C.R.A. EXPLORATION PTY. LIMITED

PHASE 1 INDUCED POLARISATION SURVEYS

CETHANA E.L. 10/76 TASMANIA 1976-77

Author M. Kirton

Submitted to R. J. Rebek

Copy J. G. Purvis

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SUMMARY

Induced polarisation surveys over Cethana E.L. 10/76 detected one major chargeability anomaly and several minor ones. Drilling this major anomaly revealed a wide zone of both banded and disseminated pyrite with some sphalerite, galena and chalcopyrite. The best intersection, at 38 m depth in 77CC5 is 1 m containing 0.8% Pb, 3.88% Zn, 1.18% Cu and 185 ppm Ag.

Correlations of core chargeability measurements and down hole arrays with surface gradient array measurements suggest that the minor I.P. anomalies recorded are due to disseminations of up to 4% pyrite.

1. INTRODUCTION

1.1 The Cethana area was selected by T. M. Porter as being prospective for volcanogenic copper-lead-zinc mineralisation on the basis of lithological similarities to some Tasmanian West Coast orebodies. Initial soil geochemical surveys over the E.L. gave a number of diffuse zones of high geochemical values. However in places scree from an over lying Rowland Conglomerate member prevented soil sampling. To penetrate this scree and to more precisely define some drilling targets an electrical induced polarisation (E.I.P.) survey was undertaken. 18 grid km were surveyed by the writer between December 1976 and February 1977 using mainly gradient array, 20 m dipole, 20 m station spacing with Huntec Model 2500 SN 214 transmitter and Scintrex IPR7 receivers S.N.'s 811231 and 910257.

1.2 Diamond drill holes CC1, 2 and 3 were drilled on the Western Cethana grid to test geochemical anomalies. Holes CC4 and 5 were drilled on the Eastern Cethana grid to test a major chargeability anomalous zone. Core samples from all holes were measured with a Scintrex CTU 2 core tester S.N. 104016, for values of chargeability, resistivity, and magnetic susceptibility. Holes CC2, 3 and 4 were logged with down hole I.P. arrays. CC1 and CC5 blocked up after drilling and could not be logged.

1.3 During May 1977 an additional 7 km of grid line were surveyed by a contract crew from Scintrex Ltd., using a Scintrex 15 kVA transmitter and IPR8 receivers S.N.'s 305122 and 304126. These traverses were 19800, 20,000 20,200, 20,400, 20,600, 20,800, 21,000 and 21,200 (part) mE.

1.4 Experience gained at some of the west coast orebodies suggest that a copper content in mineralised zones lowers intrinsic resistivities by providing ionic current paths between the pyrite grains. Thus to better define such zones of base metal concentrations within the broad I.P. anomaly a magnetic induced polarisation (M.I.P.) survey was attempted. With this technique the HN measurements reflect the intrinsic conductivity of the chargeable material. Unfortunately a large overhead power line in the area of interest caused electrical interference in the detector and made the readings unreliable.

1.5 More detailed E.I.P. surveys were then planned to cover this area using 10 m dipoles and an IPR8 receiver to measure decay curve forms in the hope that this data would discriminate between pyrite and base metal sulphides. These surveys and an extension of the reconnaissance surveys eastwards to Gowrie Park constitute Phase II of the programme. A high sensitivity ground magnetometer survey will also be carried out over the combined grid.

2. GEOLOGY AND GEOCHEMISTRY

2.1 The geology of the gridded areas consists of Cambrian Nietta Acid Volcanics - mainly tuffs and rhyolite lavas now altered in many places to chlorite and quartz - sericite schists. Some shales occur in West Cethana, also a small remnant of basalt capping. Ordovician Roland Conglomerate overlies this sequence south of the gridded areas, and in places scree from this unit obscures the volcanics.

2.2 Soil geochemical surveys show considerable areas of anomalous lead and zinc values (>500 ppm). v. background levels of generally less than 50 ppm. A few soil values exceeded 1000 ppm. Mineralised rock outcrops gave spot values of several thousand ppm of both metals.

3. RESULTS

3.1 West Cethana

3.1.1. Plans Tc56, Tc63, Tc64 show surface data and Tc66 and Tc67 down hole values. Appendix 1 gives core sample values; because of the tendancy of the core to break into pieces too small to fit into the core tester, the distributions of values are not as representative of the total holes as could be desired.

3.1.2 The apparent resistivity contours indicate a lithological contact running approximately grid E-W, 200 to 300 m north of the main road. North of this contact resistivities are generally greater than 1.5 kΩm (and chargeabilities generally less than 10 m sec) corresponding to tuffaceous shales and lavas. South of this contact resistivities are generally less than 1.5 kΩm (and chargeabilities mostly greater than 10); this area shows a higher degree of alteration to chloritic and quartz sericite schists. An elliptically shaped area of resistivity less than 0.5 kΩm in the centre of the grid coincides with a basalt capping.

3.1.3 Down hole and core measurements indicate that intrinsic chargeabilities are low (less than 12 m sec) and resistivities are high (many hundreds of Ωm), except for a few samples which contain a few percent of pyrite in small veins and smears. These have chargeabilities up to 28 m sec (one sample only of massive sulphide gave 50 m sec) and resistivities of several hundred Ωm. This indicates that mineralisation is coarse grained pyrite with very little base metal sulphides.

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3.1.4 Background surface values of less than 10 m sec thus represent the average effect over the 20 m dipole length of a few pyrite veins bulk averaging about 1%. Background values in the range 10-20 m sec represent overall pyrite contents of 1-3% and the anomaly of 27 msec on the southern ends of Traverses 1000, 1100, and 1200 m E may represent about 4-5% py equivalent. This anomalous zone is in a tuff shale unit containing some black shales which would contribute to the chargeability.

These figures are orders of magnitude only; it should be noted that chargeability is proportional to the total surface area of sulphide grains and not directly to the total sulphide content. To a first approximation grain surface area is related to volume percentage by a two-thirds power law.

3.2 East and Central Cethana

3.2.1 Plans Tc55, Tc65, Tc69 and Tc70 show surface data and Tc68 down hole data. On plan Tc65 chargeability values (mV/V) as measured by slice 211 on the IPR8 receivers used have been converted to equivalent IPR7 values (msec) by a multiplication factor of 0.74.

3.2.2 The major feature shown on these profiles in an anomalous zone of up to 40 msec extending along the southern parts of traverses 21700 to 22200 E inclusive. This zone was interpreted as being caused by two bodies of chargeable material, a wider higher amplitude (40 msec) body to the south and a smaller body to the north. Interpreted dips appear to be steeply northwards; however allowing for surface slope the dips become near vertical. A pole-dipole array survey along traverse 21800 E indicated depth to top of chargeable bodies to be about 30 to 40 m and that the bodies have considerable depth extents.

3.2.3 These zones were tested by diamond drill holes 77CC4 and CC5. CC4 intersected large amounts of pyrite, CC5 intersected pyrite with varying amounts of base metal sulphides. The best intersection at 38 m hole depth, gave 0.8% Pb, 3,88% Zn, 1.18% Cu and 185 ppm Ag.

3.2.4 Apparent resistivities are generally high (2000 +Ωm) on the southern parts of the traverses probably influenced by dry soil and scree surface conditions on the hill sides. This is also true over the mineralised zone despite the intrinsic resistivities shown by the down hole array as being very much lower. The northern parts of the traverses show generally low chargeabilities and with low resistivities caused by deeper weathering over flat slightly swampy country.

4. CONCLUSIONS AND RECOMENDATIONS

4.1 The downhole surveys and core sample measurement go a long way towards explaining background and minor anomaly variations in chargeability in terms of total sulphide content. Because of the high intrinsic resistivities of the country rocks, the surface apparent resistivity measurements are controlled by near surface resistivity contrasts in the overburden.

4.2 The large anomaly in East Cethana and the base metal intersection obtained is now being further explored by more detailed I.P. and magnetometer surveys. Its eastwards continuation is also being investigated. Following these surveys further drill sites will be selected and recommended.

M. Kirton.
(M. Kirton)

LOCATION

Burnie SK 55-3 1:250,000 field sheet.

KEYWORDS

Geophys - I.P., Cambrian, acid volcanics, volcanogenic, copper, lead, zinc, pyrite, silver.

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	LIST OF PLANS	SCALE
Tc56	Cethana West - Profiles of Chargeability and Apparent Resistivity	1:4000
Tc63	Cethana West - Contours of Chargeability	1:5000
Tc64	Cethana West - Contours of Apparent Resistivity	1:5000
Tc55	Cethana East - Profiles of Chargeability and Apparent Resistivity	1:4000
Tc65	Cethana Central-Profiles of Chargeability and Apparent Resistivity	1:4000
Tc69	Cethana East-Contours of Chargeability	1:5500
Tc70	Cethana East - Contours of Apparent Resistivity	1:5500
Tc66	Diamond Drill Secn. 77CC2 Down Hole I.P. log	1:500
Tc67	Diamond Drill Secn. 77CC3 Down Hole I.P. log	1:500
Tc68	Diamond Drill Secn. 77CC4 and 5 Down Hole I.P. log CC4	1:500

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APPENDIX 1

CETHANA, TAS: I.P. CORE TESTING RESULTS 1977

* The magnetic susceptibility (χ) of all samples were below 1 x 10^{-3} units (the lower limit of CTU-2 core tester) except for samples * below.

