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# Aberfoyle Exploration Pty Ltd

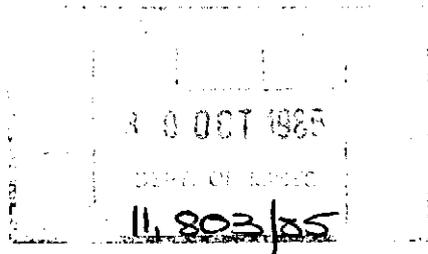
075001

(Incorporated in Victoria)

144 Camberwell Road, Hawthorn East, Victoria 3123 Australia

Telephone: (03) 82 2226

Telex: AA38646



EL 34/82 CLEVELAND TASMANIA  
ANNUAL REPORT ON EXPLORATION TO  
30th OCTOBER 1985.

**MICROFILMED**

**OPEN FILE**

Distribution:

Department of Mines, Tasmania

Gordon's Hill Road  
P.O. Box 56  
Rosny Park  
TASMANIA. 7018.

Prepared by:

E.V. Dronseika  
Mine Geologist

Issued By:

J.R. Sise  
Assistant Manager.

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## INTRODUCTION

This report documents the surface exploration of Utem anomalies carried out south of Cleveland Tin Mine during 1985 up to the end of August, 1985.

## LOCATION

E.L. 34/82 is located approximately 60Km south west of Burnie in north west Tasmania at 41° 28' S, 145° 24' E. See Diag. 1.

## ACCESS AND TOPOGRAPHY

The Corinna Highway passes through the northern portion of the exploration licence. Access to the southern anomalies is gained from a gravel road leading from the 7 level mine offices across Deep Creek. This road crosses the eastern Utem anomaly approximately 2Km south of the mine. Access to the western anomaly is gained via cleared logging tracks from this gravel road.

Most of the area has been heavily logged, fired and partially resown with eucalyptus. Large fallen trees make access on foot very slow.

## HISTORY OF INVESTIGATION

A Utem survey in 1979 identified two significant conductive trends near to prospective lithologies south of the mine. However, intermittent exploration activity directly under the responsibility of the Mine Administration until 1984 failed to generate significant progress in the evaluation of the anomalies. In June 1984 after a memo from T. Eadie (Appendix 1), a work proposal initiating exploration under the administration and funding of Aberfoyle Exploration was generated. (Appendix 2).

## SUMMARY OF WORK COMPLETED

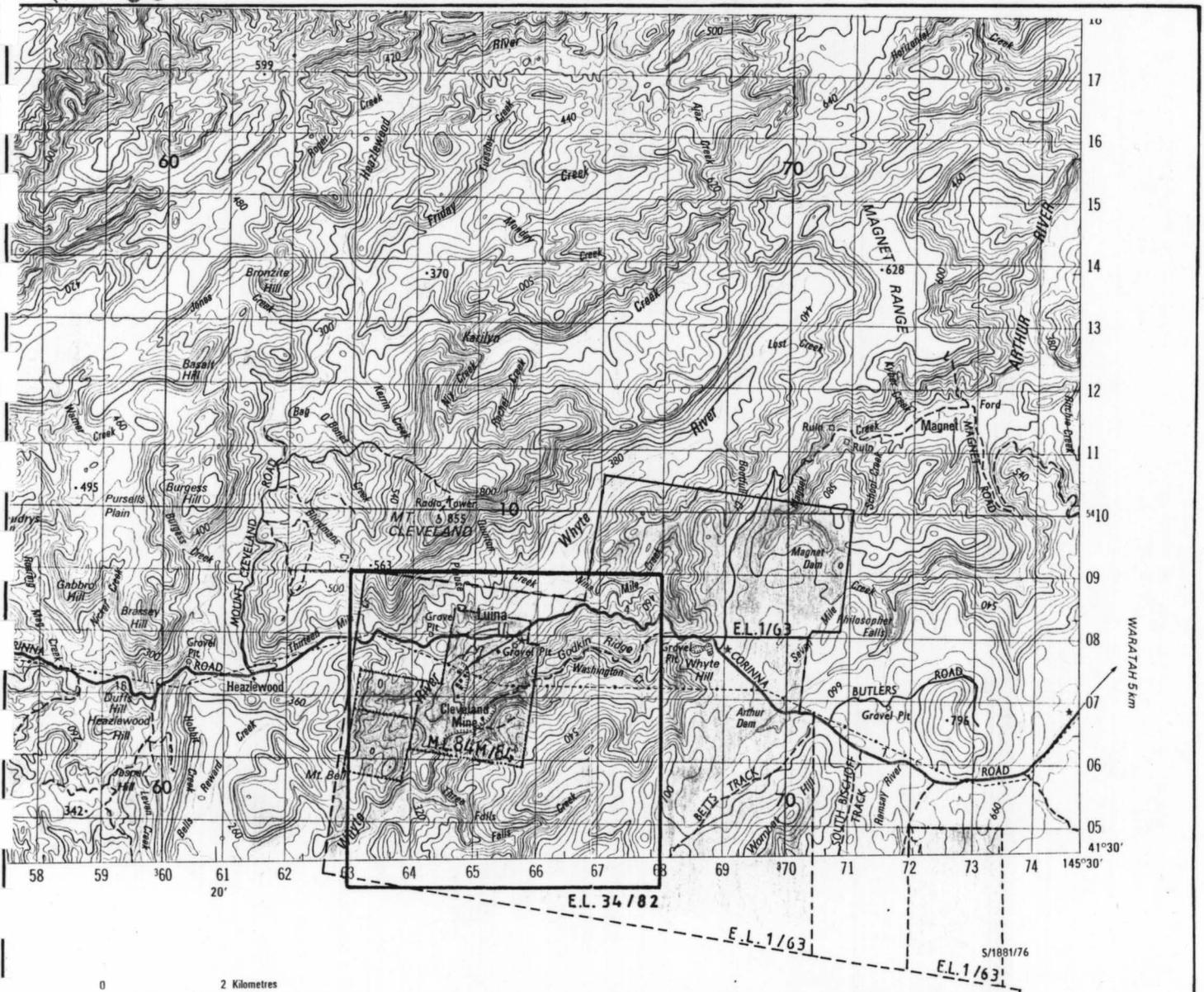
In early February, 1985 5840m of lines were cut including 4 cross-lines of 800m length each. Utem and ground magnetics were read over all 4 lines. Two lines 2880N and 3060N were read with max-min E.M.

In March, 1985 three costeans totalling approximately 300m in length were completed. One road cutting was scraped clean by bull-dozer, mapped in detail at 1:200 scale and sampled geochemically for Sn, Cu, Pb, Zn and Ag. The costeans were also sampled and mapped in a similar fashion. Isolated rock chip samples of weathered bed-rock were collected for assay and petrological description from various locations.

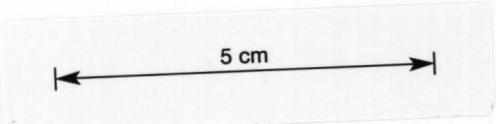
## GEOLOGY

### Regional Geology

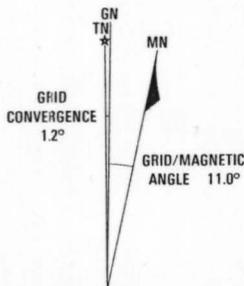
E.L. 34/82 lies within the Dundas Trough a north-south trending early Palaeozoic Eugeosynclinal feature located between areas of Proterozoic basement. Within the licence occurs an unfossiliferous volcano-sedimentary sequence probably equivalent to the Crimson Creek formation. This sequence is intruded



0 2 Kilometres



TASMAP publication



TRUE NORTH, GRID NORTH AND MAGNETIC NORTH ARE SHOWN DIAGRAMMATICALLY FOR THE CENTRE OF THE MAP. MAGNETIC NORTH IS CORRECT FOR 1978 AND MOVES EASTERLY BY 0.1" IN ABOUT THREE YEARS.

INDEX TO ADJOINING MAPS

WELCOME 7816	CIRCULAR HEAD 7916	TABLE CAPE 8016
SANDY CAPE 7815	ARTHUR RIVER 7915	HELLYER 8015
CONICAL ROCKS 7814	PIEMAN 7914	SOPHIA 8014

- Lake, perennial; Stream, perennial.....
- Lake, intermittent; Stream, intermittent.....
- Lake, mainly dry; Stream, mainly dry.....
- Swamp, perennial; intermittent.....
- Land subject to inundation .....
- Bore or well; Spring; Tank or small dam.....
- Breakwater; Pier; Wharf.....
- Wreck, exposed; Lighthouse.....
- Rock, bare or awash; Foreshore flat; Sand.....
- Reef; Rock ledge.....

SHEET 7915  
ARTHUR RIVER  
TASMANIA  
EDITION 1 1977

GOVERNMENT PRINTER TASMANIA

# CLEVELAND TIN LIMITED

APPROVED	Location Plan. E.L. 34/82. & M.L. 84M/84. DRAWING No    Diag. 1.	DRAWN	E.V.D.
		CHECKED	
		DATE	19.8.85.
		SCALE	1:100,000

by fault bounded, partially serpentized mafic and ultramafic units related to the Cambrian Heazlewood River complex. The whole area underwent a period of major deformation in the early-middle Devonian followed by intrusion of late high level granitic plutons in the late Devonian to early Carboniferous. Metalliferous hydrothermal activity related to these granitic plutons is inferred to generate Ag-Pb-Zn veins and cassiterite-sulphide replacement bodies within the region.

### Local Geology

The area immediately surrounding the Utem anomalies is inferred to directly correlate with stratigraphic units recognized within the Cleveland Mine sequence further to the north despite being off-set by a north west trending fault. (Diag 2).

Five main stratigraphic units are recognized within the sequence of the mine area.

1. Ultrabasic Sequence - Very little detailed geology is known west of the mine due to poor surface exposures and very limited diamond drilling intersections. Dark grey-green serpentinites and lighter talc rocks occur interbedded with gabbros, pyroxenites, dolerites and other basic/mafic rocks. The sequence is thought to have been emplaced 'en masse' although faulting is not always evident along its contact with the Crescent Spur Sandstone unit.
2. Crescent Spur Sandstone - This unit is typically a turbidite sequence composed of grey fine to medium grained micaceous greywacke with interbedded red and brown argillite and minor grey banded chert. Interbedded brown argillite/shales is characteristically chaotically foliated in sandstone exposed around the mine. This habit has also been observed in shale units interbedded with sandstone exposed in all costeans south of the mine.

Minor serpentinites and altered basic rocks also occur interbedded or tectonically intruded within sandstone and argillite-shale in an area adjacent to the ultrabasic sequence. The western Utem anomaly (Anomaly B) is thought to lie near this contact area.

3. Halls Formation - This unit is dominated by light grey to dark brown shale and interbedded sandstone-greywacke with lesser chert and an internal unit of mafic pyroclastics and volcanics (Henry's volcanics). At least 10 discrete lenses of tin mineralization are recognized within the formation. Some tin bearing lenses have been observed to continue into limestone along strike.

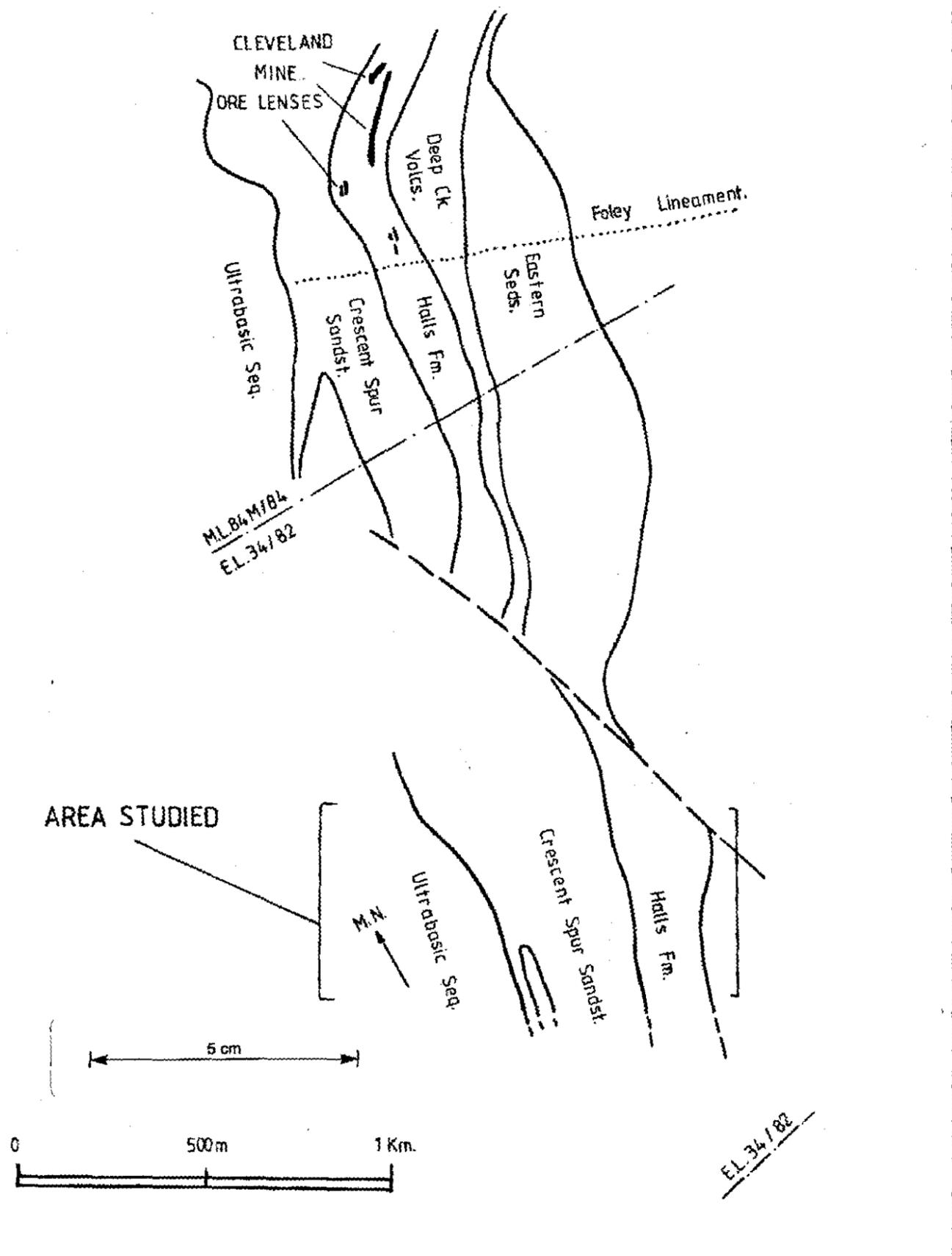
The eastern Utem anomaly (Anomaly A) is inferred to lie near to the correlated Hall's Formation and Crescent Spur Sandstone Unit contact south of the mine.

4. Deep Creek Volcanics - These are composed of predominantly massive basaltic lava of spilitic composition with intercalated and interbedded pyroclastics, volcanoclastic greywacke, argillite and red grey chert.
5. Eastern Sediments - This unit exhibits lithological similarities to Hall's Formation and is composed of grey and brown shales, mudstones with lesser interbedded grey chert, mica sandstone and argillite limestone.

Cross-lines established over the Utem anomalies south of the mine have not been extended further east of the Deep Creek volcanics. It is uncertain therefore if this specific unit (Eastern Seds) has been located near the southern boundary of the exploration licence.

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CLEVELAND TIN LIMITED			
APPROVED	REGIONAL GEOLOGICAL PLAN.	DRAWN	E. V. D.
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		DATE	13-9-85
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	DRAWING No	Diag. 2.	

Costean Geology

Costeaning aimed to establish lithological identify in the vicinity of Utem anomalies and their location is shown on Diag. 9. All costeans were mapped at 1:200 scale in either plan or section view. (See Appendix - Plans).

1. Anomaly A - Costean Line 2880N

From the west massive light grey mica sandstone occurs with interbeds of grey to dark grey chaotically foliated locally graphitic shale-mudstone. Adjacent to this lies weakly foliated grey, khaki and brown shale with interbedded light to dark grey closely jointed fine grained chert and soft friable porous grey siltstone/fine sandstone. Some of the matrix in the siltstone may be dolomite (Petrology sample 315773). Other siltstones are weakly pyritic.

