

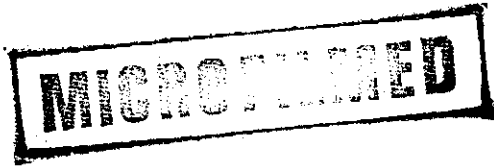
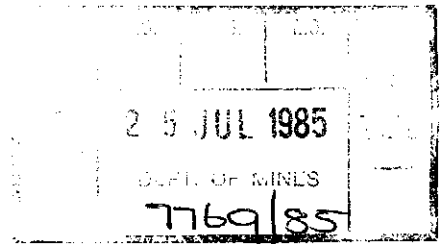
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PROJECT NAME: COMSTAFF PROPRIETARY LIMITED

TITLE: PINNACLES  
EL 5/63 AREA 4



AREA NAME/S, STATE 1 : 250,000 SHEET NO/S & COORDINATES: 1:250 000 Sheets K55-03(Burnie)  
1:250 000 Sheets K55-05(Queenstown)

COMMODITY/IES: Sn, Cu, Pb, Zn, Ag, Au

TEXT PAGES NO: 8

PLAN NOS: See List of Plans

TABLE NOS: -

APPENDICES: 1

AUTHOR/S: R W L SHAW

DATE: June 1985

AUSTRALIAN ANGLO AMERICAN LIMITED

Incorporated in the State of Victoria

## C O N T E N T S

## INTRODUCTION

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The Pinnacles Chert Line

## EAST OF THE CHERT LINE

Leo's Find/Pullpin to Marsh View Road Exhalitic Zone  
East of EAF Grid

## DISCUSSION

## REGIONAL CONSIDERATIONS

\*APPENDIX 1 - Drill Hole Logs

\*Department of Mines Copy

L I S T   O F   P L A N S

TAS/2/3990	Pinnacles Grid - EAF	Geological Interpretation
3991	" " "	Plan " "
TAS/2/4135	Brown's Workings Area	Drillhole Surface Trace
4245	Southern Trenches Area	" " "
4265	Long Section - Thomas' Tunnel Area	
4266	" " - Southern Trenches Area	
4246	Section 5080N	Drillhole Geology and Geochemistry
4247	" 5040N	" " "
4250	" 5000N	" " "
4251	" 4960N	" " "
4252	" 4920N	" " "
4259	" 4800N	" " "
4260	" 4600N	" " "
4261	" 4500N	" " "
4262	" 4460N	" " "
4263	" 4400N	" " "
4267	" EAA 2400S - EAF 4200N	
2511	" Drill hole EAB 1	
2512	" " " EAB 2	
4264	Interpretive sections through Pinnacles Burns Peak area - (Bound in text).	
3077	Regional Geological Interpretation Tullah Plan	
3079	" " "	Rosebery Plan

COMSTAFF PROPRIETARY LIMITEDEL 5/63 AREA 4PINNACLESINTRODUCTION

Having established an acceptable interpretation and understanding of the geology and mineralisation at the Brown's Tunnel locality on the Pinnacles 'line' (ref. RHR 1985) the principles were extended to the remainder of the zone. This work has permitted development of an overview of the Pinnacles Volcanogenic subprovince; it puts known mineral occurrences in context; it permits extrapolations to be made beyond the Pinnacles line sensu stricto, both higher and lower in the stratigraphy and along strike, and it clearly identifies a catalogue of targets for follow-up ranging from "ready to drill" to those requiring additional field work to ascertain their ranking for drill testing.

WORK DONE

Gridding, soil sampling, geophysical surveys and geological mapping have been done on a 2 km x 1 km (or more) grid known as EAF. The "Pinnacles Chert Line" is approximately centrally positioned within the grid. Excluding the work done at Brown's Tunnel, which is reported in the document referred to above, four new drill holes were completed along the Chert Line (Interim Report '85) and all pre-existing holes were relogged:

85-2386 Electrolytic Zinc drill holes: PP 34, 36, 39, 40, 41, 42, 46, 48, 50, 51, 52 and 59.

Comstaff drill holes; PIN 1, PIN 2, CP 7, 9, 10, 12, 13, 14 and 15.

In addition to the reinterpretational work on the drill hole data follow-up of soil gold anomalism in the eastern part of the EAF grid was achieved by chip sampling existing track and trench exposures.

STRUCTURE OF REPORT

This report will focus on the reinterpretation of the Pinnacles Chert Line based primarily on the results of drill hole data. This will then be used as a model to compare and assess the prospectivity of anomalies in and beyond the limits of the EAF grid.

The text will rely on the reader referring to the maps and plans for an understanding of the complex variables which influence the distribution of lithotypes and metal in this volcanogenic subprovince. R H Roberts' March 1985 report "Brown's Workings" is also an essential reference.

**RESULTS**The Pinnacles Chert Line

The feature which differentiates the Pinnacles volcanogenic prospect from others in Western Tasmania is the abundant development of "chert". It is recognised in all the significant mineral shows; Brown's Tunnel, Thomas's/McGuinness' Workings and the Southern Trenches area. It is this 'dog-leg' line of prospects which is known as "The Pinnacles Chert Line." (TAS/2/3990, 3991, 4135, 4245, 4265 and 4266).

Briefly, the Brown's Tunnel area was shown to host a 110,000 tonne lens of precious-metal-rich mineralisation in a horizon of cherts, volcanoclastics and shales. This host horizon is sandwiched between a volcanic porphyry footwall and barren epiclastics. Rapid lateral facies changes occur in the host horizon and the hanging wall lithotypes.

Moving south, to the Thomas's Tunnel area, a densely drilled line of section has been used to identify equivalent horizons to Brown's. Additionally, this line of section has a greater E-W extent thus permitting the context of the mineralisation to be established (TAS/2/4250). For ease of reference the geological units will be numbered according to the following pattern:-

- UNIT 6 - Upper host horizon - Pyroclastic ash, (black) shales, cherts and volcanoclastics.
- UNIT 5 - Barren epiclastics - Epiclastics, pyroclastic lapilli tuff (ignimbritic) with ripped up shales.
- UNIT 4 - Lower host horizon - Cherts, volcanoclastics, shales, pyroclastic ash and ore.
- UNIT 3 - "Footwall" porphyry - Complex mix of green porphyritic (feldspar) volcanic lithologies.
- UNIT 2 - Felsic lapilli tuff - Distinctive tuffaceous unit with an horizon of black shales.
- UNIT 1 - Western Series Shales - Barren, calcareous, well laminated shales and siltstones.

It is obvious by reference to the Thomas's Tunnel section that the UNIT 1 to 6 sequence is not a time stratigraphic succession although younging direction is from west to east. The relationship of UNIT 1 to 2 and both these to the remaining UNITS is not understood but evidence suggests UNIT 1 can be regarded as "basement" to the Pinnacles system while UNIT 2 is transitional to it.

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The key to understanding the geometry of Pinnacles is UNIT 3. It is footwall to the Brown's Tunnel deposit where great thicknesses of feldspar porphyry underly the lower host horizon (UNIT 4). Progressing southwards and downwards in the Brown's Tunnel area UNIT 3 transgresses westwards being replaced by members of UNIT 4. This takes place in the context of subvertical structurally enhanced bedding foliations indicating that the UNIT 3/UNIT 4 boundary is a facies boundary. This stratigraphy is apparently maintained southwards. At the Thomas's Tunnel reference-section, holes CP 14 and 7 complete the inference drawn above by showing that UNIT 3 "keels" out to be replaced by UNIT 4.

UNIT 5 traces south from Brown's Tunnel to Thomas's Tunnel but is unrepresented in sections through Southern Trenches. Lithologically, the unit is very variable with a considerable range in component fragment size and composition. It is unified, however, in being characteristically studded by ripped up shale fragments and being totally devoid of geochemical anomalism in contrast to the enclosing host horizon rocks of UNIT 4 and 6. Interestingly its gross morphology in section parallels the facies boundary between UNITS 3 and 4. The background levels of geochemical values in UNIT 5 indicate a provenance remote from the volcanic and geothermal products responsible for the mineralisation at Pinnacles.

In the absence of UNIT 5, south of CP 12, differentiation between UNIT 4 and UNIT 6 becomes subjective. CP 12 (TAS/2/4259) lacks the development of pyroclastic ash as a component of the lower host horizon so the definition of UNIT 4 is modified slightly to refer only to the chert, volcanoclastic and shale facies. UNIT 6 is retained for the pyroclastic ash dominated facies.

At Southern Trenches, UNIT 4 (var) facies is rapidly engulfed by UNIT 6 (var). The ore grade mineralised part of the sequence is restricted to UNIT 4 (var) and it dies out as rapidly as its host lithotype (TAS/2/4260-4263).

One can summarise the interpretation presented above as a complex interplay of volcanic and related sedimentary formations which were subject to the influence of mineralising solutions. The geometry of change is one of north plunging facies successively replacing each other southwards around a porphyry "keel" which is genetically related to the mineralisation.

UNIT 2 is anomalous in having an approximately 50° E dipping contact with UNIT 4. It is probable that tectonics have played a role in this but it is by no means certain. The "transitional" nature of UNIT 2 is evidenced by the persistent presence of a laminated black shale unit which averages over 1% Zn with some Pb. This exceeds "anomalous" black shale levels by a margin which suggests a metal input from the target Pinnacles geothermal system.

UNIT 1 has a 50° dipping contact with UNIT 2. The change is very abrupt to a geochemically barren, carbonate rich siltstone and shale, formation. This we classify, with little difficulty into the Western Sedimentary sequence of the Mt Read Volcanics.

### EAST OF THE CHERT LINE

Drill hole information immediately east of the Chert Line is limited to EAB 3, and the short sections of other holes which penetrate UNIT 6. Much of the following relies on surface mapping information, which, in the light of the foregoing has substantial limitations in interpreting this complex environment.

The lithotypes present east of the Chert Line in EAF grid are dominated by pyroclastic ash. This is variable in its degree of alteration from weakly to strongly silicified. It frequently has a greenish hue caused by a talcose mineral and is often well foliated. Within this sequence a number of 'exhalitic' horizons are recognised both in outcrop and through their geochemical signature. The continuity of most is unknown but one, the most easterly, known as the Leo's Find/Pullpin to Marsh View Road line can be traced for at least 1.5 km of the 2 km grid. The features which have permitted the classification of these units as 'exhalitic' are the presence of cherty silicification or silica, increases in the amount of pyrite, often finely crystalline and clotty, and the presence of smears of sphalerite and galena. In addition the Leo's Find Line has a black shale facies with weak sphalerite mineralisation. This latter facies of an exhalite horizon is an important component of the Pinnacles Chert Line.

An important contributor to the stratigraphy east of the Pinnacles Chert Line is quartz porphyry. It occurs as discordant plugs or stocks and characteristically has an extremely fine ground mass in which are studded coarse (0.5cm) quartz phenocrysts in varying concentrations.

These bodies occur in two zones, one east of the Pinnacles Chert Line and one associated with the Leo's Find Line. They may have a genetic link to the mineralisation but they are geochemically not anomalous. The weight of evidence suggests they are intrusive. A crudely parallel to contact foliation is sometimes developed. The porphyry may have been responsible for the development of divergences in structural trends by wedging apart the stratigraphical sequence. These features are best illustrated in the Leo's Find and Burns Peak area.

A detailed study of the smaller 'exhalitic' units has not been done. However, the Leo's Find Line has received sufficient attention to suggest drill testing is required. This was prompted by the presence of highly anomalous levels of gold in the soils. Details of this work follow:-

#### Leo's Find/Pullpin to Marsh View Road Exhalitic Zone

The 2 km x 1 km grid, EAF, was soil auger sampled at 20m intervals on lines 200m apart. Strong gold anomalies with values peaking at >20 ppm Au (spotty, unrepeatable) were delineated over 1000m combined strike length in the eastern half of the grid. Test pitting and pan concentrate analysis of two lines confirmed the presence of gold both visually and analytically. Coincident responses in base metals were weak.

Numerous roads, tracks and costeans traverse the areas of anomalism. These have been chip/channel sampled over 2 and 3m widths depending on lithotype. Distribution of rock anomalies for gold correlate well with the areas of soil anomalism. The peak gold value is 0.36 ppm over 2m accompanied by 5 ppm Cu, 25 ppm Pb, 115 ppm Zn and below level of detection (0.5 ppm) Ag.

Geological mapping showed that the gold anomalies were related to siliceous, pyritic, occasionally base metal bearing exhalitic horizons. In the north two horizons are separated by an elongate quartz porphyry plug. Tracing the western horizon southwards it passed into a black shale facies with veinlets of sphalerite before dying out as a mixed shale exhalitic zone in the vicinity of the Marsh/View Road anomaly.

Geological mapping failed to find outcropping massive volcanogenic mineralisation. The greatest encouragement that the exhalitic horizon may include an ore-bearing facies, is in the blow of mineralisation located at Leo's Find and in the consistency with which the horizon is anomalous in gold.

At Leo's Find a 1m x 0.5m exposure of sulphides and sulphate mineralisation was sampled according to its principal components with the following results:

Rock Type	Cu	Pb	Zn	Ag	Au
pyritic cherty exhalite	120	730	680	8.5	0.13 ppm
sulphide facies	2.12%	9.49%	17.2%	75	1.06 ppm
barite facies	0.225%	1.36%	2.84%	8	0.26 ppm
barite, chlorite sericite altn	0.1150%	2.38%	3.73%	17	1.14 ppm

Leo's Find is the extreme northern limit to which the exhalite can be traced. Beyond this point, apart from the interference of the quartz porphyry body, a shaley depositional environment impinges on the stratigraphy. The nature of the relationship of the shales to the pyroclastic ash and exhalites is not known. Southwards the gross width and actual gold values in rock generally decline and certainly no significant quantities of base metals are exposed in the exhalite south of the costean 2/3 area.

#### East of EAF Grid

Only a brief reconnaissance of the data available for the area to the east of EAF grid has been done. However both drill holes EAB 1 and 2 have been inspected to ascertain the nature of the relationship between the andesites and the 'Pinnacles' stratigraphy (TAS/2/2511, 2512).

Despite the preliminary nature of the work done the initial impressions are worth recording if only to draw attention to the requirement for further study.

It is felt that the east-younging stratigraphy is undisturbed across Burns Peak and that previously interpreted synclinal folding is not present. The andesites are the youngest part of the sequence studied in this recent phase of work at Pinnacles. The west-dipping stratigraphy in EAB 1 and 2 is due to overturning of the beds. An excellent correlation to surface exists from EAB 2. However in EAB 1 the exhalitic units or target zones are absent. They are now recognised as being cut out by barren epiclastics - the important disrupter of the geothermal event on the Chert Line (UNIT 5).

EAB grid contains numerous geochemical anomalies. Many are apparently related to higher background values in the andesites but the presence in original sampling of up to 3.1% Zn with Cu, Pb, Ag and Au values of interest in EAB 1 requires that the area should not be discarded as of no potential economic merit. Recutting of core provided a 7m zone of cherty exhalite with up to 275 ppm Cu, 0.4% Pb, 0.68% Zn, 13 ppm Ag and 0.03 ppm Au.

### DISCUSSION

Before looking at the strike extensions to the Pinnacles area an interpretation which links the data of the Brown's Tunnel area, the Chert Line as presented here and the EAF/EAB grid results will be described. The importance of the interpretation is that it provides a framework which links all the known examples of mineralisation, it permits a genetic engine to be defined, it recognises disruptive hiatus to be recognised and consequently sets up a rationale for further drilling beyond that which is required by the direct mineral leads in recent drilling (TAS/2/4264).

Until further work proves otherwise the green porphyry (UNIT 3) is considered to be the most potent element in the generation and distribution of ore minerals. This unit has the shape of a north plunging synform but its contacts are facies boundaries not tectonic. It is at or immediately above the boundary that the majority of the ore minerals occur. These occurrences include

Brown's Tunnel lens	(RHR 1985)
Thomas's Tunnel lens	(CRM 1985)
EAF 16 mineralisation	(" ")
Costean 16 outcrop	(TAS/2/4250)
McGuinness' Workings	

An alteration column with mineralisation has been identified cutting through the green porphyry beneath Brown's Tunnel. Similar feeder systems have not been identified beneath the other mineral occurrences but it is unlikely that the Brown's one is unique. Certainly there are no other likely formational candidates for the role of mineraliser and geothermal engine.

It is well recognised that shale horizons within the geological succession record periods of quiescence in which active geothermal systems have the opportunity to deposit and see their products preserved. Four of the above listed mineral occurrences lie within the same quiescent unit - the "Pinnacles Chert Line". This line is pinched out at the surface north of Brown's Tunnel by the eastward expansion of UNIT 3 and the disruptive down cutting UNIT 5 (epiclastic PcL with shale fragments). The shale member of UNIT 2 is of particular interest. It is the lowest stratigraphical level at which highly anomalous or mineralised shale is recognised.

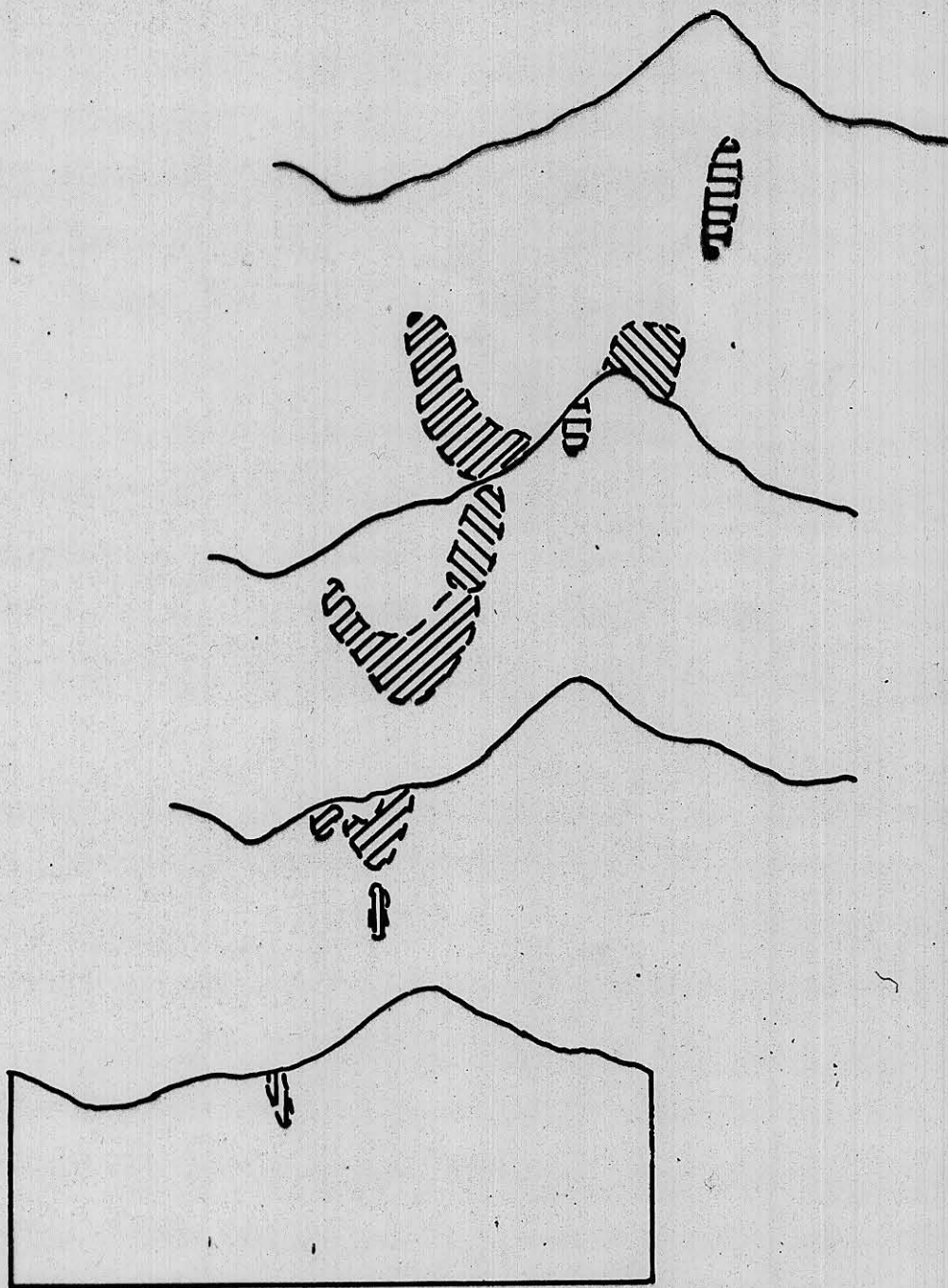
We have no evidence of how this shale unit changes as it impinges on UNIT 3 but its gross content of metal certainly increases towards UNIT 3; CP 12 contains 8m at 2% Zn versus CP 14 with 30m of 1% Zn. The third significant shale horizon is on Leo's Find Line, much higher in the sequence. The geochemistry of this horizon has already been described but in summary it is one of persistently anomalous levels of gold with base metal accumulation only at the most northern exposure of the line. Lack of exposure prevents inspection of the intersection of this exhalite with UNIT 3.