DEPTH (M)	CORE DIAM: (ins)	M (msec)	ρ (Ω m)	
77CC1				
21	lump	28	5	Weathered Schist c 3% py.
62.7	1.4	1	700	schist
77.6	1.4	1	810	schist
78.6	1.4	22	680	schist c py. and gn in vein.
81	1.4	1	1030	schist
81	1.4	1	980	schist
81	1.4	1	750	schist
*82	1.4	50	750	schist c 10 cm band massive py χ = 100 x 10^{-6} units.
82	1.4	6	1300	schist
87	1.4	1	1040	schist
87	1.4	1	950	schist
77CC2				
30	lump	14	840	Weathered rock c 4% py.
107.5	1.4	11	802	vitric tuff c 3% py
108	1.4	18	641	vitric tuff c 1 cm band massive py
*124.5	1.4	8	3675	Breccia c patches of hem: & mag: χ = 400-800 x 10^{-6} units.
135	1.4	1	1038	vitric tuff
163.9	1.4	14	514	vitric tuff
		7	1058	
		1.5	157	
77CC3				
37.9	1.8	10	302	wtrd.vitric tuff c 1% f.g. py
		5	309	
38.7	1.8	2	1166	vitric tuff c 1% f.g. py.
		2	713	
39.8	1.4	2	259	vitric tuff c specs of sulphides
		3	610	
		4	760	
		15	882	vitric tuff c 2 mm band of py.
49.9	1.4	3	213	chl. qtz. ser. sch. after vitric
		2	967	tuff
		2	1145	
54.0	1.4	2	612	schist
55.0	1.4	3	966	schist
57.6	1.4	4	868	chl. sch
		13	1529	chl. sch. c patchs sulph.

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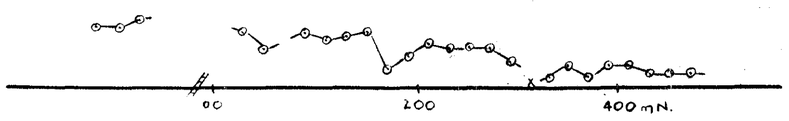
DEPTH (M)	CORE DIAM: (ins)	M (msec)	ρ (Ω m)	
73	1.4	2	847	bleached ser. sch.
91	1.4	3	1019	tuff
99	1.4	3	1137	vitric tuff
		3	1333	vitric tuff
		4	1529	vitric tuff
		2	534	vitric tuff
107	1.4	3	3763	vitric tuff
		2	941	vitric tuff
		2	612	vitric tuff
112.5	1.4	2	235	tuff
120	1.4	3	608	pyroclastic
154.5	1.4	8	220	chl. tuff. grit
168	1.4	14	156	chl. tuff c 10% Su
181	1.4	16	1437	breccia c v.f.g. py
188	1.4	18	1058	cherty tuff c 2 mm band py.
188.3	1.4	6	168	cherty c v.f. dissems. py.
		10	1317	cherty c v.f. dissems. py.
190	1.4	10	588	cherty c v.f. dissems. py.
77CC4				
60.6	1.8	52.5	10.4	Qtz. ser. chl. schist c 20% massive py.
85.3	1.4	30	9.2	vitric tuff c 15% vein + dissem. py.
106.1	1.4	1	448	Barren sil. coarse sandy tuff
118.0	1.4	1	410	barren sil. coarse sandy tuff
128.0	1.4	31	7.8	vitric tuff c 30% massive py.
141.6	1.4	2	250	Barren sil. gritty tuff
77CC5				
49.0	1.4	1	392	Barren chl. tuff breccia
56.7	1.4	10	1517	altered tuff c gn
66.3	1.4	7	1235	chl. tuff breccia;gn. in qtz veins
		9	1235	
68.9	1.4	1	1197	Barren chl. tuff breccia
70.0	1.4	1	336	Barren chl. tuff breccia
70.6	1.4	1	1307	Andesite dyke
90.6	1.4	1	3153	Barren tuff breccia
97.7	1.4	27	2642	coarse tuff breccia c py & gn in bands
		15	1960	
		22	3234	
106.3	1.4	5	2104	Alt. sil. tuff grit c 2% py & gn.
113.0	1.4	4	1989	alt. sil. tuff c py band.
118.4	1.4	6	2450	alt sil. tuff c 3-5% py.
131.0	1.4	14	490	alt. sil. tuff c 1% f.g. py.

8340



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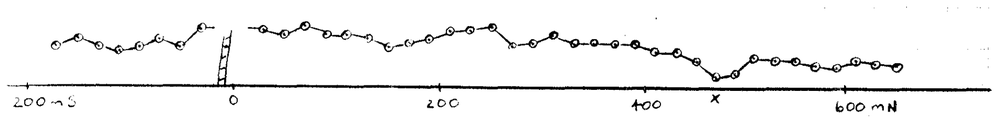

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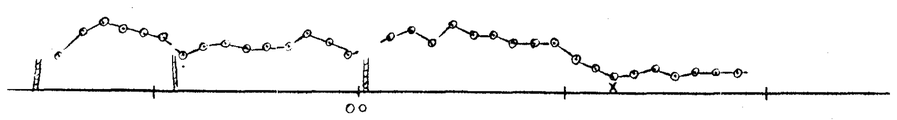

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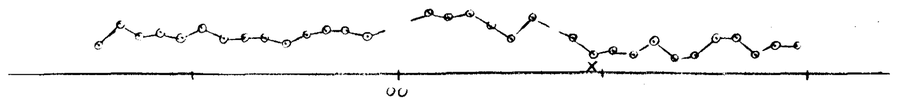

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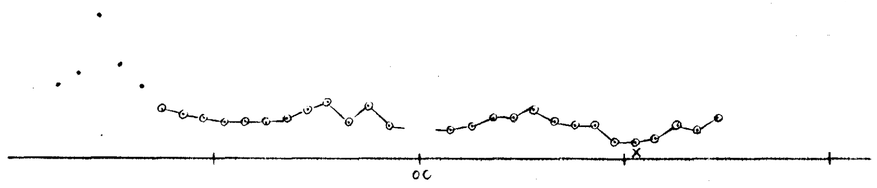

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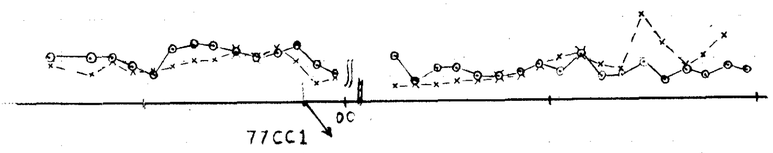

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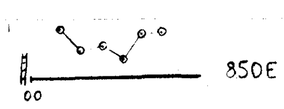

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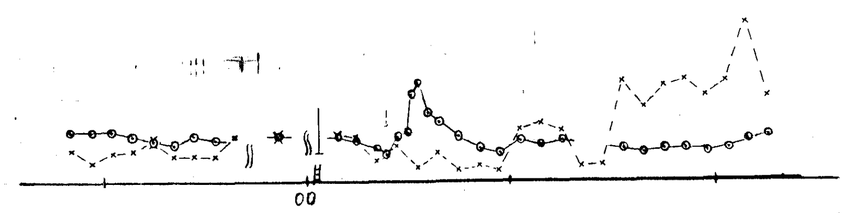

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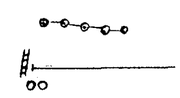

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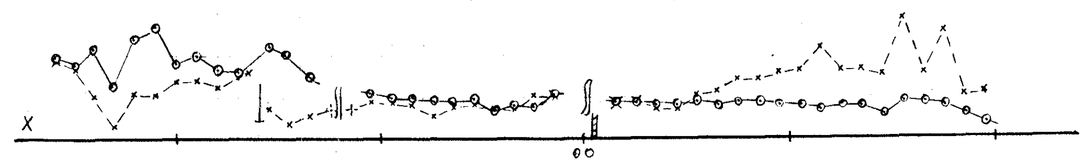

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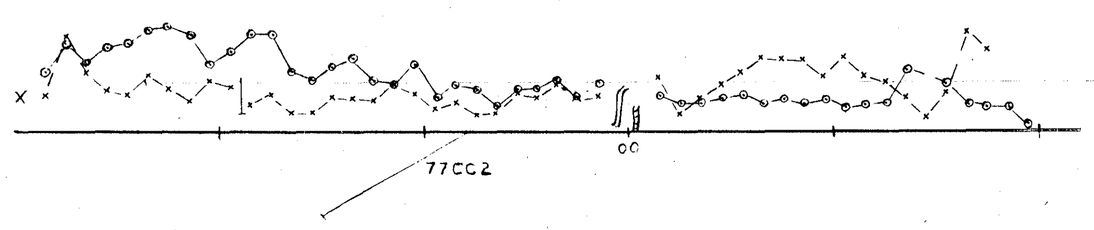