Ground water seepage with subsequent Fe-hydroxide precipitation is noted from porous siltstones near to the sandstone contact.

A zone of weak Fe-oxide staining is also noted superimposed over interbedded cherts and shales east of the sandstone contact.

Minor shearing occurs along lithological contacts between cherts and shales and parallel to foliations within foliated grey shale.

The Utem anomaly is inferred to lie over a thin irregular chert band approximately 5 metres east of the main sheared sandstone-shale contact.

2. Anomaly A - Road Cutting Line 3060N

Massive grey fine to medium grained mica sandstone in the west of the road cutting occurs with interbeds of grey chaotically foliated shale. Weak shearing is evident within grey foliated shales adjacent to the sandstone contact.

Further east weakly foliated grey shale occurs with interbeds of light to dark grey fine grained massive chert and porous soft weakly dolomitic siltstones. Within this zone chert bands may show thin white clayey-shale shears along bedded surfaces. Moderate orange to red-brown Fe-oxide staining possibly related to minor thin irregular dark red-brown (secondary?) mesh veins is noted across this unit.

The Utem anomaly is inferred to lie several metres to the west of the main sheared sandstone-shale contact.

3. Anomaly B Costean Line 3060N

From the west fine grained khaki to red-brown massive weathered mudstone-siltstone lies adjacent to soft decomposed red-brown clayey altered serpentine rocks typifying the rocks of the ultrabasic unit. These rocks show localized weak development of thin black Mn-oxide as stains and coatings on joints and lie against khaki massive weathered mica sandstone which in turn contains interbeds of thin red-brown chaotically foliated shale. The contact between the ultrabasic rocks and massive sandstone is weakly sheared and lies several metres west of the inferred Utem anomaly.

4. Anomaly B Costean Line 2880N

From the west khaki, light brown to red-brown massive mudstone lies adjacent to extensive red-brown clayey soft decomposed ultrabasic rock. This ultrabasic rock in turn contains minor interbands of light to dark grey massive chert, brown shale, fine grained purple shale, greywacke and metabasalt. Further eastward a band of massive grey mica sandstone with chaotically foliated shale interbeds lies within the ultrabasic unit.

Mica sandstone is distinguished from altered ultrabasic rock is hard specimen by the presence of coarse macroscopic mica flakes. Chromium assays of weathered bed-rock confirm the interpreted position of the contact between sandstone and ultrabasic rock.

The Utem anomaly lies a metre east of the contact between weathered ultrabasic rock and an interband of shale/chert.

## GEOCHEMISTRY

### Sample Collection Procedure

Samples were collected manually from the floor of the costeans and side of the road cutting by chipping approximately 2-3 Kg. of weathered bed-rock along a pre-determined line. A small number of samples were also collected from specific locations reflecting various lithologies or alteration zones.

### Sample Preparation

All samples were crushed and pulverized by Abermet in Burnie. Pulp samples were despatched to Analabs in Burnie or Cleveland Mine Assay Lab in Luina for metal assays.

### Assay Technique

A summary of assay methods by code (as displayed on assay sheets) is given.

#### a. Analabs, Burnie.

Code 101 - Partial digestion using perchloric acid then A.A.S.  
(Cu, Pb, Zn, Ag)

Code 103 - Total digestion using nitric, perchloric, hydrofluoric, hydrochloric acids then A.A.S. (Cu, Pb, Zn, Ag)

Code 402 - X.R.F. on pulverized sample (Sn)

#### b. Cleveland Mine Assay Lab, Luina

B1 - X.R.F. on pulverized sample (Sn)

C1 - Partial digestion using nitric, hydrochloric acids then A.A.S.  
(Cu, Pb, Zn)

C5 - Lithium metaborate fusion (total) the A.A.S. (Cr)

### Costeans Road Cutting Geochemistry

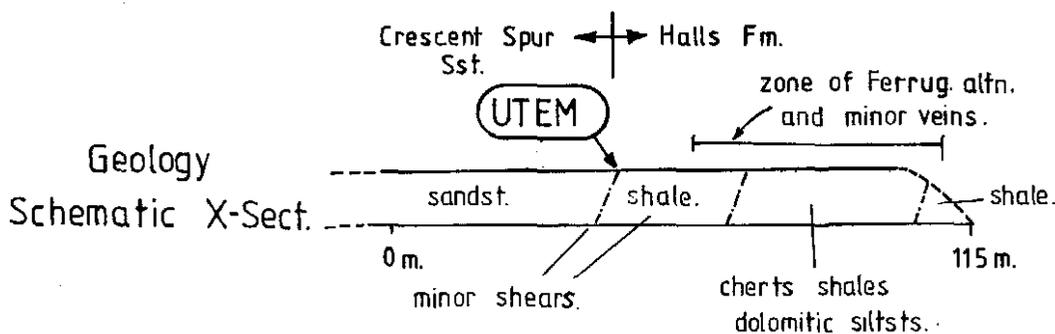
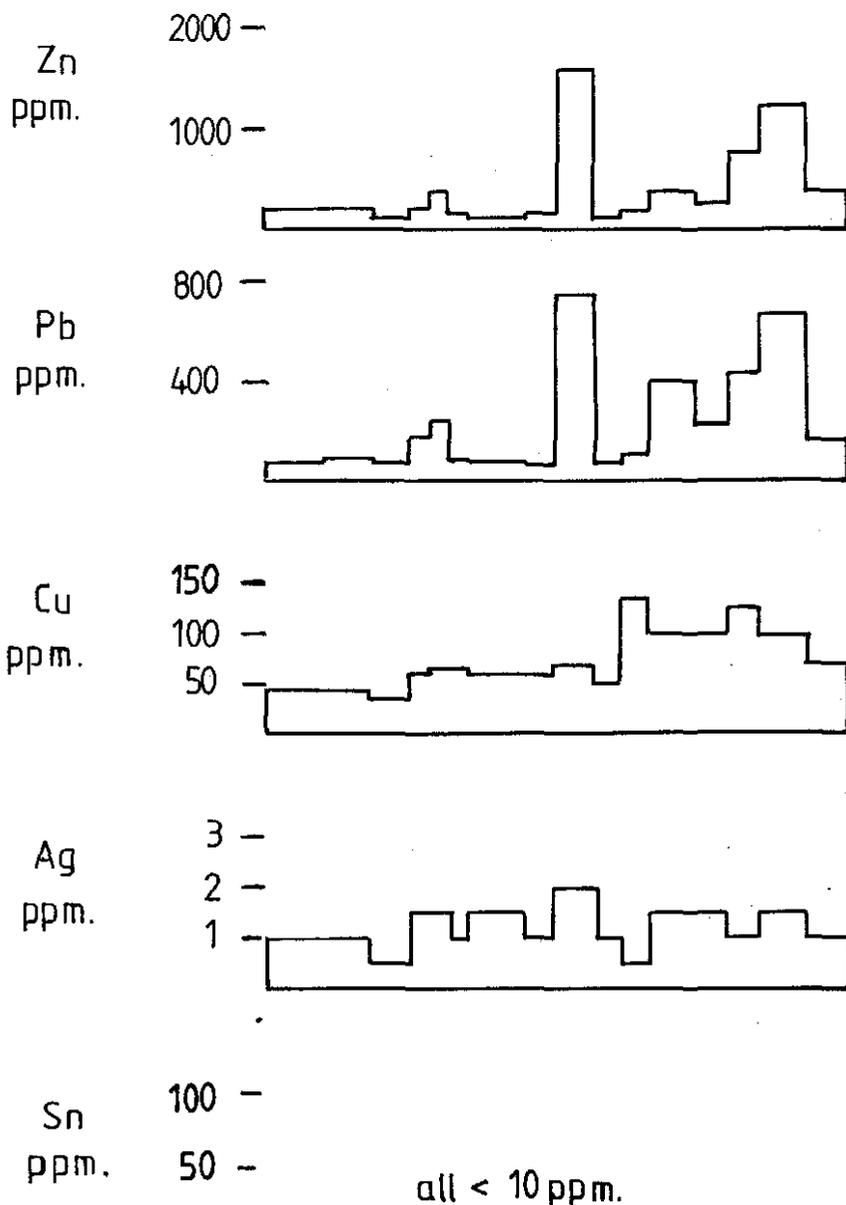
Results from geochem. sampling are plotted as profiles with simplified schematic geologic cross sections on Diag. 3, 4, 5 and 6.

#### a. Road Cutting Anomaly A 3060N

An anomalous zone reflected by samples containing Zn values over 500ppm, Pb values over 300ppm and Cu values over 100ppm is observed to coincide with a zone of ferruginous staining, alteration and weak mesh veining in cherts, shales and weakly dolomitic siltstones.

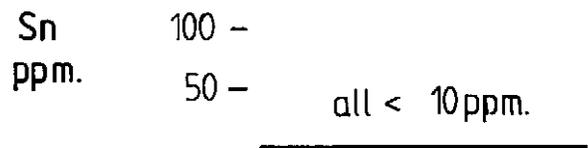
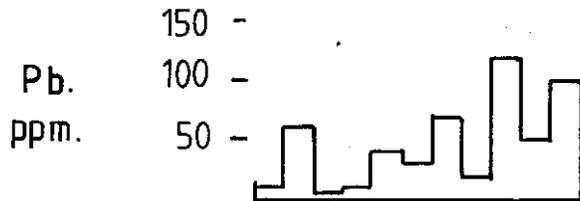
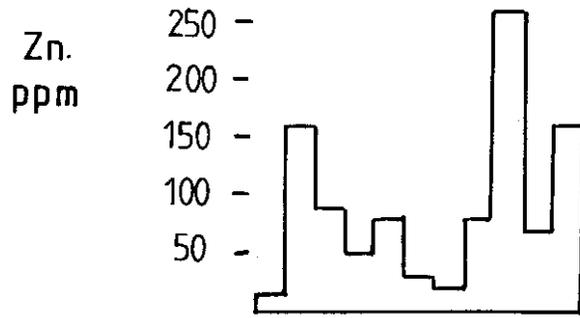
Fe-oxide staining possibly related to minor thin irregular dark red-brown (secondary?) mesh veins is noted across this unit.

The Utem anomaly is inferred to lie several metres to the west of the main sheared sandstone-shale contact.

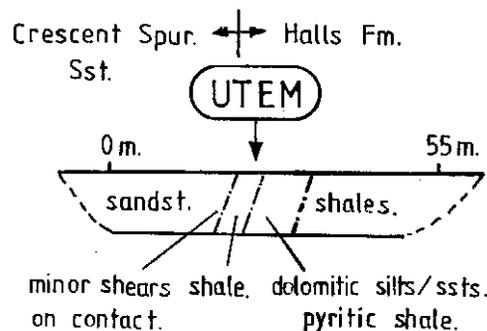


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APPROVED	Geochem. Assay Profile. Road-cut. Anom.A 3060 N.	DRAWN	E.U.D.
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		DATE	4.6.85
		DRAWING No	Diag. 3.
		SCALE	

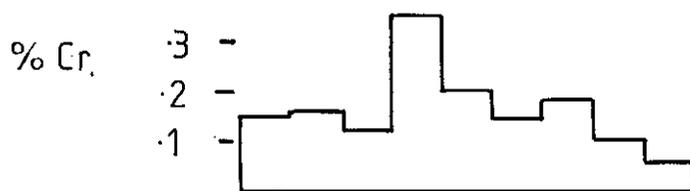
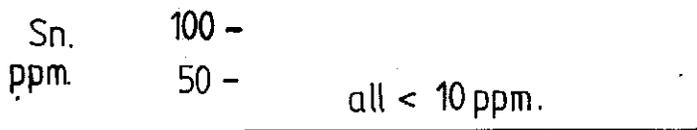
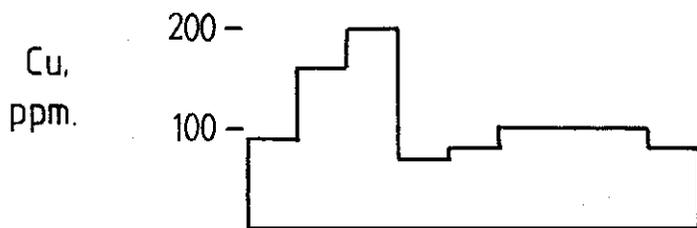
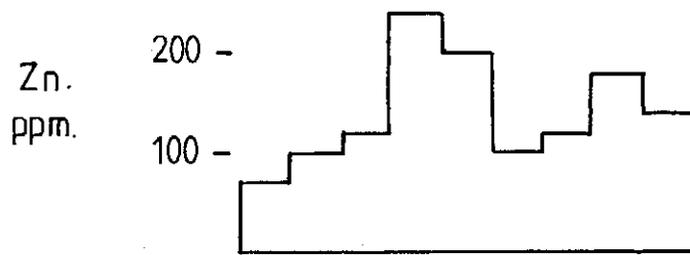


Geology  
Schematic X-Sect.

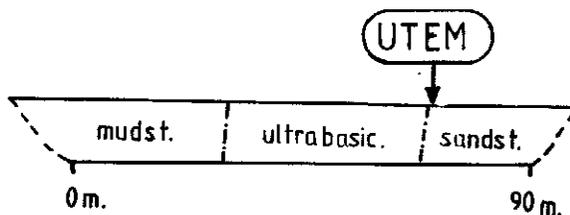


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APPROVED		Geochem. Assay Profile. Costean Anom. A. 2880 N.	DRAWN	E.U.D.
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			DATE	4.6.85.
			SCALE	
DRAWING No		Diag. 4.		

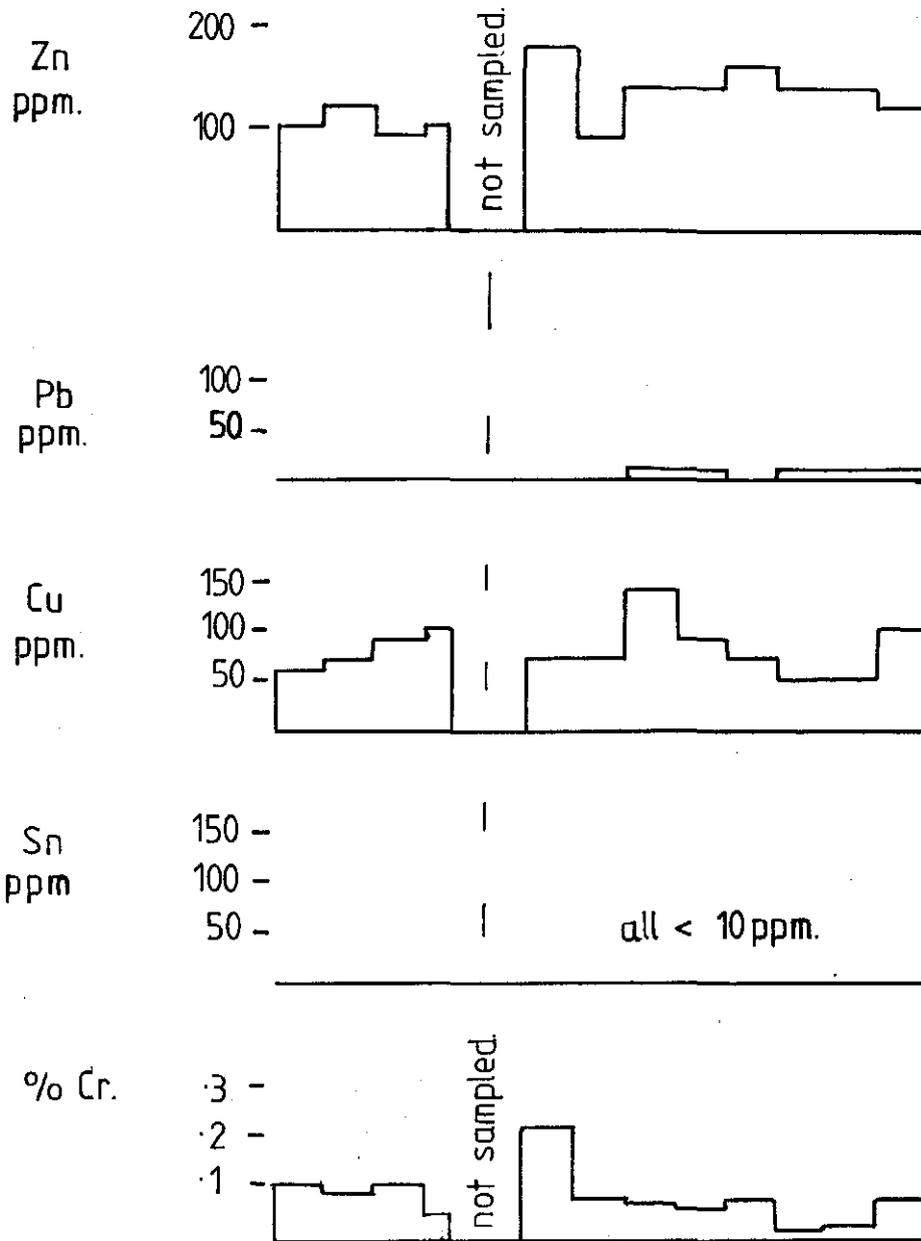


Geology  
Schematic X-Sept.

