000

963001

C.R.A. EXPLORATION PTY. LIMITED

EXPLORATION AT THE LAKE BARRINGTON COPPER PROSPECT, SHEFFIELD EL 7/73, NORTHERN TASMANIA

JULY 1979 - MARCH 1981

AUTHOR : J.G. PURVIS

DATE : 10th APRIL 1981

SUBMITTED TO : T.W. DICKSON

ACCEPTED BY : T.W. Dickson

COPIES :
CRAE LIBRARY (MELBOURNE)
DEPT OF MINES (TASMANIA)
CRAE BURNIE OFFICE
CRAE HOBART OFFICE
CARPENTARIA EXPLORATION CO.

10520

CONTENTS

1. SUMMARY

Two diamond drillholes have been put down at the Lake Barrington copper prospect, which is situated within the Sheffield EL 7/73 (Asarco-CRAE JV), in Northern Tasmania.

The holes were aimed at a 400m long coincident copper geochemical/ IP anomaly within Cambrian acid volcanic tuffs and lavas.

Drillhole DD 80 LB1 intersected 0.1m of banded massive sulphide within fine grained altered tuff between 179.4 - 179.5m, assaying 14% Cu, 0.75% Pb, 0.59% Zn, 84 ppm Ag and 1.35 ppm Au. Some core was lost in this interval and the sulphide could be as much as 0.75m in true width. Mineralogical study of the massive sulphide has confirmed the logging interpretation that it is a conformable syngenetic sulphide sediment.

Both drillholes intersected widespread dispersed copper mineralisation within the acid volcanic tuffs. Best intersections, apart from the massive sulphide, were:

DD 80 LB1:	18	- 18.3m	0.3m @ 1.88% Cu
	21.7	- 22.3m	0.6m @ 0.77% Cu
	31.5	- 46.7m	15.2m @ 0.38% Cu
DD 80 LB2:	87	- 89 m	2m @ 0.37% Cu
	190	- 192 m	2m @ 0.76% Cu
	226	- 227 m	1m @ 0.56% Cu
	247	- 250 m	3m @ 0. 5% Cu
	270	- 286 m	16m @ 0.31% Cu

The intersection in drillhole LB1 is the first massive sulphide discovered within the acid volcanics on the Sheffield EL. Despite its narrow width, the find is highly significant because it represents a time-space horizon within the volcanic episode along which massive sulphides were actually being deposited. Elsewhere along this horizon conditions potentially may have been favourable for the accumulation of a significant body of massive sulphide.

A programme of further drilling on this horizon is recommended.

2. CONCLUSIONS

1. The massive sulphide intersected in drillhole DD 80 LB1 is a conformable syngenetic sulphide sediment. Further massive sulphide can be expected along strike on the same horizon.

2. From the drilling results, the copper mineralisation in the volcanics appears to be strengthening eastwards towards the lake. The massive sulphide is most likely to be stronger in this direction also.

3. The massive sulphide is associated with an IP anomaly. The geophysical results confirm the eastward extension of the mineralisation, and also suggest that it may improve at depth.

3. RECOMMENDATIONS

Further diamond drilling is recommended to test the horizon on which massive sulphides were encounted in drillhole LB1.
The recommended programme is (in proposed order of drilling):

1. DD 80 LB1 to be re-entered and wedged off above the massive sulphide.
The wedged hole to be drilled to get a full-recovery intersection of the massive sulphide a few meters from LB1, and to continue to 100 - 150m beyond the present end of LB1, to test the zone of copper mineralisation in tuffs believed to be in this area by extrapolation from LB2.

2. Hole 'A' to be sited on section 4700E 5m north of LB1 and drilled under this hole so as to pass 50 - 60m vertically beneath the massive sulphide intersection.
The length of hole 'A' to be determined by the results of the wedged continuation of LB1.

3. Hole 'B' to be sited on section 4800E so as to pass through a point 140m vertically beneath 4750N.
From the geophysical and geological evidence, this position is believed to be the strike continuation of the massive sulphide horizon.

In addition to the drilling programme, it is recommended that maximum use of downhole geophysics be made to try and delineate the strike extensions of the massive sulphide horizon. A downhole electrode has already been placed in the sulphide zone in hole LB1.

4. INTRODUCTION

The Lake Barrington copper prospect lies within the 199 sq km Sheffield EL 7/73 (Asarco-CRAE Joint Venture).

The prospect was initially delineated by Asarco in 1973, as a 1300 ppm Cu drainage anomaly in a creek draining 0.5 sq km of acid volcanic rocks on the steep western shores of Lake Barrington.
Asarco gridded the prospect, mapped it, and carried out soil and rock sampling. Although soil anomalies up to 2800 ppm Cu were outlined, no signs of mineralisation could be found in the volcanics and Asarco ceased work in 1975.

In July 1979, a reconnaissance survey of the prospect by G.Purvis of CRAE found evidence of sulphide mineralisation in some of the volcanics in the area of the main soil anomaly, and deposits of secondary limonite highly anomalous in copper, in the bed of the creek.

CRAE commenced systematic exploration in the area of the main soil anomaly in mid 1980. This work comprised gridding, mapping, rock sampling, magnetometer and dipole-dipole IP surveys.
The rock sampling obtained results up to 0.94% Cu with minor silver and gold, but pyrite was the only sulphide seen and to date no copper minerals have been noted on surface in the mineralised volcanics.

The IP survey delineated a 400m long chargeability and resistivity anomaly coincident with the main soil anomaly, and in November 1980 two diamond drillholes totalling 485m were put down to test this zone.

This report details the results of all CRAE work done to date. The programme has been carried out by G.Purvis with assistance from J.Couper (Contract Geologist), who supervised the drilling while Purvis was absent on leave.
The geophysical surveys were designed and supervised by M.Flis.

A recommended programme of further drilling is outlined.

5. GEOLOGY

5.1 ROCK TYPES

Details of the geological units present are given in the legends of the geological plan and sections, at the back of this report.

The prospect occurs within a steeply-dipping Cambrian sequence of predominantly rhyolitic volcanics, with some intercalated dacitic and andesitic volcanics.

Rock types present include lavas, coarse tuffaceous debris (breccio-conglomerates and grits), finer grained vitric tuffs and fine tuffaceous sediments (tuff-shales and tuffaceous siltstones).

On surface, evidence of hydrothermal alteration apart from silicification, is not readily apparent. The schistosity so conspicuous elsewhere in the strongly-altered acid volcanics of the Sheffield-Cethana belt is essentially absent at Lake Barrington. In the drillholes the rocks are weakly to moderately altered (quartz-sericite-carbonate) and silicification is widespread.

5.2 MINERALISATION

The style of mineralisation is essentially syn-volcanic, although there is some (remobilised?) fracture-filling mineralisation in the more-massive rocks such as the lavas and breccio-conglomerates. Generally the sulphides are dispersed in thin irregular blind stringers, small patches and disseminated grains.

The most abundant sulphide is pyrite. Copper minerals present include chalcopyrite, bornite and chalcocite, with traces of malchite and cuprite. Sphalerite is an uncommon accessory in places.

The copper mineralisation occurs in all rock types, with the best values concentrated in the tuffaceous rocks. The most significant mineralisation occurs in the finer grained tuffs.

6. DISCUSSION OF RESULTS

6.1 GEOPHYSICAL RESULTS

The results of the geophysical surveys are detailed in the report by M.Flis- see Appendix 5 at the back of this report.

The main IP response on lines 4600E and 4700E appears to be due to concentrations of pyrite in the upper parts of both holes LB1 and LB2, while the massive sulphide horizon correlates with a more-subtle IP response on the southern flank of the main IP anomaly on 4700E. This subtle response is clearly visible again on the IP profile for line 4800E, although at slightly greater depth, and is obvious target for a future drillhole.

Further eastwards, on line 4900E, the IP anomaly is present although even deeper. Because of the possibility that the response is located between 4800E and 4900E, drilling on 4900E is not recommended at this stage.

An important feature of the IP results is that the mineralisation appears to be strengthening with depth and continues below the 150m penetration limit of the survey.

An electrode has been placed in the massive sulphide in DD 80 LB1 in preparation for a misse a la masse survey. The results will assist planning for future drilling, as will the awaited results from the recently-completed aerial EM survey.

6.2 GEOLOGICAL RESULTS

There is a good geological correlation between to two drillholes, even with the variable dip of the rocks - which is due largely to the irregular shape of the rhyolite lava. The tuffs which host the massive sulphide in LB1 are considered to have their along-strike extension in the tuffs intersected between 170-195m in LB2.

The comparison of the copper values in this unit in the two holes is part of the evidence for the apparent strengthening of the copper mineralisation towards the east. The same trend is shown by the copper values in the gritty tuff and breccio-conglomerate intersected in the tops of both holes - the values are much stronger in LB1.

Drillhole LB1 was not as effective as it could have been. Not only was there poor recovery in the interval that included the massive sulphide, but the hole was stopped prematurely by the contract geologist only 8m past the massive sulphide intersection. The correlation with LB2 indicates that there is probably a sequence of well-mineralised tuffs just beyond the present limit of LB1.

If the eastwards trend towards stronger copper values holds true, then these tuffs could well contain economic mineralisation.
By wedging off and extending LB1, it is planned to get an accurate assessment of the size and grade of the massive sulphide and to test these mineralised tuffs as well.

The occurence of even a thin body of massive sulphide in this acid volcanic environment is regarded as very significant and requires careful follow-up drilling.
The massive sulphide in LB1 defines a time-space horizon on which massive sulphide deposition was actually taking place. Elsewhere on this horizon within the Lake Barrington prospect, conditions could potentially have been favourable for the accumulation and preservation of a significant body of massive sulphide.

It is recommended that initially one hole be put 60m vertically beneath the intersection in LB1, as the geophysical results suggest the mineralisation may improve with depth.

A second hole 100m away to the east on line 4800E is also recommended on the basis of the geophysical results.

However, there must be a committment to further drilling following the holes outlined above. Because of the irregular shape and thickness that can be expected in a massive sulphide body in this type of volcanic terrane, follow-up drilling should be carried out at spacings of from 50-100m maximum.

7. REFERENCES

BARKER R.G. JUNE 1975. Progress Report, Lake Barrington Prospect, EL 7/73 Paradise, Tasmania. Unpub. Asarco Rep.

8. KEYWORDS

Copper - acid volcanics - alteration - massive - sulphides drill-diamond - geophys - IP.

9. LOCATION

BURNIE SK 55-3, 1:250,000 SHEET, TASMANIA.

10. LIST OF PLANS

PLAN NO	TITLE	SCALE
TV 375	LOCALITY PLAN-LAKE BARRINGTON PROSPECT	1:50000
TV 376	GEOLOGICAL PLAN	1:1000
TV 377	GEOLOGICAL SECTIONS-4500E, 4600E, 4700E	1:1000
TV 378	GEOLOGICAL SECTIONS 4800E, 4900E.	1:1000
TV 379	IP CHARGEABILITY CONTOURS	1:1000
TV 380	IP RESISTIVITY CONTOURS	1:1000
	LINE 4500N, 4600E - 4900E	1:2500

11. LIST OF APPENDICES

Appendix 1.	Diamond Drill Logs - Holes DD 80 LB1, DD 80 LB2
Appendix 2.	Report on Lake Barrington Drilling- by J.Couper, Contract Geologist.
Appendix 3.	Petrological Descriptions of Drillcore Samples.
Appendix 4.	Rock Sample Ledger.
Appendix 5.	Report on Geophysical Surveys- by M.Flis.

APPENDIX 1

DIAMOND DRILL LOGS

HOLES DD 80 LB1

DD 80 LB2

963011

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 1 of 6

TENEMENT NAME LAKE BARRINGTON No. .....

LOGGED BY: G. PURVIS

CO-ORDINATES 4700E 4920N AZIMUTH 210° MAG DRILLERS PARRY COMMENCED 19·10·80 DEPTH 187·5 m HOLE No. DD 80 LB1

RL COLLAR ..... INCLINATION 60° DRILL TYPE BOYLES COMPLETED 28·10·80 CASING LEFT 2·3m NW DPO No(s) 26472, 73, 74

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ....) Pb	Zn	Cu ppm	Ag	Au
0	2·3	-			NO CORE – TRICONED										
							816101	8·4	8·7	0·3	18	28	1770	3	8·63
2·3	38·4		NQ		BRECCIO-CONGLOMERATE	Vuggy gossanous limonite ± qtz in	795551+	8·7	11·0	2·2	15	56	790	1	
			to		Partly weathered, massive, pinkish-	fractures at all angles, up to 5mm	52+	11·0	13·6	2·2	13	50	440	<1	
			27·6m		brown to grey, fairly hard-weakly	av. 1-2mm. Cut clasts. Density	816102	13·6	14·2	0·6	6	13	320	<1	<·04
			then		silicified in places.	av 1/0·5m. Below 18m the	795553+	14·2	16·0	2·3	13	120	270	<1	
			BQ		Clasts of acid volcanics and possibly	limonitic fractures also contain py.	54+	16·0	18·0	2	14	56	350	<1	
					some granitic material, mixed	Rare veins:	816103	18·0	18·3	0·3	120	690	1·88%	35	0·38
					basic volcanics.	8·5m 25mm lim 50°/LCA; 17·6m	795555+	18·3	21·7	3·15	18	46	490	<1	
					Clasts mostly rounded, some angular,	4mm Py-haem 10°/LCA; 18·2m	816104	21·7	22·3	0·6	21	17	7700	3	<·04
					up to 60mm, average <10mm, in	120mm py-haem-lim 30°/LCA (1st Cs	795556+	22·3	25	2·8	11	64	730	<1	
					gritty matrix & minor qtz frags.	to bedding); 22·2m 20mm lim-py>	57+	25	27·9	2·9	9	91	870	<1	
					Rock weakly to mod altered-sl	cp-bornite 60°/LCA; 21·75-22·2m //LCA	816105	27·9	28·2	0·3	10	17	1160	<1	<·04
					carbonate, sl silicif, bleaching in	2-3mm irreg py>bornite>cp;	795558	28·2	28·4	0·2	6	14	1670	<1	
					places	28·1m 6mm/80° LCA qtz-lim-py.	816106	28·4	28·6	0·2	10	19	600	<1	<·04
					Crude bedding: 4·3m 43°/LCA;	28·8m 30mm/30° LCA. Qtz-lim.	107	28·6	28·8	0·2	4	9	380	<1	<·04
					10·6m 40°/LCA; 16·3m 50°/LCA;	32m 2× 10mm + 15mm/60° LCA.	108	28·8	29·1	0·3	12	24	1930	2	<·04
					20·7m 47°/LCA; 32·9m 55°/LCA;	Py-haem, trace cp.; 32·35 5mm/25°	795559+	29·1	31·5	2·45	10	110	320	<1	
					38·1m 50°/LCA.	LCA py-lim; 34m 30mm/55°/LCA	60+	31·5	33·8	2·3	16	67	2500	1	
						Py-haem-lim; 35·25m 35mm/45°	816109	33·8	34	0·2	52	22	1·52%	16	0·12
						LCA Py-bornite-lim; 35·4m 15mm	795561	34	35·2	1·05	8	7	517	<1	
						/43° LCA. Py-bornite-haem-lim.	816110	35·2	35·6	0·4	48	42	2·7%	10	0·06
						35·5-37·1m Several Qtz-py-lim-bornite	795562	35·6	36·8	1·2	8	15	1904	<1	
						veins at all angles, up to 5mm.	816111	36·8	37·1	0·3	16	30	7200	8	<·04
						37·9m 8mm/30° LCA. py; 39·4m 15mm	795563+	37·1	39·5	2·4	15	56	2900	<1	
						/15° irreg. Py.	816112	39·5	39·8	0·3	22	13	2500	<1	<·04
						Minor dissem py>cp throughout	795564+	39·8	42	2·25	12	73	1560	<1	
						25-28m 1% cp>py	816113	42	42·4	0·4	12	10	3800	<1	<·04
						Cuprite x/s at 38·55m.	795565+	42·4	45·4	3	11	59	2800	<1	
							816114	45·4	46	0·6	74	42	4300	10	0·18

+ - indicates sample taken with core grinder - otherwise 1/2 core

963012

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 2 of 6

TENEMENT NAME LAKE BARRINGTON No. 1

PLAN – MAP REFERENCE

CO-ORDINATES ... AZIMUTH ... DRILLERS ... COMMENCED ... DEPTH ... HOLE No DD 80 LB 1

RL COLLAR ... INCLINATION ... DRILL TYPE ... COMPLETED ... CASING LEFT ... DPO No(s) 26474, 67,

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC) Pb (ppm)	Zn (ppm)	Cu (ppm)	Ag (ppm)	Au (ppm)
38.4	47.6		BQ		GRITTY TUFF Occasional clasts and thin interbeds of vitric tuff. Brownish-grey, partly weath, mod silicif. Massive. Weak-mod alt. Most gritty frags < 2mm of acid volc detritus - mainly qtz, feldspar, glass - rounded + angular. Poorly sorted, crudely bedded in places. Upper contact a bedding plane 55°/CA Numerous vuggy limonitic veins + fractures - core mod broken. 47.6 – 48.85m – fi gr. vitric tuff, pale greenish brown. Upper contact 40°/CA. Bedding: 41.4m 65°/CA; 44.5m 35°/CA; 48.4m 35°/CA.	Numerous limonitic veins av 1-2mm up to 8mm. Some ± py or ± qtz. Abt 1 dispersed limonite and dark Mn or hornite, in mmod hairline fractures, patches + dissem. Up to 5%. 41.2 – 41.3 – Minor malachite 41.3 – 41.45: 15% bedded Mn? + hornite? + minor malachite (1%) + trace cuprite. 42.3 – 42.4: 1% malachite assoc ± 5-10% Mn? + hornite? in sandy tuff. Minor cuprite @ 44m. 44.6m 5mm/45° CA vein approx to bedding. cp – lim – hornite. 45.3 – 45.65m. Limonitic breccia zone 55°/CA. Trace cuprite. 45.75m 10mm/30° CA. Lim-py vein. 45.75 – 46.50m 5-10% dissem Mn? – hornite? Trace malachite + cuprite. 47.50 – 48m: 10% lim in breccia zones.	816115 116 117 118 119 816126 127 128 129 130	46 46.3 46.7 47.5 48.4 49 51 52.5 53.8 55	46.3 46.7 47.5 48.4 49 51 52.5 53.8 55 56.9	0.3 0.4 0.8 0.9 0.6 1.9 1.6 1.3 1.1 1.9	18 14 8 21 10 20 17 9 11 14	13 13 15 13 30 57 28 19 25 32	1.39% 1.19% 540 1000 1600 870 280 2800 580 270	1 <1 <1 <1 1 <1 <1 <1 <1 <1	<.04 <.04 <.04 <.04 <.04
47.6	56.05		BQ		BRECCIO-CONGLOMERATE As before except finer gr. Weath confined to occasional oxidised fractures. Pale fawn-green. Weak-mod alt, heavily carbonatted and deformed matrix. Clasts – rounded up to 45mm, smaller usually angular clasts 5mm or less. Much higher proportion of matrix to clasts than before. Lower contact 60°/CA.	49m: py-lim band 35mm/65° CA. 49.3 – 49.4m: irreg patches of lim-hornite > py-cp 5-7% overall. 49.7 – 49.9m: 10°/CA – network py>lim>hornite. 53.25 – 53.35m: 10-15% cp>hornite>py. Below 53.8m: 1% overall py-cp >hornite, in irreg patches + dissem.										