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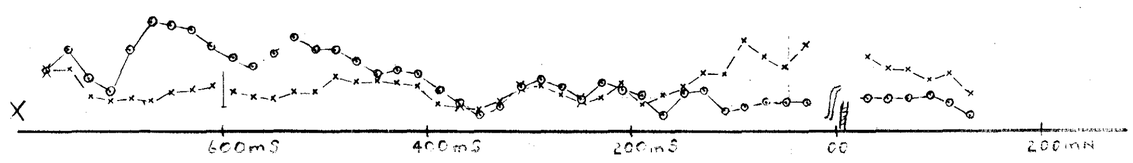

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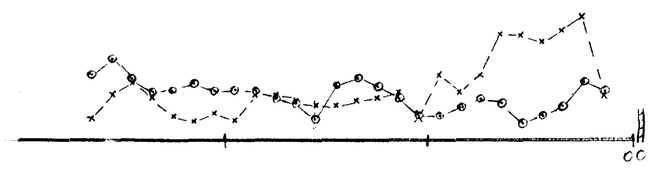

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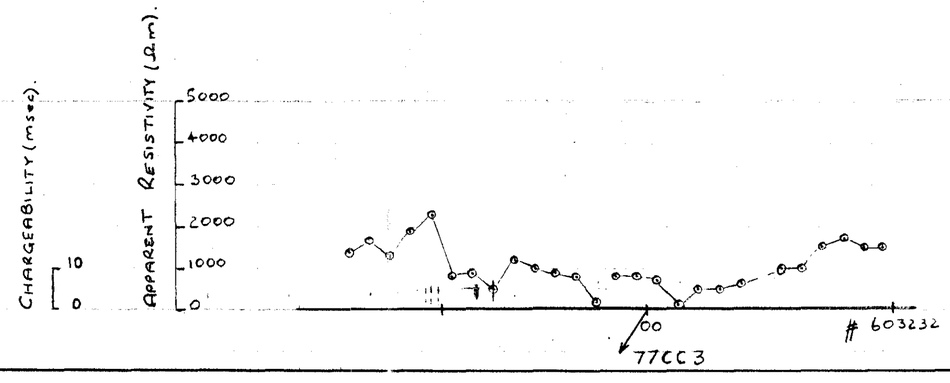

8340 1400E

H ROAD/TRACK.

JJ CURRENT LINE

X CREEK

5 cm

874010

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PROFILES OF CHARGEABILITY & APPARENT RESISTIVI

CETHANA WEST — E.L. 10/76 NORTH-WEST TASMAN

BURNIE SK 55-3

SCALE 1:4000

100m 0 100 200 300 400m

Geophysicist: M.K. Feb. 1977 Report No: 8960

Gradient array – 20m dipole Plan No: Tc56

8342

18 200 E
18 600 E
100 E
200 E
19 000 E
300 E
400 E
500 E
600 E
19 400 E
700 E
800 E
900 E
1000 E
1100 E
19 800 E
1200 E
1300 E
1400 E

7.5
10
12.5
15
10
10
10
12.5
15
12.5
12.5
15
20
25
15
20
10
5
10
12.5
10
10
5
10

Creek

5 cm

Contour interval 2.5 m secs
Gradient array 20m dipole

874011

CRA EXPLORATION PTY LIMITED

CONTOURS OF CHARGEABILITY

CETHANA WEST - E.L. 10/76

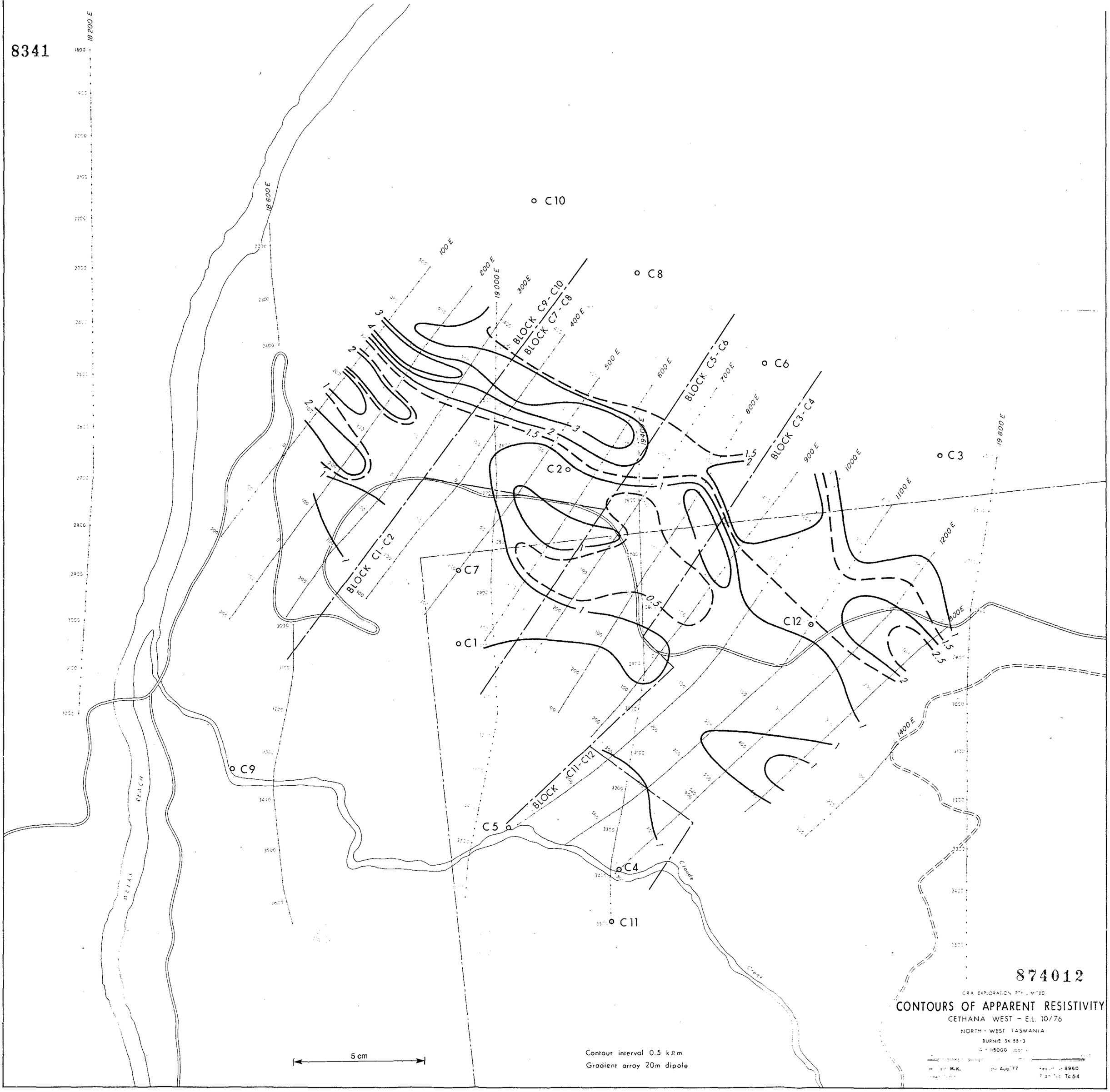
NORTH - WEST TASMANIA

BURNIE SK 55-3

1:5000

M.K. Aug '77 8960 Tc63

8341



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CONTOURS OF APPARENT RESISTIVITY

