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COMSTAFF PROPRIETARY LIMITED

E. L. 5/63

THE RENISON BELL EAST AREA
WINTER 1970.

ANGLO AMERICAN CORPORATION (AUSTRALIA) LIMITED

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AMG REFERENCE POINTS ADDED

923002

E.L.5/63 THE RENISON BELL EAST AREA

1. SUMMARY:

A programme of geological mapping, stream sediment sampling and heavy concentrate sampling was carried out in the Renison Bell East area during the winter of 1970. but was not completed due to access problems. The area is underlain by a succession of interbedded arenaceous, argillaceous and tuffaceous sedimentary rocks together with highly altered ultrabasic to intermediate intrusives. Stream sediment sample anomalies for tin, nickel, zinc, copper and bismuth were found.

2. INTRODUCTION:

The Renison Bell East area of six square miles, refers to that part of E.L.5/63 south of the Pieman River (see Plan 1). between Rosebery to the east, and Renison Bell to the west. Access is by the metalled Murchison Highway and the Emu Bay railway line which pass through the area (see Plan 3). The terrain is rugged, the elevation ranging from 200 to 2000 feet, and is drained by the northerly flowing Exe, Colebrook and Ring Rivers which are left bank tributaries of the Pieman River. The area is densely vegetated with horizontal, ti tree and bauera scrub.

The region is of interest as it is in the most highly mineralised part of North West Tasmania. It is possible that the Renison Bell tin ore bodies strike into the south west corner, and that the Lyell, Hercules-Rosebery, copper-lead-zinc-silver zone may pass through the eastern part of the area.

2.1 PREVIOUS WORK:

1890 Alluvial tin was first found in the Ring River.

1900 The Emu Bay Railway line was constructed and the Renison ore bodies found together with a tin bearing limonite gossan at the mouth of the Exe.

1911 Prospecting along the Exe River located the cassiterite lode known as Salmon's Prospect which was mined by trenches and short adits from 1911 to 1918, and 1928 to 1945, the total recorded production was 10 tons of metallic tin. Prospecting also located the Proprietary lodes which are south of the Murchison Highway along the Exe. The total recorded production is four tons of metallic tin.

1966 After prolonged bargaining since 1942, Mines Exploration Pty. Ltd. carried out work on Salmon's Prospect. While a grid was cut, no geochemical sampling nor geophysics were carried out. One diamond drill hole, DDXI, was drilled to 608'6" on a bearing of 213°MN and depressed at an angle of 10° from the horizontal, from a railway car clamped to the tracks. Tin mineralisation was encountered over a four foot section but no assay data is available. Hole collared October 1966 by Constaff logs in file E10/22 24/3/67

file E10/22?

3. GEOLOGY: (see Plan 2)

3.1 General

The Renison Bell East area is situated within a northerly trending belt of Palaeozoic geosynclinal rocks. It lies between the Mt.Reid volcanic belt to the east which hosts the Rosebery mines and the Precambrian (?) anticline to the west which hosts the Renison orebodies. The geological mapping was carried out in relation to a compass and tape survey of the major water courses. Aerial photographs were used for mapping the road and railway.

3.2 Succession

The lithologies mapped are interbedded greywackes, siltstones, shales, mudstones and tuffs, which probably form part of the Lower Cambrian Crimson Creek formation. The rocks are generally in thin units which are lensoid in form, and the interbedded nature of the rock types means that only a broad idea of the succession can be formed. The succession fines upwards with an increase in mudstone and shale horizons and a reduction in tuffaceous material. The rocks may be broadly grouped into two categories;

(a) a predominance of greywackes with shale and siltstones.

(b) a predominance of siltstones and shale with minor greywackes.

Tuffs occur throughout both groups. The greywackes are green, grey and purple in colour and are fine to coarse grained. Typical units are between 9 inches to one foot thick. They exhibit graded bedding, pelite flake breccias, scour and fill structures, roll casts and incipient flame structures. The best developed greywacke units are exposed along the Murchison Highway between the Colebrook and Ring Rivers. The grading is well sorted, the rock units pass from a coarse sandstone up to a cleaved argillite and include pelite flake breccia horizons. Multiple grading also occurs but generally the degree of sorting only slightly changes throughout the greywacke unit. A greywacke conglomerate consisting of roughly graded boulders, cobbles and pebbles of quartzite, acid volcanics and shales outcrops west of Colebrook River.

The siltstones are green to grey in colour and are both massively and finely bedded. The thin beds exhibit current ripple laminations with ripple cross stratification and indistinct grading. They probably form part of a turbidite profile. The massive siltstones are very jointed, they are coarse grained and may include thin sandstone lenses. They are metamorphosed to a cleaved and jointed arenite.

The tuffs are dark green to dark grey in colour and are fine to medium grained. They are thinly bedded with limonitic shale and sandstones and exhibit spheroidal weathering. The rock is described from thin section analysis as a crystal/lithic tuff consisting of angular quartz, K-feldspar andesine, devitrified shards, volcanic glass, felsite, pyroxenes and particles of intermediate and basic fine-grained igneous rocks set in a matrix of chlorite, felsic ash, carbonate and opaques including sphene and leucoxene. In the field the tuffs are distinctive by their weathering form, the degree of iron staining, and their hardness.

Mudstones and shales occur throughout the succession interbedded with the greywackes, tuffs and siltstones. The mudstones are green, grey and red in colour, very jointed and generally metamorphosed to argillites. Soft green chlorite shales occur with the predominantly greywacke sequence. Grey graphite and black pyritic carbonaceous shales outcrop along with fine tuffs and siltstones on Salmon's Prospect along the Exe River and on the main road. Grey pyritic slates occur along the Exe River and at the Proprietary Mine south of the main road.

A sequence of greywacke, shale and siltstones fining upwards to predominantly siltstones is indicative of deposition from both turbidity and waning currents. The tuffaceous nature of the rocks point to a provenance of a weathering volcanic pile, while the presence of lithic/crystal tuffs indicate contemporary volcanism. This sequence of rocks was deposited in a eugeosynclinal trough environment, the margin of which may have been the Mt.Reid volcanic arc where there was still some acid volcanism probably towards the close of a volcanic cycle.

Igneous Intrusives

Two large dykes of ultramafic to intermediate rocks ranging from hartzburgite to diorite truncate the area. The largest complex appears to have been injected from the south, it splits into two dykes, the western one of which inter-fingers with the sedimentary sequence of the Exe River and appears to die out as sills and dykes. The complex is roughly differentiated from south to north. The most southerly exposed part is composed of serpentinised hartzburgite containing disseminated chromite and veined with magnetite, chlorite and serpentine. The main mass is serpentinised microgabbro. The interfingering sills and dykes within the Exe River sequence are microdiorites and amphibolites. The whole complex has been serpentinised and chloritised. The degree of serpentinisation is very variable. Where serpentinisation has been strongest the pyroxenes and olivines have been altered to amphiboles and the rock to an amphibolite. The degree of alteration is proportional to the amount and concentration of serpentine and chlorite veins. Chloritisation is strongest in the sills and dykes along the northern Exe where the rocks are virtually chlorite amphibolites. These rocks are extensively veined with quartz and plagioclase which may be an end product of the differentiation process. The felsic veins which are also injected into the country rock, carry pyrrhotite, chalcopyrite, arsenopyrite and pyrite.

An extremely chloritised igneous complex is exposed along the Colebrook River. It is veined with serpentine, chlorite and with mineralised quartz veins carrying pyrite, galena, chalcopyrite and cassiterite. It is probably an altered ultramafic mass related to the eastern complex.

These basic complexes follow the structural grain of the region and were probably injected prior to the main period of deformation. A dark grey medium-grained dolerite dyke cuts the country rock east of the Ring River. It cuts across the structural trend and is post the main period of deformation.

3.3 Structure

The dominant structure of the area is a southerly plunging asymmetric syncline. The western limb is steeply dipping with beds overturned to dip to the west due to minor isoclinal and drag folding. The eastern limb is extremely sheared and is affected by the presence of the mafic complex. which could be along an anticlinal axis since rocks to the east dip and face east. In general the rocks have fractured rather than folded under the deformation stresses hence jointing and cleavage are complex, while minor folds and small scale structures were not observed.