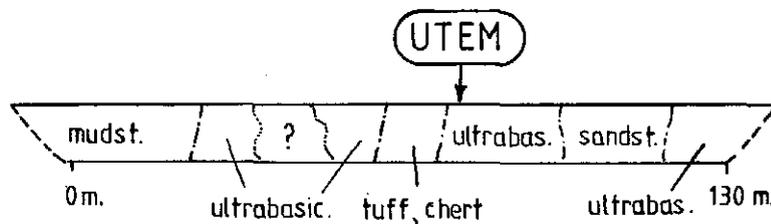


CLEVELAND TIN LIMITED

APPROVED		Geochem. Assay Profile. Costean Anom. B. 3060 N.	DRAWN	E.V.D.	
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		DRAWING No	Diag. 5.	DATE	4.6.85
				SCALE	



Geology Schematic X-Sect.



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APPROVED		Geochem. Assay Profile. Costean Anom.B. 2880 N. DRAWING No    Diag. 6.	DRAWN	E.U.D.
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			DATE	4.6.85.
			SCALE	

All Sn values were below 10ppm.

b. Costean Anomaly A 2880N

All metal values recorded are interpreted to be within background values.

c. Costean Anomaly B 3060N

All metal values recorded are interpreted to be within background values. Chrome assays were carried out to assist in the definition of the ultrabasic unit. The differentiation of rock types using chrome is not strong although highest values were recorded over ultrabasic rock which had been differentiated from sandstone by the absence of macroscopic white mica.

d. Costean Anomaly B 2880N

Again all metal values recorded are interpreted to be within background values. Lowest % Cr values were recorded over sandstone surrounded by ultrabasic rock in the east of the costean.

BASE METAL DISPERSION IN ORE HORIZONS ALONG STRIKE TO ORE ZONES

Tin bearing lode lenses have been observed to pass into 'unaltered' limestone lenses along strike of various locations at Cleveland mine.

To determine what kind of geochem. signature may be present in 'unaltered' rocks along strike from ore, one drill hole C1460 approximately 100m north of a mapped ore lode termination was selected and geochemically sampled ( $\frac{1}{2}$  BQ Core) across the limestone bearing ore horizon. Assay results of specific lithologies are shown on Diag. 7.

The limestone bands have surprisingly low base metal values with Sn assays from 30 to 35ppm with only zinc values up to 1600ppm. Higher base metal values are clearly developed in cherts, immediately adjacent to limestones.

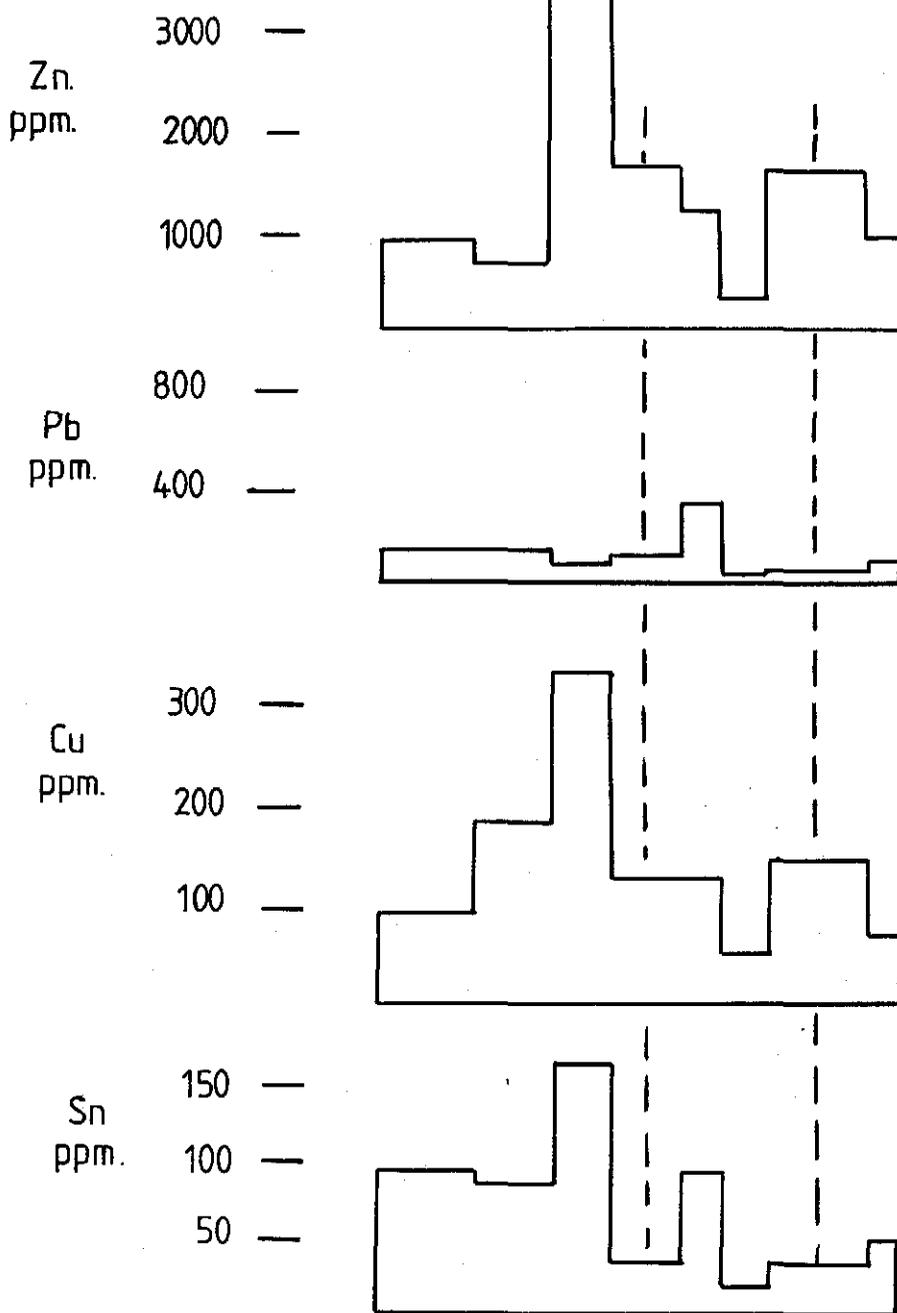
Assays of 'unaltered' limestone collected from drill holes C752 and C753 by P. Collins (Collins 1981) clearly show relatively low base metal values as well. Diag. 8.

Inspections of hole C1460 drill core reveal very thin (mms thick) isolated sulphide bearing veins to coincide with anomalous base metal values.

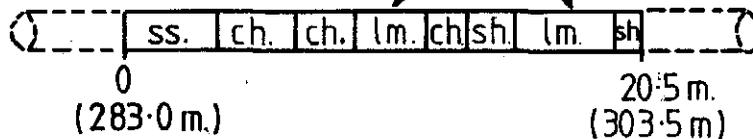
DISCUSSION

The 1985 Utem survey relocated the anomalies close to where they had been previously identified. Clearly they are reproducible anomalies over bona-fide bed-rock conductors.

Over the western anomaly (Anomaly B) the Utem conductor is inferred to be close to the contact between ultrabasic rocks and sediments. Along the northern costean weak shearing is evident on the ultrabasic-sandstone contact. Lithological contrast or minor shearing may be the cause of the Utem Anomaly. No significant geochemical values are interpreted along the costeans. No further work is therefore recommended in this area.



D.D.H. C 1460  
(approx. 100m.  
north of Halls  
C-D. Lens.)



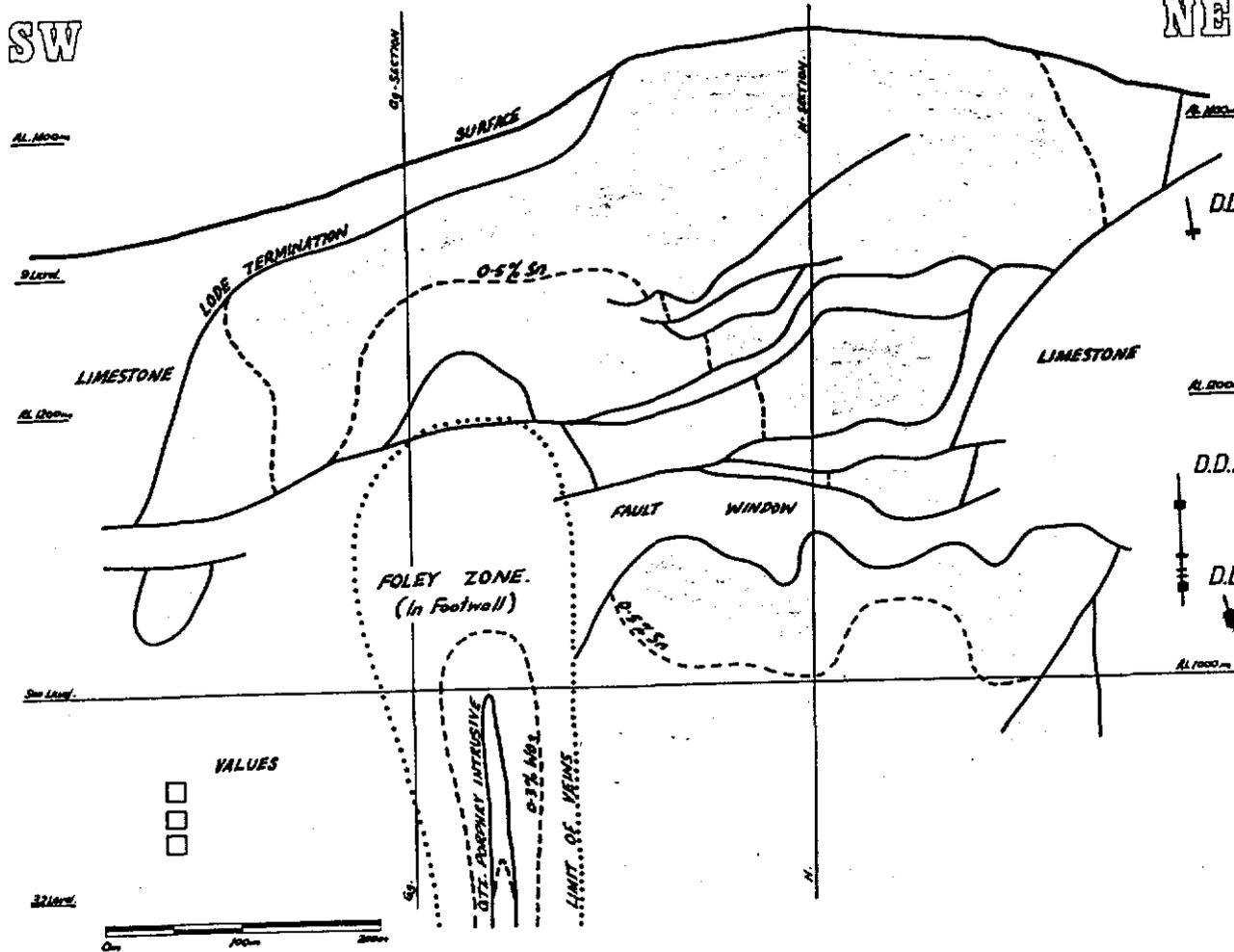
ss - sandstone.      ch - chert.  
sh - shale.          lm - limestone.

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APPROVED	Geochem. Assay Profile. D.D.H. C 1460. DRAWING No    Diag. 7.	DRAWN	E.V.D.
		CHECKED	
		DATE	4.9.85.
		SCALE	

SW

NE



VALUES

□
□
□

5 cm

(ppm.)

	Cu.	Pb.	Zn.	Sn.
DD.H. C 752. [ lmst	2	<3	127	<2

Al. 800m [ lmst.	16	9	64	8
"	64	3	117	8
D.D.H. C 735. "	25	<3	146	27
"	12	<3	16	<2
"	59	3	291	10

	Cu.	Pb.	Zn.	Sn.
Al. 1000m				
ss.	90	120	900	90
ch.	180	120	650	80
"	320	70	3400	160
lmst.	120	100	1600	35
ch.	120	320	1100	90
sh.	50	10	280	15.
lmst.	140	15	1500	30
sh.	70	70	850	45

075017

# CLEVELAND TIN LIMITED

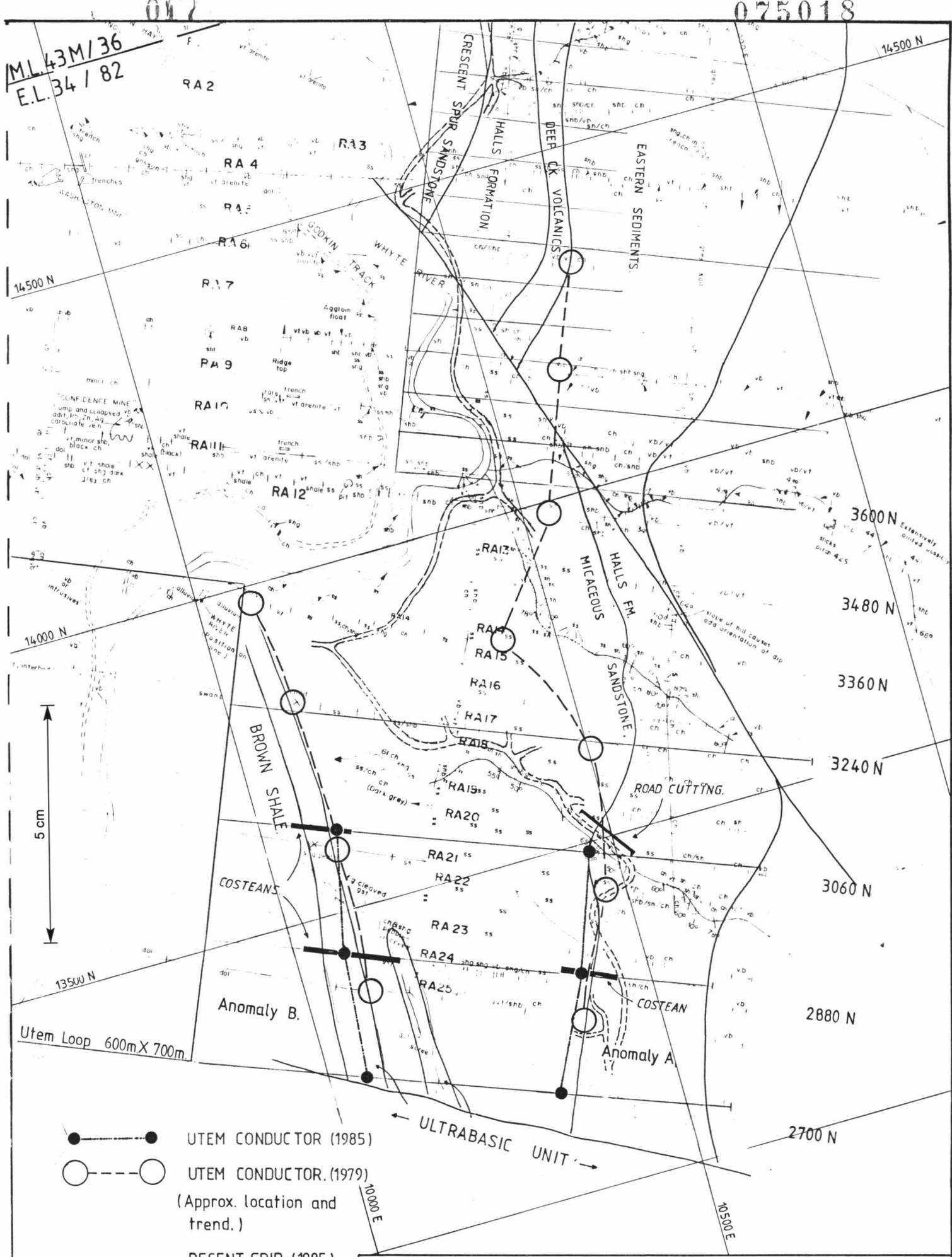
APPROVED	Longit. Project - Composite. Lithogeochem. Assays.	DRAWN	E.V.D
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		DATE	19.8.85
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	DRAWING No	Diag 8.	