Our interpretation rests simply on recognition that UNIT 3 is genetically related to the mineralisation. It forms a submarine volcanic pile in a heap of volcanosediments. Metal bearing geothermal eruptions, coincident with reduced vulcanism and increased shale deposition, provided the opportunity, in the three horizons described above, for deposition of ore minerals.





The middle horizon - the Pinnacles Chert Line - has been tested and greatest success has been encountered closer to UNIT 3. It would seem logical to regard the anomalous gold levels of Leo's Find and the zinc values in the UNIT 2 shale member as pathfinders to possible massive accumulations of metal at the facies boundary between themselves and UNIT 3. (The value of gold as a pathfinder is seen in the unmineralised trenches above the Brown's Tunnel lens).

### REGIONAL CONSIDERATIONS

The regional scale here is defined as within the confines of EL 5/63 Area 4 (TAS/2/3077, 3079). It is clear that the details of the stratigraphy have been varied by recent work. This throws open to review the precise relationship of the southward strike extensions of the Pinnacles area through the Chester Mine and Mt Kershaw to the Pieman River and eastwards from Pinnacles to Mt Block. The eastern salient of Area 4, Farm Creek, should be reviewed.

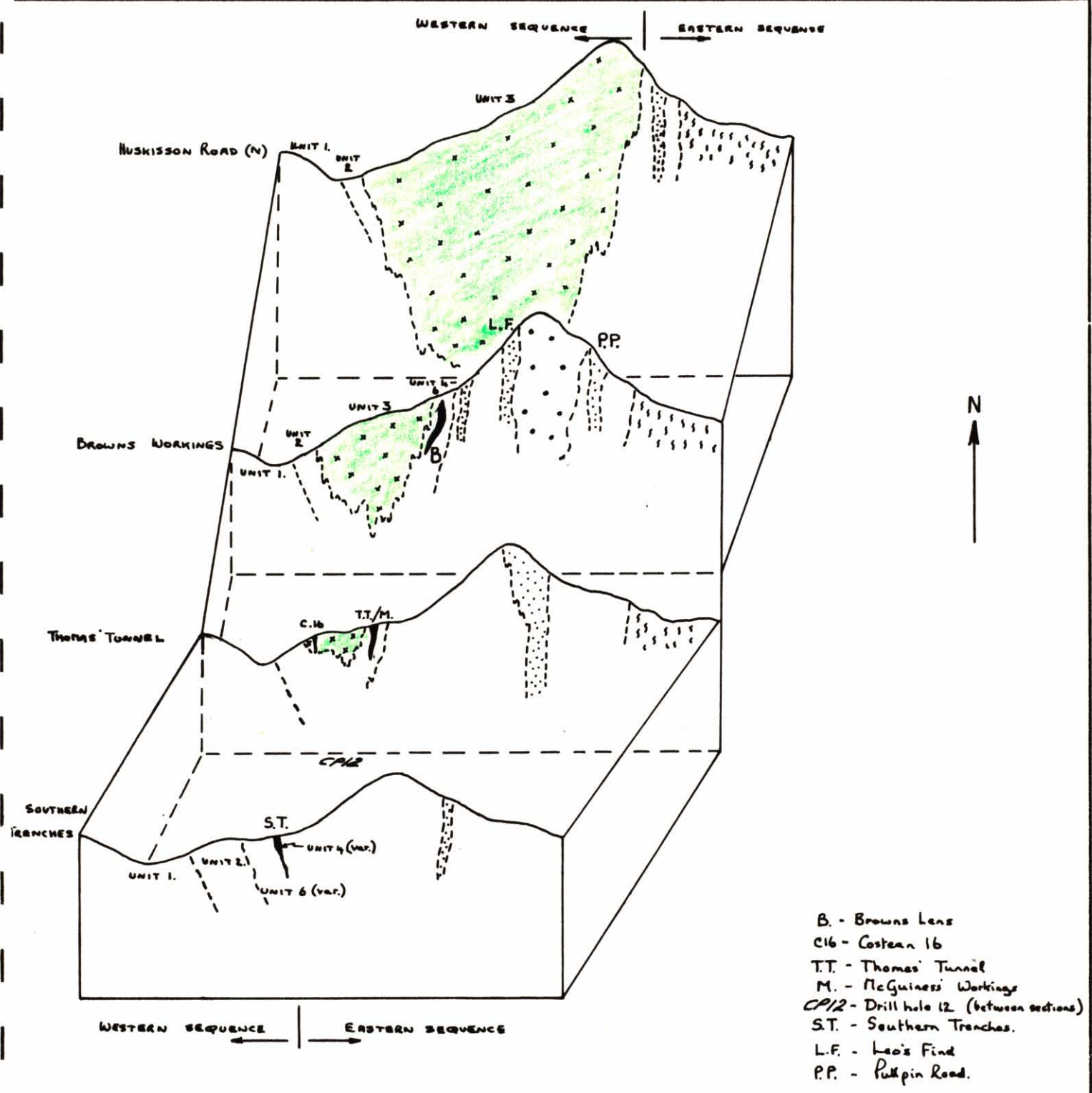


EXPLORATION TARGETS

-  - S. Trenches
-  - T.T./M/C16/CP12
-  - Browns
-  - Leo's Find

OVERLAY SHOWING POTENTIAL  
LOCI OF MASSIVE SULPHIDE  
DEPOSITION.





- B. - Browns Lens
- C16 - Costean 16
- T.T. - Thomas' Tunnel
- M. - McGuinness' Workings
- CP12 - Drill hole 12 (between sections)
- S.T. - Southern Trenches.
- L.F. - Leo's Find
- P.P. - Pulpin Road.

**LEGEND**

- |   |  |
|---|--|
| <p><b>WESTERN SEQUENCE.</b></p> <ul style="list-style-type: none"> <li>UNIT 6. Upper host horizon</li> <li>UNIT 5. Barron epiplastics</li> <li>UNIT 4. Lower host horizon</li> <li>UNIT 3. "Footwall" porphyry</li> <li>UNIT 2. False lapilli tuff</li> <li>UNIT 1. Western series shales.</li> </ul> | <p><b>EASTERN SEQUENCE</b></p> <ul style="list-style-type: none"> <li>/// - Exhalitic units</li> <li>././ - Quartz porphyry</li> <li>--- - N.E. Shale basin</li> <li>    - Pyroclastic ash.</li> <li>■ - 'Ore' lens</li> </ul> |
|---|--|

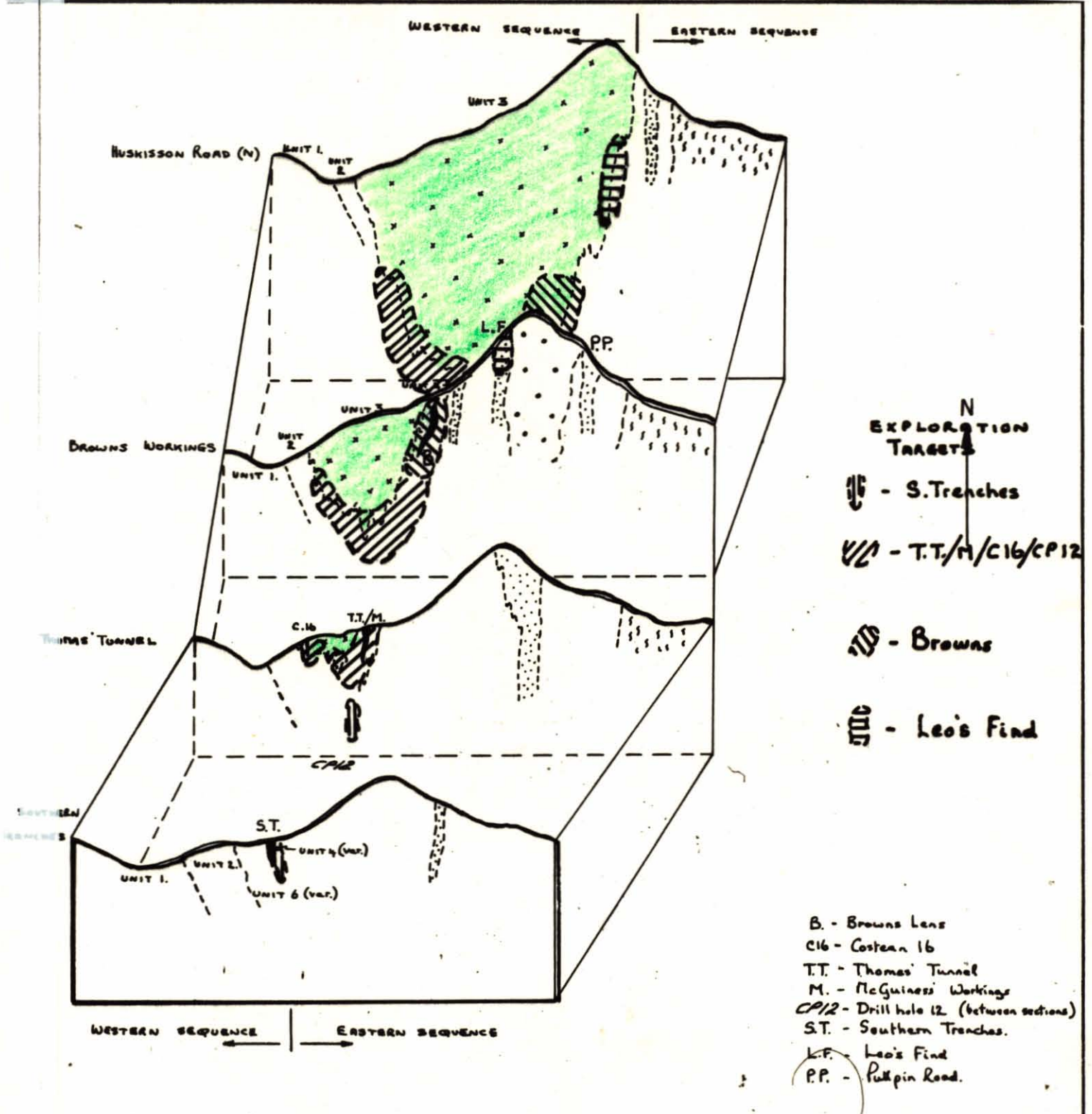
TAS/2/4264

COMSTAFF PROPRIETARY LIMITED

E.L. 5/63. AREA 4.

INTERACTIVE SECTIONS THROUGH  
HANNACLES AND BURNS BANK AREA

DRAWN BY	DATE	CHECKED BY	DATE
STAVE/1985	1985	1985	1985
SCALE	SCALE	SCALE	SCALE



- N  
EXPLORATION TARGETS
- S. Trenches
  - T.T./M/C16/CP12
  - Browns
  - Leo's Find

- B - Browns Lens
- C16 - Costean 16
- T.T. - Thomas' Tunnel
- M. - McGuinness' Workings
- CP12 - Drill hole 12 (between sections)
- S.T. - Southern Trenches.
- L.F. - Leo's Find
- P.P. - Pulpin Road.

**LEGEND**

- |   |  |
|---|--|
| <p><b>WESTERN SEQUENCE.</b></p> <ul style="list-style-type: none"> <li>UNIT 6. Upper host horizon</li> <li>UNIT 5. Barren epistalctics</li> <li>UNIT 4. Lower host horizon</li> <li>UNIT 3. "footwall" porphyry</li> <li>UNIT 2. Falsic lapilli tuff</li> <li>UNIT 1. Western series shales.</li> </ul> | <p><b>EASTERN SEQUENCE</b></p> <ul style="list-style-type: none"> <li> - Exhalitic units</li> <li> - Quartz porphyry</li> <li> - N.E. Shale basin</li> <li> - Pyroclastic ash.</li> <li> - 'Ore' lens</li> </ul> |
|---|--|

OVERLAY SHOWING POTENTIAL  
LOCI OF MASSIVE SULPHIDE  
DEPOSITION.

TAS/2/4264

COMSTAFF PROPRIETARY LIMITED  
 TAS/2/4264  
 E.L. 5/63. AREA 4.  
 INTERPRETIVE SECTIONS THROUGH  
 FANGLIES AND BROWN BANK AREA

Reid in 1918 records the presence of old workings with galena on the western slopes of Mt Kershaw. Comstaff's exploration has succeeded in finding only large residual deposits or accumulations of lead/zinc anomalous manganese/limonite wad. More work is needed to ascertain the prospective worth of this zone. The Chester pyrite mine has only briefly been inspected recently. Alteration (clay, sericite, silica) is intense and pyrite is ubiquitous. Much has the appearance of 'footwall' style mineralisation. Andesite dykes are present which post date the mineralisation. No work by Comstaff has probed for a north plunging aspect to the Chester mineralisation and no work addresses the definition of a 'hanging wall' or identifies a pattern of alteration which would aid interpretation of the geometry.

In view of the genetic tie of the Pinnacles mineralisation to UNIT 3, Chester pyrite mine must be a manifestation of an individual system and there is no reason why it should not have a base metal/precious metal facies in addition to the pyrite lode.

The prospectivity of the eastward continuation of the Pinnacles line to Mt Block at the Farm Creek area depends on clarifying the relationship between the Western Series sediments which appear to impinge on the area from the north and the andesitic terrain east of Burns Peak. The geological problems are probably insurmountable by mapping available outcrop, and are compounded by the abundance of glacial debris.

If a deliberate attempt were made to explore this ground before being led in there by results from the eastern part of EAF grid then it should be preceded by a detailed geochemical survey for gold. The objectives of such a survey would be to establish hard targets early, or in the absence of anomalies, delay, on firm negative evidence, investment in that part of EL 5/63 Area 4.

*Staplin*

for: RWL SHAW  
June 1985.

A P P E N D I X      1



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IP 34

Geochemistry

	<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
)	95.1-102.5	0.4%	0.7%	3.9%	5 ppm	0.1 ppm
\$53 cut off.	100.3m-100.9m @ \$119	1.52%	8.7%	14.8%	43 ppm	1.2 ppm



016

120018

PP 86 Geochemistry

<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
1254-13073m	0.3%	0.5%	5.1%	7m	0
\$5 cutoff. 1254-12908m @ \$38	0.4%	0.8%	6.2%	8m	0



018

PP 34

beschreib.

120020

	<u>Intervall</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
\$35 cutback	7.2m-9.0m. @ #43	0.2%	0	2.4%	17ppm	4.4ppm



020

120022

PP 40 - ~~Lead~~ Lead density.

Interval	Cu	Pb	Zn	Ag	Au
\$53 cut off 6.0m - 9.18m @ <del>240</del> )	1.0%	6.9%	13.9%	51.6 ppm	21.4 ppb

Zone of interest.

9.18m - <del>13.5m</del> )	0.4%	1.7%	3.8%	17.5 ppm	0
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022

120024

PP41      Geochemistry

	<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
1)	20.85-27.4m	0.22%	0.5%	2.4%	12.4 ppm	0
2)	32.25m-42.75m	0.2%	0.4%	2.7%	12 ppm	0.2 ppm
\$53 cutoff	37.25-38.25m	0.4%	4.0%	6.7%	34.1 ppm	0





PP46

Gechemistry

	<u>Interval</u>		<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
\$35 cutoff	1) 16.65m - 17.85m	@ \$38.	1.10%	40.1	5.0%	37 ppm	-
	2) 17.85m - 18.42m	@ \$5	0.55%	0	5.5%	21 ppm	-
\$53 cutoff	1) 18.42m - 20.1m	@ \$14	1.33%	6.5	16.0	49 ppm	-
	<u>zone of interest</u> 20.1m - 22.5m		0.14%	0	2.0%	18 ppm	0.4 ppm

026

# AUSTRALIAN ANGLO AMERICAN LIMITED DRILLHOLE LOG

120028

Summary Sheet

Page of

PROJECT *Pinnacles* AREA *M<sup>c</sup> Guinness workings* DRILLHOLE TYPE

CO-ORDS DEC<sup>LN</sup> AZIMUTH RL DH No. *PP48*

DATE COMMENCED DATE COMPLETED DRILLED BY DRILL RIG

Non Coring to: HQ Core to: HQ Core to: BQ Core to: EOH

### SURVEY DATA

Instrument:

DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

### LOG SUMMARY

ROCK TYPE

MINERALIZATION

Style

Grade

Intersection width (Corr)

0-9.5m - evidence of possible  
Ch/De Unit.

9.5-22.8m - Fine grained epidote schist  
E.c.

Signature

Date



028

# AUSTRALIAN ANGLO AMERICAN LIMITED DRILLHOLE LOG

120030

Summary Sheet

Page of
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PROJECT <i>Pinnacles.</i>		AREA <i>McGrinness workings.</i>		DRILLHOLE TYPE
CO-ORDS	DECL <sup>LN</sup>	AZIMUTH	RL	DH No. <i>PP51</i>
DATE COMMENCED	DATE COMPLETED	DRILLED BY	DRILL RIG	
Non Coring to:	HQ Core to:	NQ Core to:	BQ Core to:	EOH

SURVEY DATA			Instrument:				
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

ROCK TYPE		MINERALIZATION		
		Style	Grade	Intersection width (Corr)
<i>0 - 24.38m.</i>				
<i>PCA (A:Si, u) - old cherty zones.</i>		<i>minor dissemin py.</i>		
<i>24.38 - 32.4m.</i>				
<i>Ec &amp; grey sil. sh.</i>				
<i>32.4 - 77.7m. - crossbedded</i>				
<i>Coarse Ec with rippled shale</i>				
<i>chert</i>				
<i>77.7 - 81.68m.</i>				
<i>Fine grained Ec grading into shale</i>				
<i>81.68m - 96.3m.</i>		<i>minor sph veining - beds</i>		
<i>grey shales (minor interbedded</i>				
<i>volcaniclastic zones)</i>				
<i>96.3 - 106.48</i>				
<i>- Volcaniclastic breccia.</i>				
<i>Fine grained shaly matrix with green</i>				
<i>pyrophy fragments. (GPF-5)</i>				
<i>106.48 - 110.44</i>				
<i>- PCA</i>				
<i>110.44 - 115.5m. - Fine grained epidotic, shales</i>				
<i>&amp; siltstone.</i>				

Signature \_\_\_\_\_ Date \_\_\_\_\_



DRILLHOLE LOG

Summary Sheet

120032

030

PROJECT	Pinnacles	AREA	Thomas Tunnel.	DRILLHOLE TYPE
CO-ORDS		DECLIN	AZIMUTH	RL
DATE COMMENCED		DATE COMPLETED	DRILLED BY	DRILL RIG
Mon Coring to:	HQ Core to:	HQ Core to:	BQ Core to:	EOH

DH No. PPS9

SURVEY DATA				Instrument:			
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

ROCK TYPE		MINERALIZATION		
Depth	Description	Style	Grade	Intersection width (Corr)
0-45.72m	GPF			
45.72m-60.35m	PCA - minor chalybeous			
60.35m-67m	PCA(A:Si) - poorly developed host horizon - CO <sub>2</sub> AT	minor base metal veining + py dissemination		
67m-85.3m	PCA (A:Cu/Ag <sup>2+</sup> )	minor py + base metal veins		
85.3m-98.6	PCL			
98.6-99.3m	Shale (A:Si) - siliceous			
99.3-113.4	PCL with and large fragments of grey siliceous chert/shale	Trace min assoc with shale/chert frags.		
113.4-120.0	PCL			

Signature Date

031

**AUSTRALIAN ANGLO AMERICAN LIMITED  
DRILLHOLE LOG**

120033

Summary Sheet

Page  
of

<b>PROJECT</b>	Pinnacles	<b>AREA</b>	Southern Trenches	<b>DRILLHOLE TYPE</b>	
<b>CO-ORDS</b>	<b>DEC<sup>LN</sup></b>	<b>AZIMUTH</b>	<b>RL</b>	<b>DH No.</b>	Pin 1
<b>DATE COMMENCED</b>	<b>DATE COMPLETED</b>	<b>DRILLED BY</b>	<b>DRILL RIG</b>		
<b>Non Coring to:</b>	<b>HQ Core to:</b>	<b>NQ Core to:</b>	<b>BQ Core to:</b>	<b>EOH</b>	

SURVEY DATA				Instrument:		
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION	
	Uncorr	Corr			Uncorr	Corr

ROCK TYPE		MINERALIZATION		
		Style	Grade	Intersection width (Corr)
0-95.5m.	PCA.	Trace base metal (sph/gln)	< 1/2	
		shingles assoc with qb/CO <sub>2</sub> veins.		
95.5m-102.3.	Host horizon - mix of grey siliceous shales & silicified, pyritic PCA - minor chert zones (No trace Fe development), - CO <sub>2</sub> alt.	minor sph, gln, py veins	= 1/2	
		occasional brecciated concretions + pervasive py dissemination		
102.3-115.5m.	PCA.	Trace base metal veins.		
115.5m-133.8	Green - buff coloured felsic tuff.			
133.8-159.5m.	Interbedded siliceous green - buff tuff & grey/black siltstone / brack shaly shale.	minor sph veins assoc with CO <sub>2</sub> in siltstone.	< 1/2	
159.5-EOH.	Interbedded grey/black shales & subordinate siltstone & sandstone.	minor <del> </del> sph gln veins assoc with CO <sub>2</sub> .	< 1/2	

Signature \_\_\_\_\_ Date \_\_\_\_\_

032

Pin 1

geochem.