Minor faulting, fracturing and fissuring accompanies the mineralised veins exposed along the Exe River. The trend follows the main grain that is NNW-SSE. Fracturing occurs in areas of intense folding along fold axes, and adjacent to the basic igneous complexes.

3.4 Metamorphism

The area has undergone regional metamorphism of the chlorite greenschist facies. The greywacke and tuff matrix has been altered to a mass of chlorite, sericite, zoisite, carbonate and opaques, mudstone metamorphosed to argillite, shales to slates, and silstones to arenites. Pyroxenes of the igneous complex have been uralitised and feldspars saussuritised.

3.5 Mineralisation

Tin, copper, lead and zinc mineralisation occurs throughout the area associated with quartz-pyrite-arsenopyrite tourmaline veins in irregular fracture zones.

Tin

Cassiterite mineralisation occurs in two lodes exposed along the Exe River north of the main road and exposed along the railway. The 'Railway lode' is exposed as a quartz limonite gossan with cassiterite veinlets. It strikes 341 degrees True. A channel sample analysed 1040 ppm Sn. The 'Main lode' has been mined by short adits and drives together with trenches along a length of 3500' from where it is exposed in the Exe River to the workings south of the railway. The tin mineralisation occurs in irregular pod like veins of quartz-arsenopyrite-pyrrhotite-chalcopyrite and green tourmaline; striking 333° and dipping to the NE at 74°. The cassiterite veins occur over a 5' width at Salmon's Prospect and a channel sample gave an analysis result of 2600 ppm Sn. A channel sample across the mineralised section along the Exe River gave an analysis of 2320 ppm Sn. The Mines Exploration drill hole intersected 3'9" of tin mineralisation at approximately 160' below the Salmon's Prospect trenches.

The Proprietary Mine south of the main road and near the Exe River has been mined by a system of drives and stopes. The mineralisation occurs in a complex fissure with fractured quartz-tourmaline veins and inclusions of cleaved slates striking 320°. A channel sample from the 2' mineralised face analysed greater than 1% Sn.

Cassiterite veinlets occur in a quartz-pyrite vein associated with a limonite gossan near the western margin of the chloritised basic complex at Colebrook Creek.

Alluvial tin is present in all the heavy concentrate samples collected at intervals of a quarter mile along the Colebrook Creek. It appears that tin has been concentrated in the Quaternary alluvial flats through which the Colebrook flows.

Copper

Chalcopyrite veins and malachite staining occurs along the Exe River and are associated with the mineralised quartz veins. Disseminated chalcopyrite occurs associated with the chloritised basic complex in Colebrook Creek.

Zinc

Veinlets of sphalerite occur with limonite gossans along the Exe River and at the Railway lode.

Lead

Galena is recorded from the Mines Exploration drill hole in a quartz-pyrrhotite-arsenopyrite vein.

Chromium

Chromite is present as the predominant heavy mineral in all the heavy concentrate samples collected. It occurs as disseminated grains throughout the basic igneous complex.

3.6 Quaternary Deposits

Large erratics of Owen Conglomerate (Ordovician) and Dolerite (Jurassic) occur throughout the area indicating the region has been covered by moraine deposits. Boulder clay is exposed along the railway. An alluvial flat measuring 4000' x 3000' is drained by the Colebrook Creek, it is a possible site for alluvial tin deposits.

4. GEOCHEMISTRY:

Coarse active stream sediment samples were collected at 500' intervals along the main drainage channels and 200' intervals along the river tributaries (see Plan 3). The samples were dried and sieved at Waratah. The minus 80 mesh fraction was analysed by AMDL and Geomin for Cu, Zn, Bi, Ni and Sb by AAS, As by colorimetry and Sn by both X-Ray fluorescence (AMDL) and colorimetry (Geomin).

In an area such as this which has been actively prospected, contamination plays a significant role. Stream sediment orientation cannot be undertaken due to the probable number of undiscovered costeans and adits which provide contamination.

Tin

Values widely range between 1 ppm and 4800 ppm. Values above 380 ppm are taken as probably anomalous (fig.No 1). The anomalies are sporadic due to the alluvial nature of the tin. The cassiterite mineralisation along the Exe River gives rise to a stream sediment anomaly as does the accumulation of tin in the alluvial flats drained by the Colebrook River (see Plan 5).

Arsenic

Values range between less than 5 ppm and 8500 ppm. Values above 240 ppm are regarded as probably anomalous (Fig. No.1). It was decided to analyse the stream sediment samples for As since the cassiterite mineralisation in the area is associated with arsenopyrite. There is no close relationship in the sample values due probably to the difference in mobilities between the two elements.

Copper

Values range between 4 ppm and greater than 1%. Values above 200 ppm are regarded as being probably anomalous (Fig. No.3). The copper anomalies are very sporadic, but are generally due to trace amounts of chalcopyrite in quartz veins. The value of greater than 1% is from a stream draining the workings at Salmon's Prospect (see Plan 4).

Nickel

Values range between less than 5 ppm to 1400 ppm. Values above 660 ppm are regarded as being probably anomalous (Fig.No.2). The highest nickel values are associated with the ultrabasic dykes and values increase progressively upstream to where they outcrop (see Plan 4). The isolated nickel anomalies could be due to unmapped dykes but do warrant further investigation.

Zinc

Values range from 18 ppm to 5400 ppm. Values above 240 ppm are regarded as being possibly anomalous, (Fig.No.2). In general the high zinc values follow the nickel values. A moving average curve drawn for sample values upstream along the Exe River showed a standard progressive increase in values towards the ultrabasic intrusives (see Plan 4).

Silver

Values range from less than 0.2 ppm to 20 ppm. Values above 2 ppm are regarded as being probably anomalous (Fig.No.3). The highest values obtained from the Exe River north of the railway line are probably due to contamination (see Plan 4).

Bismuth

Values range from less than 10 ppm to 180 ppm. Values above 30 ppm are regarded as being probably anomalous (Fig. No.3). The highest values are from streams draining the north western part of the area (see Plan 5). This could be due to contamination from Renison Bell where the ore is known to contain bismuth.

Antimony

It appears from the few results to hand that values greater than 8 ppm are possibly anomalous. However, Geomin cannot detect Antimony below 12 ppm, which was the highest value recorded.

