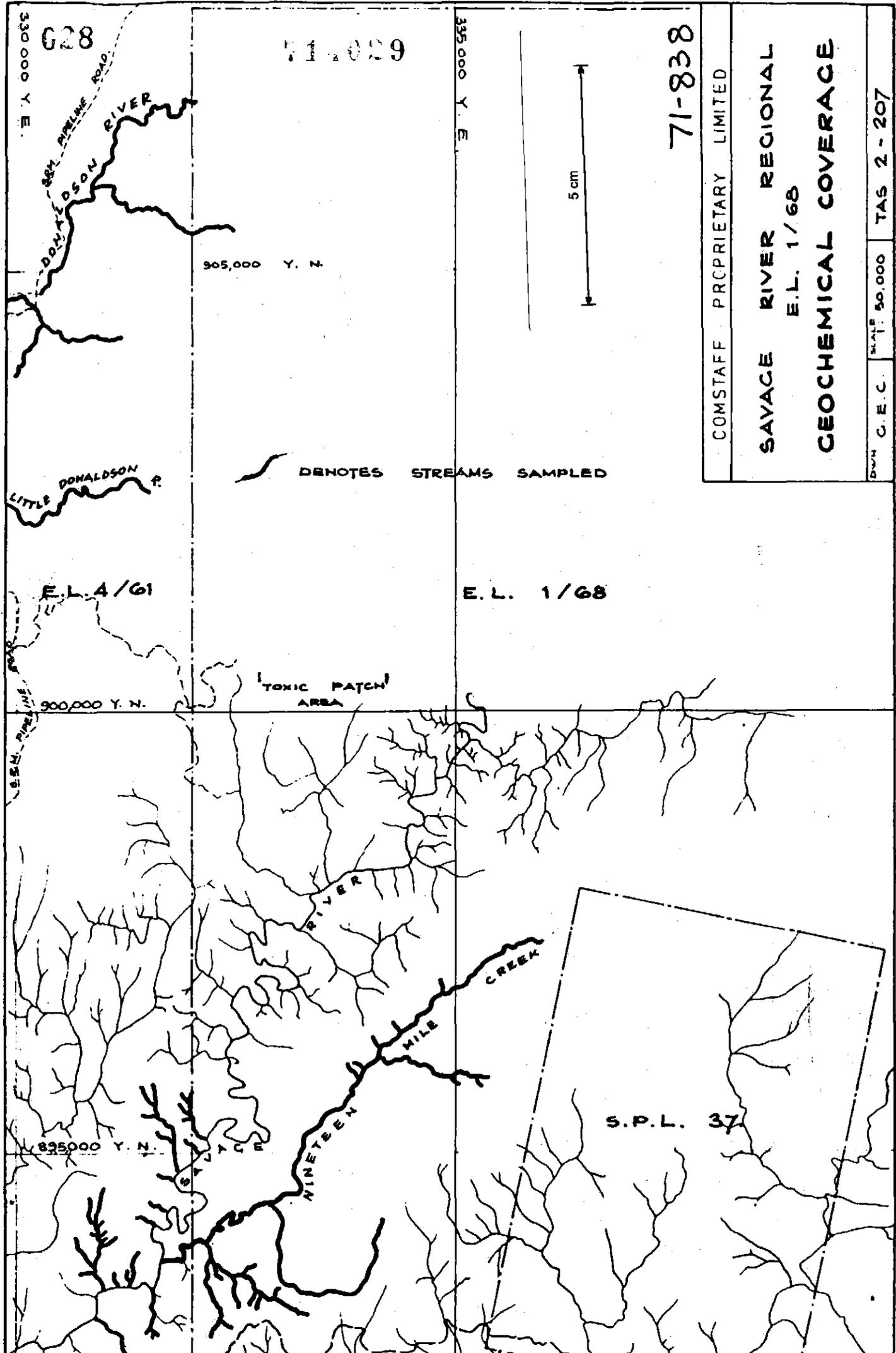
- ⊛ Digheam anomaly location
- Access road/walking track construction
- Grid lines cut
- Grid line/drainage surveying
- Grid line/drainage sampling
- Geophysical survey
- Geological mapping
- Drilling