963013

U12

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 3 of 6

TENEMENT NAME LAKE BARRINGTON No.

PLAN – MAP REFERENCE

CO-ORDINATES AZIMUTH DRILLERS COMMENCED DEPTH HOLE No. DD 80 4B

RL COLLAR INCLINATION DRILL TYPE COMPLETED CASING LEFT DPO No(s) 26467, 69, 69, 70, 71

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ...) PPM Pb	Zn	Cu	Ag	Au
7.05	74.55		BQ		ALTERED RHYOLITIC LAVA Hard, patchy silicif., pinkish-fawn. Mod alt - highly carbonated + sericitized. Angular qtz av 1-3mm, feldspar phenocrysts av 1-2mm, in carbonated vitric + felsic groundmass. Vague clast shapes in places of same material - esp near top of interval. Possible flow banding: 58.2m 40°/LCA; 59.4m 60°/LCA; Lineation of clasts: 66.2m 35°/LCA. Gritty bdy intruded 68.25-68.6m bedding 35°/LCA. 60.4-61m: Clayey argillan zone. Chilling evident at base of unit.	Dispersed sulphides (py-cp) throughout in small patches, blebs, fine stringers and disem grains. Mostly <2% Best zones: 57.1-58.05 3% cp >py; 61-65.7m 2-3% py>cp;	816131	56.9	58.5	1.6	14	41	2400	1	
							132	58.5	59.6	1.1	12	30	1040	<1	
							133	59.6	61.9	2.3	16	39	210	<1	
							134	61.9	63	0.95	18	34	800	1	
							135	63	64.5	1.65	16	27	1170	1	<.04
							136	64.5	66.5	1.9	18	40	940	1	<.04
							137	66.5	67.5	0.9	13	25	1290	1	
							138	67.5	68.5	1	12	21	160	<1	
							139	68.5	70	1.6	10	22	800	<1	
							816140	70	72.6	2.5	9	20	380	<1	
							141	72.6	73.9	1.7	8	21	850	<1	<.04
							142	73.9	75.6	1.7	13	27	240	<1	
							143	75.6	77.4	1.8	37	31	330	1	
							144	77.4	79.5	2	16	20	26	<1	<.04
							145	79.5	80.7	1.2	13	21	41	<1	
							146	80.7	82.5	1.8	15	22	350	<1	
74.55	77.4		BQ		GRITTY VITRIC TUFF Weak-mod alt ashy debris from the lava - fragments of qtz, feldspar and glass in fi gr vitric matrix. Occasional clasts of lava + tuff up to 90mm av. <10mm. Fine bedding visible in places: 75.95 25°/LCA. Upper contact 35°/LCA, lower 45°/LCA. Sericitic + carbonated pale fawny-tan colour. Some chlorite towards base.	74.55-75.8: Minor py+cp. 75.8-77.4: 2-3% py>>cp mainly in veinlets but all angles.	147	82.5	83.7	1.2	15	24	55	<1	
							148	83.7	85.5	1.8	33	45	98	<1	
							149	85.5	87.5	2	13	58	45	<1	<.04
							816150	87.5	89	1.5	12	38	31	<1	
							151	89	91.3	2.3	7	19	27	<1	
							152	91.3	93	1.7	10	22	120	1	<.04
							153	93	95	2	12	15	63	<1	
							154	95	97	2	16	18	85	<1	
							155	97	99	2	27	17	28	<1	<.04
							156	99	1013	2.2	15	23	42	<1	<.04
							157	101.3	103	1.7	5	17	10	<1	
							158	103	104.7	1.7	8	57	21	<1	
77.4	84.6		BQ		ALTERED RHYOLITIC LAVA - as above Fawny tan - grey colour. Angular qtz 1-3mm, av 1mm.	77.4-81m: 2% py in veinlets all angles - networks. Av 1-2mm. Trace cp 81-82.3m: 3-5% py>cp dispersed.	159	104.7	106	1.3	16	44	130	1	
							816160	106	108.3	2.3	20	32	190	1	<.04

963014

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 4 of 6

TENEMENT NAME LAKE BARRINGTON No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. DD 80 4B

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) 26475, 71

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC) Pb (ppm)	Zn (ppm)	Cu (ppm)	Ag (ppm)	Au (ppm)
					Feldspars 1-2mm av <1mm. Fi gr vitric groundmass now invaded by silica. Weak-mod alt. Probable flow banding 84.4m 35°/LCA Minor thin qtz-carb veins below 82m. 84.5–84.6 Breccia zone 35°/LCA // to flow banding & lower contact.	82.3–84.5: 1–3% py, trace cp. 84.5–84.6: 15% py/cp in massive patches.	816161+	108.3	109.7	1.4	15	113	126	<1	<.04
							162+	109.7	112.6	2.9	22	128	539	<1	
							163+	112.6	113.8	1.1	20	132	535	<1	
							164+	113.8	114.8	1	10	35	110	1	<.04
							165+	114.8	117.5	2.7	10	53	178	<1	
							166+	117.5	120	2.5	12	87	302	<1	
84.6	87.5		BQ		INTERMEDIATE DYKE (?). Pale fawny-tan colour, softer - not silicif - clayey. Broken in places. Upper chilled margin. 1mm rounded qtz-carb amygdales in conspicuous microlathic groundmass & tiny (<1mm) feldspar laths. Alt mod - sericitisation. Vague lineation 43°/LCA @ 86.5m. Lower contact 30°/LCA.	Minor py except in included brecciated lava clast 85–85.1m: 7% py.	+ - indicates sample taken with core grinder - otherwise cut core								
87.5	103		BQ		ALTERED RHYOLITIC LAVA. Exactly as before. Pinkish-tan in colour. Silicified - strongly in places. Fractured - badly broken in places. Minor qtz-carb veins. Minor chlorite assoc & fractures and qtz veins below 95.5m 92.65m: Flow banding 45°/LCA. 97.2m: 45°/LCA; 100m 50°/LCA.	Generally up to 1% py>cp in stringers, patches & disseminated. Best zones: 91.7–92.7m: 1–2% py>cp. 94–96.8m: 2–3% py trace cp. 97.55–99m: py-qtz vein // LCA 2–8mm. 5% py overall. 99–100.8m: 2% py.									

963015

014

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 5 of 6

TENEMENT NAME LAKE BARRINGTON No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. DD 80 LB1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) 26475

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC) Pb ppm	Zn ppm	Cu ppm	Ag ppm	Au ppm
103	104.6		BQ		INTERMEDIATE DYKE (?) Pale fawn-brown, soft/fr. Sericitised feldspar phenocrysts up to 3mm in microlithic felsic groundmass – raw alt to sericite + carb. <1mm qtz-carb amygdales often containing py. 103.25: Flow banding 32°/LCA. Lower contact an annealed breccia zone 30°/LCA.	1% fi gr py in basal 25cm Otherwise trace py only.	816167^+	120	122.50	2.5	15	111	1141	<1	<.04
							168+	122.50	124.90	2.3	8	81	257	<1	
							816179^+	124.9	128.5	3.6	12	81	153	<1	
							180+	128.5	136.2	3.45	13	152	257	<1	
							181+	136.2	138.6	2.4	12	45	154	<1	
							192+	138.6	141.4	2.8	15	78	161	<1	<.04
104.6	108.4		BQ		ALTERED RHYOLITE LAVA Exactly as before. Reddish-fawn in colour. Silicified (very hard). Alteration products (sericite + carb) concentrated in abundant micro-fractures. Lower contact sharp 50°/LCA.	3% py. Minor cp > gn where sulphides strongest 106–107m (5%) Sulphides in bleached stringers + patchy networks.									
108.4	109.45		BQ		VITRIC TUFF v. fi gr. weakly alt ash ± bedding in places. Pale creamy grey to dark grey. Sericitised. Bedding disrupted + variable – 55°/LCA at 109.2m. Lower contact irreg. 15–20°/LCA.	1–2% py trace cp. Dispersed.									
109.45	176.05		BQ		ALTERED RHYOLITIC LAVA Fawny greenish-grey. Massive. Hard but not silicif. Some vughs due to	v. minor sulphides (py + cp in grains stringers + small patches), except in following zones:									

Eastman Camera Surveys:

Depth	Azimuth	Dip
30m	210°	60°
60m	209°	59.3°
90m	208°	59.3°
120m	208°	58.5°
150m	208°	56.7°
180m	208°	56.3°

963016

SHEET No. 6 of 6

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TENEMENT NAME LAKE BARRINGTON No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. DD 80 LB1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) 26464

DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC) Pb ppm	Zn ppm	Cu ppm	Ag ppm	Au ppm
				leaching of) carb vein material	109.45–112.7m: 2-3% py, minor	816169	173.75 *	175.3	1.55	100	210	70	4	<.04
				0.5–2mm, feldspars mostly 2mm	cp-bornite > gn-sp.	170	175.3	177.6	1.65	100	200	390	5	<.04
				or less in ill schistose, carbonated +	163–166: 2% py.	171	177.6	179.4	1.80	100	310	1200	5	<.04
				sericitised matrix. Some clayey	146–176.05m: Minor py + sp in	172	179.4	179.5	0.10	7500	5900	14%	84	1.35
				broken zones. Fracturing below 170m.	thin stringers assoc ± chlorite	173	179.5	180.4	0.25	600	1100	4700	8	<.04
				Thin qtz veinlets ± minor chlorite	(dark magnesian chlorite). Minor	174	180.4	181.8	1.50	200	2800	2100	7	<.04
				Slight agglomeratic character	cp + gn below 172.5m. ↑ 1% py >	175	181.8	184	2.10	100	1300	350	5	<.04
				towards top – vague clast shapes.	cp > gn – sp below 174m. Chlorite	176	184	185.05	1.05	100	230	260	5	<.04
				Schistosity more pronounced in areas	stringers up to 2mm at ↑↑ CA	177	185.05	186.20	0.85	100	230	300	5	<.04
				with clasts.	to mineral lineation.	178	186.20	187.50	0.75	100	310	450	5	<.04
				Flow banding: 118.4m 55°/LCA;		Best intersections:			Int.					
				117m 40°/LCA; 127.8m 45°/LCA;			18	18.3	0.3	120	690	1.88%	35	0.38
				133.7m 35°/LCA; 141.7m 35°/LCA.			21.7	22.3	0.6	21	17	7700	3	<.04
				148.5m 45°/LCA; 168.8m 40°/LCA.			31.5	46.7	15.2	17	48	3760	1	
				Vague clast shapes below 170m		inc:	35.2	35.6	0.4	48	42	2.7%	10	0.06
				Sharp lower contact ± chilling. 55°/LCA.		and	46	46.7	0.7	16	13	1.28%	<1	<.04
							179.4	179.5	0.1	7500	5900	14%	84	1.35
176.05	187.50		BQ	ALTERED VARIABLE TUFFS	176.05–179.4: 1-2% py > cp-sp > gn		179.5	181.8	2.3	360	2130	3120	7	<.04
				Above 184m, mostly gritty and	disem + thin stringers assoc ± carb									
				coarsely sandy vitric tuffs with	179.4–179.5* Vughy MASSIVE SULPHIDE	*	Depth intervals from 173.75–187.50 are approximate only							
				lenses fi gr tuff; below 184m mostly	cp > py > sp in qtz gangue. Banded		due to mislabelled core markers by driller and poor							
				fi gr tuff becoming almost tuff-free	72°/LCA – sl contorted. Core loss		core recoveries. The interval 177.6–180.4 has 0.65m							
				at base, with irreg interbeddings	at both upper and lower contacts.		of core lost. This has been assigned to that portion below							
				of sandy and gritty tuffs.	179.5–180.4: 2-3% sp-cp-py. disem		the massive sulphide although it is probable that some of							
				Greenish-grey to cream, weak-mod	(Note 0.65m core loss here).		this lost core is from the sulphide zone. Therefore the 0.65m							
				alt (sericite, carbonate) Silici below 178m.	180.4–181.5: 3% cp-bornite-		given to the massive sulphide is a minimum size – it							
				Much interval brecciation and	sp > py. Dispersed, usually assoc ± carb.		could be as much as 0.75m.							
				disrupted bedding.	181.5–183.1: 1-2% sp > bornite-cp-py.									
				Numerous brittle zones with core loss	181.5: 5mm/60°. Banded vein cp-		Sample 795688 – massive sulphide at 179.4 – for							
				esp below 185.2m.	bornite-sp in qtz-carb gangue.		polished section. (DPO 26491)							
				Bedding: 177.6m 65°/LCA; 184.7m 30°/LCA	183.1–187.5: Minor disem py-cp-sp-gn.									
				HOLE.										

963017 U16

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 5

TENEMENT NAME LAKE BARRINGTON No. .....

LOGGED BY: J. COUPER

CO-ORDINATES 4600E 4978N AZIMUTH 213° MAG DRILLERS PARRY COMMENCED 29·10·80 DEPTH 298m HOLE No. DDH0 48.2

RL COLLAR ..... INCLINATION 46·5° DRILL TYPE BOYLES COMPLETED 19·11·80 CASING LEFT 21m NW (12-33m) DPO No(s) 26476

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZINC CORP.) PPM. Pb	Zn	Cu	Ag	Au
0	3				TRICONED - NO CORE.										
3	27·4	24·2	NQ		BRECCIO-CONGLOMERATE. With alternating siltstone and shale. Bedding ∠ ca. varies 5°–85°, average 30°. Graded bedding in siltstones facing ? down hole.	Pyritic seams, mod oxidised, at: 22·1m, 22·4m, 22·8m, 23·1–23·8m >5% sulphides.									
							816002+	21	24	3	27	53	620	1	
27·4	49·5	21·3	NQ		SILTSTONE AND SHALE. Pale grey, banded. Graded bedding facing down the hole ? Bedding ∠ ca 20°.	31·5m > 10% sulphides. Trace disseminated py 36·9m. Carbonate veins.	003+	24	27	3	7	94	150	<1	
							004+	27	30	3	7	76	130	<1	
							005+	30	33	3	7	49	110	<1	
49·5	50·0	0·5	NQ		TUFF. Fine grained, siliceous. Brecciated										
50·0	51·7	1·4	NQ		INTERMEDIATE LAVA OR INTRUSIVE. Soft, pale green, altered (sericite, carbonate). Frequent ankerite-chalcedony amygdales 1-2mm. Sericitised plagioclase phenocrysts.	∠ ca 60° at 51·7m. Petrological sample 795600 taken at 51m.									
51·7	53·0	0·9	NQ		BROKEN ZONE. Clay and Tuff-shale breccia.										
53·0	54·6	1·50	NQ		TUFFACEOUS GRIT. Fine to medium grained, quartzose, gritty, partly brecciated.										

+ – indicates grind sample.

963018

017

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 2 of 5.

TENEMENT NAME. LAKE BARRINGTON No. .....

LOGGED BY: J. COUPER

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH 298m HOLE No. DD 90 LB1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s). 26476, 482

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZINC CORP.) ppm Pb	Zn	Cu	Ag	Au
54·6	73·9	19·4	BQ		TUFFACEOUS GRIT – CONGLOMERATE Shale and siliceous tuff 55·2 – 56·2m.	Minor qtz-carbonate veins, often leached, pyritic mineralisation associated with the veins. 61·3 – 61·8m >5% sulphides. 68m, 68·4 – 68·6m >10% sulphides.	816006+	60	63	3	9	70	77	<1	
							007+	63	66	3	11	60	44	<1	
							008+	66	69	3	9	49	160	<1	
							009+	69	72	3	9	55	110	<1	
73·9	74·2	0·3	BQ		ALTERED INTERMEDIATE LAVA OR INTRUSIVE. of 50 – 51·7m.	Banding < ca 45°.	816010+	81	84	3	11	84	410	<1	
							11+	84	87	3	37	100	260	1	
							795522	87	88	1	46	74	4600	2	<.04
							23	88	89	1	24	32	2900	1	<.04
74·2	91·0	16	BQ		TUFFACEOUS GRIT Minor siliceous zones. Crude banding. Puggy broken zone 90·9 – 91m.	py + cp ? – minor, in veins + fractures. py >10% in ghost breccia zone 84·6 – 85·1m.	24	89	90	1	33	43	220	1	<.04
							816013+	90	93	3	39	91	680	2	
							14+	93	96	3	18	96	320	1	
							15+	96	99	3	17	75	180	1	
							16+	99	102	3	12	57	310	<1	
91·0	141·8	50·4	BQ		PORPHYRITIC RHYOLITE LAVA. Pale colored, with quartz phenocrysts and sericitised feldspar phenocrysts, in sericitic, carbonated groundmass. Weak flow banding. Petrological samples: 795599 at 97m + 795598 at 140m.	1-2% py ± cp, in veins and irregular, assoc ē common qtz-carbonate veinlets and ferruginous alteration, down to approx 118m. 118 – 125m: Abundant py up to 10% sulphides in veins and irregular with subordinate qtz vnlt. 125 – 141·8m: Minor veining with traces of py + cp.	17+	102	105	3	11	59	210	<1	
							18+	105	108	3	16	67	89	<1	
							19+	108	111	3	9	75	200	<1	
							020+	111	114	3	11	170	210	<1	
							021+	114	117	3	13	149	180	<1	
							22+	117	120	3	39	124	230	1	
							23+	120	123	3	39	107	190	1	
							24+	123	126·7		25	73	270	1	
							25+	126·7	129		11	91	120	<1	
							26+	129	132	3	27	250	230	<1	
							27+	132	135	3	21	330	340	<1	
141·8	153·7	11·7	BQ		TUFFACEOUS GRIT – CONGLOMERATE As above. Black shale clasts common.	Minor pyritic seams. 10cm qtz vein ē trace py-cp at 151·3m. Banded py 153·9 – 154m >10% sulphides.	28+	135	138	2·8	13	165	480	<1	
							816029+	138	141	3	4	56	1260	<1	

+ + indicates grind sample.