5. Plans

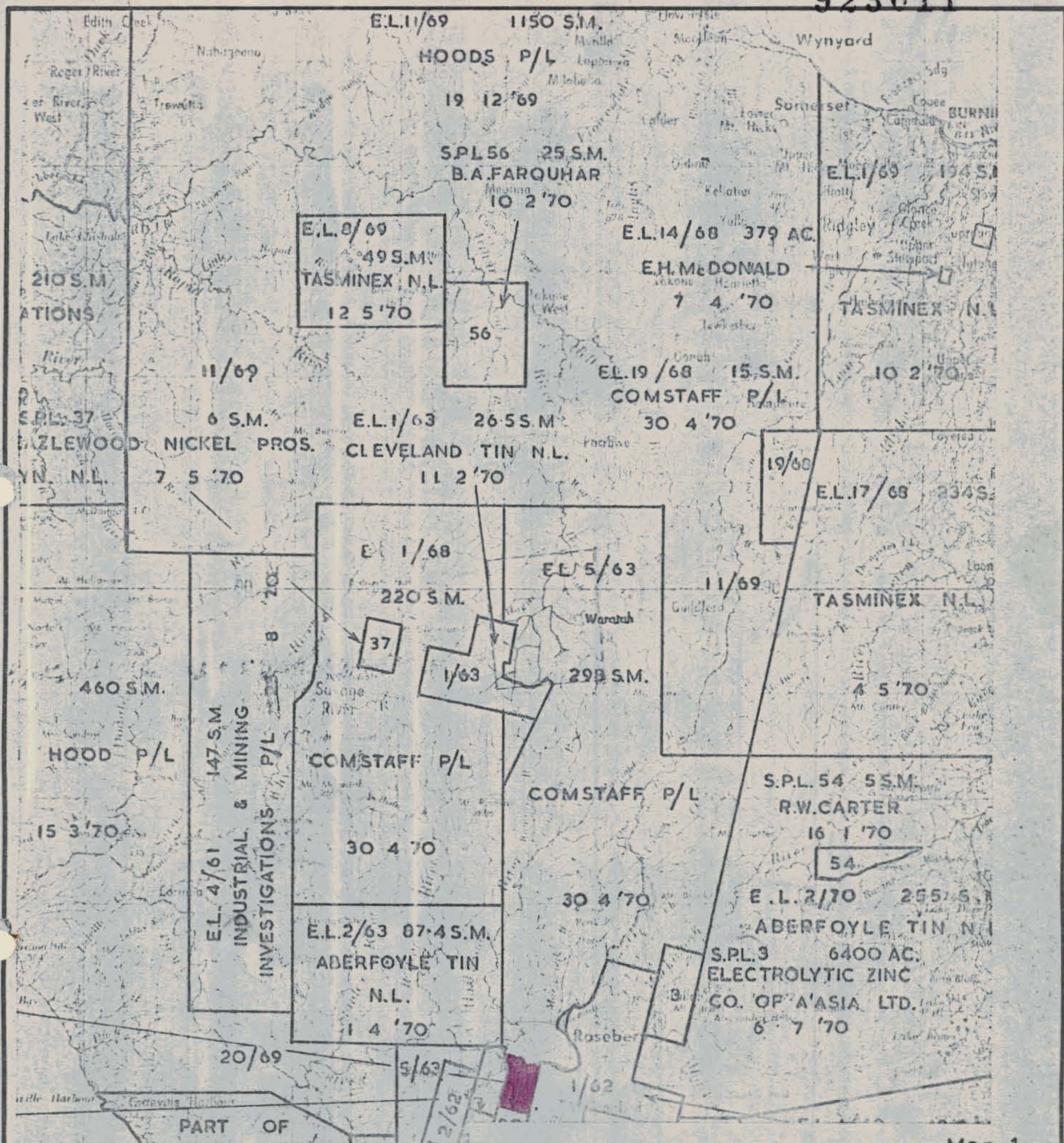
Plan No.	Title	Scale
1	Locality plan	1;500,000
2	Geology	1:25,000
3	Geochemistry 1970 winter programme and planned soil sampling grids	1:25,000
4	Geochemical anomalies Zn, Ag, Cu, Ni	1:25,000
5	Geochemical anomalies Sn, As, Bi	1:25.000