COMSTAFF PROPRIETARY LIMITED

EL 1/68
HEAZLEWOOD
LOCALITY PLAN

COMPILED R.H.R.	DRAWN GEODRAFT	SCALE 1 : 50 000	Fig. 5. TAS/2/3178
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COMSTAFF PROPRIETARY LIMITED

SAVAGE RIVER REGIONAL
GEOCHEMICAL COVERAGE

E.L. 1/68

Scale 50,000

TAS 2 - 207

71-838

71-029

G28

WAVY LINE DENOTES STREAMS SAMPLED

5 cm

E.L. 4/61

E.L. 1/68

TOXIC PATCH AREA

S.P.L. 37

330,000 Y. E.

335,000 Y. E.

905,000 Y. N.

900,000 Y. N.

825,000 Y. N.

G29

71-838

71-838

COMSTAFF PROPRIETARY LIMITED

SAVAGE RIVER REGIONAL
E.L. 1 / 68

GEOCHEMICAL ANOMALIES

DWN G. E. C. SCALE 1: 50,000 TAS. 2 - 208

3000 Y. E.

3000 Y. E.

805,000 Y. N.

900,000 Y. N.

835,000 Y. N.

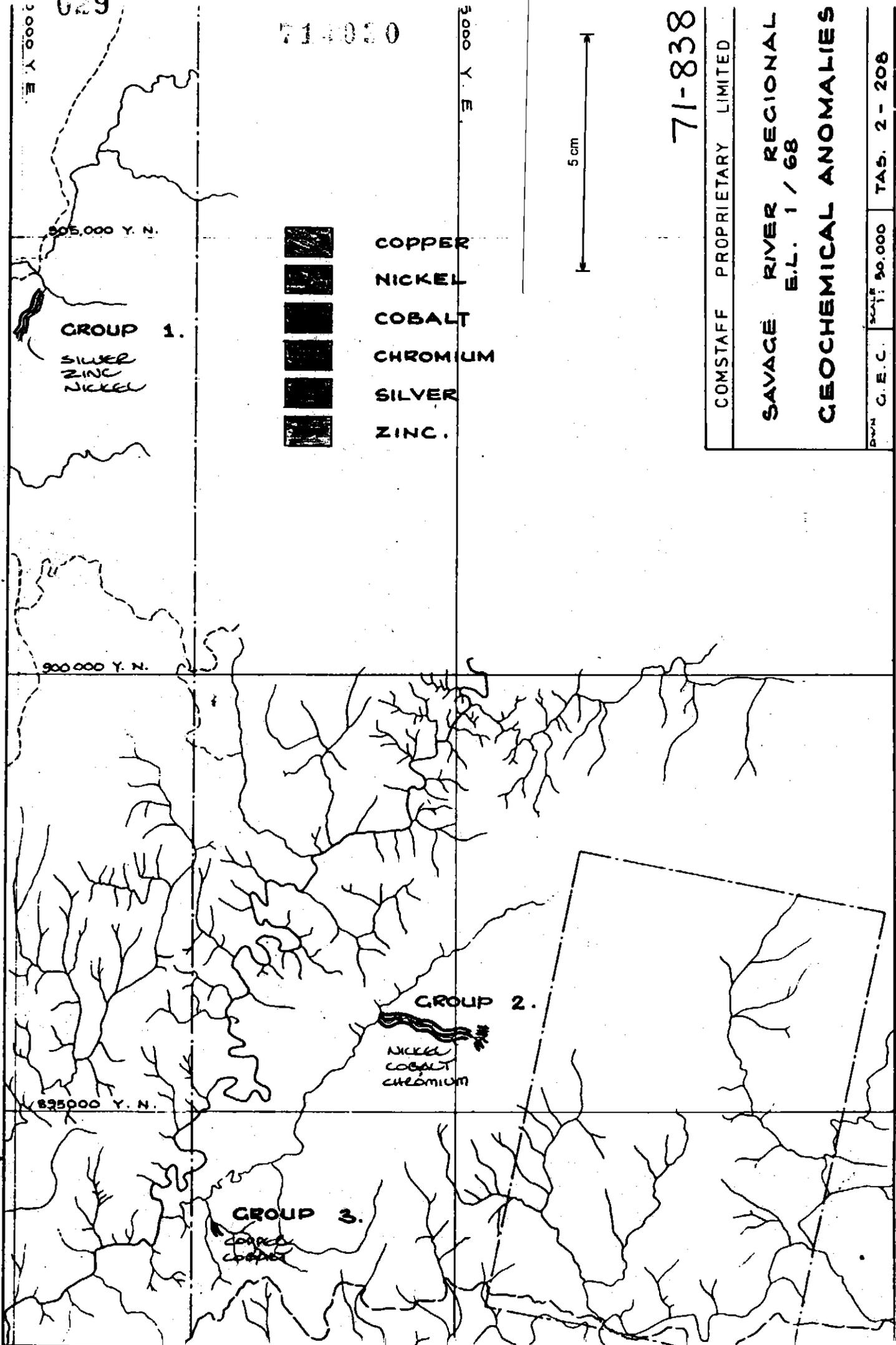
GROUP 1.
SILVER
ZINC
NICKEL

-  COPPER
-  NICKEL
-  COBALT
-  CHROMIUM
-  SILVER
-  ZINC.