963019

U18

SHEET No. 3 of 5

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME LAKE BARRINGTON No. .....

LOGGED BY: J. COUPER

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH 298m HOLE No. DD 80 LB2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 264.82, 84.7

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZINC CORP) ppm Pb	Zn	Cu	Ag	Au
153.7	170	12.3	BQ		ACID INTRUSIVE (GRANOPHYRE). Fine grained, crudely banded ∠45°/ca. Altered - sericite-carbonate. Sericitised feldspar phenocrysts. Qtz-carbonate veins common. Breccia zone 168.6-169.7m. Petrological sample 795597 taken at 167.7m.	Py > cp in qtz-carb breccia 154.5-154.7m. Qtz-carb veins common c Minor py < trace cp in veins + blebs < 2%. Rare blebs of gn in carbonate.	795519	153	153.7	0.7	26	83	450	<1	<.04
							20	153.7	155.1	1.2	75	85	1140	3	<.04
							21	155.1	156	0.8	190	62	190	1	<.04
							795526+	156	159	1.65	520	151	190	1	
							27+	159	162	0.95	400	156	1030	3	
							816031+	162	165	3	86	178	1000	2	
							32+	165	168	3	67	230	1560	3	
							33+	168	171	3	470	890	3000	6	
170	195.50	25.2	BQ		ALTERED RHYOLITIC TUFFS Mainly fine altered (sericite-carbonate) vitric tuff or vitric crystal tuff with small qtz eyes. Silky to sandy texture with rare lithic clasts. Crude banding. (10° ∠ Ca @ 182.5-188.9m). Py in qtz zones 170-182.5m. Brecciation 188.9-193.2m. Bedding 20° ∠ Ca at 193m. Petrological samples: 795596 @ 179m; 795594 @ 187m.	170-182.5m: Py > cp 1-5% in veins, trace disseminated sulphides. Qtz-carbonate veins common. 182.5-188.9m: Cp > py up to 2% assoc c qtz-carb veins. Massive irregular cp in breccia at 182.5m. Cp > py in 2-5mm vein at 189m. Cp > py in veins over 30mm at 189.4m. Cp > py > 5% 190.9-191.3 in veins and irregular bands.	34+	171	174	3	45	158	2100	4	
							35+	174	177	2.7	30	350	1410	2	
							36+	177	180	3	16	91	1720	2	
							37+	180	183	3	58	340	2000	2	
							38+	183	186	3	42	280	340	1	
							816039+	186	189	3	30	97	1490	2	
							795576	189	190	0.95	26	55	1380	2	<.04
							17	190	191	1	39	68	8300	11	<.04
							18	191	192	1	1660	2700	7000	11	<.04
							816041+	192	195.5	3.5	41	150	530	1	
							42+	195.5	198	2.5	21	124	380	<1	
195.50	205.90	9.2	BQ		TUFF-SHALE fine grained, finely banded, dark grey with siliceous silty bands ∠ Ca 25°.	Upper contact ∠ Ca 60° on qtz vein. Qtz-carb veins common often in bedding (1-2mm). Trace py.									

+ - indicates original sample

963020

019

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 4 of 5

TENEMENT NAME LAKE BARRINGTON No. .....

LOGGED BY: J. COOPER

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH 298m HOLE No DD 80 LB 2

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) 26482, 76, 84,

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC,.....) ppm Pb	Zn	Cu	Ag	Au
205.90	212.30	6.6	BQ		INTERMEDIATE INTRUSIVE OR LAVA	Scattered fine qtz-carb veins.									
					(MICRODIORITE?) Coarse gr.	Nil sulphides.	816043+	213	216	3	760	980	170	<1	
					Porphyritic, with sericitised		44+	216	219	3	360	1040	62	1	
					feldspars - conspicuous. Lesser		45+	219	222	3	470	2300	830	3	
					altered pyroxene phenocrysts, in		46+	222	225	3	44	133	360	<1	
					sericite-carbonate groundmass.		795513	225	226	1	26	40	160	1	<.04
					Distinct pale green colour.		14	226	227	1	61	60	5600	4	<.04
					Weak flow banding.		15	227	228	1	22	47	520	1	<.04
					Petrological sample 795595 at		795528+	228	231	3.1	57	96	1330	2	
					207m		29+	231	234	2.95	70	86	540	1	
							795530+	234	237	3	24	61	600	1	
212.30	226.2	13.90	BQ		TUFF-SHALE	Trace cp - 6m - veins + fractures.	31+	237	239	2	58	87	550	1	
					As before. Finely banded ∠ca 30°	In breccia: trace cp > py	32+	239	241	2	30	64	870	1	
					Many qtz-carb veinlets, much	disseminated in qtz-rich bands.	816048+	241	244	3	16	67	660	2	
					carbonate in breccia 225.9-226.2m		49+	244	247	3	22	81	830	2	
							795509	247	248.5	1.5	30	68	6000	4	<.04
226.2	282	55.10	BQ		ALTERED RHYOLITIC TUFFS.	Heavy cp > sp(?) in qtz-carbonate	10	248.5	250	1.5	35	67	4000	3	<.04
					Largely poorly-sorted, sandy,	@ 226.8-226.9.	11	250	251.5	1.5	28	53	630	1	<.04
					lithic-vitric crystal tuff.	Banded py 241.4-241.5m.	12	251.5	253	1.5	190	270	1720	2	<.04
					(Petrologist says probably subaerial)	Qtz-carb veins common (predate	816052+	253	256	3	58	128	1600	3	
					-see samples 795592 @ 255m +	the weak schistosity as all are	795533+	256	259	3	28	130	810	1	
					795591 @ 270m; 795593 @ 283m	stressed), ē py > cp. esp: 237.2;	34+	259	262	3	14	47	500	1	
					Moderately altered - (qtz-sericite	237.9; 237; 246.8-247.5; 249.1-249;	35+	262	265	2.96	15	60	300	1	
					-carbonate) and weakly schistose	250.5-251.4; 258.7; 265.5;	36+	265	268	3	23	87	1350	2	
					Small qtz eyes, sericitised	Heavy cp in 4×10mm veins	816053+	268	270	2	11	69	630	<1	
					feldspar phenocrysts, glass shards	271-271.6m.	795501	270	272	1.85	12	30	3400	3	<.04
					and vague lithic clasts of tuff	Total cp ≈ 3% 273m-279.1m	02	272	274	1.8	12	32	4500	3	<.04
					and lavas. Some black shale	(inc 40mm qtz-cp vein 273.3m)	03	274	276	1.85	16	68	2900	2	<.04
					clasts 247-250m. Matrix now	279.1-280.4m > 10% sulphides.	04	276	278	1.95	16	71	1580	2	<.04
					qtz-sericite-carbonate after	from 280.4m, trace only cp + py.	05	278	280	2	14	71	6700	4	<.04
					glass.		06	280	282	2	14	55	2000	1	<.04

963021

020

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 5 of 5

TENEMENT NAME LAKE BARRINGTON No. .....

LOGGED BY: J. COUPER

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DD 80 LB 2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 26482, 76, 84

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC, ...) ppm Pb	Zn	Cu	Ag	Au
					Some very fine gr siliceous vitric tuff and minor banded shale, 273·7-282 m.										
282	298	16·2	BQ		TUFF-SHALE Siliceous. Mainly finely banded dark shale with pale siltstone bands as above (vitric tuff). ∠ ca 10°-30° Rock generally harder-silicified.	Wh-carb veins common. Good traces of cp + py in veins esp // to bedding. 10mm cp vein at 293·3 m.	795507	282	284	1·7	9	21	2500	1	<·04
							08	284	286	2·2	6	17	1240	1	<·04
							816062+	286	288	1·9	5	53	850	<1	
							795537+	288	290	2	18	47	110	<1	
							38+	290	292	2·05	26	52	930	2	
							39+	292	294	2·05	32	94	3400	2	
							40+	294	296	2	16	44	230	<1	
							41+	296	298	1·7	27	53	130	2	
					END OF HOLE.										
					EASTMAN DOWNHOLE CAMERA SURVEYS:		Best Intersections:			Int.					
								87	89	2	35	53	3750	1	<·04
								190	192	2	850	1385	7650	11	<·04
								226	227	1	61	60	5600	4	<·04
								247	250	3	32	67	5000	3	<·04
								270	286	16	13	46	3100	2	<·04
							incl:	278	280	2	14	71	6700	4	<·04

Depth:	Azimuth	Dip
30 m	213°	-44·5°
60 m	212°	-44·5°
90 m	212·5°	-43·5°
120 m	213°	-42°
150 m	213°	-40·5°
180 m	213°	-40·2°
210 m	213°	-38·3°
240 m	215°	-36·5°
270 m	215°	-33°.

+ - indicates grind sample

APPENDIX 2

REPORT ON LAKE BARRINGTON DRILLING - BY J. COUPER,

CONTRACT GEOLOGIST.

Report on Lake Barrington Drilling-Sheffield EL 7/73, by J.Couper (Contract Geologist)January 1981.

LAKE BARRINGTON DRILLING

Diamond drill holes DD80-LB1 and DD80-LB2 were drilled between Oct 19 and Nov 19, 1980.
The drill holes were designed to test the strong I.P. anomaly labeled: 'Anomaly A' and to test the coincident copper-soil geochemical anomaly.

DD80 LB1

LB1 collared at 4700E 4920N angled - 60 Deg. to grid south. The hole was aimed for an I.P. target at approx 130m and final depth approx 180m. Details are set out in the log sheets and cross section drawings at a scale of 1:1000.

LB1 SUMMARY

0-56 Breccio-conglomerate and tuff grit
56-175.6 Acid lava, minor tuff, altered lava
175.6-187.5 Fine tuffs.

LB1 MINERALIZATION

Pyritic mineralization dominates and occurs in all but a few minor rock units. Chalcopyrite is visibly significant in the lower sections. Sphalerite is rare. Mineralization in the breccio-conglomerate and grits down to 56m occurs essentially as discreet pyritic seams up to 20cm in width. Oxidation and leaching is significant down to 28m.
In the lavas between 56 and 122 metres, pyrite is associated with networks of quartz-carbonate veins with total sulphide levels of approx 2-3% on average with local concentration to approx 5% especially from 94m.
In the lavas between 122 and 175 metres pyritic mineralization is rare - less than 1%.
In the tuffs from 175.6 metres chalcopyrite with pyrite and traces of sphalerite are associated with quartz-carbonate.
A discreet chalcopyrite rich relatively massive vein occurs over 10cm. in broken core at approx 179.6m.

LB1 ASSAY RESULTS

The best result in LB1 is from the 10cm. (true width 6cm)vein at 179.6m 14% Cu, 84ppm Ag,1.35% Au, with 0.75% Pb and 0.59% Zn.
The composite values over 4m from 177.6 to 181.6 are 0.54% Cu, 8ppm Ag <0.04% Au, with 373ppm Pb, 0.15% Zn.

A core loss of 25cm occurs within this zone and we can never be certain exactly where the loss occurred.
In the upper part of LB1, individual pyritic zones report copper values up to 27000ppm, silver up to 35ppm, and gold up to 0.63ppm, over sample lengths mainly in the range of 20 to 30cm.
These values will be downgraded when composited with the additional fill-in sample values.

DD80-LB2

LB2 collared as proposed at 4600E, 4978N - 46.5 Deg Grid sth. Drilling and sampling details are set out in the log sheets and cross section drawings at a scale of 1:1000.

This hole was extended well beyond the original proposed depth to test not only the principal I.P. anomaly (A) approx 4850N, but also the geochemical combined with weaker I.P. anomaly at approx 4800N and to pass the vertical projection of the Lithological change from essentially tuffs and lavas to fine grained tuffs and shale.

LB2 SUMMARY

LB2 is less readily summarized due to rapid changes in rock types.

0	- 91	Breccio-conglomerate tuff grit, shale and siltstone
91	- 142	Acid lava
142	- 192.9	Fine tuff-lavas and tuff grit
192.9	- 205.9	Shale, siltstone, fine tuff
205.9	- 212.3	Porphyritic lava
212.3	- 226.2	Shale
226.2	- 273.7	Fine lavas, minor fine tuffs and tuff grit
273.7	- 298	Fine tuff, shale

LB2 MINERALIZATION

Pyritic mineralization of variable intensity occurs in all but a few minor units.
Mineralization usually occurs in veins, but irregular masses in breccia, bands and minor dissemination also occur.
In the lavas and fine tuffs, the mineralization style is essentially in the form of fine vein networks.
Quartz-carbonate is ubiquitous and usually dominates over sulphides.
Abundant pyrite veining with total sulphides around 10% occurs between 118 and 125m in acid lava.
The same lava above and below this zone is also commonly veined but sulphide levels are in the 1 to 2% range.

In shales, fine veins may be developed along bedding; and dissemination may occur at siltstone bands.
Associated Sulphides
Chalcopyrite rarely dominates over pyrite. There is a tendancy for visible chalcopyrite to become more obvious in the lower parts of the hole.
Galena occurs in trace amounts in quartz-carbonate veins and on fractures with chalcopyrite and is best developed in the shale horizon from 212m.

ASSAY RESULTS
LB2
The best intersection in LB2 occurs (on the basis of grind samples and pending cut core assays) between 272 and 284 metres.
Composite value over 12m is: 5767ppm Cu, 2ppm Ag, 14ppm Pb and 85ppm Zn. The maximum value is 8100ppm Cu from 278 to 280.

Chalcopyrite is the dominant sulphide and occurs in association with quartz-carbonate veins and irregular masses in fine grained silicic and brecciated tuff and shale.
Other intersections of interest in LB2 are:
(pending cut core assays)
8400ppm Cu from 87-90m... veins and breccia in tuff grit.
7400ppm Cu from 189 to 192m... veins and breccia in tuff grit.
4100ppm Cu from 225 to 228m... veins in shale shale breccia and tuff - lava.
5100ppm Cu from 247 to 250m... veins in tuff grit.

The significance of each of the intersections is that all occur at or close to contact.
The host rock is brecciated. The host rock is more commonly clastic.
Silicification is significant especially in the case of the deepest intersection.

DISCUSSION

I.P.
Both drill holes have properly tested the principal I.P. anomaly (Anomaly A).
The target I.P. position in both cases being at approx. 130m drillhole depth.
LB2 intersected abundant pyritic veining with total sulphides of approx. 10% between 118 and 125m. The same lava above and below veining is common above and below this zone! but sulphide levels are in the 1 to 2% range.
The intersection is literally a bulls-eye.
In LB1 a similar result exists but the mineralisation is more disbursed! and this seems to be reflected by the I.P. Common to abundant pyritic veins and networks in the lava persist down to approx 122m. Total sulphide content is in the 2 to 3% range, but local concentration over 5% occurs especially from approximately 94 metres. Below 122m pyrite mineralisation is rare.

I.P. Anomaly 'B' on line 4600E is not conclusively explained by the result of LB2. The vertical projection falls between 200 and 250m on the drill section. Pyrite is common in veins in the lava unit from 226m.
The shale unit above 226m may also be a suitable conductor.

GEOLOGY

Correlation of surface mapping with drilling is obscure. Only broad generalizations can be made.
The quartz rich tuffaceous grit (Tg) unit as mapped clearly includes the quartz rich lava units intersected in drilling.
On section 4600E a possible correlation exists between the breccia at 4770N and the copper mineralisation in LB2 between 272 and 284m

GEOCHEMISTRY

The geochemical surface values for copper in soils, are satisfactorily explained by the concentration levels in the drill holes; but direct relation is possible only for the top 50m of each hole.
The scatter of metal values in surface rock samples is consistent with the style of mineralisation intersected.

Relatively high lead and zinc values in shales between 213 and 222m in LB2, relate to observed galena in veins and as scattered specs on fractures. Elsewhere Pb and or Zn values seem to follow copper.

LB1, a geochemical trend in copper values appears to exist in the lava unit from 56m. The copper values tend to decrease with depth, and are lowest where pyrite veining is most intense. A similar trend is not apparent in LB2.

ALTERATION

Hydrothermal alteration of the Barrington rocks is relatively slight. In the lava units (Rd) the only conspicuous alteration is in the felspar laths. This appears to be sericitic; but definition awaits the petrographic report. The mass of these rocks appears unaltered.
The minor lava unit (Ra) which occurs in both holes is apparently highly altered and is almost certainly a later intrusive.
Apart from the quartz-carbonate which may be the product of hydrothermal alteration, the principal alteration affecting the rocks is in the form of silicification and ferruginous alteration which is directly related to vein mineralisation.
HIghly silicified shales occur in the bottom of LB2 and is related to the mineralised zone; however the silicification is still continuing beyond the end of the hole; further mineralisation is possible.

INTERPRETATION

The mineralisation is interpreted as epigenetic. A relationship may exist between quartz-carbonate and sulphides; but it is not necessarily diagnostic, as each may occur independently...locally.

The intensity of the quartz-carbonate and pyritic veining does however reflect significant hydrothermal activity.

The placement of the better copper values in stronger veins and in breccia zones, outside the lava units, infers that the copper mineralisation may be independent of the intense pyritic veining in the lava units. Certainly, some metal differentiation has occurred.

The principal lava units have generally conformable relations with the other units. The inference has been, that the lavas are concordant flow rocks. I suspect that the lavas are intrusive.
The rock textures are more characteristic of intrusives and generally lack the glassy matrix usually associated with extrusives.
The occurrence of brecciated zones in the contact rocks suggests forcefull intrusion. Silisification of the breccia zones and wall rocks is readily explained. Likewise the entire hydrothermal and mineralization event is consistent with this interpretation.

The results of petrographic analyses are pending; and should give a more certain definition of the rocks.

Further interpretation is highly speculative. Mapping is only sketchy outside the anomalous area.

We seem to be dealing with the peripheral zone of a late stage hydrothermal event. Mineralisation is fracture controlled. The rocks have been flooded with silica, carbonate, and pyrite. Silicification and ferruginization affects all rock types; but the bulk of these materials is confined to the fracture system.

Copper-silver +/- gold is the principal metallic mineralisation. At nominal cut-offs of 2500ppm Cu, the mineralisation is restricted to more specific fracture zones.

The possibilities for massive sulphides seem to have been reduced substantially.