120034

Zones of interest - none worthwhile very weak geochem.

<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
93m-102.3	638ppm	1148ppm	0.83%	47ppm	X

minor anomolism in host shale



03A

Pin 2 biochemistry

120036

Interval

Cu

Pb

Zn

Ag

Au

151.1-165.8

254 ppm

4357 ppm

0.8%

5.4 ppm

x

156.5-162.7

600 ppm

0.84%

4.4%

6 ppm

x

035

# AUSTRALIAN ANGLO AMERICAN LIMITED DRILLHOLE LOG

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120037

Summary Sheet

<b>PROJECT</b> Pinnacles	<b>AREA</b> Thomas Tunnel.	<b>DRILLHOLE TYPE</b>
<b>CO-ORDS</b>	<b>DECL<sup>LN</sup></b>	<b>AZIMUTH</b>
<b>DATE COMMENCED</b>	<b>DATE COMPLETED</b>	<b>DRILL RIG</b>
<b>DRILLED BY</b>	<b>RL</b>	<b>DH No.</b> CP7
<b>Non Coring to:</b>	<b>HQ Core to:</b>	<b>NQ Core to:</b>
<b>BQ Core to:</b>	<b>EOH</b>	

SURVEY DATA				Instrument:		
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION	
	Uncorr	Corr			Uncorr	Corr

ROCK TYPE		MINERALIZATION		
		Style	Grade	Intersection width (Corr)
6 - 64.5m. G - PF.		: minor py.		
64.5 - 92.6m. PCA - Alteration increases from 78.90m. in form of silicification + localised zones of intense green clt alteration. : PCA (A: Si Cl Py)		: minor blds - stringers of sph, py plus py disseminations	< 1/20	
92.90 - 99m - "Cherty" PCA not true exhibit, but exhibitic component is responsible for the intense silicification, mineralization & grey appearance of core. : CO <sub>2</sub> veining. (PCA/Ex.)		: veins of sph, sph, opy : minor zone zone of massive py. : fine grained py intense.	1/8	
99m - 122m - Epidiastic breccia with abundant ripped up clots of shale. (Ec.)				
122m - 157m - Very coarse epidastic breccia - large blocks of ripped up black shale, sandstone, + occ. clots of silicified + mineralised PCA. Period of very turbulent deposition. - graded bedding evident. (Ec.)				

Signature \_\_\_\_\_ Date \_\_\_\_\_



037

120039

CP7

Geochemistry

<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au.</u>
92m - 98m (Euhedral zone in PFA)	602 ppm	2340 ppm	8140 ppm	-	20.05 ppm
145m - 148m (sph in black shales)	17 ppm	1127 ppm	9048 ppm	-	20.05 ppm

Black shale unit is <sup>weakly</sup> anomalous in Zn + Pb. <sup>\*</sup> from 163m - 148m compared to the units either side.

$$\bar{x} = \frac{Pb}{410 \text{ ppm}} \quad \frac{Zn}{1625 \text{ ppm}}$$

No \$35 or \$53 ore zones

Bedding

<u>Depth</u>	<u>Core Angle</u>	- From Orig. Logs.
164.5	60°	
165.5	65°	
167.5	37°	
164.00	47°	
171	28°	
177	35°	
180	32°	
181.5	80°	
182.5	0-5°	
187.00	60°	
193.50	40°	
194.00	60°	
71.7m	45°	- Entank texture in PCA. (RHR)
90.4m	70°	" " " "
93.9	50°	- Pyrite layers. "

039

**AUSTRALIAN ANGLO AMERICAN LIMITED**  
**DRILLHOLE LOG**

120041

Summary Sheet

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of

<b>PROJECT</b> Pinnacles	<b>AREA</b> Southern Tranches	<b>DRILLHOLE TYPE</b>
<b>CO-ORDS</b>	<b>DECL<sup>LN</sup></b>	<b>AZIMUTH</b>
<b>DATE COMMENCED</b>	<b>DATE COMPLETED</b>	<b>DRILLED BY</b>
<b>DRILL RIG</b>	<b>DH No. CP9</b>	
<b>Man Coring to:</b>	<b>HQ Core to:</b>	<b>NQ Core to:</b>
		<b>BQ Core to:</b>
		<b>EOH</b>

SURVEY DATA				Instrument:		
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION	
	Uncorr	Corr			Uncorr	Corr

LOG SUMMARY			
ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
0-71.5 Host horizon, cherts/Vc + shales. Alt - Si, Al, Sr, CO <sub>2</sub> <sup>2+</sup> Epidiolic component + zones of massive mineralization between 52m - 62m.	sph, gln veins, shales, minor py.	1/6	
(62.2-71.5 - mixed zone of epididolic breccia, shales + cherts - all parts of massive min.)	py with lenses of sph + lesser sph.	5/6	
71.5-158.4 Altered + variably mineralized PCA.	+ abundant sph mineralization stringers.	1/6	
71.5-113.4 - abundant sph stringer mineralization dominates. CO <sub>2</sub> <sup>2+</sup> veing common + usually associated with min. This zone tends to be intensely silicified.	179m-80 - abundant sph stringers. Little or no other base metals.	5/6	
113.4-118.4 <sup>P=Hf</sup> Ser/CO <sub>2</sub> <sup>2+</sup> /Al altered PCA - dark green colored with white carbonate spots. Zone of dominant gln stringer mineralization.	gln/sph stringer mineralization	1/6	
118.4-280m. dark silicified PCA with minor zones of gln; sph veing. Min - associated with CO <sub>2</sub> <sup>2+</sup> /glc veing.	gln/sph veining; py sparsely disseminated throughout + also associated with the veining base metals.	<1/6	

Signature \_\_\_\_\_ Date \_\_\_\_\_

040

120042

CP9

Geochemistry

	<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
163 lbs.	52m-72m	787 ppm	2360 ppm	1.6%		2005 ppm
	53m-54m	1969 ppm	3760 ppm	2.4%		2005 ppm
4 in AD	78m-86m	788 ppm	395 ppm	2.9%		0.05 ppm
	116m-118m	124 ppm	1.8%	3.2%		

\$35 cut/A

58m-59m	1m @ \$5.24	6500 ppm	8300 ppm	5.7%		0.05 ppm
79m-80m	1m @ \$4.9	260 ppm	830 ppm	9.0%		0.15 ppm

No \$53 dollar or.

04!

CP9

Bedding in host horizon shales (from RHR)

<u>Depth</u>	<u>B/CA</u>
23.5m	45°
31.6m	0-10°
22.8m	15°
34.8m	15°
42.5m	20°



043

120045

CP 10.      Geochem

Weak mineralisation in PCA - occ up to 1/2 m.

In cherty PCA zone 151m - 156m.

Cu	Pb	Zn	Ag	Au
278 ppm	1479 ppm	9830 ppm	8 ppm	0.14

120046 AUSTRALIAN ANGLO AMERICAN LIMITED  
**DRILLHOLE LOG**

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Summary Sheet

PROJECT *Pinnades.* AREA *between ST & T.T.* DRILLHOLE TYPE

CO-ORDS DECLIN AZIMUTH RL DH No. *CP 12*

DATE COMMENCED DATE COMPLETED DRILLED BY DRILL RIG

Non Coring to: HQ Core to: NQ Core to: BQ Core to: EOH

SURVEY DATA				Instrument:			
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

LOG SUMMARY

ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
<i>0-35.6m: Bedded / <sup>shale</sup> grey/white siltstones &amp; fine sandstones with lesser interbedded black shale units. - B/CA = 70° (sh/sh/SSn).</i>	<i>: Rare scattered py apatite &amp; ore odd localized conc of sph/gln</i>	<i>&lt; 1/2 %</i> <i>&lt; 1/2 %</i>	
<i>35.6m - 77.00m. Volcaniclastic with chert imp. Green fragments of either GPF or PCA mixed with grey cherts. Minor shale interbedded. Grey chert zone from 35.66 - 39.30m. Whole unit silicified &amp; weakly mineralised. (G-PF/PCA (A: Si/Ser))</i>	<i>: Trace sph/gln veinlets assoc' with CO<sub>2</sub>. Shales tend to host the min. Py occurs as sparse fine grained dissemination @ 38m, 10cm zone of semi-massive pyrite associated with chert.</i>	<i>&lt; 1/2 %</i> <i>1 %</i> <i>≈ 10 %</i>	
<i>.77.00-87m. Zone of silicified lithic buff &amp; shales. Mixture of lithic &amp; xtal fragments set in grey/green matrix, weak foliation present. Cherty component still present. (Ch-PCA (A: Si/Ser/Ch))</i>	<i>: Trace base metal veinlets of sph &amp; CO<sub>2</sub>. Disseminated py.</i>	<i>&lt; 1/2 %</i> <i>≈ 1 %</i>	
<i>87m - 107.8m - Volcaniclastic breccia. Very hard &amp; siliceous. Qtz, Bldgr xtals, odd lithic set in pale greenish matrix - unit characterised by rounded white <sup>qtz</sup> xtals - which CO<sub>2</sub> veining. (PCA-Q) PLT</i>	<i>: Rare disseminated py.</i>		

Host horizon on 2/5/5h

Signature Date



046

120048

CP 12      Geochemistry

0-87m host horizon - weakly anomalous in Pb + Zn. Some  
zones Au kick present.

	Cu	Pb	Zn	Ag	Au
73m - 87m (Esthete portion)	<del>155 ppm</del>	<del>241 ppm</del>	<del>2356 ppm</del>	6 ppm	0.18 ppm

87m - 107.8m - geochemically barren

107.8 - 128.4m - mineralized shales

(107.4 - 128.4)	Cu	Pb	Zn	Ag	Au
	34 ppm	1249 ppm	1246	2 ppm	20.05 ppm

bt geochemically barren,

No sub ore or ore zones.

097

AUSTRALIAN ANGLO AMERICAN LIMITED

120049

DRILLHOLE LOG

Summary Sheet

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PROJECT *Pinnacles* AREA *Southern Trenches* DRILLHOLE TYPE

CO-ORDS DEC<sup>LN</sup> AZIMUTH RL DH No. *CP 13*

DATE COMMENCED DATE COMPLETED DRILLED BY DRILL RIG

Non Coring to: HQ Core to: NQ Core to: BQ Core to: EOH

SURVEY DATA

Instrument:

DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

LOG SUMMARY

ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
0-61.7m. Host Horizon. ch/Uc/Sh. 0-31m - Grey/black shales, calcareous with minor zones of silicification. - CO <sub>2</sub> <sup>2-</sup> veining present.	Weakly mineralized throughout with sph/py stringer mineralization. thin along bedding planes - common		
31-61.7m - grey/green volcanics. - silicification of silicified shales, volcanics & extrusive zones. Estable for core 50m	Massive py in patches, generally disseminated throughout. sph/py stringers. 44-50 - mineralized by sph/py - py		
61.7-117.6 Felsic Lapilli tuff			
61.7-82.7m - very felsic lapilli tuff - red made up of fine bedded shales - set in pale brownish/green matrix (core cherty/blocc with coarse py)			
82.7-105.8 Green felsic lapilli tuff Lapilli - mid to ash sized zones. shales in dark green chlorite matrix. Minor CO <sub>2</sub> <sup>2-</sup> veining. No min - again all cherty/blocc with coarse py			
105.5-117.6 FLT (Some colour variations - due to alteration chlorite or argillite/mudstone)			

Signature Date

# AUSTRALIAN ANGLO AMERICAN LIMITED DRILLHOLE LOG

120050

Summary Sheet

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of

<b>PROJECT</b>	<b>AREA</b>	<b>DRILLHOLE TYPE</b>
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<b>CO-ORDS</b>	<b>DEC<sup>LN</sup></b>	<b>AZIMUTH</b>	<b>RL</b>	<b>DH No. CP13</b>
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<b>DATE COMMENCED</b>	<b>DATE COMPLETED</b>	<b>DRILLED BY</b>	<b>DRILL RIG</b>
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Non Coring to:      HQ Core to:      NQ Core to:      BQ Core to:      EOH

**SURVEY DATA**      Instrument:

DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

**LOG SUMMARY**

ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
117.6-130.4m    Fine bedded black shale with minor indet. FIT sand. Sph assoc with CO <sub>2</sub> <sup>2-</sup> veining. Veining effects at shale - FIT	: sph stringers.		
130.4-145.4    Fine grained bedded calcareous black shale with very minor indet. volcanitic sand. CO <sub>2</sub> <sup>2-</sup> mineral in veins + clots.	: minor sph. veining.		
145.4-186m    Coarse to fine grained epidiotic breccia, generally silicified. Contains minor zones of black/grey silicified shale. Epidiotic fragments: - subrounded white/grey porphyro volcanic fragments, grey chert fragments, shale fragments, etc + tabs. set in finer grained matrix of the same lithologies. CO <sub>2</sub> <sup>2-</sup> veins + clots. CO <sub>2</sub> <sup>2-</sup> altered - pipes part of core very speckled appearance.	: minor sph stringers.		
186-194m    Gradational from above used to grey shales/siltstone/sandstone of Western sequence			
194 -> EOH.    Calcareous grey silt/sandstone.			

Signature \_\_\_\_\_ Date \_\_\_\_\_

CP13

biochemistry

<u>Interval</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au.</u>
8m-15-72-	448ppm	3101ppm	105 <sup>3</sup> <sub>6</sub>	116ppm	<0.05ppm
29-42-84-10	2151ppm	8141ppm	24 <sup>3</sup> <sub>6</sub>	10ppm	<0.05ppm
49-45-61-22m	1174ppm	1736ppm	22 <sup>3</sup> <sub>6</sub>	5ppm	0.04ppm

Little that still slightly anomalous in zinc. 50.2%

\$35 dollar ore

32-50-33-10	0.6m @ \$39	0.52 <sub>6</sub>	0.27 <sub>6</sub>	64 <sub>6</sub>	14ppm	0.02ppm
49-45-50-45	1m @ \$45	0.78 <sub>6</sub>	0.33 <sub>6</sub>	70 <sub>6</sub>	19ppm	0.1ppm

CPIB

<u>Depth</u>	<u>B/CA</u>	<u>Fol/CA</u>
20.5	10°	
21.2	26°	
23.42	40°	
25	60°	
24.7	51°	
30.6	60°	
31.7	58°	
34.8	60-63°	
41	65	
44.4	62	
47.4	65	
58.4	31°	

120

70°

~~180~~

= 70°

194

Bedding axis from // b CA

↓  
244.30

to b's to CA:

051

AUSTRALIAN ANGLO AMERICAN LIMITED

DRILLHOLE LOG

Summary Sheet

120053

Page of

PROJECT *Pinnacles* AREA *Thomas Tunnel* DRILLHOLE TYPE

CO-ORDS DECLIN AZIMUTH RL DH No. *CP14*

DATE COMMENCED DATE COMPLETED DRILLED BY DRILL RIG

Non Coring to: HQ Core to: HQ Core to: HQ Core to: EOH

SURVEY DATA				Instrument:			
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

LOG SUMMARY

ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
0-52.13 GPF			
52.13-62m P <sub>CA</sub> (A: s / ser / cm)	: weakly mineralized. Trace sph blebs.	< 1/20	
62-127.7m: Hard silicified volcaniclastic breccia. Qtz + felds + xstls + minor lithics set in greenish fine grained matrix. Characterised by the presence of rounded Qtz xstls. - Feldic lapilli buff. (FLT)	: sparse py dissemination		
127.7m-160m: Highly altered brittle black shales. Minor interbedded Ft units. CO <sub>3</sub> <sup>2-</sup> veining + alteration common.	: minor sph/qlz veins + blebs assoc. with CO <sub>3</sub> <sup>2-</sup> veining.	~ 1/10	
B/CA. 75°, 60° BS. (A: Ser / CO <sub>3</sub> <sup>2-</sup> )			
160m-197m: FLT with minor interbedded black shale units. CO <sub>3</sub> <sup>2-</sup> veining common.	: Trace base metals assoc with CO <sub>3</sub> <sup>2-</sup> in shale unit	< 1/10	
197m-265.25: Grey/black calcareous competent bedded silty shales + stls. Minor silicified stls interbedded till 215m. No mineralization existent. Calcareous			
B/CA. 75°, 64°, 73° S2° 60° S0° (Calc: sph/ssn).			

Signature Date

QP 14

Geochemistry

0-52.26

Barren geochemically.

52.26-62.35

Weakly anomalous Zone of  $\text{Pb}$  &  $\text{Zn}$ .

Cu - 14 ppm - 86 ppm

$\bar{x} = 32 \text{ ppm}$

Pb - 48 ppm - 1600 ppm

$\bar{x} = 416 \text{ ppm}$

Zn - 240 ppm - 9600 ppm

$\bar{x} = 3120 \text{ ppm}$

62.35-127.7

- geochemically Barren.

127.7-160

- Weakly mineralized w.r.t. Zn.

Cu

Pb

Zn

$\bar{x}$  80 ppm

949 ppm

0.96%

Rest geochemically Barren.

No \$35 or \$53 ore zones.