GROUP 2.
NICKEL
COBALT
CHROMIUM

GROUP 3.
COPPER
COBALT



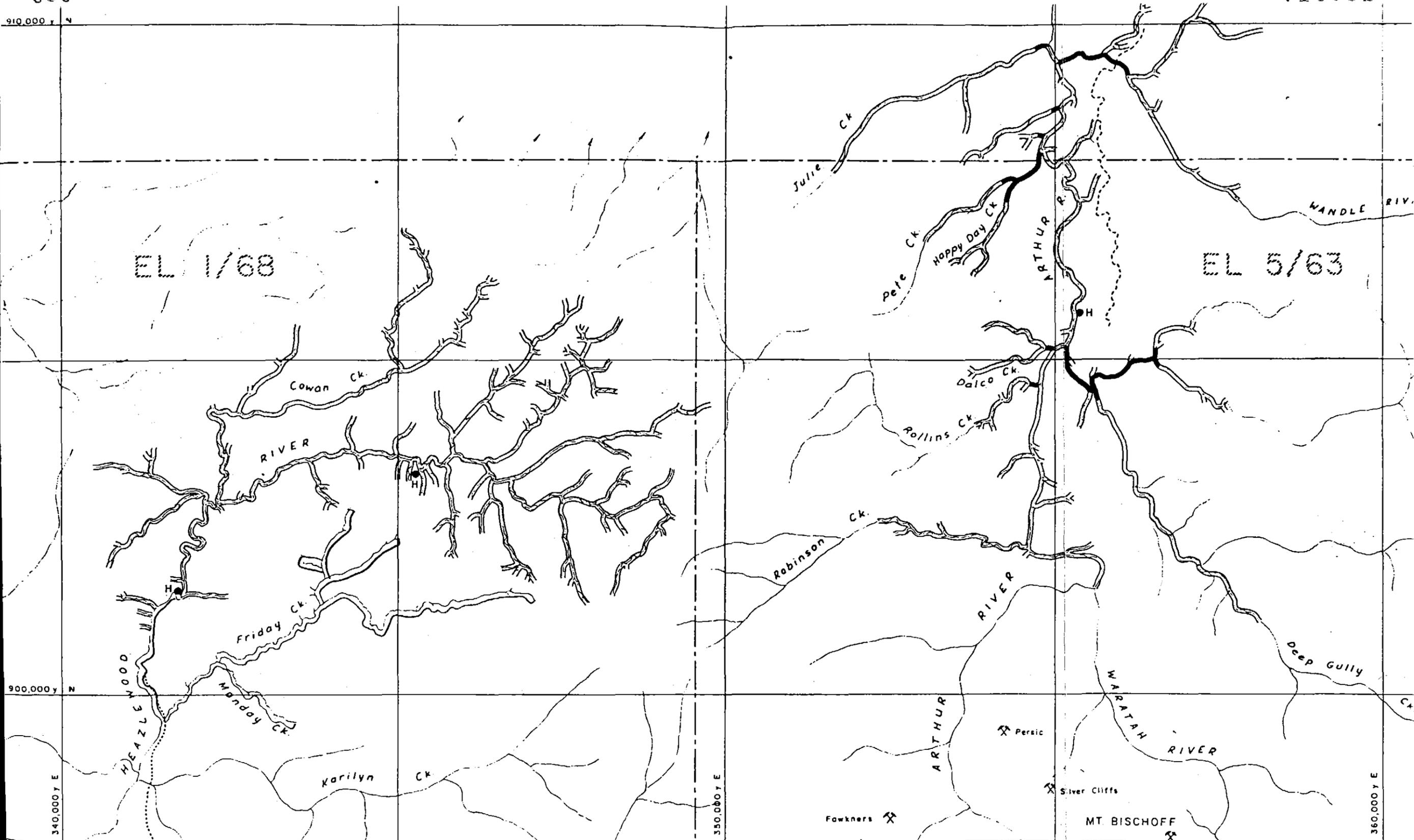
910,000 x

900,000 y N

340,000 y E

350,000 y E

360,000 y E



LEGEND

- E.L. boundary
- Road or track
- Foot track
- Mine or workings
- Creek sampled 1972/73
- Creek sampled, including heavy concentrator
- Helicopter landing pad

5 cm

Fig. 8.