Perhaps the greater prospect lies in the possibility of finding a low grade bulk tonnage deposit...? at depth. Otherwise exploration targets seem to be restricted to individual narrow fracture zones such as typified by the principal intersections in the drill-holes.

Since the precious metals are important, a high tonnage may not be necessary.

CONCLUSIONS

The drilling program has properly tested the I.P. target; which is shown to be a zone of intense pyritic vein mineralisation within a body of acid lava.
Base metal values are not significant. Copper mineralisation at a cut-off of 2500ppm with silver and gold values occurs in veins and breccia zones adjacent to the lava units, but separate from the main pyritic mineralisation.

The area should be re-assessed with particular emphasis on the petrogenesis. Mapping of the area outside the anomalous zone would be necessary to establish the extent of the igneous association; and to give a better perspective.

Within the anomalous area; the main zone of interest is now... perhaps, the breccia zone mapped at 4770N on line 4600E and the extension of this zone.
The possibly anomalous section south of this zone, e.g. as on section 4700E, where some high copper and silver values report in the surface rock samples, may also warrant attention.

APPENDIX 3

PETROLOGICAL DESCRIPTIONS OF DRILLCORE SAMPLES.

U28

963029

Central Mineralogical Services

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

Mr. J.G. Purvis
Senior Geologist
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BURNIE / TAS. 7320

5th February, 1981

REPORT CMS 80/12/50

YOUR REFERENCE:	D.P.O. No. 26486
DATE RECEIVED:	24th December, 1980
SAMPLE NOS.:	816801, 816821, 816829, 795591 - 795600
SUBMITTED BY:	J.G. Purvis
WORK REQUESTED:	Petrology

Copy to:
The Chief Geologist
C.R.A. Exploration Pty. Ltd.
G.P.O. Box 384D
MELBOURNE / VIC. 3001

Copy & Invoice to:
Administration Officer
C.R.A. Exploration Pty. Ltd.
P.O. Box 93
NORTHLAND CENTRE / VIC. 3072

for H.W. Fander, M. Sc.

REPORT CMS 80/12/50

Notes:

Brief petrological descriptions were prepared in tabulated form. These incorporate data from stereobinocular and petrological microscopic examination of representative thin-sections and related offcuts, and include comments on alteration features and correlations where applicable.

The suite includes four distinct to semi-distinct lithological groups:

1. Porphyritic Andesites with sericite-albite-chlorite-calcite (± epidote, rare pyrite) alteration assemblages (possibly deuteric). These rocks are essentially unstressed; specimens No. 816801, 816821, 816829.

2. Intermediate Minor intrusives with primary detail obscured by marked sericite-siderite alteration (similarly group 3), but with broadly dioritic composition inferred from the relict fabric, weakly sheared; specimens No. 795595, 795600.

3. Rhyolitic Tuffs with pervasive quartz-sericite-siderite (± pyrite) alteration analogous to that of group 2 rocks. Includes vitric-crystal and lithic-vitric-crystal tuff, probably subaerial, and a single, similarly altered pelitic ash. Variably sheared; specimens No. 795591, 795592, 795593, 795594 and 795596.

4. Rhyolitic Lavas/Minor Intrusives with alteration features closely analogous to groups 2 and 3; that is, of low-temperature hydrothermal character and predating the weak tectonic cleavage; specimens No. 795597, 795598, 795600.

D. Cowan, B. Sc.

Central Mineralogical Services

	Classification - Composition	Fabric	Accessories	Comments
816801 (T.S. 35649)	Porphyritic Andesite. Sericite-stained/albitised plagioclase, frequent, completely chloritised amphibole, subordinate biotite, pyroxene phenocrysts. Sericitised/chlorite-stained felsitic groundmass.	Typical andesitic fabric, devitrified groundmass.	Sparse quartz microphenocrysts, leucoxenised opaques. Thinly disseminated oxidised pyrite.	Strictly a quartz-andesite (basic dacite). ?Deuteric alteration, but probably enhanced by low-grade metamorphism. Incipiently stressed.
816 821	Porphyritic Andesite. Frequent sericite-stained/albitised plagioclase, chloritised/carbonated ferromag phenocrysts, disseminated quartz-carbonate, chlorite amygdales. Chloritised subtrachytic groundmass.	Coarsely porphyritic, amygdaloidal, andesitic, weakly flow-structured. Weakly fractured.	Minor leucox. opaques. Sparsely disseminated pyrite, minor epidote.	Thoroughly altered, but distinctly andesitic. Sparse quartz-calcite-healed fractures intersected by later sericite films, shear-zones.
816 829	Porphyritic Andesite. Sericite-pseudomorphed plagioclase, variably chloritised augite, chlorite-pseudomorphed amphibole phenocrysts. Chlorite-sericite-stained felsitic groundmass.	Coarsely porphyritic, andesitic, incipiently subtrachytic. Unstressed.	Disseminated (primary) magnetite, minor leucoxenised opaques, rare quartz phenocrysts.	Appears closely related to 816801, 816821, but characterised by conspicuous accessorymagnetite and relatively fresh pyroxene.
795 591 270m LB2	Rhyolitic tuff. Quartz and frequent sericitised feldspar crystals/fragments, sericite-ankerite-stained lava and minor tuff clasts, poorly resolved, similarly altered matrix.	Poorly sorted psammitic tuff. Patchy, vague, sericitised shards. Weaklysheared.	Disseminated leucoxenised opaques. Sparse, fine to ultrafine chalcopyrite.	Lithic-vitric-crystal tuff, probably subaerial. Chalcopyrite largely restricted to discontinuous, pre-tectonic carbonate films, rare stressed quartz veins.
795592 55m LB2	Rhyolitic Tuff. Extensively sericite/microcrystalline quartz altered/carbonate-stained rhyolitic lava clasts, sericitised feldspar, minor quartz crystals/fragments. Poorly resolved sericitic matrix.	Incipiently sheared, psammitic tuff with patchy, vague, relict shard textures.	Leucoxenised opaques; rare fine to ultrafine pyrite, ?chalcopyrite. Minor trace barite.	Affinities with 795591, but relatively homogeneous fabric. Sulphide largely restricted to (stressed) ankerite-quartz veins with accessory barite.
795 593 53m LB2	Rhyolitic Tuff. Sericitised/carbonate-stained lithic clasts, subordinate sericitised feldspar, minor quartz crystals/fragments; carbonated-sericitised, poorly resolved matrix.	Similar to 795591 and particularly 795592. Weakly sheared.	Leucoxenised opaques. Minor traces chalcopyrite.	Close affinities with 795592, ?subaerial. Chalcopyrite largely restricted to stressed/boudinaged quartz-ankerite(-sericite) veins.
795 594 187m LB2	"Pelitic Ash". Ultrafine sericite and closely intergrown cryptocrystalline quartz. Disseminated fine silt-sized clastic quartz, mica flakes. Films, spongyimpregnations of siderite carbonate.	VAgue, but semi-pervasive microscopic shardy textures. FAintly banded.	Rare, fine to ultrafine pyrite, ?chalcopyrite.	Vitroclastic silty shale with thoroughly sericitised, poorly preserved shards. Sulphide largely restricted to microscopic carbonate films veinlets.
795 595 207m LB2	Porphyritic ?Microdiorite. Sericite-pseudomorphed plagioclase, subordinate siderite-sericite-semi-pseudomorphed pyroxene phenocrysts, siderite-stained, sericitised mesostasis.	Weakly flow-orientated phenocrysts. Essentially dioritic-textured. Microlathic groundmass.	Conspicuous ultrafine leucoxenised opaques. Rare, very fine pyrrhotite, pyrite, ?chalcopyrite.	Thoroughly altered, but essentially unstressed, intermediate ?minor intrusive (alternately, core of flow). Sulphide particles in siderite, sericitised plagioclase.
795 596 (T.S. 35657) 179m LB2	Rhyolitic Tuff. Frequent sericitised feldspar, subordinate quartz crystals/fragments, sparse sericitised/silicified lithicclasts in thoroughly sericitised shardy matrix.	WEakly banded. Eutaxitic fabric enhanced by weak slaty cleavage.	Sparse vitric tuff clasts. Disseminated leucoxenised opaques. Semi-pervasive cloudy siderite. Rare pyrite.	Vitric-crystal tuff with minor lithic component. Probably ignimbritic. Affinities with 795591, 92, 93; similarly altered/incipiently

Central Mineralogical Services

	Classification - Composition	Fabric	Accessories	Comments
[redacted]597 795597 (T.S. 35658) 167.7m LB2	Granophyre. Disseminated sericitised, carbonated feldspar phenocrysts in sericite-siderite-stained groundmass of alkali feldspar microlaths, subgraphic quartz.	Essentially porphyritic, micrographic (granophyric). Sporadic siderite-sericite-quartz veinlets.	Leucoxenised opaques, rare sericitised biotite flakes. Traces fine to ultrafine pyrite.	Minor "granitic" intrusive. Alteratio closely analogous to that in the rhyolitic tuffs. Quartz and carbonate sericite veinlets mutually displac
795 598 140m LB2	Porphyritic Rhyolite. Frequent sericitised feldspar and conspicuous quartz phenocrysts. Thoroughly sericitised-sideritised-silicified felsitic groundmass.	Evenly disseminated phenocrysts, locally perlitic groundmass.	Traces apatite, leucoxenised opaques. Rare pyrite films.	Devitrified, pervasively altered lava or chilled minor intrusive. Pyrite restricted to sericitic fractures.
795 599 97m LB2	Porphyritic Rhyolite. Frequent sericitised feldspar, subordinate, partly resorbed quartz phenocrysts, weakly, but pervasively sericite-stained felsitic groundmass. Patchy siderite clots, veins.	Weakly flow-structured, incipiently sheared.	Sparse leucoxenised opaques, apatite. Rare pyrite films.	Very similar to 795598, but relatively weakly fractured. Mild shearing postdates siderite(-sericite-quartz-pyrite) veins.
795 600 (T.S. 35661) 51m LB2	Amygdaloidal "Porphyry". Frequent ankerite-chalcedony (± sericite) amygdales, disseminated sericitised plagioclase phenocrysts in thoroughly sericitised/carbonated feldspar microlathic groundmass.	Amygdales mean 1-2 mm. Weakly sheared, parallel to incipient flow-structure.	Conspicuous fine leucoxenised opaques. Minor vein siderite (with sericite).	Compositional detail obliterated, but of intermediate affinities, ?minor intrusive. Of associated specimens similar to 795595.

032

963033

CENTRAL MINERALOGICAL SERVICES

Date 12th March, 1981

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
795688
Sulphides

Job No. CMS 81/3/12 Date Received: 9.3.1981

Reference D.P.O. No. 26491

Sample No. 795688 179.4 m in DD 80-B1.

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 36304

a. Hand Specimen:

Massive sulphides, minor gangue.

b. Microscopic:

The sample consists mainly of sulphides, with subordinate gangue; the fabric is crudely banded, with elongate, subparallel gangue patches and voids, and compositional banding of the sulphides as well.

The major sulphides are pyrite and chalcopyrite, with traces of galena and sphalerite. Pyrite occurs as clusters with euhedral outlines, but with spongy cores and growth-zoning; the cores are intricately intergrown with ultrafine chalcopyrite and growth-zones are delineated by thin shells of chalcopyrite; the pyrite is distinctly anisotropic. The textural characteristics of the pyrite and its anisotropism strongly suggest a syngenetic origin, with diagenetic recrystallization.

The chalcopyrite is fairly massive and also forms veinlets cutting pyrite and minute grains in gangue (dominantly in carbonate). Small, irregular grains of galena (seldom more than 30 μ, occasionally up to 50-100 μ) are relatively common in chalcopyrite, but sphalerite is rare.

Gangue minerals comprise quartz and carbonate (probably dolomite; a calcite/ankerite stain test was negative).

The pyrite was etched with HNO_3, which accentuated concentric zonal textures and revealed greater detail supporting a syngenetic origin.

H.W. Fander, M. Sc.

APPENDIX 4

ROCK SAMPLE LEDGER

034

963035

GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 1

TENEMENT SHEFFIELD EL 7/73 D.P.O. No. 26455, 62

AREA/PROSPECT LAKE BARRINGTON SAMPLE No's. GEOLOGIST G.P. DATE July 1980

PLAN REFERENCE ANALYSED BY ZINC CORP.

Sample No.	LOCATION.	Metal Content in ppm. Pb	Zn	Cu	Ag	Au	Mo		Geological observations
816601	4600E/4875N	37	27	250	<1	<.04			o/c. Mod. silif tuff? ± several % py.
816602	4600E/4814N	85	22	110	<1	<.04			scree: Qtz sst ± much disseminated haem.
03	4600E/4953N	40	107	310	<1	<.04			o/c: fractured vitric tuff ± limonite.
04	4600E/4885N	8	11	84	<1	<.04			o/c: Vitric tuff ± limonite-qtz veins.
05	4600E/4865N	26	117	290	1	<.04			scree: Micaceous tuff-shale ± bedded limonite
06	4600E/4850N	26	28	460	<1	<.04			scree: Gritty tuff ± limonite fractures
07	4600E/4848N	4	19	90	<1	<.04			scree: Gritty tuff ± much dark Fe oxides
08	4600E/4837N	44	50	89	<1	<.04			scree: Silic vdc ± much heavy black mineral.
09	4600E/4834N	130	19	2700	3	<.04			scree: leached bleached vdc ± limonite.
816610	4600E/4831N	37	153	1410	2	<.04			scree: Gossanous, heavy, ferruginous silic vdc.
11	4600E/4820N	70	100	9400	57	0.35			o/c: 50mm massive py zone in gritty tuff
12	4600E/4805N	45	184	400	1	<.04			scree: Silic sandy vdc, ± limonite.
13	4600E/4770N	20	102	1210	1	<.04			o/c: Hard tuff breccia ± ferruginous matrix
14	4500E/5020N	45	54	690	2	<.04			Scree: Gritty tuff ± fine limonitic fractures.
15	4500E/5018N	37	134	300	2	<.04			Scree: Brown ochreous sl. cherty tuff.
16	4500E/4900N	40	17	110	<1	<.04			scree: sl. leach. bleach. vitric tuff ± limonite
17	4500E/4883N	42	20	380	2	<.04			scree: ditto.
18	4500E/4875N	18	26	280	1	<.04			scree: leach. bleach. sl. silif tuff ± limonite.
19	4500E/4845N	24	620	1080	2	<.04			scree: limonitic, fractured volcanic.
816620	4500E/4778N	14	62	120	<1	<.04			o/c: Sandy vitric tuff ± much gossanous limonite
21	4500E/4800N	21	134	66	1	<.04			Scree: Ferruginous gritty volcanic.
22	4700E/4780N	42	119	280	1	<.04			Scree: Fine gritty tuff ± gossanous Fe oxides
23	4700E/4850N	20	210	150	1	<.04			o/c: Limonitic, brecciated breccio-conglomerate
24	4700E/4845N	37	65	270	1	<.04			o/c: Bleached, silif breccio-cong ± py vein.
25	4700E/4835N	24	42	46	<1	<.04			scree: Silif, vdc breccia ± disseminated py.
26	4700E/4830N	36	109	1310	1	<.04			o/c?: 2° limonite-gossanous covering brec-cong
27	4700E/4825N	25	93	1080	1	<.04			scree: gossanous limonite in fine gritty tuff.
816758	4700E/4785N	15	50	560	<1	<.04	<2		scree: silic, brecciated ferruginous volcanic
59	4700E/4760N	25	92	1400	1	<.04	<2		scree: Highly ferruginous ± heavy tuff?
816760	4700E/4745N	22	71	360	1	<.04	2		scree: silif, v. limonitic gritty tuff
61	4700E/4740N	16	160	160	<1	<.04	2		o/c: tuff breccia ± matrix of limonite
62	4700E/4742 N	5000	250	960	1	<.04	10		scree: Limonite veined fi gr vitric tuff
63	4700E/4670N	25	61	2400	4	<.04	2		scree: fi gr tuff ± abundant limonite fractures
64	4700E/4628N	25	80	1240	2	<.04	<2		scree: Vitric tuff ± abundant limonite fractures
65	4700E/4620N	41	123	1220	4	<.04	<2		o/c: Vitric tuff ± ferruginous patches + lim veins

A 21146

035

963036

GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 2

TENEMENT SHEFFIELD EL 7/73 D.P.O. No. 26462

AREA/PROSPECT LAKE BARRINGTON SAMPLE No's. GEOLOGIST G.P. DATE July 1980

PLAN REFERENCE ANALYSED BY ZINC CORP

Sample No.	Location	Metal Content in ppm. Pb	Zn	Cu	Ag	Au	Mo		Geological observations
816766	4700E/4530N	75	154	350	2	<.04	2		Scree: gossanous, limonitic tuff
67	4700E/4640N	16	17	46	<1	<.04	2		Scree: vitric tuff ± minor fine sulphides
68	4700E/4463N	63	32	170	1	<.04	2		Scree: tuff-shale breccia ± ferruginous matrix.
ROCK SAMPLES TAKEN BY J. COMER - DPO 26479 (ZINC CORP - FEBRUARY 1981)									
816063	4800E/4900N	2	6	10	<1				Tuff-grit. Weathered, ferruginous.
64	4800E/4907N	13	40	1280	1				As above - ferruginous.
65	4800E/4922N	8	10	24	<1				Tuff-grit. Bleached.
66	4800E/4965N	8	61	14	<1				Sfc. Acid Lava - xyl tuff. Silicic.
67	4800E/5030N	14	48	29	<1				Sfc. Acid lava - xyl tuff.
68	4800E/4985N	6	48	31	<1				As above.
69	4800E/5080N	6	33	9	<1				As above.
816070	4800E/5100N	4	27	16	<1				As above + gritty tuff
71	4800E/5113N	6	22	6	<1				Tuff-grit.
72	4800E/5115N	4	11	7	<1				Acid lava. Silicic.
73	4900E/5050N	6	10	25	<1				Tuff-shale. Sft. ferruginous.
816074	4900E/5048N	8	22	11	<1				Tuff-grit. clasts to 8cm.
816183	4800E/4425N	8	47	31	<1				Xyl-tuff or lava. Sft. poor. Dark matrix.
84	4800E/4445N	8	66	390	<1				As above
85	4800E/4472N	7	76	84	<1				As above with possible lithic clasts.
86	4800E/4475N	11	74	120	<1				As above
87	4800E/4500N	10	80	32	<1				As above
88	4800E/4555N	3	18	180	<1				Tuff-fi gr. Minor qtz. Hematitic.
89	4800E/4570N	6	20	60	<1				Tuff-silicic. Vitric or siltstone.
816190	4800E/4575N	4	5	26	<1				Sfc. Tuff-siltstone. Fi gr.
91	4800E/4625N	8	29	39	<1				Xyl tuff - med-fi gr. Sft-feldspar.
92	4800E/4643N	4	7	20	<1				As above.
93	4800E/4758N	8	48	110	<1				Sfc. Tuff-grit. Qtzose, lithic clasts. Limonite.
94	4800E/4785N	43	38	1500	1				Tuff-Gritty, lithic. Ferruginous.
95	4800E/4803N	6	11	30	<1				Tuff-grit. Silicic.
96	4800E/4905N	5	27	110	<1				Acid lava. Silicic, sl. ferruginous
97	4800E/4823N	34	33	770	<1				Tuff-grit. Weathered. Sl. limonitic.
98	4800E/4850N	12	12	38	<1				Tuff-grit. Sfc. clasts to 15mm.
99	4800E/4860N	58	29	1670	1				Tuff-grit. Ferruginous.
816200	4800E/4880N	7	7	160	<1				Tuff-grit. Bleached.

