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**MICROFILMED**

COMSTAFF PROPRIETARY LIMITED

1970 - 1971 SUMMER FIELD SEASON REPORT

E.L. 5/63

VOLUME I

CONTENTS

1. Huskisson Regional Report
2. Huskisson Grid Report
3. Preliminary Report for the Huskisson South Project

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HUSKISSON REGIONAL REPORT.

HUSKISSON REGIONAL REPORT1. GENERAL1.1. Location

The area of about 12 square miles refers to that part of E.L.5/63 between the Chester, Pinnacles and Silver Falls mines and the Huskisson River (Plan Tas 2-225).

1.2. Physical Features

The country is hilly and covered with virgin temperate rain forest. It is well dissected with a topographic variation of 1000'. Drainage is swift along southerly and westerly channels towards the south-flowing Huskisson River. Soils are thin in general, but surface outcrop, except in stream beds, seems virtually restricted to serpentinite.

1.3. Access

Adequate dry weather access is provided by a dirt road constructed this summer from a point about a mile north of the Pinnacles small workings. It is about 10 miles long and, due to shortage of funds, its construction was terminated about one mile south of the Huskisson grid (see later). Two branch roads were constructed to serve the north Huskisson area and Ross Creek systems (Lynch Creek road) and the Huskisson serpentinite north of the existing grid (Huskisson north road). Four-wheel drive vehicles with wheel chains are essential in wet weather.

Most of the forest is open myrtle and fern providing easy access to and along stream beds. Bauera and horizontal scrub in particular restrict progress in most areas of black mudstone and quartzite rocks, but are little developed elsewhere. Sword-grass and ti-tree over serpentinite hinder progress as well.

#### 1.4. Previous work

Previous work prior to the summer 1968/69 season seems to be limited to the development of two small lead barium prospects that are shown on the geological survey map. During summer 1968/69 two out of three cut lines sampled over the Huskisson serpentinite realised very highly anomalous nickel geochemical values. As a result of this, during the summer of 1969/70, a detailed grid was cut and sampled to cover the anomalous zone. In addition a small programme was carried out along and north of Lynch Creek to determine if the serpentinite shown on the official map did in fact exist and if so, to determine its relationship with the serpentinite to the south.

#### 1.5. Objectives

- 1.5.1. To locate areas of potential mineralization by stream sediment sampling within a group of Cambrian or Precambrian sediments known to be mineralized elsewhere within the Tasman geosyncline - particularly in an antiformal environment which the Huskisson area was deduced to be, lying between the Huskisson syncline and the Que syncline.
- 1.5.2. To map the rocks and structure and attempt to correlate these with the Coldstream Ramsay sequence to the north and the geochemistry.
- 1.5.3. To continue the investigation of the Huskisson serpentinite.

#### 1.6. Exploration Methods

Active stream sediment samples were collected at 500' intervals on all major river systems and most tributaries following a tape and compass survey. Heavy concentrates were taken from various significant points, viz.,

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1. All major streams above significant tributary confluences,
2. All significant tributaries, and
3. The north and south bank tributaries of Lynch Creek as it drains the Huskisson serpentinite.

All roads were soil sampled. Samples were taken from the centre of the road at 200' or 100' intervals depending on whether the road was respectively along strike or across strike. The Huskisson north road was soil sampled at 50' intervals. A line of soil samples (Ao horizon) was taken at 50' intervals across a north Huskisson serpentinite outcrop along the Huskisson River.

Sediment and soil samples were dried and sieved in Waratah and the -80 mesh fraction sent to Geomin for nickel, copper, zinc, and silver analysis. Samples from certain areas were additionally analysed for bismuth, antimony and tin. All anomalous samples were analysed for associated elements. Heavy sediment samples were sent to Geomin, examined mineralogically, assayed for platinoids and given a complete spectrographic scan. A small fraction was to be returned for specialised examination in Waratah. All major rivers, many tributaries and all roads were geologically mapped.

2. GEOLOGY (Plan Tas 2-226)

2.1. General

Cambrian rocks crop out in the area (Tasmanian Mines Department Publications). In general, the rocks conform to the classic Alpine-type sedimentation related to eugeosynclinal development, viz., shale to sandstone, tuff to graywacke, conglomerate with intercalated volcanic rocks.

The sediments can be divided into two separate units. The lowest and more durable detrital unit comprises

quartzites, dark grey siltstones and black mudstones. This is overlain by a unit of impure siltstones, sandstones and graywackes, all possibly tuffaceous in part. In the west and possibly the east (Review of 1969-1970 Exploration Programme E.L. 5/63, Chester - Silver Falls and Pinnacles Areas.), the unit grades upwards to black mudstone and dark grey siltstones. Coarse graywacke and a thick conglomerate horizon are interbedded towards the middle of the unit only in the eastern section of the area.

A large, slightly discordant, ultrabasic body (the Huskisson serpentinite) was emplaced roughly along strike within sediments to the west of the area. In the vicinity minor sodic, basic and intermediate intrusive rocks crop out. The regional grain is north-south due mainly to a major north-south trending anticlinal structure. Basically, the rocks face the right way up.

## 2.2. Structure

A dominant anticlinal structure whose axis trends north-south through the centre of the area and then bends to SSE in the south, is flanked by two major synclinal structures, the Que syncline (with the Owen Rift fault) on the east and the Huskisson syncline on the west. Superimposition of at least two fold phases also effect the plunge of the axis, which is zero in the far south to form a depression (saddle shaped) at this point, and dips to the south elsewhere. Stereographic plots estimated the plunge to be between 5° and 25°. The anticline is asymmetrical, the axial plane dips at a calculated 78° to the east. Dips on the western side of the axis vary between vertical and 70° to the west and some beds dip 70° to the east. The latter are thought to be overturned. Dips on the east side of the axis vary between 70° and 40° to the east. Previous work (1969-1970 Exploration Programme) on Chester Pinnacles realised a minor synclinal structure within the eastern limb, immediately west of the Owen Rift fault.

Whereas the anticline is interpreted in the simple form as described, in Ross Creek within about 4000' of the axis, some very tight minor folding was observed. Elsewhere, all minor folds tended to be very small flexures which could be attributed to drag effects. It seems that the anticline tends to change to an antiformal (anticlinorium?) structure to the north of the area.

Cleavage and jointing are not very conspicuous. Of the quartzite-dark grey siltstone-black mudstone unit there is a dearth of cleavage in the competent quartzite beds, whereas the mudstones tend to develop a blocky character bounded by smooth flow-fold planes. In the tuffaceous and non-tuffaceous siltstone beds cleavage was better developed parallel to the main fold axis. In the same rock minor jointing is well developed, often with small displacements of about 1/8" on joint planes.

Ubiquitous shearing in the Huskisson serpentinite is probably related to the mode of emplacement and not to the general tectonics of the area. In addition, the eastern contact is defined by a discrete shear zone.

Two outcrops of brecciated quartz rock in the NW of the area south of Ross Creek define a fault of little apparent significance which strikes NW-SE. In this connexion it should be pointed out that most rock type boundaries can be traced by strike continuation and there is little need to postulate faulting to explain stratigraphic extensions as these conform fairly well to the folded structures described above.

Sedimentary structures recognised were graded bedding in tuffaceous sediments and graywacke, current bedding in fine impure sandstone, and various small structures

(possible flame) identifiable in one dimension only on the interface between siltstone and coarser rocks.

The sedimentary structures described above establish that the beds which are not observed to be overturned face right way up.

2.3. Stratigraphy

2.3.1. Lowest Palaeozoic

Unit 1 - Cambrian(?)

The oldest rocks by virtue of the southerly plunge lie in the core of the anticline in a poorly exposed 1000' section along Ross Creek to the north of the area. They consist of weathered sandstones and siltstones. No dips and strikes were recorded and hence the relation to the overlying rocks remains uncertain as does the thickness. This unit can possibly be correlated with the top of the Ramsay series (Review on 1969-1970 Exploration Programme, Coldstream-Ramsay River Systems).

Unit 2 - Cambrian(?)

An overlying unit has been defined as well bedded grey to dark-grey quartzites with varying amounts of feldspar, muscovite and carbonaceous matter, dark-grey siltstones and mudstones. The unit is estimated to be about 2500' thick. In general the individual quartzite beds are from 1' to 20' thick with well developed bedding planes rarely spaced more than one foot apart. Disseminated fine iron pyrite tends to develop along well defined bands parallel to bedding both in the siltstones and mudstones.

Unit 3 - Cambrian(?)

An even younger unit is conformable and consists of pyroclastic and normal sediments. Black mudstones and shales, dark-grey siltstones, partly tuffaceous chocolate-brown limonitic siltstones and grey-brown siltstones, grey, mauve-grey, mauve-brown and grey-green tuffaceous sandstones and turbidites form an alternating sequence. The rocks are transitional laterally and vertically.

This unit is estimated to be at least 6500' thick east of the anticlinal axis and 8000' thick west of the anticlinal axis (see section on Plan Tas 2-226).

Many of the siltstones are in fact finely laminated with thin tuffaceous bands and many tuff beds are massive, structureless, fine grained grey-green rocks with relatively conspicuous angular feldspars in a cloudy chloritic matrix. The latter are readily mistaken for graywackes in hand specimen. From thin section work it appears the tuffs have a mainly intermediate to basic provenance.

To the east of the anticlinal axis, only in the tributaries of Lynch Creek, coarse graywacke, graywacke conglomerates and conglomerate beds are developed toward the middle of the unit which probably indicates a detrital source to the east of the area. The best developed bed of conglomerates is situated about 1250' above the base of the unit and is about 300' thick. It is composed of rounded water-worn quartzite cobbles and generally an impure sandstone matrix. Thin beds of siltstone seem to be interbedded with the conglomerate and in some exposures form a matrix to the cobbles. Beds above and below the conglomerate are conformable.

Also in this unit a black mudstone facies tends to develop both laterally and to the west of the anticlinal axis and higher up in the sequence. Shales or mudstones of this facies occur immediately east of the Huskisson serpentinite and may possibly correlate with similar rocks (1969-1970 Exploration Programme - op.cit.) immediately west of the Owen Rift fault near the Pinnacles workings (see section on Plan Tas 2-226).

To the north of the area at Ross Creek and its main tributary, the unit succession east of the anticline axis changes. Chocolate-brown siltstones with coarser chocolate-brown and mauve-brown tuff bands alternate;

there is little or no graywacke. About 1500' higher up they grade into alternating beds of non-tuffaceous grey and dark-grey micaceous siltstones and sandstones.

2.3.2. Ordovician(?)

To the west of the Huskisson serpentinite, limestone crops out on the Huskisson River one mile north of Lynch Creek. It probably belongs to the Ordovician Gordon Limestone series.

2.3.3. Tertiary

A small outlier of basalt (presumed Tertiary) caps the hill NE of the Huskisson grid.

2.3.4. Quaternary

Glacial till(?) extends along some ridges in the east of the area near Burns Peak. Unsorted Owen conglomerate (Ordovician) boulders and quartzite cobbles are residual erratics.

A river terrace towards the end of the Huskisson north road carries rounded water-worn kaolinised granite gravel presumably derived from the Meredith granite mass (Mt. Ramsay) exposed 5 miles to the NW.

2.4. Intrusives

Intrusive rocks were seen only west of the anticlinal axis in unit 3. They occur both as a large serpentinite-pyroxenite complex and as minor sodic, basic and intermediate rock bodies.

2.4.1. Ultrabasic rocks

2.4.1.1. Structure

The serpentinite-pyroxenite body strikes north-south along the structural grain and is slightly discordant with the country rocks. Along the Huskisson river at

the north end of the ultrabasic it is 400' thick. The eastern contact is an almost vertical, smooth shear plane which abuts against an altered massive, talc-tremolite-chlorite rock which was probably derived from an ultrabasic source. The latter has an intrusive relationship to the quartzitic country rock. The western contact was not exposed.

Southwards the serpentinite thickens to Lynch Creek where the body is 2500' wide - this was mapped last year (Review on 1969-1970 Exploration Programme, E.L. 5/63, Huskisson Lynch Creek Serpentinite,). South of Lynch Creek the eastern contact swings eastward 2000' before continuing SSE to the grid.

#### 2.4.1.2. Petrography

The mapping carried out to date indicates the serpentinite is a complex intrusion of bands of serpentinitised dunite, peridotite and pyroxenite. The layers may be due to magmatic segregation and/or multiple injections. Very coarse pyroxenite with crystals 6" long found on the Huskisson north road and the north bank tributary of Lynch Creek are thought to be a late basic pegmatitic phase.

On the road three zones of cross fibre asbestos were exposed; fibres range up to  $\frac{1}{4}$ " long. The south bank tributary of Lynch Creek has exposed serpentinite which is sheared and altered to talc chlorite schist in part. Also a xenolith of country rock (shale) was seen enclosed by the intrusion.

#### 2.4.2. Minor Intrusives

Thin section work indicates the minor intrusives are of sodic, basic and intermediate compositions. They all crop out west of the anticlinal axis in the Lynch Creek drainage system. The basic end of the series is an andesine dolerite with well developed ophitic texture and patches of secondary chlorite replacing pyroxene. Transitional rock types are likely to exist between the latter and the intermediate end of

the series described as a pyroxene monzonite or mangerite. This rock contains large and small prismatic crystals of oligoclase, pigeonite (marginally altered to hornblende), orthoclase patches, and accessory biotite and opaques. The most acid rock is described as a sodic syenite tending to monzonite. It consists predominantly of laths of albite (verging on sodic oligoclase) with interstitial patches of orthoclase. In addition, there are a few patches of quartz, and occasional flakes of chlorite. Pyrite is associated with fractures.

#### 2.5. Metamorphism

Dynamic metamorphism has developed axial plane cleavage and strain extinction in the quartz grains of quartzites (thin section). Shales have been indurated and sandstones metamorphosed to quartzites. Tuffs have chloritic matrices (thin section) and chlorite has developed on minor joint planes in the chocolate-brown siltstones of several localities. In the intrusive rocks (thin section) retrograde metamorphic effects are both chlorite replacing pyroxene and clinopyroxene marginally altered to hornblende. These observations point to regional metamorphism in the order of low greenschist facies grade.

#### 2.6. Mineralisation

No significant mineralisation was found. Brick red limonite probably derived from pyrite was found in small amounts associated with quartz veins in two localities, the brecciated quartz rock (see Structure) and quartzite float on the Lynch Creek road. An area of porous limonitic float on the Huskisson north road may be gossanous. The material is rather light in weight, has an earthy lustre and is pale yellow-brown in colour. Rather heavier material of dull lustre and purple, brick-red colour is associated.

Small veinlets of quartz and ferruginous carbonate with minor pyrite were found in several localities especially close to the axis of the anticline. Replacement pyrite occurs as small aggregates and very fine disseminations in most minor intrusives and in many quartzite bands. Finely disseminated pyrite which is distributed along well defined bands parallel to bedding in black mudstones and dark-grey siltstones may have developed biogenically in postulated stagnant conditions of deposition.

2.7. Alteration

Weathering to a considerable degree is confined to units 1 and 3 which comprise unstable minerals that break down to give a soft yellow or yellow-brown coloured ochre sometimes in the form of diffusion rings and sometimes as a hard outer skin to leached core material.

2.8. Correlation with the Chester-Pinnacles, Renison Bell, and Ramsay-Coldstream Areas

2.8.1. Chester-Pinnacles Area

The essential relationship to this area is depicted on the section (plan Tas 2-226). What is not portrayed is that the Huskisson anticline west of the Owen Rift fault plunges to the south and the Que syncline east of the Owen Rift fault plunges to the north (1969-1970 Exploration Programme - op.cit.) It seems likely that the Owen Rift fault is a hinge fault which has compensated for the plunge discrepancies by a twisting movement in the near vertical plane between the two structures described. In consequence it is possible that the Read Volcanics which crop out in the Que syncline may occur in the Huskisson syncline but are overlain by the Ordovician Gordon Limestone series and younger rocks.

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2.8.2. Renison Bell Area

The rocks described in the stratigraphy section have similarities to those found seven miles to the south at Renison Bell east (1970 Winter Field Season Report, - E.L. 5/63, The Renison Bell East Area). Both areas share a common north-south grain. Also, the serpentinite at Renison Bell east may correlate with the Huskisson serpentinite and the syncline west of the serpentinite at Renison Bell east may be the southern end of the Huskisson syncline. A definite correlation cannot be attempted until the intermediate ground is mapped.

2.8.3. Coldstream-Ramsay Area

The rocks of the Coldstream Ramsay area one mile to the north (1969-1970 Exploration Programme - op.cit.) are not readily correlated with the Huskisson units. It is probable that they terminate in the south plunging anticline north of Ross Creek. Mapping in the Que, Hatfield rivers will either confirm this or indicate a faulted break.

3. GEOCHEMISTRY

For this section please refer to plans Tas 2-227 and Tas 2-228, sheets 1 and 2.

3.1. Summary

One area of probable significant zinc and lead high values was found adjacent to the eastern contact of the Huskisson serpentinite. Most other anomalies form an area of high copper, zinc and nickel values on the southern part of the Lynch Creek road and in nearby creeks. These are thought to represent high background values rather than a true anomaly.

3.2. General

The area of probable higher background copper, zinc and nickel values lies close to the base of the impure tuffaceous siltstone-sandstone sequence of unit 3. They are distributed in an arc around the anticlinal axis and continue west of the axis both on the road, and as a series of high copper values in the streams draining the area. Similar high values are found about a mile south of the main arcuate zone.

Several PH readings were taken towards the end of the programme and in all cases were around neutral (6.5 to 7). However, in a few cases when high stream sediment zones were resampled it was found that the values had altered significantly. This discrepancy cannot be explained by the PH results obtained and its cause seems inexplicable for a change in geochemical environment is unlikely. The possibility of analytical error cannot be ruled out.

The significant lead, zinc high values from the south bank tributary of Lynch Creek which drains the Huskisson serpentinite are continuous along the whole length of the stream course.

No high values apart from an isolated copper high resulted from sampling the Ross Creek system. The heavy sediment sample results have yet to be evaluated.

3.3. Discussion of Separate Elements

In this connexion please refer to the histograms (Plan Tas 2-229, sheets 1 and 2).

3.3.1. Copper3.3.1.1. Streams

Values range from 2 to 150 ppm with a population peak of 18 ppm. Values greater than 60 ppm are considered to be possibly anomalous. High copper values are confined to those streams draining unit 3 west of the anticlinal axis.

3.3.1.2. Soils

Values range from 2 to 130 ppm with a population peak of 3 ppm. Values greater than 70 ppm are considered as being possibly anomalous. These values are concentrated on the southern section of the Lynch Creek road.

3.3.2. Zinc3.3.2.1. Streams

Values range from 10 to 5800 ppm with a population peak of 75 ppm. Values greater than 450 ppm are considered to be possibly anomalous and those greater than 950 ppm are probably anomalous. Most probably anomalous values are located on that south bank tributary of Lynch Creek which drains the serpentinite. Two other probable anomalous values together with several possibly anomalous values are associated with high nickel, copper, silver and mercury values in the possibly anomalous arcuate zone.

3.3.2.2. Soils

Values range from 4 to 180 ppm with a population peak of 5 ppm. Values greater than 100 ppm are considered to be possibly anomalous. These values are coincident with the high copper values on the southern section of Lynch Creek road. The few values higher than 100 ppm on the Huskisson north road have significance only in their association with high lead values at the serpentinite, country rock (shale) contact.

Other higher values are associated with the basalt outlier and the soil sampling profile across the Huskisson serpentinite outcrop along the Huskisson river.

3.3.3. Silver

3.3.3.1. Streams

Values range from below the limit of detection (0.2 ppm) to 2.2 ppm. Values greater than 1.2 ppm are unlikely to be anomalous in view of a perfectly normal curve but are used where related to other high values. Except in the ultrabasic rocks high zinc, copper and nickel values were associated with high silver values.

3.3.3.2. Soils

Values range from below 2 ppm to 6.4 ppm. Values greater than 1.6 ppm are considered to be possibly anomalous. Two values, one at 1.8 ppm probably caused by the basalt outlier and one of 6.4 ppm is related to Read Volcanics. This latter isolated high value should be checked out.

3.3.4. Nickel

3.3.4.1. Streams

A separate histogram was drawn for streams draining ultrabasic rocks.

For streams not draining ultrabasic rocks, values range from 2 to 900 ppm with a population peak of 35 ppm. Values greater than 200 ppm were considered to be possibly anomalous. All values higher than 330 ppm were from streams contaminated by nearly serpentinite. Other possibly anomalous values were associated with high zinc values.

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In those streams that drain the Huskisson serpentinite values range from 100 ppm to 3600 ppm and following an even distribution. Values greater than 2000 ppm are considered as being possibly anomalous and all fall on the north bank tributary of Lynch Creek.

## 3.3.4.2.

Soils

Separate histograms were drawn for ultrabasic and non-ultrabasic soils.

For non-ultrabasic soils, values range from below the limit of detection (2 ppm) to 130 ppm with a population peak of 3 ppm. Values greater than 80 ppm are considered to be possibly anomalous. Apart from high values associated with the basalt outlier they are coincident with the area of high copper, zinc values at the north end of Lynch Creek road.

For ultrabasic soils, values range from 25 to 4000 ppm, with a population peak of 125 ppm. Values greater than 2000 ppm (the first threshold value used on the Huskisson grid last year (Review of 1969-1970 Exploration Programme, Exploration Licence 5/63, Huskisson Serpentine Area) were considered to be possibly anomalous. The peak value of 4000 ppm lies 220' east of the area of limonite already described (see Mineralisation). However, a sample of limonite only assayed:

Ni	500
Co	120
Cr	Greater than 10,000
Zn	150
Mn	300

*the histogram shows values to 360 ppm.*

3.3.5. Lead

Most stream sediment samples with high zinc, nickel and copper were analysed for lead. Values range from 20 ppm to 140 ppm with a population peak of 40 ppm. Values greater than 225 ppm are considered to be probably anomalous and all lie on the south bank tributary of Lynch Creek which drains the Huskisson serpentinite. Within this creek system the very small tributaries that drain the serpentinite rather than the contact are not anomalous, thus suggesting that the zone of anomalous lead values may be associated with the serpentinite, country rock (shale) contact.

3.3.6. Cobalt

Most stream sediment samples with high nickel and zinc were analysed for cobalt. Values range from 4 to 150 ppm and none were considered anomalous.

3.3.7. Bismuth

Initially all stream sediment samples were analysed for bismuth and thereafter only samples with high copper, zinc and nickel values. Values range from below the limit of detection (5 ppm) to 25 ppm with a population peak at 8 ppm. Values show a normal distribution and are unlikely to be anomalous. However, the three peak values of 25 ppm coincide with the probably anomalous area of lead and zinc. Part of the Lynch Creek road (not the possibly anomalous zinc, copper and nickel zone) was analysed for bismuth. All values were below the limit of detection.

3.3.8. Mercury

Most stream sediment samples with high zinc, copper and nickel were analysed for mercury. Values range from below the limit of detection (0.005 ppm) to

0.6 ppm with one value of 16 ppm which is considered probably anomalous.

3.3.9. Gold

Most stream sediment samples with high copper values were analysed for gold. Values range from below the limit of detection (0.02 ppm) to 0.13 ppm and none were considered anomalous.

3.3.10. Antimony

Initially stream sediment samples were analysed for antimony and thereafter samples with high copper, zinc and nickel values. All values were below the limit of detection (8 ppm).

3.3.11. Tin

Initially samples from Lynch Creek were analysed for tin and thereafter samples with copper, zinc and nickel values. Values range from 6 to 30 ppm and none were considered anomalous.

3.3.12. Arsenic

Most stream sediment samples with copper, zinc and nickel were assayed for arsenic. Values range from below the limit of detection (5 ppm) to 25 ppm and were not considered anomalous.

3.3.13. Molybdenum

Most stream sediment samples with high copper, zinc and nickel were analysed for molybdenum. All values were below the limit of detection of 1 ppm.

3.3.14. Miscellaneous

A mistake by the laboratory led to part of the Ross Creek system being analysed for Ta, Mo, W,

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Be, Ni, Cu, Zn, Sn, Ag, Bi, and Sb. For the three elements not already discussed values for tungsten were below the limit of detection (50 ppm), values for tantalum were below the limit of detection (30 ppm), and values for beryllium ranged from 1 to 5 ppm and were not considered anomalous.

4. RECOMMENDATIONS

For this section please refer to plan Tas 2-230.

4.1. The area of probably anomalous lead, zinc stream samples adjacent to the eastern contact of the Huskisson serpentinite should be investigated by a grid with lines spaced at 500' intervals, two of which are to be extended to cross the width of the serpentinite. The grid could be extended further to the north of Lynch Creek by one grid line cut to cross the width of the serpentinite, and two further grid lines spaced 500' apart cut to investigate the eastern serpentinite contact zone. No soil samples taken at 100' intervals should suffice and be analysed for copper, zinc, nickel, cobalt and lead.

It must be recognised that part of the serpentinite over which the grid is to be established is a river terrace and the mapping of this will be vital in the interpretation of geochemical results.

4.2. Three north-south lines should be cut to investigate the arcuate zone of scattered possibly anomalous copper, zinc, nickel and mercury values in unit 3. The lines are indicated on the map and should be cut from points located in the creek toward the road. No soil samples taken every 100' should suffice, and be analysed for copper, zinc, nickel and mercury.

4.3. Five east-west lines should be cut to investigate the possibly anomalous copper, zinc and nickel zone,

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on the southern part of Lynch Creek road and the high copper values in the streams to the NW. No soil samples taken every 100' should suffice and be analysed for copper, zinc and nickel.

