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CRA EXPLORATION PTY LTD

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24 FEB 1986			
DEPT. OF MINES			
No. 1809/86			

EL 10/76 CETHANA, NORTH WESTERN TASMANIA

REPORT ON EXPLORATION FOR 12 MONTHS TO FEBRUARY 1986

**OPEN FILE**

Author: S.J. Caithness

Date: 23 January 1986

Submitted to: T.W. Dickson

Accepted by:



Copies: CRAE Hobart  
CRAE Canberra  
Department of Mines,  
Tasmania

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REPORT NO: 13743

**MICROFILMED**

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### 1. SUMMARY

A regional drainage geochemistry survey has been carried out over Cethana EL 10/76. The survey was designed to look for fine gold as a primary target and as a pathfinder for volcanogenic massive sulphides.

Two diamond drillholes are proposed to further test the Cethana West prospect. These holes are designed to investigate along strike from percussion drillhole PD84 CC9 which intersected approximately 20m of semi-massive sulphide. A third drillhole is tentatively proposed depending on results from the preceding holes.

### 2. INTRODUCTION

This report describes all work carried out over Cethana EL 10/76 for the 12 months ending 28th February, 1986. The EL was pegged in 1976 to cover a relinquished Mines Department reserve within EL 7/73.

Work carried out over the Licence to date includes stream sediment, soil and rock chips geochemistry, gridding, geophysics, geological mapping and drilling.

### 3. CONCLUSIONS

The pyritic intersection in drillhole PD84 CC9 may represent the along strike extension of a base metal massive sulphide deposit. Further drilling of this zone is proposed.

Stream sediment anomalies may result from old workings scattered throughout the EL. Follow-up sampling and geological investigation needs to be carried out in order to determine the cause of the anomalies.

#### 4. RECOMMENDATIONS

A minimum of two holes are recommended to test the strike extensions of the sulphide horizon intersected in PD84 CC9 and the alteration system in the area.

Follow-up drainage sampling and geological investigation is recommended for the anomalous stream sediment catchments.

#### 5. GEOLOGY

EL 10/76 covers a portion of the north eastern extension of the Cambrian Mt. Read Volcanic Belt. These volcanics are unconformably overlain by the Roland conglomerate which underlies the Ordovician Moina Sandstone. Numerous old workings are scattered in and around the EL. Details of the geology are shown on Plan TASH 1711 (after Jennings, 1979).

#### 6. REGIONAL DRAINAGE GEOCHEMISTRY

A regional drainage sampling programme has been carried out over EL 10/76. The programme was designed to search for fine (invisible) gold both as a primary target and as a pathfinder for volcanogenic massive sulphides. Large (5 kg.) -4 mesh samples were collected and analysed using the CN leach technique with results reported in parts per trillion. A standard -80 mesh sample was also collected at each site to check previous explorers sampling.

A number of highly anomalous samples were collected in the Lake Cethana area with best results being (in ppm) 600 Pb, 440 Zn, 60 As and 5250 ppt Au. Follow-up sampling will be carried out to determine whether these anomalies can be attributed to known workings. Sample locations are shown on Plan TASH 2862 and assay results are in Appendix 1.

#### 7. DRILLING

Two percussion holes, PD84 CC9 and PD84 CC10, were drilled in mid 1984. The holes were sited to test UTEM anomalies with PD84 CC9 also testing a coincident geochemical response. Although neither hole intersected significant Ag-Pb-Zn nor Au mineralization, PD84 CC9 did traverse a 20m. highly pyritic section which included 5m. of "probable massive sulphide". This 5m. interval contained "elevated" Pb and Zn values. No electrical geophysical techniques can be used downhole or at surface due to the presence of H.E.C. power lines immediately adjacent to the drill site.

A general geochemical zonation is evident within the prospect. The zonation ranges from more Cu rich in the north, through a Pb rich zone then into a Zn rich area in the south. The Pb-Zn rich zone approximately correlates with the chloritic acid volcanics mapped by Gerald Purvis.