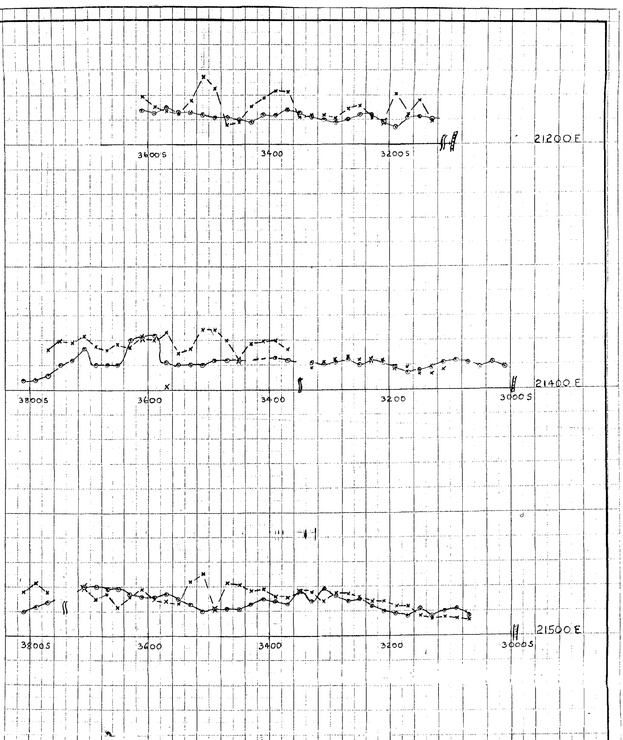
CETHANA WEST - E.L. 10/76

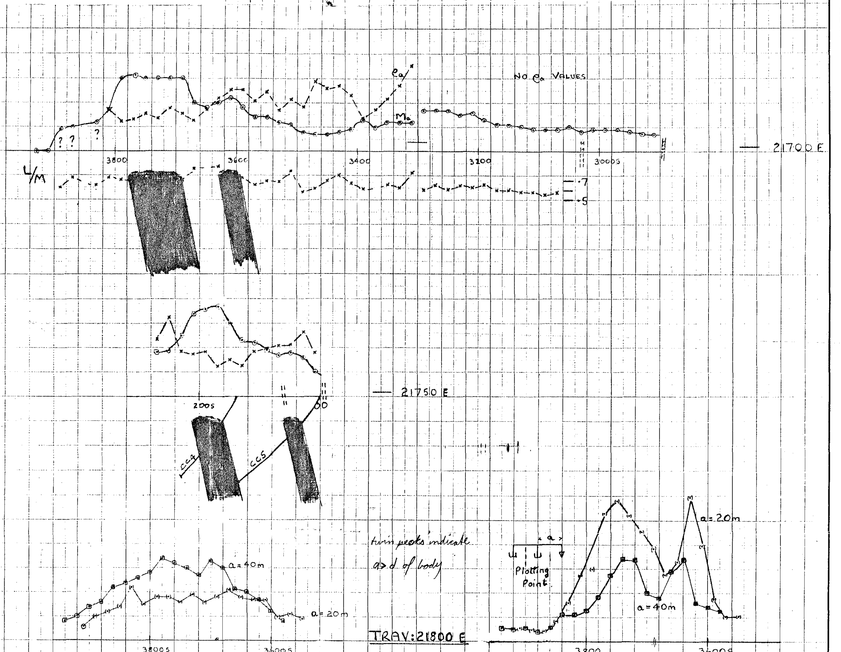
NORTH - WEST TASMANIA

BURNIE SK 55-3

M.K. 2nd Aug. 77 8960 Tc64

8343



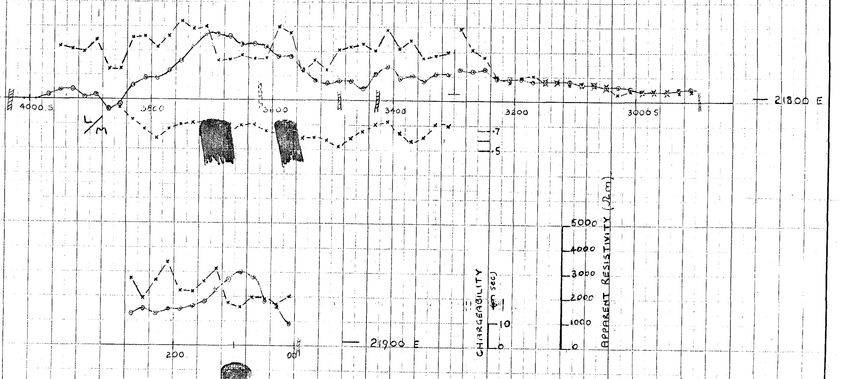


trim peaks indicate
d > d of body

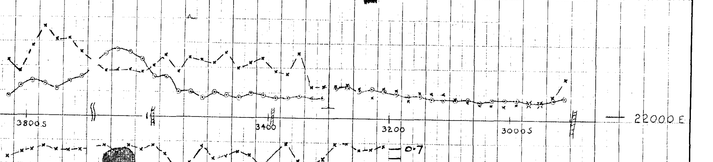
TRAV: 21800 E

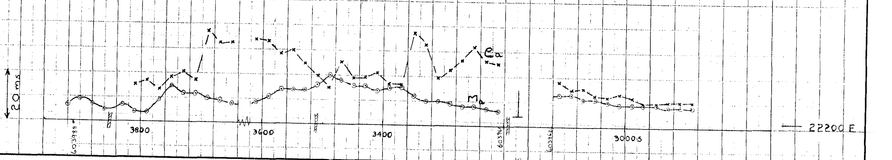
CHARGEABILITY. APPARENT RESISTIVITY.

3-ELECTRODE ARRAY.



- ROAD/TRACK
- CURRENT LINE
- CREEK
- CHARGEABLE BODY





874013

C.R.A. EXPLORATION PTY. LIMITED

PROFILES OF CHARGEABILITY & APPARENT RESISTIVITY

CETHANA EAST — E.L. 10/76 NORTH-WEST TASMANIA

BURNIE SK 55-3

SCALE 1:4000

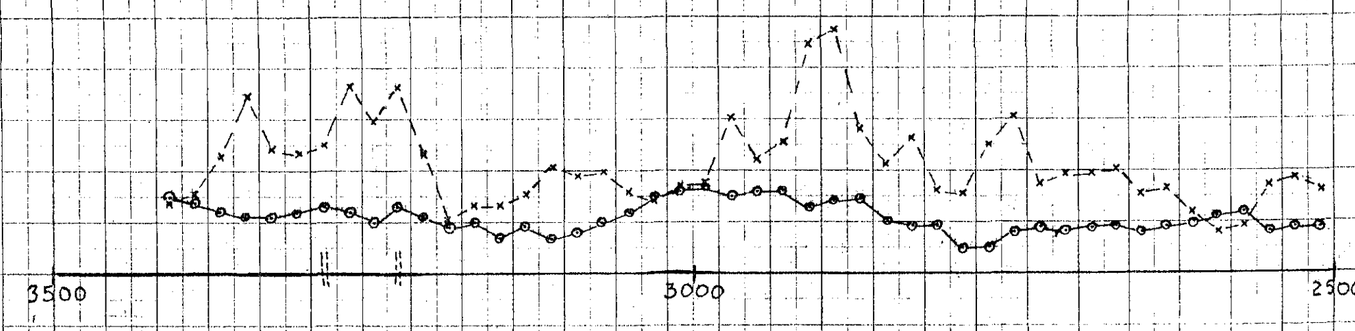
5 cm

Geophysicist: M.K.
Gradient array — 20m dipole

Feb. 1977

Report No. 8240
Plan No. Tc55

8044



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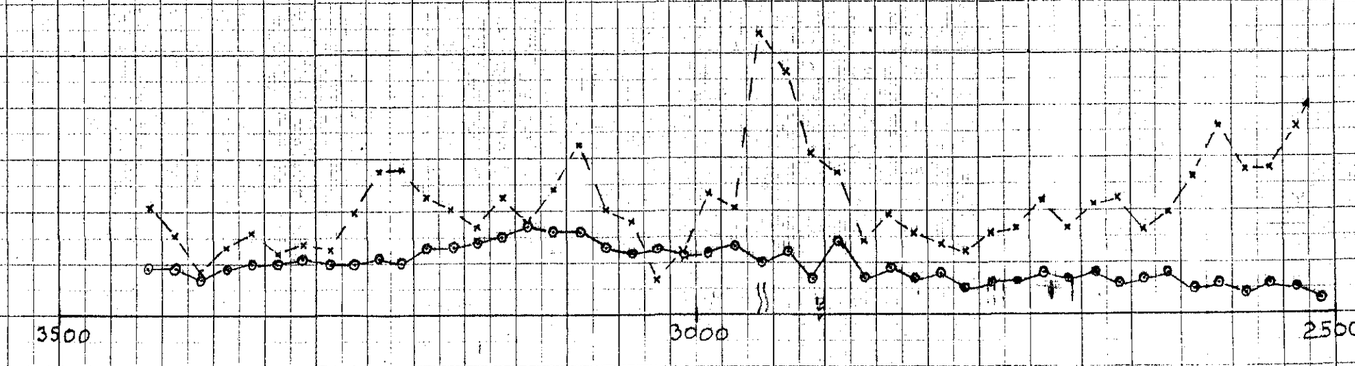

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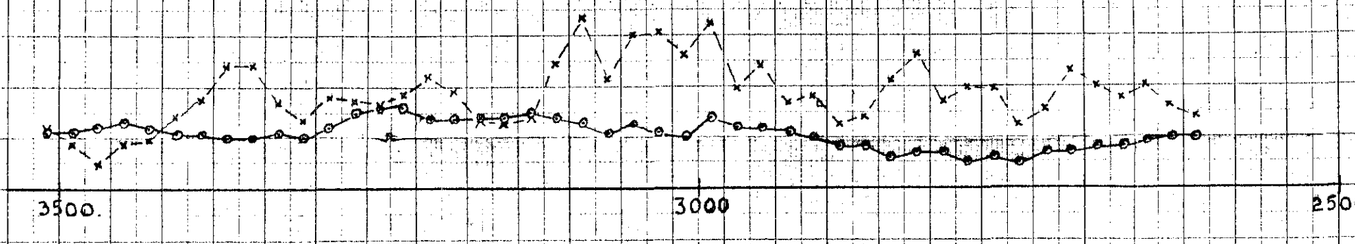