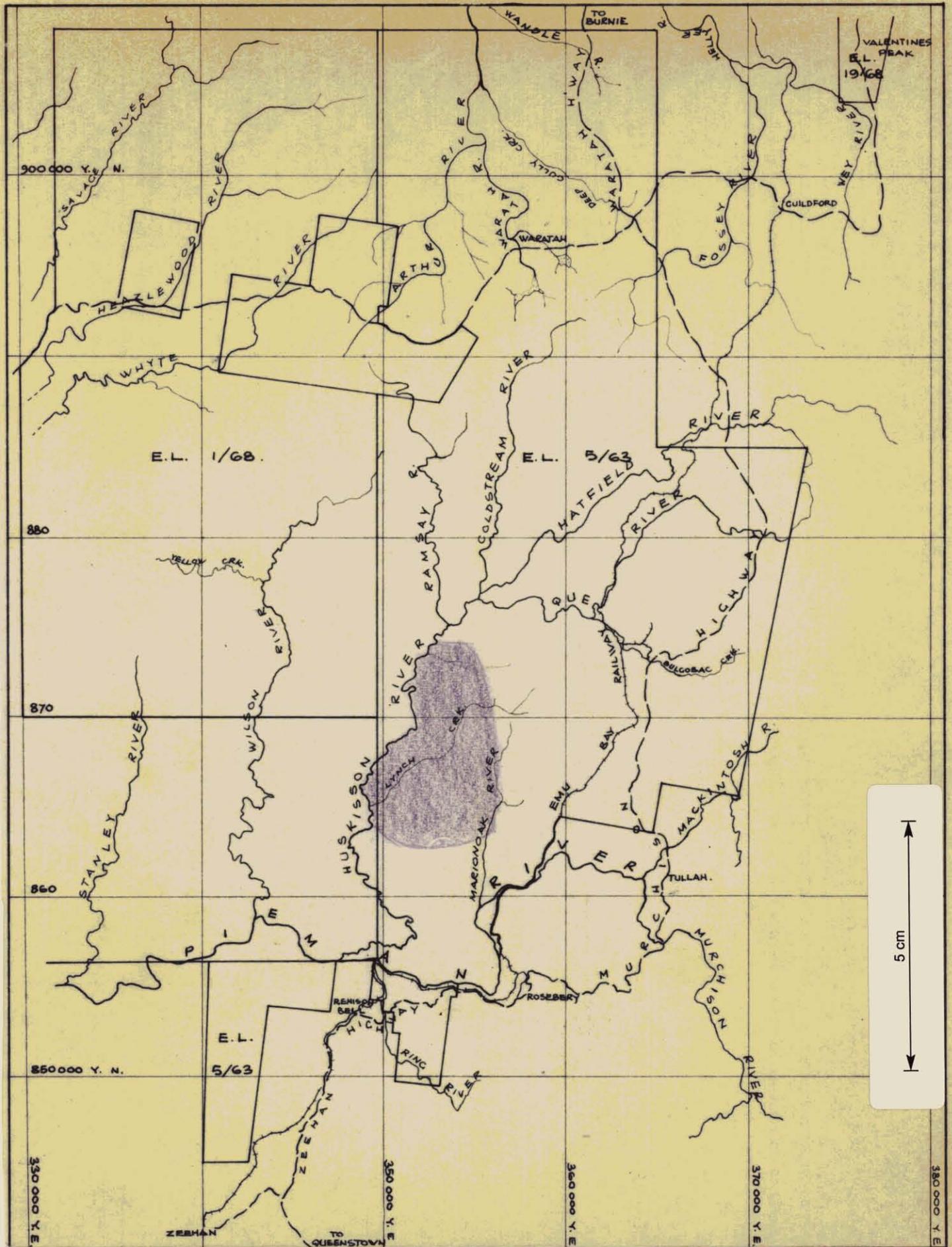
- 4.4. The high silver value of 6.4. ppm on the Huskisson access road, point HR 32, should be resampled together with 50' spaced sampling on either side for 200'.

5. PLANS

<u>PLAN NO.</u>	<u>TITLE</u>	<u>SCALE</u>
Tas 2-225	Locality Plan - Huskisson Regional	1:250,000
2-226	Huskisson Regional Geology	1: 50,000
2-227	Huskisson Regional Geochemical Coverage	1: 50,000
2-228,		
Sheet 1	Huskisson Regional Geochemical Anomalies - Cu, Ni, Hg.	1: 50,000
Sheet 2	Huskisson Regional Geochemical Anomalies - Ag, Pb, Zn.	1: 50,000
2-229		
Sheet 1	Huskisson Regional Histograms - Ni, Cu, Bi.	-
Sheet 2	Huskisson Regional Histograms - Ag, Pb, Zn.	-
2-230	Huskisson Regional Proposed Follow-up Grids.	1: 50,000

D. WALLIS

The author was assisted in the work on this area by the Exploration Manager, Dr. J.F. Lambert and geologist M.F. Everett.



LOCATION MAP.



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LOCALITY PLAN

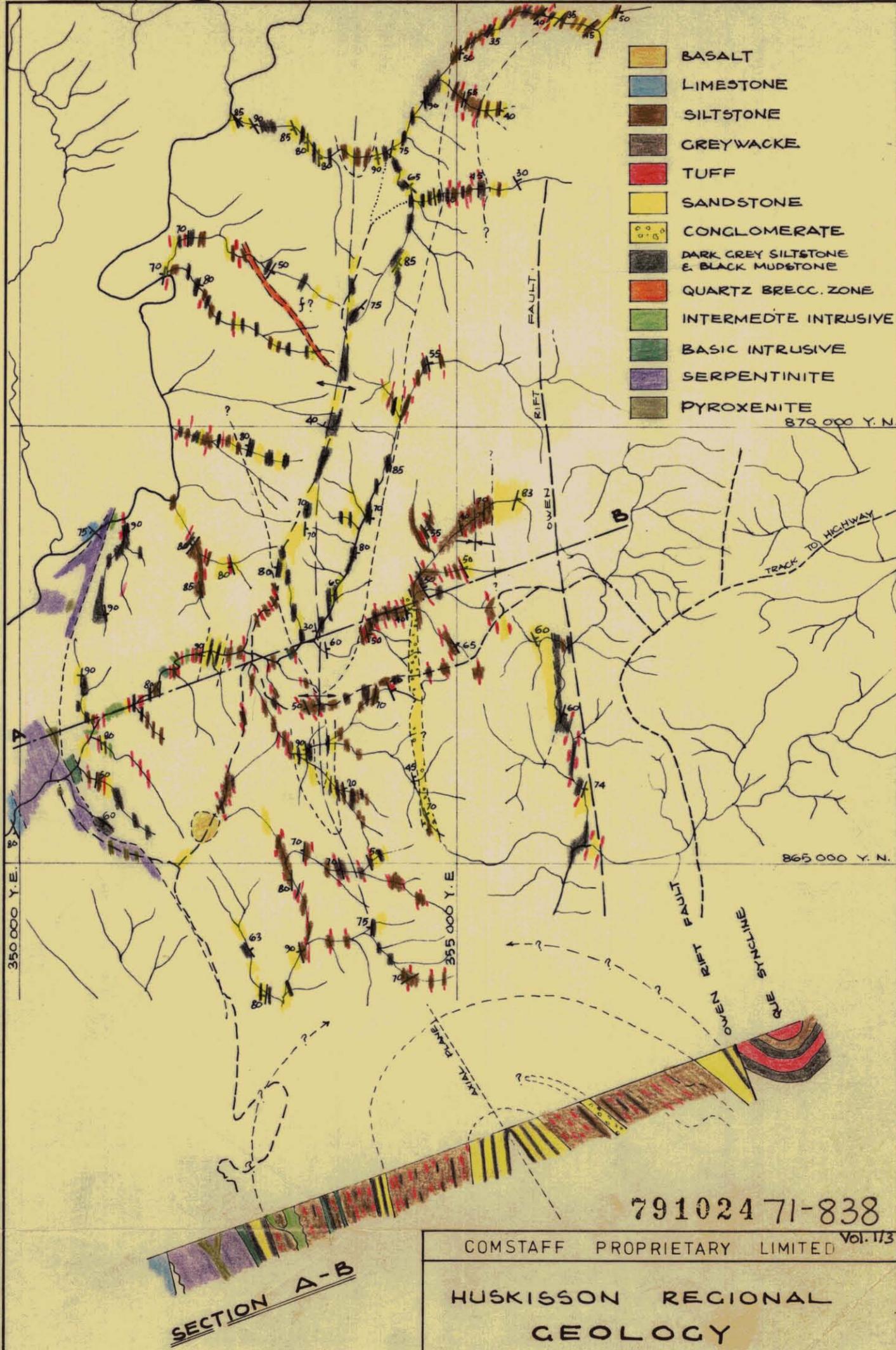
HUSKISSON REGIONAL

DRAWN G. C.

COMPILED G. C.

SCALE 1:250,000

TAS-2-225

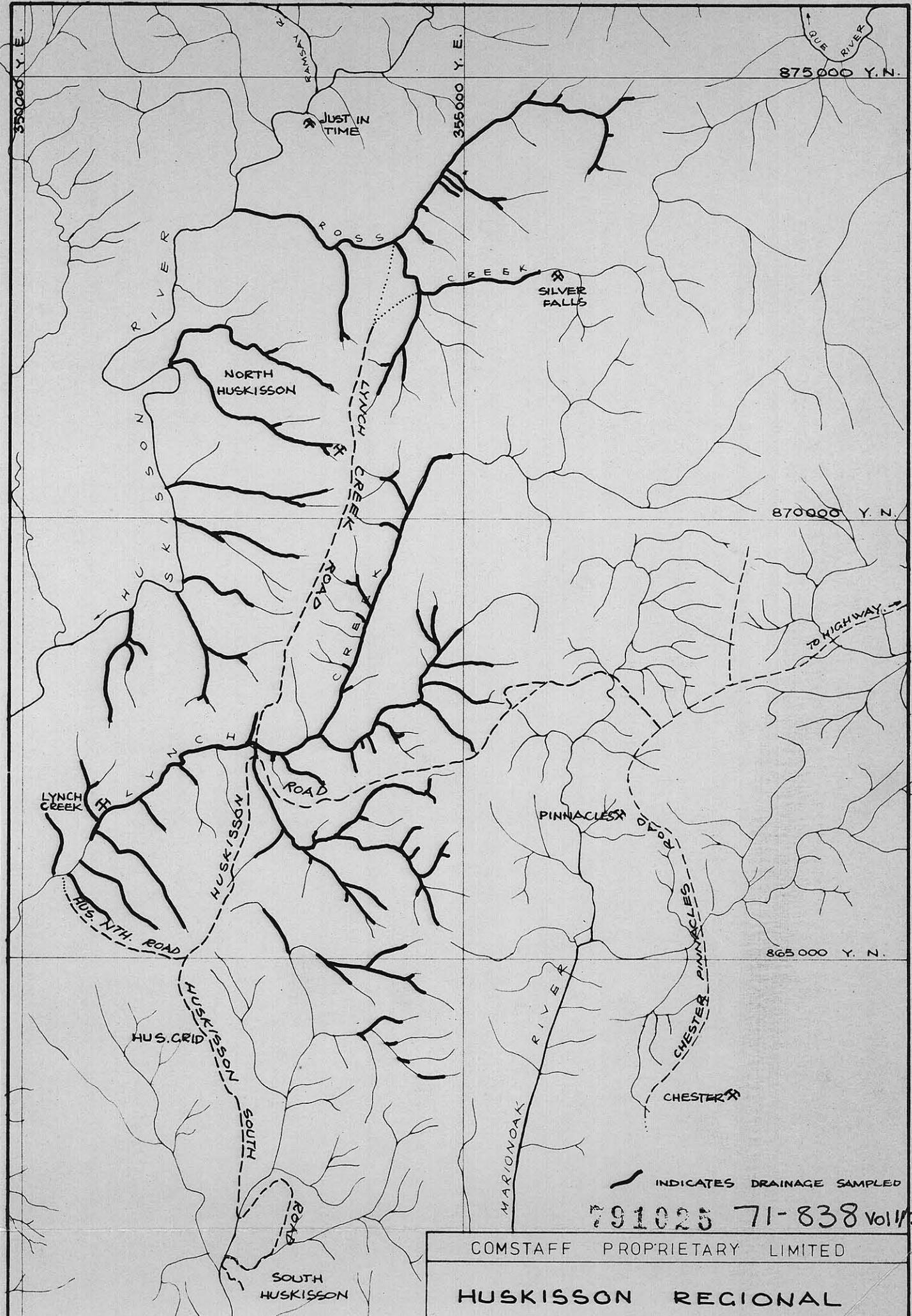


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HUSKISSON REGIONAL GEOLOGY

OWN C.E.C. SCALE 1:50000 TAS 2 - 226



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COMSTAFF PROPRIETARY LIMITED		
<b>HUSKISSON REGIONAL GEOCHEMICAL COVERAGE.</b>		
DWN. C.E.C.	SCALE 1:50,000	TAS 2 - 227

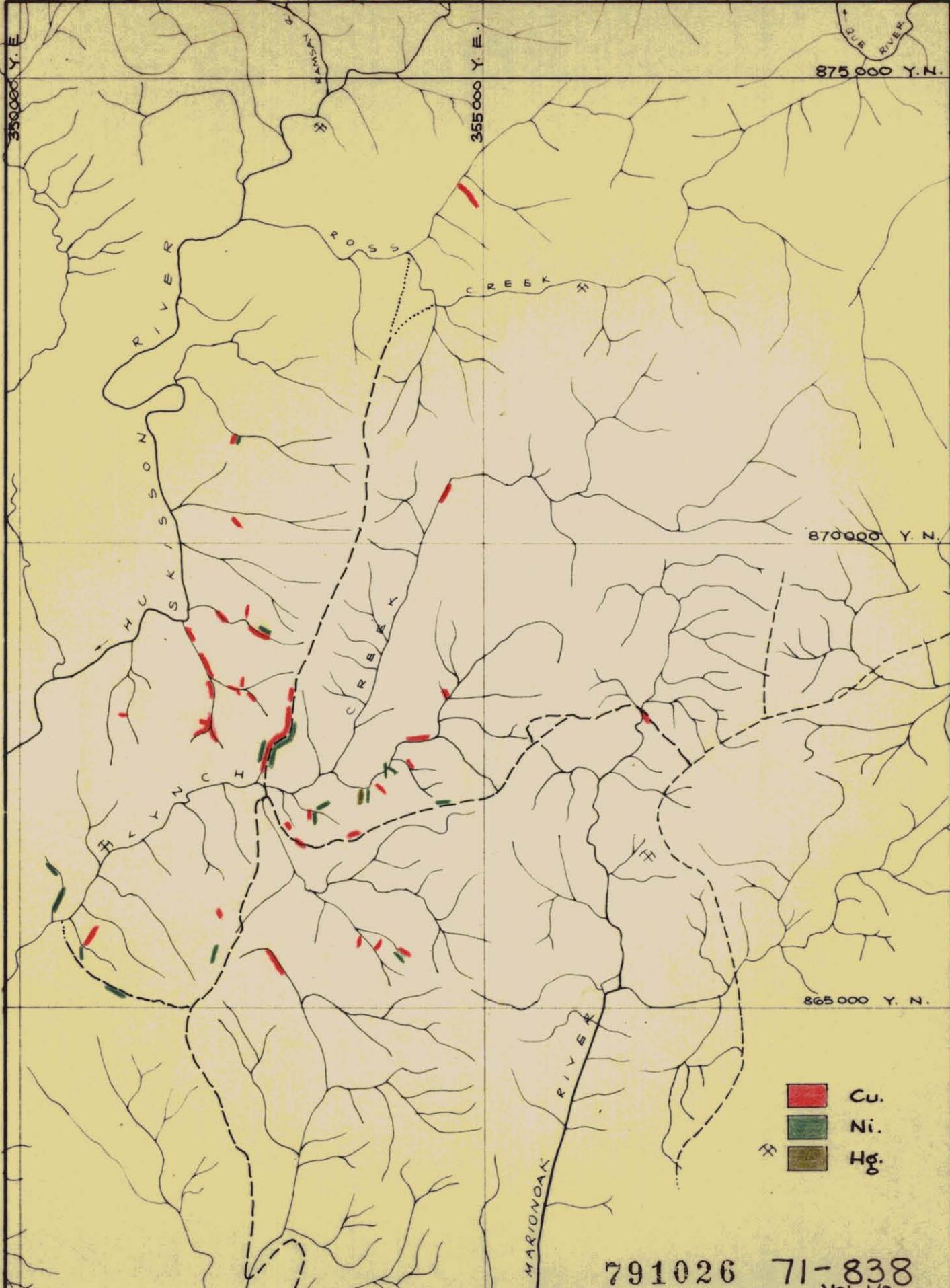
350000 Y. E.

355000 Y. E.

875000 Y. N.

870000 Y. N.

865000 Y. N.



- Cu.
- Ni.
- Hg.

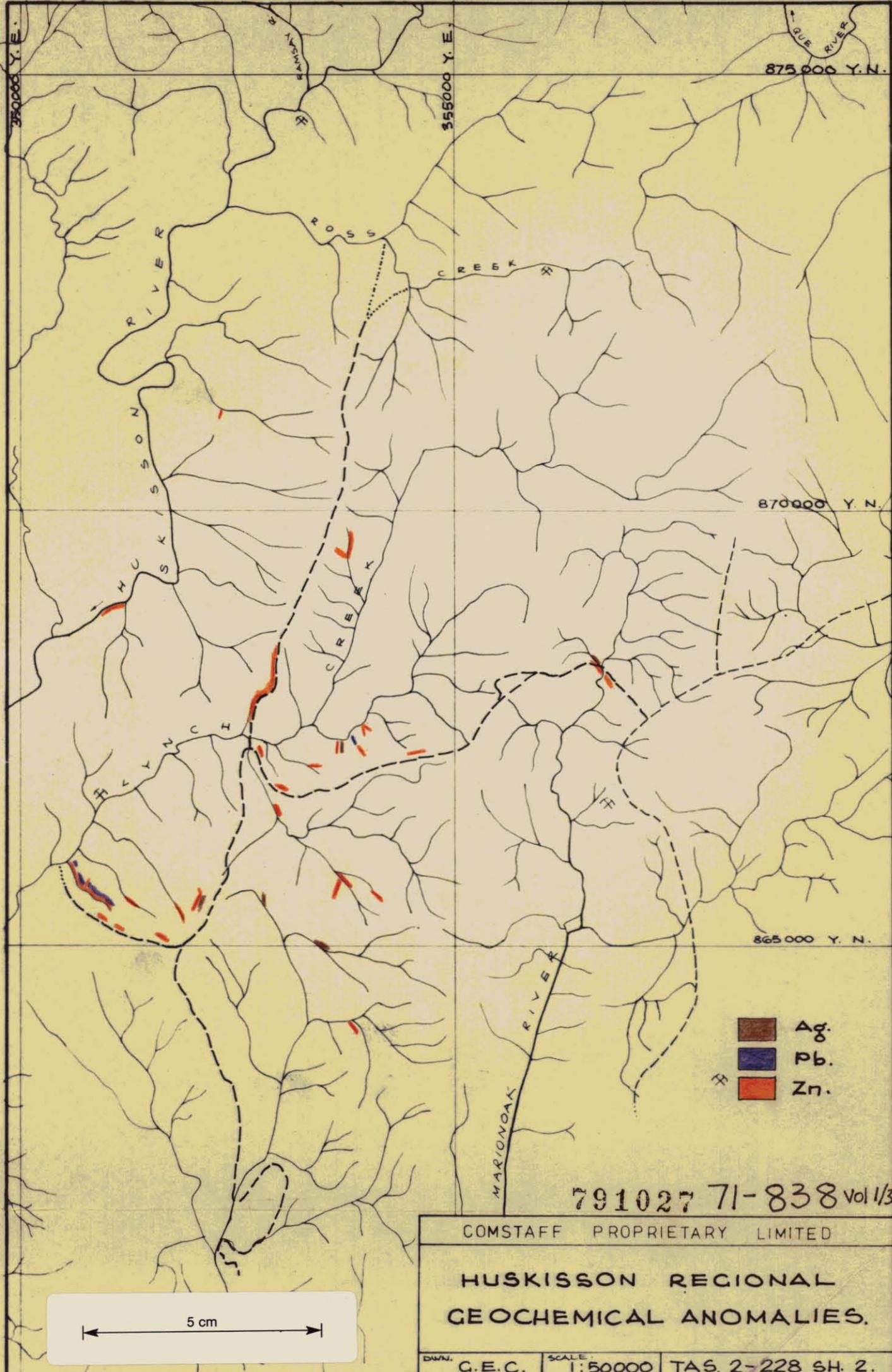
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COMSTAFF PROPRIETARY LIMITED

### HUSKISSON REGIONAL GEOCHEMICAL ANOMALIES.

5 cm

DWN. C.E.C.	SCALE. 1:50000	TAS 2-228 SH. 1
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875 000 Y. N.

870 000 Y. N.

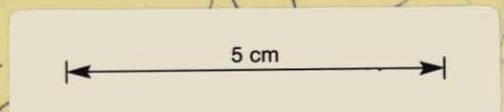
865 000 Y. N.

- Ag.
- Pb.
- Zn.

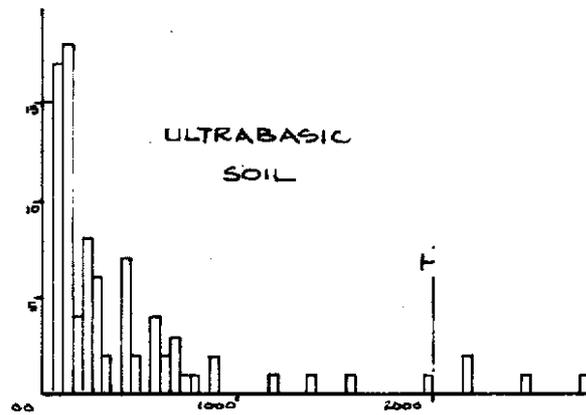
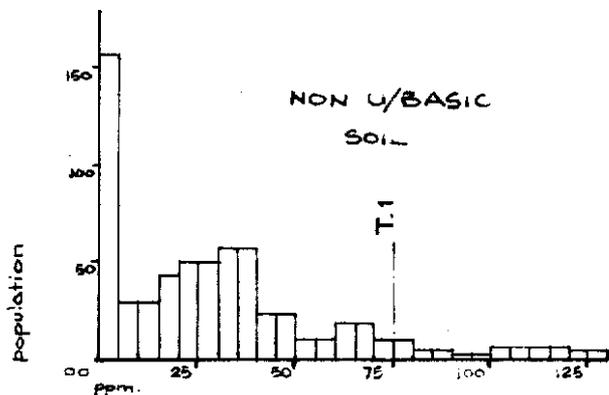
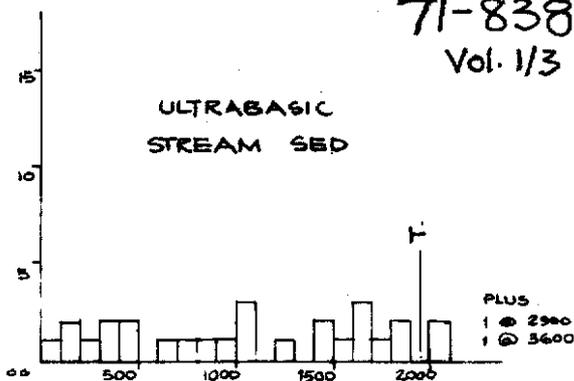
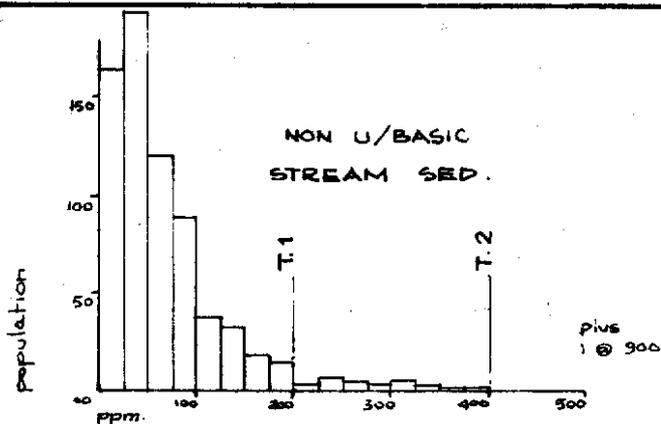
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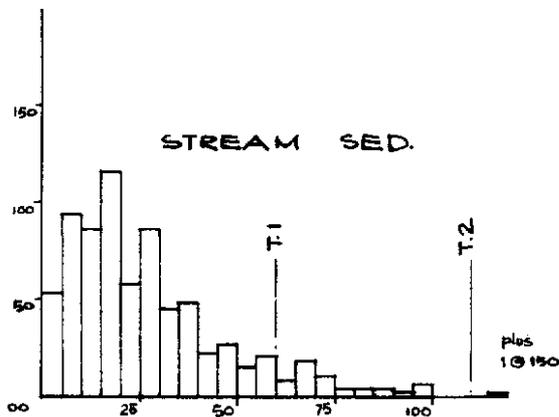
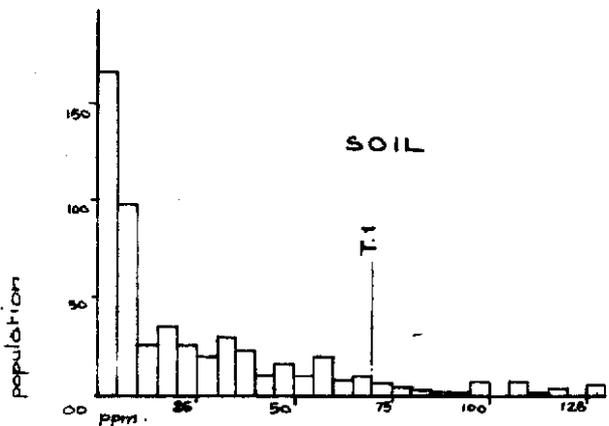
**HUSKISSON REGIONAL  
GEOCHEMICAL ANOMALIES.**



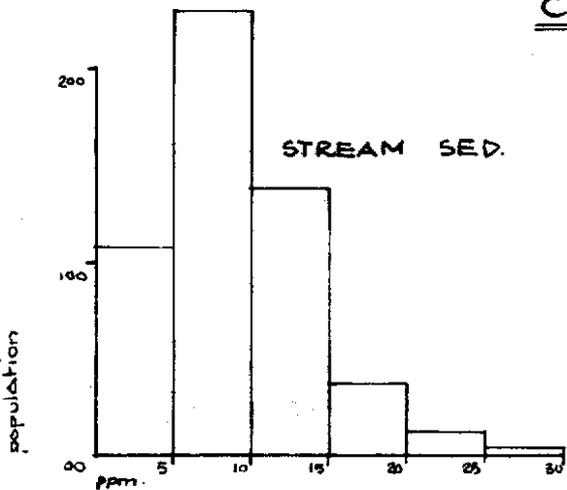
DWN. G.E.C. SCALE 1:50000 TAS. 2-228 SH. 2.



NICKEL.