Using a classic volcanogenic model, this implies that the Cu rich footwall sequence lies to the north of the host horizon (chloritic zone) and hanging wall sequence. The position of a mapped "sinter" generally to the south or within the chloritic zone, further enhances this interpretation. To the north and south of the chloritic zone, sericite alterations dominate thereby forming a sericitic envelope around the potential host horizon.

All measurements from geological mapping indicate a steep north easterly dip implying an overturned system.

(sample was collected  
during the NE.)

## 8. FUTURE PROGRAMME

### 8.1 Drainage Geochemistry

Follow-up drainage sampling and geological investigation will be used to determine the source of anomalous drainage samples already collected.

### 8.2 Drilling

Three diamond drillholes are proposed to test the prospective chloritic horizon along strike from PD84 CC9.

Diamond Drillhole 'A': Collar co-ords.: Line 900E 00N  
Azimuth: 210 degrees (mag) (local grid south).  
Dip: -70 degrees  
Total depth: 250m

This hole is to be collared in quartz sericite schist - chlorite zone contact thereby passing from the footwall into the postulated host horizon. A total depth of 250m is anticipated in order to test the entire chloritic zone. The hole will also test a zone of elevated Pb geochemistry with high Pb to Cu ratios and the flank of an IP chargeability anomaly. None of the previous drilling has traversed this schist-chlorite zone contact.

Diamond Drillhole 'B': Collar co-ords: Line 700E 60S  
Azimuth: 210 degrees (mag) (local grid south)  
Dip: -65 degrees  
Total depth: 250m

Drillhole 'B' is designed to test the along strike extensions of the pyrite intersection in PD84 CC9. The hole will be collared in acid lithic tuff and traverse the chloritic zone, again drilling from footwall to hanging wall sequence. The continuation of the UTEM anomaly investigated in PD84 CC9 will be tested at approximately 85m depth. This anomaly is interpreted to be dipping subvertically therefore the direction of drilling should not matter.

Diamond Drillhole 'C' : Collar co-ords: Line 1200E 240S  
Azimuth: 210 degrees (M) (Local grid south)  
Dip: -65 degrees  
Total depth: 200m

This hole is proposed in order to test the possibility of significant mineralization occurring between drillholes DD77 CC2 and DD77 CC3. This zone has the potential to host a large CRA sized orebody and contains the prospective chloritic horizon (i.e. possible ore host). Elevated soil geochemistry is coincident with the chloritic zone.

All holes should be tested with downhole geophysics where possible.

#### 9. REFERENCES

- |              |      |   |
|--------------|------|---|
| Flis M F     | 1983 | Exploration of Cethana EL 10/76, North Tasmania 1981-82. CRAE Report No. 11923.                         |
| Jennings I B | 1979 | Geological Atlas, 1 Mile Series, Sheet 37, Sheffield Explanatory Report. Department of Mines, Tasmania. |

Purvis J G 1979 Exploration at East Cethana EL 10/76  
Northern Tasmania - September, 1977 to  
September 1979. CRAE Report No. 9717

Temby P A 1985 EL 10/76 Cethana Area, Northern Tasmania.  
Report on Exploration for 12 months to 28th  
February, 1985. CRAE Report No. 13109.

10. LOCATION

BURNIE 1:250,000 Sheet Sk 5503

11. KEYWORDS

Geochemistry-drainage, Drill diamond, Drill percussion, Volcanics

12. LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Tash 2916 ✓	Cethana EL 10/76 Location Plan	1:2 000 000
Tash 2662 ✓	Sheffield EL 7/73 & Cethana EL 10/76 Location Plan	1:100 000
Tash 2862 ✓	Cethana EL 10/76 Grid Locations, Drill Holes and Stream Sediment Sample Locations	1:5 000
Tash 2915 ✓	Cethana EL 10/76 Geology and Drill Hole Location Plan	1:1 000
Tash 2163 ✓	Cethana EL 10/76 Drill Section PD84 CC9	1:1000

Tash 2912 ✓	Cethana EL 10/76 Proposed Drill Section "A"	1:1 000
Tash 2913 ✓	Cethana EL 10/76 Proposed Drill Section "B"	1:1 000
Tash 2914 ✓	Cethana EL 10/76 Proposed Drill Section "C"	1:1 000

13. LIST OF APPENDICES

Appendix I Regional Stream Sediment programme logs  
and assay results.