Fig. No.	
1	Histograms Sn, As
2	Histograms Zn, Ni
3	Histograms Cu, Ag, Bi

Rowena Armfield
for G. Pigott

JANUARY 1971

923011



5 cm

COMSTAFF PROPRIETARY LIMITED

RENISON BELL EAST
LOCALITY PLAN

DRAWN	COMPILED	SCALE 1:500,000	TAS-2-169

21.7.17

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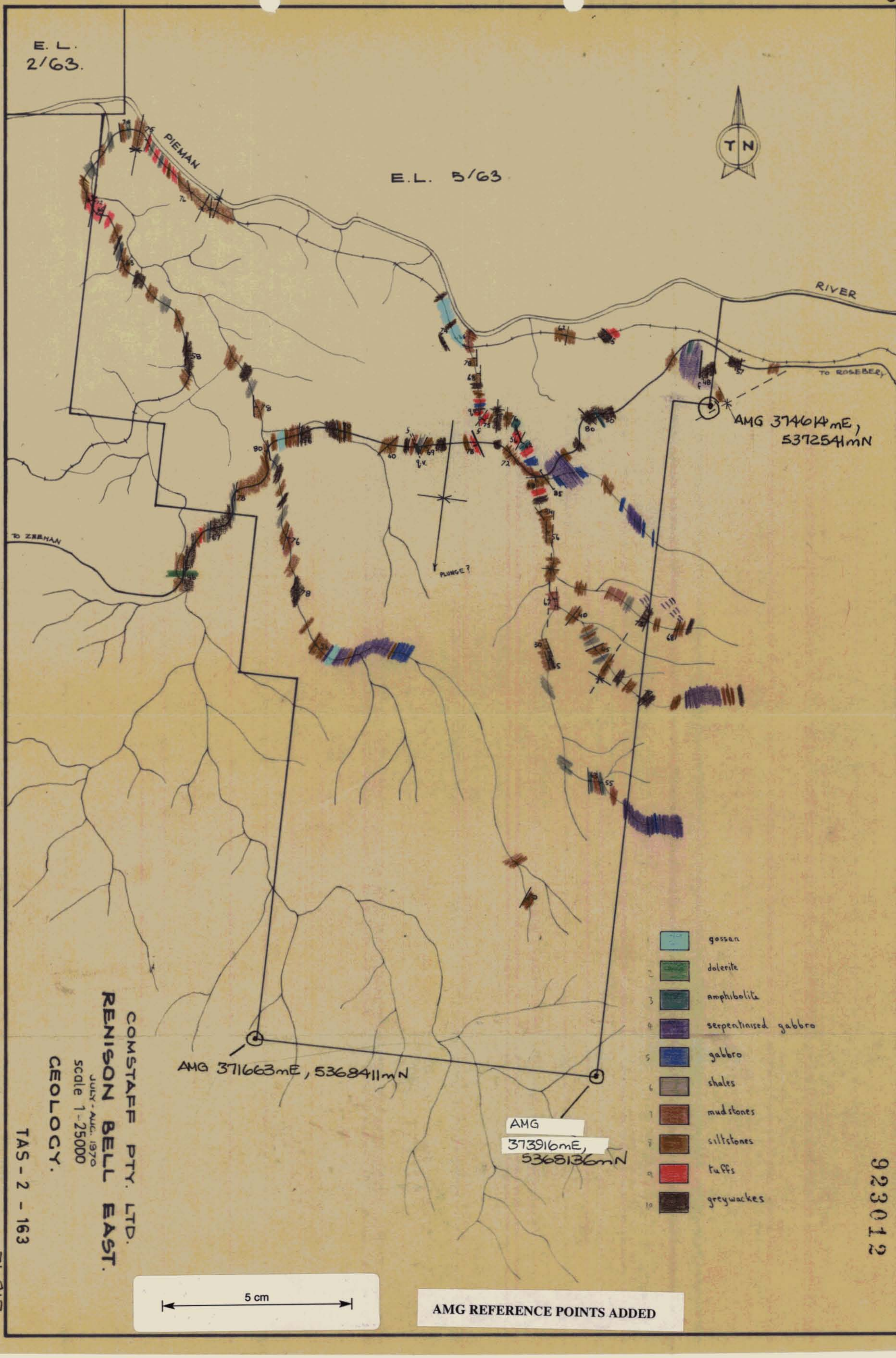
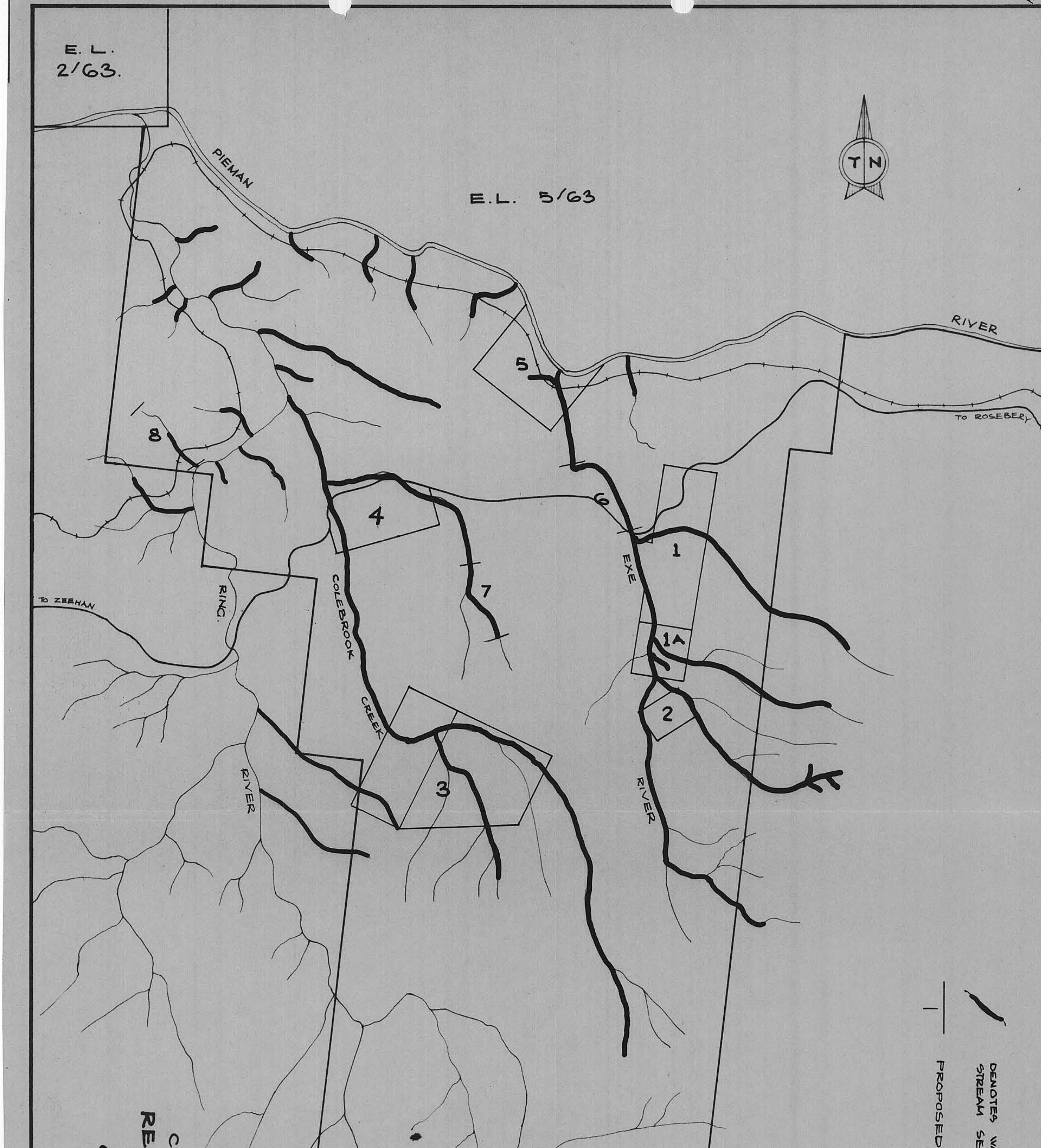
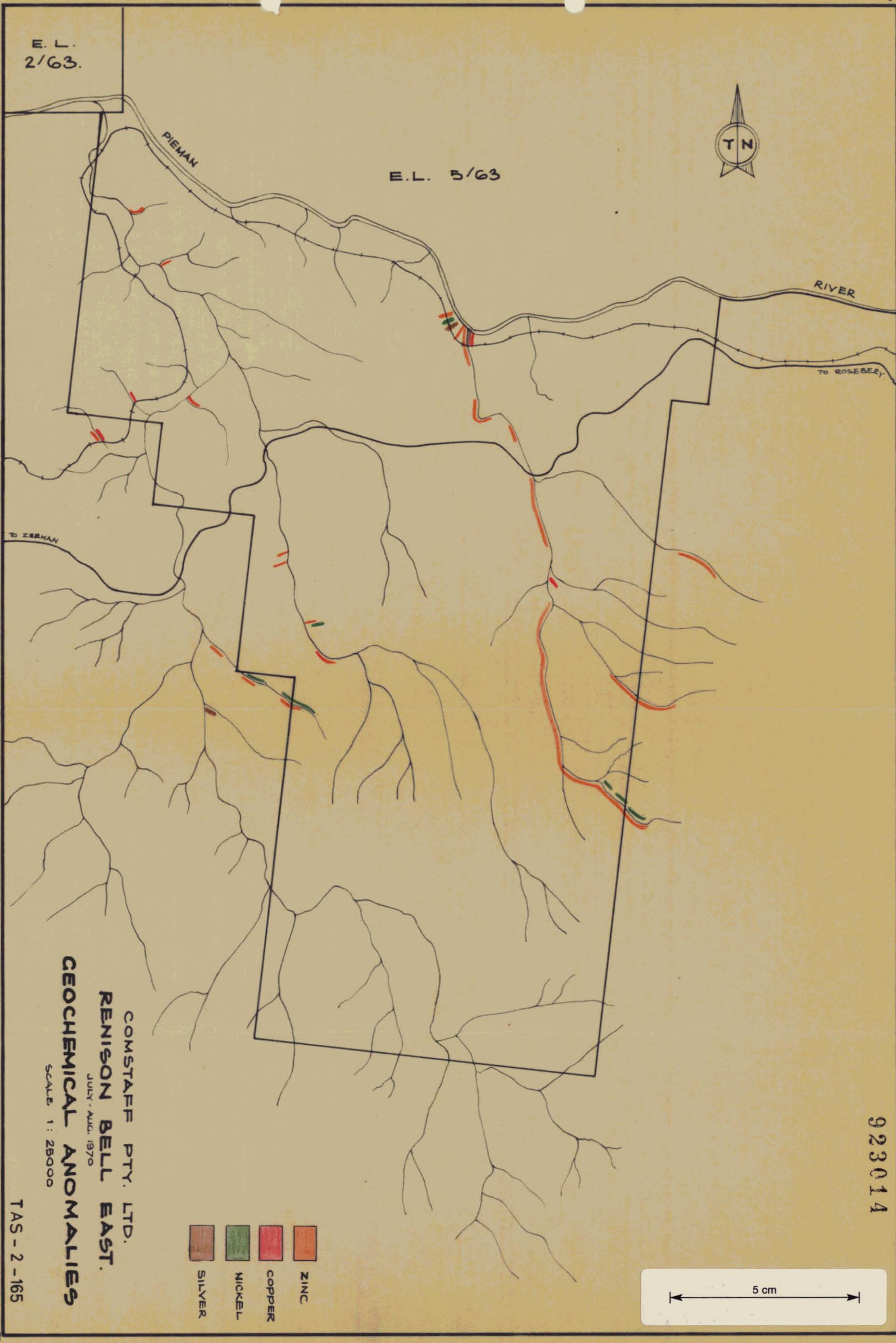


E. L. 2/63.
E.L. 5/63
PIEMAN
RIVER
TN
TO ROSEBERY
TO ZEEHAN
PLUNGE ?
AMG 374614mE, 5372541mN
AMG 371663mE, 5368411mN
AMG 373916mE, 5368136mN
gossan
dolerite
amphibolite
serpentinised gabbro
gabbro
shales
mudstones
siltstones
tuffs
greywackes
COMSTAFF PTY. LTD.
RENISON BELL EAST.
JULY - AUG. 1970
scale 1-25000
GEOLOGY.
TAS - 2 - 163
MAP No. 2
71-717
923012
5 cm
AMG REFERENCE POINTS ADDED

011


E.L. 2/63.
PIEMAN
RIVER
E.L. 5/63
TN
TO ROSEBERY
TO ZEEHAN
RING
RIVER
COLEBROOK
CREEK
EXE
RIVER
1
1A
2
3
4
5
6
7
8
DENOTES WATERWAYS COVERED BY STREAM SEDIMENT SAMPLING
PROPOSED GRIDS
923013
COMSTAFF PTY. LTD.
RENISON BELL EAST.
JULY - AUG. 1970
GEOCHEMISTRY
1 : 25000
TAS - 2 - 164
MAP No. 3 71-717
5 cm