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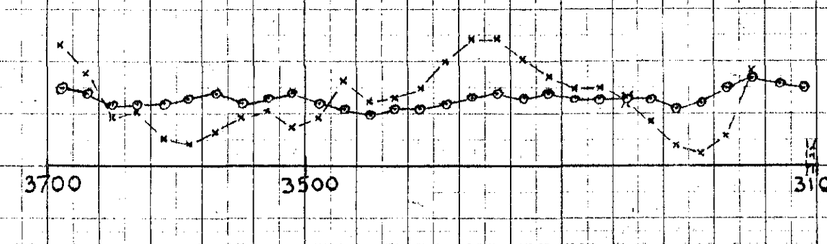

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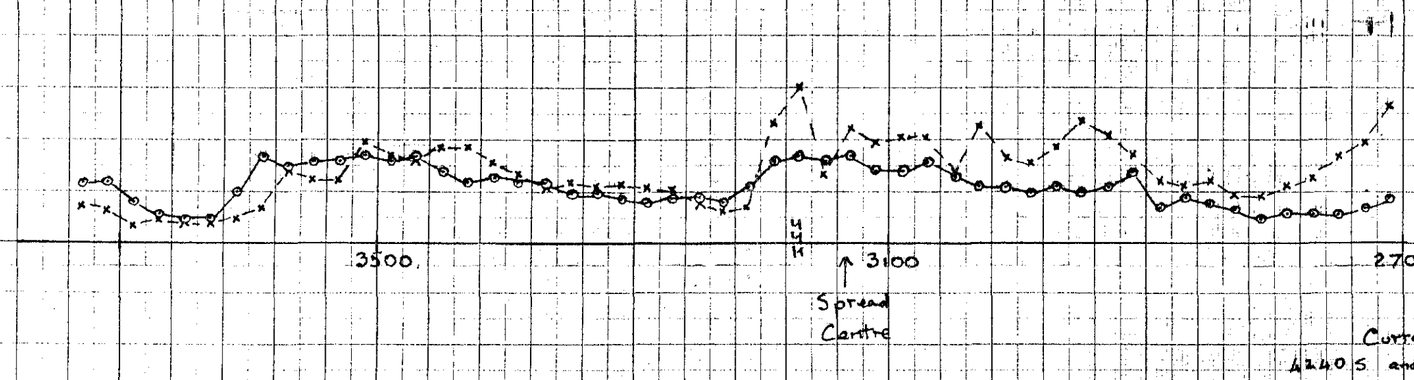
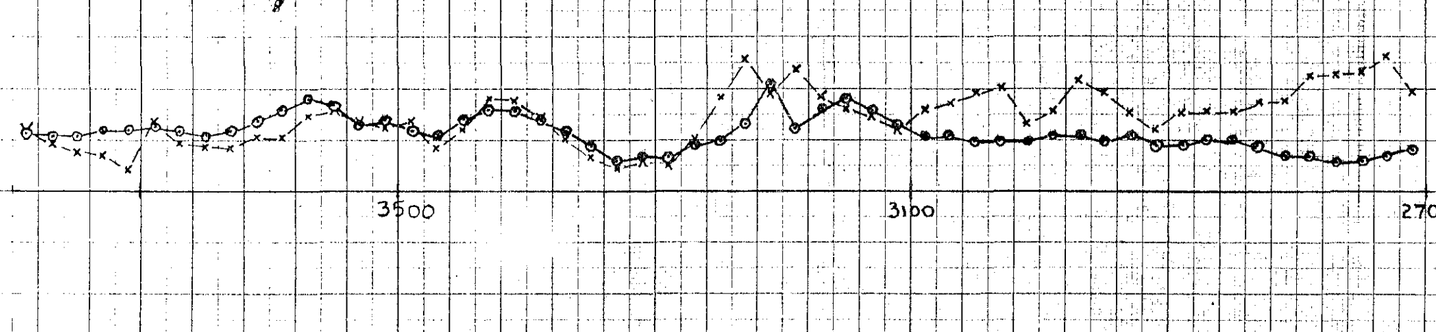
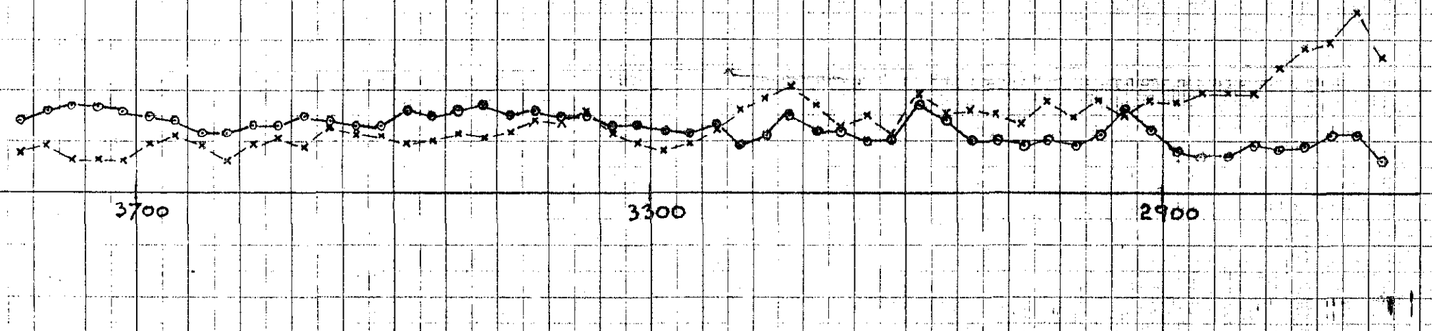


20600E

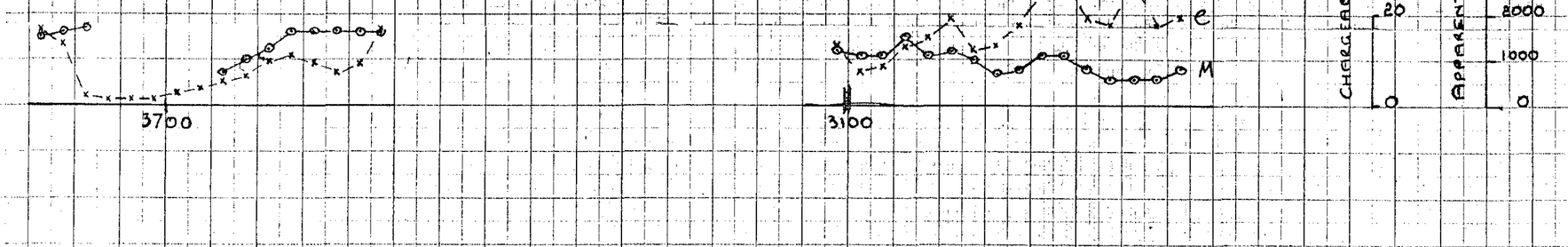
Current electrodes at 1240S and 2040S on 20600E