Appendix II PD84CC9 Drill Log and assay results.

APPENDIX I

REGIONAL STREAM SEDIMENT PROGRAMME LOGS

AND ASSAY RESULTS

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SAMPLE NUMBER	LOCATION			ANALYSES									Geological Observations		
	Easting	Northing	Sample Type	Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppm)	Au (ppt)		
1153903 904	431150	5407850	-80# -4#	14	165	190	<1	18	3.41	5400	410	<0.005	<50	Slas flow; mod gradient; 2m wide; colluvial banks; moderately incised; eucalypt forest; 60% gravel, 30% sand, 8% silt, 2% clay + organics. F.g. porphyritic basic - intrusion rock; mod grained subhed feldspar phenocrysts + minor feldspar phenocrysts; magnetic; possible andesite.	
1153905 906	431150	5407950	-80# -4#	39	29	200	<1	4	8.60	1680	280	<0.005	1400	No flow; mod gradient; 1m wide; moderately incised; colluvial banks; eucalypt forest; 40% gravel, 20% sand, 20% silt, 15% clay, 5% organics. Foliated, altered, mg. epiclastic; mg. feldspar + lesser qz fragments in a fine matrix. Dark grey-green altered f.g. volcanic; locally magnetic.	
1153931 932	428200	5406600	-80# -4#	15	84	60	<1	48	1.83	550	60	0.04	5250	Moderate flow; steep gradient; 4m wide; well incised; colluvial/rock banks; eucalypt forest; 30% gravel, 40% sand, 20% silt, 10% clay + organics. Hard, siliceous, mg quartzite; fine disseminated % on bank; qz veinings; sericite alter.	
DETECTION LIMIT															
ANALYTICAL METHOD															

Project : SHEFFIELD - MOINA	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 1
Tenement : CETHANIA EL 10/76	DPO's :		Laboratory : AMDL
Area / Prospect : REGIONAL STREAM SEDIMENTS			Collected By : S. CAITHNESS Date : MARCH 1985.

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045012

011

SAMPLE NUMBER	LOCATION			ANALYSES										Geological Observations
	Easting	Northing	Sample Type	Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppm)	Au (ppt)	
1153933 934	428000	5408200	-80# -4#	32	500	450	5	20	3.22	320	130	0.02	350	Moderate flow; moderate gradient; 6m wide; well incised; colluvial alluvial banks; eucalypt forest; 50% gravel, 40% sand, 9% silt, ~1% clay & organics. Coarse conglomerate; fine and medium siliceous quartzite; quartzite; sericitic; trace disseminated pyrite; green grey foliated shale.
990639 640	429475	5406820	-80# -4#	15	12	18	<1	<2	0.68	80	15	4000	150	4m wide; strong flow; steeply inclined; steeply incised; no staining; gravel bar; % + colluvial banks. Rounded conglomerate; Mn quartzite; very sandy.
990641 642	429350	5406600	-80# -4#	18	36	34	<1	12	2.51	840	120	0.01	50	5m wide; strong flow; steep gradient but not incised; moderate clay; gravel bar; Rounded conglomerate; Mn quartzite % and float; Fe staining + mining contamination.
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 2
Tenement : CETHANA EL 10/76	DPO's :	Laboratory : AMDE	
Area / Prospect : REGIONAL JOSEPH SEDIMENTS		Collected By : S. GATHNESS I. CLEMENTSON	Date : MARCH 1985

012

045013

APPENDIX II

PD84CC9 DRILL LOG AND ASSAY RESULTS

Drill Hole : PD84 CC9  
 Licence : Cethana EL 10/76  
 Locality : Cethana West Grid  
 Collar Location : 600mE 4602mN (approx. 428515E 5408470N AMG)  
 Inclination : -60°  
 Azimuth : 360° (Grid North)  
 Drillers : Overland Drilling  
 Date : June 1984  
 Total Depth : 102m  
 Logged : I.M.Clementson