012



923014

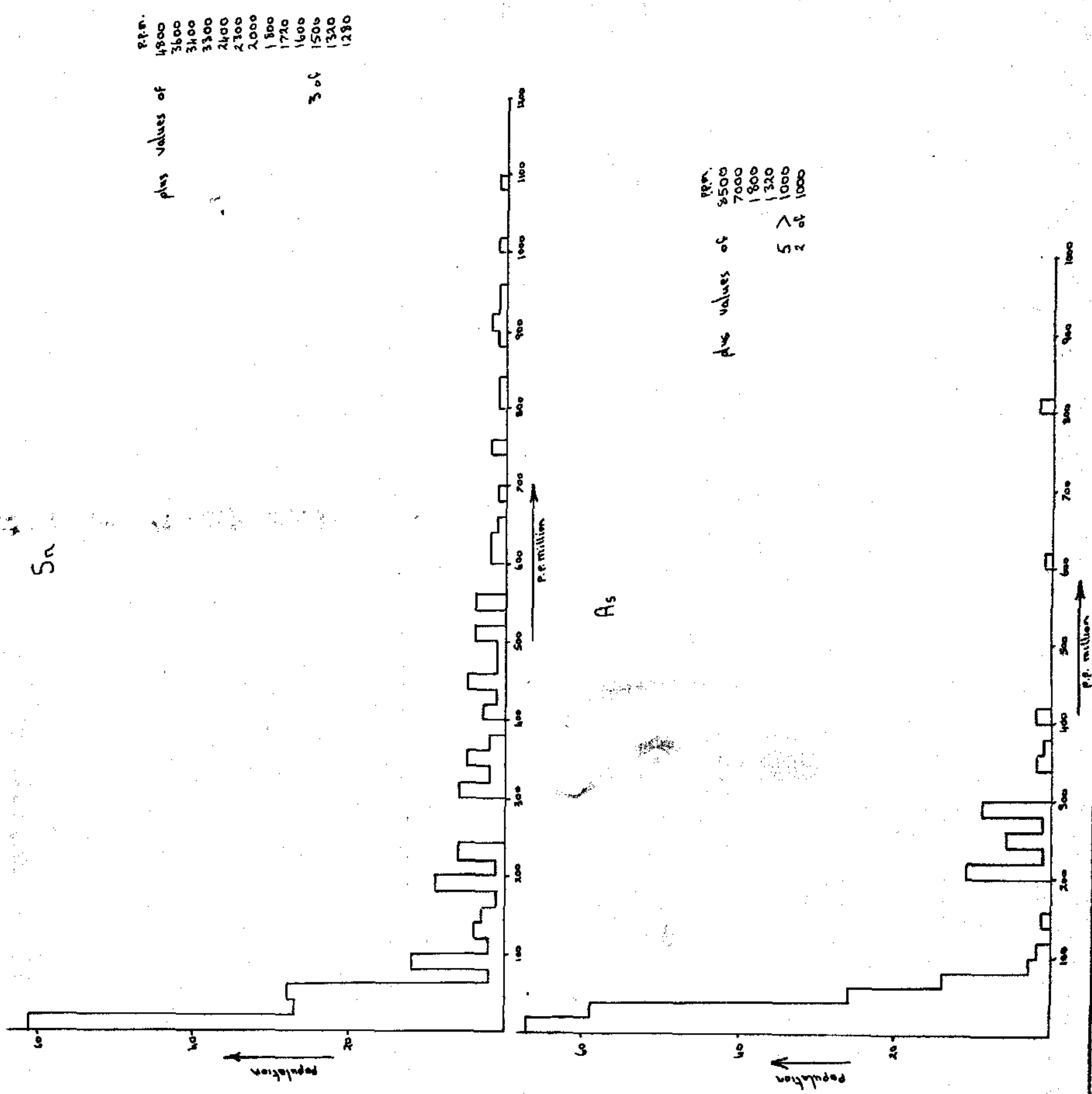
MAP No. 4.71-717

013


E.L. 2/63.
E.L. 5/63
PIEMAN
RIVER
TO ROSEBERY
TO ZEEHAN
T N
COMSTAFF PTY. LTD.
RENISON BELL EAST.
JULY - AUG. 1970
GEOCHEMICAL ANOMALIES
SCALE 1: 25000
ANTIMONY
BISMUTH
ARSENIC
TIN
5 cm
TAS - 2 - 165
MAP No. 5.
71-717
923015

014

923016



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RENISON BELL EAST

HISTOGRAMS

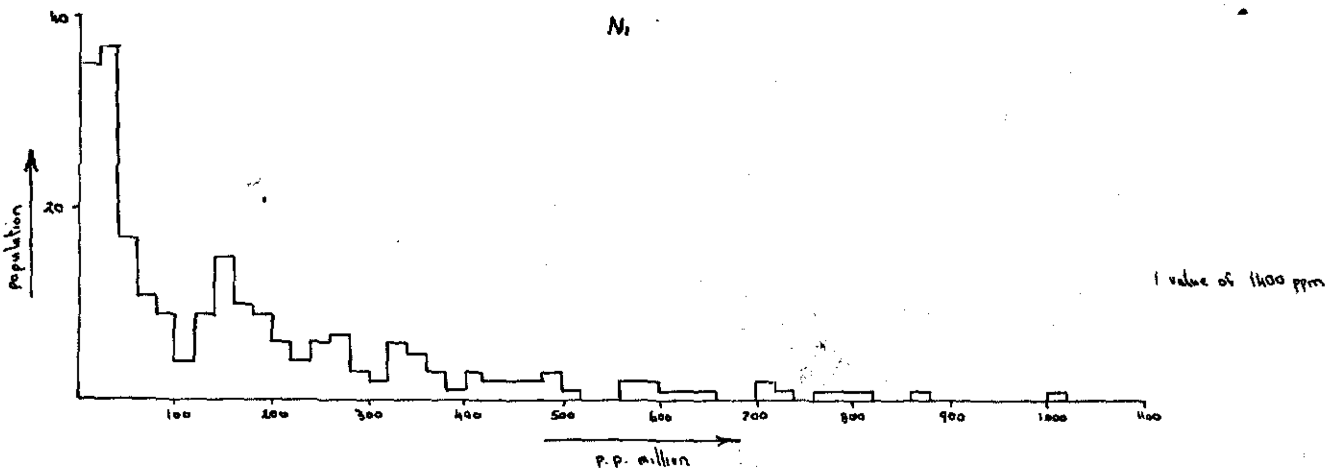
TIN ARSENIC

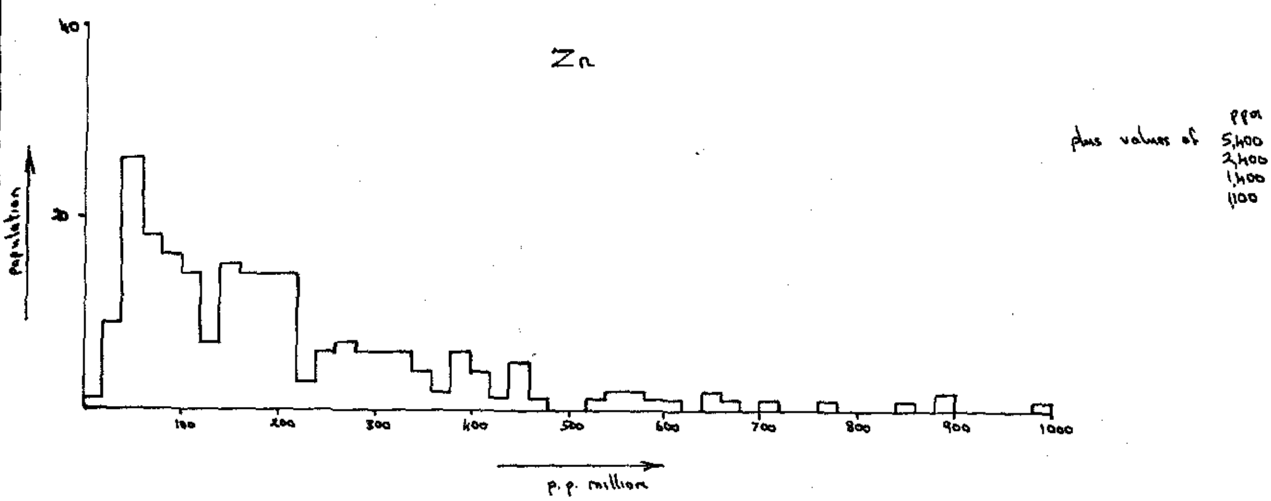
TAS - 2 - 170

71 - 717

FIG. No 1

923017





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RENISON BELL EAST

HISTOGRAMS

NICKEL ZINC.