20800E



21000E



21200E

C.R.A. EXPLORATION PTY. LIMITED

PROFILES OF CHARGEABILITY & APPARENT RESISTIVITY

CETHANA CENTRAL- E.L. 10/76 NORTH-WEST TASMANIA

874014

BURNIE SK 55-3

SCALE 1:4000

5 cm

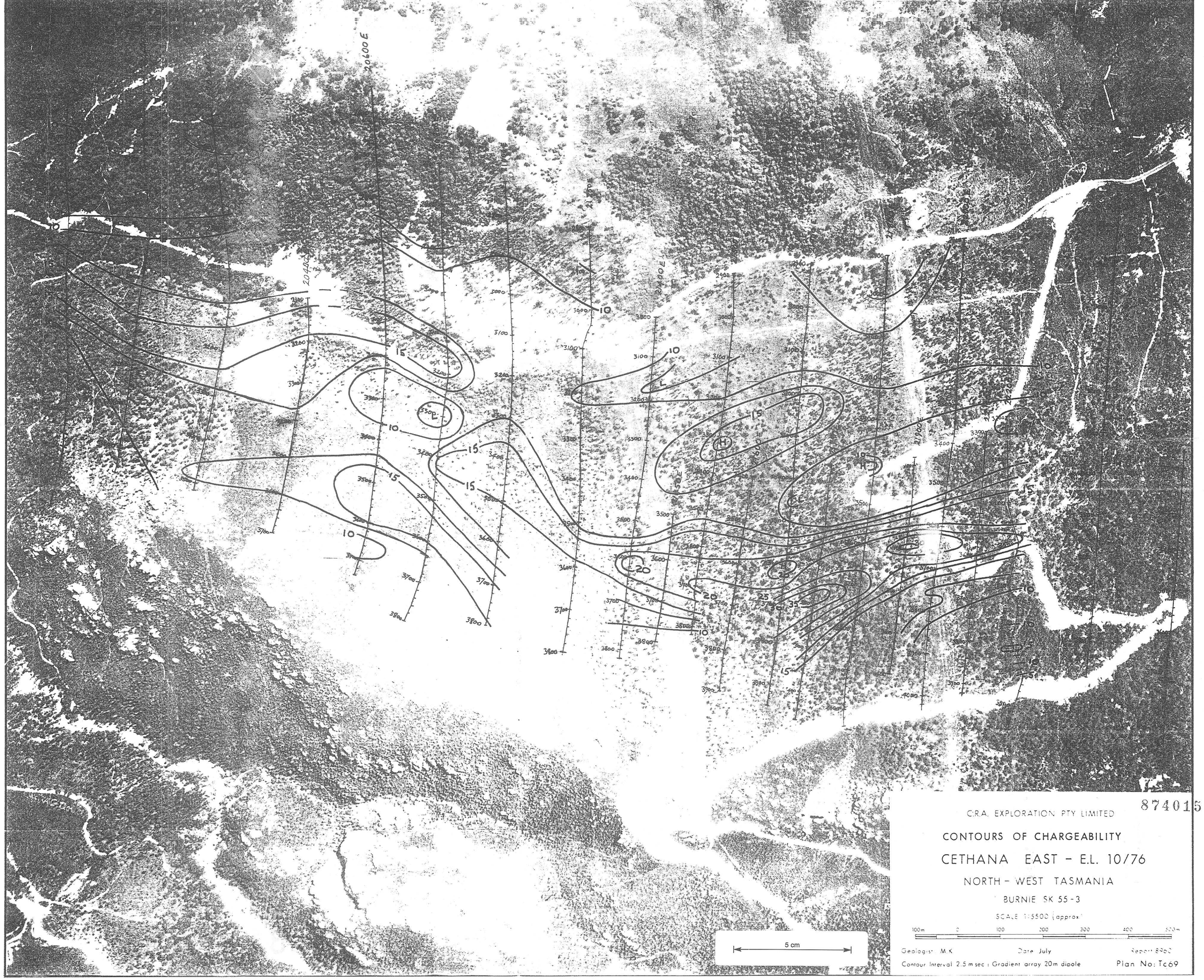
100m 0 100 200 300 400m

Geophysicist: M.K.
Gradient array – 20m dipole

July 1977

Report No: 8960
Plan No: Tc 65

8045



874015

C.R.A. EXPLORATION PTY LIMITED

CONTOURS OF CHARGEABILITY

CETHANA EAST - E.L. 10/76

NORTH - WEST TASMANIA

BURNIE SK 55-3

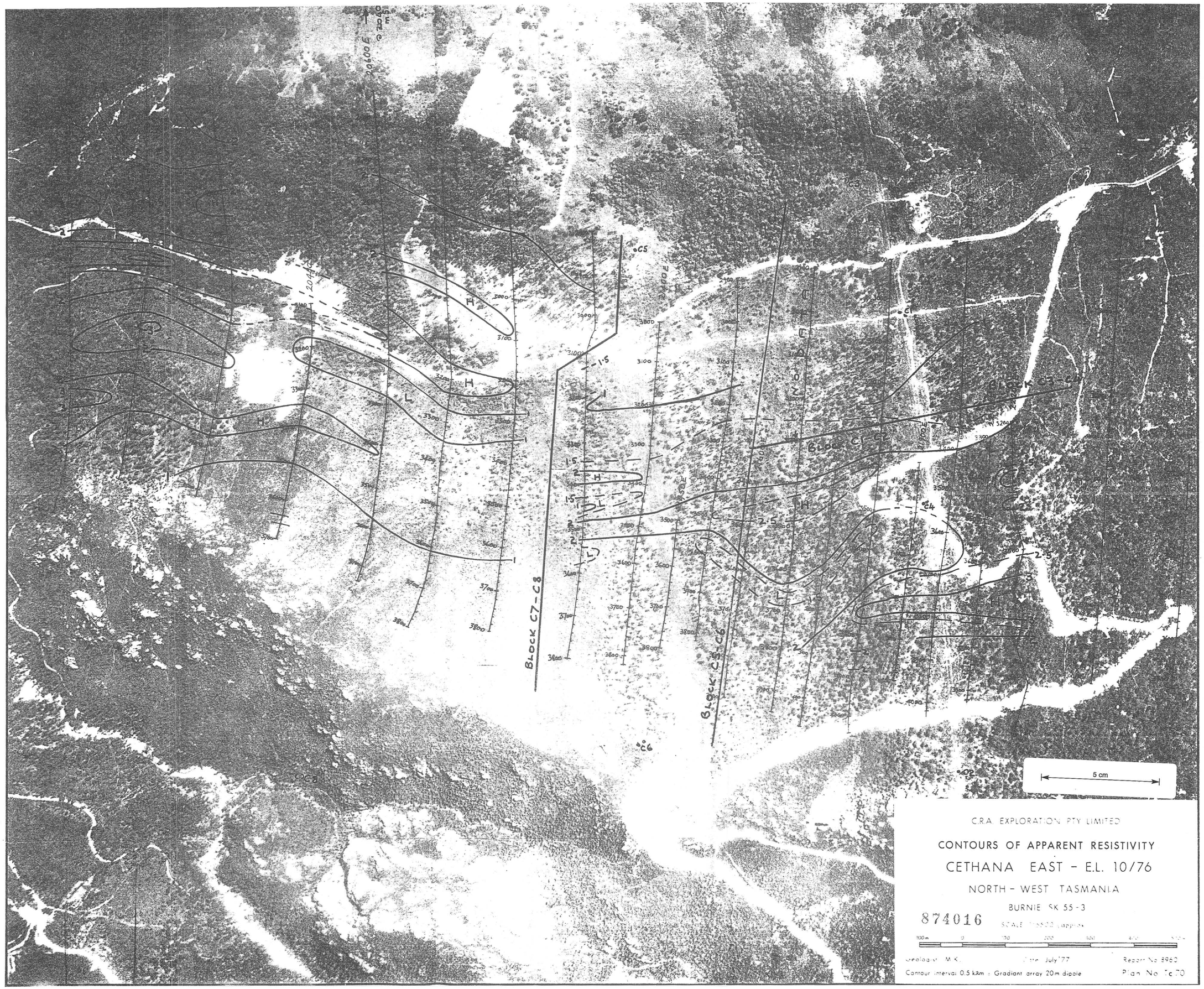
SCALE 1:5500 (approx)

100m 0 100 200 300 400 500m

Geologist: M.K Date: July Report 8900

Contour Interval 2.5 m sec : Gradient array 20m dipole Plan No: Tc69

8346


BLOCK C7-C8
BLOCK C5-C6
C5
C6
C7
C8
C4
5 cm
C.R.A. EXPLORATION PTY LIMITED
CONTOURS OF APPARENT RESISTIVITY
CETHANA EAST - E.L. 10/76
NORTH - WEST TASMANIA
BURNIE SK 55-3
874016
Contour interval 0.5 kΩm : Gradient array 20m dipole