UTD

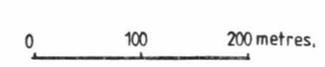
017

075018

ML 43M/36  
E.L. 34/82



- — ● UTEM CONDUCTOR (1985)
- — ○ UTEM CONDUCTOR (1979)  
(Approx. location and trend.)
- RECENT GRID (1985)



<b>CLEVELAND TIN LTD</b>			
APPROVED		UTEM ANOMALIES.	
E.V.D. 16.8.84.		(South of Mine)	
		Diag. 9.	
DRAWN	E.V.D.	CHECKED	E.V.D.
DATE	16.8.84.	SCALE	1:

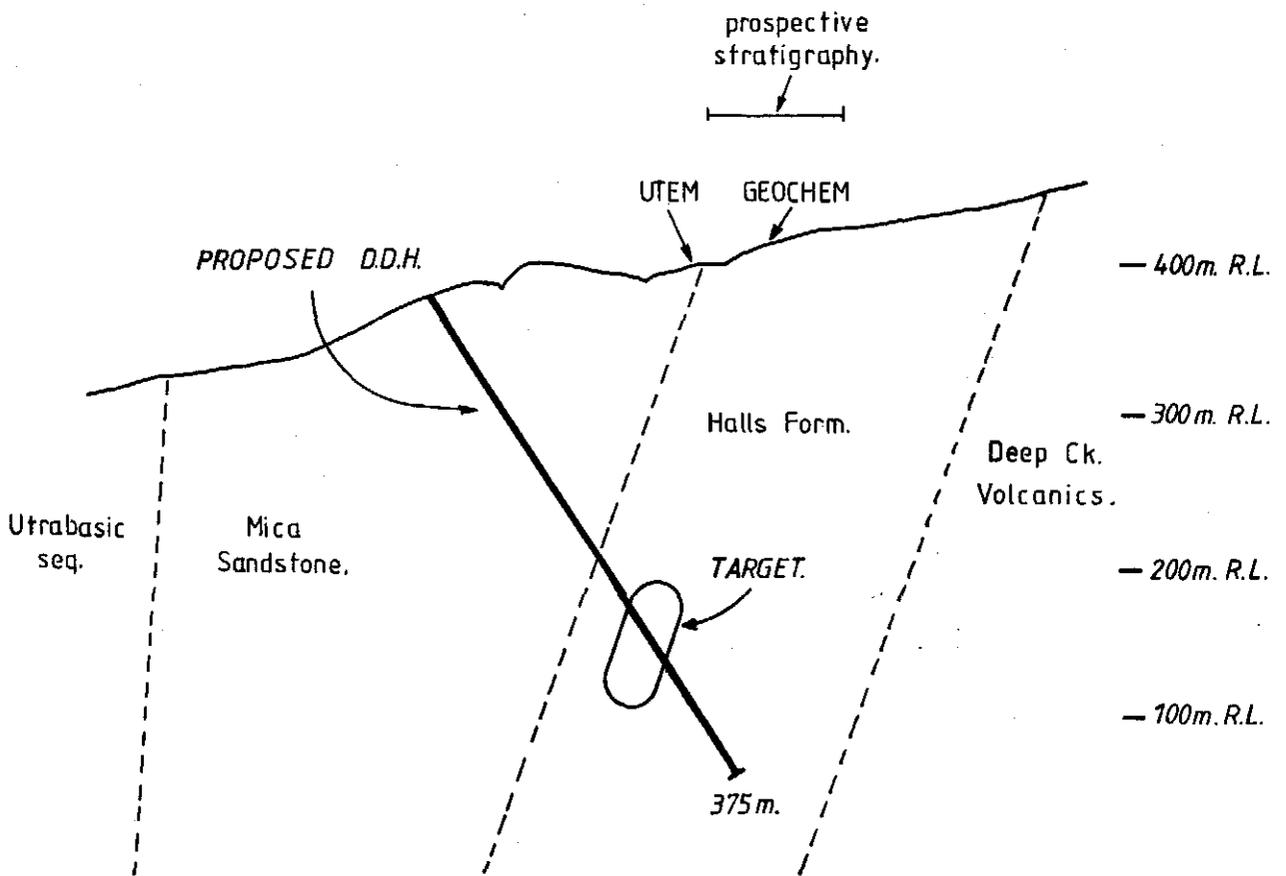
Over the eastern anomaly (Anomaly A) the Utem conductor is recorded on surface to lie very close to the sandstone-shale contact. Thin shear near the sandstone-shale contact may be the cause of the Utem anomaly. If the anomaly is thought to be generated by a conductor 50m to 100m below its surface location then with the inclined dips observed in both road cutting and costean the conductor would hosted within rock types 15 to 35m east of the surface location. That is within shales, cherts and weakly dolomitic siltstones correlated with Hall's Formation of the mine sequence and therefore within conceptually prospective rocks. Only a few metres further east a zone of ferruginous alteration displays anomalous zinc, lead and copper geochemistry.

A comparison between the geochem. assay profiles from drill hole C1460 (100m away from lode-ore at Cleveland) and the Anomaly A road cutting show significant differences. Zinc and copper values are higher overall in the drill hole with lead values significantly higher in the road cutting. Sn values are significant in the drill hole although very low values (30-35ppm Sn) are observed in the limestone horizon itself, unlike the road cutting where all Sn values were below 10ppm.

Metal zoning is present at Cleveland Mine with a W-Mo-Bi centre passing progressively outwards into Sn then Cu, Zn and Pb. In comparison with drill hole C1460 the relative geochem. distribution within the road cutting suggests that if a tin-sulphide ore system was to exist below the road cutting it would be further away than drill hole C1460 is to the lode at Cleveland Mine. Insufficient data however exists to indicate precise distances.

#### RECOMMENDATION

One diamond drill hole is proposed to test the prospective stratigraphy displaying anomalous geochemistry below the Anomaly A road cutting at around 200m below surface. Down-the-hole E.M. should be attempted to further search around the drill hole should no significant mineralization be intersected. A total drill hole of 375m is recommended. (Diag. 10).



**CLEVELAND TIN LIMITED**

APPROVED		SECTION 3060 N. PROPOSED D.D.H.	DRAWN	E.V.D.
			CHECKED	
DATE	23.9.85.			
DRAWING No	Diag. 10.		SCALE	1: 5000

REFERENCES

1. P. Collins. The Geology and Genesis of the Cleveland Tin Deposit Western Tasmania. Economic Geology Vol. 76 No. 2 pp 365 - 392. 1981

APPENDICES

APPEDIX A - GEOCHEMISTRY - ASSAYS

023

**ANALABS**

075024

25 MAR 1985

Phone (09) 458 7999

A division of MacDonald Hamilton & Co. Pty. Ltd.  
52 Murray Road, Welshpool, W.A. 6106

Telex AA92560

**ANALYTICAL REPORT No.** 23.3 08 2997

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

ORDER No.

PROJECT

Fiberfoyle Exploration Pty Ltd  
PO Box 952  
Burnie  
Tasmania 7320

R. DeBomford

DATE RECEIVED

RESULTS REQUIRED

18.3.85

ASAP

No. OF PAGES  
OF RESULTSDATE  
REPORTEDNo.  
OF COPIES

TOTAL No. OF SAMPLES

3

16

ST. OF SAMPLES	PRE-TREATMENT								ANALYSIS		
	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
PU	315676-315691							1	Cu Pb Zn Sn		101 402

As Above

REMARKS

RESULTS

TO

RESULTS

TO

STATE OF SAMPLES	ANALYSIS — PREPARATION				ANALYSIS — METHOD		
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorption	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tile	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER

*Profman 6*

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

23.3 08 2997

22.3.85

R. DeBomford

1 OF 2

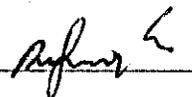
TUBE No.	SAMPLE No.	Cu	Pb	Zn						
1	315676	70	155	340						
2	315677	100	650	1200						
3	315678	125	430	745						
4	315679	100	220	215						
5	315680	100	385	345						
6	315681	135	105	155						
7	315682	50	50	70						
8	315683	70	735	1550						
9	315684	60	65	145						
10	315685	60	75	105						
11	315686	65	80	155						
12	315687	65	245	355						
13	315688	60	180	230						
14	315689	35	70	110						
15	315690	45	90	175						
16	315691	45	70	175						
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5						
24	DIGESTION									
25	METHOD	101	101	101						

Results in ppm unless otherwise specified

T = element present; but concentration too low to measure

X = element concentration is below detection limit

— = element not determined

AUTHORISED  
OFFICER


## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

23.3 08 2997

22.3.85

R. DeBomford

2 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Zn						
1	STD 3036	160	610	255						
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5						
24	DIGESTION									
25	METHOD	101	101	101						

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 — = element not determined

AUTHORISED OFFICER



**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		23.9 000 2997					28.9.85		R. DeBomfo		1 OF 1	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Pg	Sn						
1	315676	95	165	420	1.0	3				0	8m	
2	315677	75	610	995	1.5	X				8	17.5m	
3	315678	120	270	410	1.0	X				17.5	23.3	
4	315679	100	225	290	1.5	X				23.3	29.8	
5	315680	100	245	325	1.5	X				29.8	38.8	
6	315681	140	100	120	0.5	X				38.8	44.4	
7	315682	55	55	105	1.0	X				44.4	49.2	
8	315683	85	680	1600	2.0	X				49.2	57.6	
9	315684	70	60	190	1.0	X				57.6	63.3	
10	315685	70	65	140	1.5	4				63.3	75.5	
11	315686	60	95	185	1.0	X				75.5	78.7	
12	315687	70	145	320	1.5	X				78.7	82.3	
13	315688	55	120	300	1.5	5				82.3	86.4	
14	315689	40	70	160	0.5	X				86.4	94.5	
15	3156900	50	90	205	1.0	3				94.5	103.3	
16	315691	50	65	230	1.0	6				103.3	115.2	
17												
18												
19												
20												
21												
22												
23	DETECTION	5	5	5	0.5	3						
24	DIGESTION											
25	METHOD	103	103	103	101	402						

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AAS - Partial digestion  
 AAS - Total digestion  
 D.P.F.  
 AUTHORIZED OFFICER  
*[Signature]*

# CLEVELAND TIN LIMITED

Southern Utah Anomalies - Anom B (West) Line 2880 N Costean

## GENERAL ASSAY REPORT

5274

Date	Sample	PPM Sn	PPM Cu	PPM Pb	PPM Zn	% Cr.	Interval
	Alcofogle Ex 4804	<10	100	10	120	0.08	0 - 10m
	4805	<10	50	10	140	0.03	10m - 20m
	4806	<10	50	10	140	0.02	20 - 30m
	4807	<10	70	<10	160	0.08	30 - 40m
	4808	<10	90	10	140	0.06	40 - 50m
	4809	<10	140	10	140	0.07	50 - 60m
	4810	<10	70	<10	90	0.08	60 - 70m
	4811	<10	70	<10	180	0.22	70 - 80m
	4812	<10	100	<10	100	0.05	95 - 100m
	4813	<10	90	<10	90	0.11	100 - 110m
	4814	<10	70	<10	120	0.07	110 - 120m
	4815	<10	60	<10	100	0.11	120 - 130m

E.V.D. - Southern Utah  
costeans

Method

B1  
↓  
C1 C1 C1 C5

Interval  
from  
100m  
to  
130m  
Total  
from 100m  
to 130m  
costeans

ASSAYER

*Dennis Henne*

CHIEF ASSAYER

*[Signature]*

DATE

24/4/35







031

Cleveland Mine  
 Southern Utem - Costeans + Road-cutting

HOLE No.:

SHEET No.:

**SAMPLE DATA**

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL		Length (L)	Assays (A)				Product (A x L)		
				From	To		% Snt	% Sns	% Cu		P. Snt	P. Sns	P. Cu
							Cu (ppm)	Pb (ppm)	Zn (ppm)	Sn (ppm)			
Northern road-cutting	355 196	Dolomitic siltst.		17-2m			150	45	80	<10			
" " "	197	Ferrugin alter?		28-0m			400	200	160	<10			
Eastern Costeans 2880W	198	Sheared dol. silt.		-			60	20	50	<10			
	199	Leached dol. silt.		-			20	20	60	<10			
	200	Pyritic shale		-			60	20	50	10			
	201	Sheared shale		-			20	15	35	<10			
		on sst. contact		-									
		Method					C1	C1	C1	B1			

075032

APPENDIX B - PETROLOGY

## Central Mineralogical Services

---



39 Beulah Road  
Norwood, S.A. 5067  
Telephone 42 5659

Mr. E.V. Dronseika  
Senior Mine Geologist  
Aberfoyle Exploration Pty. Ltd.  
P.O.Box 952  
BURNIE / TAS. 7320

29th April, 1985

### REPORT CMS 85/4/11

YOUR REFERENCE: Letter dated 12.4.1985  
DATE RECEIVED: 15th April, 1985  
SAMPLE NOS.: 315773 - 315779  
SUBMITTED BY: E.V. Dronseika  
WORK REQUESTED: Petrology

 for

H.W. Fander, M. Sc.

Copy to:  
The Chief Geologist  
Aberfoyle Exploration Pty. Ltd.  
144, Camberwell Road  
HAWTHORN EAST / VIC. 3123

REPORT CMS 85/4/11

Seven rock chip samples from the Cleveland area were received for petrological examination. Representative thin-sections were prepared and examined together with their respective offcuts in transmitted and oblique incident light. Attached tabulated descriptions summarise the microscopic data and include interpretative comments.

Summary

This suite is a composite of sedimentary and altered igneous rocks, with finer detail in some samples partly obscured by weathering effects.

Sediments are sub- to labile, variably turbiditic psammopelitic types, volcanomict in part and generally incipiently sheared. Mineralogical assemblages reflect incipient ("chlorite grade") regional metamorphism locally complexed by marginal contact alteration (phlogopitisation). This group includes a pyritised-pyrrhotitic pelite (315774), but is generally unmineralised.

Igneous rocks range from basic (315776) through picritic (315778) to serpentinitised ultramafic (315777). The picrite and serpentinite appear closely related, with affinities to, for example, the Serpentine Hill complex. The moderately altered basalt (315776) appears to represent a separate facies, conceivably a younger minor intrusive, on the basis of contrasting alteration patterns. Interpretation, however, will be dependent on field evidence.