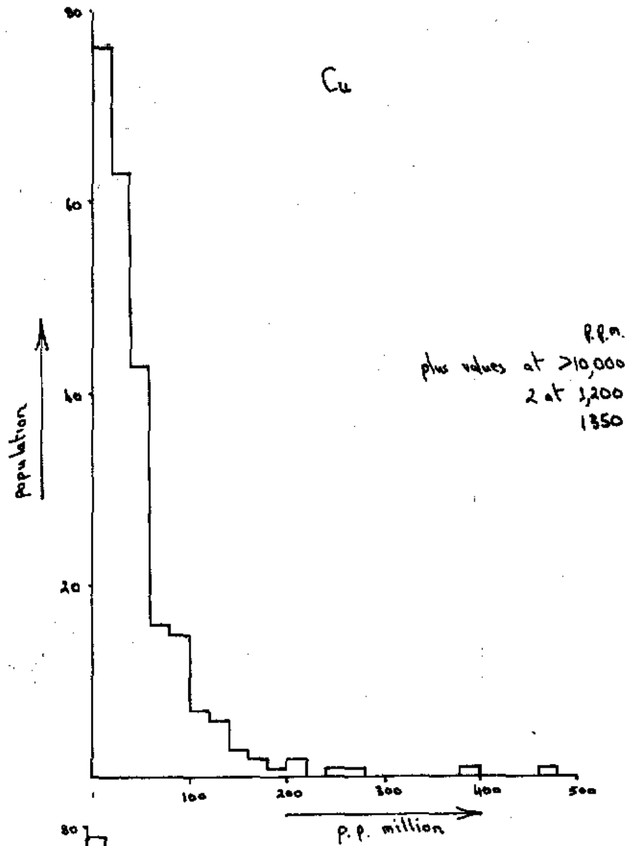
TAS-2 - 170

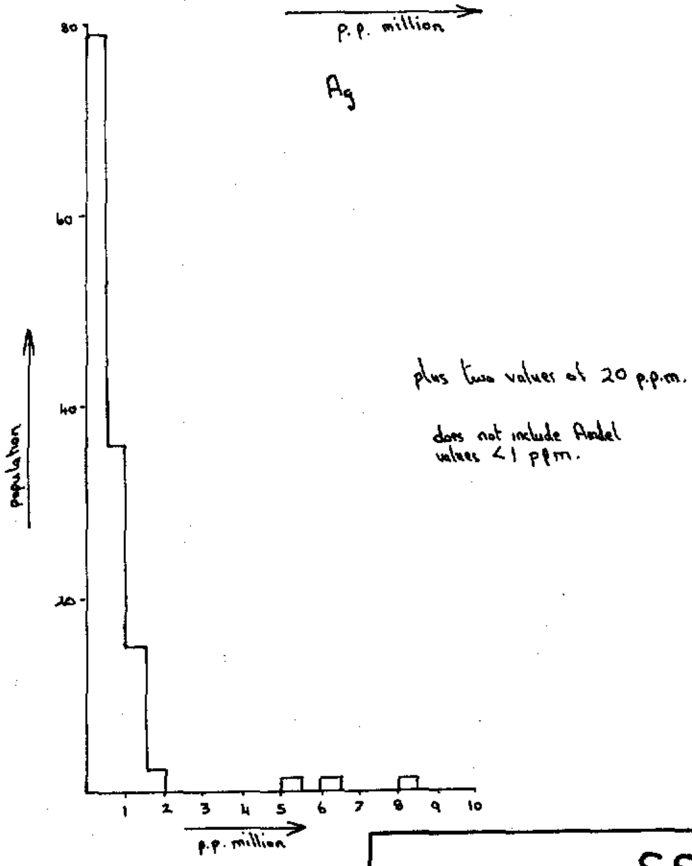
71-717

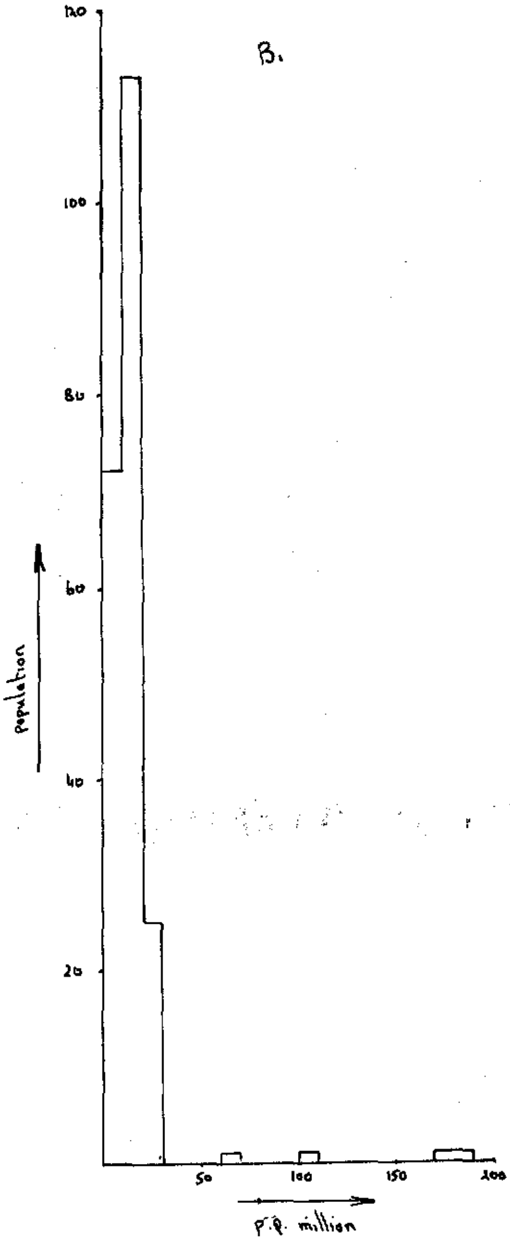
FIG No 2

016

923018







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RENISON BELL EAST

HISTOGRAMS

COPPER SILVER BISMUTH

TAS - 2 -170

71-717 FIG No 3

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E.L. 5/63 - RING RIVER PROJECT

Addendum to
1970 Winter Report
on the
Renison Bell East Area

ANGLO AMERICAN CORPORATION (AUSTRALIA) LIMITED
ANGLO AMERICAN CORPORATION (AUSTRALIA) LIMITED

E.L. 5/63 RING RIVER PROJECT

Addendum to 1970 Winter Report on the Renison Bell East Area

SUMMARY :

A short prospecting programme of geological mapping and stream sediment sampling was completed along that portion of the Ring River which lies in E.L. 5/63 and forms the southern part of the Renison Bell East area. The rock sequence of conglomerates, pyroclastics, siltstones, shales and argillites dips steeply to the east and is intruded by amphibolite, altered dolerite and altered microgranodiorite bodies. Highly anomalous values for tin, bismuth, zinc, lead, silver, copper and antimony were found in the main stream and in some of the minor streams draining to the north. These values are considered to be mainly due to contamination but further work is recommended.

GEOLOGY : (See Plan Tas 2-202)

The rocks in the area form a southern extension to the sequence mapped to the north but except for the conglomerates and volcanic breccias, tend to be finer grained. The igneous intrusives are very similar.

The succession from west to east is as follows : the lowest beds in the sedimentary sequence are coarse well bedded sub-angular quartz conglomerate, the cobbles being mainly chert with interbedded argillites. The matrix of the conglomerate is essentially chloritic. The rock could be volcanic in origin. Partially assimilated and uralitised rafts or relict layers of conglomerate occur in the amphibole sill to the west. This explains the very puzzling phenomena observed in the Colebrook siltstones and minor greywackes with minor conglomerates and tuffs. The interbedded nature of these sediments suggests variable waning currents. The interbedded sequence is overlain by grey shales and argillites with are "drag" folded, then siltstones with slump structures followed by grey shales. The youngest rocks mapped consist of quartzose volcanic breccias and feldspathic tuffs with dark shales.