APPENDIX 5

REPORT ON GEOPHYSICAL SURVEYS

BY M. FLIS

037

963038

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)

54 RAGLAN STREET, PRESTON, VICTORIA 3072, AUSTRALIA

P.O. BOX 93
NORTHLAND CENTRE 3072
TELEGRAMS: CRALEX
TELEX: AA37474
TELEPHONE: 480 1866
AREA CODE 103

IN REPLY PLEASE QUOTE

MEMORANDUM TO: G.PURVIS

COPIES : R.L.BRUNKER
R.J.SMITH
T.DICKSON

FROM : M.F.FLIS

BARRINGTON IP AND MAGNETIC SURVEY

1.0 INTRODUCTION

An induced polarization survey was carried out in June 1980 on the Barrington grid. The survey was designed to test promising Cu geochem results. The target was presumed to be massive sulphides.

Geoterrex was contracted to undertake the survey; supplying a three-man crew, a 1.5 KVa Elliot transmitter and a Scintrex IPR-7 receiver. A dipole-Dipole spread of 50 m was used initially, with a 25 m spread being used over the most promosing zone. An average of one and a half spreads was completed per day. All pseudo-sections are included in this report.

2.0 DISCUSSION

Two anomalous zones have been delineated by this survey: labelled A and B on the anotated pseudo-sections included with this report. Whilst "A: is graded a a definate anomaly, "B" is probable. A line-by-line interpretation follows:

2.1 Line 4900E (50 m dipole)

A weak probable anomaly situated at 4800N exhibiting a marked resistivity low an moderate chargeability high is present. The anomaly is complicated by both topographical effects (resulting in a resistivity low in the valley) and accumulation of low chargeability materials in the creek. The anomaly constitutes a complex interaction of possibly discrete zones of disseminated materials. A general increase in resistivity to the south indicates a lithological contact at 4950N.

2.2 Line 4800E (50 m dipole)

The above zone continues on this line with both resistivity and chargeability values strengthening. The anomaly, labelled "A", is becoming more definate in form with a secondary probable anomaly forming to the south of A at around 4675 m N. This latter anomaly, labelled "B", is weak and at this stage, does not represent any significant mineralization.

2.3 Line 4700E (50m dipole)

Anomaly A is shallowing on this line, however complications from both topographical and possibly structural effects are apparent. An increase in resistivity to the north of 4940N reflects a lithology change.

2.4 Line 4600E (50m dipole)

Anomaly A reaches its peak at 4880N, exhibiting a 27m sec (50%) rise over chargeability background and a 1790 ohm meter (90%) drop in resistivity.

The anomaly here is classed as definate and reflects the presence of a good conductor. A secondary source (anomaly "B") centred on 4750N is much weaker in nature and may hint at a disseminated source adjacent to the much more massive source of anomaly A.

2.5 Line 4600E (25 dipole)

The line was covered with a 25m dipole to more accurately define the anomalous zone. Naturally both chargeability and resistivity values improve. An anomaly centre of 4880N is still apparent whilst the anomaly,s shape has tightened up.
Anomaly B still seems to be present although it has moved to 4800N, thus hinting at a rather ambiguous source-that is, disseminated.

2.6 This line was read with a 25m dipole in the hope that anomaly A would still continue at a shallow depth. This is not the case, however, having in fact deepened. Anomaly B, on the other hand, is strengthening and shallowing; here it is centred on 4825N.

3.0 CONCLUSION

Two anomalous zones have been delineated by this survey. The zones are parallel to both each other and the surrounding country rocks (as inferred from the sections)- a strike of 110 deg. mag north being apparent. Whilst anomaly B can only be classed as a possible anomaly at the best of times, anomaly A is definate and constitutes a prime target. The anomaly forms a classic dyke-type pattern, however until modelling is carried out dip, depth to bottom and depth to top remain qualitative. A depth of 65m and a sub-vertical dip to the south is interpreted.

The anomaly is coincident with anomalous copper geochem values. One might infer a classic chalco pyrite-sphalerite-pyrite/pyrrhotite assemblage, unfortunately zinc values were depressed in the area and the choice between pyrite and pyyrrhotite has yet to be made. I have been told that the types of readings obtained over anomaly A are comparable to those obtained at Renison Bell- thus suggesting a massive pyrrhotite body. The question can, of course, be easily settled by a few ground magtraverses.

4.0 GROUND MAGNETICS

Three ground magnetic profiles were done over the prospect to ascertain whether the observed I.P. responses were pyrrhotite or pyrite caused. Readings were taken along the lines 4500E, 4600E and 4700E at a station spacing of 10 meters with the sensor mounted on a two metre staff. Profiles are attached.
A comparison of the magnetic profiles, I.P. anomalies and geochem anomalies indicate that there is no magnetic signature associated with the mineralization. A pyrrhotite anomaly source can thus be safely discounted.
The increase in magnetic intensity to the south (eg from 4650 m on line 4700E) reflects a lithology change in that direction- being caused by dacitic volcanics.

5.0 RECOMMENDATIONS

Anomaly A is recommended for drilling, the target being 4880N on line 4600E at a depth of 65m. A steep dip to the south is postulated at this stage; modelling and geologic input being needed to support this interpretation.

040

963041

C.R.A. EXPLORATION PTY. LIMITED

MEMORANDUM TO -G.J.PURVIS
G.B.WEBER

COPY -R.SMITH

FROM -M.FLIS

10th April 1981.

NOTES ON THE RESULTS OF I.P.ANOMALIES DRILLED AT LAKE BARRINGTON COPPER PROSPECT

Two diamond drill holes, DD 80 LB1 and LB2 were drilled at Lake Barrington to test promising I.P. anomalies associated with elevated copper geochem values (refer memo to G.Purvis 27th June 1980).

The first hole (LB1) was planned to intersect an I.P. Target on line 4700E at 4850N at a depth of 80m. The hole in fact intersected dispersed pyrite (2-3% average) at approximately 80m vertical depth (80-110m in the hole), and a thin band of massive base metal sulphides (cp>py>sp-gn) at approximately 130m vertical depth (179.4m in the hole).

The second hole (LB2) was designed to intersect an I.P. target on line 4600E at 4875N at a depth of 65m. As with LB1 the I.P target proved to be 5-10% pyrite at a vertical depth of 70m (115-125m in the hole). Copper and zinc sulphides with pyrite occured at a depth of 140m below 4775N.

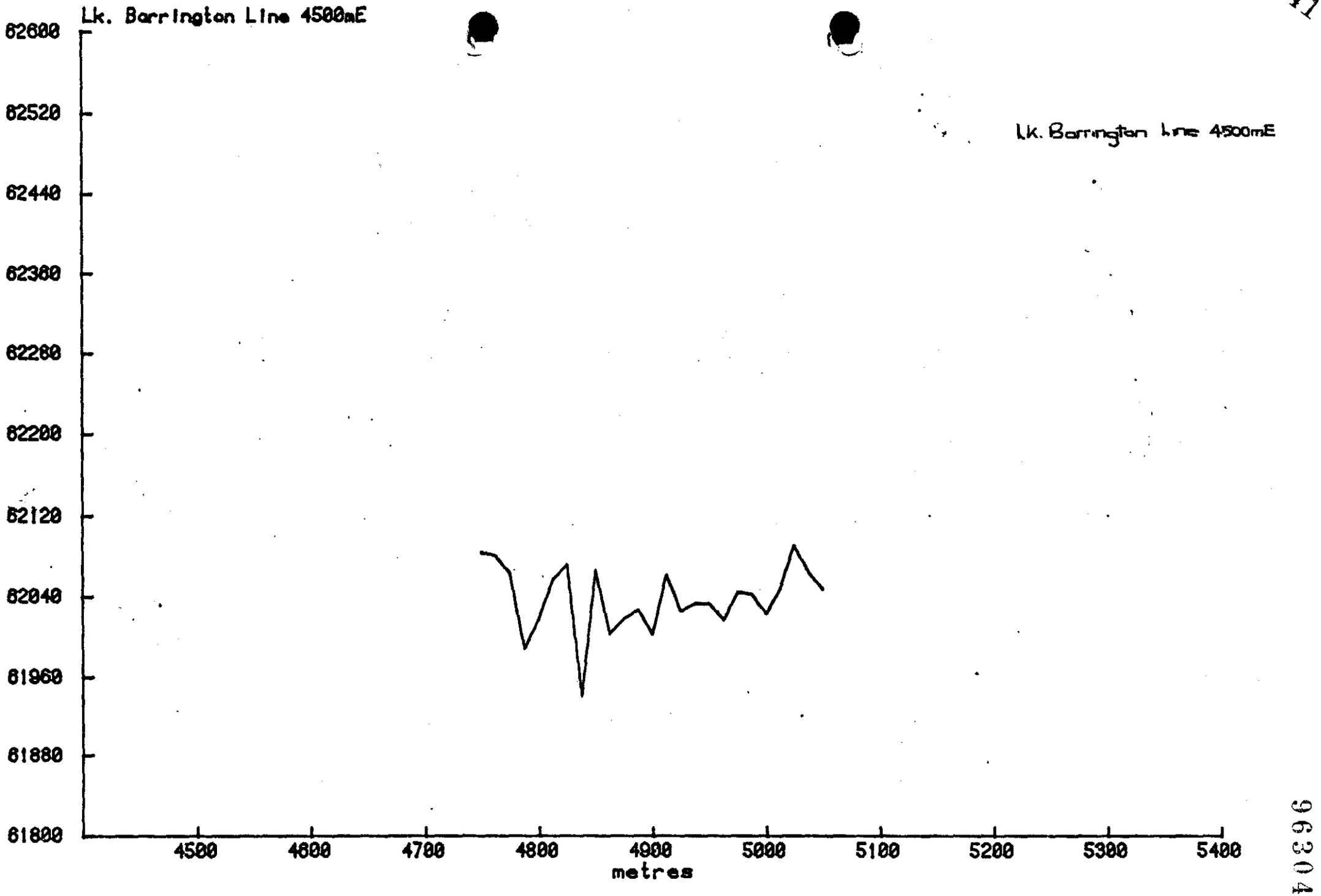
From these results it is quite obvious that the I.P. anomalies are caused primarily by pyrite abundances. Close examination of the anomalies, however, reveal that a more subtle deeper chargeable zone is present on the pseudo-sections. The generally high resistivities encounted on these sections (3-4000 ohm.m on average) indicate that a ground penetration of two to three times dipole length (ie 100-150m) has been achieved. If a maximum ground penetration of the 150m is taken then the equation between chargeable zones and pyritic and sulphide zones is more easily made (e.g. the massive base metal sulphides in LB1 can be directly correlated to the highly chargeable zone at 4825N or 4700E at N=6).

Having made this correlation the following I.P. targets are recommended for drilling (in order of priority):-

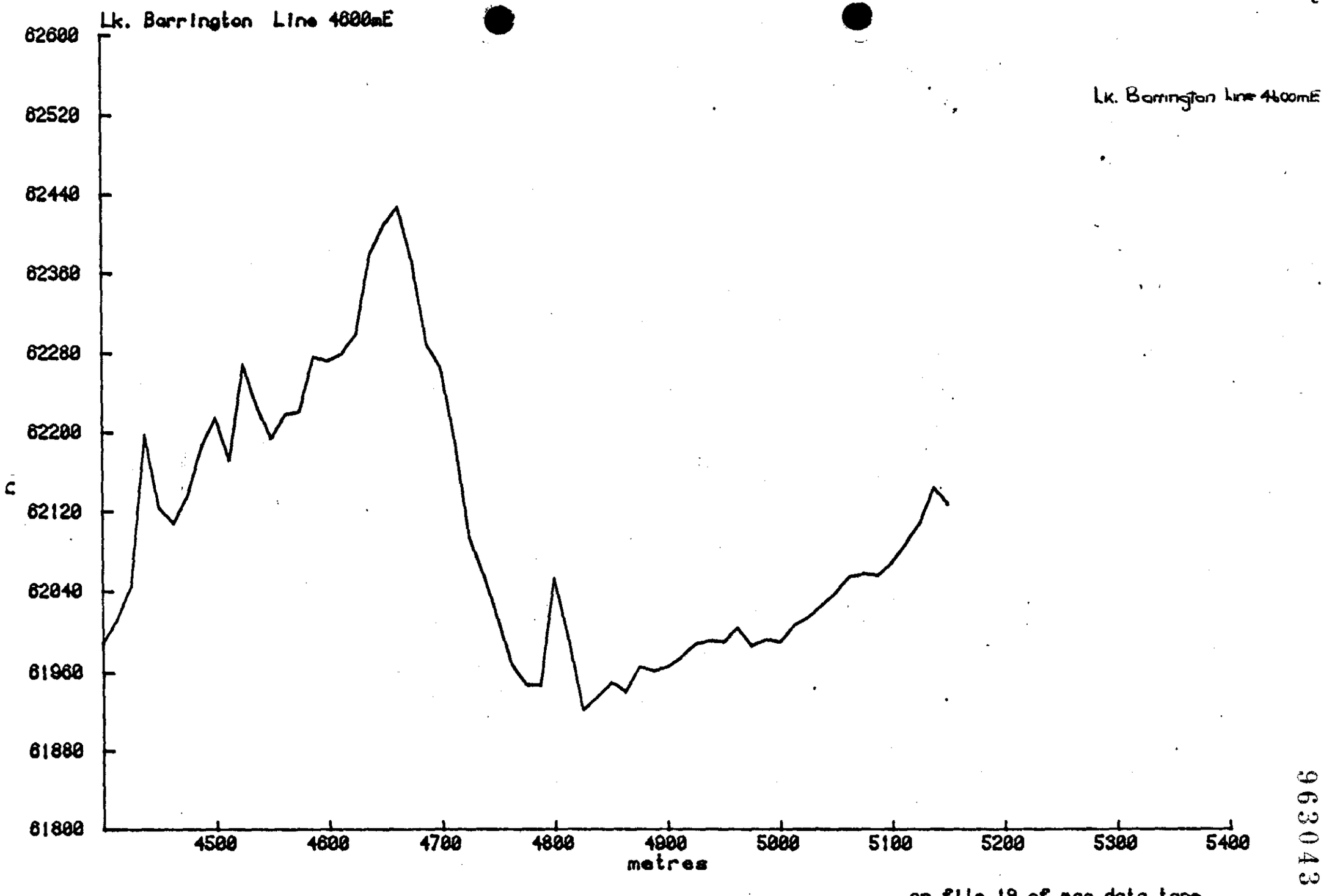
1. Line 4800E, 4750N at a depth of 140m
2. Line 4700E, 4775N at a depth of 150m
3. Line 4900E, 4700N at a depth of 150m

These targets intensify with depth and appear to be open to depth. Pyrite is expected to be present (10% dissemination) in the shallower region (80-120m). The target on line 4900E has a very low priority as the anomaly here is weakening and may be due to the sideward looking effect. A further line would have to be done (on 5000E) to confirm the 4900E anomaly