053

# AUSTRALIAN ANGLO AMERICAN LIMITED DRILLHOLE LOG

120055

Page of
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Summary Sheet

PROJECT <i>Pinnacles</i>	AREA <i>Sth of Southern Trenches</i>	DRILLHOLE TYPE <i>DDH</i>
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CO-ORDS	DECL <sup>LN</sup>	AZIMUTH	RL	DH No. <i>CP15</i>
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DATE COMMENCED	DATE COMPLETED	DRILLED BY	DRILL RIG
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Non Coring to:	HQ Core to:	NQ Core to:	BQ Core to:	EOH
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SURVEY DATA				Instrument:			
DEPTH	DECLINATION		AZIMUTH	DEPTH	DECLINATION		AZIMUTH
	Uncorr	Corr			Uncorr	Corr	

## LOG SUMMARY

ROCK TYPE	MINERALIZATION		
	Style	Grade	Intersection width (Corr)
<i>0-39.4m PCA (A: Si, CO<sub>2</sub><sup>+</sup>) minor grey cherty looking siliceous zones between 28m - 39.4m</i>	<i>Trace base metal veins.</i>	<i>&lt; 1/2</i>	
<i>39.4-63.6m Friable bedded black slates. CO<sub>2</sub><sup>+</sup> veining</i>	<i>Minor: phyllo veins &amp; stages assoc. with CO<sub>2</sub><sup>+</sup>.</i>		
<i>63.6-91.5m. Interbedded mix of grey slates &amp; grey fine grained epidioritic. (mix of qtz, feld, slt &amp; volc frags). CO<sub>2</sub><sup>+</sup> veining.</i>			
<i>91.5m-120.65m. Red grey coarse-grained epidioritic unit with minor black-stal interbeds. CO<sub>2</sub><sup>+</sup> veining.</i>			
<i>120.65-EOH. - grey/black well bedded calcareous slates, siltstones, sandstones.</i>			

Signature \_\_\_\_\_ Date \_\_\_\_\_

05A

120056

CP15

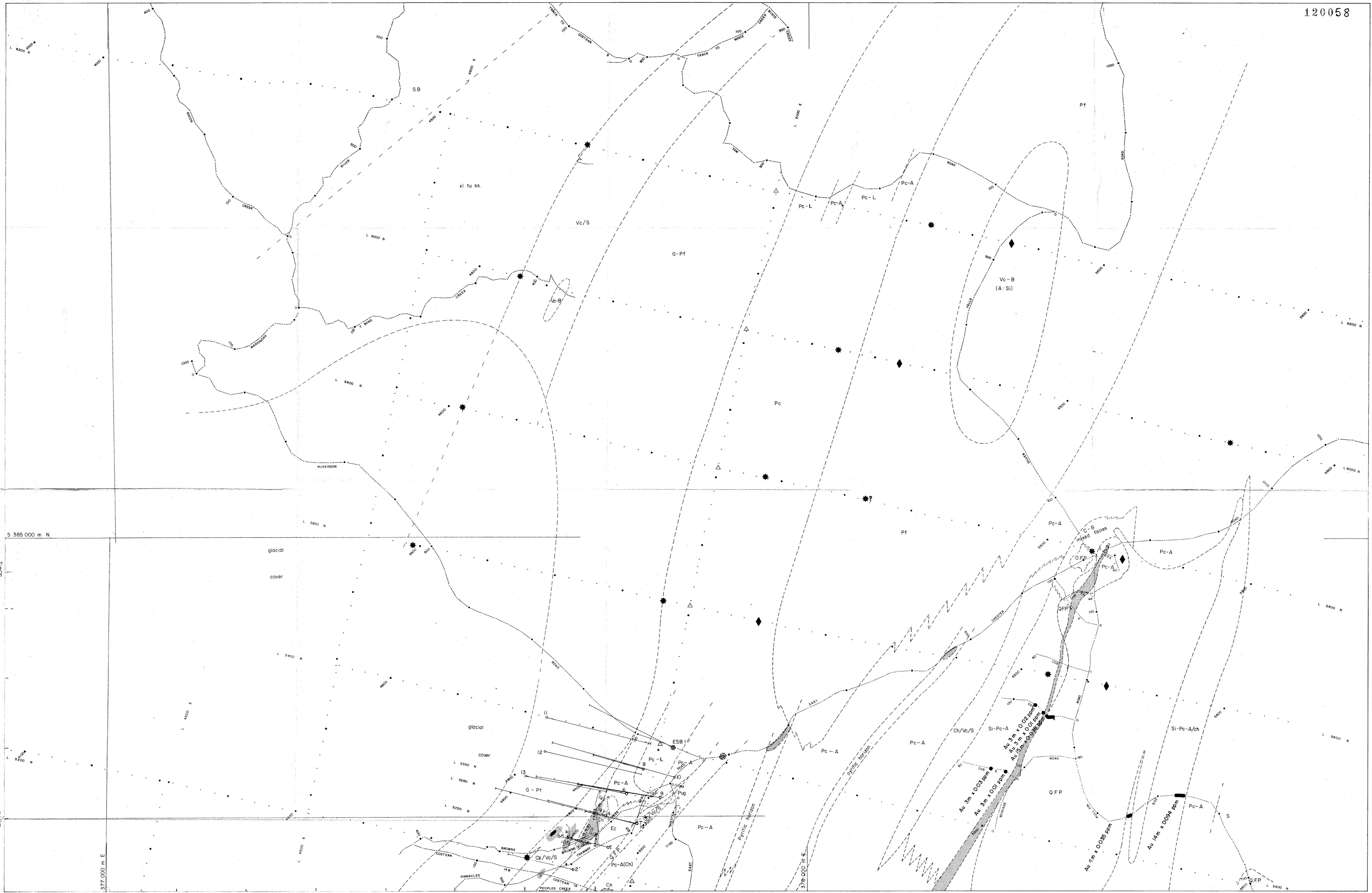
<u>Depth</u>	<u>B/CA</u>	<u>F01/CA</u>
40m		45°
70.4m	70°	<del>45°</del>
81.2	67°	
85.8	50°	
86.6	70°	
84.6	65°	
101.5	70°	
125	45°	
129°	48°	
128°	48°	
132	78°	
143.5	6	
145.1	52°	
150.	56°	

055

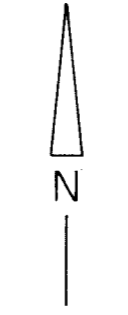
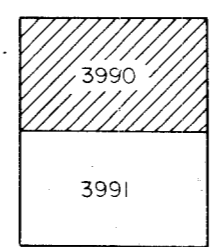
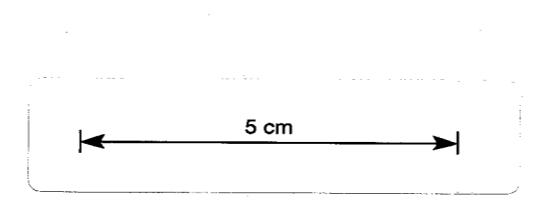
120057

CP15      Geochronology

<u>Depth</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>
4000 - 4738m	149 ppm	1.22%	2.17%	9 ppm	40.05 ppm
49m - 5000m	105 ppm	1.12%	3.13%	10 ppm	40.05 ppm

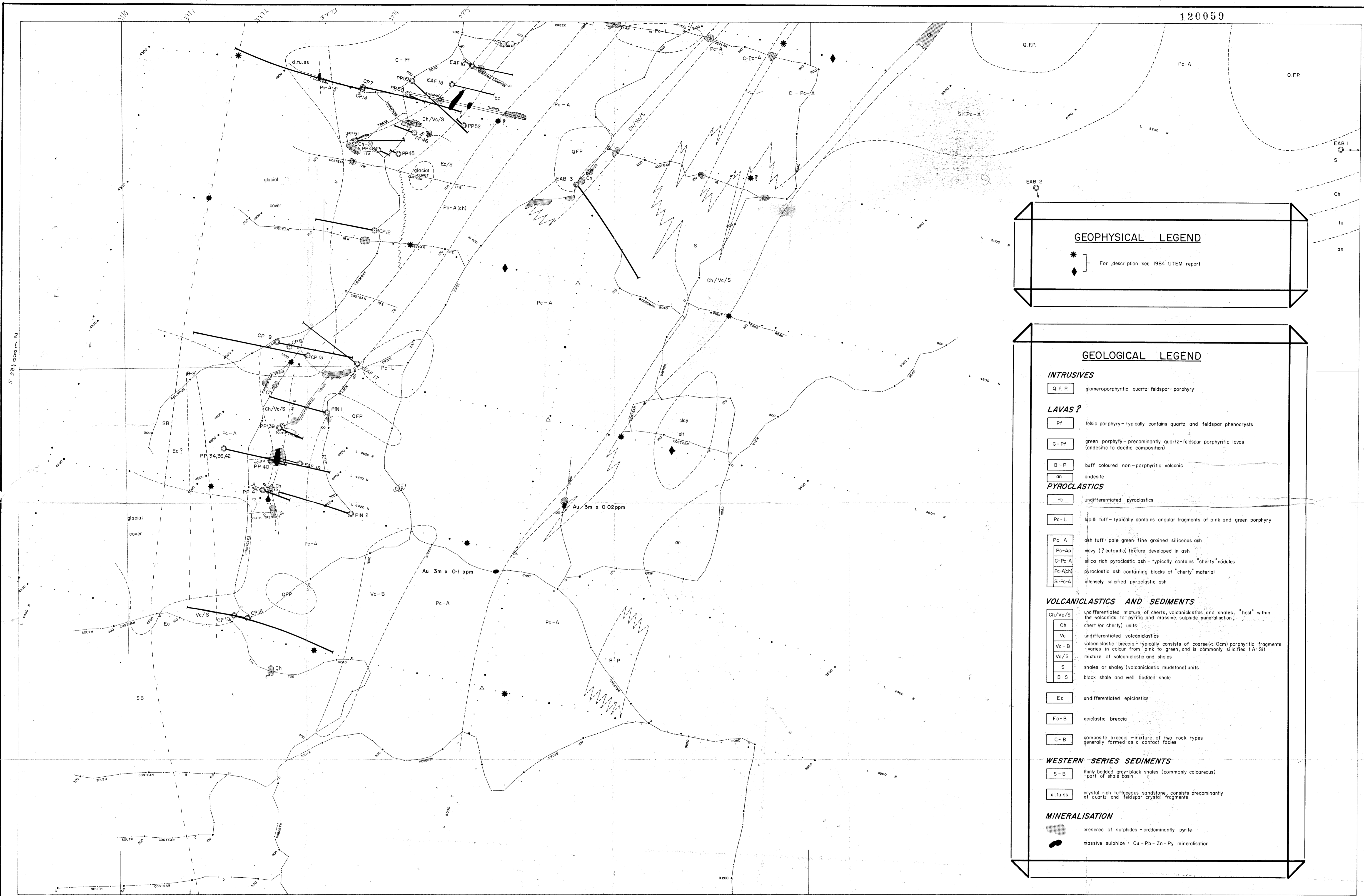


HOLE NUMBER	RL(m)
DDH ESB 1	479.71
DDH EAF 1	469.21
2	465.53
3	471.25
4	471.25
5	460.08
6	478.60
7	477.74
8	488.74
9	490.07



<b>COMSTAFF PROPRIETARY LIMITED</b>	
EL 5 / 63	PINNACLES GRID - EAF 001
4	GEOLOGICAL INTERPRETATION PLAN
DATE: 12/9/84 DRAWN: J. HARDISTY SCALE: 1:2500 SHEET: TAS/2/3990	PROJECT: R. H. ROBERTS DATE: 12/9/84 SCALE: 1:2500 SHEET: TAS/2/3990

Note: For geological legend see sheet 3991.



### GEOPHYSICAL LEGEND

\* } For description see 1984 UTEM report  
 ◆ }

### GEOLOGICAL LEGEND

**INTRUSIVES**

Q.f.P. glomeroporphyritic quartz-feldspar porphyry

**LAVAS ?**

Pf felsic porphyry - typically contains quartz and feldspar phenocrysts

G-Pf green porphyry - predominantly quartz-feldspar porphyritic lavas (andesitic to dacitic composition)

B-P buff coloured non-porphyrific volcanic

an andesite

**PYROCLASTICS**

Pc undifferentiated pyroclastics

Pc-L lapilli tuff - typically contains angular fragments of pink and green porphyry

Pc-A ash tuff - pale green fine grained siliceous ash

Pc-As wavy (? eutaxitic) texture developed in ash

C-Pc-A silica rich pyroclastic ash - typically contains "cherty" nodules

Pc-Alch pyroclastic ash containing blocks of "cherty" material

Si-Pc-A intensely silicified pyroclastic ash

**VOLCANICLASTICS AND SEDIMENTS**

Ch/Vc/S undifferentiated mixture of cherts, volcaniclastics and shales, "host" within the volcanics to pyritic and massive sulphide mineralisation

Ch chert (or cherty) units

Vc undifferentiated volcaniclastics

Vc-B volcaniclastic breccia - typically consists of coarse (<10cm) porphyritic fragments - varies in colour from pink to green, and is commonly silicified (A-Si)

Vc/S mixture of volcaniclastic and shales

S shales or shaley (volcaniclastic mudstone) units

B-S black shale and well bedded shale

Ec undifferentiated epiclastics

Ec-B epiclastic breccia

C-B composite breccia - mixture of two rock types generally formed as a contact facies

**WESTERN SERIES SEDIMENTS**

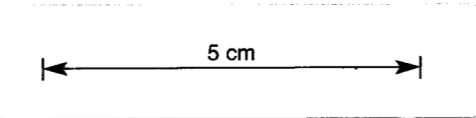
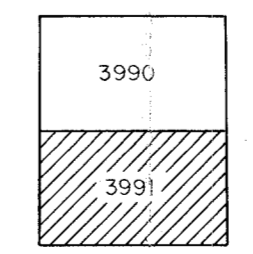
S-B thinly bedded grey-black shales (commonly calcareous) - part of shale basin

xl.tu.ss crystal rich tuffaceous sandstone, consists predominantly of quartz and feldspar crystal fragments

**MINERALISATION**

presence of sulphides - predominantly pyrite

massive sulphide: Cu - Pb - Zn - Py mineralisation



<b>COMSTAFF PROPRIETARY LIMITED</b>		PINNACLES GRID - EAF 002	
CASE No <b>EL 5 / 63</b> AREA <b>4</b>	DRAWN R. H. ROBERTS J. HARDISTY	DATE 12 / 9 / 84	SCALE 1 : 2500
AMENDMENTS 1 25/3/85 8 2 25/5/85 9 3 4 5 6	<b>GEOLOGICAL INTERPRETATION PLAN</b>		REF No TAS/2/3991



<b>COMSTAFF PROPRIETARY LIMITED</b>		<b>BROWNS WORKINGS AREA</b>	<b>003</b>
EL 5/63	4		
DRILLHOLE SURFACE TRACE		SCALE	1 : 1000
REF NO.		TAS/2/4135	

3043



<b>COMSTAFF PROPRIETARY LIMITED</b>	
LEASE NO <b>EL 5/63</b>	COMPILED J. HARDISTY
AREA <b>4</b>	DRAWN J. HARDISTY
	DATE 20/5/85
	SCALE 1 : 1000
	REF NO <b>TAS/2/4245</b>

SOUTHERN TRENCH 2 AREA 004  
DRILLHOLE LOCATION PLAN

AMENDMENTS	8
1	9
2	10
3	11
4	12
5	13
6	14
7	



APPROXIMATE SURFACE PROFILE

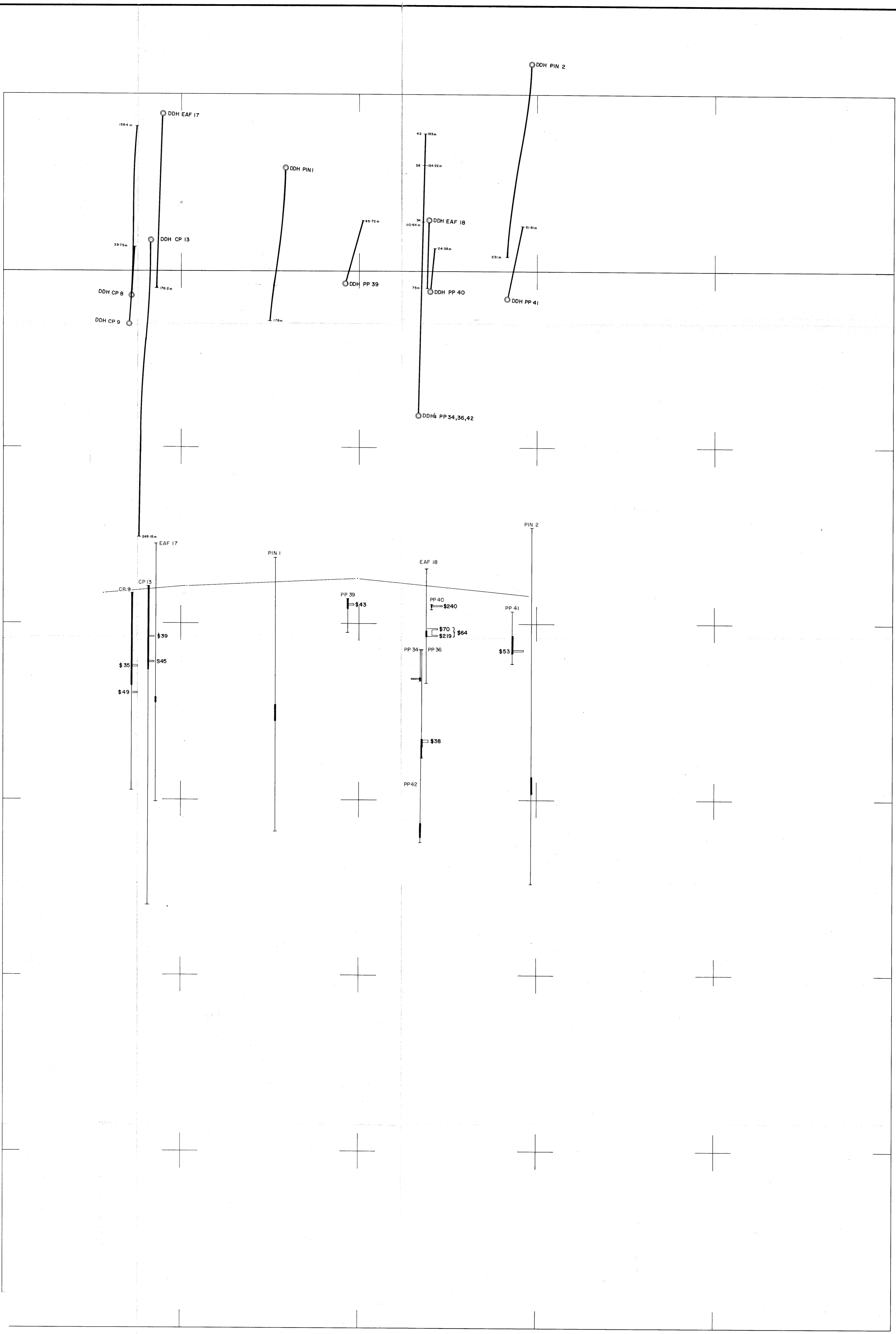
**LEGEND**

- HOLE No
- Drill section
- Target zone
- >\$35 'ore' } zone average
- >\$53 'ore' }