8348

SAMPLE No	FROM (M)	TO (M)	REC (M)	ASSAY VALUES Zn	Cu	As	Au
60-76	6-50	8-50	1-50	210	66	25	<1
60-76	8-50	9-40	1-40	210	650	23	<1
60-76	9-40	12-50	3-10	150	580	25	
60-76	12-50	13-50	1-00	850	900	35	2
60-76	13-50	14-00	0-50	320	660	9	<1
60-76	14-00	16-00	2-00	670	1644	9	<1
60-76	16-00	18-00	2-00	1220	1870	266	<1
60-76	18-00	19-30	1-30	330	630	22	<1
60-76	19-30	21-30	2-00	450	980	30	
60-76	21-30	23-00	1-30	560	970	65	
60-76	23-00	24-66	1-66	270	160	60	<1
60-77	24-66	25-66	1-00	40	120	63	<1
60-76	25-66	26-66	1-00	15	56	28	<1
60-76	26-66	27-76	1-10	20	90	26	<1
60-76	27-76	29-00	1-24	25	140	65	<1
60-76	29-76	32-00	2-00	70	180	106	<1
60-77	32-00	34-00	2-00	10	50	46	<1
60-76	34-00	36-00	2-00	50	100	68	<1
60-76	36-00	38-00	2-00	450	440	55	<1
60-76	38-00	39-00	1-00	660	1600	35	<1
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60-77	40-00	42-00	2-00	140	140	116	<1
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60-76	305-00	306-00	1-00	5	42	5	<1
60-76	306-00	307-00	1-00	5	42	5	<1
60-76	307-00	308-00	1-00	5	42	5	<1
60-76	308-00	309-00	1-00	5	42	5	<1
60-76	309-00	310-00	1-00	5	42	5	<1
60-76	310-00	311-00	1-00	5	42	5	<1
60-76	311-00	312-00	1-00	5	42	5	<1
60-76	312-00	313-00	1-00	5	42	5	<1
60-76	313-00	314-00	1-00	5	42	5	<1
60-76	314-00	315-00	1-00	5	42	5	<1
60-76	315-00	316-00	1-00	5	42	5	<1
60-76	316-00	317-00	1-00	5	42	5	<1
60-76	317-00	318-00	1-00	5	42	5	<1
60-76	318-00	319-00	1-00	5	42	5	<1
60-76	319-00	320-00	1-00	5	42	5	<1
60-76	320-00	321-00	1-00	5	42	5	<1
60-76	321-00	322-00	1-00	5	42	5	<1
60-76	322-00	323-00	1-00	5	42	5	<1
60-76	323-00	324-00	1-00	5	42	5	<1
60-76	324-00	325-00	1-00	5	42	5	<1
60-76	325-00	326-00	1-00	5	42	5	<1
60-76	326-00	327-00	1-00	5	42	5	<1
60-76	327-00	328-00	1-00	5	42	5	<1
60-76	328-00	329-00	1-00	5	42	5	<1
60-76	329-00	330-00	1-00	5	42	5	<1
60-76	330-00	331-00	1-00	5	42	5	<1
60-76	331-00	332-00	1-00	5	42	5	<1
60-76	332-00	333-00	1-00	5	42	5	<1
60-76	333-00	334-00	1-00	5	42	5	<1
60-76	334-00	335-00	1-00	5	42	5	<1
60-76	335-00	336-00	1-00	5	42	5	<1
60-76	336-00	337-00	1-00	5	42	5	<1
60-76	337-00	338-00	1-00	5	42	5	<1
60-76	338-00	339-00	1-00	5	42	5	<1
60-76	339-00	340-00	1-00	5	42	5	<1
60-76	340-00	341-00	1-00	5	42	5	<1
60-76	341-00	342-00	1-00	5	42	5	<1
60-76	342-00	343-00	1-00	5	42	5	<1
60-76	343-00	344-00	1-00	5	42	5	<1
60-76	344-00	345-00	1-00	5	42	5	<1
60-76	345-00	346-00	1-00	5	42	5	<1
60-76	346-00	347-00	1-00	5	42	5	<1
60-76	347-00	348-00	1-00	5	42	5	<1
60-76	348-00	349-00	1-00	5	42	5	<1
60-76	349-00	350-00	1-00	5	42	5	<1
60-76	350-00	351-00	1-00	5	42	5	<1
60-76	351-00	352-00	1-00	5	42	5	<1
60-76	352-00	353-00	1-00	5	42	5	<1
60-76	353-00	354-00	1-00	5	42	5	<1
60-76	354-00	355-00	1-00	5	42	5	<1
60-76	355-00	356-00	1-00	5	42	5	<1
60-76	356-00	357-00	1-00	5	42	5	<1
60-76	357-00	358-00	1-00	5	42	5	<1
60-76	358-00	359-00	1-00	5	42	5	<1
60-76	359-00	360-00	1-00	5	42	5	<1
60-76	360-00	361-00	1-00	5	42	5	<1
60-76	361-00	362-00	1-00	5	42	5	<1
60-76	362-00	363-00	1-00	5	42	5	<1
60-76	363-00	364-00	1-00	5	42	5	<1
60-76	364-00	365-00	1-00	5	42	5	<1
60-76	365-00	366-00	1-00	5	42	5	<1
60-76	366-00	367-00	1-00	5	42	5	<1
60-76	367-00	368-00	1-00	5	42	5	<1
60-76	368-00	369-00	1-00	5	42	5	<1
60-76	369-00	370-00	1-00	5	42	5	<1
60-76	370-00	371-00	1-00	5	42	5	<1
60-76	371-00	372-00	1-00	5	42	5	<1
60-76	372-00	373-00	1-00	5	42	5	<1
60-76	373-00	374-00	1-00	5	42	5	<1
60-76	374-00	375-00	1-00	5	42	5	<1
60-76	375-00	376-00	1-00	5	42	5	<1
60-76	376-00	377-00	1-00	5	42	5	<1
60-76	377-00	378-00	1-00	5	42	5	<1
60-76	378-00	379-00	1-00	5	42	5	<1
60-76	379-00	380-00	1-00	5	42	5	<1
60-76	380-00	381-00	1-00	5	42	5	<1
60-76	381-00	382-00	1-00	5	42	5	<1
60-76	382-00	383-00	1-00	5	42	5	<1
60-76	383-00	384-00	1-00	5	42	5	<1
60-76	384-00	385-00	1-00	5	42	5	<1
60-76	385-00	386-00	1-00	5	42	5	<1
60-76	386-00	387-00	1-00	5	42	5	<1
60-76	387-00	387-50	0-50	5	42	5	<1

SW

NE

CHARGEABILITY (msec)

40 20 0

77-C.C 2 collar 35m W of line
Azimuth 210° mag; dip 61°
140m
230, 900
410, 910
640
584

Chloritic qtz - ser. schist with limonite (Cs)

Chloritic qtz - ser schist & much lim + Mn (Cs)

Manganese & limonite stains

Chloritic schistose acid volcanic - after ash flow tuff ?
3% magnetite, 2% pyrite, minor gn sp

125-230m
0.07% Pb, 0.12% Zn

1-3% py, minor gn sp

280-400m
0.04% Pb, 0.2% Zn

Green altered vitric tuff
1-3% py, minor gn, sp, trace cp

450-470m
0.1% Pb, 0.33% Zn

Pebble breccia
minor, py, trace gn

Green altered tuff
minor py, trace sp, gn

Haematitic pebble breccia
minor pyrite

Green altered tuff

Weakly altered welded pyroclastic
trace py

Altered vitric tuff Breccia 2% py

Weakly altered vitric tuff 2% py

Haematitic breccia - conglomerate
Green tuff 2% py

Haematitic breccia - conglomerate
minor py 3% py

Green tuff

Green tuffaceous pebble - breccia
minor py, trace sp, gn, cp

Minor py, trace gn, sp

Vitric tuff - shale
2% py, trace gn, sp, cp

DOWN HOLE GRADIENT ARRAY 10m dipole.

NO DATA.

M

RESISTIVITY (Ω.m)

500, 60
1195

1100, 130
23, 94

647
591
277

267
Acid volc. bre

1180, 630
1280, 770

648
592
296

CAULT ?

Massive pebble b
qtz - chlorite - hr
(T

Tuff shales (T)

649
393
316.5

230, 100
30, 50

Pebble breccia (Tg)

312.5

300, 120
44, 90

650
394
335.5

Vitric tuff shales (T)

230, 110
41, 70

651
395
355.5

Vitric tuff shales (T)

210, 122

396
369.5

Tuff shales (T)

220, 120

652
376

Qtz grit with lenses of shale (Tg)

23, 33
397
387.5m

Tuffaceous grit (Tg)

150 m.

Sample site with values in ppm - soils: Pb 220, Zn 120
- rocks: 23, 33
- Sample number: 397 (N.B. all sample N°s prefixed by 60...)