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The sequence is intruded by various basic to intermediate rock bodies. A recognisable sill of tremolite-actinolite-chlorite amphibolite, which can be traced northwards to Colebrook Creek, intrudes the conglomerate. This rock is probably an altered gabbro and is very similar to the altered gabbro dykes which outcrop to the east of the area. A body of altered dolerite occurs intruding the sequence. A relict ophitic texture can be seen although the rock has a very weathered tremolite-actinolite-plagioclase-quartz-chlorite assemblage. It is almost certainly related to the amphibolite sill to the west. A small body, described from thin section as an altered microgranodiorite, occurs on a tributary of the Ring. This is gabbroic in texture and is probably a silicified derivative of the differentiated basic dyke. Veins of serpentine transect the pyroclastic rocks near the large basic dyke to the east.

The dominant structure is a southerly plunging syncline and the rocks described above exist on the western limb. Minor drag and isoclinal folds with mylonitic shears occur throughout the sequence. The metamorphic facies (chlorite greenschist), is the same as for the rocks to the north. Mineralisation in the form of quartz-argillite-breccia veins carrying arsenopyrite were observed in an old adit. Chalcopyrite and pyrrhotite in quartz veins occur on the amphibolite conglomerate contact. Disseminated pyrite and occasional pyrrhotite occur throughout the igneous intrusive bodies.

<u>GEOCHEMISTRY</u>: (see Plan Tas 2-203)

Anomalies in tin, bismuth, zinc, lead, silver, copper, and antimony occur along the main Ring River. Contamination from the mines of the north Dundas mineral field obviously plays a significant part, as the Ring River drains part of this field where native silver, tetrahedite, chalcopyrite, arsenopyrite, jamesonite, galena, sphalerite and bismuthinite occur. Tin anomalies also occur in the northerly flowing left bank tributaries of the Ring. These creeks are draining the Renison Bell Tin Mining Company's lease where extensive

.....3/...

soil sampling has been carried out. A portion of that company's grid encroaches into the south eastern portion of E.L. 5/63.

RECOMMENDATIONS :

The main Ring River should be sampled every one hundred feet and possible anomalies located by drawing cumulative or moving average curves and inflexions noted. Ao samples should also be taken from both banks. This programme could be carried out from a two day fly camp, access being from the Dundas tramway and through the Renison Company's lease. If nothing comes out of this programme then 5000 feet of grid lines should be cut and sampled. (see Plan Tas 2-203).

February 1971 G. Pigott

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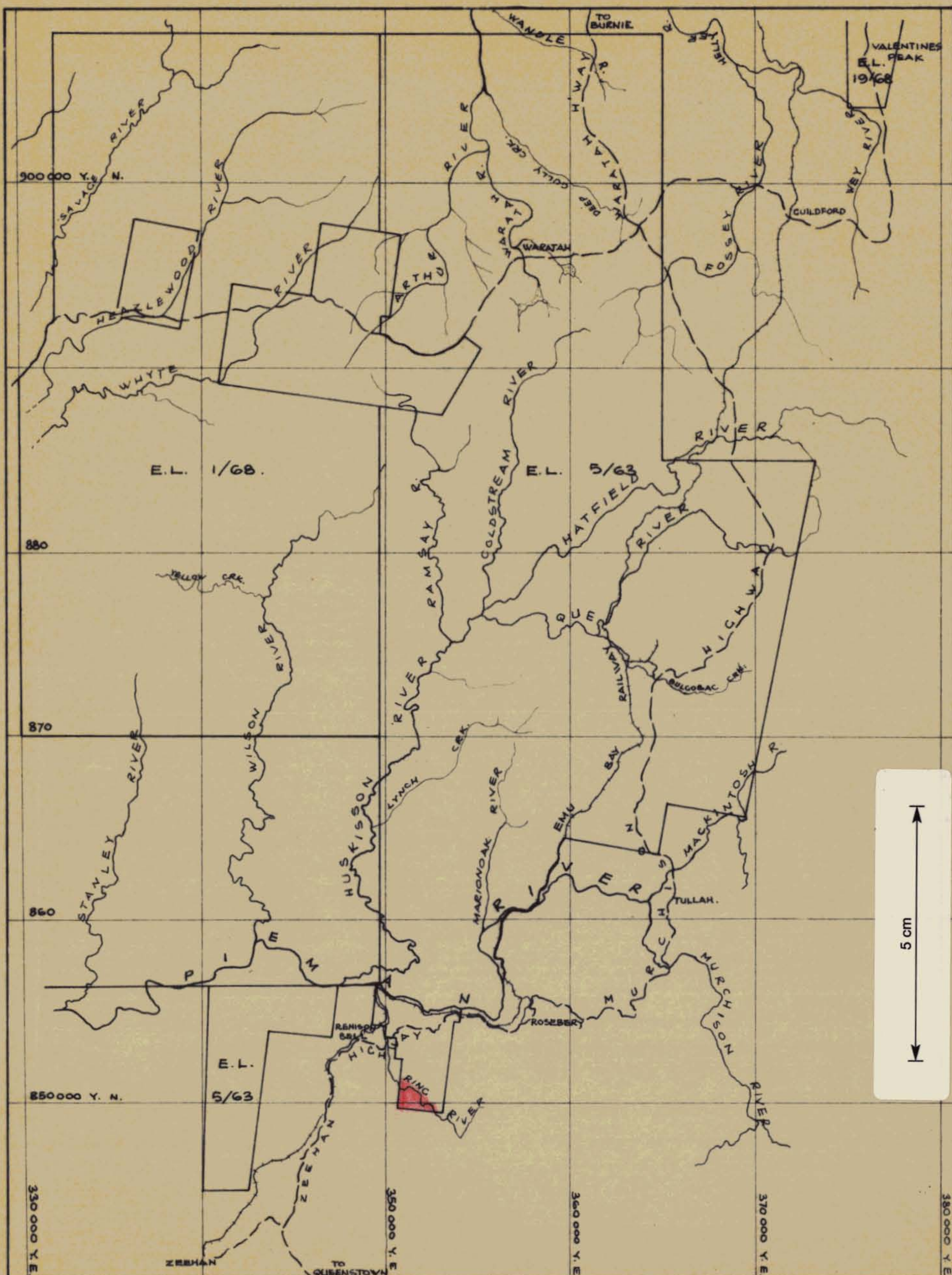
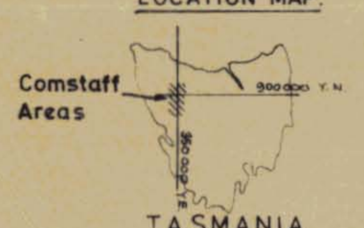
923023



LOCATION MAP.



COMSTAFF PROPRIETARY LIMITED.