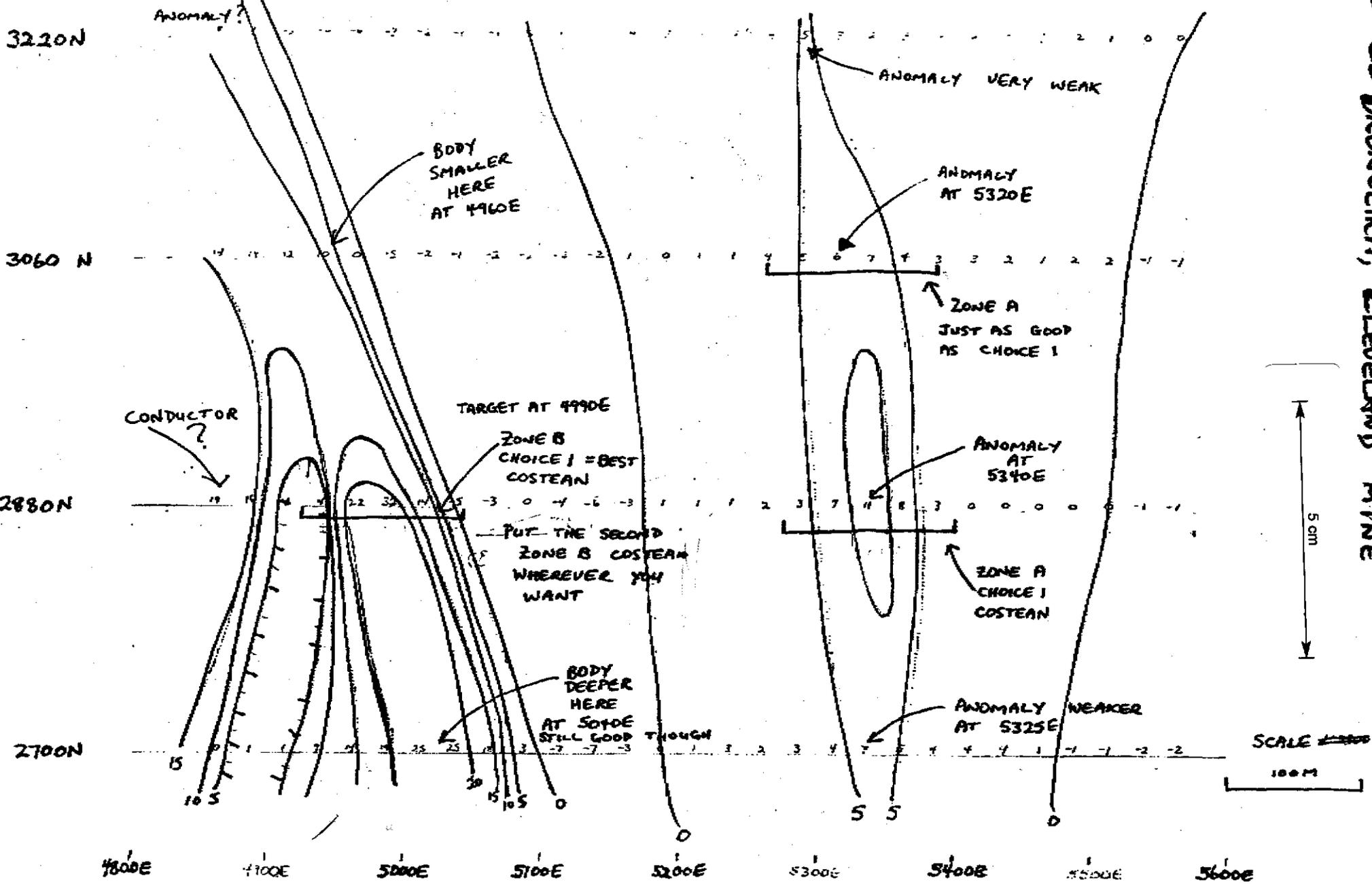
D. Cowan, B. Sc.

sample no.	Classification - Composition	Fabric	Accessories	Comments
315-773 (T.S. 53065)	<u>Weathered Sandstone</u> . Framework of montmorillonitic-degraded lithic clasts, minor quartz grains, degraded feldspar, mica flakes. Montmorillonitic-degraded chlorite matrix. Disseminated cavities after carbonate rhombs.	Relict turbiditic silty fine sandy clastic; weakly bedded.	Conspicuous clastic silt-sized leucoxenic semi-opaques. Minor clasts of carbonaceous pelite.	Thoroughly weathered labile greywack apparently basic-volcanomict ("tuffaceous"), weakly dolomitic. Detail obscured by weathering effect
315-774	<u>Pyritic Pelite</u> . Semi-sericitic white mica with closely intergrown chlorite, subordinate to minor silt-sized clastic mica flakes, quartz grains. Pervasively disseminated microscopic films, clots of pyrite.	Weakly siltstone-parted, massive to weakly laminated silty shale. Incipiently concordantly sheared.	Conspicuous fine silt-sized detrital leucoxenic semi-opaques; traces sericitic degraded splintery clastic	Incipiently sheared chloritic-sericitic silty shale. Pyrite is secondary after "syngenetic" pyrrhotite; partly remobilised into feldspar. late microfractures.
315-775	<u>Ferruginised Greywacke</u> . Interspersed lenses, clasts of variably hematite-pigmented chloritic shale, silty shale and chlorite-matrixed silty fine-grained turbiditic labile to quartzose sandstone.	Slump breccia-like, but confused by shearing/boudinaging effects.	Abundant extensively martitised fine-grained clastic magnetite.	Slump-brecciated labile turbiditic sandstone/siltstone/silty shale intercalation. Semi-pervasive ultrafine hematite derived from clastic magnetite.
315-776	<u>Altered Basalt</u> . Albitised/chlorite-stained plagioclase laths with incipiently chloritised, colour-zoned pyroxene (titaniferous pale brown to colourless augite) and a sparse chlorite mesostasis. Disseminated leucoxenised	Fine-grained "doleritic" (sub-ophitic). Incipiently stressed. ilmenite.	Traces of fine- to ultrafine-grained pyrrhotite (partly pyritised).	Moderately altered, incipiently stressed basalt, trend medium-grained ophitic, consistent with core zone of thick flow or, alternately, a minor intrusive.
315-777	<u>Altered Serpentinite</u> . Variably Fe-stained intergrowths of pale and bright green chlorite with patchy "serpentine"- and locally "tremolite"-derived textures.	Variable. Phyllitic to vaguely relict mesh-textured, "serpentinitic".	Thinly disseminated fine-grained relict primary chromite, leucoxenic semi-opaques.	Chloritised serpentinite, reflecting localised tremolitic alteration. Vague relict mesh textures, consistent with derivation from a medium-grained dunite or peridotite.
315-778	<u>Altered, Weathered "Picrite"</u> . Variably Fe-stained pyroxene and relatively minor feldspar-pseudomorphous talc aggregates with minor intergrown chlorite. Sporadic irregular talc veinlets.	Relict medium, even-grained, weakly ophitic "doleritic". Mildly sheared veinlets.	Conspicuous fine relict primary chromian magnetite, leucoxenised opaques.	Primarily a strongly pyroxenic (ortho- and clinopyroxene), medium-grained basic. Ultramafic-related. Thoroughly steatitised, extensively weathered.
315-779 (T.S. 53071)	<u>Lithic Sandstone</u> . Framework of variably Fe-stained/degraded phlogopitic felsic intermediate lava and pelite clasts, subangular quartz, sericitic feldspar, mica flakes. Fe-stained phlogopitic matrix.	Weakly bedded, poorly sorted (silty fine to medium) sandy clastic. Incipiently sheared.	Clastic leucoxenic semi-opaques, minor clasts of impure chert, cherty argillite. Traces of graphite.	Moderately altered (phlogopitised) quartzose-micaceous sublabile lithic sandstone. Marginal contact alteration pattern. Extensively weathered.
	075036			

035

APPENDIX C - GEOPHYSICS

Ed, a picture is worth a thousand words; the words will come later. Tom  
 CLEVELAND UTEM - FRASER FILTER OF CH 6

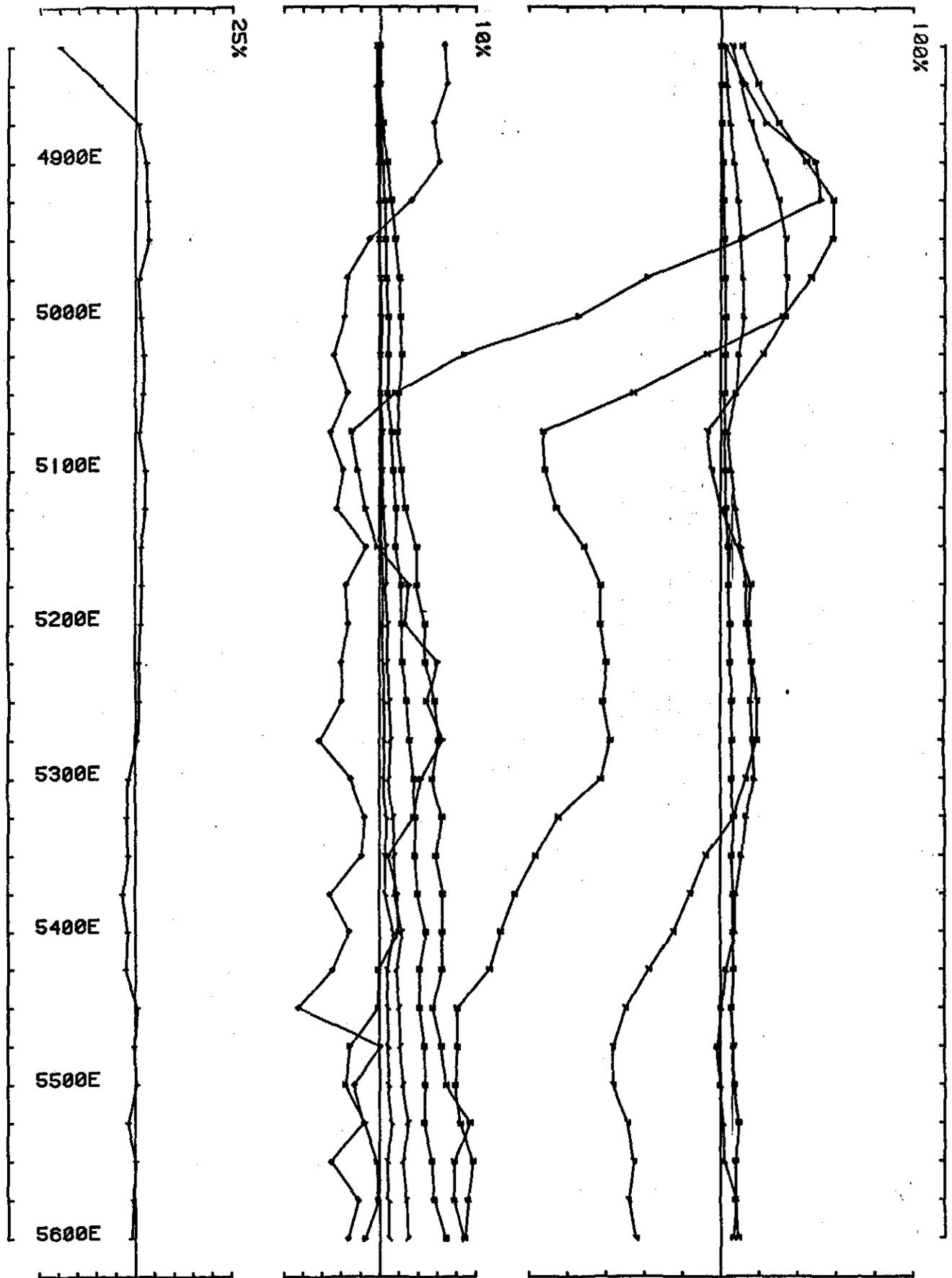


037B ED DRONSEIKA, CLEVELAND MINE

FROM 1086

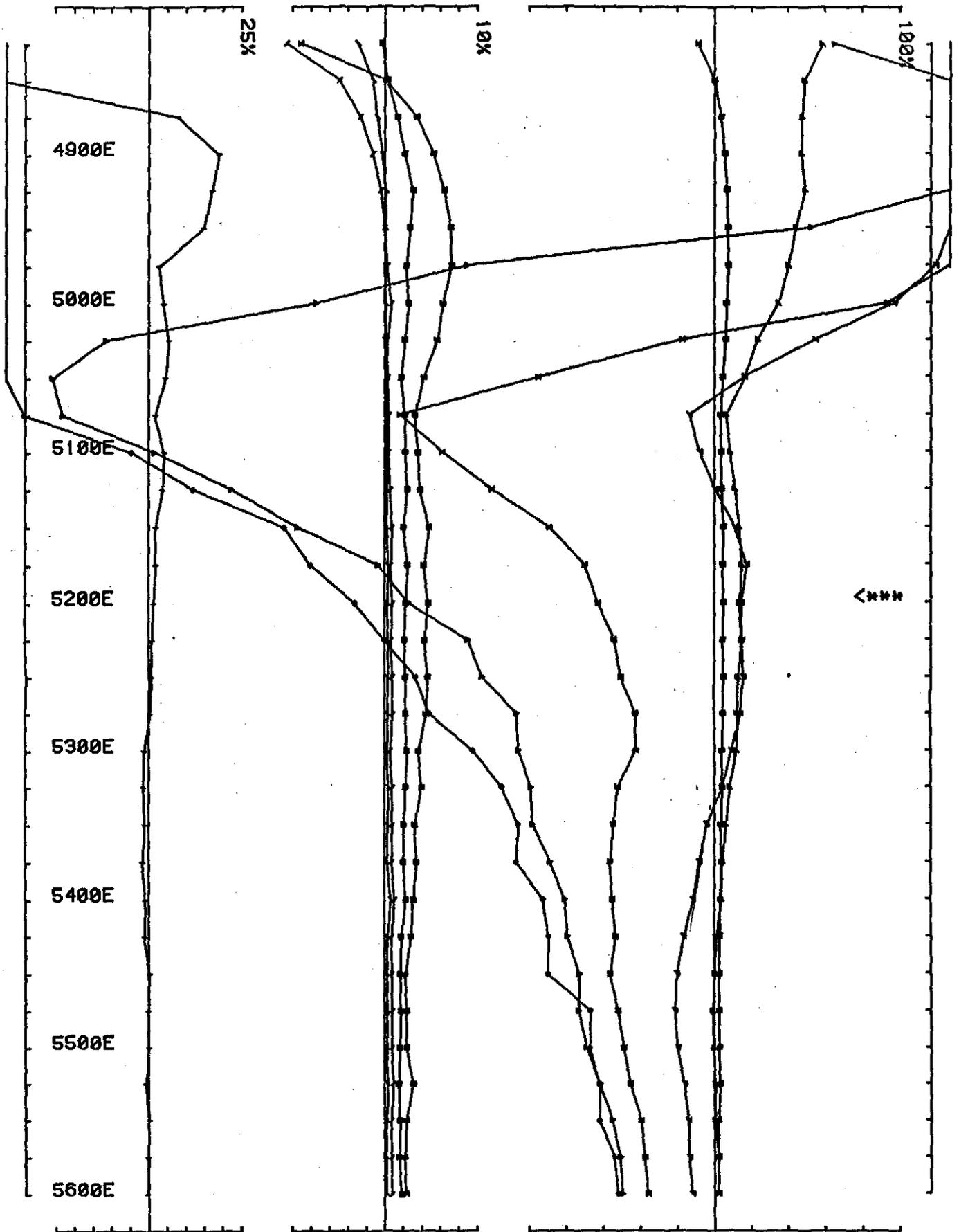
85.03.14 09105

075038



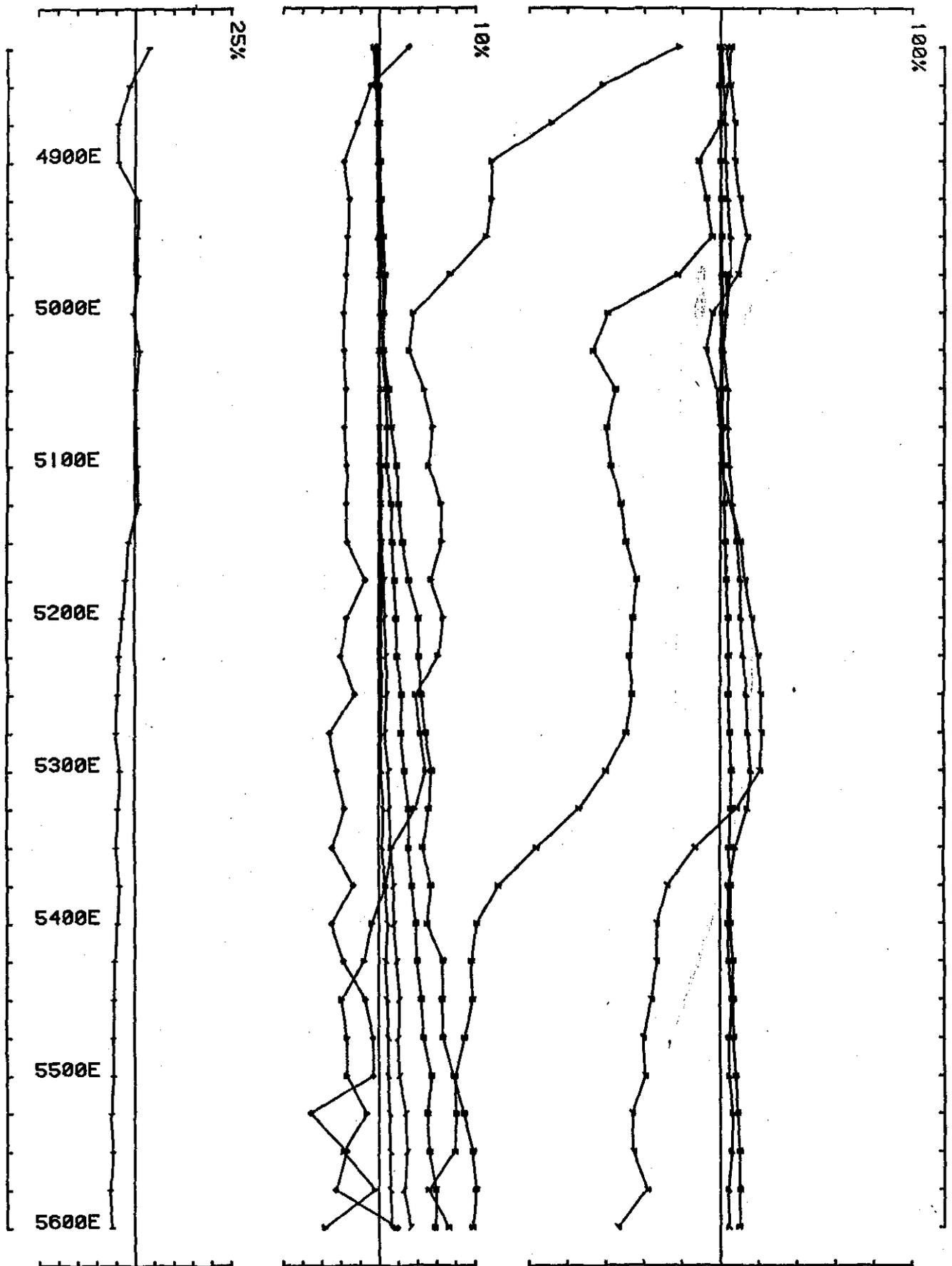
UTEM SURVEY conducted by PMM DGH Job 8549  
Project Area Cleveland Survey for Aberfoyle Exploration freq(hz) 26.230  
Loopno 0001 Line 2700N component Hz secondary Ch 1.