Bedding dip

Schistosity dip

874017

5 cm

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL SECTION 77-C.C 2

DOWN HOLE I.P. LOG

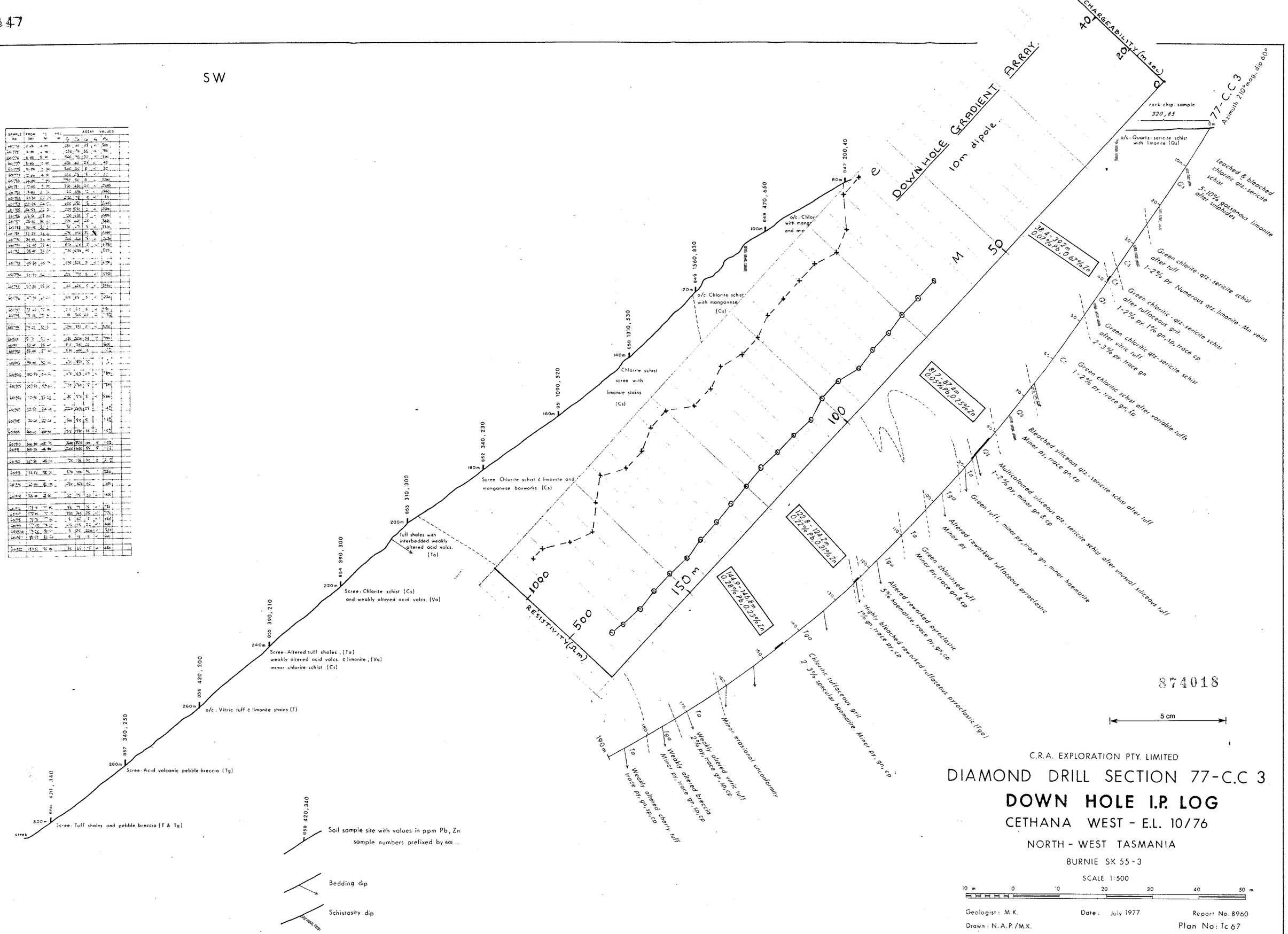
CETHANA WEST - E.L. 10/76

NORTH - WEST TASMANIA

8347

SW

SAMPLE No	FROM (m)	TO (m)	WIDTH (m)	ASSAY VALUES				
601774	2.20	4.20	2.00	686	64	25	5	500
601775	4.20	6.40	2.20	630	76	35	5	770
601776	6.40	8.40	2.00	540	70	32	5	580
601777	8.40	9.40	1.00	538	66	23	5	45
601778	9.40	12.20	2.80	540	80	8	5	32
601779	12.20	14.20	2.00	656	76	5	5	22
601780	14.20	16.00	1.80	776	54	8	5	1280
601781	17.00	18.20	1.20	530	620	22	5	2560
601782	18.20	20.20	2.00	612	636	12	5	2960
601784	21.36	22.20	0.84	736	78	8	5	30
601783	20.20	21.36	1.16	696	96	5	5	2460
601785	22.20	23.40	1.20	728	576	5	5	2580
601786	23.40	25.36	1.96	728	960	22	5	3480
601788	25.36	27.20	1.84	54	27	5	5	3320
601789	27.20	32.20	5.00	274	852	35	5	10080
601790	32.20	34.40	2.20	540	660	5	5	2620
601791	34.40	36.40	2.00	578	492	5	5	1780
601792	36.40	38.40	2.00	736	2028	45	5	570
601793	45.36	47.35	1.99	436	504	5	5	1780
601794	51.35	53.35	2.00	624	72	5	5	1020
601795	53.35	55.35	2.00	66	624	5	5	3360
601796	55.35	57.35	2.00	574	492	5	5	2280
601797	57.35	59.35	2.00	31	552	5	5	1960
601798	59.35	61.35	2.00	18	564	22	5	52
601799	61.35	63.35	2.00	436	1104	5	5	1520
601800	63.35	65.35	2.00	48	2520	55	5	1700
601801	65.35	67.35	2.00	8	540	22	5	660
601802	67.35	69.35	2.00	530	660	5	5	52
601803	69.35	71.35	2.00	636	852	5	5	1020
601804	71.35	73.35	2.00	478	420	25	5	896
601805	73.35	75.35	2.00	736	768	5	5	744
601806	75.35	77.35	2.00	88	576	5	5	1380
601807	77.35	79.35	2.00	2220	2028	55	5	132
601808	79.35	81.35	2.00	564	612	5	5	132
601809	81.35	83.35	2.00	1968	1920	35	5	156
601810	166.50	168.50	2.00	3480	2520	100	5	1128
601811	165.20	167.20	2.00	2340	1656	55	5	528
601812	167.20	169.20	2.00	756	1356	35	5	1176
601813	51.35	53.35	2.00	576	1008	5	5	1380
601814	53.35	55.35	2.00	336	828	5	5	1080
601815	55.35	57.35	2.00	32	72	20	5	408
601816	73.35	75.35	2.00	92	72	5	5	72
601817	170.20	172.20	2.00	336	348	25	5	732
601818	172.20	174.20	2.00	5	84	5	5	468
601819	174.20	176.20	2.00	5	276	22	5	456
601820	176.20	178.20	2.00	5	324	220	5	552
601821	178.20	180.20	2.00	5	72	5	5	660
601822	183.20	185.20	2.00	36	48	15	5	468



874018

5 cm

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL SECTION 77-C.C 3

DOWN HOLE I.P. LOG

CETHANA WEST - E.L. 10/76

NORTH - WEST TASMANIA

BURNIE SK 55-3

SCALE 1:500

10 m 0 10 20 30 40 50 m

Geologist: M.K. Date: July 1977 Report No: 8960

Drawn: N.A.P./M.K. Plan No: Tc 67

8349

SOUTH

NORTH

77-C.C.4 Azimuth 180°, dip 55°

77-C.C.5 Azimuth 180°, dip 55°

Gtz - sericite chlorite schist 3-5% py, 1-5% hematite

3-5% py, often in stringers 2cm thick 2% hematite

Gtz - sericite chlorite schist after crystal tuff

2% py

1% py

Altered siliceous tuffaceous grit 3-5% py, 1% sp, gn

Altered sericite tuff 5% py, 1% sp, gn + tp

2% py, minor sp, gn, tp

Minor py, 2-4% hematite

Altered siliceous coarse sandy tuff

3-5% py, 1% sp, gn + tp

Altered silic and siliceous tuff

3-5% py, minor sp, gn

Altered siliceous grits, tuff 1% hematite, minor py, sp, gn + tp

Sch. 3-5% py, 1% sp, gn + tp in bedded bands to 5cm thick

Altered siliceous tuffaceous grit 3-5% py, 1-2% sp, gn +

1-2% py, minor hematite

Altered sericite tuff 5% py, 1% sp, gn + tp

Gtz - sericite chlorite schist after crystal tuff

Sch. - sericite chlorite after cream coloured, siliceous tuff

Sch. - moderately sheared throughout, grit, ash and quartz veinlets

Sch. - sericite chlorite schist after crystal tuff

Sch. - moderately sheared throughout, grit, ash and quartz veinlets

o/c. - grit, ash, minor sericite tuff

Sch. - sericite chlorite schist after very fine crystal tuff

Sch. - moderately sheared throughout, grit, ash and quartz veinlets

o/c. - sericite chlorite schist

Sch. - moderately sheared throughout, grit, ash and quartz veinlets

o/c. - sericite chlorite schist

Sch. - moderately sheared throughout, grit, ash and quartz veinlets

o/c. - grit, ash, minor sericite tuff

Sch. - moderately sheared throughout, grit, ash and quartz veinlets

o/c. - grit, ash, minor crystal tuff

149.7m

CHARGEABILITY (msec)

10% SULPHIDE CONTENT (visual estimate)

SP2 Plotting Point

C1

C2

200m

40m

4m Dipole

P1 P2

Casing

POLE-DIPOLE ARRAY

GRADIENT ARRAY

1.4m Dipole

RESISTIVITY (Ω m)

DEPTH (m)

Soil sample site with values in ppm Pb, Zn, Cu sample Nos. prefixed by soil

Bedding dip

Schistosity dip

Shearing dip

N.B. Drillhole survey for CC 4 & 5 by acid tube method

874019

5 cm

C.R.A. EXPLORATION PTY. LIMITED

DIAMOND DRILL SECTION 77-C.C 4 + 5

DOWN HOLE I.P. LOG C.C 4

CETHANA EAST - E.L. 10/76

NORTH - WEST TASMANIA

BURNIE SK 55-3

SCALE 1:500

10m 0 10 20 30 40 50m

Geologist: M.K. Date: July 1977 Report No: 8960

Drawn: N.A.P./M.K. Plan No: Tc68

Tc 68