M.FLIS

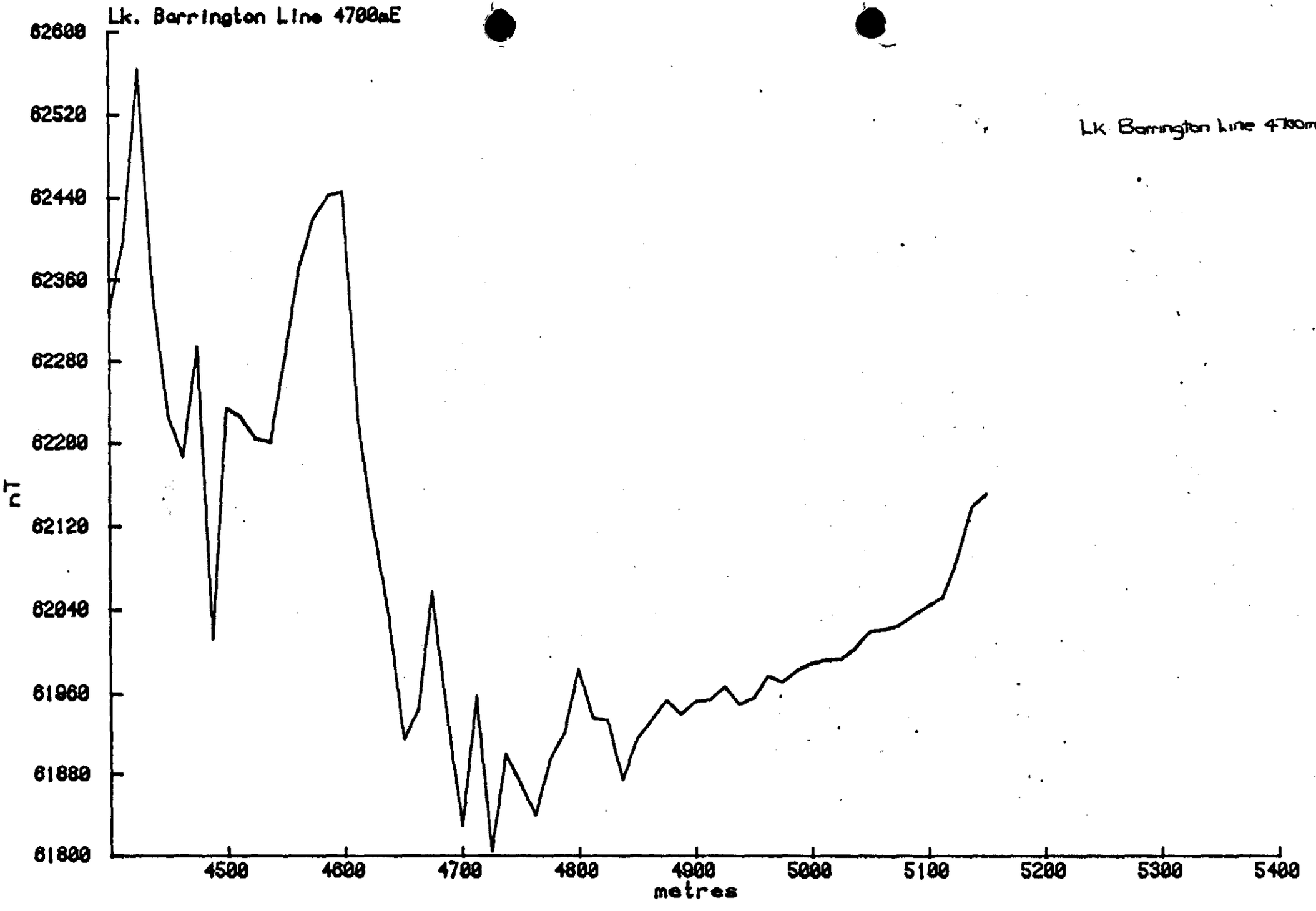


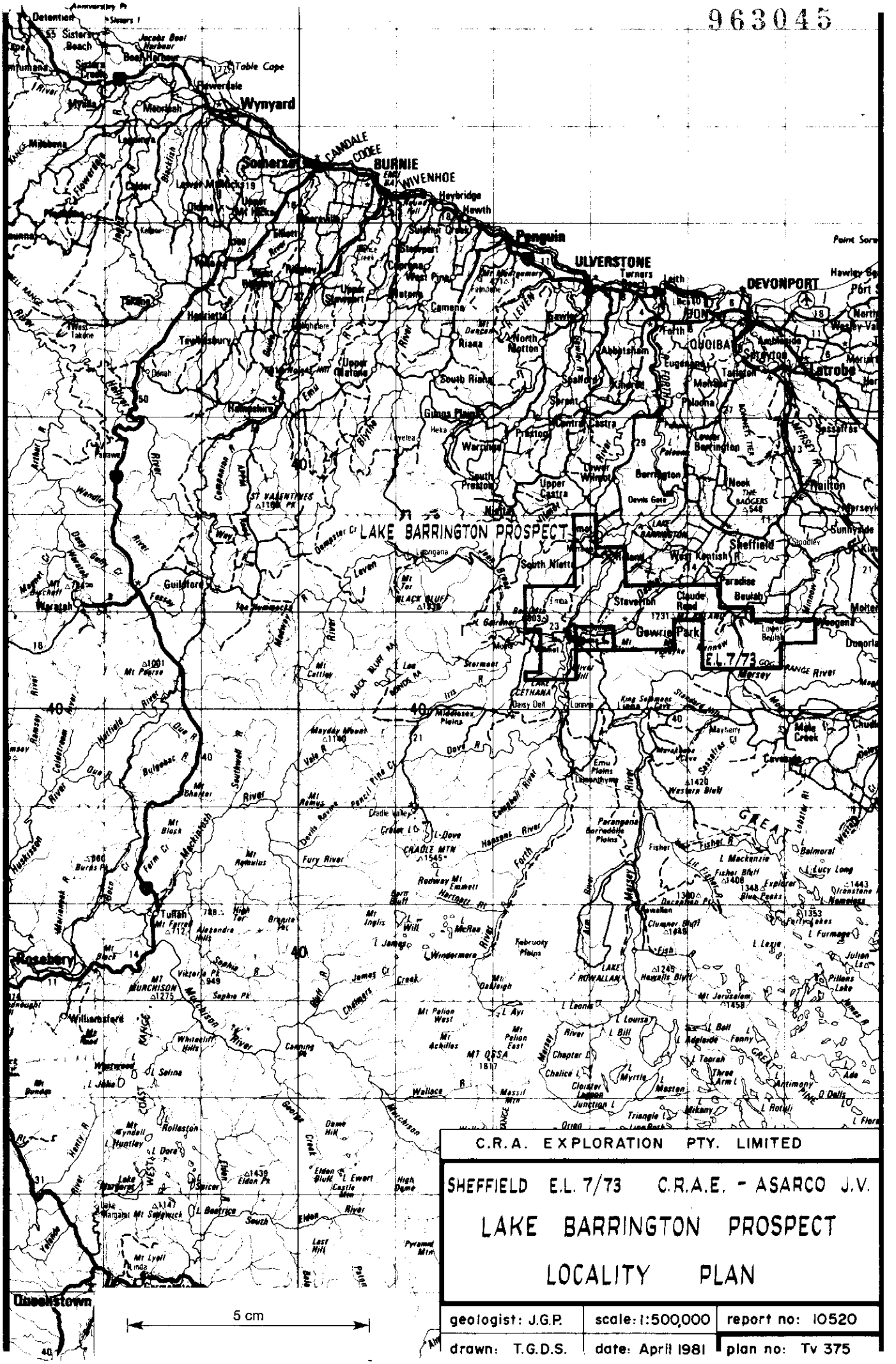
on file 21 of mag data tape



Lk. Barrington Line 4600mE

on file 19 of mag data tape





C.R.A. EXPLORATION PTY. LIMITED

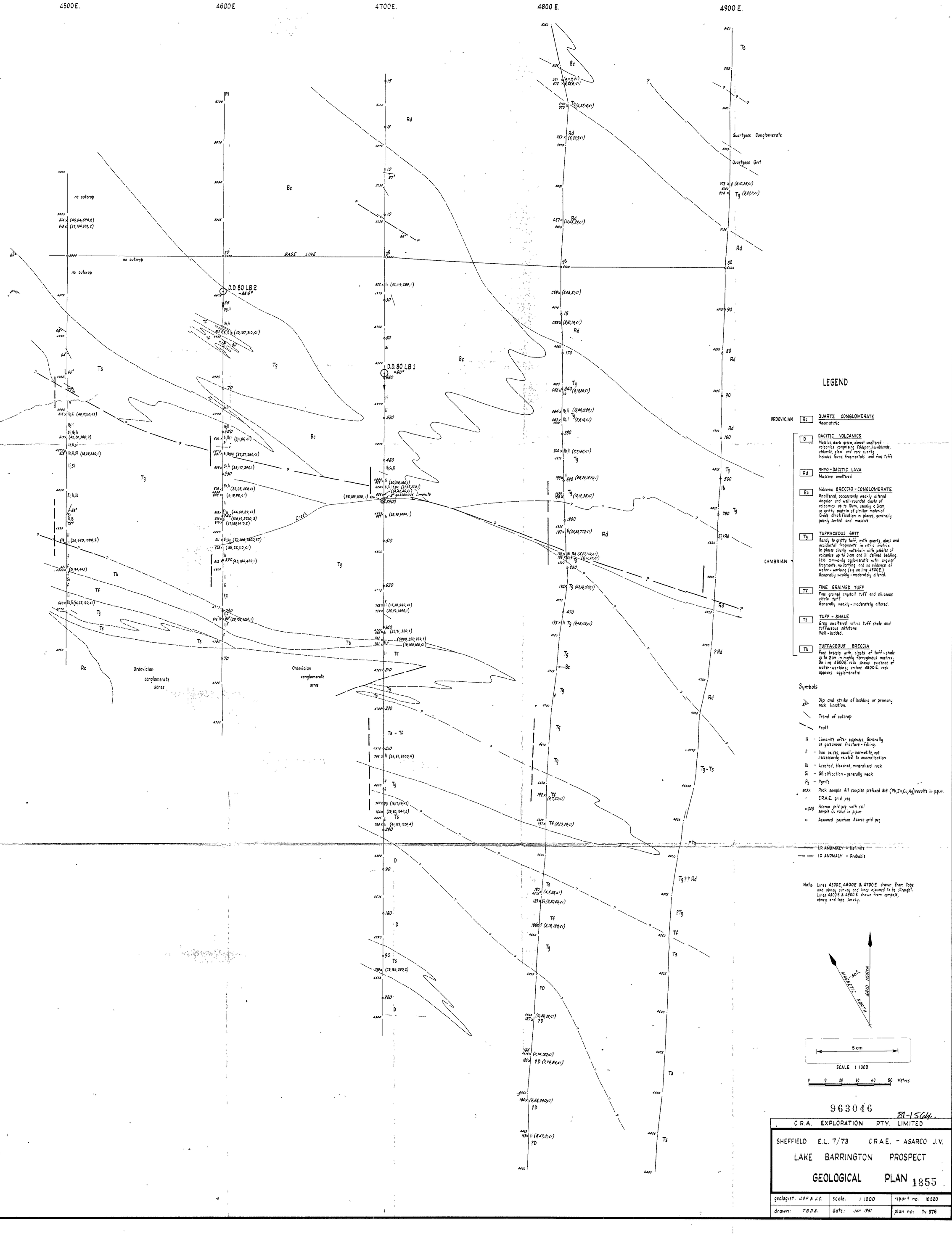
SHEFFIELD E.L. 7/73 C.R.A.E. - ASARCO J.V.

LAKE BARRINGTON PROSPECT

LOCALITY PLAN

geologist: J.G.P.	scale: 1:500,000	report no: 10520
drawn: T.G.D.S.	date: April 1981	plan no: Tv 375

4500E. 4600E 4700E. 4800 E. 4900 E.



LEGEND

ORDOVICIAN

Rc QUARTZ CONGLOMERATE
Hematitic

CAMBRIAN

D DACITIC VOLCANICS
Massive, dark green, almost unaltered volcanics comprising feldspar, hornblende, chlorite, glass and rare quartz. Includes lavas, fragmentals and fine tuffs

Rd RHYO-DACITIC LAVA
Massive unaltered

Bc Volcanic BRECCIO-CONGLOMERATE
Unaltered, occasionally weakly altered Angular and well-rounded clasts of volcanics up to 10cm, usually < 3cm, in gritty matrix of similar material Crude stratification in places, generally poorly sorted and massive

Tg TUFFACEOUS GRIT
Sandy to gritty tuff, with quartz, glass and accidental fragments in vitric matrix In places clearly waterlain with pebbles of volcanics up to 3cm and ill defined bedding. Less commonly agglomeratic with angular fragments, no sorting and no evidence of water-working (eg on line 4500E.) Generally weakly-moderately altered.

Tf FINE GRAINED TUFF
Fine grained crystall tuff and siliceous vitric tuff
Generally weakly-moderately altered.

Ts TUFF-SHALE
Grey unaltered vitric tuff shale and tuffaceous siltstone
Well-bedded.

Tb TUFFACEOUS BRECCIA
Fine breccia with, clasts of tuff-shale up to 2cm in highly ferruginous matrix. On line 4600E. rock shows evidence of water-working; on line 4500E. rock appears agglomeratic

Symbols

- 87° Dip and strike of bedding or primary rock lineation.
- Trend of outcrop
- Fault
- li - Limonite after sulphides, Generally as gossanous fracture-filling.
- f - Iron oxides, usually hematite, not neccessarily related to mineralisation
- lb - Leached, bleached, mineralised rock
- Si - Silicification - generally weak
- Py - Pyrite
- 603x Rock sample All samples prefixed 816 (Pb,Zn,Cu,Ag) results in p.p.m.
- C.R.A.E. grid peg
- o240 Asarco grid peg with soil sample Cu value in p.p.m
- o Assumed position Asarco grid peg

I.P. ANOMALY - Definite
I.P. ANOMALY - Probable

Note- Lines 4500E, 4600E & 4700E drawn from tape and abney survey and lines assumed to be straight. Lines 4800E & 4900E drawn from compass, abney and tape survey.

MAGNETIC NORTH 30° TRUE GRID NORTH

5 cm
SCALE 1 1000
0 10 20 30 40 50 Metres

963046

81-1564.

C.R.A. EXPLORATION PTY. LIMITED

SHEFFIELD E.L. 7/73 C.R.A.E. - ASARCO J.V.

LAKE BARRINGTON PROSPECT

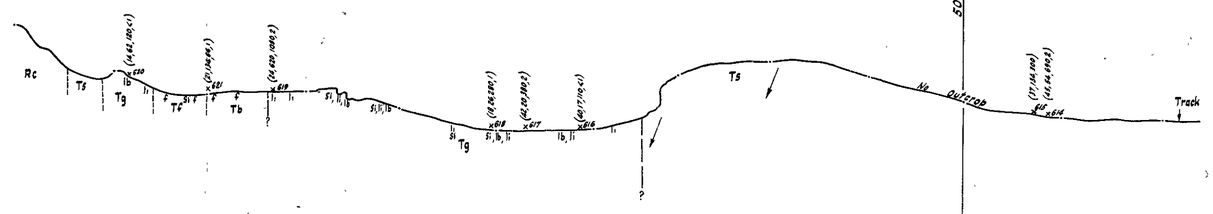
GEOLOGICAL PLAN 1855

geologist. J.G.P. & J.C.	scale. 1 1000	report no. 10520
drawn: T.G.D.S.	date: Jan 1981	plan no: Tv 376