FIGURE 1



UTEM SURVEY conducted by PMM DGH Job 8549  
Project Area Cleveland Survey for Aberfoyle Exploration freq(hz) 26.230  
Loopno 0001 Line 2700N component Hz secondary Ch 1

FIGURE 2

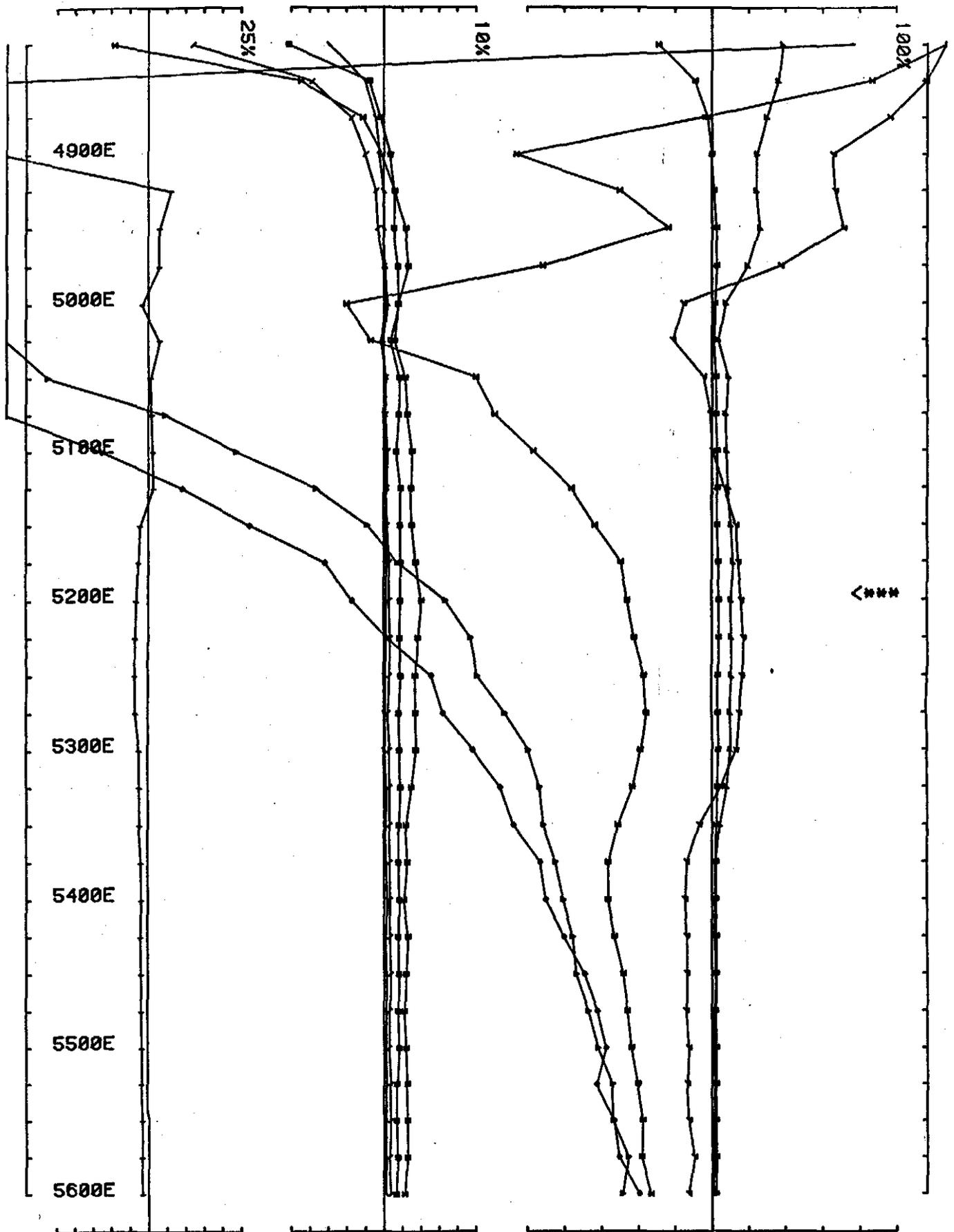


UTEM SURVEY conducted by PMM DGH Job 8549  
Project Area Cleveland Survey for Aberfoyle Exploration freq(hz) 26.230  
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FIGURE 3

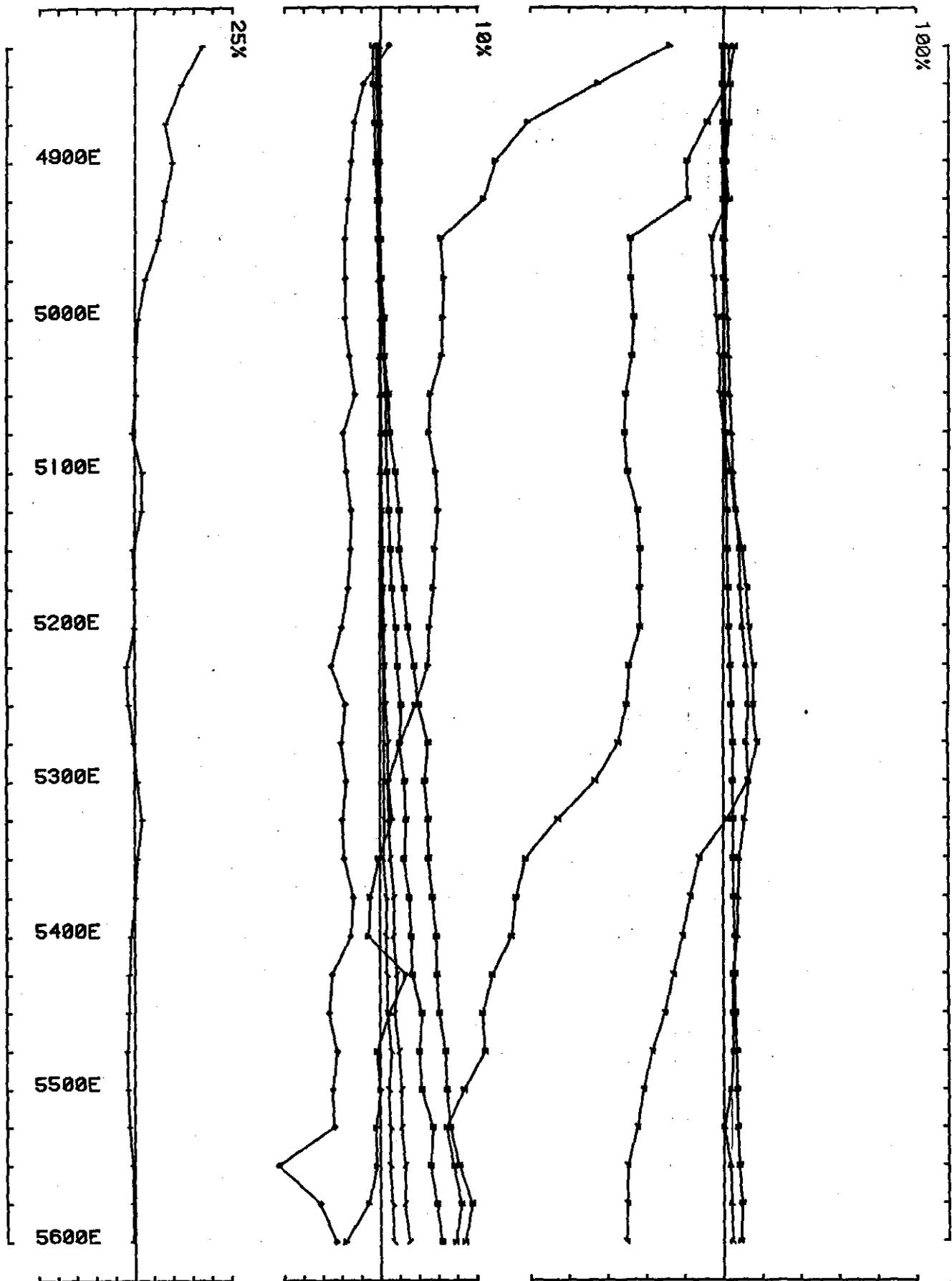
041

075042



UTEM SURVEY conducted by PMM DGH Job 8549  
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FIGURE 4

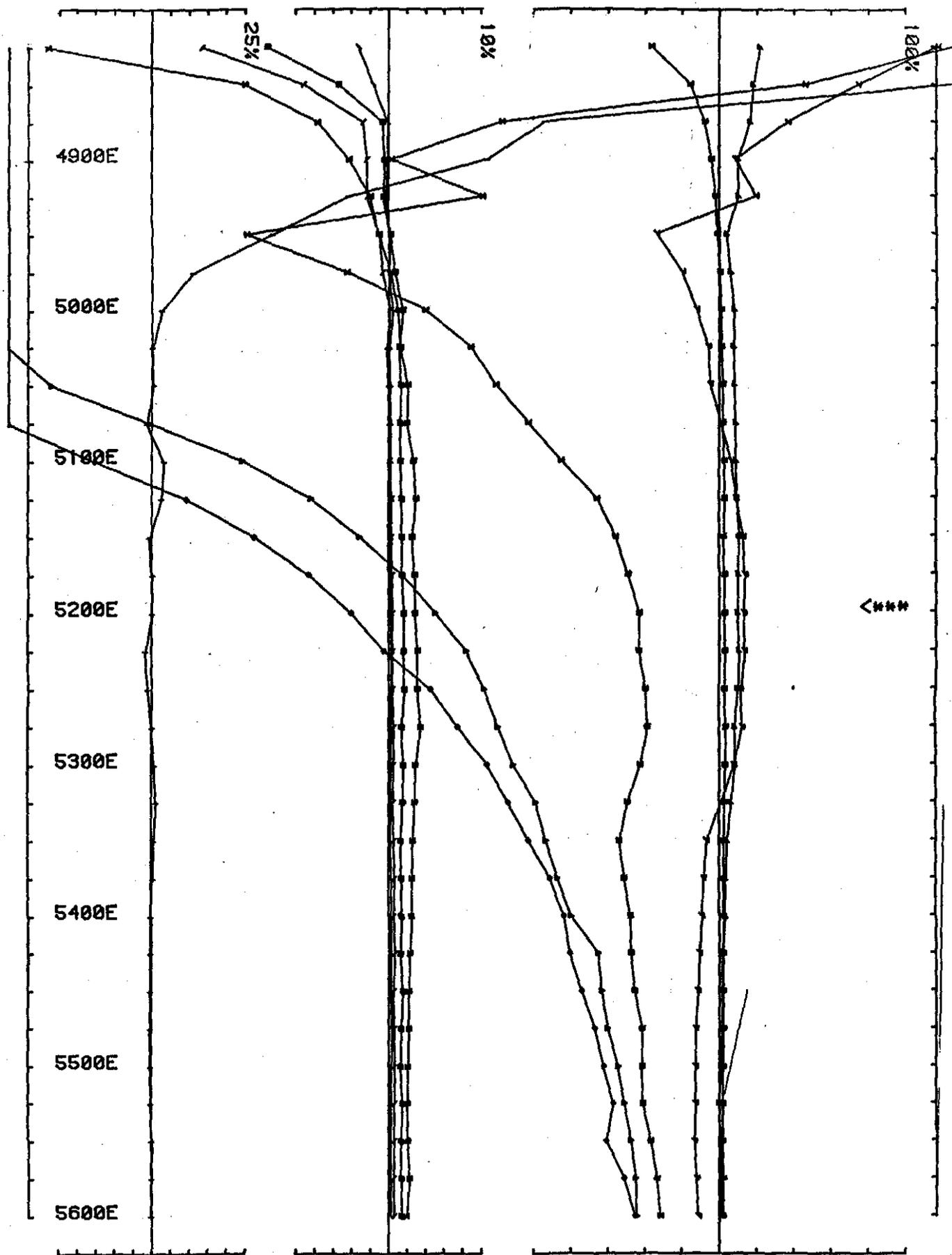


UTEM SURVEY conducted by PMM DGH Job 8549  
Project Area Cleveland Survey for Aberfoyle Exploration freq(hz) 26.230  
Loopno 0001 Line 3060N component Hz secondary Ch 1.