013

<u>From (m)</u>	<u>To (m)</u>		
0	10	Soil/Clay	: Red and ochre clays, some probably derived from nearby Tertiary basalts (note high mag susceptibility of uppermost clays).
10	21	Weathered Acid Volcanics	: Intensely weathered acid volcanics; probably tuffaceous including recognisable laminated tuff. Abundant quartz and fragments of quartz rich fragmental tuff or arkosic arenite.
21	55	Quartz-Sericite Chlorite (epidote) Tuffs (?)	: Light to mid greenish grey quartz-sericite-chlorite (and/or epidote)foliated (schistose) acid volcanic or volcanoclastic. Quartz "eyes" visible : possibly phenocrysts, indicating that the rock is a porphyry, more probably qz clasts in a coarse volcanoclastic. Chlorite abundant both as an "alteration" product of discrete grains (?clasts of mafic minerals or mafic rich fragments) and dispersed within the dominantly quartz-sericite matrix. Epidote as a selective and occasionally pervasive alteration takes over from chlorite (occasionally supplements it) in a number of zones, principally 40-48m.

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01A

White, soft, massive zeolite (?) coating joint faces and in thin veinlets.

Disseminated pyrite is ubiquitous throughout, amount varies but never exceeds 5%. Grain size is also variable, most is very fine (0.2 - 0.5mm) [where visible] but in the more pyritic zones coarser (1-1½mm) euhedral crystals occur.

Hematite occurs frequently as both "earthy" disseminations and joint coatings and as disseminated and clots of specular hematite (within the core of which pyrite is occasionally visible).

55            72            Quartz-Sericite-Epidote  
Foliated Tuff

: Light greenish grey, quartz-sericite schistose tuff(?) with pale green-yellowish green epidote pervasive throughout the matrix and selectively replacing ? feldspars.

Minor chlorite in parts.  
Generally very fine grained (or finely crystalline) except 62-63m where a coarser grain/crystal fraction probably reflects an increase in grain size in the parent tuff. Disseminated pyrite throughout, Maximum 5% Average 2-3%

72            96            Phyllite

: Dark grey-green (almost black) chloritic phyllite. Well foliated, sericitic. Occasional quartz grains visible in the phyllites. Strongly, but variably pyritic.

72 - 80m up to ± 7% pyrite  
80 - 85m up to ± 15% "  
85 - 96m up to ± 7% "

with fragments (particularly between 80-85m) of semi-massive pyrite to 25%. Originally fine tuffaceous sediment. Much of the pyrite is coarse grained and euhedral ? diagenic.

045015

96

102m

Phyllite/Quartz  
Sericite Schist

: Alternating phyllite (as above) and quartz-  
sericite schist, slightly chloritic and epidote  
rich.

013

045016

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

SHEET 1 OF 2  
0181

TENEMENT NAME EL 7/73 Sheffield No. ....  
PLAN - MAP REFERENCE Cethana West Grid.

CO-ORDINATES 428515 E 5468470 N DRILLERS Overland COMMENCED June 1984 DEPTH 102 m HOLE No. P.D.84.CC9  
Azimuth 360° mag. INCLINATION -60 DRILL TYPE Peruasion COMPLETED ..... CASING LEFT 102 m DPO No(s) 31912