COPPER



791028

BISMUTH

5 cm

COMSTAFF PROPRIETARY LIMITED

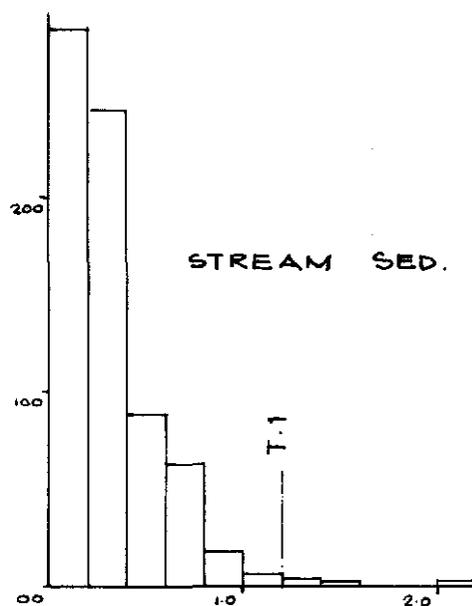
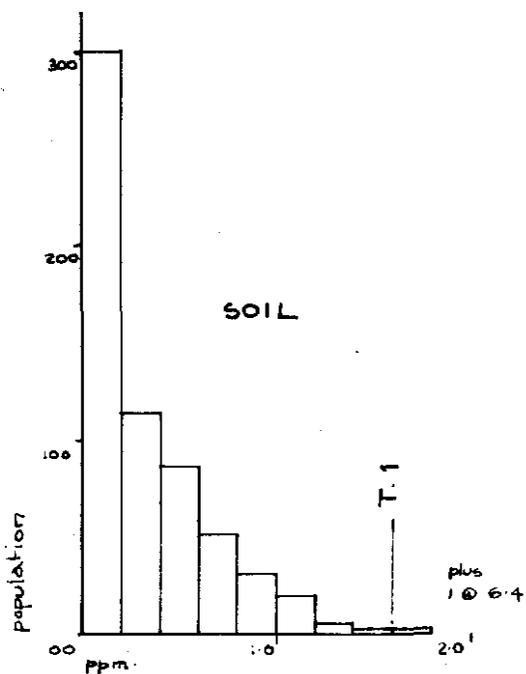
HUSKISSON REGIONAL

HISTOGRAMS

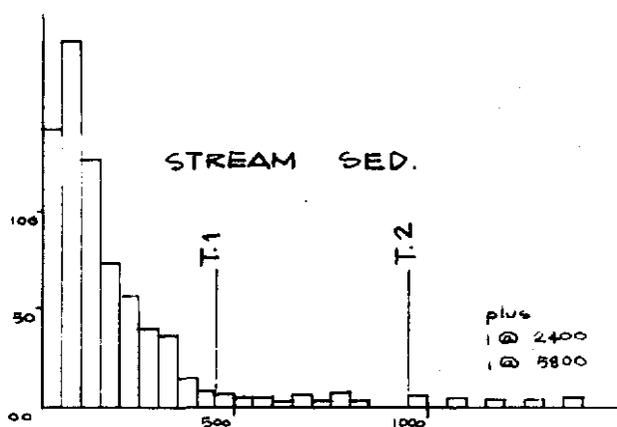
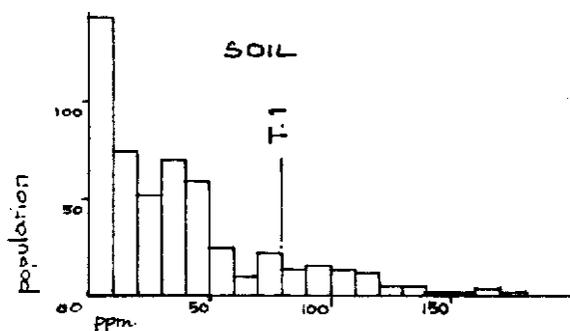
Ni. Cu. Bi.

DWN. GEC.

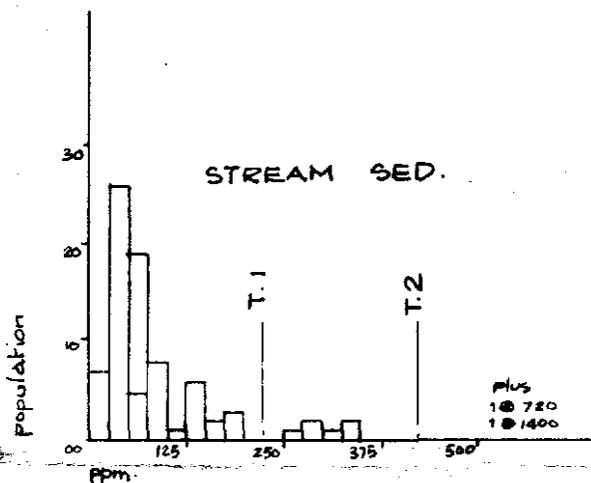
TAS. 2-229 SH. 1.



SILVER



ZINC



LEAD

5 cm

791029

COMSTAFF PROPRIETARY LIMITED

HUSKISSON REGIONAL

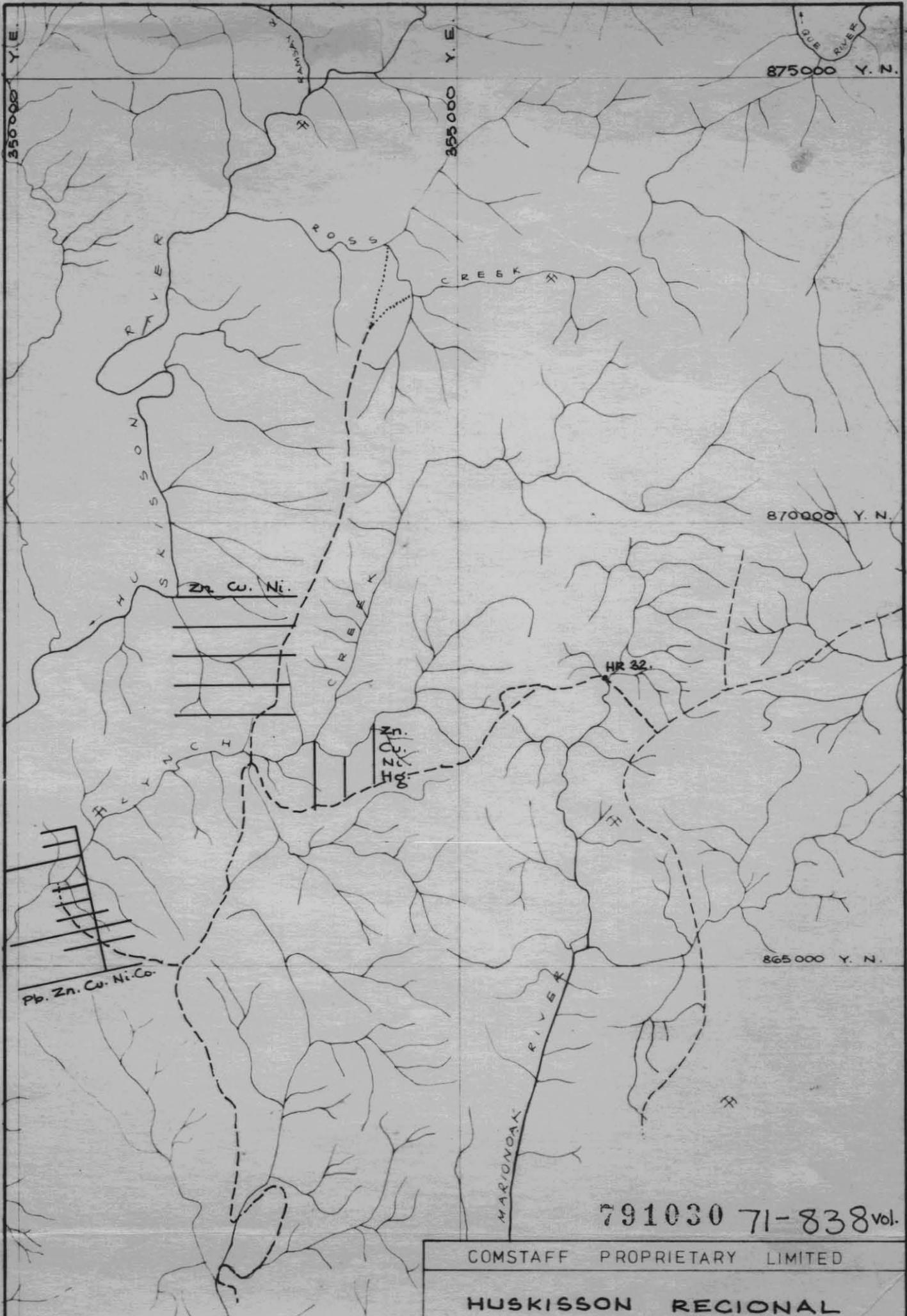
HISTOGRAMS

Ag. Pb. Zn.

DWN.

G.E.C.

TAS. 2-229 SH. 2.



350000 Y.E.

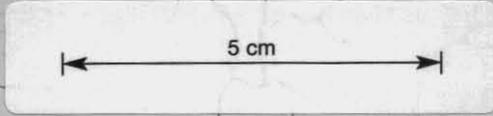
355000 Y.E.

875000 Y.N.

870000 Y.N.

865000 Y.N.

791030 71-838 vol. 1/3



COMSTAFF PROPRIETARY LIMITED		
HUSKISSON REGIONAL PROPOSED FOLLOW-UP GRIDS.		
DWN C.E.C.	SCALE 1:50000	TAS 2-230

HUSKISSON GRID REPORT.

HUSKISSON GRID REPORT

Section A of this report deals with the chrysotile asbestos find in the north of the Huskisson grid, while Section B concerns the drilling programme in the southern sector of the grid.

SECTION A - HUSKISSON ASBESTOS SUMMARY1. INTRODUCTION

During the course of road construction for the 1970/71 Huskisson programme, a bulldozer exposed chrysotile asbestos cross-fibres in pyroxenite serpentinite of the northern sector of the Huskisson grid.

This exposure was considered interesting enough to warrant further investigation.

Immediate follow-up work entailed the use of a 20 ton bulldozer, with rippers, to costean the area and provide further exposure. This was only partly successful as the serpentinite did not break easily and it subsequently proved necessary to drill andblast the serpentinite and then use the bulldozer merely to clean-up. This method proved far more efficacious but slow.

The final exposure thus obtained was examined geologically. This report outlines the data obtained and stage reached at this time and offers a proposal to the investigation.

2. GEOLOGY2.1 General

The Huskisson serpentinite is thought to be part of a layered ultramafic intrusion and has an irregular arc-shaped form with an approximate N-S trend. It appears to narrow both to the north and to the south of the Huskisson grid.

## 2.

To the west of the serpentinite is believed to be the Huskisson syncline, plunging to the NW. As yet, we have no field evidence of this supposedly major structure.

To the east of the serpentinite is the Huskisson anticline, plunging at  $15^{\circ}$  to  $20^{\circ}$  to the south. This structure was recognised following mapping during the 1970/71 Huskisson regional programme.

To the east of this anticline lies the Que syncline which plunges  $15^{\circ}$  to  $20^{\circ}$  to the north, as established by regional mapping in previous field seasons.

Separating the Huskisson anticline and the Que syncline is a zone of shearing and some dislocation previously known as the Owen Rift Fault and now called the Owen Shear Zone. The severe shearing of this zone is possibly due to the difference in plunge between the two adjacent structures, viz., the Que syncline plunging north and the Huskisson anticline plunging south.

Severe shearing is also characteristic of the Huskisson serpentinite and as it lies between major structures of different plunge, i.e., the Huskisson anticline and the Huskisson syncline; the same theory may also hold good in this case.

## 2.2 The Serpentinite

Broadly, the serpentinite body may be divided into two distinct parts - the northern sector and the southern sector.

The northern sector appears to be a layered peridotite and pyroxenite serpentinite with numerous veins of coarse, fibrous magnetite and asbestos.

The southern sector (south of line 14/20N) is believed to consist mainly of serpentinitised peridotite or dunite in that no pyroxenites or asbestos and very little fibrous magnetite have been found in this area to date. (see Section B).

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3.

Both sectors of the serpentinite body are strongly sheared in part.

2.3 Pyroxenite

The pyroxenites trend N-S, are often near vertical, sometimes steeply dipping to the west, and are thought to form part of the layered complex. They appear to be related somehow to the occurrence of asbestos. The reason is not known but it is significant that so far asbestos has been found only in close association with pyroxenites and indeed the best developed fibres and veins occur actually within altered pyroxenite. However, it appears that not all pyroxenites bear asbestos.

2.4 Chrysotile

2.4.1 Distribution

The exact locality of the chrysotile may be seen on the accompanying maps (Nos. Tas 2-232, Tas 2-233). The chrysotile is best developed at location 1 (see map No. Tas 2-233), whereas incidental exposures have been mapped at locations 2 and 3 and merely observed at location 4 (minor occurrence only). Locations 3 and 4 are 2000' apart (see map No. Tas 2-232) but the chrysotile has not been traced continuously over this distance. (In fact, barren rock is known to exist between locations 3 and 2 and 2 and 1). Work to date has indicated a chrysotile bearing zone with a minimum width of 70'. However, the chrysotile is only patchily distributed within this zone and makes up only a very small percentage of the total.

The strike directions of the veins do not follow a definite pattern, nor by dividing the fibres into their respective widths does any correlation emerge. Thus, it is not yet possible to define the strike trend of the chrysotile bearing zone.

## 4.

2.4.2 Character

From detailed mapping at location 1 it seems that the average fibre lengths vary from 1/16" to 1/4" and only rarely exceed this. Moreover, it was noted that the best fibre development was not in situ but rather in the rubble. These fibres of lengths up to 1/3" are not uncommon. The overall impression gained was that the chrysotile veins tend to vary markedly in width over relatively short distances down dip of the vein.

The cross-section of the asbestos bearing veins may be 3-layered, viz., two outer layers of cross-fibre and a single inner layer of residual serpentinite. The widest veins (+ 1/3") are rarely unbroken and either or alternatively the cross-fibre is cut by one or more rather regular hair-like "cracks" aligned parallel to the veins wall. This would mean that fibre lengths would tend to be shorter after treatment.

At location 1, the percentage of fibre to waste was been estimated at 80:1 while cob widths rarely exceed 10". Of the approximately 160' of mapped ground at location 1, 95' is barren of fibre (one section 45' wide the other 40' wide). The remaining 75' contains a total of 10.75" of fibre width.

3. FUTURE WORK

Clearly, much more work is necessary to define the broad zone of asbestos mineralisation.

Initially, this work should be carried out by contracting a 15 ton bulldozer, with rippers, to clear 20' wide ribbons through the dense vegetation. The ribbons should run on a bearing of 235° (parallel to existing grid lines) and should cover the full width of the serpentinite in the northern sector of pyroxenites. Where rough terrain precludes access to the bulldozer, lines should be cut as extensions to the ribbons.

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5.

It is suggested that the ribbons are spaced 500' as shown on map No. 2-232. The total length of these ribbons is 32,500'.

Points along the ribbons at which cross-fibre is encountered will be drilled and blasted. The resulting exposure should be carefully mapped geologically.

If a series of chrysotile bearing locations is revealed along the ribbons, then further bulldozing between locations on different ribbons is necessary. The object of this is to try to establish if the asbestos is continuously exposed at surface over a considerable strike length or whether it occurs, as seems apparent at this time, merely as a series of isolated outcrops bearing no obvious relationships to their neighbours.

If the results of the investigations outlined above prove favourable, and the grade and classification of the fibre also proves favourable, pattern drilling would be undertaken.

The amount of work involved in the assessment of the Huskisson serpentinite as an asbestos bearing area will require the full time services of a junior geologist. It is also recommended that this person be given the task of supervising the cutting and sampling of the Huskisson-Lynch Creek grid (see Huskisson Regional Report) as to some extent the areas overlap.

The project would require the services of 1 geologist, 4 field assistants, a bulldozer and drill cum explosives operator over a period of 2 months at a cost of \$8,500.

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SECTION B - HUSKISSON DRILLING PROJECT

1. GENERAL

This report constitutes part B of the Huskisson Grid Report. Part A concerns the chrysotile project.

2. INTRODUCTION

From the Pinnacles area, a four wheel drive access road was constructed. This was completed on February 7th and a drill-site was prepared. An Acker drill was positioned on March 3rd and a depth of 600' was reached on April 4th, whereupon the drill was moved to another site.

3. PREVIOUS WORK

Geochemical sampling of the A soil horizon along the Huskisson grid during the 1969/70 summer season revealed anomalous values in both Ni and Co. These anomalies, occurring over sheared pale green serpentinite on lines 00, 5N, 10N and 14/20N, have a strike length of 1500' and a width of 500' (see map No. Tas 2-232).

Anomalous values ranged from 8,000 ppm to over 1% in nickel and in cobalt from 550 to 1200 ppm.

To the west and downslope of the main geochemical anomaly is a 1-200' wide zone of above background soil values (up to 9,000 ppm Ni and 1,000 ppm Co). This zone has been attributed to an halation of the main anomaly.

Trenching over the geochemical nickel/cobalt anomalies on lines 00 and 14/20 and subsequent chip-sampling of the exposed rock yielded values between 2,000 ppm and 3,500 ppm Ni. These relatively low values were attributed tentatively to strong surface leaching and biochemical enrichment of the overlying soils.

7.

Matching peaks in the Ni and Co chip-sample values coincided with the leached, pale, greenish-yellow serpentinite which carried a few magnetite veins.

As a direct result of the high geochemical values, an attempt was made to drill at line 00 32.0E with an E100 Mindrill. The object was to penetrate the contact zone and check for sulphides. However, mechanical failure and a helicopter crash prevented drilling from taking place at that time.

4. SITING

The drill was sited at the intersection of the base-line and line 5N (see map Tas 2-232). It was aligned at  $240^{\circ}$  with a depression of  $45^{\circ}$ .

Subsequent bore-hole surveys (fluoric-acid etching) indicated that an angle of  $50^{\circ}$  was maintained by the hole.

The drill was positioned and aligned so that the hole would penetrate beneath the geographical centre of the main geochemical anomaly and would pass through the contact zone at least 200' below surface.

5. OBJECT

Primarily the hole was planned to give geological information about the serpentinite and its contact.

Obviously, it was hoped that nickel mineralisation would also be encountered and the hole was designed to give a possible intersection beneath the geochemical highs and/or at the serpentinite contact.

It was thought that nickel mineralisation would occur within shear zones aligned parallel to the contact and dipping steeply eastwards. The hole as sited would intersect both the shear zones and the contact at a high angle.

038

8.

6. GEOLOGY

6.1 General (see Section A)

6.2 Summary of Geology of Core

0-21'

Mainly consists of fine-grained to coarse-grained weathered grey sandstone, occasionally sparsely pyritic, and locally with minor brown-green tourmaline. Quartz veining is common but with no preferred orientation.

21-49'

As above but with grey-black siltstones becoming more predominant. The siltstones frequently show signs of brecciation and shearing.

49-62'

Zone of altered tuffs, pyritised in part. Two types of tuff may be distinguished :

- (i) This type consists of numerous large, generally elongate, fragments of deformed and partly recrystallised quartz-rich rock, together with elongate fragments and vein-like folia rich in chlorite or serpentinite, set in a very fine-grained foliated mass.
- (ii) This tuff is composed of irregular fragments of quartz, abundant angular to lath-shaped fragments of twinned plagioclase and volcanic rock fragments, separated and partly replaced by pale green chlorite and abundant finely granular sphene, the whole showing foliation.

039

62-78'

This section consists largely of quartz-veined, grey-black, pyritised, indurated, foliated siltstone. Many of the quartz-veins replace minor faults with throws up to 1" but they have no preferred orientation. Minor lithologies include a very fine-grained chert-like rock, extensively veined by quartz and a possible fine-grained tuff.

78-111'

Doleritic or Gabbroic Zone. This zone consists of extensively altered dolerite or fine hornblende gabbro. The alteration in places appears to have been mainly pseudomorphous, without significant deformation. It may have been either "hydrothermal" or low-grade (burial?) metamorphic in origin. Quartz-veining was observed occasionally and the laboratory record the presence of localised zones of deformation indicated by foliated chlorite and fine fragmentation.

111-128'

This section consists of indurated, quartz-veined, highly pyritic black siltstone. Some chalcopyrite, pyrite and possible pyrrhotite was recorded. Minor sandstone was present.

128-146'

Mainly grey-green, quartz-veined sandstone.

146-156'

Gabbroic zone? very vuggy, appears to be sparsely pyritic. Some siltstone and sandstone.

156-199'

Mainly grey-black weakly pyritic indurated siltstone and minor sandstone. It is quartz-veined and brecciated in part.

040

199-203'

Contact zone of serpentinite. The contact appears to be at 70° to the long axis of the core. Ten inches of quartz rich ("jasperoid") rock is followed by 18" of compact dark green serpentinite. This, in turn, is replaced by highly sheared serpentinite. The contact between the sheared serpentinite and the compact serpentinite appears to be at 32° to the long axis of the core.

203-209'

Very sheared, talc-rich, pale, yellow-green serpentinite.

209-245'

Largely talc-rich apple green to dark green serpentinite, much veined with magnetite/chromite. Some shearing displacing earlier magnetite veins. Predominant shears are at 40° to long axis of core. Orbicular(?) chromite was observed to have developed in talc along one shear plane. Very occasionally, there is a small smear of pyrite along a shear plane.

245'-254'

Pyritic zone. This section consists of dark green serpentinite, talc rich, and conspicuously containing pyrite in varying amounts throughout. The majority of shear zones were at 40° to the long axis of the core.

254-418'

This section consisted of mainly dark-green to apple-green, talcose serpentinite. Minor chromite was present. Shearing was recorded at 40°, 45° and 75° to the long axis of the core. No sulphides were observed.

041

418-600'

Here the character of the serpentinite appears to change from a much veined talcose to a less talcose "speckled" type. In the latter, chromite and magnetite occur as aggregates giving the core a speckled appearance, rather than in predominantly vein form. Major shears occur at 30° and 60° to the long axis. Where talc occurs it tends to be more confined to definite shear zones, rather than evenly distributed throughout the core.

6.3 Geological Conclusions

- 6.3.1 No economic mineralisation occurs at the serpentinite contact at this point.
- 6.3.2 No economic mineralisation has yet been proved within the serpentinite.
- 6.3.3 No definite zoning was observed within the core that would help determine the geological attitude of the serpentinite body.
- 6.3.4 Observed minor sulphides within the serpentinite part of the core were not related to any markedly different rock type.
- 6.3.5 On the other hand the contact intersection indicates this is steeper (near vertical) than was originally thought.

7. GEOCHEMISTRY

7.1 General

During the preparation of the drill site, "gossanous" material was exposed at the serpentinite contact. Some of this material was "grab" sampled and sent for spectrographic scan with the resulting values of interest:

Co	10,000 ppm
Ni	6,000 ppm
Cr	2,500 ppm
Mn	10,000 ppm

042

12.

This "gossanous" zone was located on the contact and for 30' either side. It consisted of thickly scattered nodules of manganese-rich material within the soil. The soil itself was red and lateritic over the serpentinite but was a buff colour over the adjacent tuffaceous sediments.

It now seems probable that this "gossanous" material is merely relict ferricrete that has been retained as weathered nodules in the soil, the manganese acting as a scavenger for the other elements.

7.2 Geochemistry of the Borehole

Sections of the core that showed visible mineralisation were split, crushed, and analysed by A.A.S. for Cu, Ni, and Co. One section (55'-62') was analysed by spectrographic scan but the results were of low order.

The data are summarised below in tabular form :

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Depth	Geology	Observed Mineralisation	Cu	Co	Ni	
55-56'	altered mafic vitric tuff	possible pyrite	30	30	25	) as part of spectro-graphic scan-other elements and values of low order.
56-61'			40	40	200	
61-62'			30	30	100	
111-114'	indurated, quartz-veined black siltstone	chalcopyrite, pyrite & possibly pyrrhotite	95	230	350	) A.A.S.
114-117'			25	25	65	
117-120'			75	20	80	
120-123'			400	20	65	
123-126'			1,000	25	65	
126-129'			100	15	50	
240-243'	dark green talc-rich serpentinite	Pyrite/magnetite/chromite	<5	65	1,700	) A.A.S.
243-246'			<5	65	1,900	
246-249'			<5	60	2,000	
249-252'			<5	55	2,000	
252-255'			<5	60	2,000	

044

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14.

No striking geochemical results were obtained for the serpentinite at depth appears to have a very low background with regard to Ni and Co values.

Clearly, we are no nearer resolving the problem of high soil chemistry in this area and probably another probe is required to test the rocks beneath the anomalous zone.

8. GENERAL CONCLUSIONS AND FUTURE RECOMMENDATIONS

The results of this drill hole are inconclusive. High soil values undoubtedly exist. These values could possibly result from surface and sub-surface nickel sulphide mineralisation.

Also, little is known about the internal structure of the serpentinite and it is possible that the present diamond drill hole was drilled parallel to the mineralised zones (for an example of one possibility see Fig. Tas 2-234). With this in mind, it is recommended that one more diamond drill hole be drilled at a position 750' along line 5N. The angle of the hole would be 50°, its bearing 060° magnetic, and its maximum length 650'. Any mineralised zones dipping to the west should be intersected by this hole.

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15.