FIGURE 5

043

075044

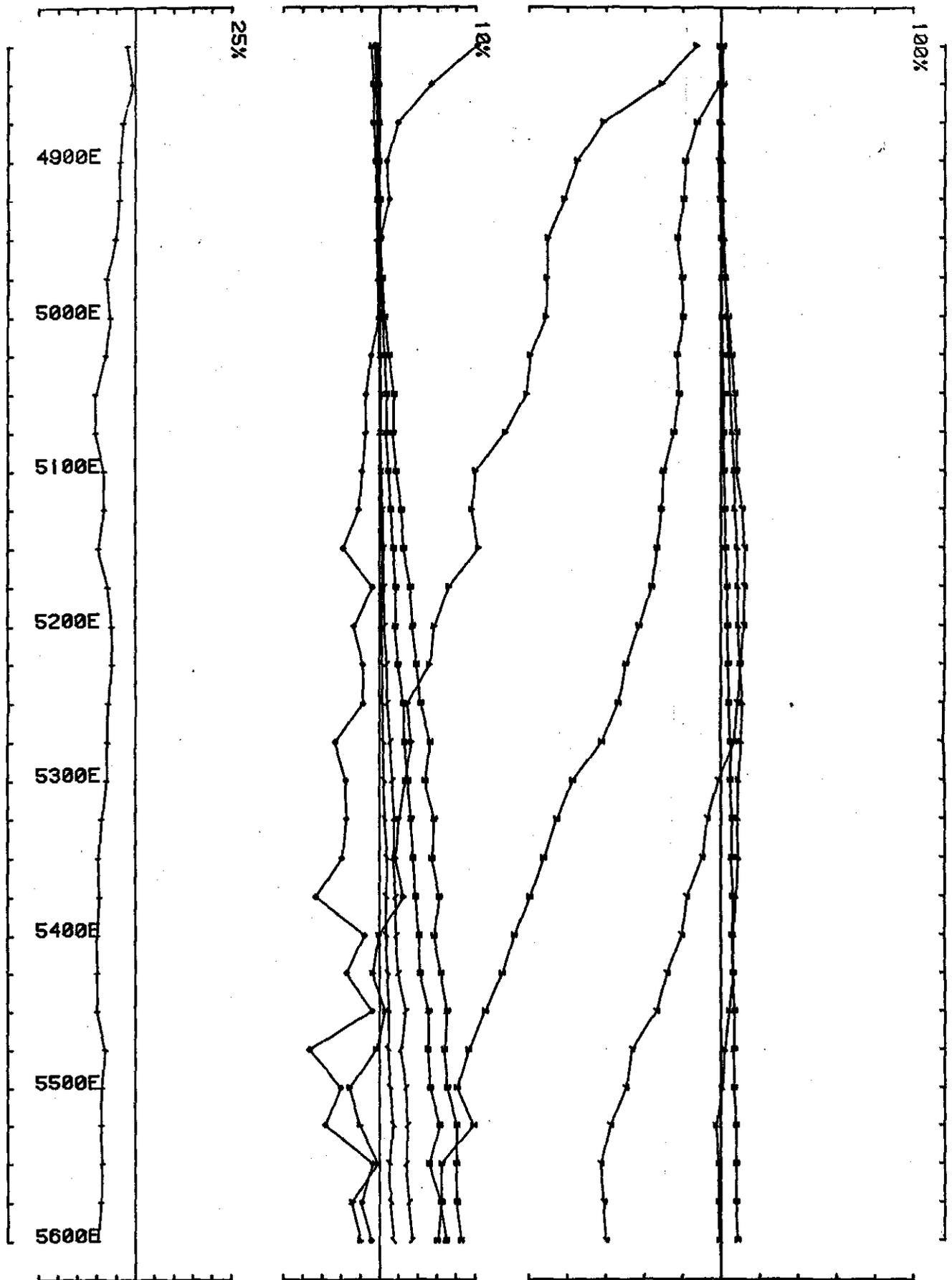


UTEM SURVEY conducted by PMM DGH Job 8549  
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FIGURE 6

044

075045

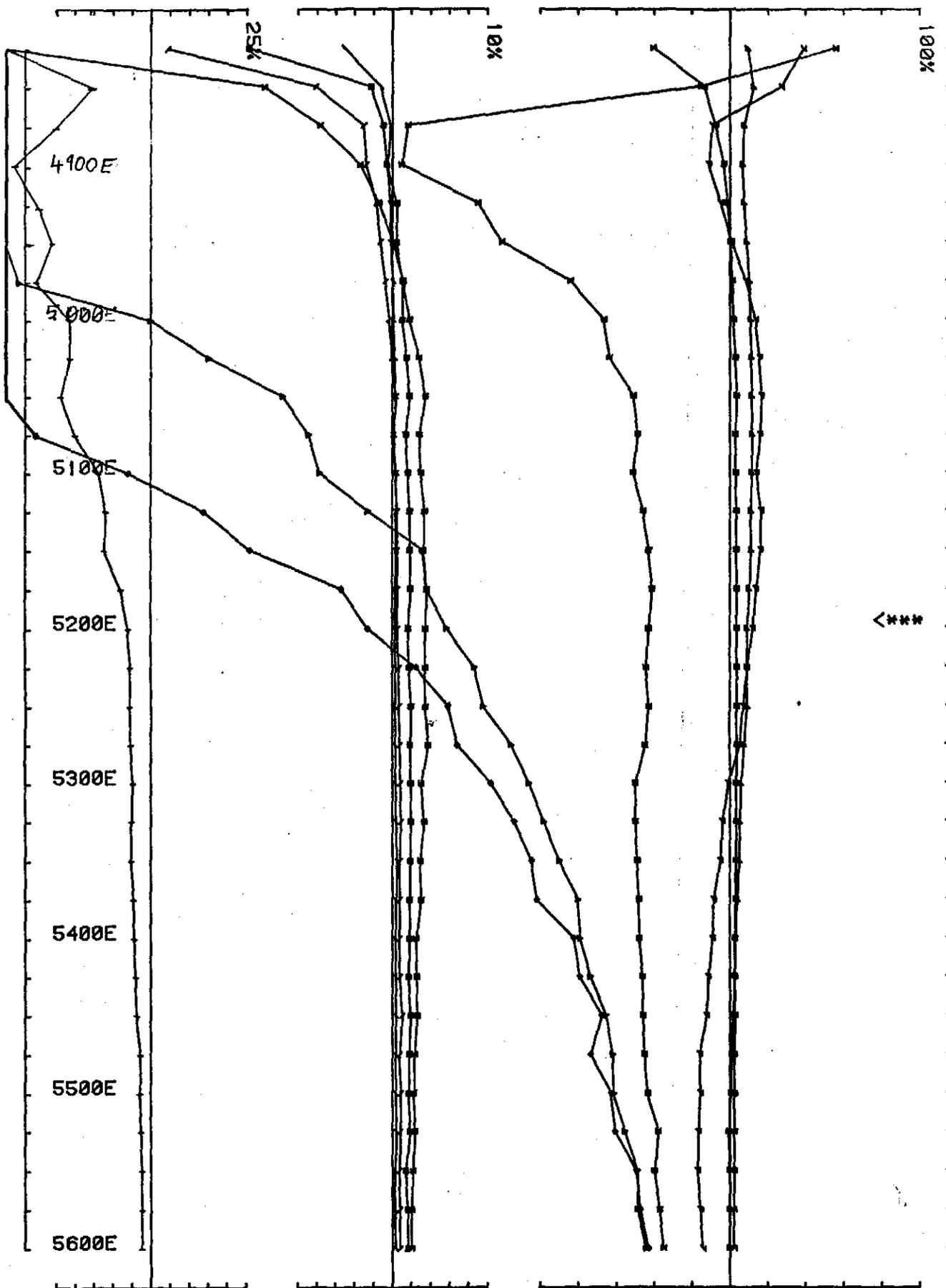


UTEM SURVEY conducted by PMM DGH Job 8549  
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Loopno 0001 Line 3240N component Hz secondary Ch 1.

FIGURE 7

045

075046



UTEM SURVEY conducted by PMM DGH Job 8549  
Project Area Cleveland Survey for Aberfoyle Exploration freq(hz) 26.230  
Loopno 0001 Line 3240N component Hz secondary Ch 1.

FIGURE 8

ABERFOYLE

MEMORANDUM

---

Date	30 September 1985	Ref	ETE:ES
To	Ed Dronseika	From	Tom Eadie
At	Cleveland Tin	At	Hawthorn
Copies to		Keep	

---

Subject UTEM At Cleveland

Introduction

In 1979, a UTEM survey covered much of the prospective stratigraphy north and south of the Cleveland mine. Only one area was considered to be worth further work. This was at the extreme south end of the grid.

In 1985, this area was recut and resurveyed with UTEM. The UTEM data is shown, both continuously and point normalized, in Figures 1 to 8. Two conductors were recognized, both of which can be traced right across the grid (Figure 9).

Interpretation

The two conductors have been named Zone A which is in the central area of the grid and Zone B, which is to the west. The exact surface projections of these zones are shown in the Fraser-filtered channel 6 data in Figure 9. The best part of Zone A is on L2880N. However even here the conductor must be considered weak, with a time constant of less than 0.2 milliseconds. The source of the anomaly must be less than 50 metres deep.

The Zone B anomaly is caused by a small shallow body which is most clearly defined on L2880N. This also is a very weak conductor.

Costeans over the surface projections of the anomalies gave the results described by Ed Dronseika in his report. It is apparent that enough conductive material (shale, clay alteration, weathered iron sulphides, etc.) was found in these costeans to explain the UTEM anomalies.

Conclusion

The best of the UTEM anomalies in the Cleveland area have been explained by costeans. No further work is necessary on the basis of geophysics.

E T EADIE  
Geophysicist

*Tom Eadie*

APPENDIX D - PLANS - SECTIONS

APPENDIX E - PHOTOGRAPHIC PLATES



Plate E. 1 Costean Anom. A. 2880N (Looking East)



Plate E. 2 Road-cutting Anom. A 3060N. Note ferruginous zone in road-cutting exposure right of centre. (Looking North)

051

075052



Plate E. 3 Costean Anom. B 3060N (Looking West)

052

075053



Plate E. 4 Costean Anom. B 2880N (Looking West)

053

075054



Plate E. 5 Weakly dolomitic siltstone. Costean Anom. A 2880N  
(cms. scale on geo-pick)

054



Plate E. 6 Costean Anom. A 2880N Massive mica sandstone on left adjacent to sheared grey shale. (cms. scale on geo-pick)

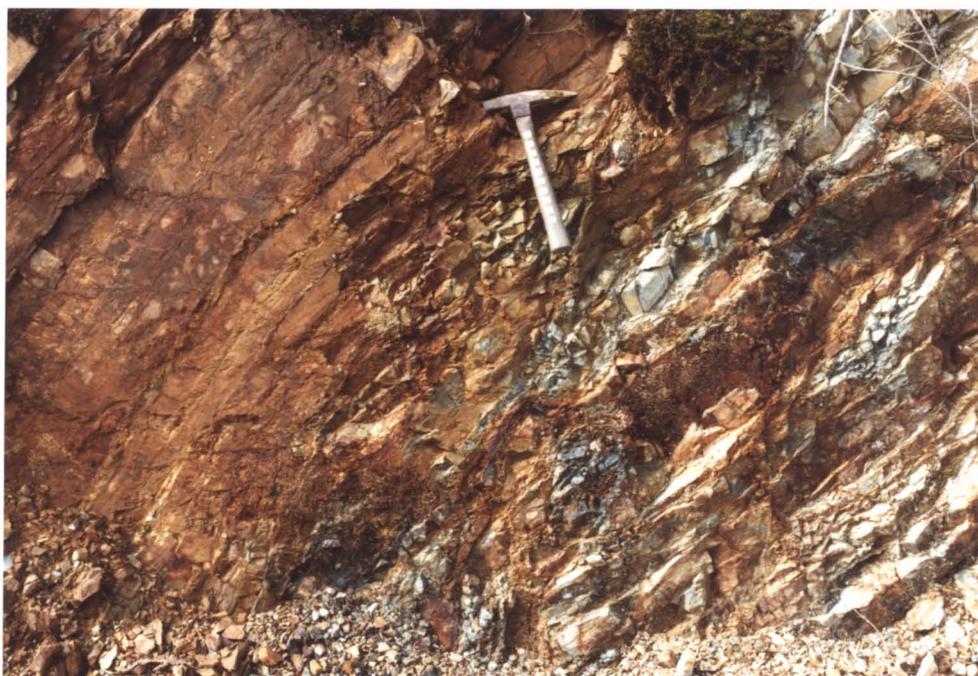


Plate E. 7 Road-cutting Anom. A 3060N (Eastern End) Jointed siliceous shale and chert. Ferruginous on left side. (cms. scale on geo-pick)



Plate E. 8 Costean Anom. B 3060N Weathered serpentinite left of pick, mica sandstone right side. (cms. scale on geo-pick)

APPENDIX F - EXPENDITURE

CODE	ACCOUNT DETAIL	BUDGET FULL YEAR	VALUE THIS PERIOD	VALUE Y. T. D.	BALANCE
<b>WP-308 CLEVELAND MINE UTEM</b>					
1401	GEOLOGY - SALARIES	750.00	120.00	1605.00	(855.00)
1402	GEOLOGY - WAGES	0.00	0.00	510.00	(510.00)
1403	GEOLOGY - CONTRACTORS	200.00	0.00	277.50	(77.50)
1404	GEOLOGY - MATERIALS	100.00	0.00	0.00	100.00
1406	GEOLOGY - FUEL	150.00	0.00	0.00	150.00
1410	GEOLOGY - DISTRICT ACCOMMODATION	300.00	0.00	24.99	275.01
1411	GEOLOGY - FREIGHT	0.00	21.14	50.82	(50.82)
1412	GEOLOGY - VEHICLE COSTS	175.00	15.00	205.00	(30.00)
<b>TOTAL GEOLOGY</b>		<b>1675.00</b>	<b>156.14</b>	<b>2673.31</b>	<b>(998.31)</b>
1702	SURVEY - WAGES	0.00	0.00	164.00	(164.00)
1703	SURVEY - CONTRACTORS	2600.00	0.00	2774.00	(174.00)
1704	SURVEY - MATERIALS	100.00	0.00	87.50	12.50
<b>TOTAL SURVEY</b>		<b>2700.00</b>	<b>0.00</b>	<b>3025.50</b>	<b>(325.50)</b>
2001	GEOPHYSICS - SALARIES	480.00	0.00	650.00	(170.00)
2002	GEOPHYSICS - WAGES	2610.00	0.00	656.00	1954.00
2003	GEOPHYSICS - CONTRACTORS	0.00	0.00	1998.64	(1998.64)
2005	GEOPHYSICS - TRAVELLING	500.00	0.00	301.70	198.30
2006	GEOPHYSICS - FUEL	0.00	0.00	11.00	(11.00)
2012	GEOPHYSICS - VEHICLE COSTS	0.00	0.00	35.00	(35.00)
<b>TOTAL GEOPHYSICS</b>		<b>3590.00</b>	<b>0.00</b>	<b>3652.34</b>	<b>(62.34)</b>
2602	GEOCHEMISTRY - WAGES	410.00	0.00	164.00	246.00
2604	GEOCHEMISTRY - MATERIALS	100.00	0.00	0.00	100.00
2610	GEOCHEMISTRY - DISTRICT ACCOMMODATI	200.00	0.00	0.00	200.00
2621	GEOCHEMISTRY - ASSAYS	900.00	0.00	387.52	512.48
<b>TOTAL GEOCHEMISTRY</b>		<b>1610.00</b>	<b>0.00</b>	<b>551.52</b>	<b>1058.48</b>
3003	TRENCHING - CONTRACTORS	1800.00	0.00	1200.00	600.00
<b>TOTAL TRENCHING</b>		<b>1800.00</b>	<b>0.00</b>	<b>1200.00</b>	<b>600.00</b>
6101	TENURE - SALARIES	0.00	75.00	615.00	(615.00)