SOUTH

LINE 4500 E. - LOOKING WEST

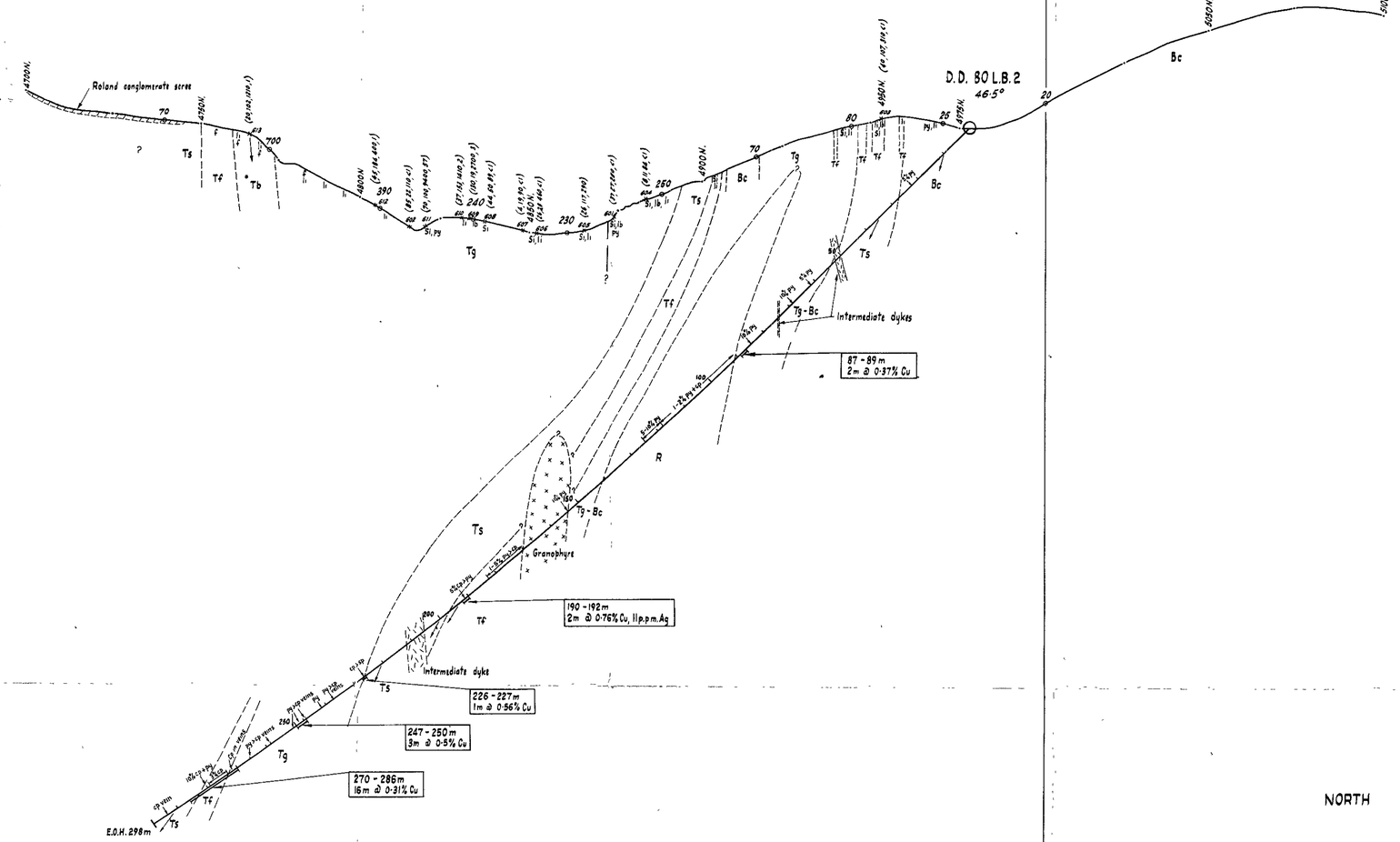
NORTH



SOUTH

LINE 4600 E. - LOOKING WEST

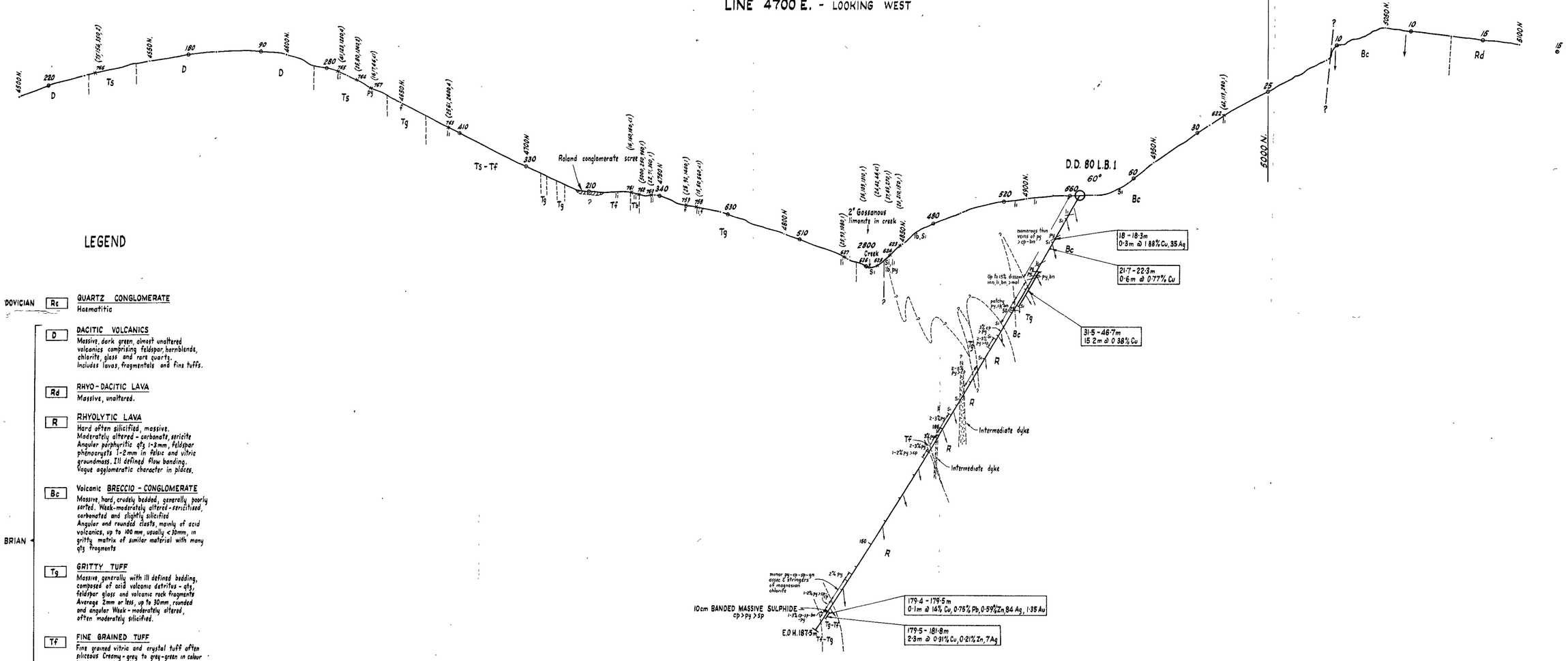
NORTH



SOUTH

LINE 4700 E. - LOOKING WEST

NORTH



LEGEND

ORDOVICIAN

- **Rc** — **QUARTZ CONGLOMERATE**
  Haematitic

BRIAN

- **D** — **DACITIC VOLCANICS**
  Massive, dark green, almost unaltered volcanics comprising feldspar, hornblende, chlorite, glass and rare quartz. Includes lavas, fragmentals and fine tuffs.
- **Rd** — **RHYO-DACITIC LAVA**
  Massive, unaltered.
- **R** — **RHYOLYTIC LAVA**
  Hard often silicified, massive. Moderately altered - carbonate, sericite. Angular porphyritic qtz 1-3 mm, feldspar phenocrysts 1-2 mm in felsic and vitric groundmass. Ill defined flow banding. Vague agglomeratic character in places.
- **Bc** — Volcanic **BRECCIO - CONGLOMERATE**
  Massive, hard, crudely bedded, generally poorly sorted. Weak-moderately altered - sericitised, carbonated and slightly silicified. Angular and rounded clasts, mainly of acid volcanics, up to 100 mm, usually < 30mm, in gritty matrix of similar material with many qtz fragments
- **Tg** — **GRITTY TUFF**
  Massive, generally with ill defined bedding, composed of acid volcanic detritus - qtz, feldspar glass and volcanic rock fragments. Average 2mm or less, up to 30mm, rounded and angular. Weak - moderately altered, often moderately silicified.
- **Tf** — **FINE GRAINED TUFF**
  Fine grained vitric and crystal tuff often siliceous. Creamy-grey to grey-green in colour. Weak - moderately altered - stricite, carbonate ± chlorite. Bedding often ill defined or highly disrupted and variable
- **Ts** — **TUFF - SHALE**
  Grey, weakly or unaltered, v. fine grained, vitric tuff shale and tuffaceous siltstone. Well bedded, often brittle
- **Tb** — **TUFFACEOUS BRECCIA**
  Fine breccia with, clasts of tuff-shale up to 2 cm in highly ferruginous matrix. On line 4600 E. rock shows evidence of water-working; on line 4500 E. rock appears agglomeratic

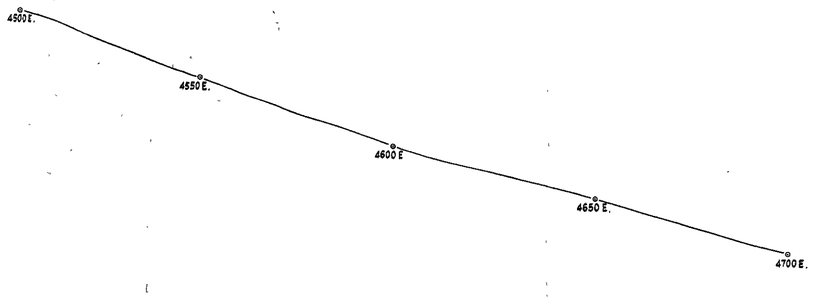
Symbols

- / — Dip of bedding (in tuffs) or flow banding (in lavas).
- Py — Sulphide veins ≥ 25 mm true width
- / — Fault
- li - Limonite after sulphides
- f - Iron oxides, usually haematite, not necessarily related to mineralisation.
- lb - Leached, bleached, mineralised rock.
- Si - Silicification
- Py - Pyrite; cp - chalcopyrite, bn - bornite; sp - sphalerite; ga - galena; Mn - manganese, Mal - malachite
- 603x — Rock sample. All samples prefixed BIG. (Pb, Zn, Cu, Ag) results in p.p.m.
- · — C.R.A.E. grid peg.
- ⊙240 — Asarco grid peg with soil sample Cu value in p.p.m.

WEST

EAST

BASELINE 5000 N. - LOOKING NORTH



5 cm

SCALE 1:1000

0 10 20 30 40 50 Metres

963047

81-1564

C.R.A. EXPLORATION PTY. LIMITED

SHEFFIELD E.L. 7/73 C.R.A.E. - ASARCO J.V.

LAKE BARRINGTON PROSPECT

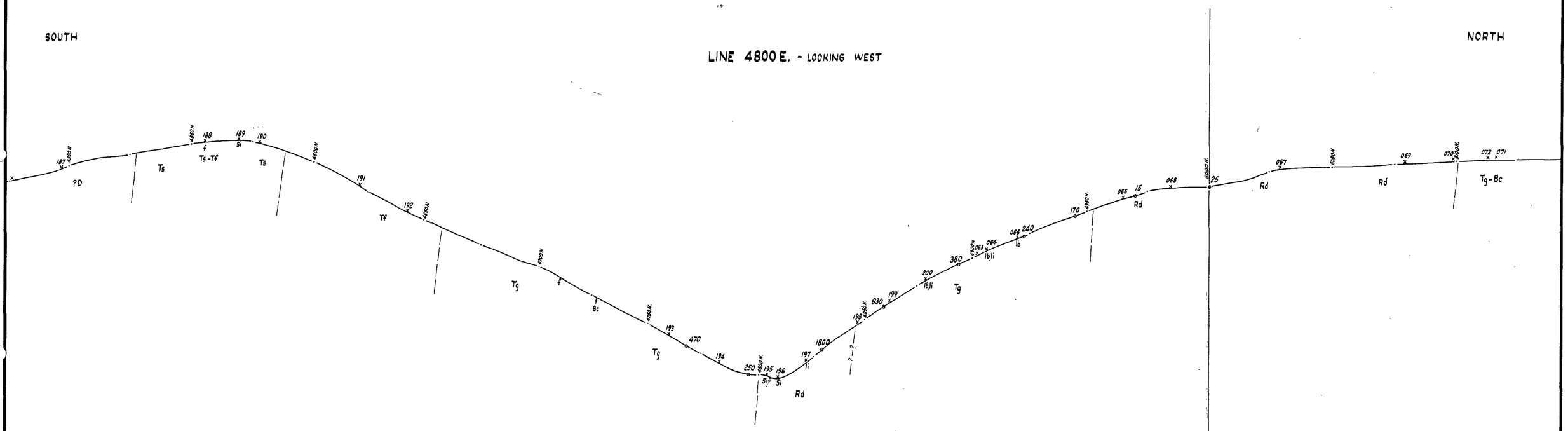
GEOLOGICAL SECTIONS 1856

geologist: J.G.P.	scale: 1:1000	report no: 10520
drawn: T.G.D.S.	date: April 1981	plan no: Tv 377

SOUTH

LINE 4800 E. - LOOKING WEST

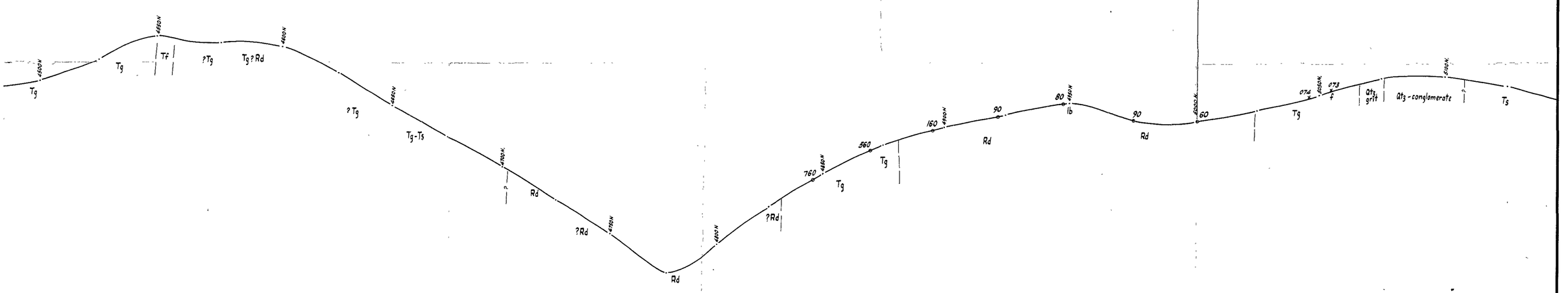
NORTH



SOUTH

LINE 4900 E. - LOOKING WEST

NORTH



LEGEND

DOVICIAN

- **Rc** — QUARTZ CONGLOMERATE. Haematitic
- **D** — DACITIC VOLCANICS. Massive, dark green, almost unaltered volcanics comprising feldspar, hornblende, chlorite, glass and rare quartz. Includes lavas, fragmentals and fine tuffs
- **Rd** — RHYO-DACITIC LAVA. Massive unaltered.
- **Bc** — Volcanic BRECCIO-CONGLOMERATE. Unaltered, occassionly weakly altered. Angular and well-rounded clasts of volcanics up to 10cm, usually < 3cm, in gritty matrix of similar material. Crude stratification in places, generally poorly sorted and massive
- **Tg** — TUFFACEOUS GRIT. Sandy to gritty tuff, with quartz, glass and accidental fragments in vitric matrix. In places clearly waterlain with pebbles of volcanics up to 3 cm and ill defined bedding. Less commonly agglomeratic with angular fragments, no sorting and no evidence of water-working (Tg on line 4500E). Generally weakly-moderately altered

IRIAN

- **Tf** — FINE GRAINED TUFF. Fine grained crystall tuff and siliceous vitric tuff. Generally weakly-moderately altered.
- **Ts** — TUFF-SHALE. Grey unaltered vitric tuff shale and tuffaceous siltstone. Well-bedded.
- **Tb** — TUFFACEOUS BRECCIA. Fine breccia with, clasts of tuff-shale up to 2cm in highly ferruginous matrix. On line 4600E. rock shows evidence of water-working; on line 4500 E. rock appears agglomeratic

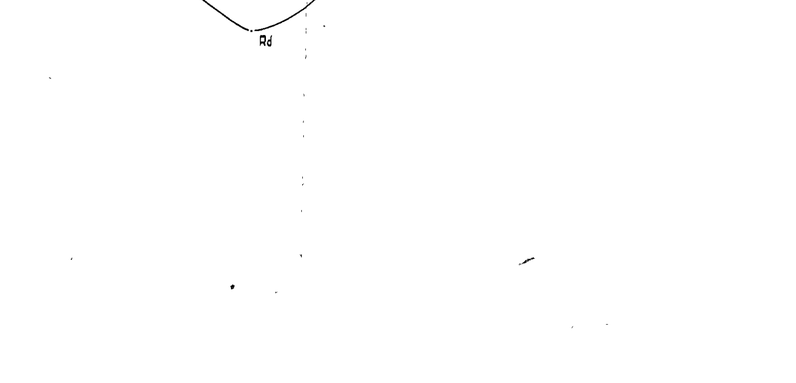
Symbols

- 67 — Dip and strike of bedding or primary rock lineation.
- Trend of outcrop
- Fault.
- li — Limonite after sulphides. Generally as gossanous fracture-filling.
- f — Iron oxides, usually hematite, not neccessarily related to mineralisation
- lb — Leached, bleached, mineralised rock.
- Si — Silicification-generally weak.
- Py — Pyrite.
- 603x — Rock sample. All samples prefixed 816.
- · — C.R.A.E. grid peg
- ⊙240 — Asarco grid peg with soil sample Cu value in ppm

WEST

EAST

BASELINE 5000 N. - LOOKING NORTH



5 cm

SCALE 1:1000

0 10 20 30 40 50 Metres

963048

81-1564.

C.R.A. EXPLORATION PTY. LIMITED

SHEFFIELD E.L. 7/73 C.R.A.E. - ASARCO J.V.

LAKE BARRINGTON PROSPECT

GEOLOGICAL SECTIONS 1857

geologist: J.C.	scale: 1:1000	report no: 10520	
drawn: T.G.D.S.	date: January 1981	plan no: Tv 378	

4500E. 4600E 4700E. 4800 E. 4900 E.

BASE LINE

D.D. 80 LB 2 -46·5°

D.D. 80 LB 1 -60°

Creek

(Not surveyed from 4700 N)

CHARGEABILITY CONTOURS
N = 2, a = 50 m
5 m sec contours
N.B. Line 4500 E. was done at a = 25m
values at N = 4 are plotted as a consequence

4880 C R A E grid peg.
Asarco grid peg
Assumed position of Asarco grid peg

MAGNETIC NORTH 30° GRID NORTH

5 cm

SCALE 1:1000

0 10 20 30 40 50 Metres

963049

81-1564.

C R.A. EXPLORATION PTY. LIMITED

SHEFFIELD E.L. 7/73 C.R.A.E. - ASARCO J.V.

LAKE BARRINGTON PROSPECT

CHARGEABILITY CONTOURS 1858

geologist. J G R	scale: 1:1000	report no: 10520
drawn: T G D S.	date: April 1981	plan no: Tv 379

4500E. 4600E. 4700E. 4800E. 4900E.

BASE LINE

D.D. 80 LB 2 -46.5°

D.D. 80 LB 1 -60°

Creek

(Not surveyed from 4700 N)

RESISTIVITY CONTOURS
N=2, a=50m
10,15,25,40,65 & 100 Ohm.M. per decade contours
N.B. Line 4500E. was done at a=25m
values at N=4 are plotted on this line
as a consequence.

4888· C.R.A.E. grid peg.
⊕ Asarco grid peg.
⊕ Assumed position of Asarco grid peg.

MAGNETIC NORTH 3° HERON GRID

SCALE. 1:1000

0 10 20 30 40 50 Metres

5 cm

81-1564.

C.R.A. EXPLORATION PTY. LIMITED

SHEFFIELD E.L. 7/73 C.R.A.E. - ASARCO J.V.

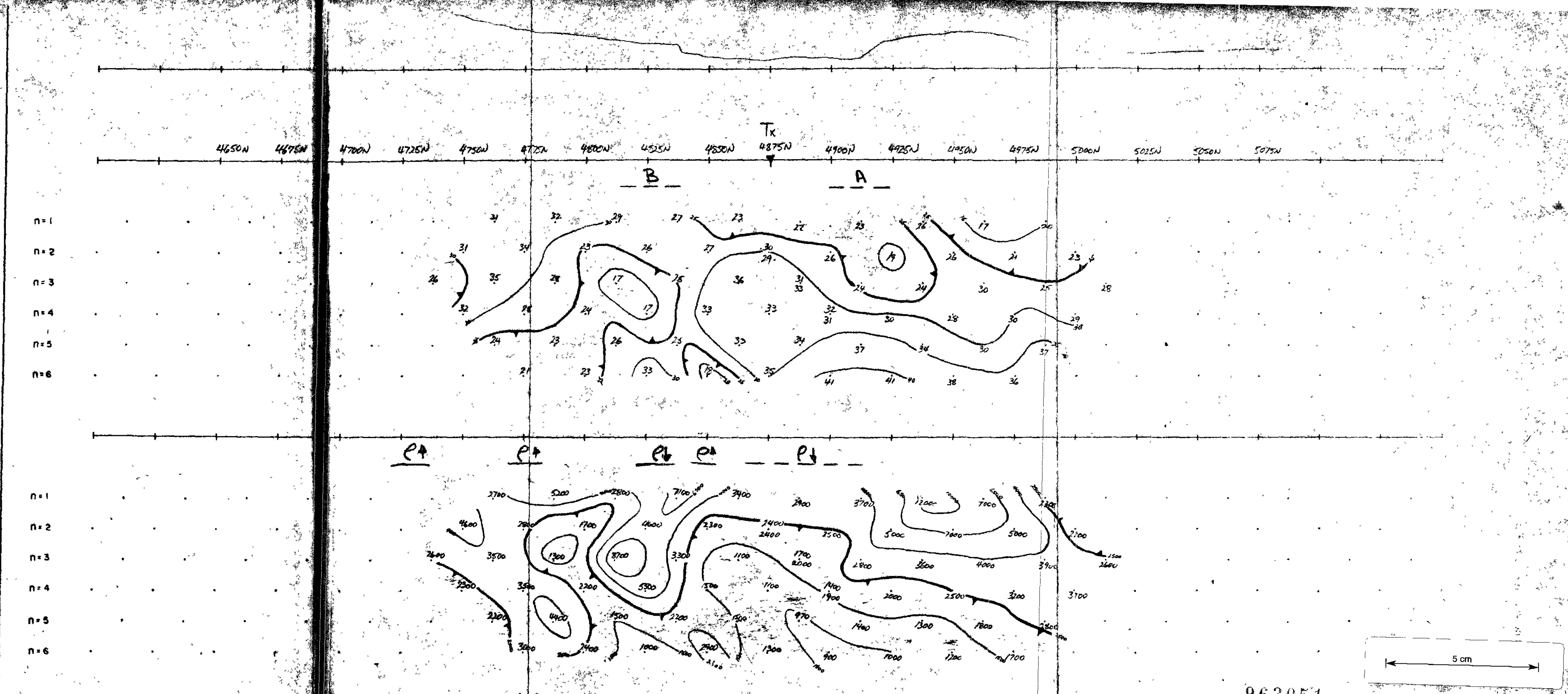
LAKE BARRINGTON PROSPECT

1859

RESISTIVITY CONTOURS

geologist: J.G.P.	scale: 1:1000	report no: 10520
drawn: T.G.D.S.	date: April 1981	plan no: Tv 380

963050



Transmitter type	Elliot 15 KVA
Timing sequence	2 sec on / 2 sec off
Receiver type	Scintrex IPR-7
Integration time	450 to 1100 msecs
I.P. measured over one current	pulse

SURVEYED COMPILED & INTERPRETED BY geoterrex limited SYDNEY

963051

81/1564.