COMSTAFF PROPRIETARY LIMITED
 HEAZLEWOOD R. & ARTHUR R. AREA
 1972/73 SUMMER SEASON REPORT
 AREAS COVERED

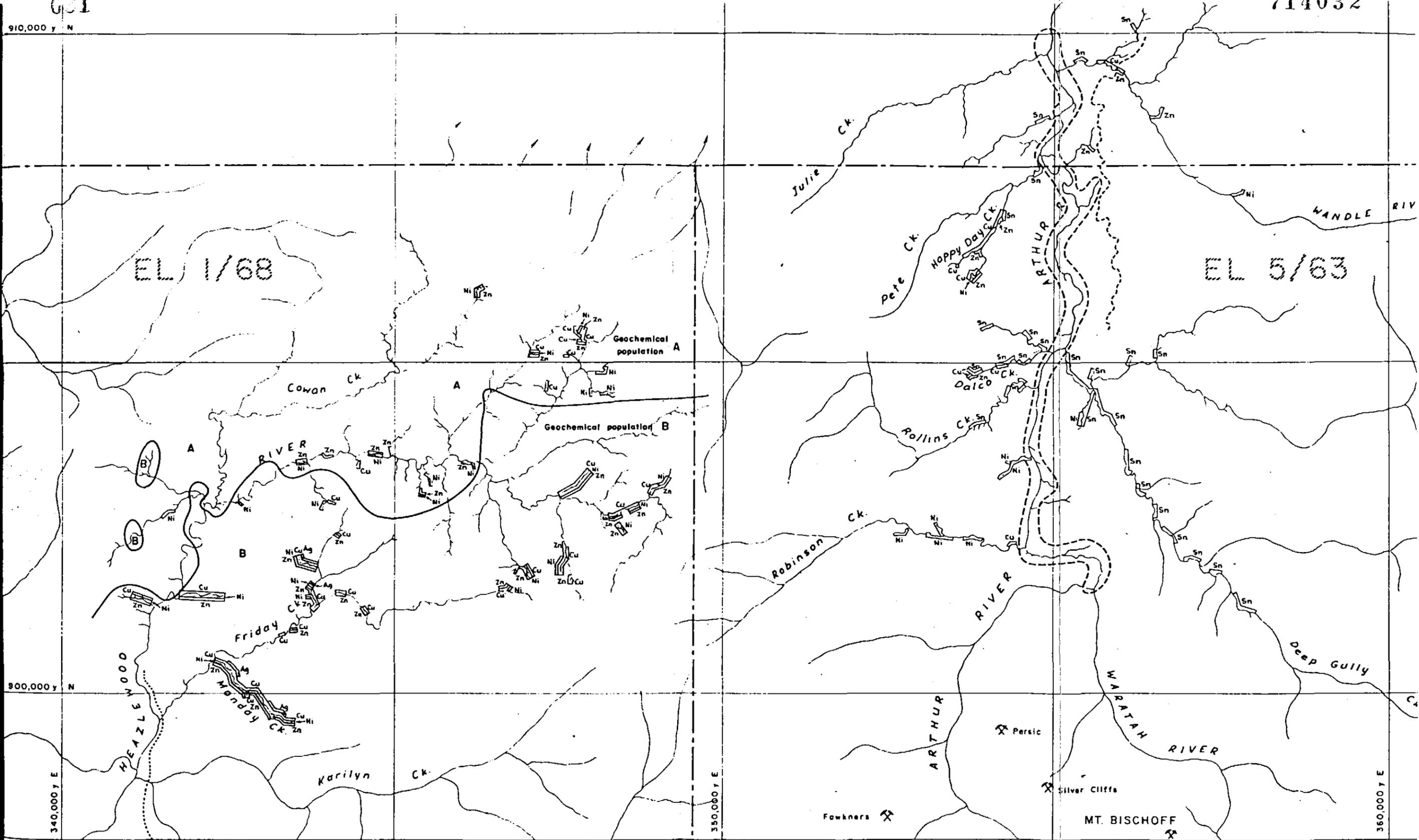
910,000 y N

900,000 y N

340,000 y E

350,000 y E

360,000 y E



LEGEND

GEOCHEMICAL ANOMALIES

- Cu Copper
- Zn Zinc
- Ni Nickel
- Sn Tin
- Ag Silver

- Theoretical limit of contamination.
- Approximate boundary between geochemical populations A and B in the Heazlewood area.

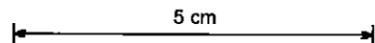


Fig. 9.

COMSTAFF PROPRIETARY LIMITE

HEAZLEWOOD R. & ARTHUR R. AREA

1972/73 SUMMER SEASON REPORT

1:50000

STREAM SED. GEOCHEMICAL ANOMALIE

632

714033

AUSTRALIAN AND AMERICAN MINING

Page 1
of

DRILLHOLE LOG

LOCAL CO-ORDS

GRD 19A L1000E/1120N

Summary Sheet

PROJECT EL 1/68

AREA HEAZLEWOOD (SAVAGE RIVER)

DRILLHOLE TYPE

DIAMOND

CO-ORDS E 365920
N 5414050

DECLIN 46.5. AZIMUTH 325 M.N RL 460

DH
No. HAA-1

DATE COMMENCED 1/2/84

DATE COMPLETED 4/2/84

DRILLED BY OVERLAND

DRILL RIG SCOUT W-250

Non Coring to: 20

HQ Core to: —

NQ Core to: 102.5

BQ Core to:

EOH-102.5

SURVEY DATA

Instrument:

DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	
0	46.5		325 M.N				
101	47.5		319 M.N				