NOTE--FOR LOCATION SEE TAs/2/4135, TAs/2/4245

9 cm

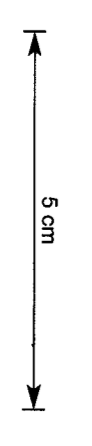
<b>COMSTAFF PROPRIETARY LIMITED</b>	
DATE	EL 5/63
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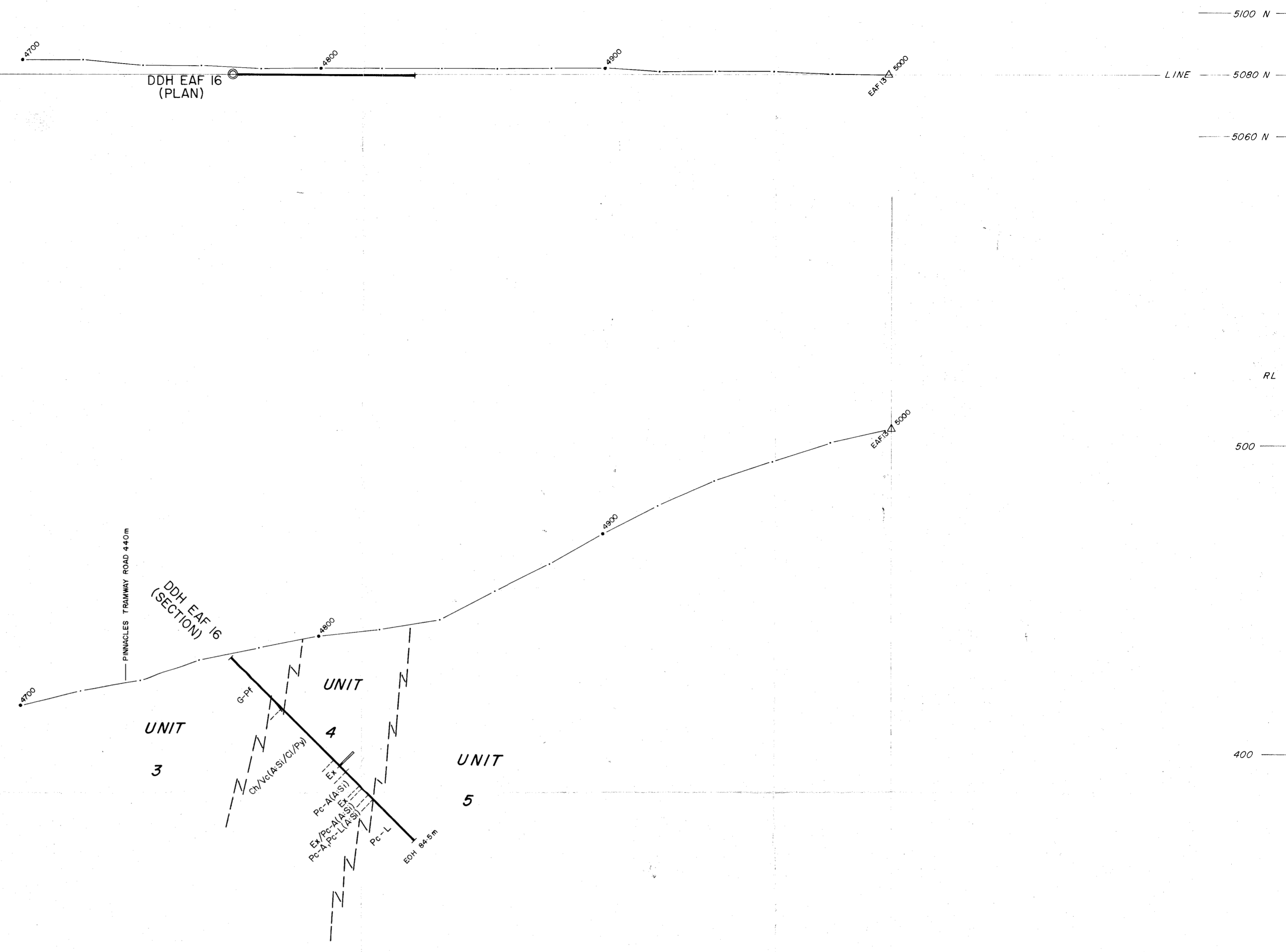
**LEGEND**

- HOLE No
- Drill section
- Target zone
- >\$35 'ore' zone average
- >\$55 'ore' zone average

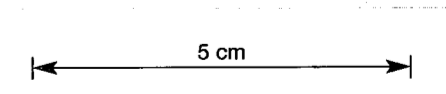
<b>COMSTAFF PROPRIETARY LIMITED</b>	
PROJECT EL 5/63	DATE 4
DRAWN R. W. L. SHAW	
CHECKED J. HARDISTY	
DATE 1/7/85	
SCALE 1:1000	
REF. No. TAS/2/4266	
PINNACLES GRID - EAF 006	
SOUTHERN TRENCH AREA	
LONG SECTION THROUGH TARGET AREA	



SECTION ORIENTATION 270° MN

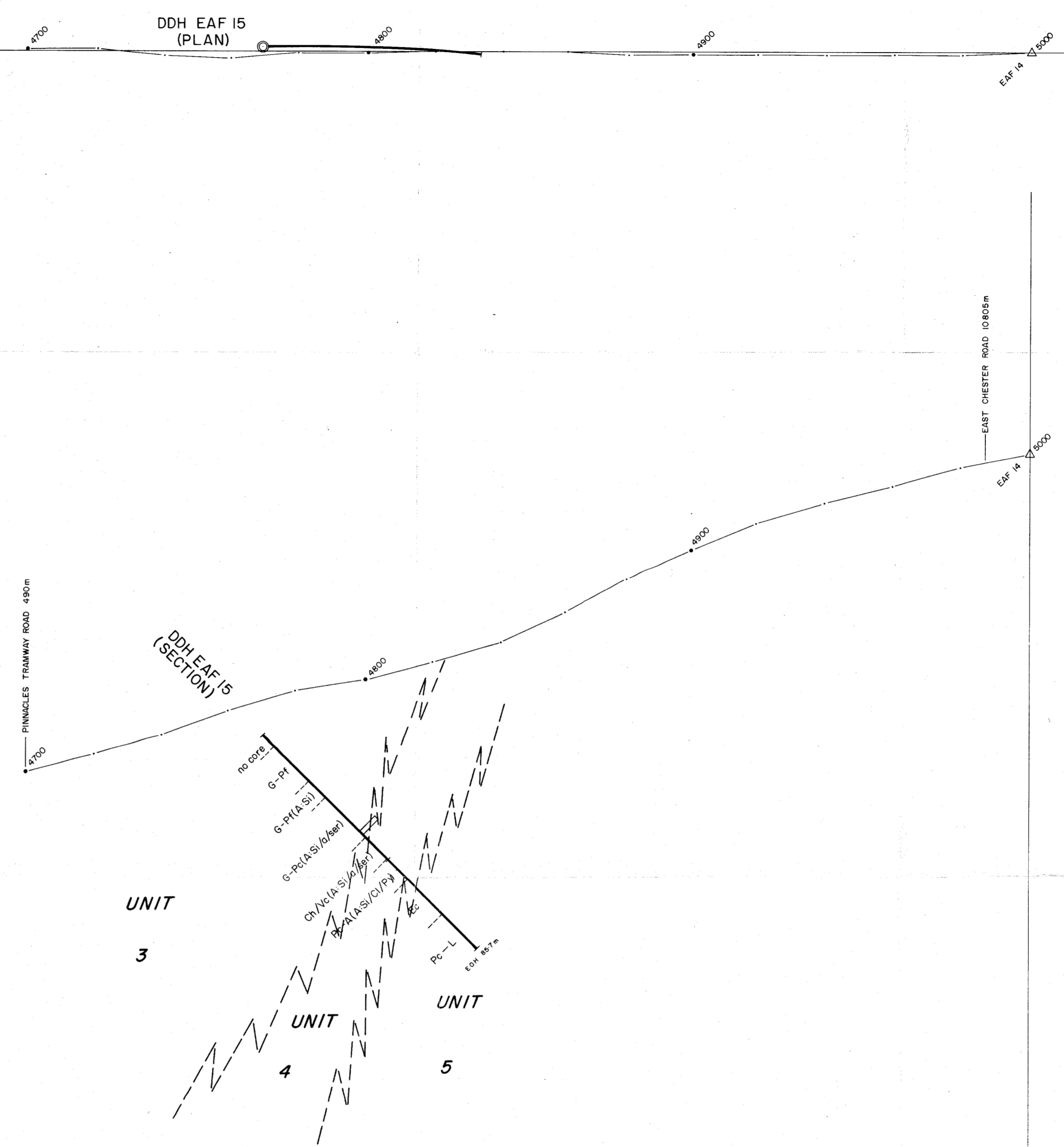


HOLE No	INTERVAL	Cu %	Pb %	Zn %	Ag ppm	Au ppm
EAF 16	49.3-50.0m	0.66	3.40	23.8	44	0.77



<b>COMSTAFF PROPRIETARY LIMITED</b>	
EL 5/63 4	PINNACLES GRID - EAF SECTION OF LINE 5080 N 007 DRILLHOLE GEOLOGY & GEOCHEMISTRY
R. H. ROBERTS J. HARDISTY 24/5/85 1:2500 TAS/2/4246	

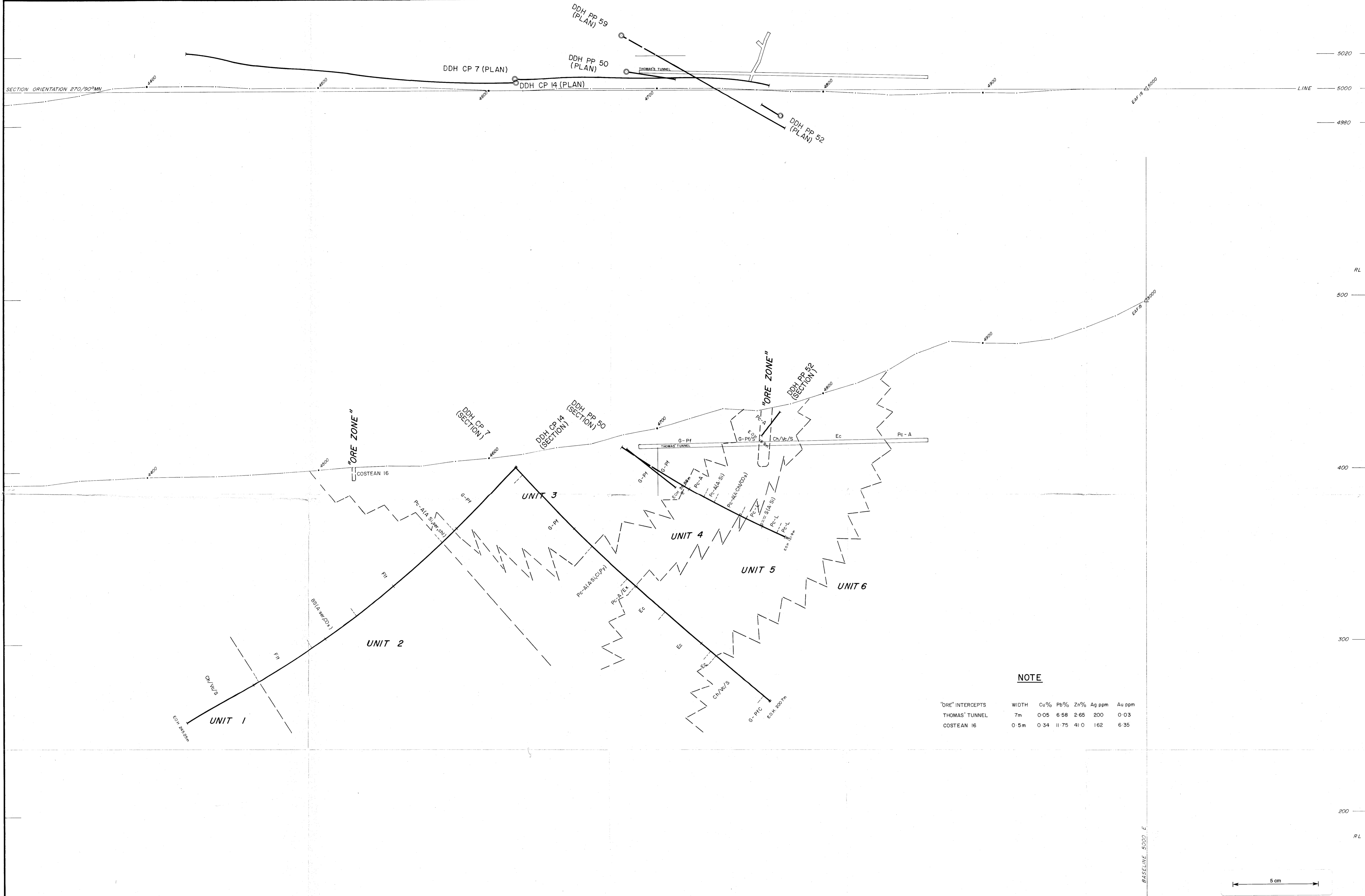
SECTION ORIENTATION 270° MN



HOLE No	INTERVAL	Cu %	Pb %	Zn %	Ag ppm	Au ppm
EAF 15	38.7 - 40.0m	53ppm	2.93	8.23	18	0.009

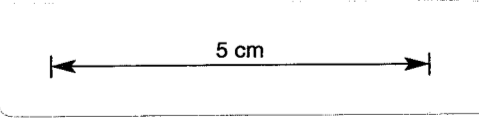
**COMSTAFF PROPRIETARY LIMITED**

LEASE No <b>EL 5/63</b>	PINNACLES GRID - EAF SECTION OF LINE 5040 N <b>008</b>	COMPILED R. H. ROBERTS
AREA <b>4</b>	DRILLHOLE GEOLOGY & GEOCHEMISTRY	DRAWN J. HARDISTY
AMENDMENTS 1 8 2 9 3 10 4 11 5 12 6 13 7 14		DATE 24/5/85
		SCALE 1 : 2500
		REF No TAS/2/4247



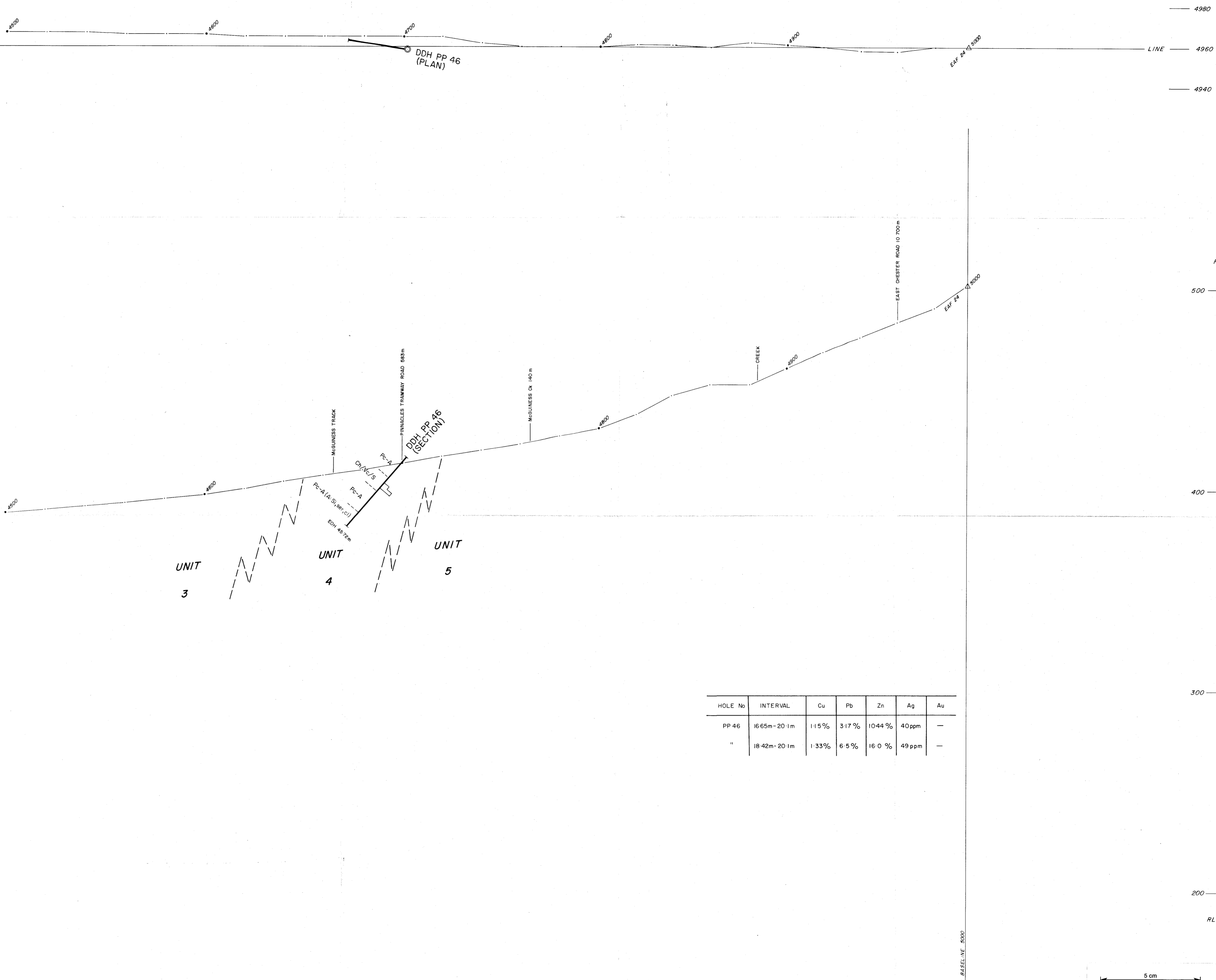
**NOTE**

"ORE" INTERCEPTS	WIDTH	Cu%	Pb%	Zn%	Ag ppm	Au ppm
THOMAS' TUNNEL	7m	0.05	6.58	2.65	200	0.03
COSTEAN 16	0.5m	0.34	11.75	41.0	162	6.35



<b>COMSTAFF PROPRIETARY LIMITED</b>		
DRAWING No. <b>EL 5 / 63</b> SHEET No. <b>4</b>	<b>PINNACLES GRID - EAF</b> SECTION OF LINE 5000 N <b>009</b> DRILLHOLE GEOLOGY & GEOCHEMISTRY	DRAWN BY C. R. MROCEK CHECKED BY J. HARDISTY DATE 7 / 6 / 85 SCALE 1 : 1000 PROJECT No. TAS/2/4250