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by...ALS...)							
From (M)	To (M)									Cu	Pb	Zn	Ag	Au			
					weathered zone	990056	12.0	15.0		135	310	620	2	<3			
						57	21.0	22.0		110	220	540	2	<3			
						60	26.0	27.0		50	180	380	1	<3			
						63	29.0	30.0		60	200	410	1	<3			
						66	32.0	33.0		20	230	340	1	<3			
						69	35.0	36.0		20	125	370	1	<3			
						71	37.0	38.0		10	230	320	1	<3			
						73	39.0	40.0		20	155	350	1	<3			
						77	43.0	44.0		30	195	660	1	<3			
						80	46.0	47.0		40	185	460	1	15			
						83	49.0	50.0		10	180	400	1	<3			
						85	51.0	52.0		10	160	300	1	<3			
						87	53.0	54.0		30	145	320	1	<3			
						89	55.0	56.0		40	115	300	1	<3			
						92	58.0	59.0		15	135	290	1	<3			
						95	61.0	62.0		25	160	460	1	<3			
						98	64.0	65.0		20	120	340	1	<3			
					target zone	101	67.0	68.0		65	140	350	1	<3			
						104	70.0	71.0		105	95	290	1	<3			
						107	73.0	74.0		250	175	640	2	3			
						112	78.0	79.0		35	110	460	2	<3			
						113	79.0	80.0		30	180	500	2	<3			
						114	80.0	81.0		40	290	780	3	3			
						115	81.0	82.0		40	320	820	3	5			
					15% pyrite	117	83.0	84.0		30	250	720	3	5			
						119	85.0	86.0		25	230	660	3	<3			
						121	87.0	88.0		20	280	600	3	5			
						123	89.0	90.0		50	195	640	3	3			
						125	91.0	92.0		15	210	480	2	3			
						127	93.0	94.0		15	200	460	2	<3			

045017



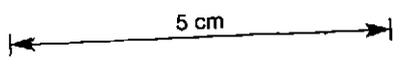
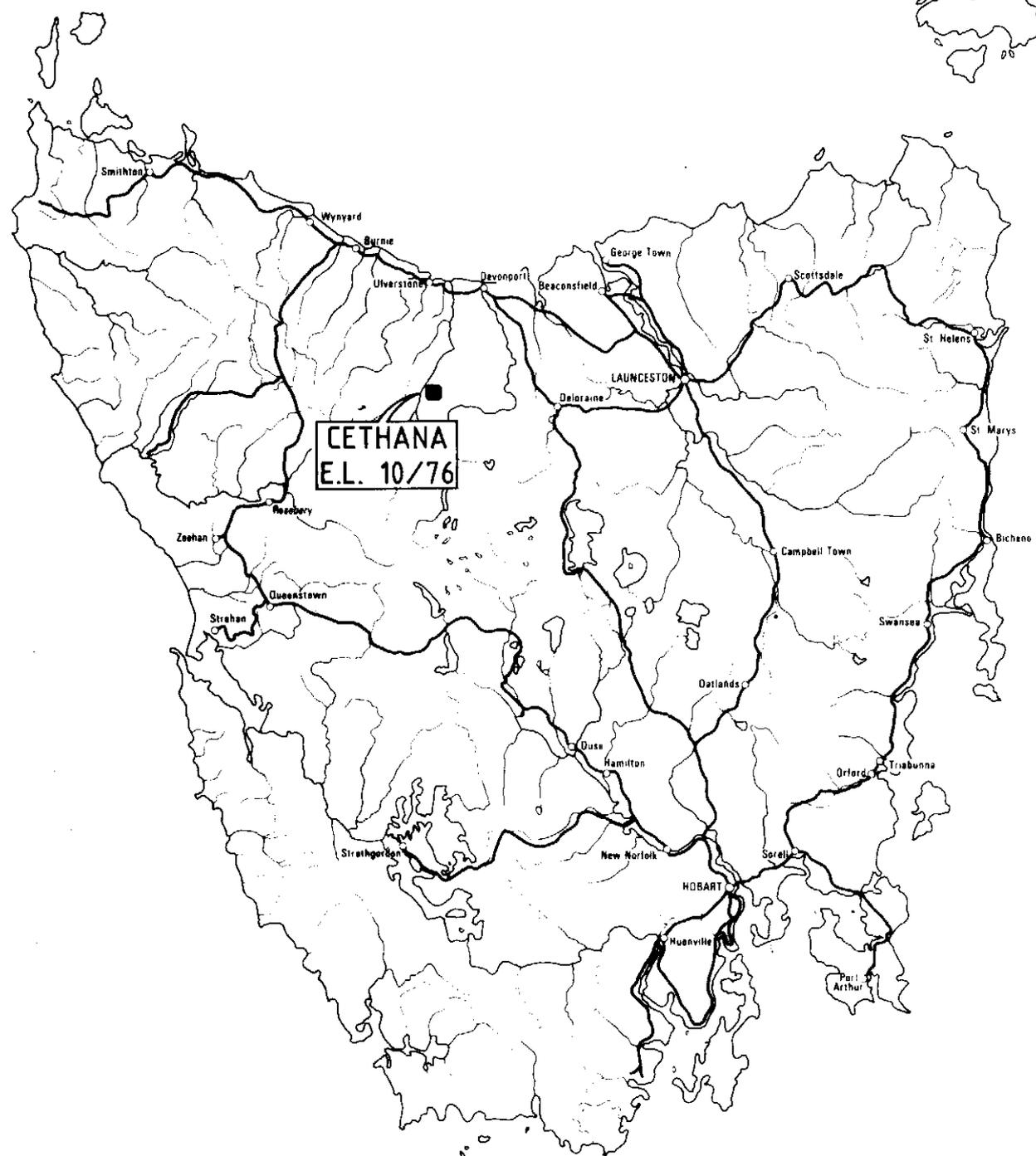
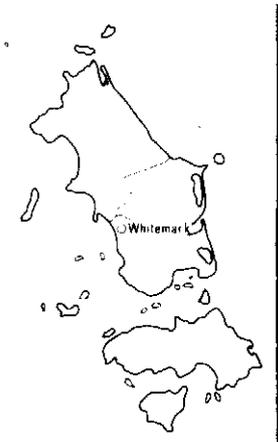
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045019