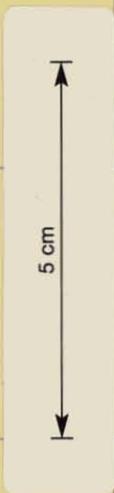
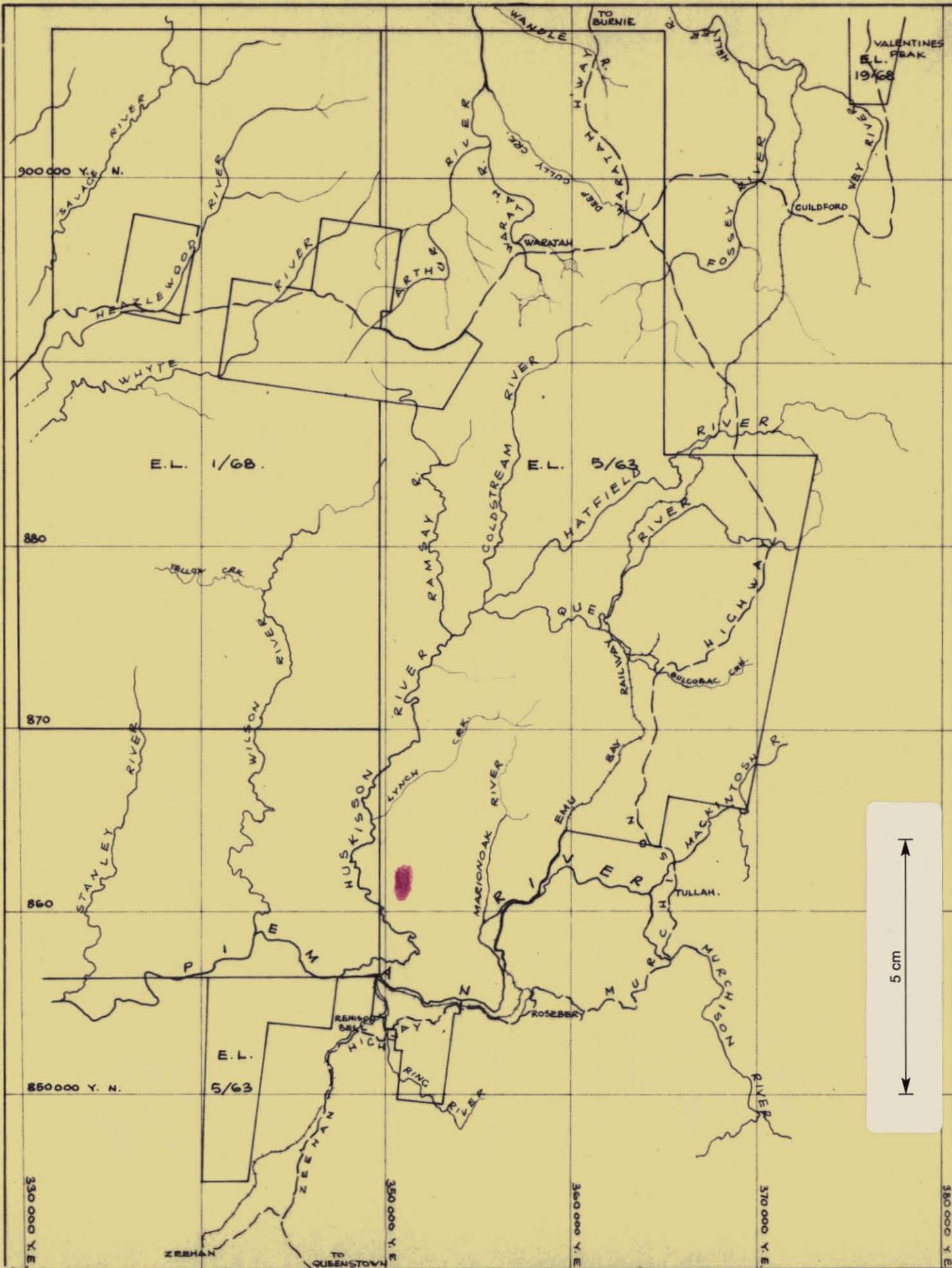
9. PLANS

<u>PLAN NO.</u>	<u>TITLE</u>	<u>SCALE</u>
Tas 2-231	Locality Plan - Huskisson Serpentinite Grid	1:250,000
2-232	Huskisson Serpentinite General	1:10,000
2-233	Huskisson Serpentinite Asbestos Details	1" = 20'
2-234	Huskisson Serpentinite Hus. DDH 1 Details	1" = 50'

M.P. EVERETT

The author was assisted in the work on  
this area by the Exploration Manager,  
Dr. J.F. Lambert, and geologist D. Wallace.

046



LOCATION MAP.



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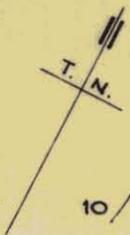
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LOCALITY PLAN

HUSKISSON SERPENTINITE GRID

DRAWN G.C.	COMPILED G.C.	SCALE 1:250,000	TAS-2-231
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048



10 / PROPOSED EXCAVATED RIBBONS

50 N

70 N  
65 N  
60 N  
55 N  
45 N  
40 N  
35 N  
30 N  
25 N  
20 N  
14/20 N  
10 N  
5 N  
LINE 00  
5 S

ASBESTOS LOCATION 1

1  
2  
3

GEOCHEMICAL 'HIGH'

HUS DDH. 1

EXISTING GRID

5 cm

- PALE GREEN SERP. W. FINE ORE VEINING.
- LAYERED DK. GREEN SERP. & PYROXENITE
- GREEN PYROXENITE
- TUFF
- GABBRO
- SANDSTONE
- LIMESTONE

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## HUSKISSON SERPENTINITE GENERAL

TECHNICAL DATA FROM REPORTS - D.F.L. 1969/70 : D.W. 1971

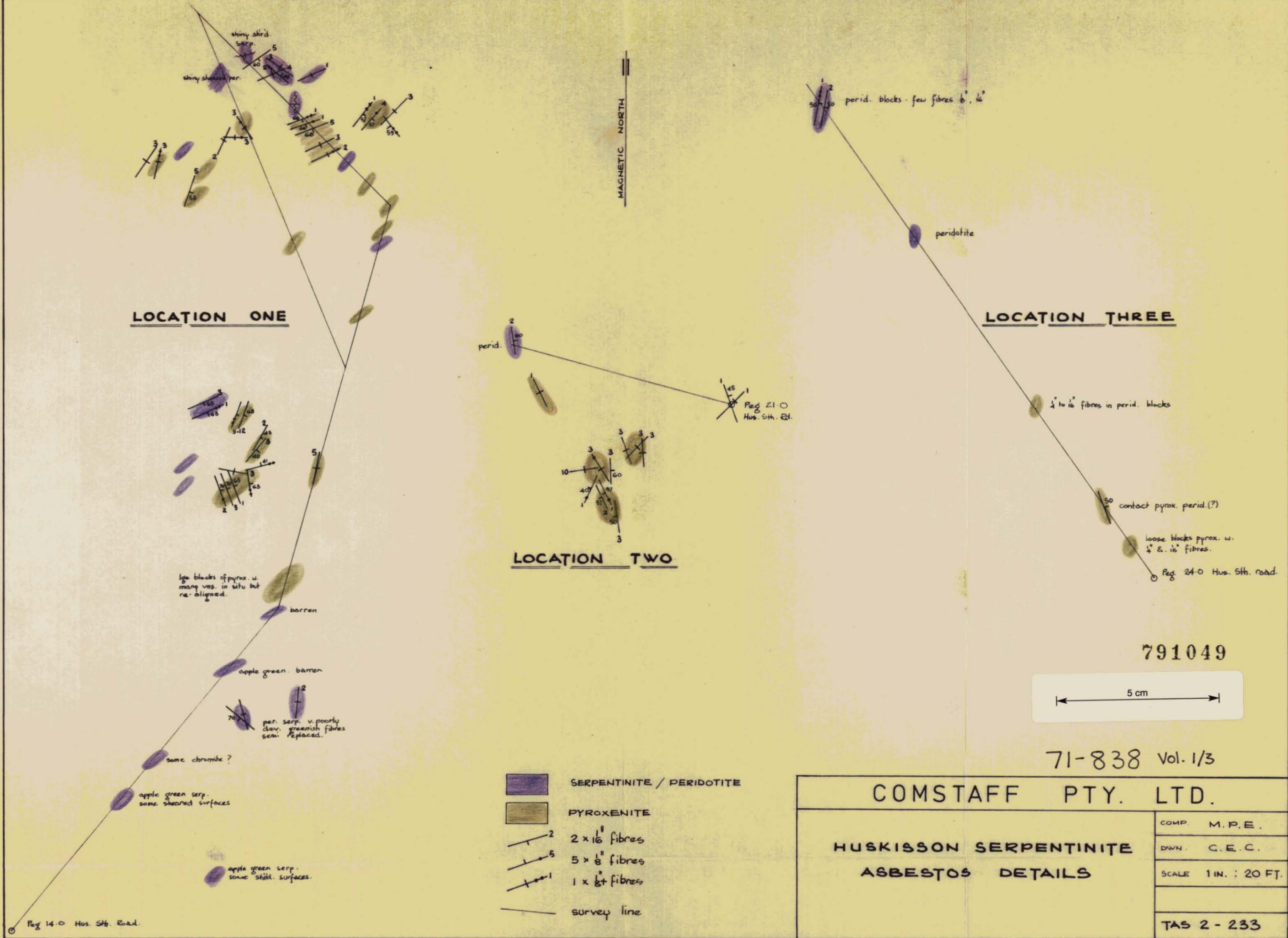
DWN: G.E.C.	SCALE: 1:10,000	TAS 2-232
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LOCATION ONE

LOCATION THREE

LOCATION TWO

MAGNETIC NORTH



lge blocks of pyrox. w. many ves. in situ but re-aligned.

barren

apple green barren

per. serp. v. poorly dev. greenish fibres semi replaced.

some chromite?

apple green serp. some sheared surfaces

apple green serp. some shield surfaces.

perid. blocks - few fibres 6", 16"

peridotite

perid.

Peg 21.0 Hus. Sth. Rd.

1/4 to 1/2" fibres in perid. blocks

contact pyrox. perid. (?)

loose blocks pyrox. w. 1/4" & 1/2" fibres.

Peg. 24.0 Hus. Sth. road.

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5 cm

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HUSKISSON SERPENTINITE ASBESTOS DETAILS

COMP. M.P.E.

DWN. C.E.C.

SCALE 1 IN. : 20 FT.

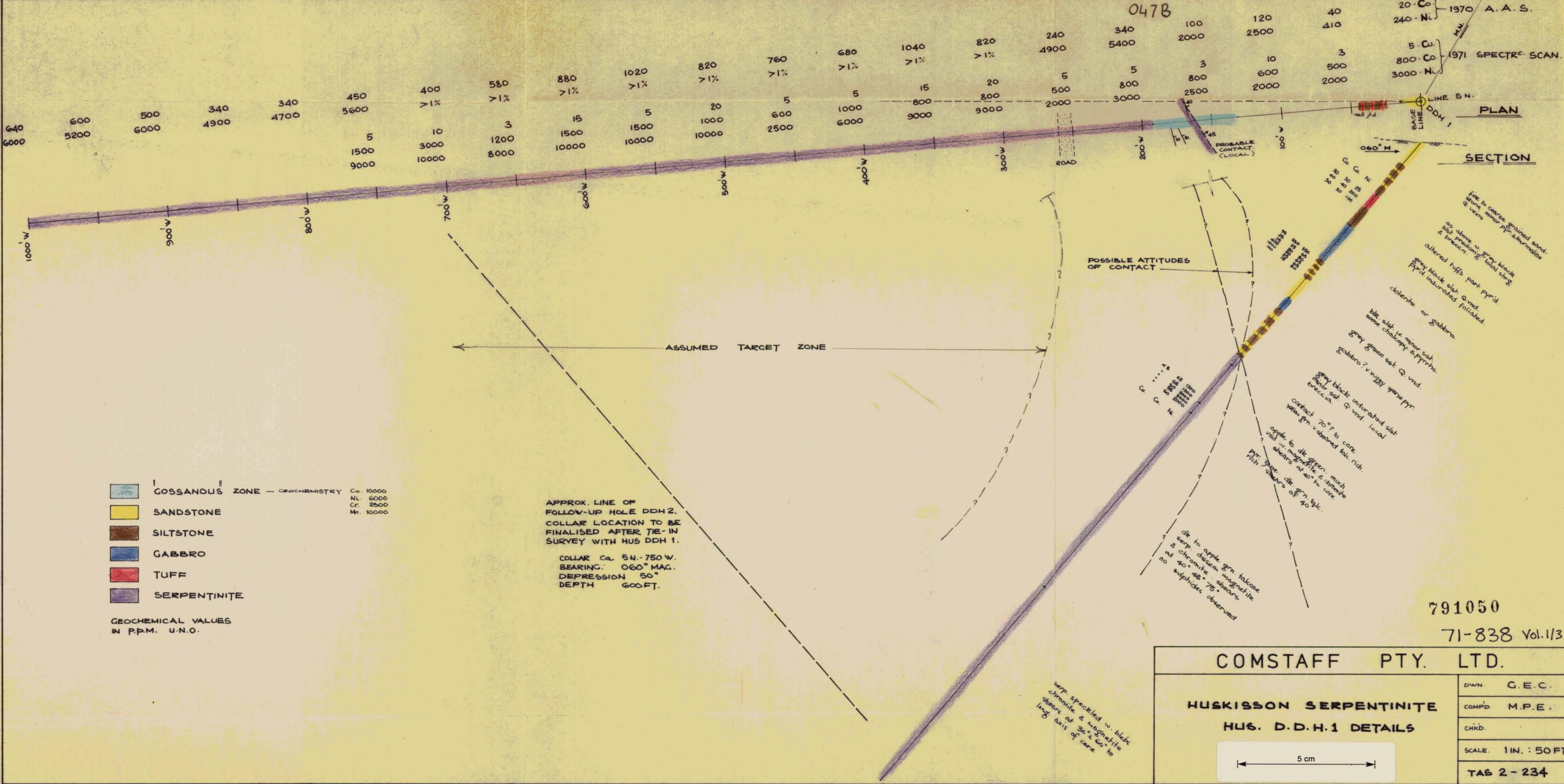
TAS 2 - 233

- SERPENTINITE / PERIDOTITE
- PYROXENITE
- 2 x 1/16" fibres
- 5 x 1/8" fibres
- 1 x 1/8" fibres
- survey line

Peg 14.0 Hus. Sth. Road.

047A

047B



- GOSSANOUS ZONE - GEOCHEMISTRY
- SANDSTONE
- SILTSTONE
- GABBRO
- TUFF
- SERPENTINITE

GEOCHEMICAL VALUES  
IN P.P.M. U.N.O.

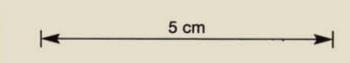
APPROX. LINE OF  
FOLLOW-UP HOLE DDH 2.  
COLLAR LOCATION TO BE  
FINALISED AFTER TIE-IN  
SURVEY WITH HUS DDH 1.

COLLAR Ca 5N-750 W.  
BEARING: 060° MAG.  
DEPRESSION 50°  
DEPTH 600 FT.

alterred tuff's part pyrd.  
dolomite or gabbro.  
ble. silt. w. minor sch.  
some chalcopyrite & pyrrho.  
grey green est. Q. vnd.  
gabbro? v. v. v. sparse pyr.  
grey black indurated silt  
fine silt. Q. vnd. local  
contact 70°? to core  
apple grn. v. v. v. talose  
rich shears at 40' to core  
pyr. zone. dk. grn. tuff.  
shears at 40'  
dk. to dk. green. much  
serp. disse. magnetite  
& chromite shears  
at 40° 45° 75°  
no sulphides observed

COMSTAFF PTY. LTD.

HUSKISSON SERPENTINITE  
HUS. D.D.H.1 DETAILS



DWN.	G.E.C.
COMPD.	M.P.E.
CHKD.	
SCALE.	1 IN. : 50 FT.
TAB 2-234	

791050  
71-838 Vol. 1/3

20-Co 1970 A.A.S.  
240-Ni  
5-Cu  
800-Co 1971 SPECTRO SCAN.  
3000-Ni

POSSIBLE ATTITUDES  
OF CONTACT

PLAN

SECTION

050

791051

HUSKISSON SOUTH PRELIMINARY REPORT.

1

2

PRELIMINARY REPORT  
FOR THE HUSKISSON SOUTH PROJECT

1. ABSTRACT

The area under consideration is bordered to the north by the Huskisson grid, to the east by the Marionoak River and Pieman River, to the south by the Pieman River, and to the west by the Huskisson River.

The object of the programme was to stream-sediment sample and geologically map the above area on a regional basis.

2. INTRODUCTION

The programme failed in its objectives and 90% of the programme remains to be accomplished.

The primary cause of delay was the construction of an access road from the Pinnacles area, via Lynch Creek, into the Huskisson area. This road had reached a point only one mile directly south of the grid when road construction was halted for the season.

Consequently, only those streams adjacent to and immediately south of the Huskisson grid were sampled before bad weather necessitated the abandonment of the project.

3. PREVIOUS WORK

Previous work in the area is negligible.

4. GEOLOGY

Nothing is yet known of the geology of the main Huskisson South area.

However, geological mapping in the Huskisson grid environs indicates that the main Huskisson serpentinite continues further south than was previously thought and, although it narrows to the south, it seems possible that

this serpentinite body continues through the Huskisson South area to link up with known serpentinite bodies in the Renison Bell East area.

Similarly, it is tentatively suggested that N-S structures mapped in the Renison Bell East area will be found to continue to the north into the Huskisson South area. Indeed, it is possible that extensions to the main Renison Bell orebodies may be located within this area.

5. GEOCHEMISTRY

5.1 Streams

Stream-sediment samples were taken every 500' from the active portion of the stream channel. A total of some 60,000' was sampled and 131 samples collected.

In Waratah, the samples were dried and sieved to a -80 mesh fraction and despatched to the laboratory for analyses in Cu, Ni, Co, Ag and Zn.

Histograms were plotted for all elements except cobalt, the latter being analysed for only a few selected samples.

Any possible anomalies were checked against histograms relating to the main Huskisson area to the north, this having a similar geological environment, as it was felt that the number of samples taken in the Huskisson area was too small for satisfactory histograms to be drawn.

Four of the stream-sediment samples were known to be taken over serpentinite. These were considered separately and only if they proved anomalous.

5.2 Soils

Soil samples were taken every 100' along the Huskisson South road. A total of 200 samples was collected and these were processed in a similar fashion to the stream

3.

sediment samples. However, care was taken to differentiate between normal samples and those known to be taken over serpentinite for which separate histograms were plotted.

### 5.3 Heavy Concentrates

No heavy concentrates were taken. This remains to be undertaken next season..

## 6. RESULTS

### 6.1 Streams

Element	Range	Population Peak	Possible Anomalies	Remarks
Cu	2-74	0-20	Nil	All previously located
Ni	2-1400	50-100	2 x 1400 2 x 1000	
Co	2-160		Nil	No histogram plotted
Ag	0-1.0	0-0.5	Nil	
Zn	8-780	100-150	1 x 780 1 x 500	New anomaly Previously located

### 6.2 Soils

#### 6.2.1 Taken over serpentinite

Element	Range	Population Peak	Possible Anomalies	Remarks
Cu	2-150	0-20	1 x 150	Taken near both gabbro and serpentinite outcrops
Ni	140- 1%	0-500	3 x >1%	Taken over previously known main Huskisson soil anomaly ..contd..

4.

Element	Range	Population Peak	Possible Anomalies	Remarks
Co	38-1000	0-100	11 x > 600 ppm	Taken over previously known main Huskisson soil anomaly
Ag	0.4-2.4	1.0-1.5	Nil	
Zn	24-100	50-100	Nil	

6.2.2 Taken over sediment

Element	Range	Population Peak	Possible Anomalies	Remarks
Cu	4-130	20-40	1 x 130	New anomaly
Ni	4-280	0-50	Nil	
Co	2-64	20-40	Nil	
Ag	0-1.8	0.5-1.0	Nil	
Zn	8-280	0-50	Nil	

6.3 Geochemical Conclusions

It is apparent that no new major anomalies have been located to date. It is recommended that no immediate follow-up work is undertaken until the Huskisson South project is completed and all the sample results may be reviewed together.

5.

7. FUTURE WORK

Some 3.5 miles of new road is needed to provide access for the Huskisson South area (see Map Tas 2-236) and as this area is believed to be thickly vegetated and of a rugged nature, the construction of this road could take two months or more.

Therefore, it is imperative that an early start is made on road construction so that a full programme of regional stream-sediment sampling and geological mapping may be completed before the close of the next summer season.

With this in mind, the following stages are proposed :

- (a) As early as access permits, two local field assistants will set up a small camp south of the Huskisson grid. Their task is to survey and blaze a suitable path for the new road extensions. To survey the first two miles should not take longer than two weeks.
- (b) As soon as the ground dries sufficiently to permit road construction, two 15 ton bulldozers (one with rippers, one with a winch) should be installed in the area. One should be used to break new ground, the other to form the road. This has proved to be the most efficacious method of road construction. Further, if one dozer breaks down, road construction is not completely halted.
- (c) If finances permit, boggy sections of the existing road should be gravelled at the earliest opportunity.
- (d) After the road has progressed approximately one mile and provided access to new drainage systems, the main camp may be established at some suitable central site, and the regional geochemical sampling and geological mapping programme commenced.
- (e) It is suggested that stream sediment samples are taken at 500' intervals and are analysed for Cu, Zn, Ag, Sn, Bi, Ni and Co.

056

791057

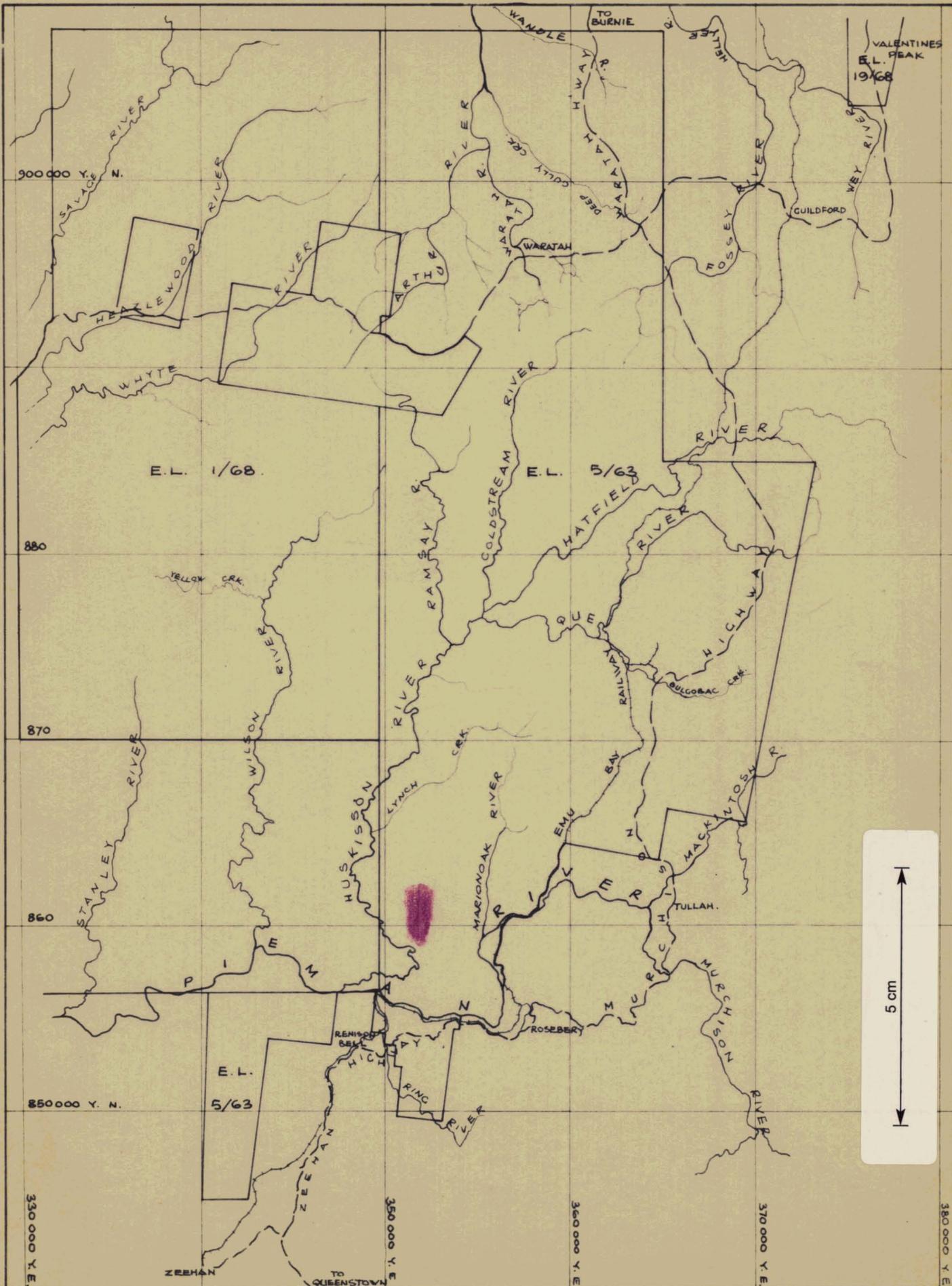
6.

8. PLANS

<u>PLAN NO.</u>	<u>TITLE</u>	<u>SCALE</u>
Tas 2-235	Locality Plan - Huskisson South Regional	1:250,000
2-236	Huskisson South Geochemistry	1:50,000

M.P. EVERETT

057



LOCATION MAP.



COMSTAFF PROPRIETARY LIMITED.