RING RIVER PROJECT
LOCALITY PLAN

DRAWN	COMPILED	SCALE	
G.C.	G.C.	1:250,000	TAS-2-201

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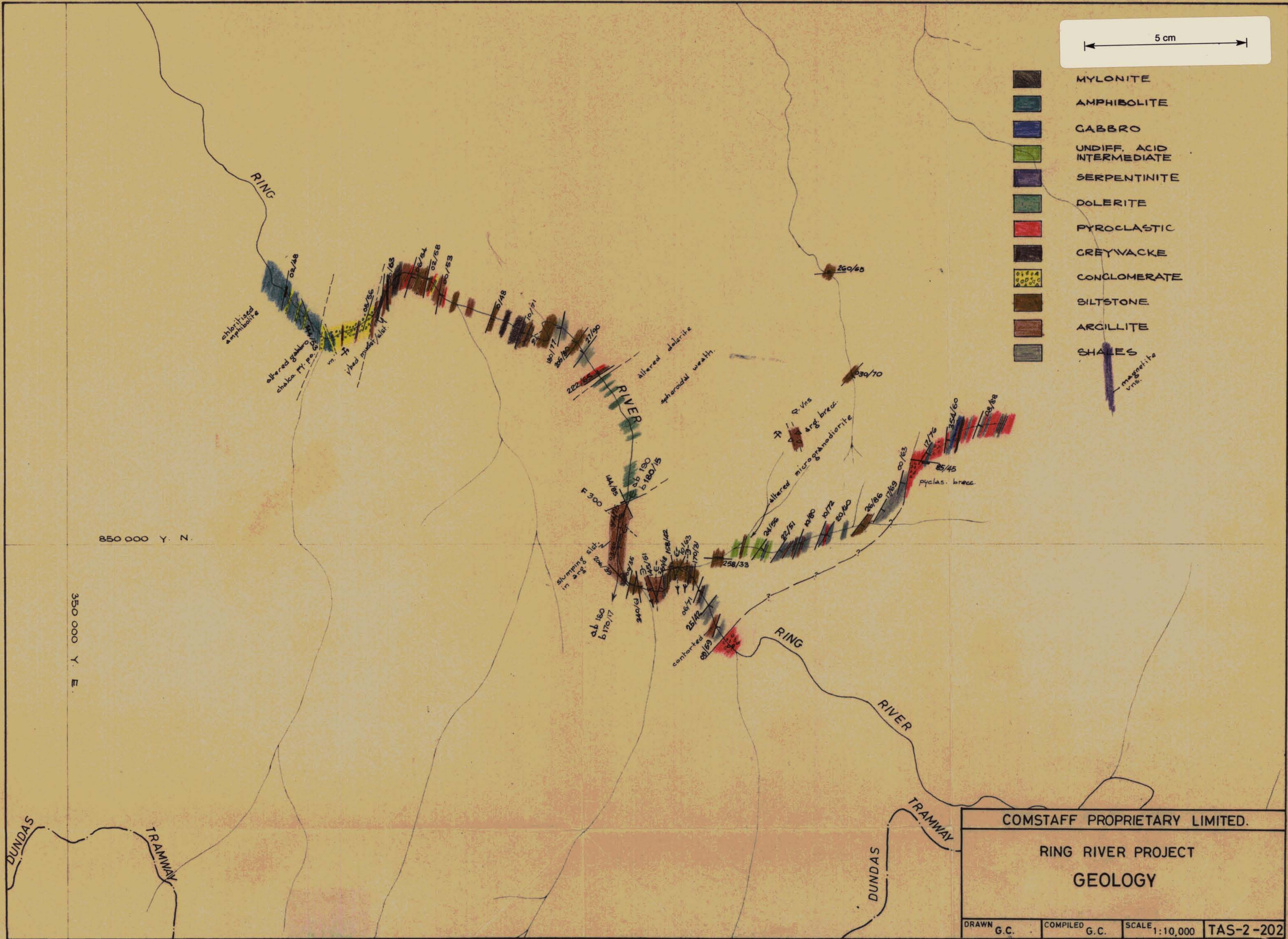
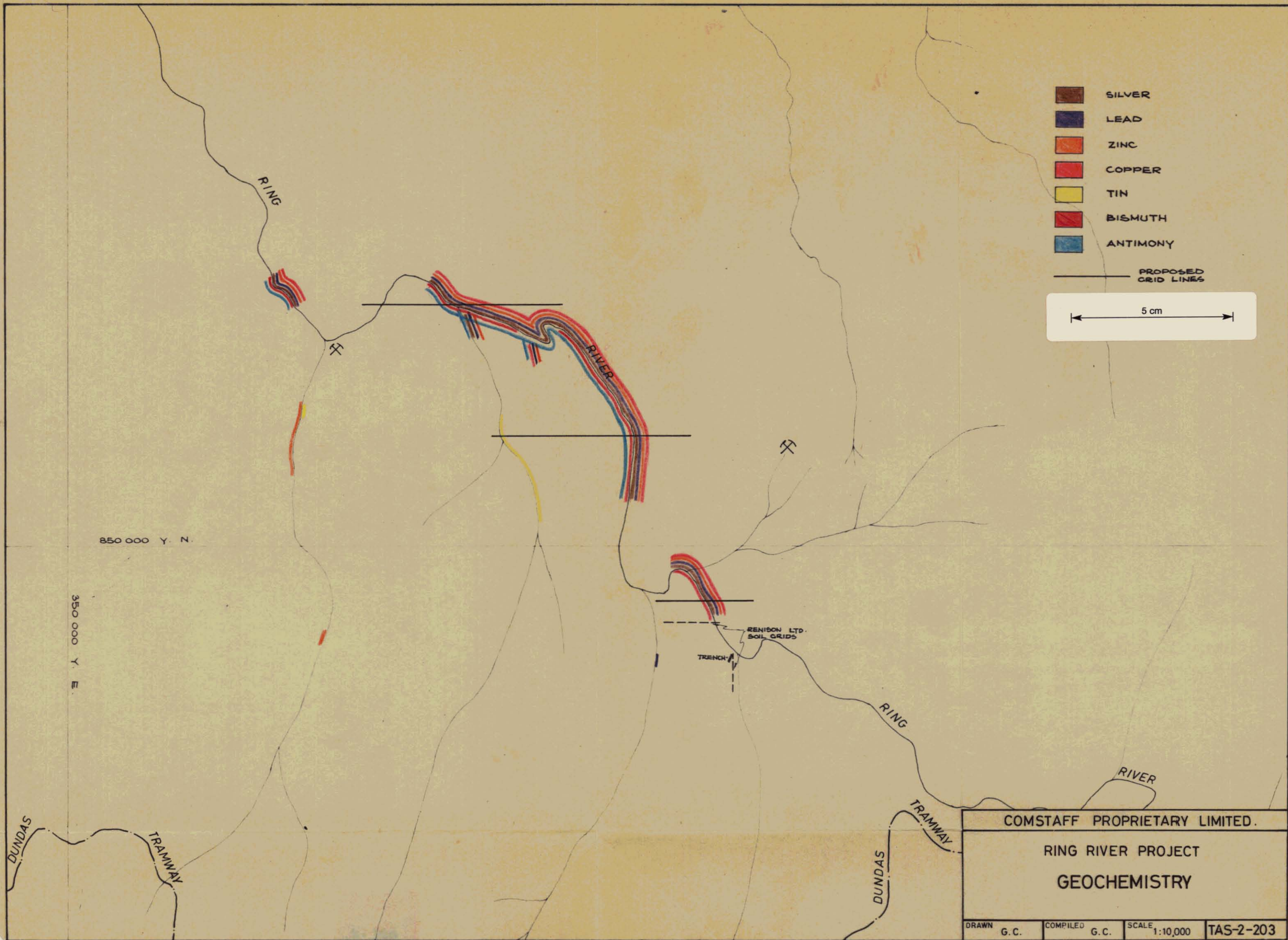
923024



5 cm
MYLONITE
AMPHIBOLITE
GABBRO
UNDIFF. ACID INTERMEDIATE
SERPENTINITE
DOLERITE
PYROCLASTIC
GREYWACKE
CONGLOMERATE
SILTSTONE
ARGILLITE
SHALES
RING
RIVER
RING
RIVER
DUNDAS
TRAMWAY
DUNDAS
TRAMWAY
850 000 Y. N.
350 000 Y. E.
chloritised amphibolite
altered gabbro
altered dolerite
spheroidal weath.
altered microgranodiorite
magnetite vns.
pyclas. brecc.
slumping sist. in arg.
contorted
F 300
260/68
030/70
258/33
85/45
COMSTAFF PROPRIETARY LIMITED.
RING RIVER PROJECT
GEOLOGY
DRAWN G.C.
COMPILED G.C.
SCALE 1:10,000
TAS-2-202

923025



COMSTAFF PROPRIETARY LIMITED.

RING RIVER PROJECT

GEOCHEMISTRY

DRAWN G.C.	COMPILED G.C.	SCALE 1:10,000	TAS-2-203