LOG SUMMARY

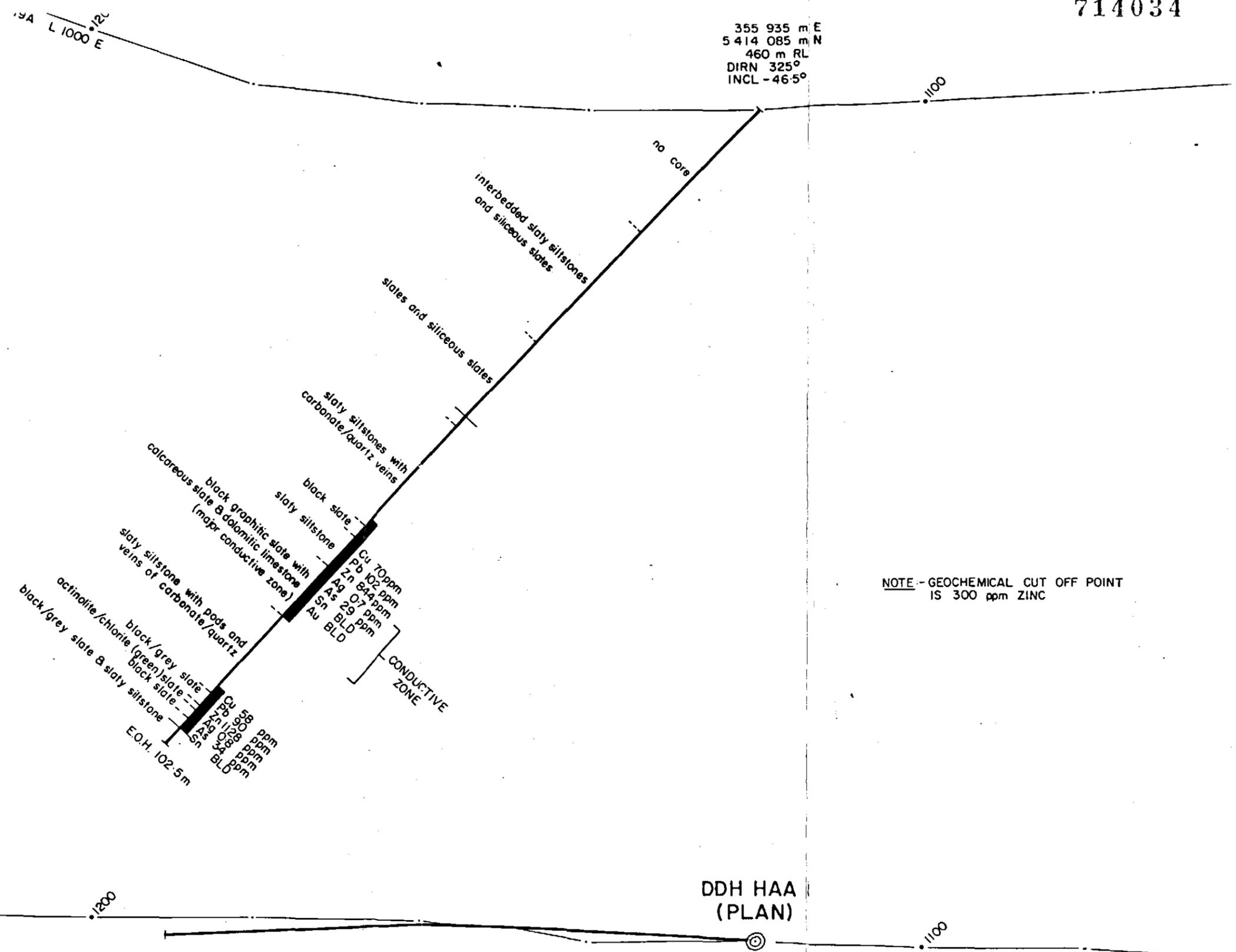
ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
0-20M: Rock roller - NO CORE			
20-38M: Interbedded slaty siltstones and siliceous slates	32.7 - 34	Minor pyrite patches & disseminations	
38-51.75: Slates and siliceous slates	51.5	Minor pyrite (syngenetic)	
51.75-67.6: Slaty siltstones - with CO ₂ /QTZ veins			
67.6-69.3 Black slate	67.6-69.3	Fine-grained disseminated pyrite.	
69.3-74 Slaty siltstone			
74-82 Black graphitic slate with calcareous shale and dolomitic limestone (major conductive zone)	74-82	Pyrite-rich zone 1-2% Av.	
74-75.7: Black slate with CO ₂ veins	74-75	Veins of coarse pyrite (1-2mm)	
75.7-76.8: Calcareous slate	75.7-76.8	Thin pyrite layers parallel to bedding	
76.8-77.2 Dolomitic limestone	76.8-77.2	Patches of massive pyrite	
77.2-77.4 Calcareous slate	77.2-77.4	Thin pyrite layers.	
77.4-77.5 Black slate			
(77.5-80) NO CORE			
80-82 Black slate	80-82	Minor disseminated pyrite	
82-94.6 Slaty siltstone ± pods and veins of CO ₂ /QTZ.			
94.6-96.4 Black/grey slate	94.6-96.4	Pyrite-rich lenses	
96.4-97.2 Actinolite - chlorite (green) slate			
97.2-98.5 Black slate	97.2-98.5	Disseminated pyrite and pyrite-rich layers	
98.5-102.5 Black/grey slate and slaty siltst.	98.5-102.5	Pyritic layers	
E.O.H.			