791058

LOCALITY PLAN

HUSKISSON SOUTH REGIONAL

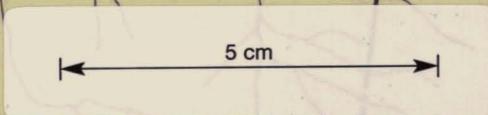
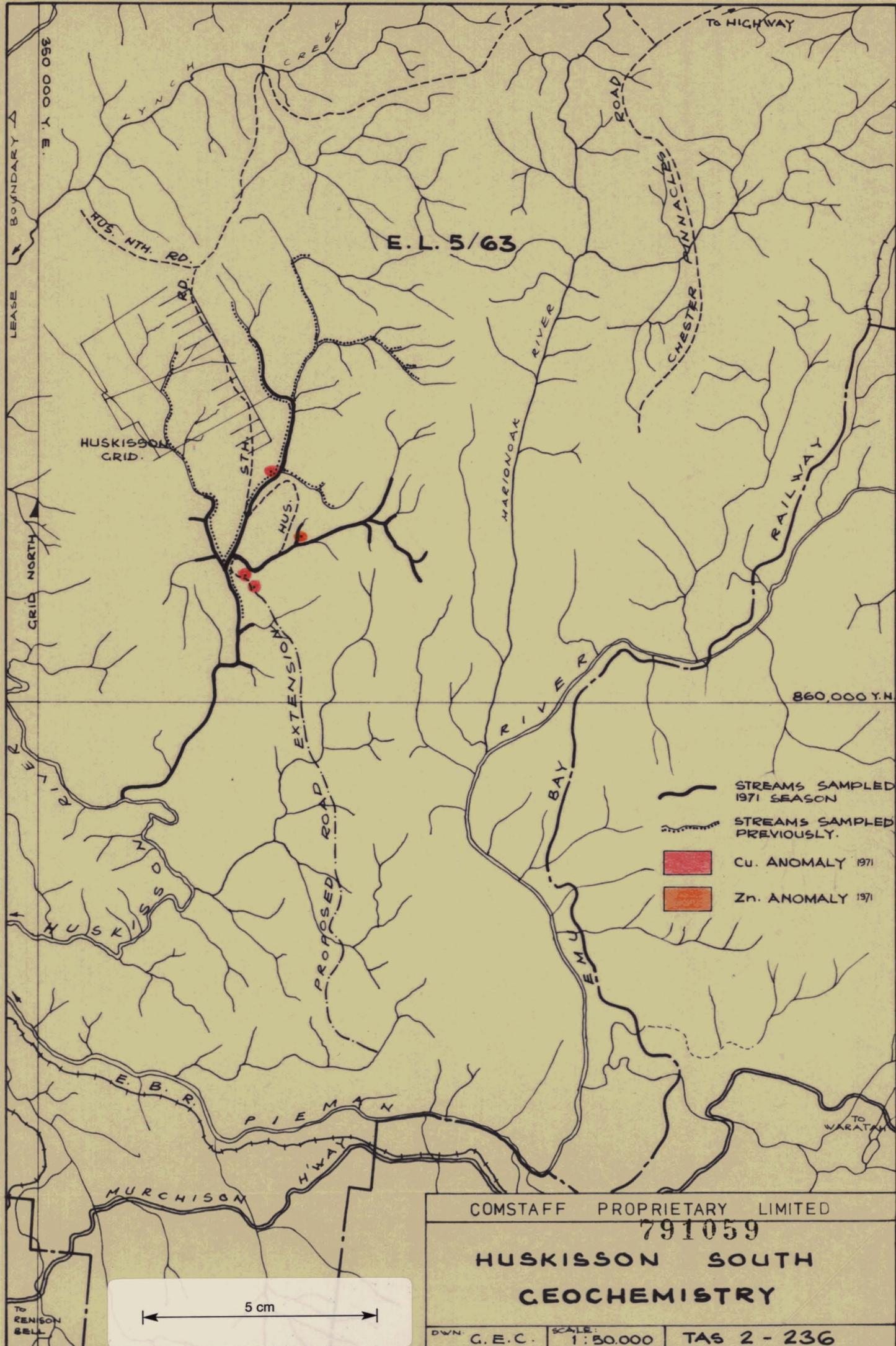
DRAWN G.C.

COMPILED G.C.

SCALE 1:250,000

TAS-2-235

058



COMSTAFF PROPRIETARY LIMITED  
 791059  
 HUSKISSON SOUTH  
 GEOCHEMISTRY  
 DWN. G.E.C. SCALE: 1:50,000 TAS 2-236

**MICROFILMED**COMSTAFF PROPRIETARY LIMITED1970 - 1971 SUMMER FIELD SEASON REPORTE.L. 5/63VOLUME IICONTENTS

1. Bulgobac-Que Regional Programme Report
2. Mt. Charter-Que River Report
3. Wombat Flat Area Report

791061

BULGOBAC-QUE REGIONAL PROGRAMME REPORT

061

BULGOBAC-QUE REGIONAL PROGRAMME REPORT

1. GENERAL

The Bulgobac-Que area refers to that part of licence E.L. 5/63 west of the Murchison Highway drained by the Bulgobac and Que Rivers (see plan Tas 2-210). Access is gained by the Murchison Highway and the Emu Bay railway line, as well as abandoned logging tracks and tramways. A road was constructed under contract to give access to the more isolated parts of the area. The road was planned to eventually join up with the Huskisson road at Lynch Creek. However, a large swamp between Silver Falls and the Que caused the road to be abandoned and so the potentially interesting Que/Hatfield area could not be prospected.

The area is of interest as it is considered that the volcanic and pyroclastic sequence could contain mineralisation similar to the Rosebery lead-zinc lodes.

A programme of geological mapping, stream sediment sampling and heavy concentrate sampling was carried out in the Bulgobac-Que drainage system during the summer of 1970-71, but was not completed on account of inadequate access. The area is underlain by the Mt. Reid porphyrys and overlying tuffaceous, argillaceous and arenaceous sedimentary rocks. Stream geochemical backgrounds were found to be low, the few sporadic anomalies in copper, zinc, lead and silver being due to contamination. Little further work is recommended.

2. GEOLOGY

2.1. General

The Bulgobac-Que area is situated within a northerly trending belt of Palaeozoic geosynclinal rocks. It lies on the eastern limb of the Que syncline along strike from the Pinnacles/Silver Falls sequence to which it is similar. The geological mapping was

2.

carried out in relation to tape and compass surveys of the tracks and major water courses.

2. Succession

The rock units mapped comprise feldspathic tuffs, argillites and shales, overlain by greywackes. These overlay and are intruded by porphyritic rhyolites, dacites and ignimbrites which form the upper part of the Mt. Reid porphyry "series" and certain intercalated argillites partially altered to hornfels. The following succession may be recognised :

- (1) Mt. Reid Porphyrys consisting of brecciated rhyolites, dacites, ignimbrites and intercalated shales and argillites are the oldest rocks in the area.
- (2) Grey shales, sandstones and minor rhyolites and tuffs.
- (3) Grey argillite, very cleaved and jointed, but with bedding discernible due to interbedded siltstones.
- (4) Interbedded feldspathic tuffs, grey argillites, shales and siltstones. The tuffs vary in size and are well layered.
- (5) Rhythmically bedded immature greywackes and arkoses fining upwards through interbedded shales and greywackes, shales and siltstones, and finally mudstones are the youngest rocks. Four and possibly five such cycles have been mapped.

- 
- (1) The Mt. Reid Porphyrys consist predominantly of porphyritic sodi potassic and potassic rhyolites. The phenocrysts consist of large corroded and embayed quartz crystals and brecciated alkali feldspars - albite when the rock is sodi potassic, orthoclase when the rock is potassic. The groundmass is pale

3.

green to grey and consists of finely crystalline quartz and alkali feldspar, together with sericite, biotite and chlorite which are probably deuteritic. Whereas flow layering and brecciation are common contact metamorphism of the sedimentary rocks on the upper contact clearly indicates the complex to be intrusive, (possible multiple injection). A mechanism of violent cauldron subsidence is visualised as causing the injection of a slowly crystallising magma into the cooling environment of geosynclinal sediments. The igneous rocks are thought to form a near-extrusive complex.

Dacitic lava flow breccias and ignimbrites occur in the rhyolite complex. The dacites consist of phenocrysts of oligoclase in a devitrified groundmass and are distinguished from the rhyolites by the absence of quartz phenocrysts. The dacites are in the form of lavas and show flow banding, cooling joints, kaolinisation and quartz veining. Ignimbrites are often associated with the dacites. They are dark grey and fragmental with a pronounced eutaxitic texture.

Intercalated within the igneous complex are grey micaceous siltstones and argillites which are indurated and partially hornfels. Black shales occur together with the ignimbrites and dacite lavas.

- (2) The oldest rocks of the sedimentary succession are grey and green shales with occasional feldspathic tuffs and rhyolite lavas. They are very similar to the intercalated sedimentary rocks within the rhyolite complex.
- (3) These are overlain by grey hard jointed argillites. Thin section examination showed the rock to consist of fine sericite, cryptocrystalline silica and fine opaques. Thin siltstone bands occur throughout the argillite and it is considered that the rock represents a metamorphosed mudstone.
- (4) The argillite is overlain by a sequence of dark grey shales, argillites and siltstones with interbedded tuffs.

The tuffaceous horizons vary in size from  $\frac{1}{2}$  inch to 1 foot. They are very coarse with feldspar and quartz fragments set in a grey groundmass, which is somewhat pyritic. The tuffs are well layered, with alternating coarse and fine layers.

- (5) Apparently overlying the tuffaceous sequence and intruded by the most westerly extension of the Mt. Reid Porphyrys are a sequence of greywackes and associated rocks. The greywackes vary from conglomerates to fine sandstones; they tend to be arkosic. The conglomerates generally form the lowest part of a cycle and consist of sub-rounded quartz, meta-sedimentary and volcanic rock clasts in equivalent amounts, in a recrystallised argillaceous matrix. Thin section examination of the greywacke sandstone showed the clasts to be angular to sub-rounded quartz, feldspar, volcanic and metamorphic rock fragments in a groundmass of chlorite, siderite, mica and epidote.

The grains are poorly sorted but the rock units do exhibit overall grading.

The massively bedded immature greywackes pass up into interbedded greywacke sandstones, siltstones and shales. The siltstones are very feldspathic, the lithic grains being derived from fine grained volcanic material, probably of acid or intermediate composition (AMDL Petrographic Report). The sequence fines upwards to predominantly shales and mudstones and then there is a clear break to the greywacke conglomerate of the next cycle.

It is possible that this greywacke cycle sequence is overlain by predominantly coarse channel conglomerates and siltstones exposed in the Que tributary, however further mapping along the Que is necessary to substantiate this observation.

065

2.3. Structure

The structure is dominated by the north plunging Que syncline; hence the rock sequence faces and dips to the west. Minor drag folds occur together with tension faults and minor shears which are parallel to the main structural trend.

2.4. Metamorphism

Metamorphic effects are limited to parts of the contact between the rhyolite complex and the intruded sedimentary rocks. Siltstones and greywackes are feldspathised while shales and mudstones are changed to hornfels or argillite.

2.5. Mineralisation

There are no records of any previous work being carried out in the area and certainly no mining operations were ever carried out. A small pod of galena was found in a fracture in the potassic rhyolite. Pyrrhotite occurs in the greywacke conglomerates as blebs surrounded by goethite. Pyrite is common in the black shales and argillites.

3. GEOCHEMISTRY (see plan Tas 2-214)

At first glance the geochemical anomalies appear to have random distribution and in part are related to contamination from the Emu Bay railway line. Closer examination raises the possibility that this chemistry is directly related to contact zones of greywacke/shale and rhyolite.

To test these anomalies close interval stream sampling will be carried out at points 1, 2, 3 and 4 with emphasis on sampling both above and below the railway line and the contact for comparative purposes. Small grids will be laid over the lead-zinc-silver anomaly at point 5 and the nickel anomaly possibly related to the pyroclastic inlier in rhyolite at point 6.

066

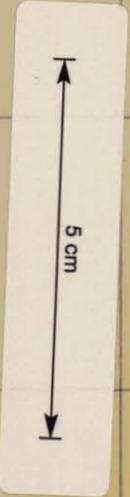
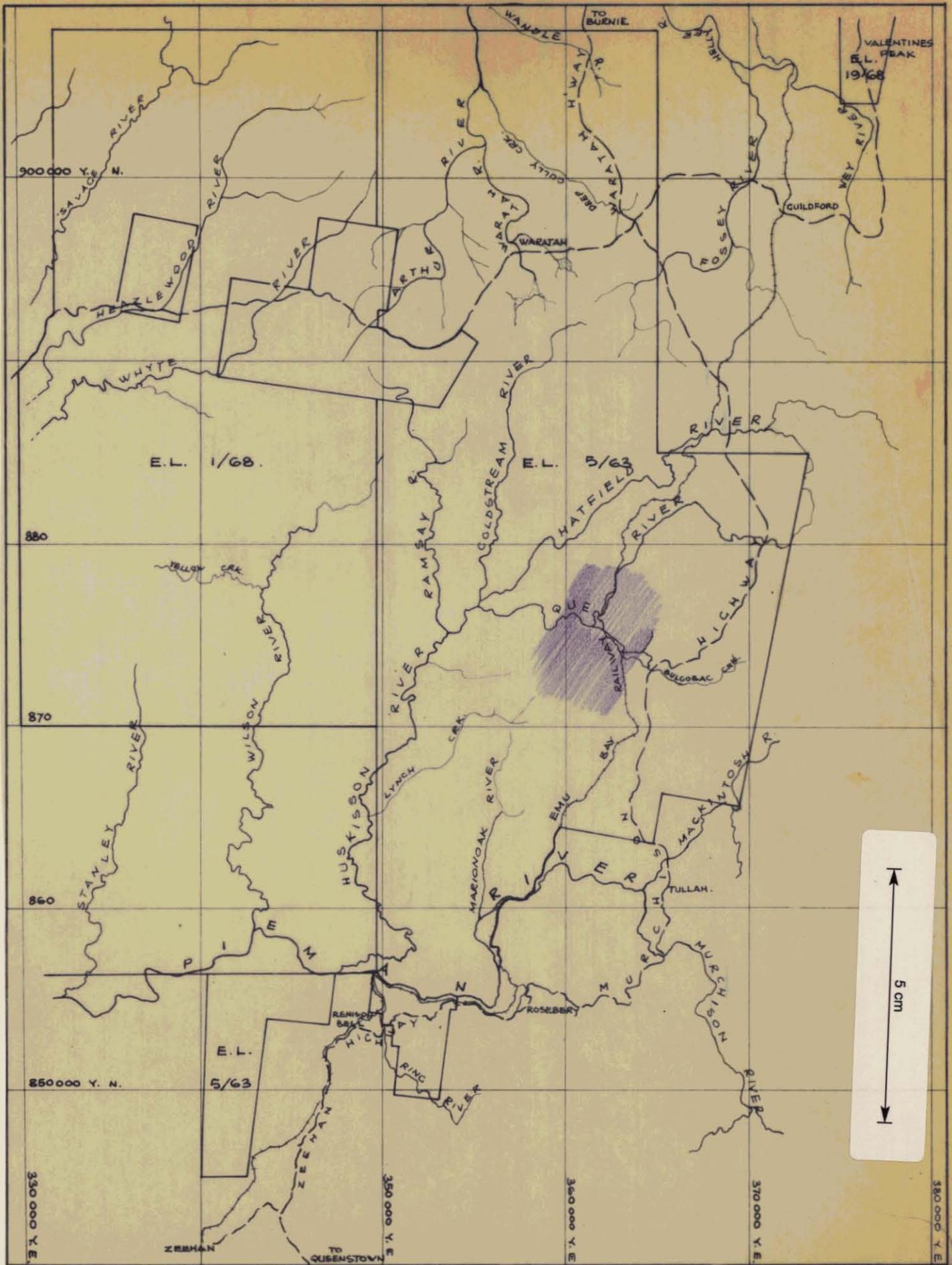
In all only 2 copper, 2 nickel, 4 tin, 7 silver, 5 zinc and 18 lead anomalous stream sediments were realised from this widespread project (cf. plan Tas 2-213), most are of relatively low order the great exception being at point 2 viz. Cu 120 ppm, Pb 4000 ppm, Zn 1400 ppm, Ag 25 ppm, Sn 120 ppm.

4. PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Tas 2-210	Locality Plan Bulgobac- Que Regional	1:250,000
2-211	Geology	1: 50,000
2-213	Stream Sampling Coverage	1: 50,000
2-214	Geochemical Anomalies	1: 50,000

G. FIGOTT

The author was assisted in the work on this area by the Exploration Manager, Dr. J.F. Lambert, and geologists, T. Chisholm and MPP. Everett.



LOCATION MAP.



COMSTAFF PROPRIETARY LIMITED.

791068

LOCALITY PLAN  
BULGOBAC / QUE REGIONAL

DRAWN G.C.	COMPILED G.C.	SCALE 1:250,000	TAS-2-210
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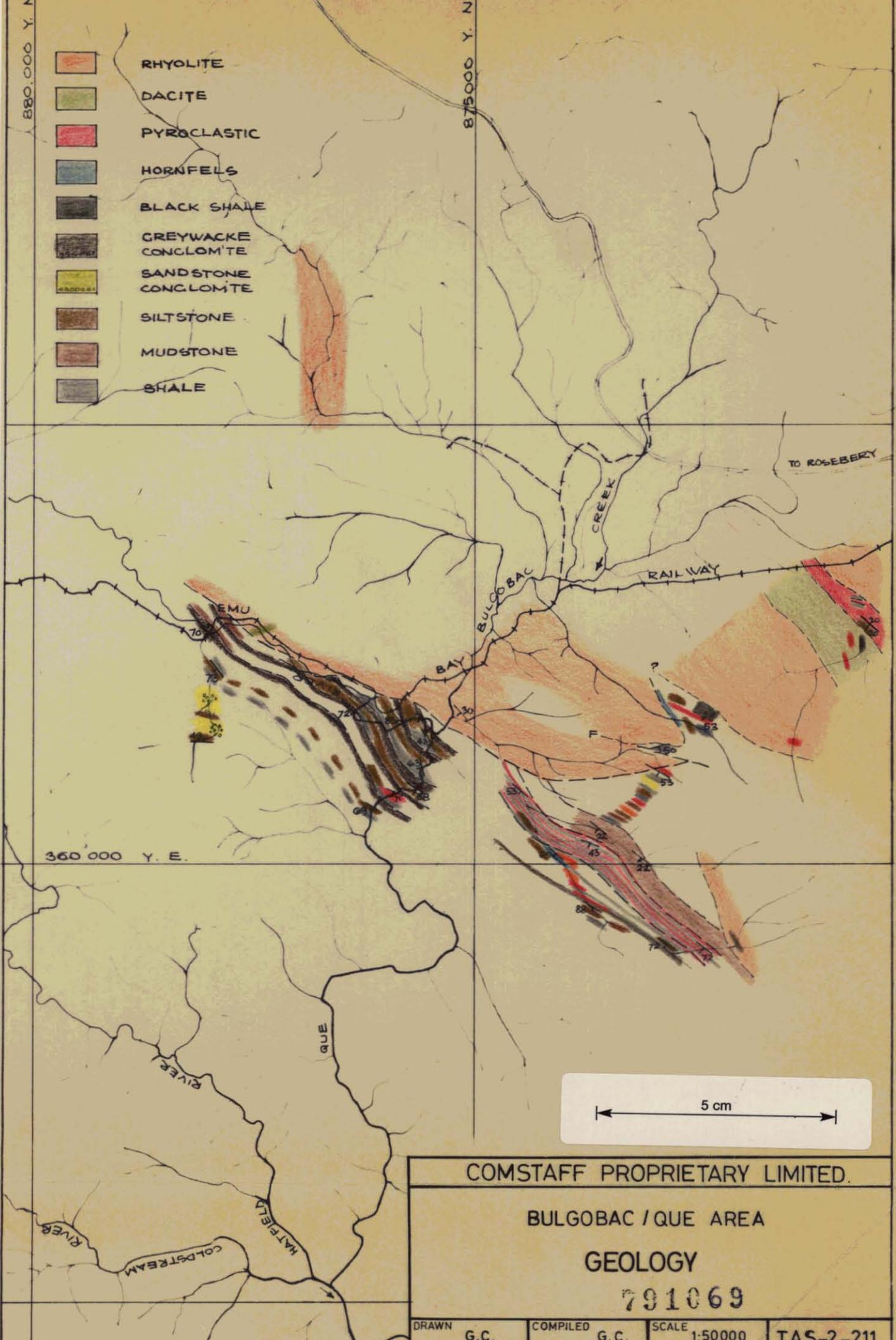
880 000 Y. N.

370 000 Y. E.

TO BURNIE

875 000 Y. N.

-  RHYOLITE
-  DACITE
-  PYROCLASTIC
-  HORNFELS
-  BLACK SHALE
-  GREYWACKE CONGLOM'ITE
-  SANDSTONE CONGLOM'ITE
-  SILTSTONE
-  MUDSTONE
-  SHALE



COMSTAFF PROPRIETARY LIMITED.

BULGOBAC / QUE AREA

GEOLOGY

791069

DRAWN	G.C.	COMPILED	G.C.	SCALE	1:50,000	TAS-2-211
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880,000 Y. N.

370,000 Y. E.

TO BURNIE

875,000 Y. N.

TO ROSEBERY

EMU

RIVER

BAY

BULGOBAC

CREEK

RAILWAY

360,000 Y. E.

QUE

RIVER

RIVER

GOLDSTREAM

HATFIELD

5 cm

COMSTAFF PROPRIETARY LIMITED

BULGOBAC / QUE AREA

STREAM SAMPLING COVERAGE

791070

DRAWN G.C.

COMPILED G.C.

SCALE 1:50,000

TAS-2-213.

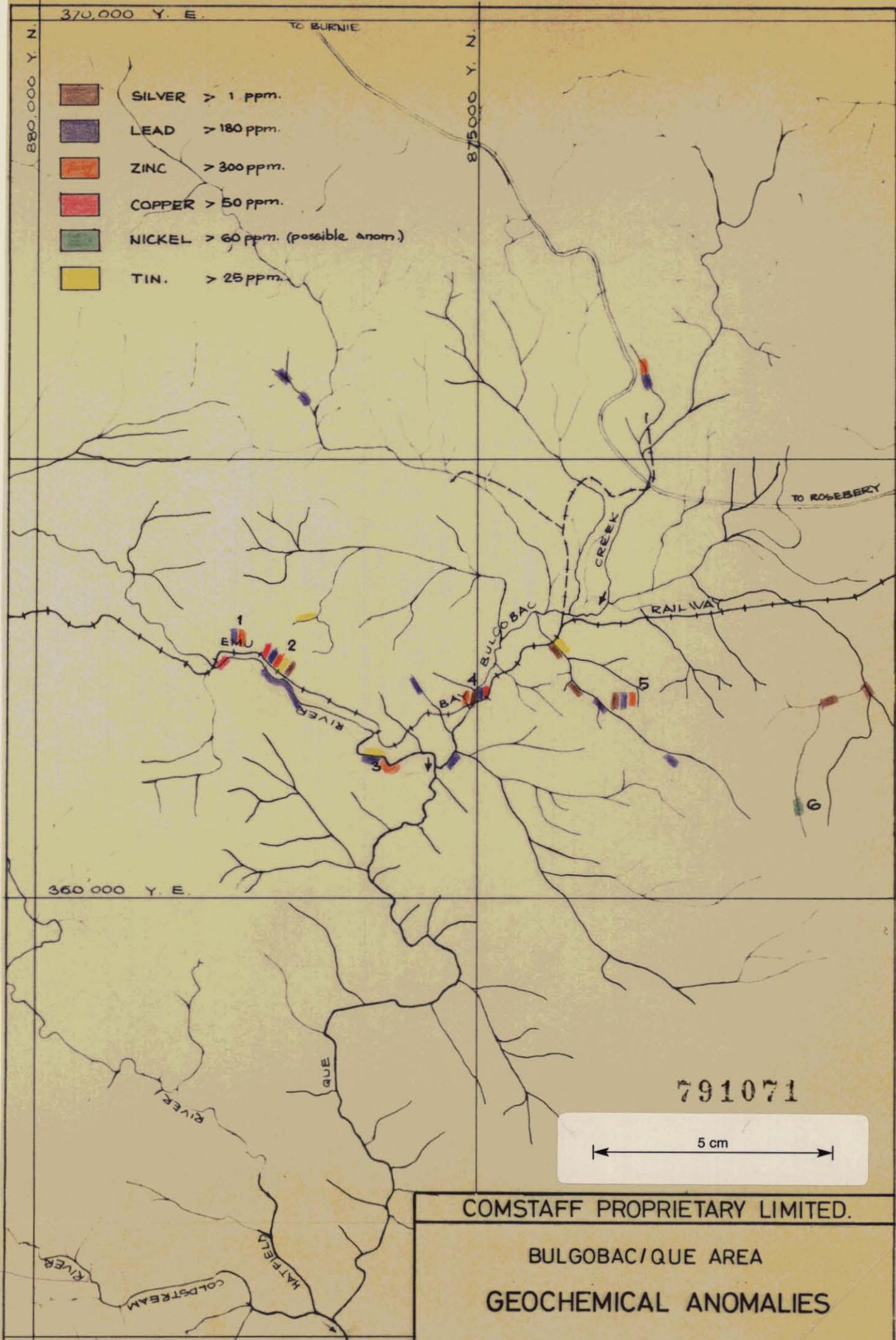
370,000 Y. E.

880,000 Y. N.

TO BURNIE

875,000 Y. N.

- SILVER > 1 ppm.
- LEAD > 180 ppm.
- ZINC > 300 ppm.
- COPPER > 50 ppm.
- NICKEL > 60 ppm. (possible anom.)
- TIN. > 25 ppm.



360,000 Y. E.

791071

5 cm

COMSTAFF PROPRIETARY LIMITED.

BULGOBAC/QUE AREA  
GEOCHEMICAL ANOMALIES

DRAWN G.C.

COMPILED G.C.

SCALE 1:50,000

TAS-2-214

071

791072

MT. CHARTER-QUE RIVER REPORT

072

1970-71

791073

MT. CHARTER - QUE RIVER REPORT

1. GENERAL (Plan Tas 2-219)

The Que River regional stream sediment sampling programme carried out during the 1969/70 summer season, located a lead/zinc anomaly over basic lavas and pyroclastics on a tributary of the Que River, on the western boundary of E.L. 5/63. Follow up work in this area took the form of a soil sample grid with an interval of 500' x 50', the Ao horizon soil samples being analysed by A.A.S. for silver, lead and zinc. This programme outlined peri-coincident anomalies trending NE over a strike length of 500'. At this stage an attempt was made to bulldoze a road into the area; this managed to reach within 1,500' of the grid before being stopped by soft ground. As a result the 300' costean, sunk over the anomalous area, had to be dug by hand. Finally, a small programme of 1,000' of self-potential and induced polarization surveys was carried out to outline possible mineralized zones.

?  
eastern?

2. GEOLOGY

2.1. Regional (Plan Tas 2-220)

Regional mapping has shown the area to be underlain by NE trending volcanics with minor intercalated sediments. 5,000' to the NW of the grid an asymmetrical syncline has been postulated with a NE trending axis and NW and SE limbs dipping at 15° and 30° respectively. A shear zone has been noted in three tributaries of the Que River trending NE and dipping steeply to the SE over a strike length of 4,000', possibly coincident with an anticlinal axis. This shear theoretically passes through the grid, though no exposures were noted during the mapping programme.

2.2. Grid (Plan Tas 2-221)

Geological mapping of the grid was not informative

due to the lack of exposure, most of the rocks were examined at the roots of fallen trees. Rock types noted include basic to intermediate lavas, lava breccia/agglomerate, tuffs, and a number of vein quartz float boulders. The strike and dip of formations in the area is open to doubt, but if the regional geology is taken into account, i.e., the rocks trend NE with steep dips to the SE, the probable stratigraphy from east to west would be as follows:

Lithic tuff  
Andesite porphyry  
Dacite lava  
Lava breccia/agglomerate

2.2.1. Lithic tuff

This formation occupies the SE corner of the grid. The rocks have undergone intense alteration which has obscured primary features. The fragments are vesicular and flow layered green glassy rocks in which relict perlitic cracking can still be recognised. Secondary carbonate, sericite and chlorite are common and replace most of the original constituents.