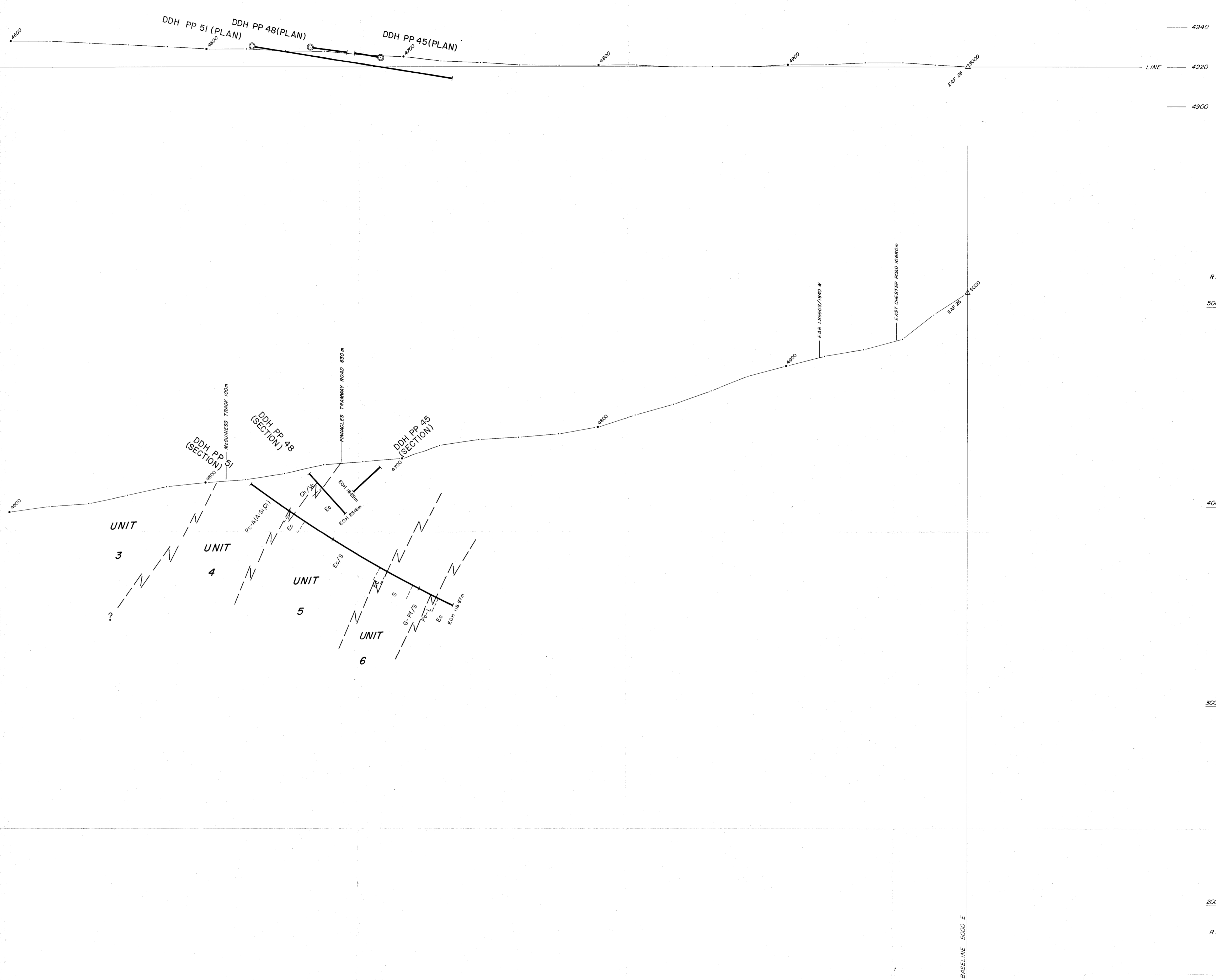
SECTION ORIENTATION 270/90° MN



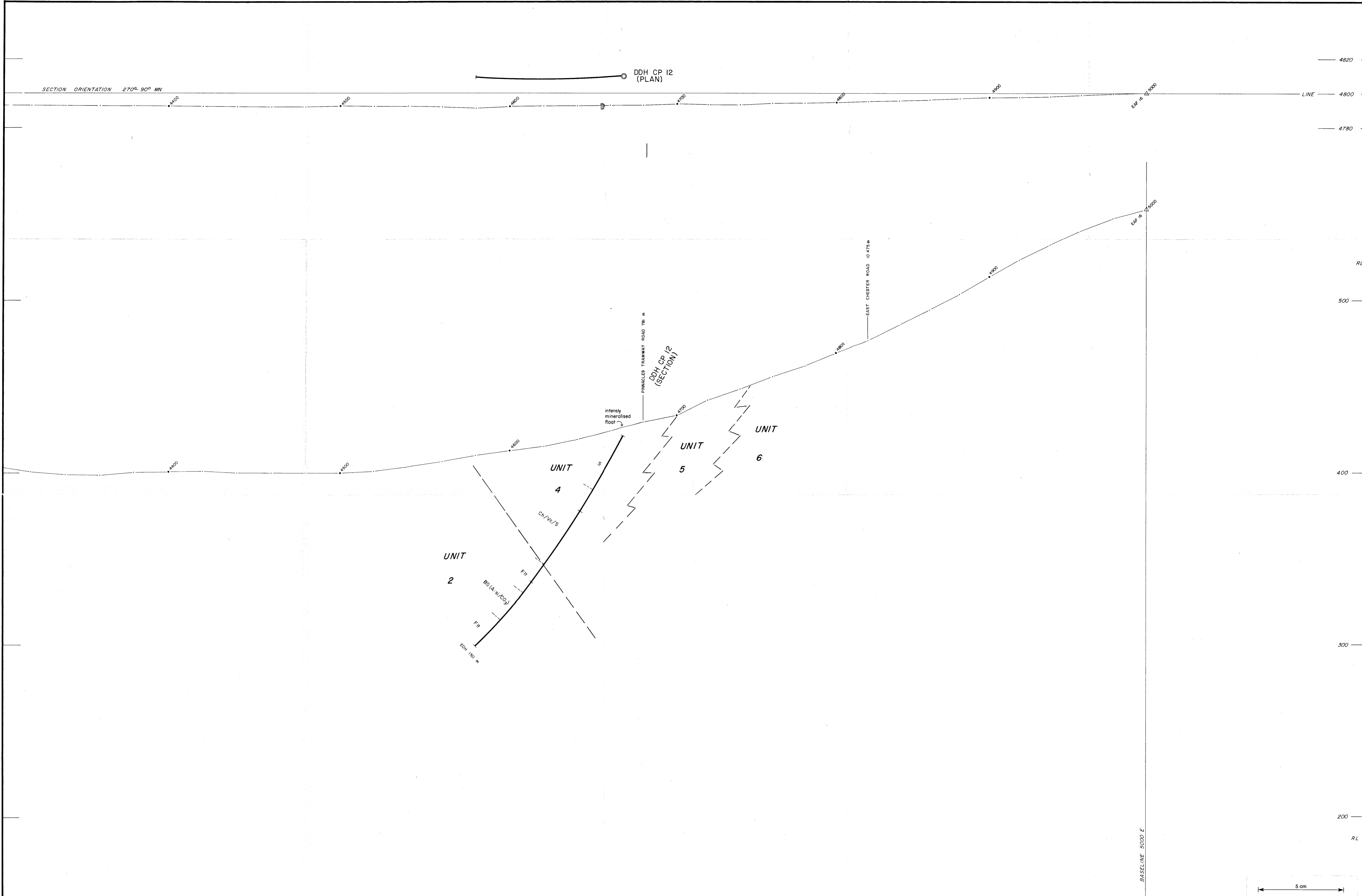
HOLE No	INTERVAL	Cu	Pb	Zn	Ag	Au
PP 46	16.65m - 20.1m	11.5%	3.17%	10.44%	40 ppm	—
"	18.42m - 20.1m	1.33%	6.5%	16.0%	49 ppm	—

<b>COMSTAFF PROPRIETARY LIMITED</b>	
TASK No. <b>EL 5/63</b>	PINNACLES GRID - EAF SECTION OF LINE 4960 N 010
AREA <b>4</b>	DRILLHOLE GEOLOGY & GEOCHEMISTRY
AMPLIFICATION 1 8 2 9 3 10 4 11 5 12 6 13 7 14	DRAWN BY C. R. MROCZEK DATE 7/6/85 SCALE 1:1000 PROJECT No. TAS/2/4251

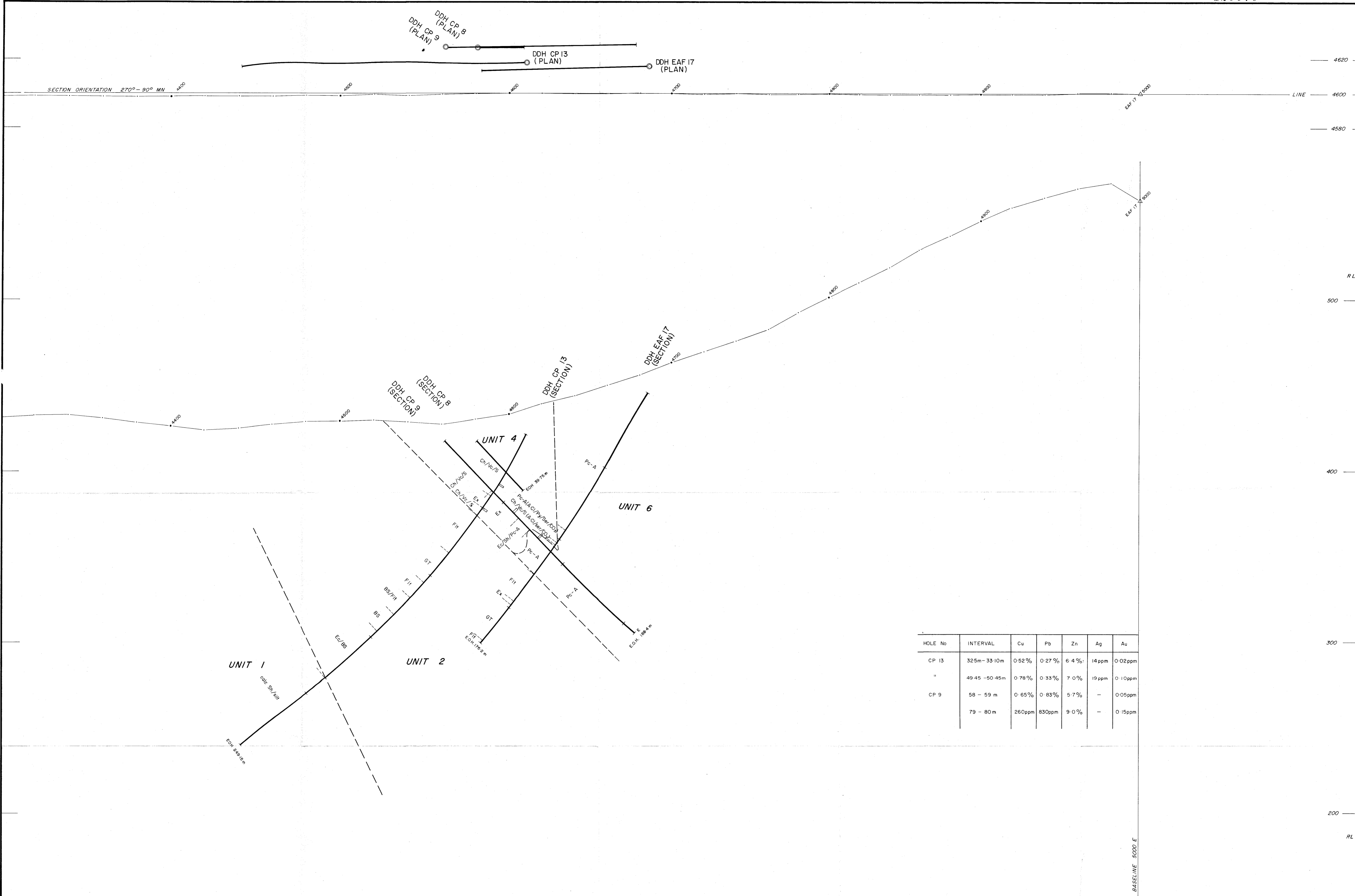
SECTION ORIENTATION 270/90° MN



<b>COMSTAFF PROPRIETARY LIMITED</b>		<b>011</b>																															
<table border="1"> <tr><td>TITLE No.</td><td>EL 5/63</td></tr> <tr><td>AREA</td><td>4</td></tr> <tr><td>AMENDMENTS</td><td>8</td></tr> <tr><td>1</td><td>9</td></tr> <tr><td>2</td><td>10</td></tr> <tr><td>3</td><td>11</td></tr> <tr><td>4</td><td>12</td></tr> <tr><td>5</td><td>13</td></tr> <tr><td>6</td><td>14</td></tr> <tr><td>7</td><td>14</td></tr> </table>	TITLE No.	EL 5/63	AREA	4	AMENDMENTS	8	1	9	2	10	3	11	4	12	5	13	6	14	7	14	PINNACLES GRID - EAF SECTION OF LINE 4920 N DRILLHOLE GEOLOGY & GEOCHEMISTRY		<table border="1"> <tr><td>COMPILED</td><td>C R MROCKEK</td></tr> <tr><td>DRAWN</td><td>J. HARDISTY</td></tr> <tr><td>DATE</td><td>7/6/85</td></tr> <tr><td>SCALE</td><td>1:1000</td></tr> <tr><td>REF No.</td><td>TAS/2/4252</td></tr> </table>	COMPILED	C R MROCKEK	DRAWN	J. HARDISTY	DATE	7/6/85	SCALE	1:1000	REF No.	TAS/2/4252
TITLE No.	EL 5/63																																
AREA	4																																
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DRAWN	J. HARDISTY																																
DATE	7/6/85																																
SCALE	1:1000																																
REF No.	TAS/2/4252																																



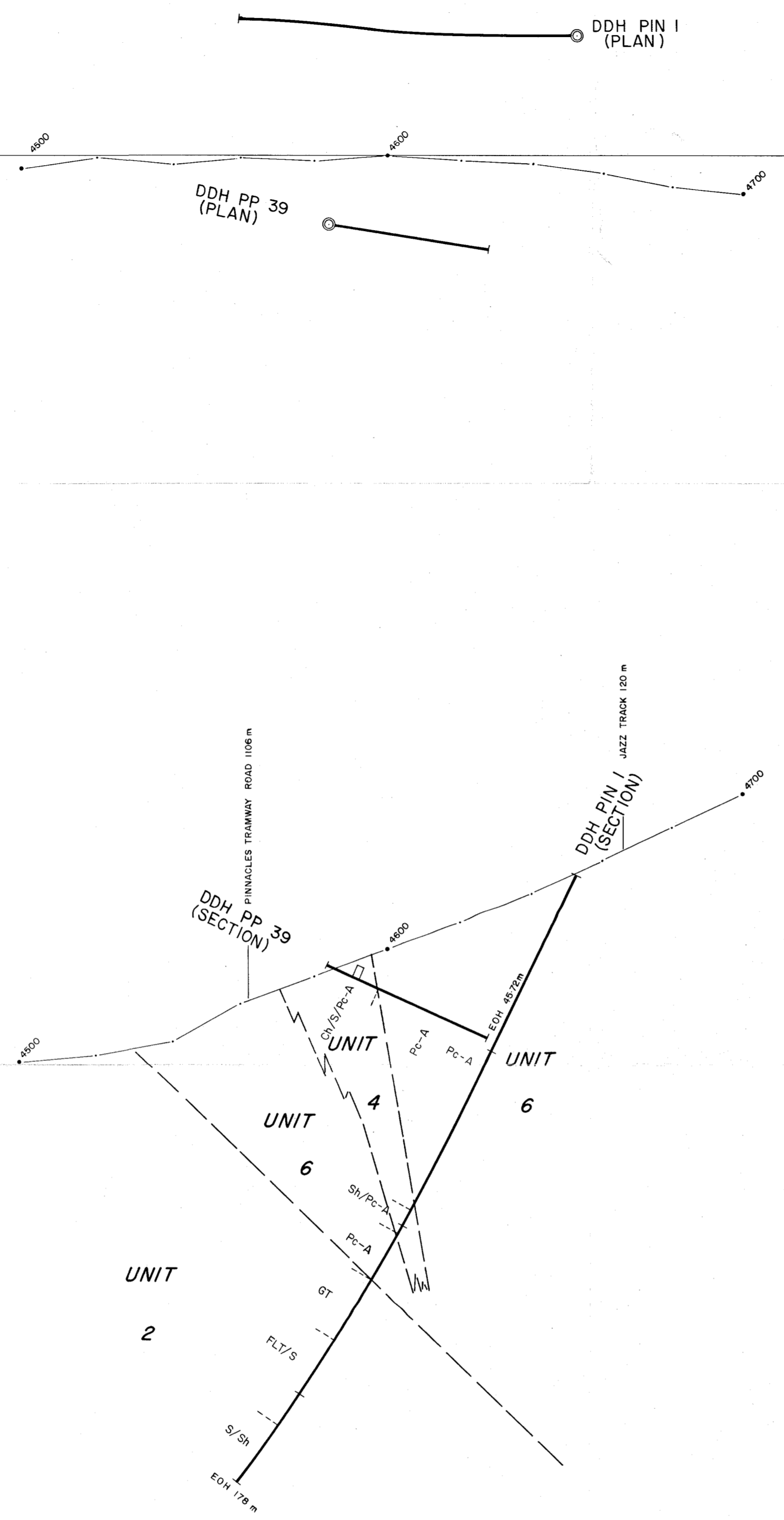
<b>COMSTAFF PROPRIETARY LIMITED</b>	
CASE NO. <b>EL 5/63</b>	COMPILED C. R. MROTCZEK
AREA <b>4</b>	DRAWN J. HARDISTY
AMENDMENTS 8 9 10 11 12 13 14	DATE 19/6/85
PINNACLES GRID - EAF SECTION OF LINE 4800 N 012	
DRILLHOLE GEOLOGY & GEOCHEMISTRY	
SCALE 1:1000 REF. NO. TAS/2/4259	



HOLE No	INTERVAL	Cu	Pb	Zn	Ag	Au
CP 13	325m - 3310m	0.52%	0.27%	6.4%	14ppm	0.02ppm
"	49.45 - 50.45m	0.78%	0.33%	7.0%	19ppm	0.10ppm
CP 9	58 - 59 m	0.65%	0.83%	5.7%	-	0.05ppm
	79 - 80 m	260ppm	830ppm	9.0%	-	0.15ppm

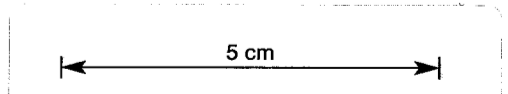
<b>COMSTAFF PROPRIETARY LIMITED</b>	
TITLE: EL 5/63 AREA: 4 AMENDMENTS: 2 9 3 9 4 10 5 12 6 3 7 14	PROJECT: C. R. MROZCEK DRAWN: J. HARDISTY DATE: 18/6/85 SCALE: 1:1000 SHEET NO: TAS/2/4260
PINNACLES GRID - EAF SECTION OF LINE 4600 N 013 DRILLHOLE GEOLOGY & GEOCHEMISTRY	

SECTION ORIENTATION 270° - 90° MN



4520  
LINE 4500  
4480  
RL  
500  
400  
300  
200  
RL

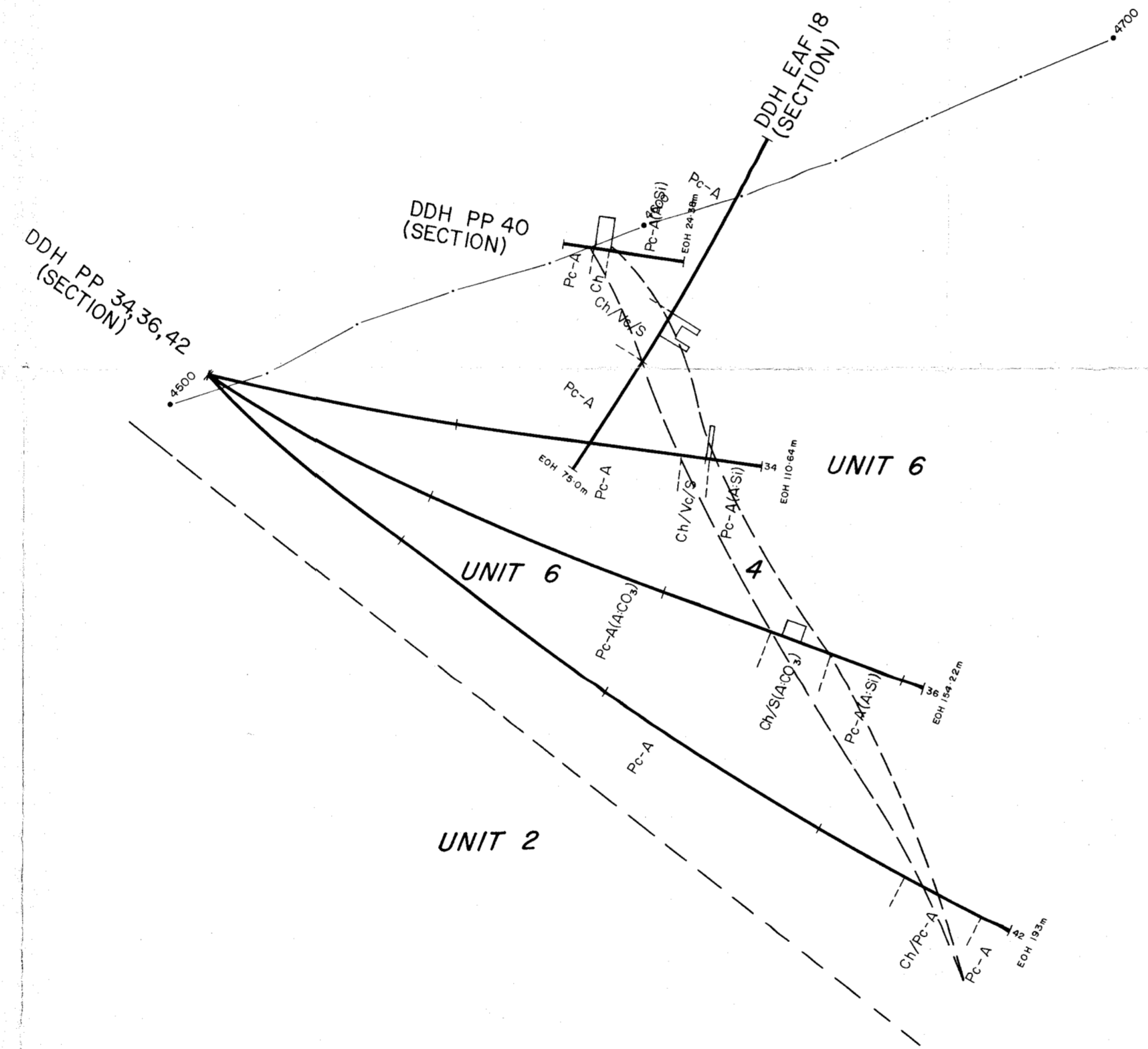
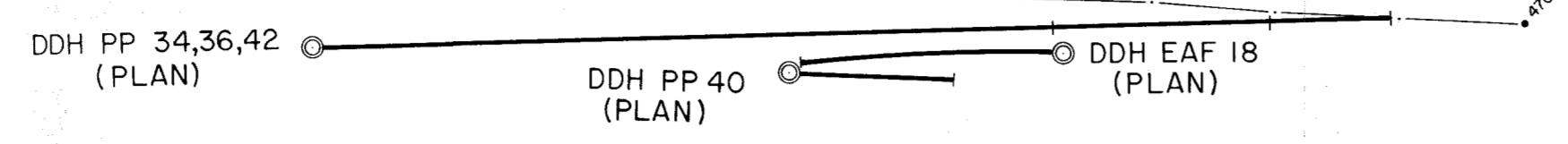
HOLE No	INTERVAL	Cu %	Pb %	Zn %	Ag ppm	Au ppm
PP 39	7.2 - 9.0m	0.2	0	2.4	17	4.4