Signature

Date

Fig. 10.

355 935 m E
5 414 085 m N
460 m RL
DIRN 325°
INCL -46.5°



NOTE - GEOCHEMICAL CUT OFF POINT IS 300 ppm ZINC

DDH HAA
(PLAN)

Fig. 11.

COMSTAFF PROPRIETARY LIMITED			
HEAZLEWOOD GRID - 19A			
SECTION OF DRILLHOLE DDH HAA			
GEOLOGICAL DETAILS			
COMPILED R. H. ROBERTS	DRAWN R. H. ROBERTS	DATE 12/7/84	AMENDED
LEASE No EL 1/68	AREA	SCALE 1:500	PLAN No TAS/2/40

Summary Sheet

PROJECT	EL 1/68	AREA	HEAZLEWOOD (SAVAGE RIVER)	DRILLHOLE TYPE	Diamond
CO-ORDS	DECL ^{LN} -45.5° AZIMUTH 320° MN RL			DH No.	HAA-2
DATE COMMENCED	7/2 '84	DATE COMPLETED	11/2 '84	DRILLED BY	OVERLAND
Non Coring to: 0-7m				DRILL RIG	Scout W-250
HQ Core to: 29.6m		NQ Core to: 99m		EQ Core to: EOH 99m	

SURVEY DATA				Instrument:			
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	
99	-43	-	316° MN				