2.2.2. Andesite porphyry

This formation occupies a NE trending zone in the eastern sector of the grid. This rock is a vesicular flow-layered andesite containing small phenocrysts of andesine in a groundmass of small plagioclase laths and abundant interstitial chlorite. The vesicles are small and filled with quartz-chalcedony, chlorite-quartz. Chlorite also occurs as patches of deuteric origin.

2.2.3. Dacite lava

The dacite forms a central wedge between the andesite porphyry and lava breccia/agglomerate. Classification of this rock is based on the presence of plagioclase and the absence of quartz phenocrysts; but the rock

074

is too altered to be certain about this. It comprises occasional phenocrysts of completely sericitised feldspar, with a relict texture suggestive of plagioclase and a groundmass of fine quartz and "felsitic" material with abundant sericite as fine films and flakes. Flow-layering is present, and this is accentuated by sub-parallel fine sericite films.

2.2.4. Lava breccia/agglomerate

These rocks occupy, as far as is known, the central and western portion of the grid. The lava fragments which are somewhat altered have probably an andesitic composition. Phenocrysts of augite are set in a vesicular, flow-layered groundmass of devitrified glass, sericitised feldspar laths, altered pyroxene and opaques. The vesicles are filled with chlorite.

2.3. Costean (Plan Tas 2-224)

The rocks exposed in the costean include lavas, tuffs and lava breccia/agglomerate.

The lavas are completely weathered and consist of red, brown and yellow stained kaolin. Relict vesicles are infilled with red iron oxide and possible talc. Occasional siliceous boulders of lava have resisted weathering.

The tuffs are also weathered and vary in colour from red to yellow to green, the latter being due to chloritization. There is a vague lineation in hand specimens suggesting that these rocks are in fact bedded.

The lava breccia/agglomerate is a fresher rock consisting of pale green amygdaloidal fragments up to 6cm in length in a slightly darker green, compositionally similar matrix. The amygdales in the fragments are infilled with quartz carbonate and iron oxide.

The contacts between formations are poorly exposed, but suggest a NE strike with variable dips to the east. The contact between lava and lava breccia in the

075

eastern portion of the costean is possibly sheared. No mineralized zones were noted.

3. GEOCHEMISTRY

3.1. Soil (Plan Tas 2-222, Sh. 1)

Soil samples from the Ao horizon were collected at 50' intervals along east-west and north-south lines 500' apart. The east-west line interval was reduced to 250' in the vicinity of the silver-lead-zinc anomalies. The samples were dried, sieved through -80 mesh and the fine fraction dispatched for analysis by A.A.S. for silver, lead and zinc. The anomalous samples were further analysed by spectrographic scan for cobalt, molybdenum, nickel, niobium, vanadium, gold, bismuth, cadmium, copper, antimony and arsenic.

3.1.1. Silver

Values range from 0.2 ppm to 26.0 ppm with a background value of 0.25 ppm. Values over 2.5 ppm are regarded as anomalous. Silver values above this figure are erratic; high points being surrounded by low order values. The anomalous samples form two rather sinuous north to north-easterly trending anomalies on the eastern border of the lead anomalies.

3.1.2. Lead

Values range from 2 ppm to 6900 ppm with a background value of 25 ppm. The histogram decay curve indicates three small breaks at 600, 1,200 and 1,800 ppm and values greater than 1,800 ppm are regarded as anomalous. The lead values exhibit a gradual build-up to anomalous areas. The anomalies have a general NE trend and lie between the silver anomalies to the east, and zinc anomalies to the west.

3.1.3. Zinc

Values range from 2 ppm to 2300 ppm with a background of 10 ppm.

Three threshold values were noted at 120, 240 and 300 ppm and values exceeding the last are regarded as anomalous. The zinc values, like lead, exhibit a gradual build-up to anomalous areas. The anomalies trend NE and occur on the western borders of the lead anomalies.

3.1.4. Spectrographic Scan (Plan Tas 2-222, Sh. 2)

Samples from the anomalous area were analysed by spectrographic scan for elements already described and results are tabulated below. All values in ppm.

791078

Element	Range	Anomalous	No. of Anomalous Value	Position
Copper	5-500	>100	10	Straddle Ag,Pb,Zn anomalies
Vanadium	10-800	>350	4	" " "
Nickel	5-80	nil		
Molybdenum	1 value of 5 ppm	nil		
Niobium	Not detected	nil		
Bismuth	1-10	> 5	1	Over Ag,Pb anomalies
Arsenic	50-150	> 50	2	" " "
Cadmium	Not detected	nil		
Gold	" "	nil		
Antimony	" "	nil		

The plotting of soil sample values gave a pattern in which the silver anomalies occupied the higher elevations in the east; followed by lead anomalies and then at the lower elevations to the west the zinc anomalies. Zinc values show similar ranges in both stream and soil samples, lead values are an order of magnitude higher in soils, while silver values, though erratic, are also appreciably higher in soils. These facts indicate a mobility in which zinc is greater than lead which is greater than silver.

3.2 Costean (Plan Tas 2-224)

A 300' costean was dug over the northern portion of the silver, lead and zinc anomalies. The trench is situated on line 60N between pegs 59E and 62E. Channel samples were taken at 5' intervals and the samples dried, split, sieved through -80 mesh and the fine fraction analysed by A.A.S. for silver, lead and zinc. Results from these samples are tabulated below, all values in ppm.

	<u>Range</u>	<u>Remarks</u>
Silver	0.8 - 11.0	Higher values confined to tuff
Lead	120 - 6000	Higher values in tuff and possibly sheared lava/lava breccia contact
Zinc	42 - 1800	Higher values confined to lava breccia/agglomerate

These values, apart from the high silver, are not considered to be encouraging; however, highest zinc and silver values occur in samples from either end of the trench, and will require following up. Costean sampling indicates that the zinc anomalies are in fact related to different formations to the silver/lead anomalies, throwing some doubt on relative element mobilities deduced from soil sample results.

4. GEOPHYSICS

4.1. Self-Potential

A quick self-potential survey was carried out on line 55N over the anomalous zone to test both the ground and possibly the efficiency of the method. Experimentation was carried out involving differing electrode lengths and configurations as well as varying electrode contact systems. Readings obtained are regarded as meaningless, ranging erratically between +51 Mv and -31 Mv, with no consistent pattern emerging.

4.2. Induced Polarization

A short induced polarization survey of 1000' at 50' stations was carried out by C.G.G. on line 60N (Plan Tas 2-223) between pegs 55E and 65E. A single point anomaly was discovered at peg 59E with minor I.P. effect and fairly low resistivity of 1000 ohm meters. This anomaly coincides with the highest zinc value in both soil and costean samples (Plan Tas 2-224).

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Geochemistry

Geochemical values are of low order when considered in relation to a massive sulphide target zone. The possibility of disseminated mineralization of economic grade has not been discounted, but a larger zone of good geochemical values than at present exists would be required before consideration would be given to diamond drilling.

5.2. Geology

Geological mapping has not indicated a mineral zone of any importance, though the rock types

breccia/agglomerate and tuff are probable host rocks. Neither shear zones, apart from a probable sheared contact, nor faults were noted.

5.3. Geophysics

The geophysical anomaly must have some significance, but as it is a single point anomaly and occurs over a peak zinc value which is not encouraging, further work is not recommended.

5.4. Future Work

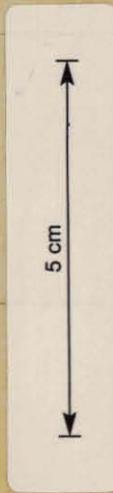
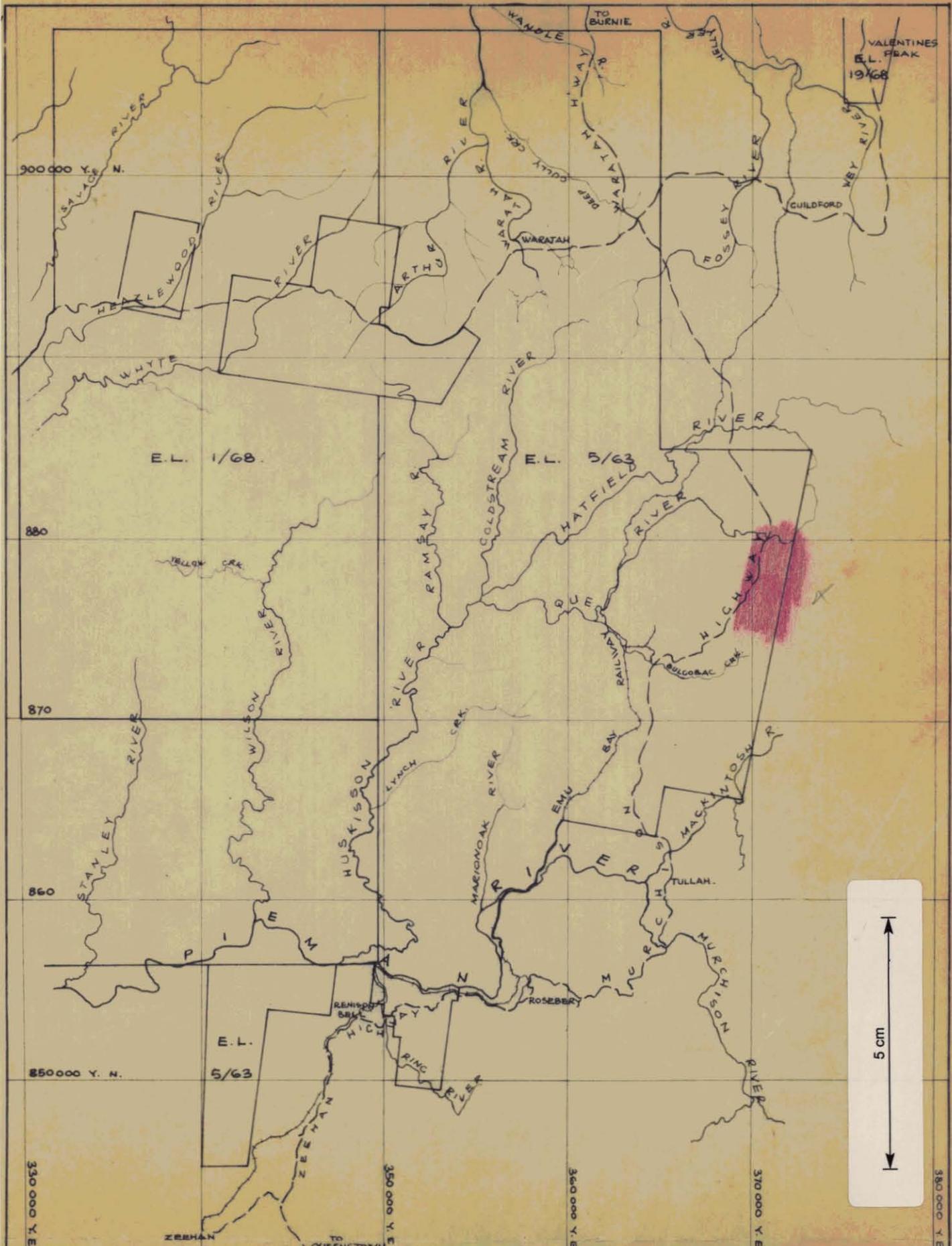
A further 250' of costeaning must be carried out (100' added to the western end and 150' to the eastern end) to conclude this stage of the investigation and if this fails to encounter encouraging values or formations, no further exploration should be attempted.

6. PLANS

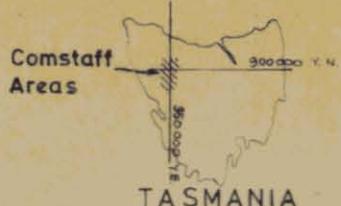
<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Tas 2-219	Locality plan - Mt. Charter region	1:250,000
2-220	Que Regional - Geology	1: 25,000
2-221	Que Grid - Geology	1: 2,000
2-222 -	Sheets 1 and 2	
	Que Grid - Geochemistry	1: 2,000
2-223	Que Grid - Geophysics (Line 60N)	1":100'
2-224	Que Grid - Costean	1": 10'

T. CHISHOLM

The author was assisted in the work on this area by the Exploration Manager Dr. J.F. Lambert.



LOCATION MAP.



COMSTAFF PROPRIETARY LIMITED.

791082

LOCALITY PLAN

MOUNT CHARTER AREA

DRAWN G. C.	COMPILED G. C.	SCALE 1:250,000	TAS-2-219
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082

375000 Y. E.

TO WAREATAH

MURCHISON HIGHWAY

TERTIARY BASALT

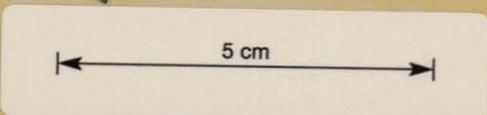
QUE RIVER

880 000 Y. N.

QUE GRID AREA

TO ROSEBERY

-  SANDSTONE
-  SILTSTONE
-  SHALE
-  BLACK SHALE
-  TUFF
-  PORPHYROID
-  BASALT

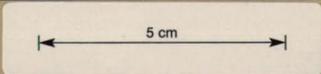


ALL DATA FROM 1965-70 FIELD SEASON  
SEE REPORT "UPPER QUE RIVER"

COMSTAFF PROPRIETARY LIMITED		
MOUNT CHARTER AREA.		
QUE REGIONAL GEOLOGY		
791083		
DWN	C.E.C.	SCALE 1:25000
		TAS 2-220

41 41d

083A



LEGEND

- QUARTZ.
- LITHIC TUFF
- ANDESITE PORPHYRY
- DACITE LAVA
- LAVA BRECCIA & AGGLOMERATE
- VEGETATION BOUNDARY
- STREAMS
- FLOAT
- OUTCROP
- GEOLOGICAL BOUNDARY INFERRED
- ROCK SPECIMEN DESCRIPTIONS

791084

COMSTAFF PTY. LTD.

MOUNT CHARTER REGIONAL

QUE GRID

GEOLOGY.

COMP. T. Chisholm

DRAWN. G. E. C.

SCALE. 1 : 2000

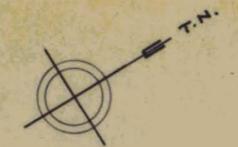
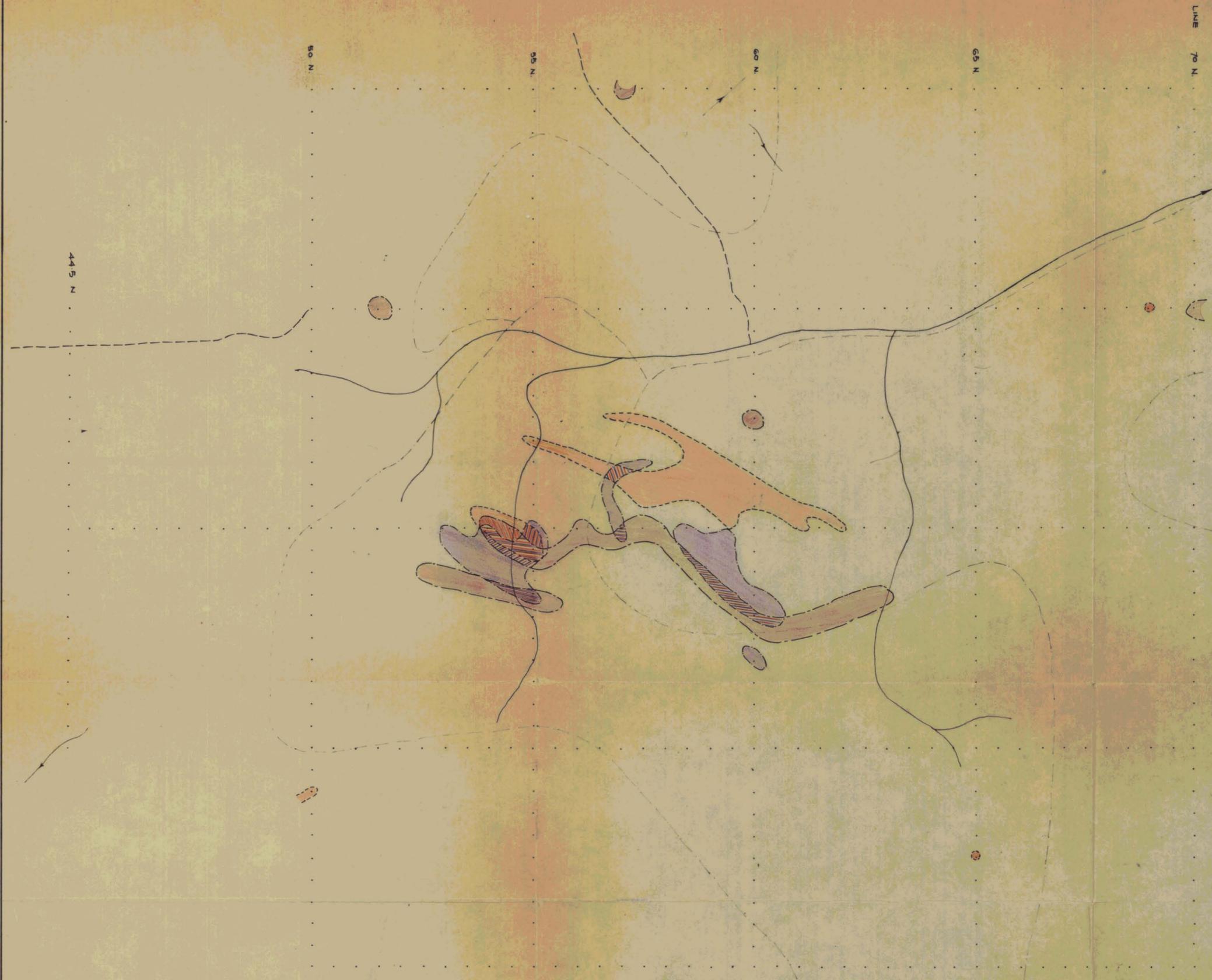
TAS 2-221

71-838



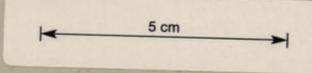
083B

084A



LEGEND

-  Ag. > 2.5 ppm.
-  Pb. > 1800 ppm.
-  Zn. > 300 ppm.



791085

<b>COMSTAFF PTY. LTD.</b>	
MOUNT CHARTER REGIONAL	COMP. T. Chisholm
QUE GRID	DWN. C. E. C.
GEOCHEMICAL ANOMALIES.	SCALE. 1 : 2000.
Ag. Pb. Zn.	TAS 2-222 SH. 1

71-838

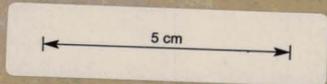
084A



085A

- LEGEND.**
- Cu. > 100 ppm.
  - V. > 350 ppm.
  - As. > 750 ppm.
  - Bi. > 5 ppm.

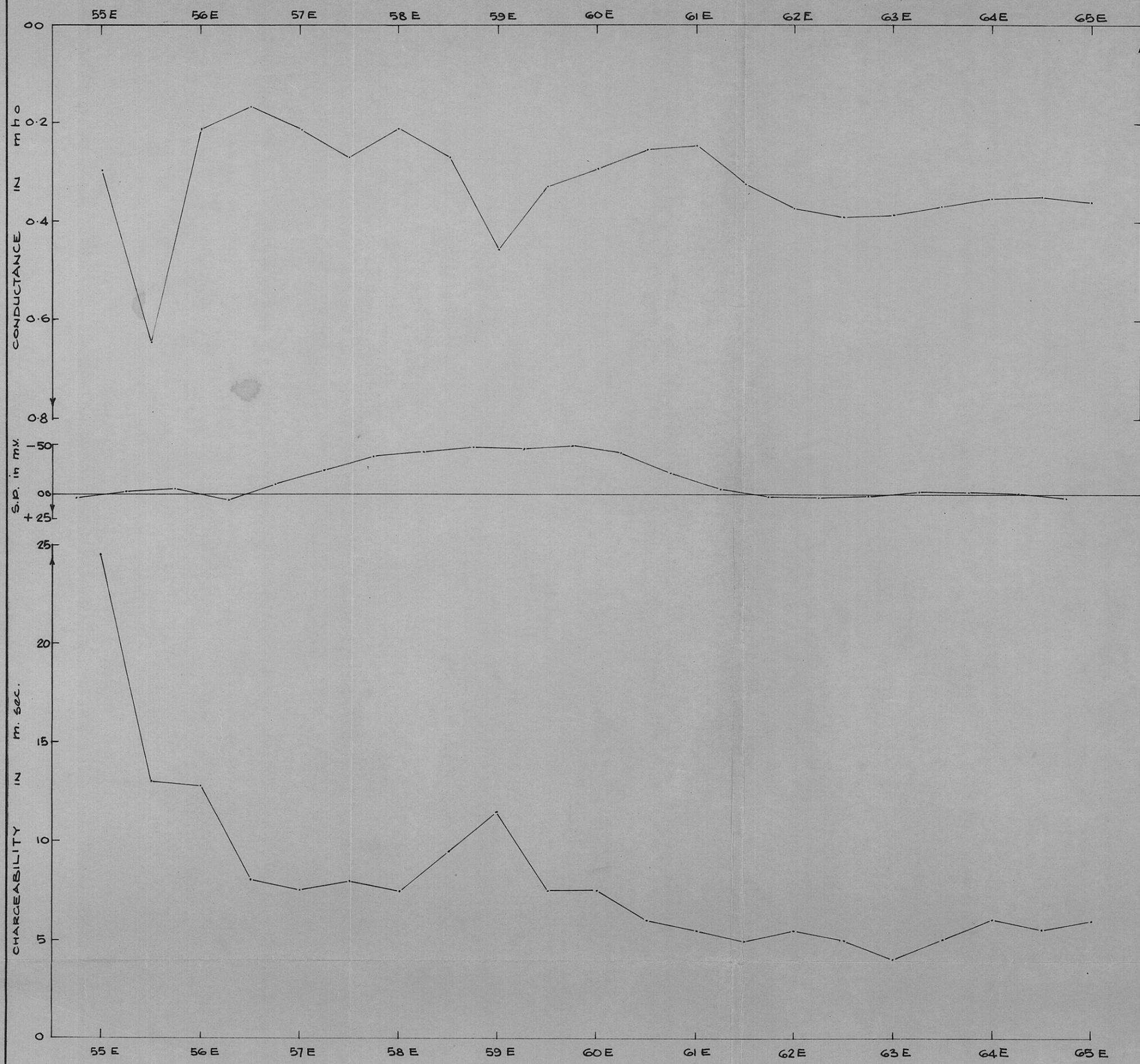
791086



<b>COMSTAFF PTY. LTD.</b>	
MOUNT CHARTER REGIONAL. QUE GRID	COMP. T. Chishelm.
GEOCHEMICAL ANOMALIES.	DRAWN. C. E. C.
Cu. V. As. Bi.	SCALE 1. : 2000
	TAS 2-222 SH. 2

71-838

086



LINE 60 N.

RESISTIVITY IN OHM. METRE.

200  
150  
83  
25

ALL DATA FROM "C.G.G." REPORT SKETCH.

791087

COMSTAFF PROPRIETARY LIMITED		
MOUNT CHARTER REGIONAL QUE GRID		
GEOPHYSICS - LINE 60 N.		
DWN. G.E.C	SCALE 1IN.:100 FT.	TAS 2-223

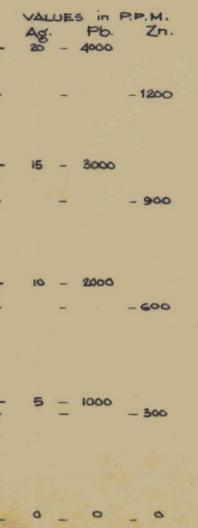
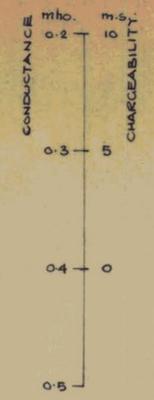
08TB

08TC

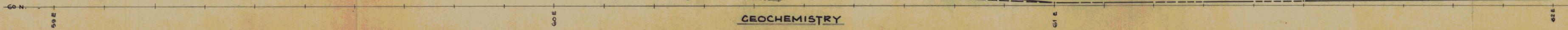
### GEOPHYSICS

I.P.

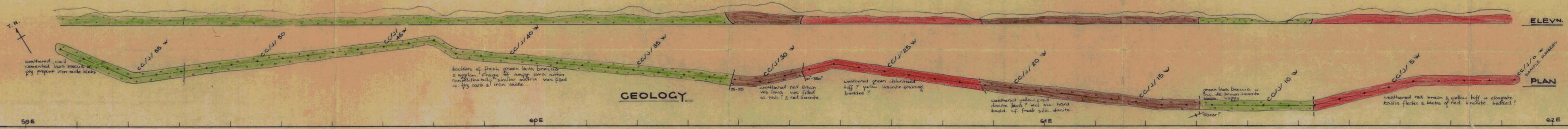
CONDUCTANCE



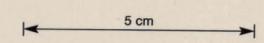
### GEOCHEMISTRY



### GEOLOGY



791088



COMSTAFF PROPRIETARY LIMITED  
MOUNT CHARTER REGIONAL  
QUE GRID  
LINE 60N. COSTEAN DETAILS.

DWN: C.E.C. SCALE: 1IN. = 10FT. TAG 2-224

088

WOMBAT FLAT AREA REPORT.

089

WOMBAT FLAT AREA REPORT

1. GENERAL

A small programme of stream sediment sampling and geological mapping was undertaken over the granite contact area at Wombat Flat.

Geological mapping has shown the existence of lower Palaeozoic sediments and intrusives, two gradational varieties of granite (Devonian?) with a Tertiary basalt capping. No exposures of the granite contact were seen, and apart from recorded occurrences of tin, no tin mineralization was noted.

Sample results indicate anomalous tin and tungsten values, with reservations expressed about their significance due to small prospects scattered through the area. Molybdenum, beryl, tantalum and niobium values are of low order.

2. HISTORY

Small workers have been active over a number of years but there is little activity at present. A dozen prospects occur in the area, half of which entailed underground development. None of the workings were large, with tin mineralization occurring in small lenticular bodies of aplite and pegmatite within the main granite mass. The cassiterite is associated with various minerals including quartz, lepidolite, molybdenite, pyrite, chalcopryrite and sphalerite. A number of alluvial deposits have been successfully worked on a small scale. The largest of these is the Wombat Flat prospect which had yielded 40 to 50 tons of tin until 1923 and has been worked sporadically since that time.