**COMSTAFF PROPRIETARY LIMITED**

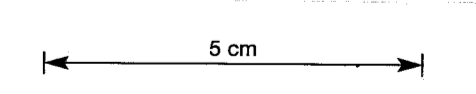
CLIENT <b>EL 5/63</b> AREA <b>4</b> AMENDMENTS 1 S 2 S 3 S 4 S 5 S 6 S 7 S	PROJECT <b>PINNACLES GRID - EAF</b> SECTION OF LINE 4500N <b>014</b> DRILLHOLE GEOLOGY & GEOCHEMISTRY	DRAWN BY <b>C. R. MROCEK</b> DRAWN BY <b>J. HARDISTY</b> DATE <b>19/6/85</b> SCALE <b>1:1000</b> REF. NO. <b>TAS/2/4261</b>
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SECTION ORIENTATION 270°-90° MN

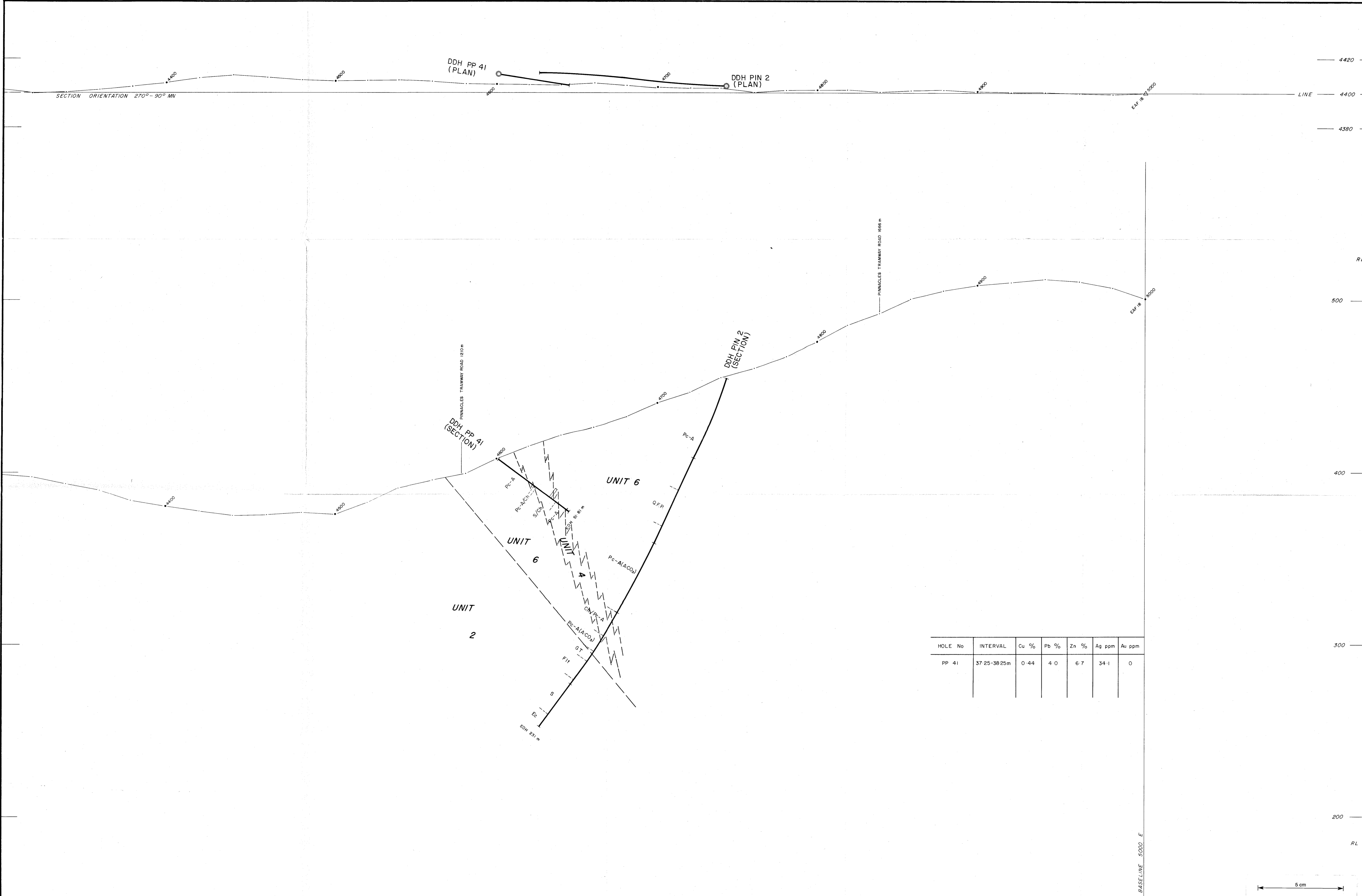


HOLE No	INTERVAL	Cu %	Pb %	Zn %	Ag ppm	Au ppm
PP 40	6.0 - 9.18 m	1.0	6.9	13.9	51.6	21.4
"	9.18 - 13.5 m	0.4	1.7	3.8	17.5	0
EAF 18	39 - 40 m	0.74	5.12	8.11	62	0.07
"	43 - 44 m	0.66	3.59	8.32	24	26.6
"	39 - 44 m	0.33	1.92	3.84	17.2	5.35
PP 34	100.3 - 100.9 m	1.52	8.7	14.8	43	1.2
PP 36	125.4 - 129.08 m	0.4	0.8	6.2	8	0

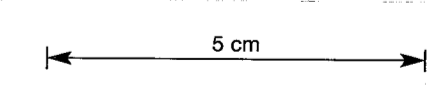
BASELINE 5000 E



<b>COMSTAFF PROPRIETARY LIMITED</b>		
CASE NO. <b>EL 5/63</b> AREA <b>4</b> SHEET NO. 1 2 3 4	<b>PINNACLES GRID - EAF</b> <b>SECTION OF LINE 4460 N 015</b> <b>DRILLHOLE GEOLOGY &amp; GEOCHEMISTRY</b>	DESIGNED <b>C. R. MROCZEK</b> DRAWN <b>J. HARDISTY</b> DATE <b>18/6/85</b> SCALE <b>1:1000</b> SHEET NO. <b>TAS/2/4262</b>

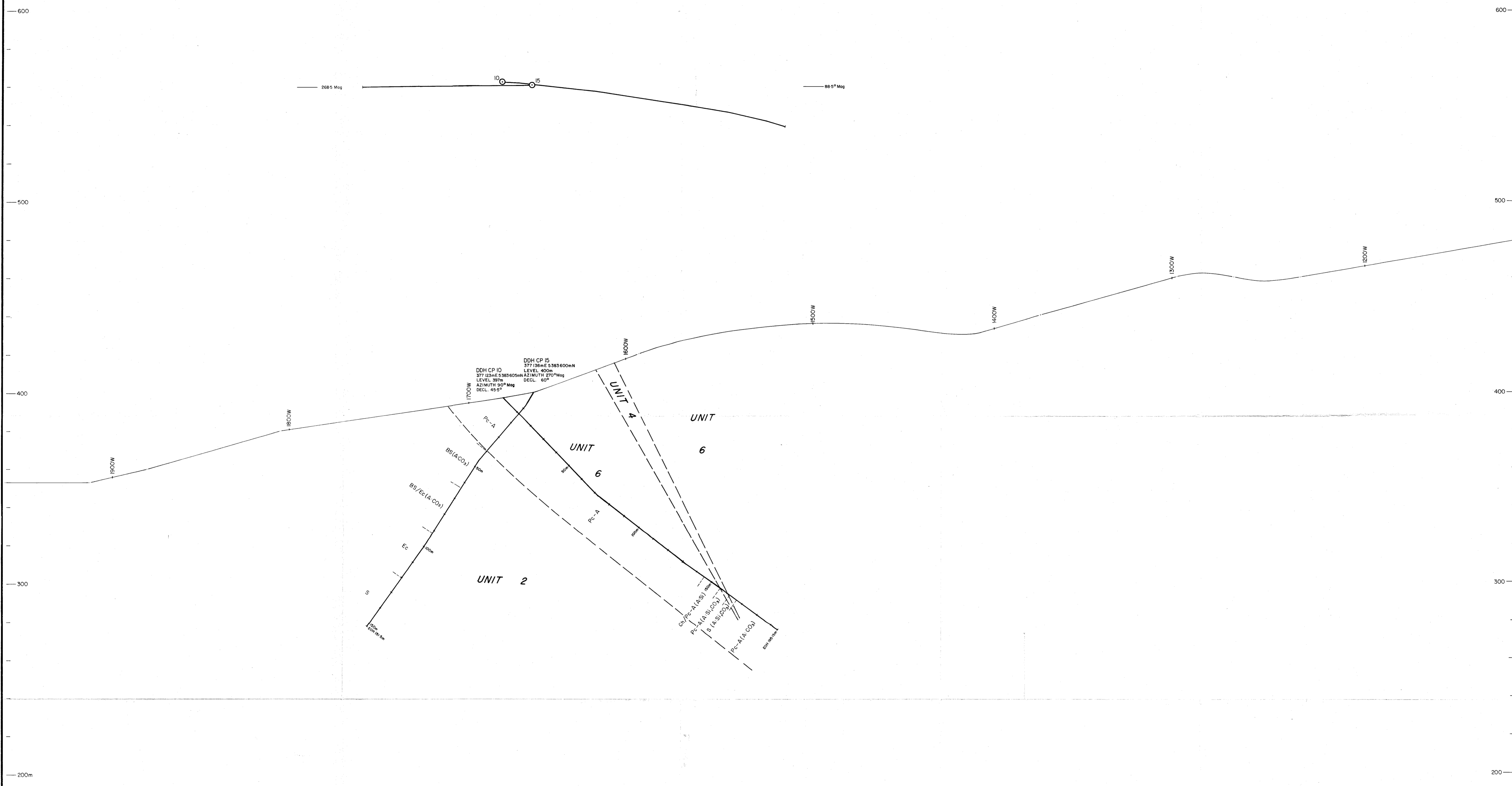


HOLE No	INTERVAL	Cu %	Pb %	Zn %	Ag ppm	Au ppm
PP 41	37.25-38.25m	0.44	4.0	6.7	34.1	0



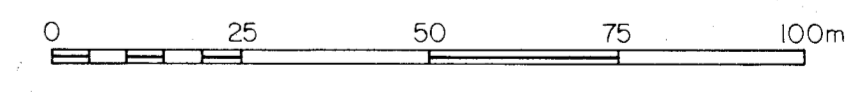
**COMSTAFF PROPRIETARY LIMITED**

CLASS. No. <b>EL 5/63</b>	<b>PINNACLES GRID - EAF</b> SECTION OF LINE 4400N <b>016</b>	DRAWN BY C. R. MROTCZEK DATE 19/6/85 SCALE 1:1000 REF. No. TAS/2/4263
AREA <b>4</b>	<b>DRILLHOLE GEOLOGY &amp; GEOCHEMISTRY</b>	
AMENDMENTS 1 8 2 9 3 10 4 11 5 12 6 13 7 14		

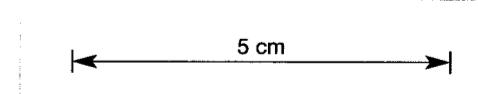


DDH CP 10  
 377 123mE 5383600mN  
 LEVEL 400m  
 LEVEL 397m  
 AZIMUTH 50°Mag  
 DECL. 45.5°

DDH CP 15  
 377 136mE 5383600mN  
 LEVEL 400m  
 LEVEL 397m  
 AZIMUTH 50°Mag  
 DECL. 45.5°



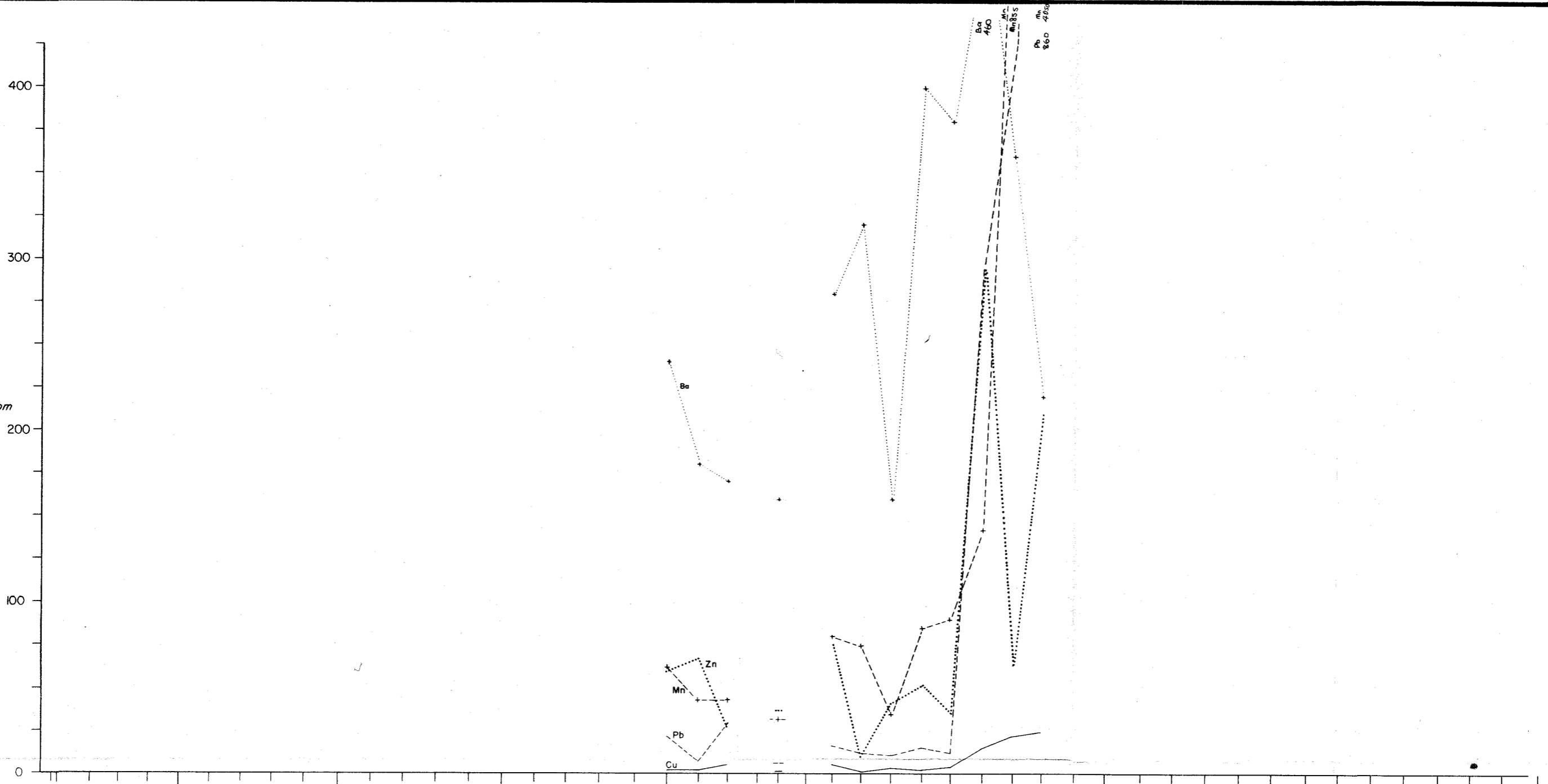
Profile drawn from 20m contours on TAS/2/3615



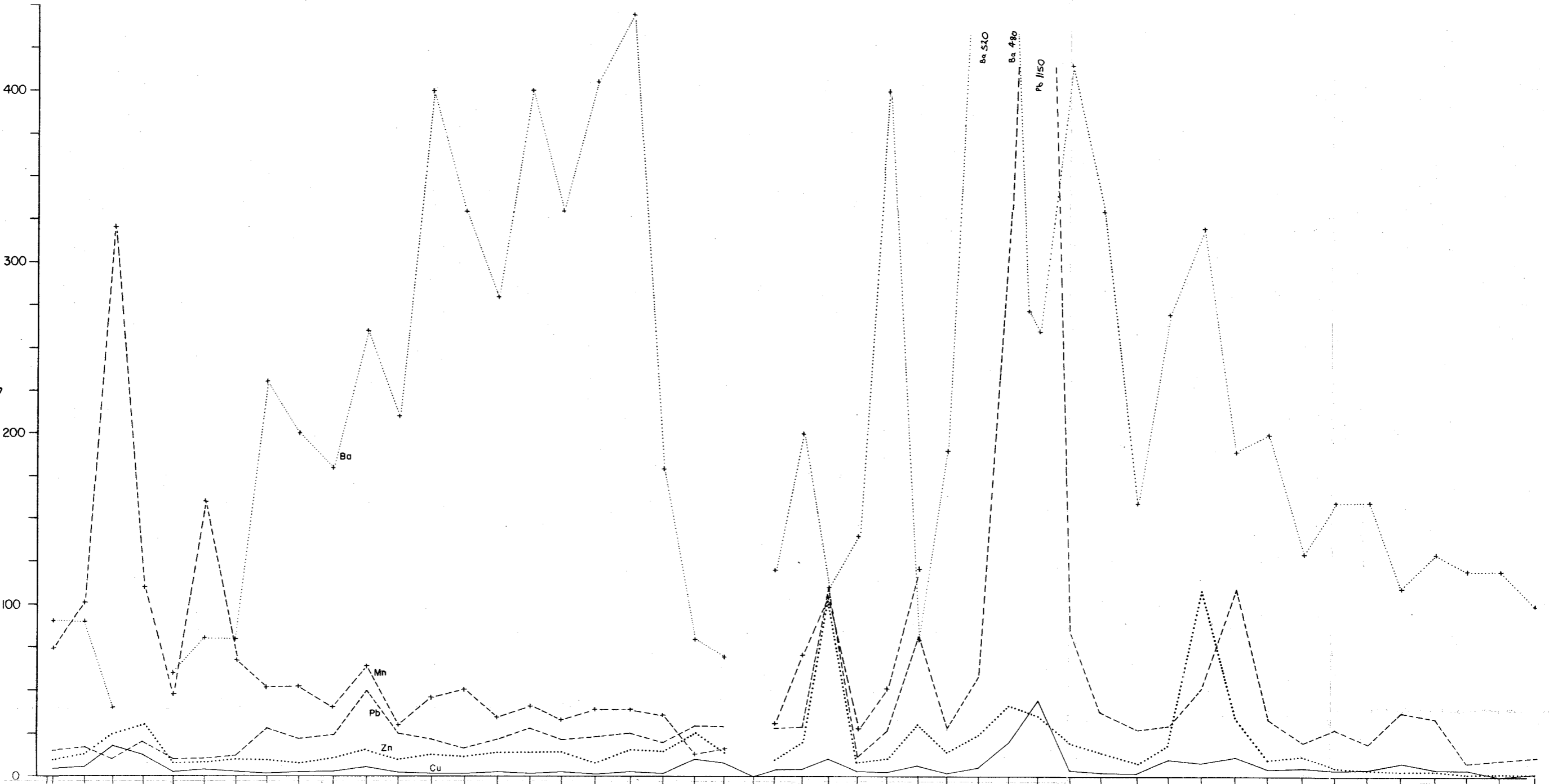
<b>COMSTAFF PROPRIETARY LIMITED</b>																		
<table border="1"> <tr><td>DATE No</td><td>5/63</td></tr> <tr><td>AREA</td><td>4</td></tr> <tr><td>AMENDMENTS</td><td>8 9 10 11 12 13 14</td></tr> </table>	DATE No	5/63	AREA	4	AMENDMENTS	8 9 10 11 12 13 14	CHESTER - PINNACLES PROJECT EAA GRID - LINE 2400S DDH's CP 10 & 15 DRILLHOLE GEOLOGY & GEOCHEMISTRY	<table border="1"> <tr><td>COMPILED</td><td>C. R. MROZCEK</td></tr> <tr><td>DRAWN</td><td>J. HARDISTY</td></tr> <tr><td>DATE</td><td>28/6/85</td></tr> <tr><td>SCALE</td><td>1:1000</td></tr> <tr><td>REF No</td><td>TAS/2/4267</td></tr> </table>	COMPILED	C. R. MROZCEK	DRAWN	J. HARDISTY	DATE	28/6/85	SCALE	1:1000	REF No	TAS/2/4267
DATE No	5/63																	
AREA	4																	
AMENDMENTS	8 9 10 11 12 13 14																	
COMPILED	C. R. MROZCEK																	
DRAWN	J. HARDISTY																	
DATE	28/6/85																	
SCALE	1:1000																	
REF No	TAS/2/4267																	