100  
075058

ABERFOYLE EXPLORATION PTY-LTD

PROJECT COST REPORT

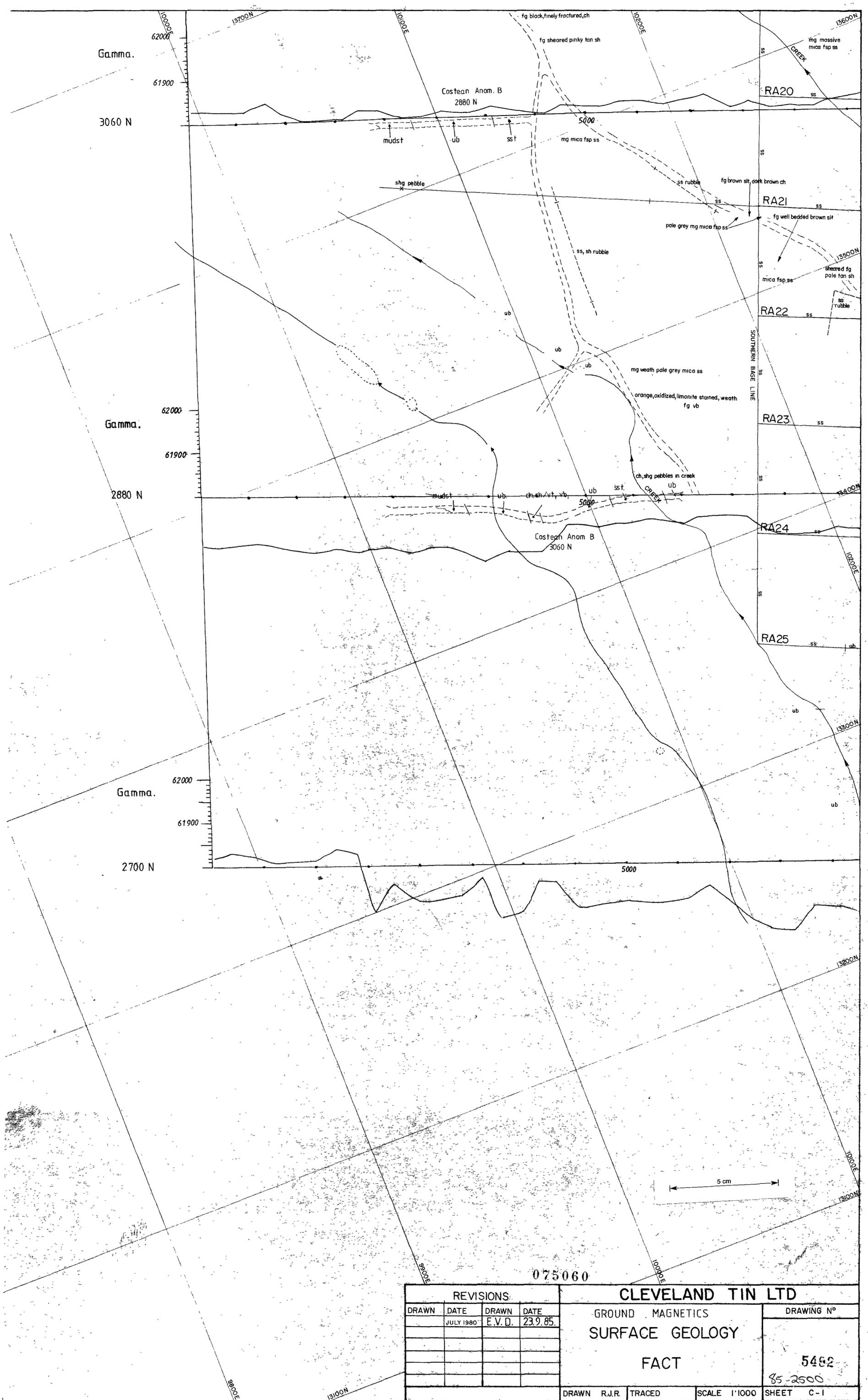
18OCT85 23:20

AS-AT PERIOD : 11 1985

CODE	ACCOUNT-DETAIL	BUDGET FULL-YEAR	VALUE THIS PERIOD	VALUE Y.T.D.	BALANCE
TOTAL TENURE		0.00	75.00	615.00	(615.00)
7001 OTHER SERVICES	SALARIES	230.00	650.00	800.00	(570.00)
7004 OTHER SERVICES	MATERIALS	60.00	252.40	297.40	(237.40)
7007 OTHER SERVICES	COMMUNICATIONS	215.00	23.77	258.95	(43.95)
7011 OTHER SERVICES	FREIGHT	0.00	55.43	72.68	(72.68)
TOTAL OTHER SERVICES		505.00	981.60	1429.03	(924.03)
9070 INDIRECT COSTS	ADMINISTRATION	1720.00	181.91	1971.95	(251.95)
TOTAL INDIRECT COSTS		1720.00	181.91	1971.95	(251.95)
**TOTAL WP-308 CLEVELAND MINE UTEM		13600.00	1394.65	15118.65	(1518.65)

058

075059



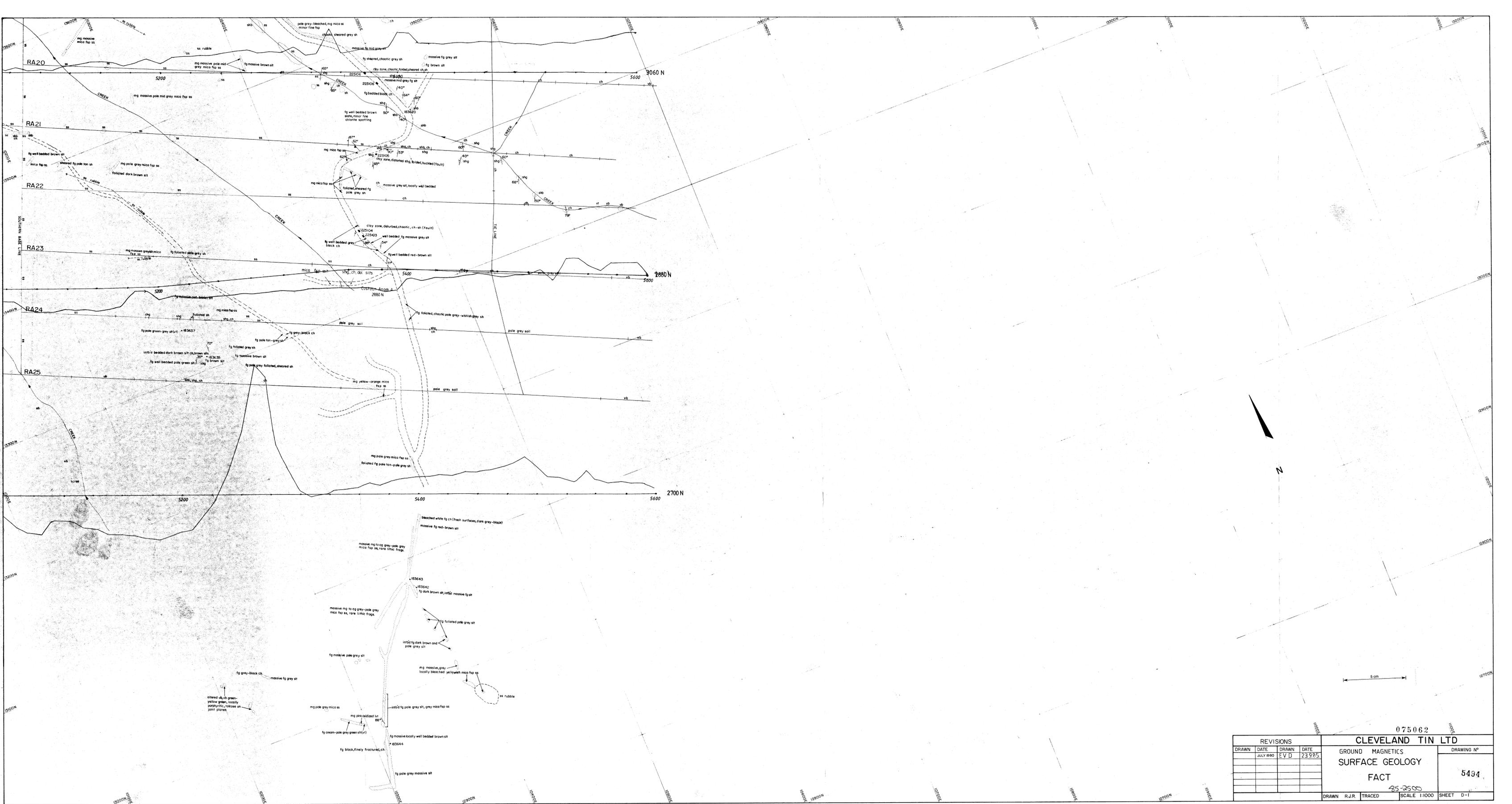
REVISIONS			
DRAWN	DATE	DRAWN	DATE
	JULY 1980	E.V.D.	23.9.85

**075060**

**CLEVELAND TIN LTD**

GROUND MAGNETICS	DRAWING N°
SURFACE GEOLOGY	
FACT	5482
	85-2500
DRAWN R.J.R. TRACED	SCALE 1"=1000 SHEET C-1



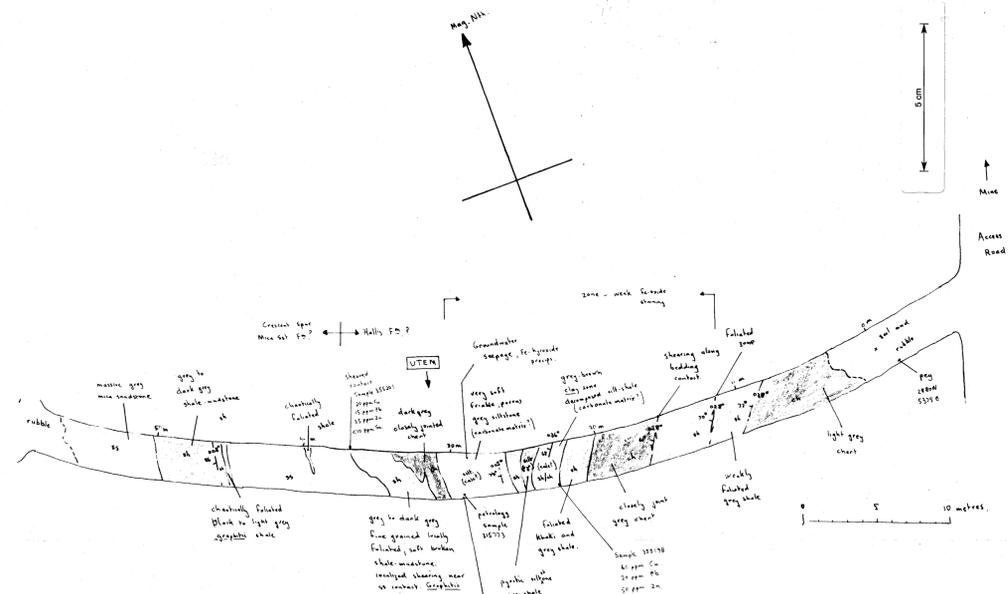


REVISIONS			
DRAWN	DATE	DRAWN	DATE
	JULY 1980	EV D	23 1985

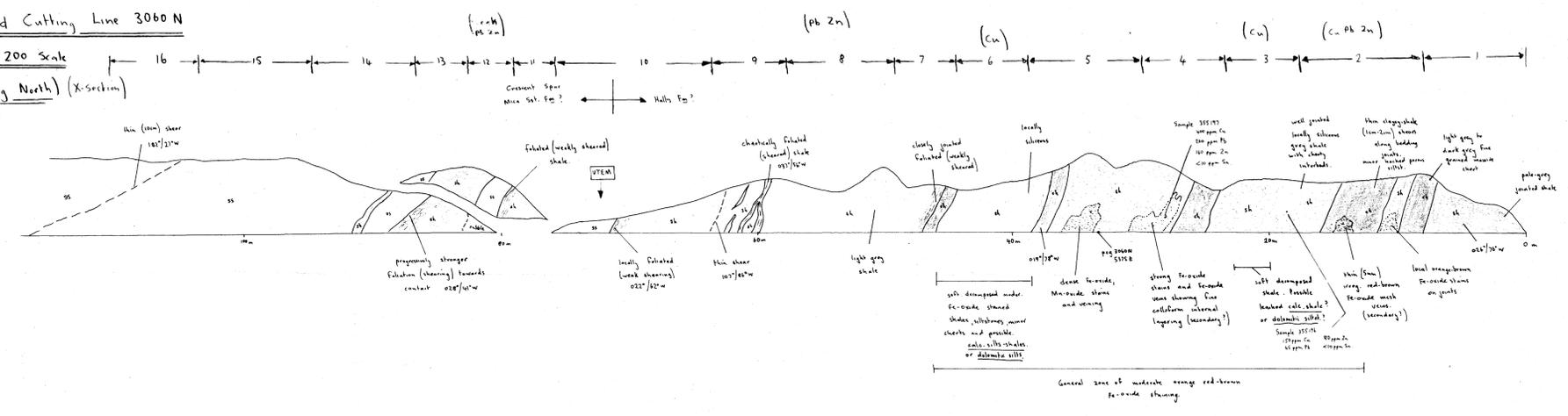
075062	
<b>CLEVELAND TIN LTD</b>	
GROUND MAGNETICS	DRAWING N°
SURFACE GEOLOGY	5494
FACT	
95-2500	
DRAWN R.J.R.	TRACED
SCALE 1:1000	SHEET D-1



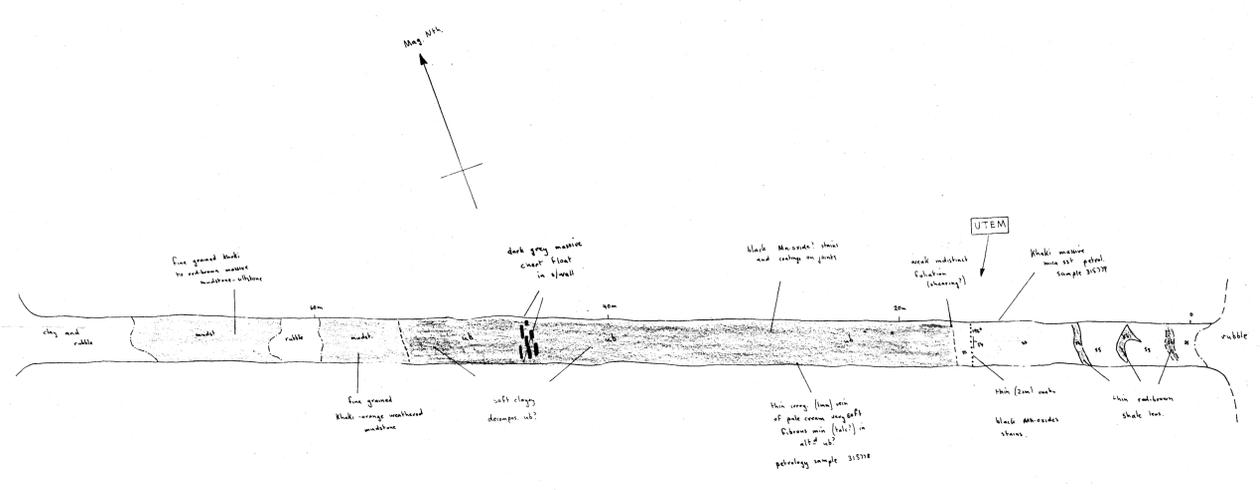
Anomaly A (East)  
 Costean Line 2880N  
 1:200 Scale (Plan view)



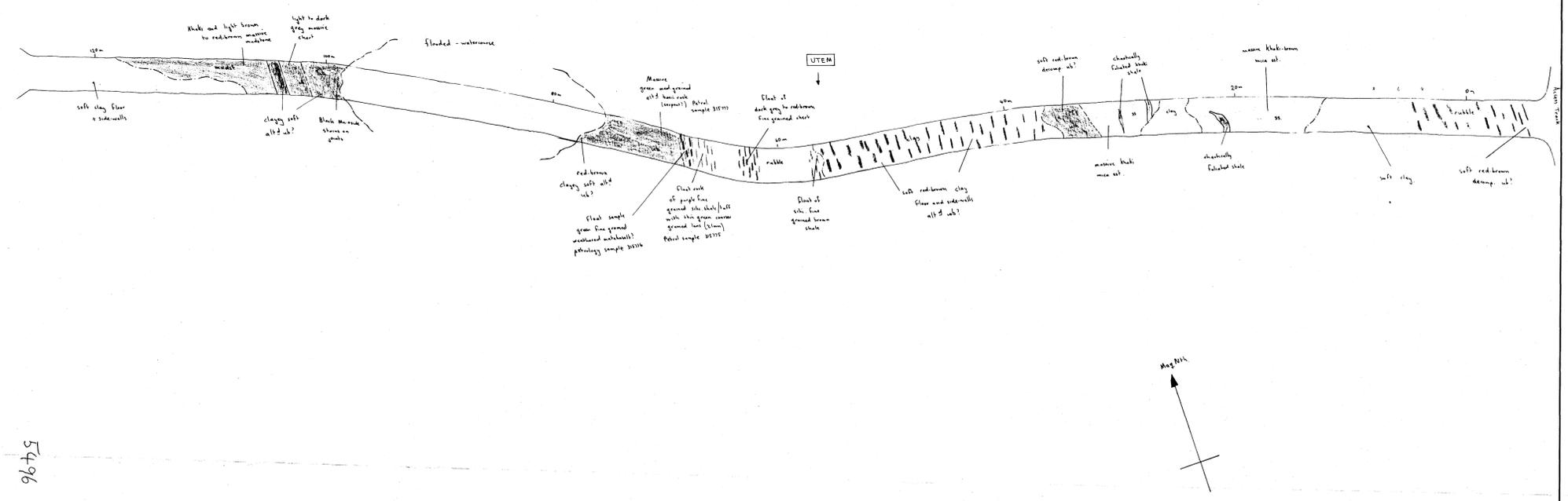
Anomaly A (East)  
 Road Cutting Line 3060N  
 1:200 Scale  
 (Looking North) (X-section)



Anomaly B (West)  
 Costean Line 3060N  
 1:200 Scale (Plan view)



Anomaly B (West)  
 Costean Line 2880N  
 1:200 Scale (Plan view)



9645