# TASMANIA

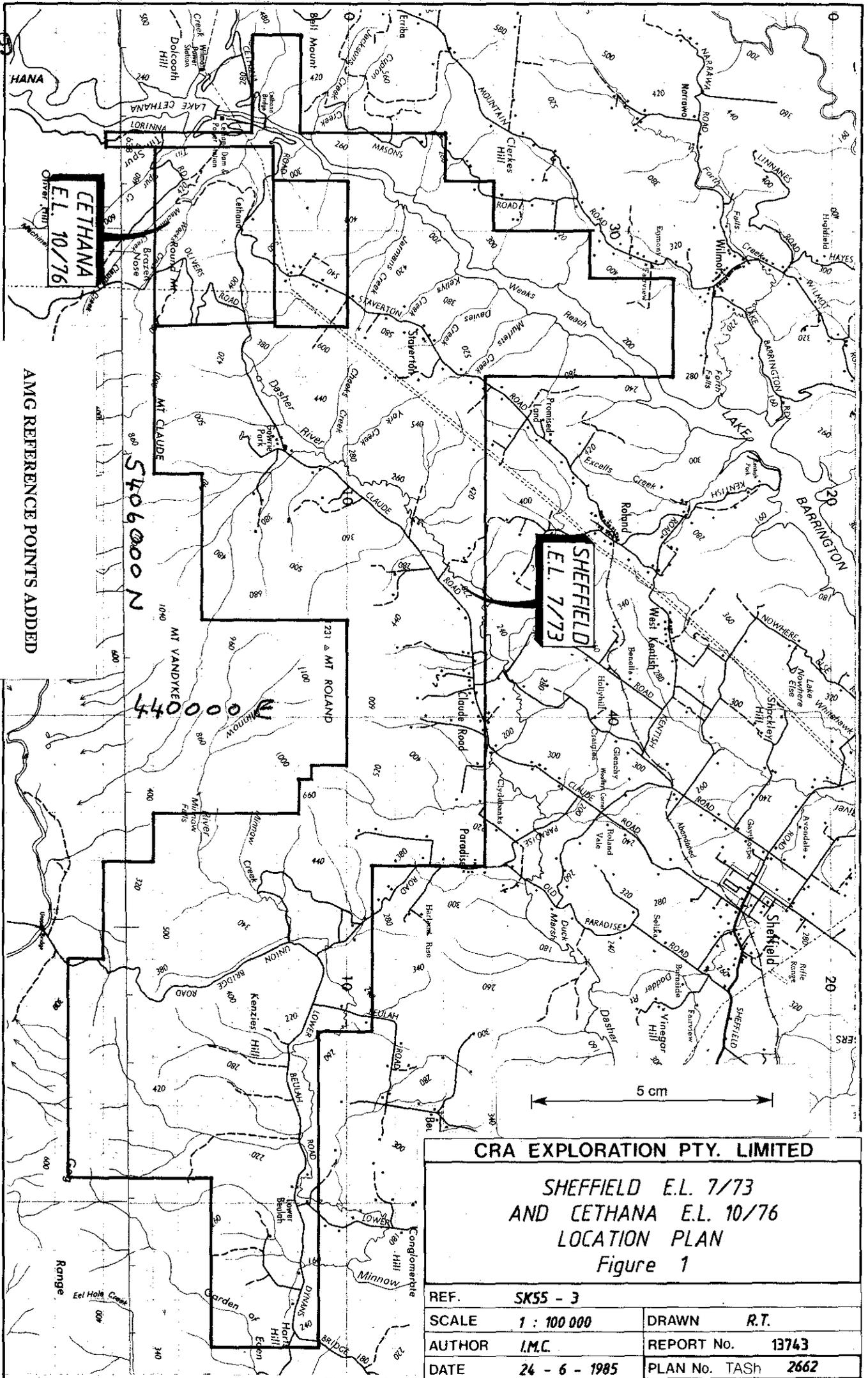