CRA EXPLORATION

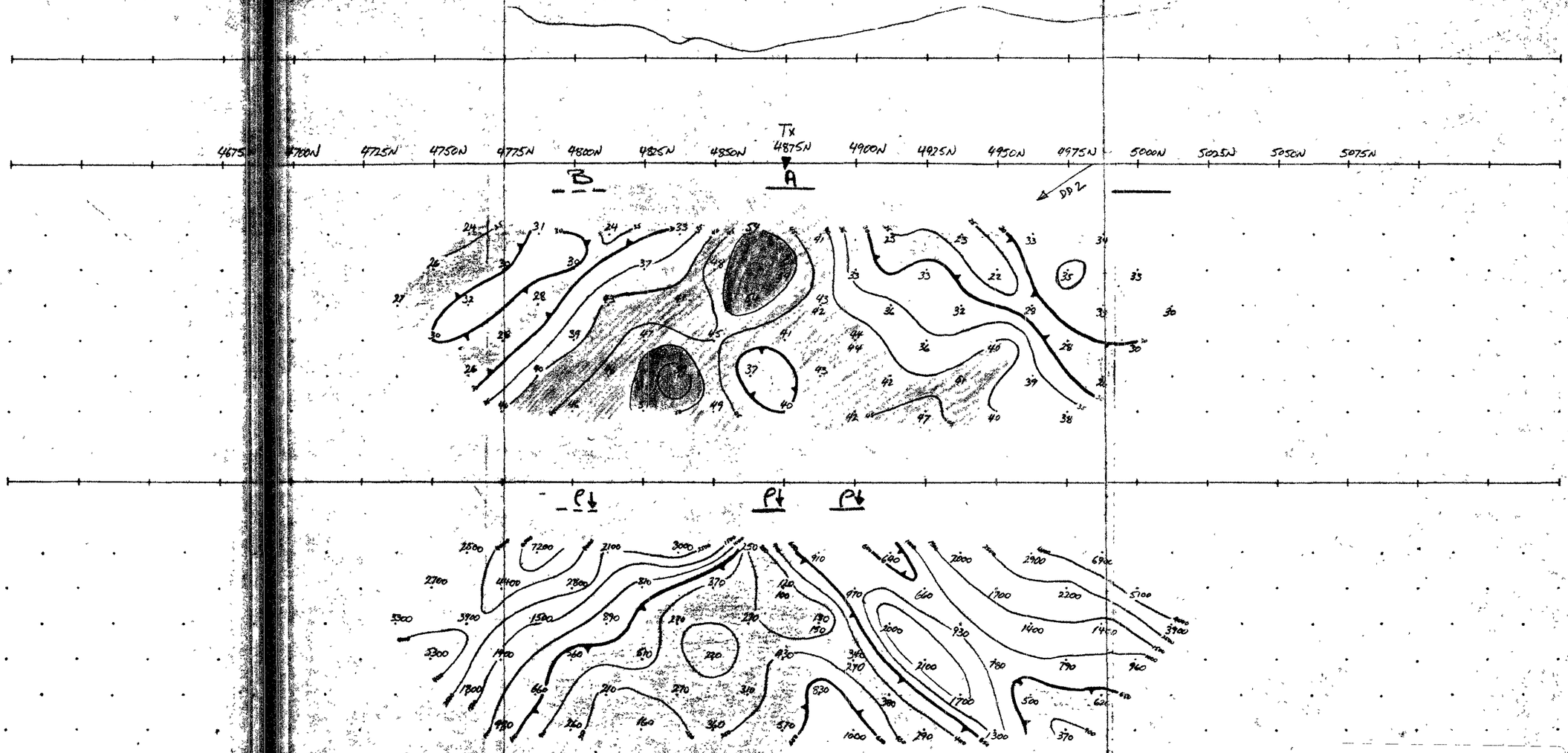
INDUCED POLARIZATION and RESISTIVITY SURVEY

BARRINGTON

LINE : 4500N

1850

Array: Dipole - Dipole	Dipole length 25m
Date 14th JUNE 1980	Job No. 80-1215	1:1250



Transmitter type	Elliot 1.5 KVA
Timing sequence	2 sec on / 2 sec off
Receiver type	Scintrex IPR-7
Integration time	450 TO 1180 msecs
IP measured over one current	square pulse

SURVEYED COMPILED & INTERPRETED BY
geoterrex limited
SYDNEY

963052

5 cm

81-1564

C.R.A. EXPLORATION

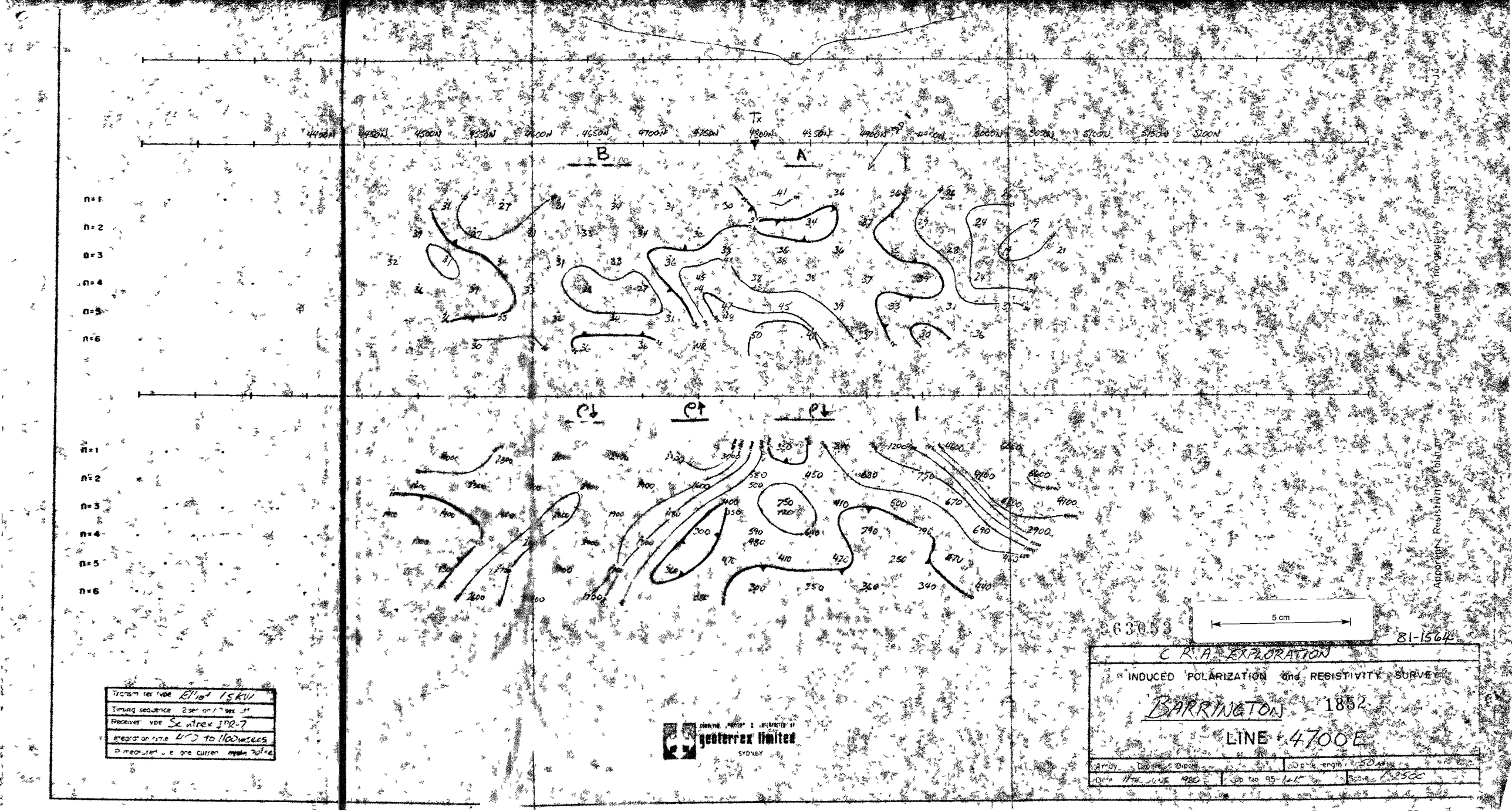
INDUCED POLARIZATION and RESISTIVITY SURVEY

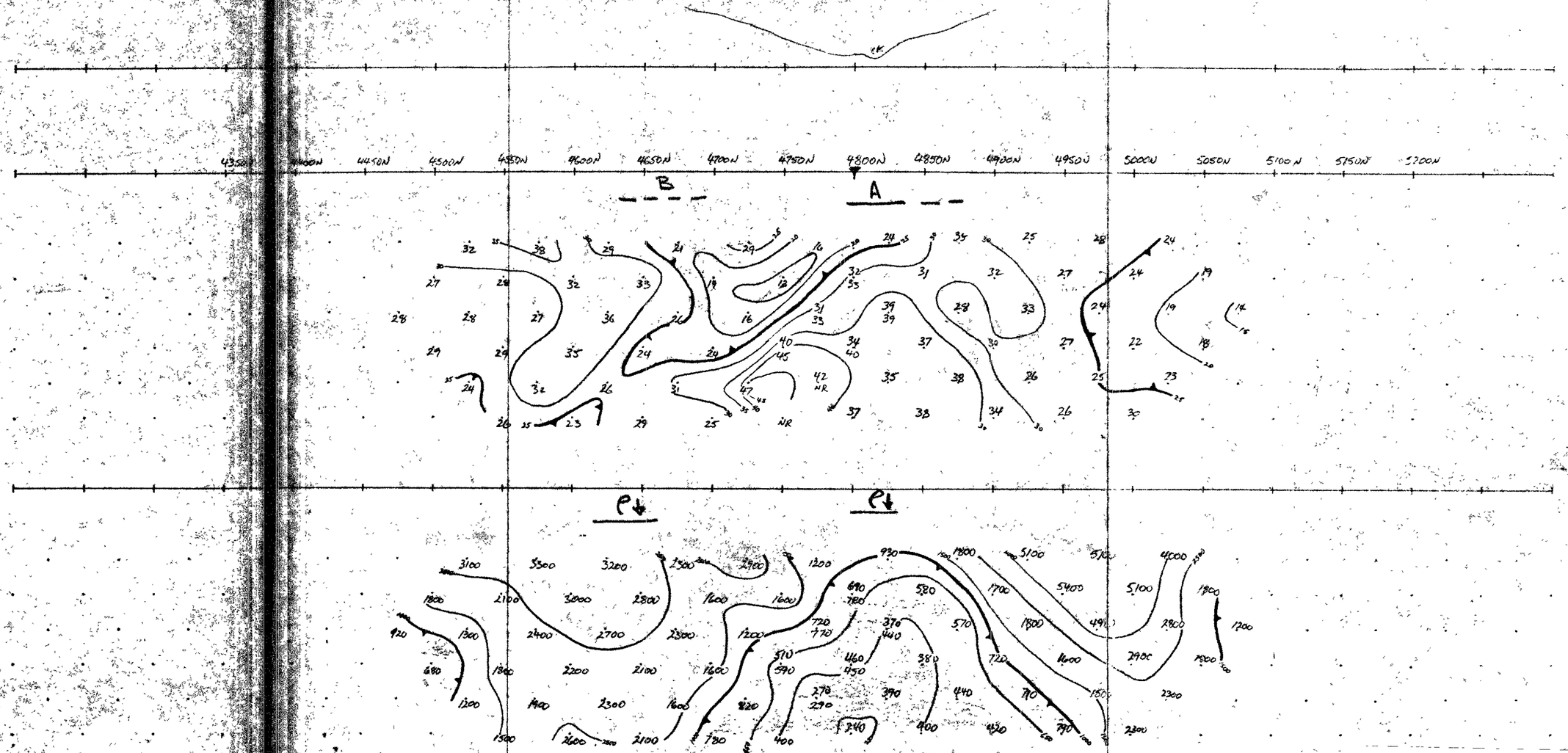
BARRINGTON

LINE : 4600E

1851

Array	Dipole - Dipole	Dipole length	25m
Date	18TH JUNE 1980	Job No.	85-1215
Scale	1:1250		


4450N
4500N
4550N
4600N
4650N
4700N
4750N
4800N
4850N
4900N
4950N
5000N
5050N
5100N
5150N
5200N
Tx
B
A
n=1
n=2
n=3
n=4
n=5
n=6
5 cm
Transmitter type Elliott ISK VII
Timing sequence 2 second on / 2 second off
Receiver type Scintrex IPR-7
Integration time 0.0 to 1100 msecs
Pre-current wave one current impulse before
geoterrex limited
SYDNEY
5663053
81-1564
C.R.A. EXPLORATION
INDUCED POLARIZATION and RESISTIVITY SURVEY
BARRINGTON 1852
LINE 4700E
Survey Dipole-Dipole
Dipole length 50m
Date 11th June 1982
Job No 95-14-C
Scale 1:250
Apparent Resistivity (ohm-m)



Transmitter type	Elliot 1.5 KVA
Timing sequence	2 sec on / 2 sec off
Receiver type	Scintrex IPR-7
Integration time	450 to 1100 msecs
I.P measured over one current cycle	

SURVEYED COMPILED & INTERPRETED BY
geoterrex limited
SYDNEY

963054

5 cm

81-1564.

C.R.A. EXPLORATION

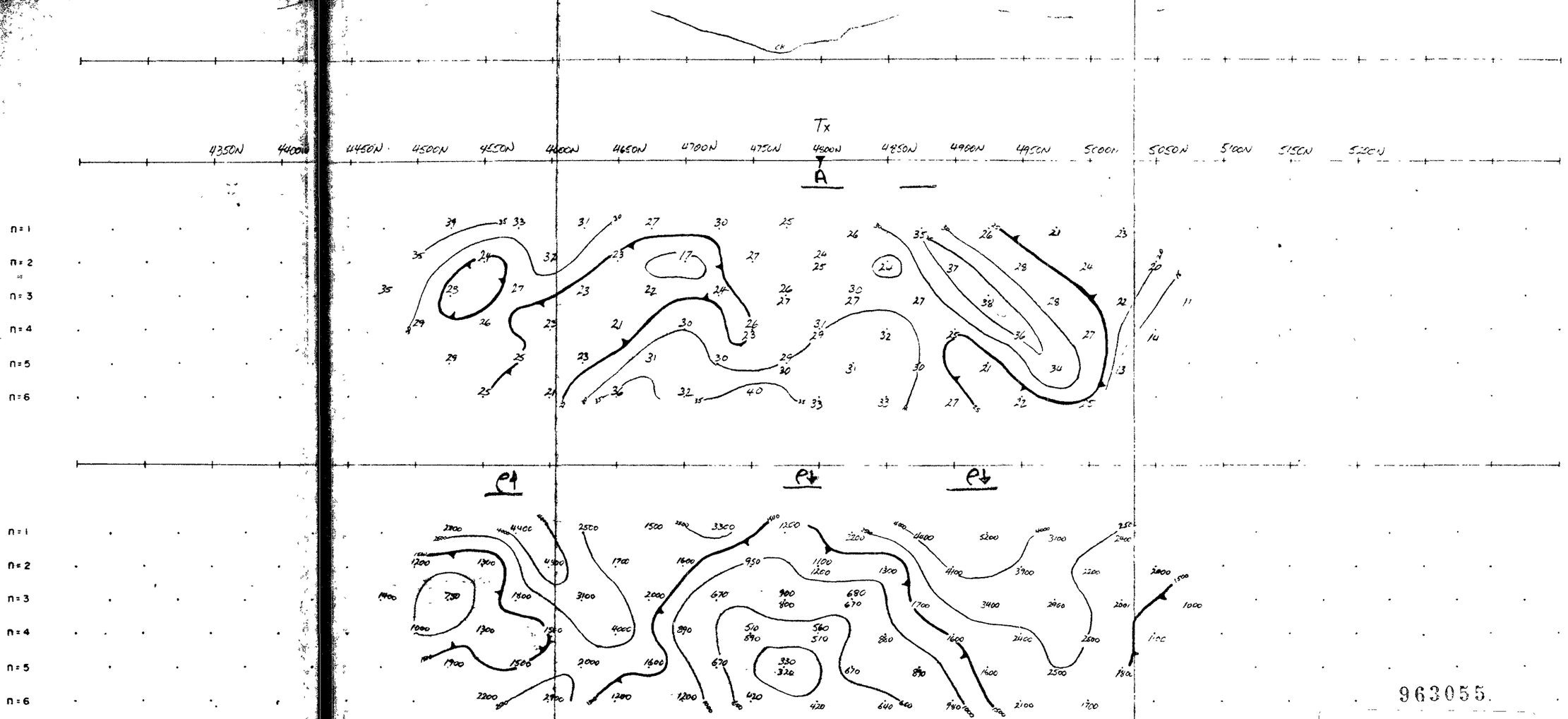
INDUCED POLARIZATION and RESISTIVITY SURVEY

BARRINGTON

LINE : 4800E

1853

Array Dipole - Dipole		Dipole range 52M
Date 17th JUNE 1980	Job No 80-12/5	Scale 1/2500



963055.

5 cm

81-1564.

Transmitter type	Elliot 1.5KVA
Timing sequence	2 sec on / 2 sec off
Receiver type	Scintrex IPR-7
Integration time	450 to 1100 msecs
IP measured over	pole current	symmetric pulse

SURVEYED, COMPUTED & INTERPRETED BY
geoterrex limited
SYDNEY

C P A. EXPLORATION

INDUCED POLARIZATION and RESISTIVITY SURVEY

BARRINGTON

LINE : 4900E 1854

Array : pole - pole	Dipole length 50m	
Date 15TH JUNE 1980	Job No 80-1215	Scale 1:2500