3. GEOLOGY

The area mapped is centered six miles to the SSW of

Waratah in the upper drainage basin of the Ramsay river (see Tas 2-215). The regional geology of the area was mapped during the summer of 1969/70. The present (1970-1971) programme concentrated on the granite contact area (see Tas 2-216).

The oldest rocks in the area are lower Palaeozoic sediments consisting of mudstones, sandstones, quartzites and argillites with minor intermediate intrusives. These formations are intruded by the Meredith granite stock measuring 17 miles EW and 12 miles NS. Both the above formations are covered in part by Tertiary basalt.

### 3.1. Palaeozoic Sediments

The sediments in this area occur in close proximity to the Ramsay river. Field mapping in 1969/70 divided the rocks into two distinct successions and sediments in the area mapped belong to the Ramsay Succession. These are essentially graywacke-free mudstones, sandstones and shales with minor limestone and tuff. An intrusive is a hard, fine grained, massive rock of basic to intermediate composition and crops out in the Ramsay and one of its tributaries.

### 3.2. Meredith Granite

The Meredith granite stock is chemically an adamellite (Groves & Solomon 1964) and varieties noted during the present programme were mainly equigranular and porphyritic with minor aplitic and pegmatitic patches.

The equigranular and porphyritic varieties consist of plagioclase, orthoclase, quartz and anhedral biotite, with the latter variety including plagioclase phenocrysts up to 5cm in length.

3.

The pegmatitic variety is a locally coarse grained quartz-feldspar rock with minor biotite.

One exposure of aplite is a finer grained quartz-feldspar rock with no biotite.

A number of quartz/tourmaline float boulders were noted with long (4cm) radiating tourmaline crystals presumably derived from late stage quartz/tourmaline veins within the main mass of granite.

### 3.3. Tertiary Basalt

Tertiary basalt rests on both the above formations to the north and east and occurs as an outlier on the plateau to the west of the Ramsay river. From previous work done in the general area it is estimated that the mantle is from 70-150' thick. The rock is composed of labradorite-augite intergrowths and is fine grained, massive and amygdaloidal.

### 3.4. Structure

Formations of the Ramsay succession trend north to NE with steep dips to the NW. Little structural information was noted within the granite; two vertical joints strike slightly north of east. No folds or faults were observed.

## 4. GEOCHEMISTRY

Reconnaissance work carried out during the 1969/70 field season entailed sampling at 1000' intervals along the Ramsay river and 500' intervals along the tributaries. These samples were analysed for tin, cobalt, nickel, copper, zinc, silver and bismuth of which only tin and cobalt proved anomalous.

Work this year entailed a detailed coverage of the tin anomalies in the granite contact area; sample spacing being reduced to 200' (see Tas 2-217). Samples were

## 4.

collected from active stream bed material, sieved through -80 mesh, and the fine fraction analysed by A.A.S. for Bi, colorimetrically for Sn, W and Mo and by X-ray fluorescence for Ta and Nb.

A number of stream bank samples were taken also at 200' intervals, down the Ramsay river for comparison with stream bed samples and hopefully as an improved method for determination of molybdenum. Comparison of results obtained proved inconclusive and certainly all molybdenum values were below the limit of detection.

4.1. Tin

Combining results from both programmes, values range from 4 ppm to 1660 ppm with a background value of 50 ppm. Values greater than 700 ppm are regarded as anomalous. Twelve values exceed this figure, six of which occur along Wombat creek in the Cleveland Tin N.L. Exploration Licence. The other six values are scattered and hence are not considered to be of much significance as they may have been contaminated as a result of alluvial workings in the area.

4.2. Tungsten

Values range from 4 ppm to 44 ppm with the majority of values below the limit of detection. Background value is below 2 ppm with two threshold values at 16 ppm and 36 ppm. 21 values in two groups and four single highs exceed 16 ppm.

Group 1 has ten values ranging from 18 to 44 ppm W, associated with four of the six molybdenum values which exceeded the detection limit, the latter ranging from 3 to 9 ppm. Sn and Be values are of low order.

Group 2 consists of seven values ranging from 16 to 32 ppm W, associated with tin values in the range 120-1000 ppm. Be and Mo values are of low order.

The four isolated tungsten highs are all associated with low order Mo, Be and Sn values.

4.3. Beryllium

Values range from 0.3 to 4.1 ppm with a background of 0.75 ppm, along an uninterrupted histogram decay curve. The higher beryllium values, while not considered anomalous, are contained in two separate groups (3 + 4 on Tas 2-218) both of which have low order Mo, Sn and W.

4.4. Molybdenum

Only six values registered above the detection limit of 1 ppm, with the result that no threshold value has been determined. Values range between 1 ppm and 9 ppm. Four of the six values are associated with the group 1 tungsten anomaly.

4.5. Niobium - Tantalum

Analysis of these elements was attempted with little success. Tantalum was below detection limit in all samples listed while yttrium interfered in the trace analysis for Niobium.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Geochemistry

The area sampled is dotted with old tin workings, most of them on or close to streams. This has resulted in contamination of stream sediment samples. Future work should be limited to soil sampling ground between the streams, this will give a clearer geochemical picture of the area.

094

5.2. Geology

All the prospects located to date have been small and further tin mineralization, if it exists, would be expected to follow a similar pattern. The possibility of roof pendant/cupola type mineralization, with tin concentrated in overlying sediments or in the granite margin cannot be overlooked owing to the impenetrable nature of the terrain. "Horizontal" and "boxwood" jungle have caused problems since the first tin mineralization was discovered and precluded anything but a brief look at the geology of the area.

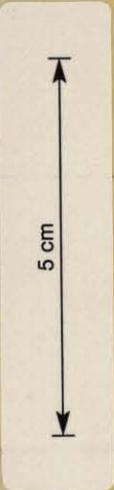
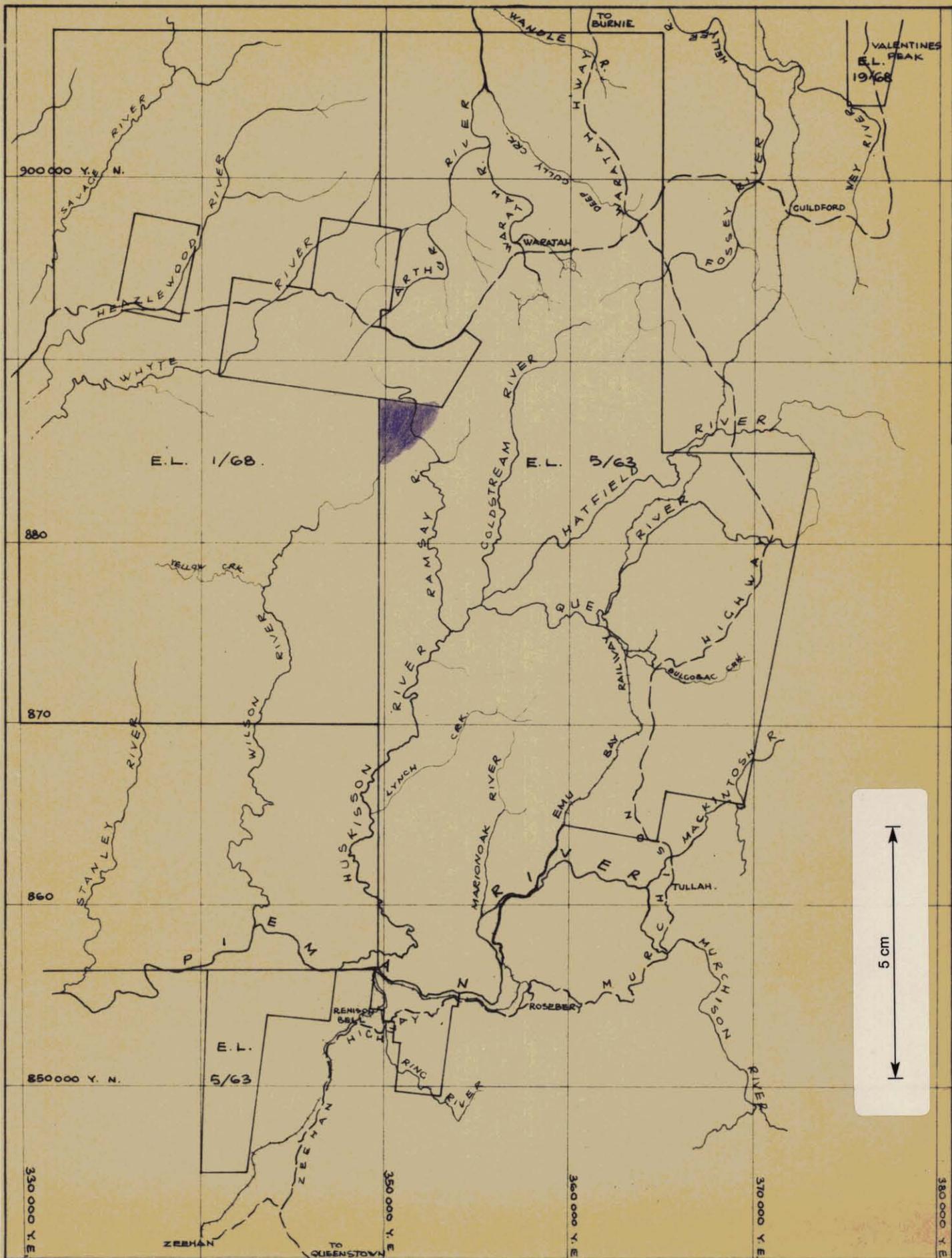
5.3. Recommendations

Geological mapping and soil sampling should be carried out to test the ground between the streams which gave anomalous tin and tungsten values. The samples should be analysed for tin, molybdenum, tungsten, beryllium and copper. If this work does not outline any significant anomalies, exploration work in the area should be discontinued.

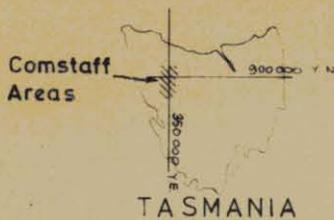
6. PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Tas 2-215	Wombat Flat area - Locality Plan	1:500,000
2-216	Wombat Flat area - Geology	1: 50,000
2-217	Wombat Flat area - Streams covered during programme	1: 50,000
2-218	Wombat Flat area - Geochemical anomalies	1: 50,000

T. CHISHOLM



LOCATION MAP.



COMSTAFF PROPRIETARY LIMITED.

791096

LOCALITY PLAN  
WOMBAT FLAT AREA

DRAWN

G. C.

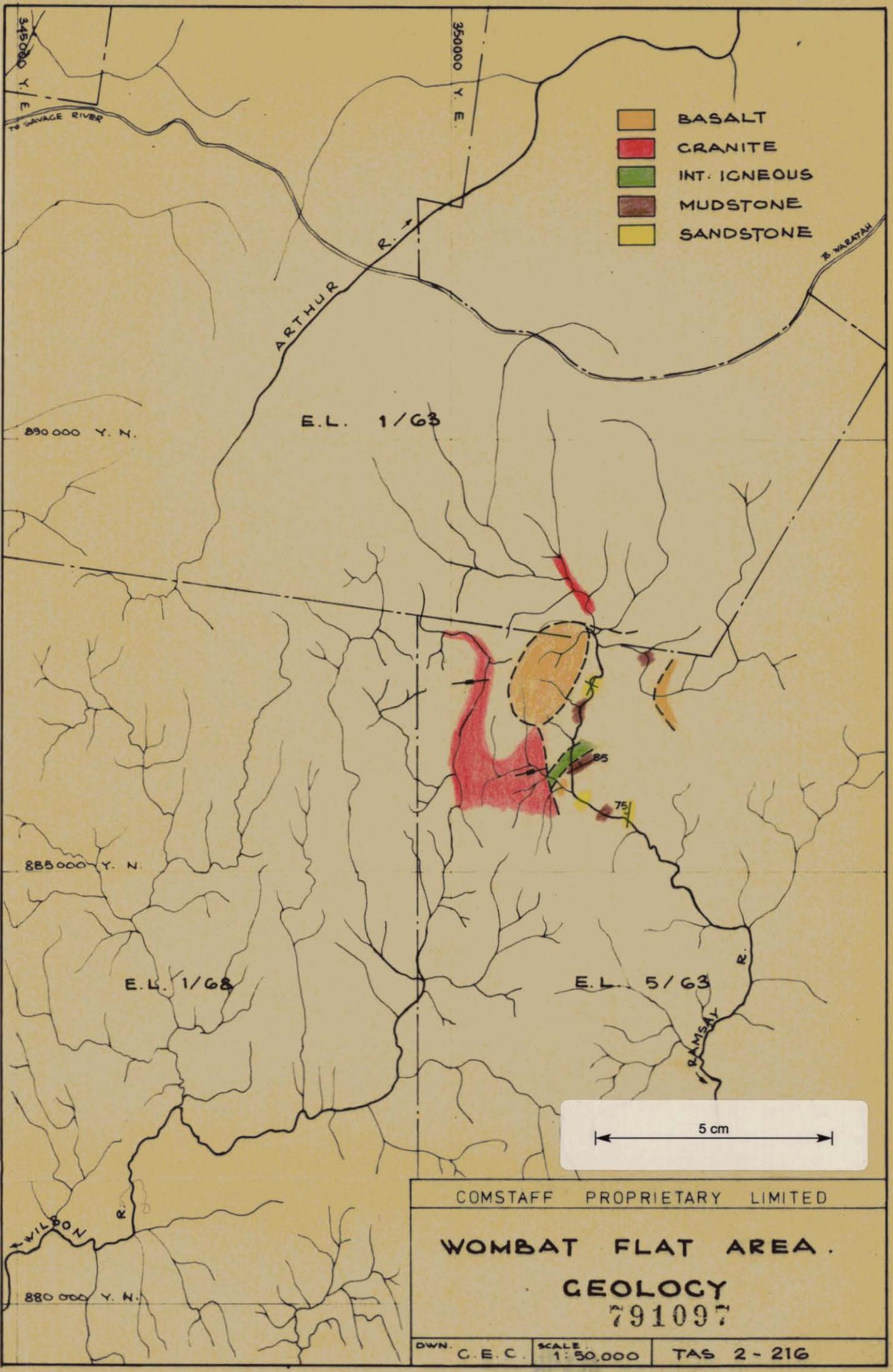
COMPILED

G. C.

SCALE

1:250,000

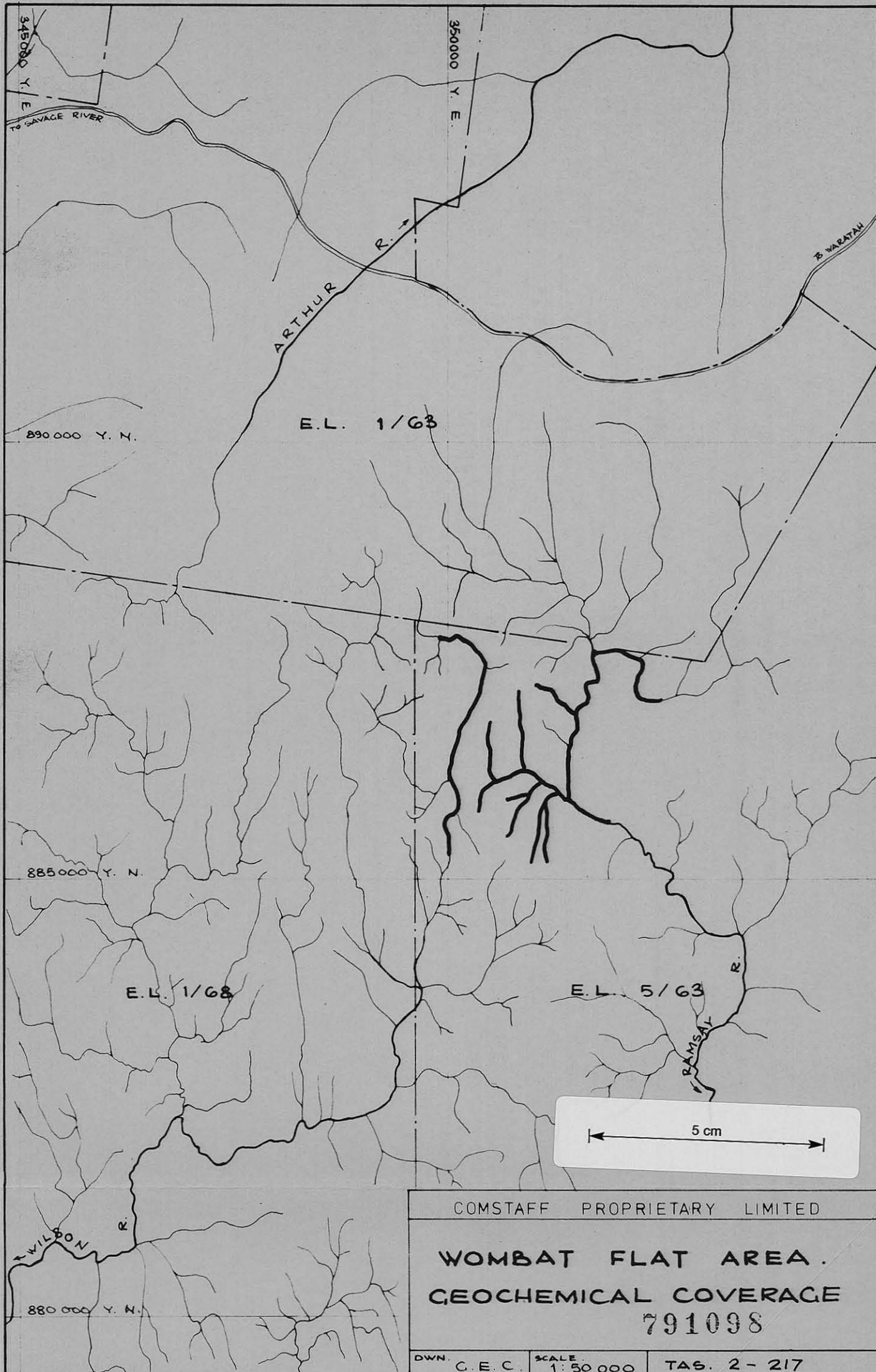
TAS-2-215



- BASALT
- CRANITE
- INT. IGNEOUS
- MUDSTONE
- SANDSTONE

5 cm

COMSTAFF PROPRIETARY LIMITED		
<b>WOMBAT FLAT AREA.</b>		
<b>GEOLOGY</b>		
<b>791097</b>		
DWN. C.E.C.	SCALE 1:50,000	TAS 2-216



345000 Y. E.  
TO SAVAGE RIVER

350000 Y. E.

ARTHUR R.

3 WABATAH

E.L. 1/63

890000 Y. N.

885000 Y. N.

E.L. 1/68

E.L. 5/63

RAMSAY R.

5 cm

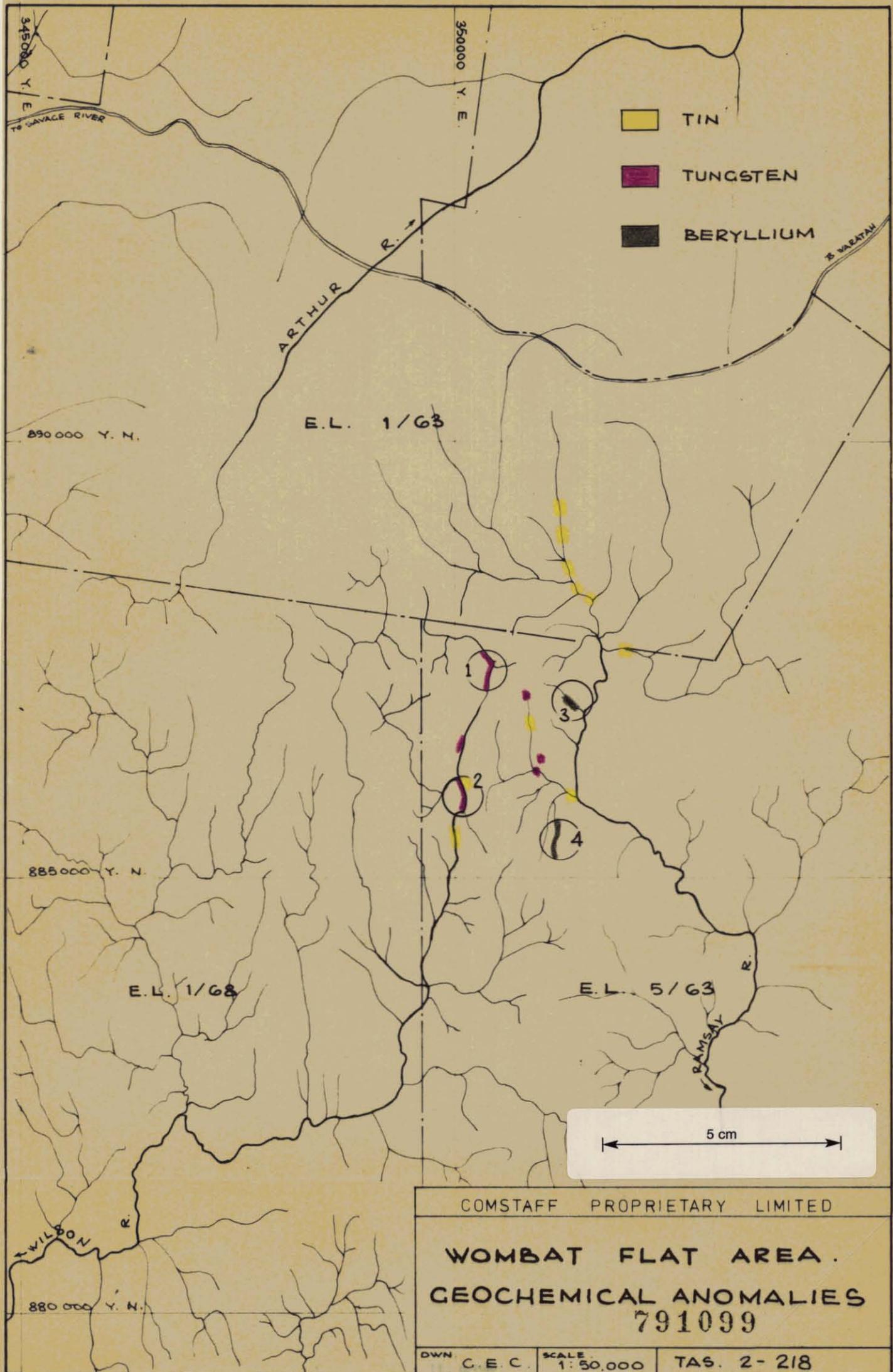
WILSON R.

880000 Y. N.

COMSTAFF PROPRIETARY LIMITED

WOMBAT FLAT AREA.  
GEOCHEMICAL COVERAGE  
791098

DWN. C.E.C. SCALE 1:50,000 TAG. 2-217



099

71-838

791100

**MICROFILMED**

COMSTAFF PROPRIETARY LIMITED

1970 - 1971 SUMMER FIELD SEASON REPORT

E.L. 1/68

VOLUME III

SAVAGE RIVER REGIONAL REPORT

SAVAGE RIVER REGIONAL REPORT.

SAVAGE RIVER REGIONAL REPORT

1. GENERAL

The reconnaissance entailed geochemical sampling and mapping of parts of the Savage River and fifteen of its tributaries to the north of the Waratah-Corinna Road. The bulk of the work was carried out in the southern part of the area along Nineteen Mile creek and its tributaries which drain the Bald Hill serpentinite contact (Map No. Tas 2-205).

Access in the northern area was gained by pushing a road eastwards from Savage River Mine's pipeline track. This road was intended to reach the Savage River. However, it did not follow the envisaged route and stopped more than a mile to the west of the River which only gave us direct access to one major creek system. This road must be extended eastwards across the so called "toxic patch" to the northern Savage system and also southwards to reach the river.

Previous work in this area is fairly minimal. No reconnaissance geochemical sampling or geological mapping has been done. However, a soil sampling grid of four lines was cut over the western portion of the Bald Hill serpentinite and some geophysics was carried out. A trench was dug on coincident S.P. and magnetic anomalies but the geological investigation of this trench did not turn up any sulphide mineralisation nor did it relate the geophysical anomalies to any particular rock type and the analytical results were considered to be poor, so it was concluded that nothing of possible economic import was present. Six heavy sediment samples were taken along Nineteen Mile creek and other creeks draining the ultrabasic but the results were never published in any reports.

*why not now?*

## 2. GEOLOGY

### 2.1. Bald Hill Area

The area of E.L. 1/68 to the west of the Heazlewood syndicate's area and north of the Waratah-Cotinna Road consists of a series of slightly altered sediments and metamorphic rocks which may be their derivatives. These have been intruded at Bald Hill by a large layered body of diorite, serpentinite, pyroxenite and gabbro.

#### 2.1.1. Sediments and Meta-Sediments

Just to the west of the Bald Hill ultrabasic a series of reasonably unaltered sediments crop out comprising shales, siltstones, argillaceous sandstones and micaceous sandstones, the latter varying in composition between arkose and sub-greywacke. No tuffaceous rocks were located in the area, but several small bands of altered basalt were found interbedded with the shales.

These rocks have been metamorphosed to varying degrees ranging from slight shearing and contortion of the micas in the sandstones to partial recrystallisation and development of a slaty cleavage in the shaley rocks. Transverse tension gashes filled with quartz are common throughout the sequence.

This group of rocks crops out along the length of Nineteen Mile Creek and upstream along the Savage River from the point where Nineteen Mile Creek enters, forming a band about one mile wide trending NNE. To the west of the band the rocks are schists (greenschists facies), consisting of quartz sericite schists and quartz sericite chlorite schists with interbedded minor quartzite which belong to the Whyte Schist group. This group contains the magnetite bearing amphibolites at Savage River. It has been suggested that the metamorphics are Pre-cambrian in age and older than the unmetamorphosed sediments which may be upper Pre-cambrian or lower Cambrian. However, the

composition of the metamorphics would seem to be similar to that of the sediments and hence it could be suggested that the former are simply the metamorphosed equivalent of the latter.

2.1.2. Ultrabasic Rocks

Only the western contact of this intrusive body has been investigated in detail and the following is the rough sequence from the contact eastwards :

A sheared zone about 100-150' wide composed of highly sheared and fractured green and black serpentinite, the contact is followed by 3500-4000' of dark green, blocky serpentinite containing odd patches of chromite and dykes of very coarse grained pyroxenite. Some of the serpentinite shows a pattern of cracks, possibly due to the volume change incurred during serpentinization. These cracks have been filled with a dark green variety of serpentinite (antigorite ?). Higher up Bald Hill, medium to coarse grained pyroxenites and patches of gabbro crop out. One specimen has been described as a fine grained serpentinite, after dunite, containing serpentine (lizardite) pseudomorphs after olivine, generally below 0.10 mm dia. and cut by sub-parallel veinlets of secondary oxides.