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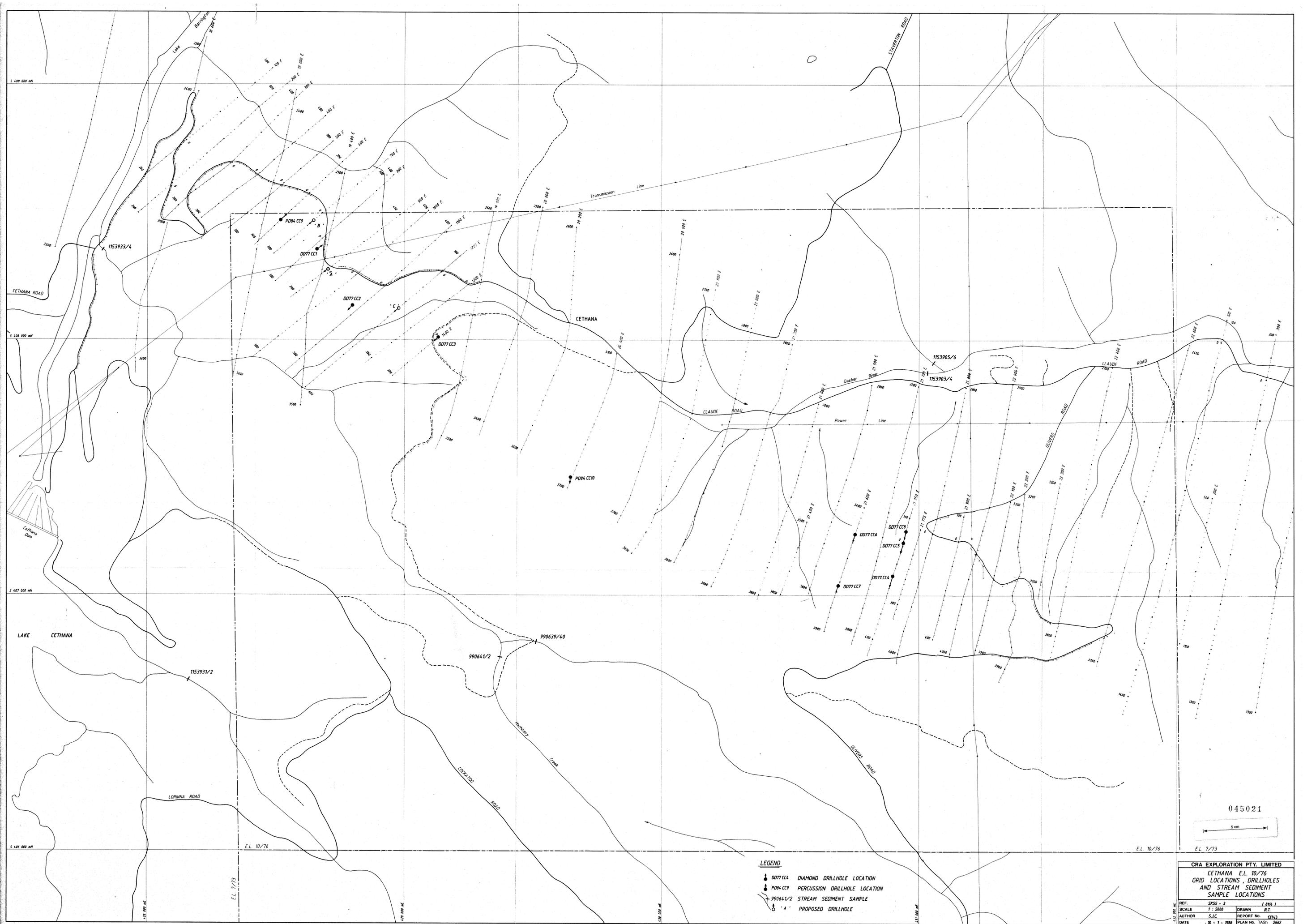