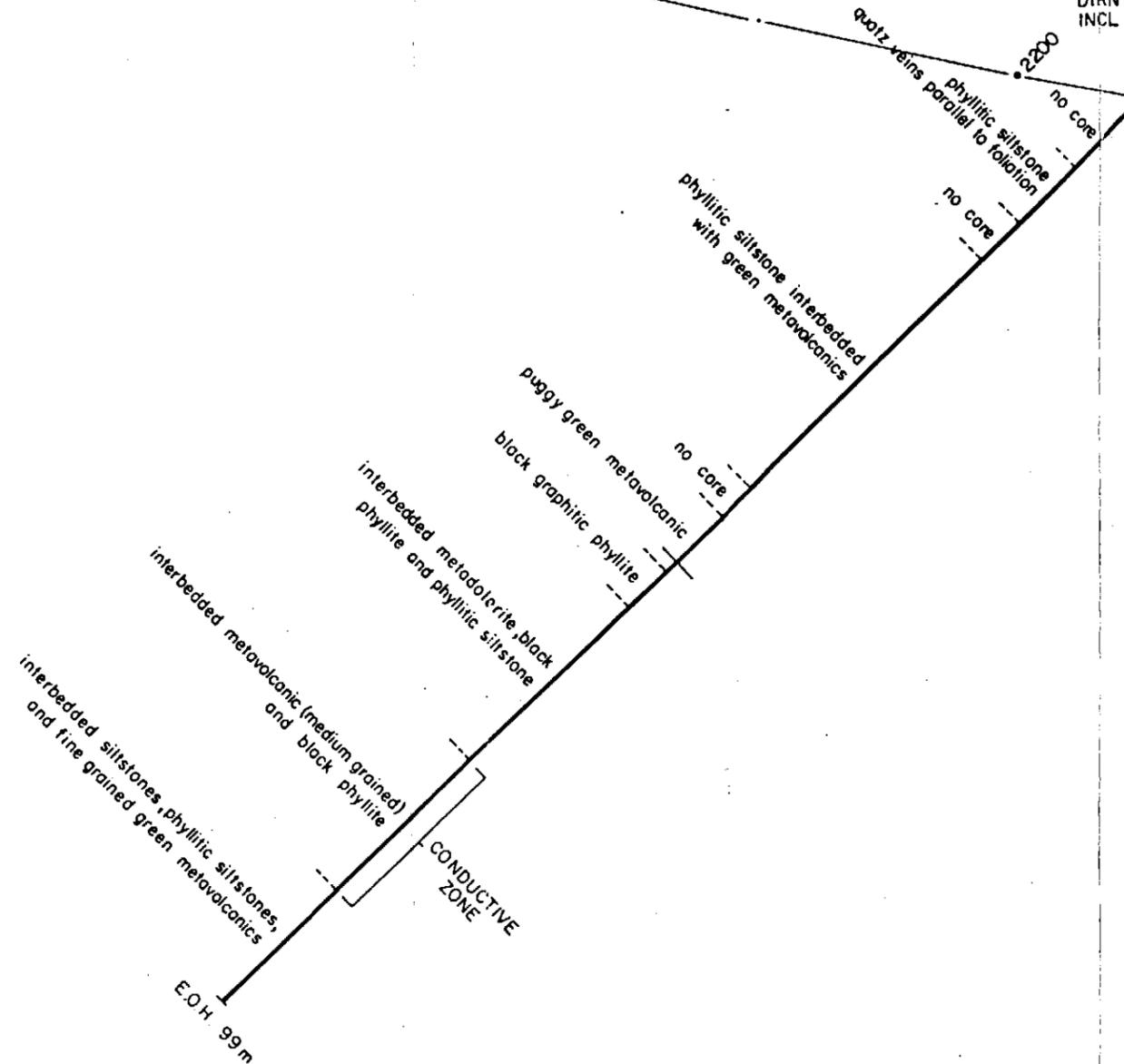
ROCK TYPE		MINERALIZATION		
DEPTH	DESCRIPTION	Style	Grade	Intersection width (Corr)
0-7m	Rock Roller - No Core			
7-13m	Phyllitic Siltstone - qtz veins parallel to fol			
13-17m	Rock Roller - No Core			
17-42m	Phyllitic Siltstone interbedded with green metavolcanics	17-42: Minor Pyrite		
42-45m	Cavity: No Core			
45-51m	Puggy green meta- volcanic			
51-55m	Black graphitic phyllite	51-55: Minor Pyrite		
55-72m	Interbedded metadoler- ite, black phyllite and phyllitic siltstone	55-57.2: Minor disseminated pyrite 58.4: Coarse pyrite in vein 64.5-67.5: Pyrite blebs		
72-86.5m	Interbedded meta- volcanic (medium grained) and black phyllite	72-86.5: Patches and blebs of pyrite		
86.5-99m	Interbedded siltstones, EOH phyllitic siltstones, and fine-grained green metavolcanics	89.9-99: Blebs & stringers of pyrite 94.1: Minor sphalerite & galena in a Co ₃ / qtz vein		

Signature _____ Date _____

GRID 29 L 2000 E SECTION ORIENTATION 2300 322°

DDH HAA 2 (SECTION)

355 070 m E
5 417 830 m N
830m RL
DIRN 320° MN
INCL -45°



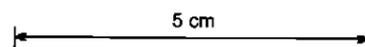
NOTE - ALL GEOCHEMICAL VALUES ARE LOWER THAN THE 300ppm ZINC CUT OFF POINT

DDH HAA 2 (PLAN)

Fig. 13.

COMSTAFF PROPRIETARY LIMITED

HEAZLEWOOD GRID - 29
SECTION OF DRILLHOLE DDH HAA
GEOLOGICAL DETAILS



COMPLD R.H.ROBERTS	DRAWN R.H.ROBERTS	DATE 12/7/84	AMENDED
LEASE No EL 1/68	AREA	SCALE 1 500	PLAN No TAS/2/40