The overlying pyroxenite is an olivine orthopyroxenite consisting of very coarsely crystalline bronzite with about 10% interstitial fresh olivine. These olivines show incipient serpentinization and slight cataclasis.

The ultrabasic body has all the characteristics of a "cold" intrusive which underwent serpentinisation at a low temperature. The sediments in contact with it show very little alteration. Three samples which were described feature dynamic metamorphism and the introduction of carbonate and chlorite veins. Jointing and shearing are associated with the contact especially within the serpentinite, but also within the sediments

4.

where there is a marked change in joint and shear trends from the regional strike of 340-350° mag. to about 10-20° which is roughly parallel with the contact.

2.2. Donaldson River Area

The area mapped is centered on the Upper Donaldson drainage basin on the NW boundary of E.L. 1/68. Rocks noted in the area are of Pre-cambrian age and consist of black mudstones and graywacke separated by an unconformity from quartz-mica and actinolite-epidote-quartz schists.

2.2.1. Mudstones (Permian?)

These rocks occur on the western boundary of the area mapped. They are fine grained, massive, grey to black carbonaceous sediments with occasional rounded quartzite pebble inclusions. The latter are not in sufficient quantity to classify the rock as a sub-graywacke.

2.2.2. Graywacke (Permian?)

On the western and eastern borders of the mudstones are rocks in which angular and rounded fragments of quartzite, chert and slate are embedded in a fine grained, grey, carbonaceous matrix. Occasional specks of phlogopite mica also occur.

2.2.3. Quartz Carbonate

Separating the metamorphosed from the unmetamorphosed rocks at one locality is possibly a vein of white, massive, quartz-carbonate rocks with disseminated pyrite mineralisation. No contacts with the country rock were exposed.

2.2.4. Quartz-Mica Schist

The eastern portion of the area mapped contains rocks consisting of quartz, muscovite and chlorite with minor sericite. The rocks are principally mosaic quartz

with thin layers of parallel, interleaved flakes of muscovite and chlorite. Small detrital grains of tourmaline, sphene, zircon, apatite and cassiterite were noted through thin section examination. Pyrite, as blebs and stringers, was noted in the rocks from the upper reaches of the Little Donaldson river.

#### 2.2.5. Actinolite-Epidote Quartz Schist

A single outcrop of this rock type was seen within the quartz-mica schists. The rock consists of sub-parallel laths and lenses of acicular crystals of pale actinolite, streaks of granular epidote and interstitial granular quartz. Small streaks of almost opaque sphene/leucoxene are common. It is believed, despite the absence of feldspar that the rock was originally of basic igneous composition. The occurrence of leucoxene is considered evidence in favour of such an origin. The eventual metamorphic grade reached is postulated as amphibolite facies.

#### 2.2.6. Basalt

Basalt crops out on higher ground overlying the above formations in part. The rock is a fine grained, massive, amygdaloidal basic extrusive.

#### 2.2.7 Structure

##### 2.2.7.1 Donaldson and Toxic Patch

The unmetamorphosed sediments strike N-S with dips of 25-44° to the east. Schistosity of the metamorphic rocks in the Donaldson river area trend north with steep dips to the east. Portions of the Savage and two tributaries mapped near the toxic patch have quartz-mica schists with schistosity trending north with steep dips to the west. The schists in the upper portion of the Little Donaldson river are locally contorted, and there is a change of strike in this area from north to north-east. No major faults or folds were noted.

2.2.7.2. Bald Hill

The dominant trend within both the schists and the sediments is 340-350° mag. with steep dips to the west (+80°). Some of the shales show considerable local contortions and minor slump folds, but no actual tectonic fold axes were observed. This structure would seem to be a remarkably consistent lineament.

Two main divergences in strike were picked up, the first along the Savage, north of Nineteen Mile creek, where strikes change from 340° mag. to 260° mag. and the dips still remain steep and to the SW and south. This could be interpreted as an overfolded anticline with a NW plunge. The other divergence is near the ultrabasic contact where the strikes swing around to the NNE parallel to the contact.

Comparing all areas mapped with structures at Savage River Mine, and regarding schistosity to be equivalent to bedding which may not be the case, the possibility of a major north trending syncline emerges. Both the Savage River Mine with easterly dipping formations and the Donaldson area are on the western limb, and Bald Hill and the toxic patch are on the eastern limb. Further work next year should establish the validity or otherwise of this interpretation.

3. GEOCHEMISTRY (see Plan Tas 2-207)

Stream sediment samples were taken at 1000' intervals along main streams and 500' intervals along tributaries. Active stream sediment was collected, dried, sieved through -80 mesh, and the fine fraction sent off for analysis for Cu, Zn, Hg, Ni, Mo, Ag, and As.

Heavy concentrate samples were taken along the main streams and quantitative mineral estimates made of their contents.

A line of soil samples was taken over the western portion of the toxic patch and tested by spectrographic scan for a number of elements.

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3.1 Stream Sediment Samples

Samples from areas underlain by ultrabasics were analysed for Cu, Ni, Co and Cr, the rest of the samples over metasediments were analysed for Ni, Cu, Zn, Ag and Mo. Selected samples were analysed for Sn, Pb, As and Hg.

3.1.1. Nickel

Separate graphs were drawn up for nickel samples over metasediments and ultrabasics due to respective differing ranges in values.

3.1.1.1. Metasediments

Values range from 2 ppm to 360 ppm with a background of 10 ppm and threshold value of 300 ppm. Four values in a single group exceed threshold and are associated with anomalous silver and zinc values.

3.1.1.2. Ultrabasic

Values range from 60 to 3700 ppm with a background value of 500 ppm and two threshold values at 1000 ppm and 2800 ppm. The two thresholds represent two rock types within the ultrabasic, the lower one higher values from pyroxenite and the higher one higher values from serpentinite. The values in a single group exceeded 2800 ppm associated with high cobalt and chromium values, but low order copper of 2 ppm to 8 ppm. This anomaly occurs within the serpentinite near the sediment/serpentinite contact.

3.1.2. Cobalt

Values range from 28 ppm to 350 ppm with a background value of 100 ppm along an uninterrupted histogram decay curve. A single high value of 900 ppm is associated with a copper high of 260 ppm. These values have been rechecked and confirmed.

Cobalt values confirm to nickel values, the highest readings being realised from the nickel anomaly area.

3.1.3. Copper

Values range from 2 ppm to 100 ppm with a background value of 5 ppm along an uninterrupted histogram decay curve. A single high value was mentioned under the heading Cobalt.

3.1.4. Chromium

Results are high with most values being more than 1%. No attempt has been made to draw a histogram from these. The higher values are associated with nickel highs. The significant chrome content confirms the intrusive nature of the ultrabasic.

3.1.5. Silver

Values vary from below the limit of detection (0.2 ppm) to 1.6 ppm with a background value of less than 0.2 ppm. Values exceeding 1.2 ppm are regarded as anomalous; the four values exceeding this figure occur on a tributary of the Donaldson and are associated with anomalous zinc and nickel (metasediments).

3.1.6. Zinc

Values range from 2 ppm to 230 ppm with a background of 30 ppm. Values exceeding 160 ppm are regarded as anomalous, the four values concerned form an anomaly as outlined under silver.

3.1.7. Mercury

Values range from 0.02 ppm to 0.5 ppm (29 samples greater than). The background value is 0.05 ppm. All values exceeding 0.5 ppm are associated with lower order Cu, Ni, Zn and Ag.

3.1.8. Lead and Tin

Low order values were obtained for these two elements and results are not considered to be of any significance. Lead values are between 2 ppm and 22 ppm and tin values between 6 ppm and 24 ppm.

3.1.9. Molybdenum and Arsenic

All samples tested were below the limits of detection.

3.2. Heavy Concentrate Samples

Heavy concentrate samples taken consisted essentially of iron oxides and rock fragments (chloritic and actinolitic schists and hornfelses). Minor amounts of ilmenite, rutile and zircon occur in some samples. One sample from the Donaldson river yielded 1 1/2% garnet, which mineral has not yet been classified.

3.3. Soil Samples

23 soil samples were taken at 100' intervals over the western border of the toxic patch. This exercise was designed as a quick look at an area of possible interest which could not be covered by a stream sediment programme in the time available. Results as tabulated below were disappointing with no significant values recorded. All results are in ppm.

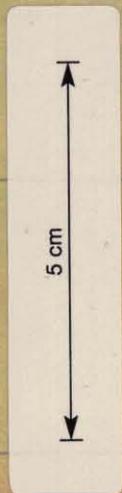
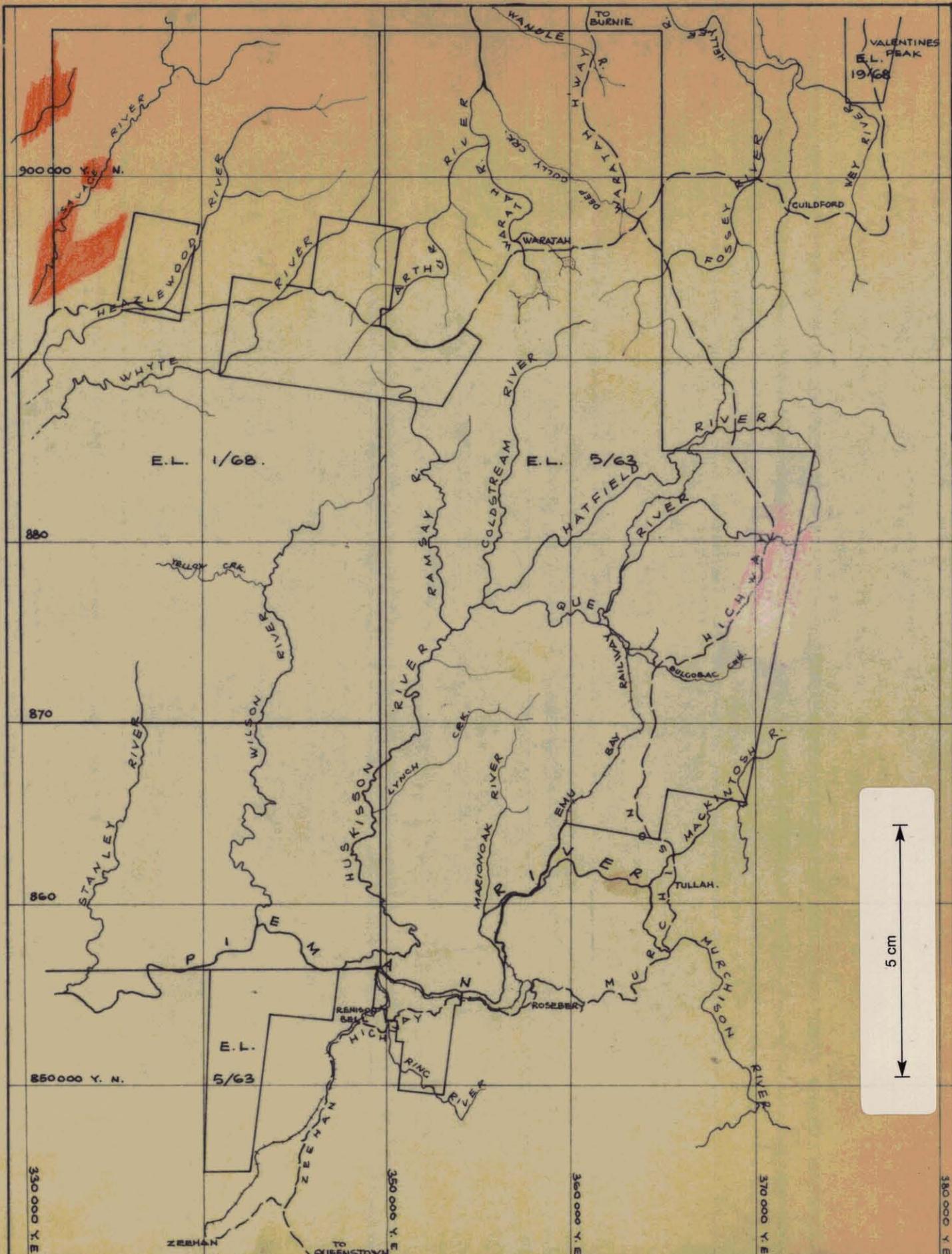
<u>Element</u>	<u>Range</u>
Ni	5-80
Cu	1-15
Ag	0.1-0.3
Co, W, Mo	below detection limit
Ta, Nb, Be	below detection limit
Zn, Sn, Ag, Sb	below detection limit

4. PLANS

<u>Plan</u>	<u>Title</u>	<u>Scale</u>
Tas 2-205	Savage River area - Locality plan	1:500,000
2-206	Savage River area - Geology	1: 50,000
2-207	Savage River area - Streams covered during programme	1: 50,000
2-208	Savage River area - Geochemical anomalies	1: 50,000

T. CHISHOLM/D. HENRY

The authors were assisted in the work on this area by the Exploration Manager, Dr. J.F. Lambert.



LOCATION MAP.

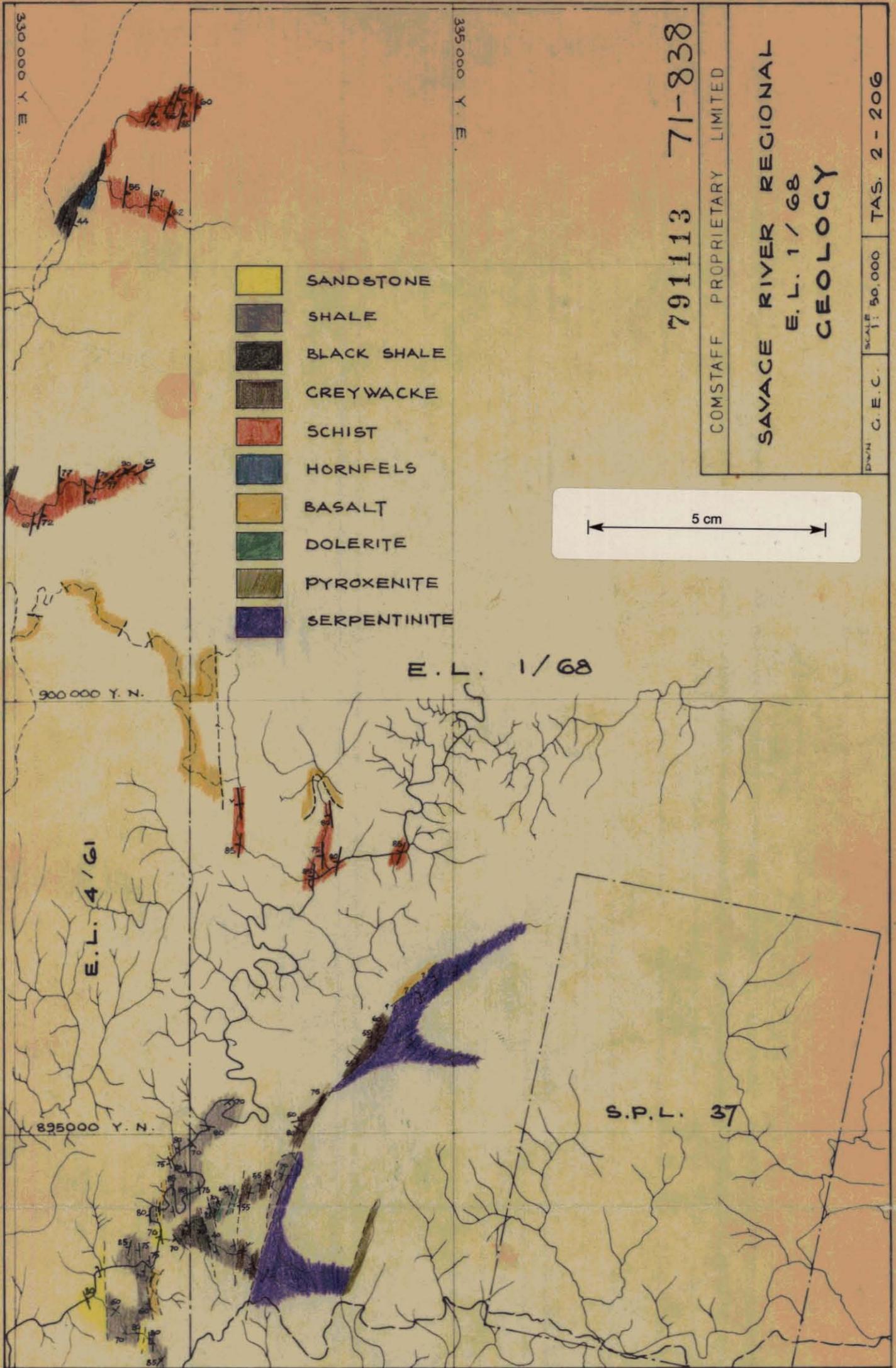


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LOCALITY PLAN  
SAVAGE RIVER AREA

DRAWN G.C.	COMPILED G.C.	SCALE 1:250,000	TAS-2-205
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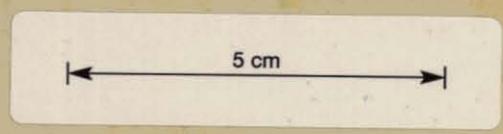
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**SAVACE RIVER REGIONAL  
E.L. 1/68  
GEOLOGY**

DRAWN C. E. C. SCALE 1:50,000

TAS. 2-206

- SANDSTONE
- SHALE
- BLACK SHALE
- GREYWACKE
- SCHIST
- HORNFELS
- BASALT
- DOLERITE
- PYROXENITE
- SERPENTINITE



E.L. 1/68

S.P.L. 37

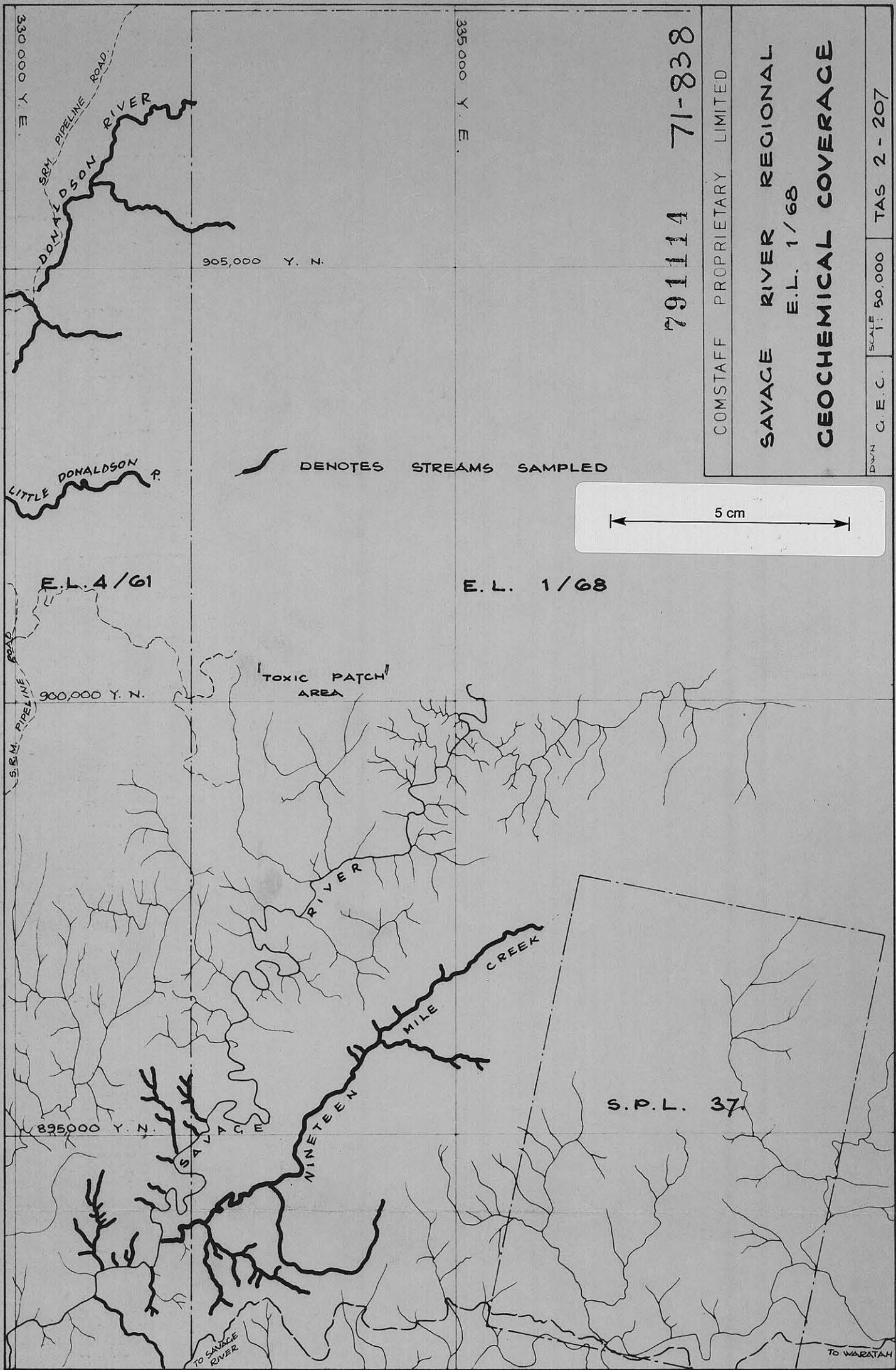
E.L. 4/61

330 000 Y. E.

335 000 Y. E.

890 000 Y. N.

895 000 Y. N.

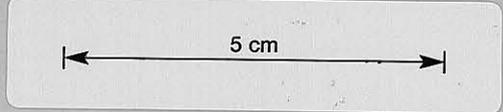


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**SAVAGE RIVER REGIONAL  
E.L. 1/68  
GEOCHEMICAL COVERAGE**

DWN C. E. C. SCALE 1:50,000 TAS 2-207



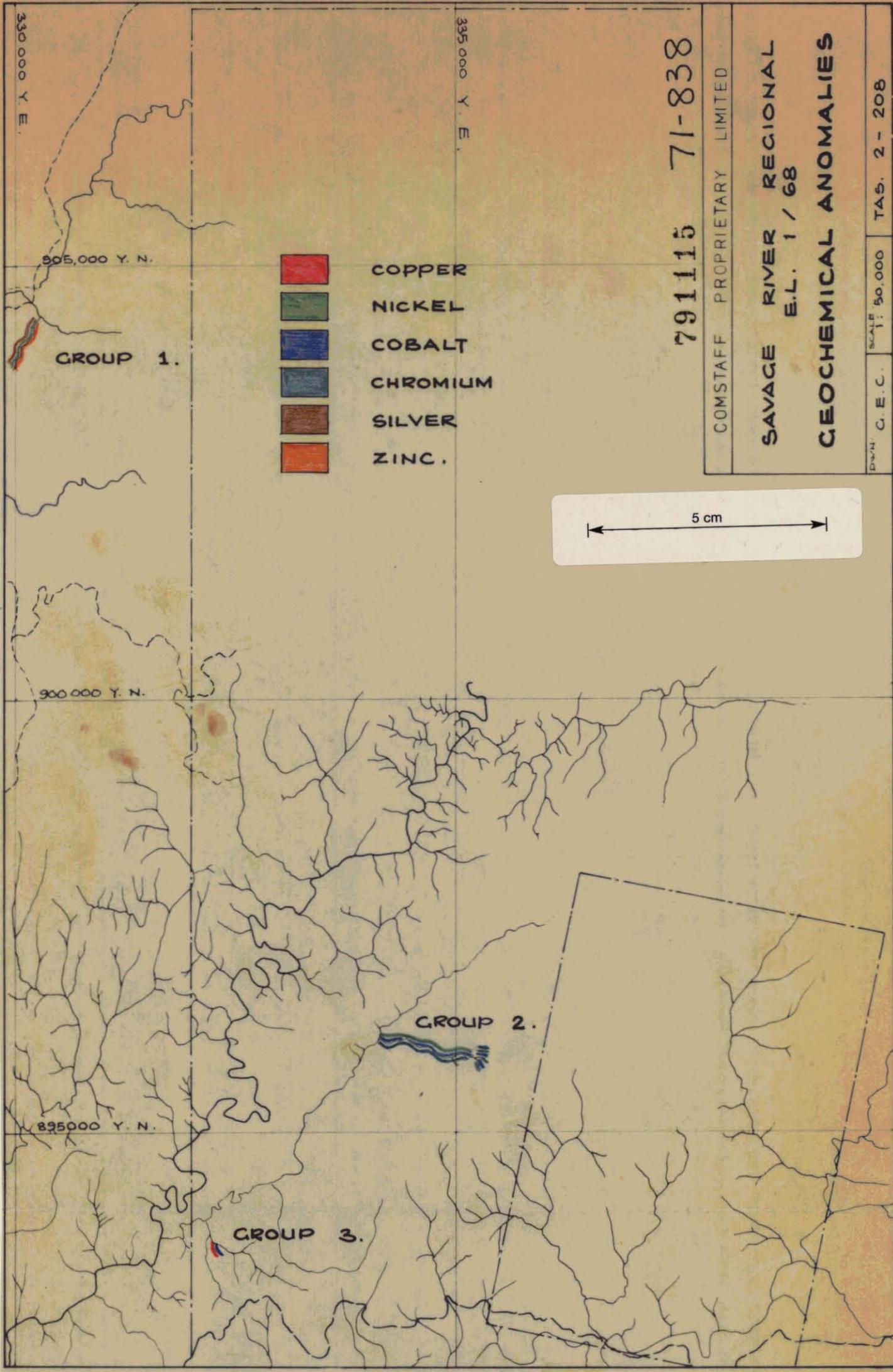
E.L. 4/61

E.L. 1/68

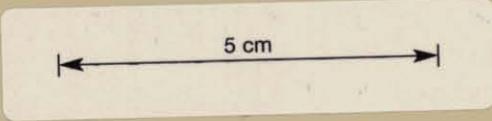
TOXIC PATCH AREA

S.P.L. 37

TO WARATAH



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



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<b>SAVAGE RIVER REGIONAL</b>	
E.L. 1 / 68	
<b>GEOCHEMICAL ANOMALIES</b>	
D.W.N. C. E. C.	SCALE 1: 50,000
TAG. 2 - 208	