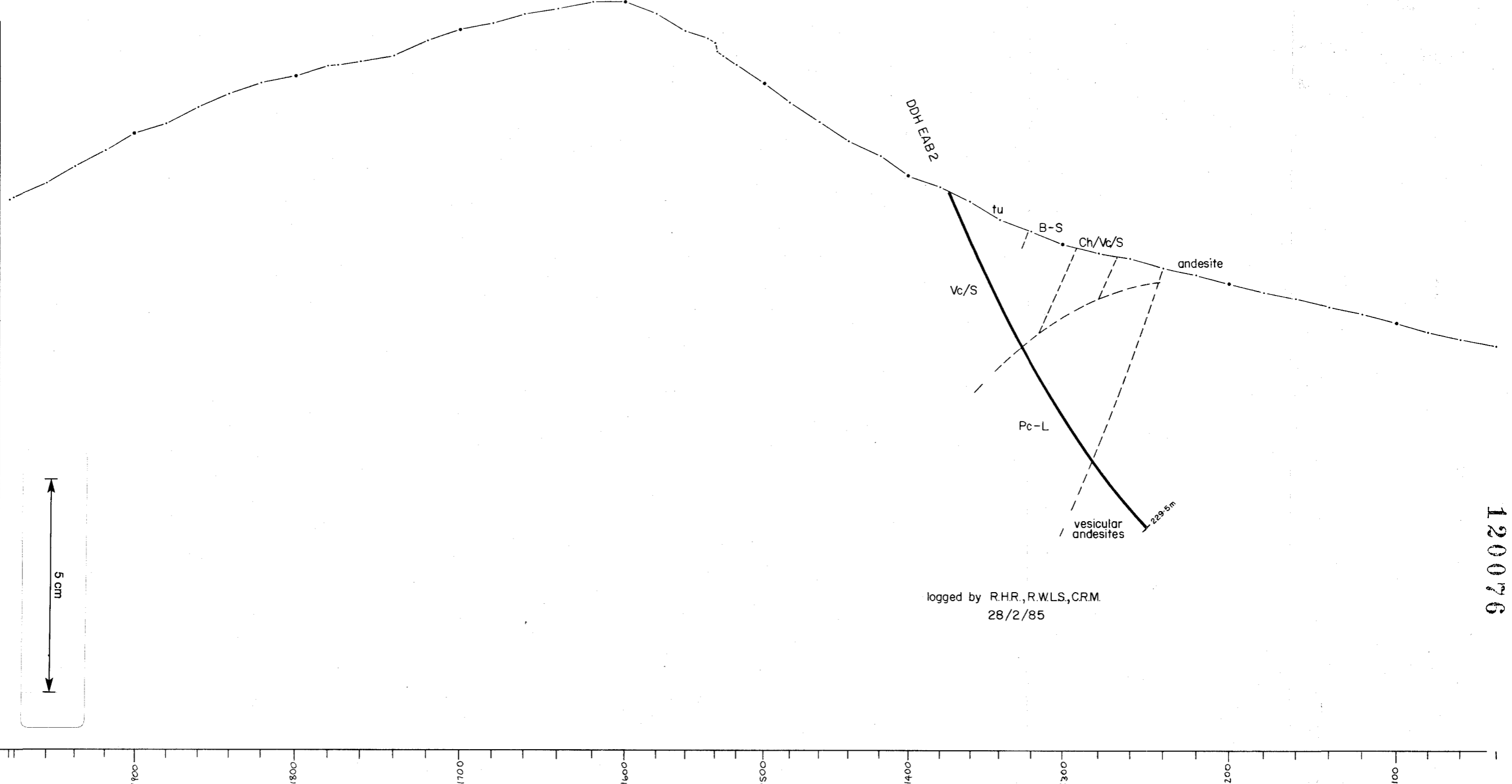
'C' GEOCHEMISTRY ppm



'A' GEOCHEMISTRY ppm



TOPOGRAPHY  
 - GEOLOGY  
 - DRILLHOLE LOCATION

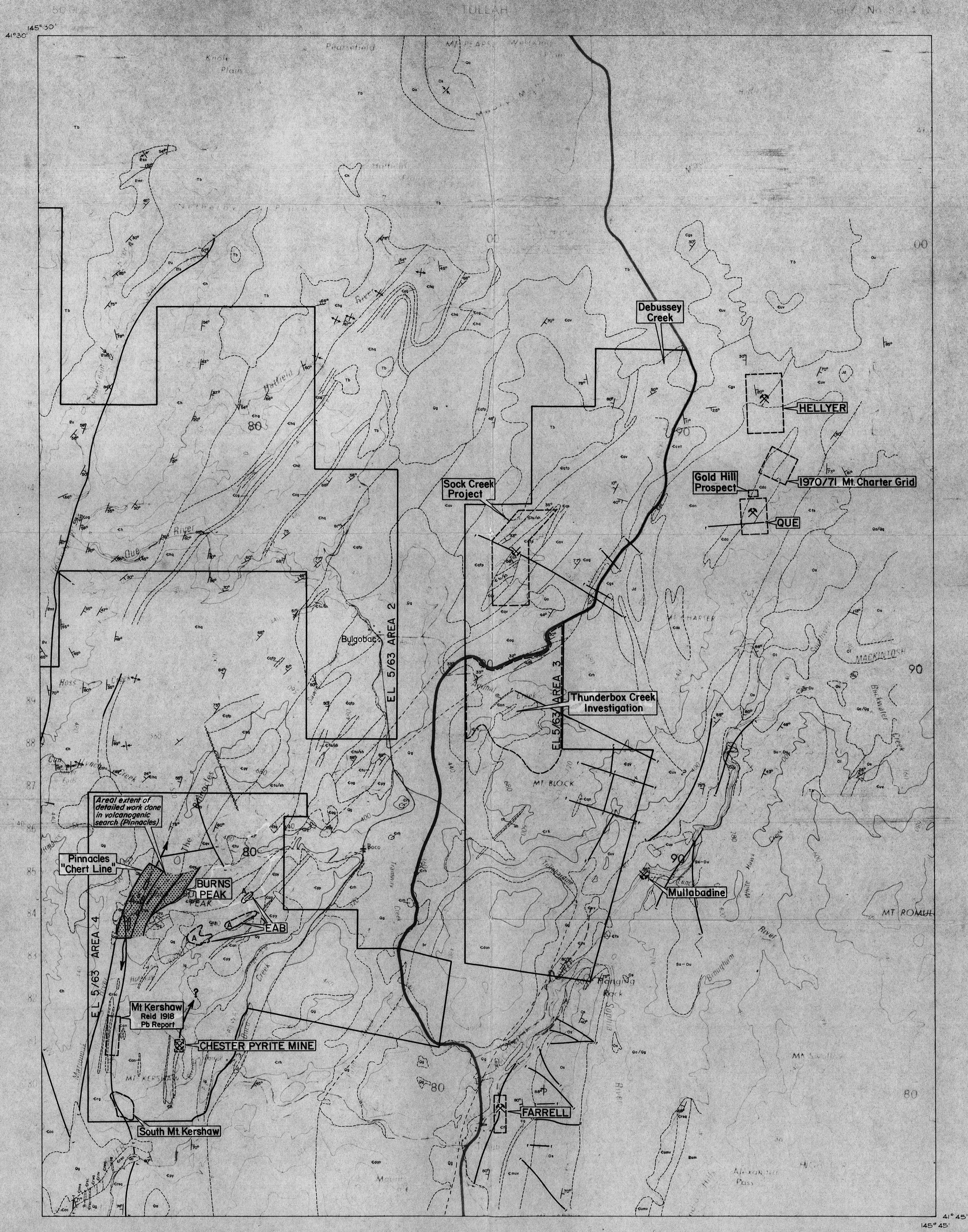


logged by RHR, RWLS, CRM  
 28/2/85

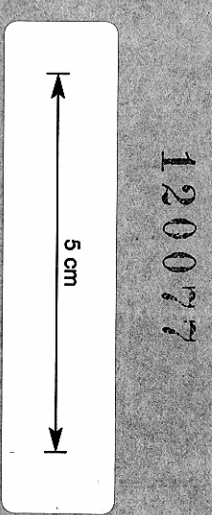
AMENDED JUNE 1985  
**COMSTAFF PROPRIETARY LIMITED**  
 EAST CHESTER GRID - EAB  
 L 2950 S PROFILES 019  
 SECTION OF PROPOSED DRILLHOLE 'B'

120076

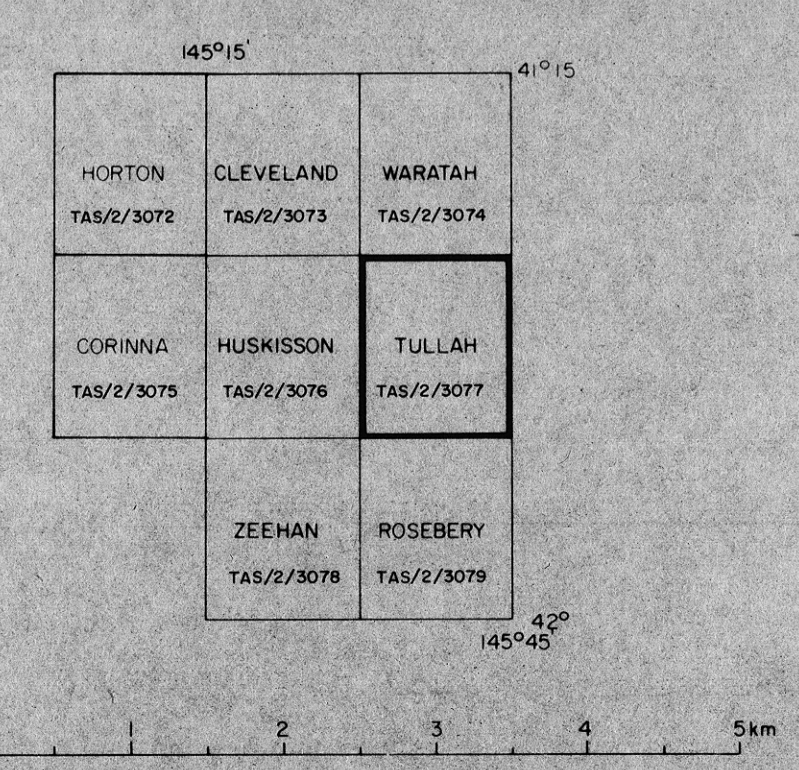
DRAWN: GEORRAFT 3/81  
 CHECKED: G.F.P.  
 SCALE: 2500  
 TMS/2/2512



COMSTAFF PROPRIETARY LIMITED  
 REGIONAL GEOLOGICAL INTERPRETATION  
 TULLAH PLAN  
 020  
 TAS/2/3077

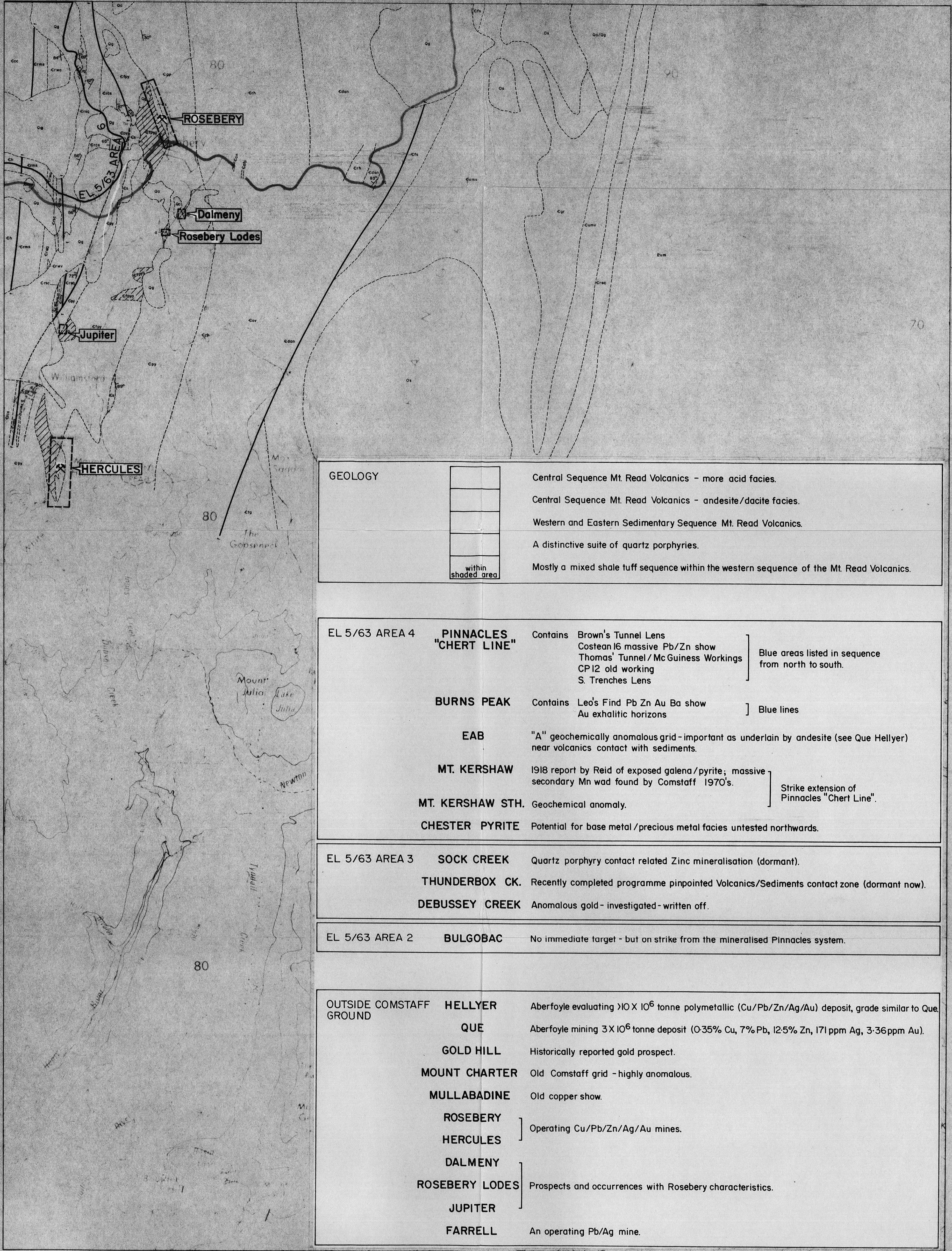


120077



COMPILED BY GFW/TWLS  
 DRAWN BY GFW/TWLS  
 CHECKED BY GFW/TWLS  
 DATE 27/9/82  
 SCALE 1:50,000

145°30'  
41°45'



GEOLOGY	
[Symbol]	Central Sequence Mt. Read Volcanics - more acid facies.
[Symbol]	Central Sequence Mt. Read Volcanics - andesite/dacite facies.
[Symbol]	Western and Eastern Sedimentary Sequence Mt. Read Volcanics.
[Symbol]	A distinctive suite of quartz porphyries.
[Symbol]	Mostly a mixed shale tuff sequence within the western sequence of the Mt. Read Volcanics.

EL 5/63 AREA 4	PINNACLES "CHERT LINE"	Contains	
		Brown's Tunnel Lens Costean I6 massive Pb/Zn show Thomas' Tunnel / Mc Guinness Workings CP12 old working S. Trenches Lens	Blue areas listed in sequence from north to south.
	BURNS PEAK	Contains Leo's Find Pb Zn Au Ba show Au exhalitic horizons	Blue lines
	EAB	"A" geochemically anomalous grid - important as underlain by andesite (see Que Hellyer) near volcanics contact with sediments.	
	MT. KERSHAW	1918 report by Reid of exposed galena/pyrite; massive secondary Mn was found by Comstaff 1970's.	Strike extension of Pinnacles "Chert Line".
	MT. KERSHAW STH.	Geochemical anomaly.	
	CHESTER PYRITE	Potential for base metal / precious metal facies untested northwards.	

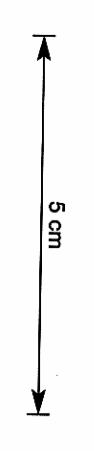
EL 5/63 AREA 3	SOCK CREEK	Quartz porphyry contact related Zinc mineralisation (dormant).
	THUNDERBOX CK.	Recently completed programme pinpointed Volcanics/Sediments contact zone (dormant now).
	DEBUSSEY CREEK	Anomalous gold - investigated - written off.

EL 5/63 AREA 2	BULGOBAC	No immediate target - but on strike from the mineralised Pinnacles system.
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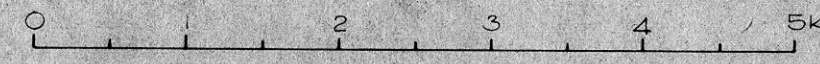
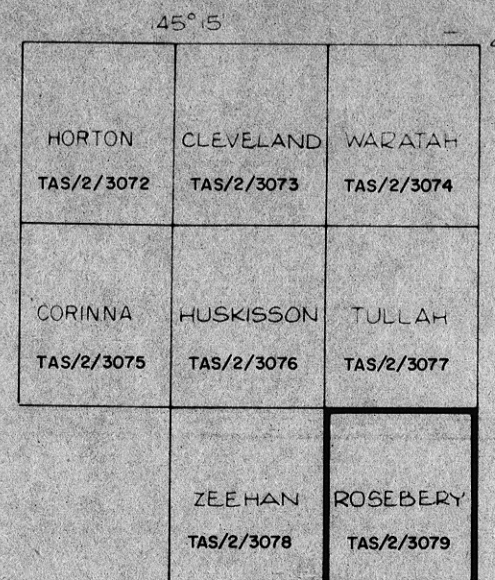
OUTSIDE COMSTAFF GROUND	HELLYER	Aberfoyle evaluating $10 \times 10^6$ tonne polymetallic (Cu/Pb/Zn/Ag/Au) deposit, grade similar to Que.
	QUE	Aberfoyle mining $3 \times 10^6$ tonne deposit (0.35% Cu, 7% Pb, 12.5% Zn, 171 ppm Ag, 3.36 ppm Au).
	GOLD HILL	Historically reported gold prospect.
	MOUNT CHARTER	Old Comstaff grid - highly anomalous.
	MULLABADINE	Old copper show.
	ROSEBERY	Operating Cu/Pb/Zn/Ag/Au mines.
	HERCULES	
	DALMENY	Prospects and occurrences with Rosebery characteristics.
	ROSEBERY LODES	
	JUPITER	
	FARRELL	An operating Pb/Ag mine.

42°  
145°45'

COMSTAFF PROPRIETARY LIMITED  
1 : 50 000  
REGIONAL GEOLOGICAL INTERPRETATION  
ROSEBERY PLAN  
021  
TAS/2/3079



120078



COMPILED BY GPR/RWLS  
DRAWN BY GPR/RWLS  
GEODATE 27/9/82  
CHECKED BY R/88  
SCALE 1 : 50 000