<b>CRA EXPLORATION PTY. LIMITED</b>	
CETHANA E.L. 10/76	
E.L. LOCATION PLAN	
REF.	SK55 - 3 ( 8114 )
SCALE	1 : 2 000 000
AUTHOR	T.v.S.
DATE	6 - 2 - 1986
DRAWN	R.T.
REPORT No.	13743
PLAN No.	TASh 2916

86-2534

019





- LEGEND**
- DD77 CC4 DIAMOND DRILLHOLE LOCATION
  - PD84 CC9 PERCUSSION DRILLHOLE LOCATION
  - 990641/2 STREAM SEDIMENT SAMPLE
  - 'A' PROPOSED DRILLHOLE

045021

5 cm

E.L. 10/76

E.L. 7/73

<b>CRA EXPLORATION PTY. LIMITED</b>			
CETHANA E.L. 10/76			
GRID LOCATIONS, DRILLHOLES			
AND STREAM SEDIMENT			
SAMPLE LOCATIONS			
REF.	SK55 - 3	(81k)	
SCALE	1:5000	DRAWN	R.T.
AUTHOR	S.J.C.	REPORT NO.	3313
DATE	10 - 1 - 1986	PLAN NO.	TAS 2862



020

020

4 500 mN

4 600 mN

4 700 mN

4 800 mN

Aeromagnetic Anomaly

190ppm Pb, 320ppm Zn, 30ppm Cu

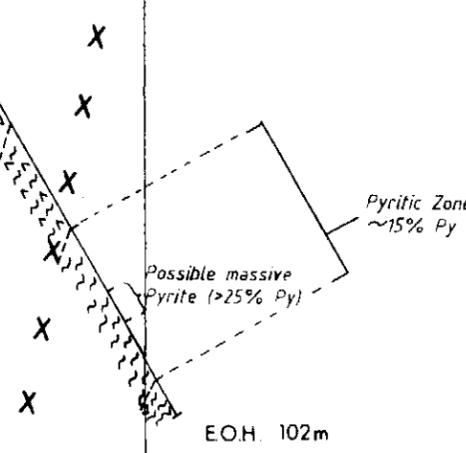
Tuffs

Chloritic Schists

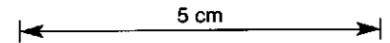
Tuffs / Schists

Quartz - Sericite Schists

Vitric Tuff, Shale, Tuffaceous Siltstone



045023



LEGEND

- Soils and Clay
- Weathered Intermediate / Acid Tuffs
- Quartz - Sericite - Chlorite Schists
- Quartz - Sericite - Epidote Schists
- Phyllite, Pyritic
- Interbedded Phyllite / Schists
- Interpreted Location of E.M. Anomaly

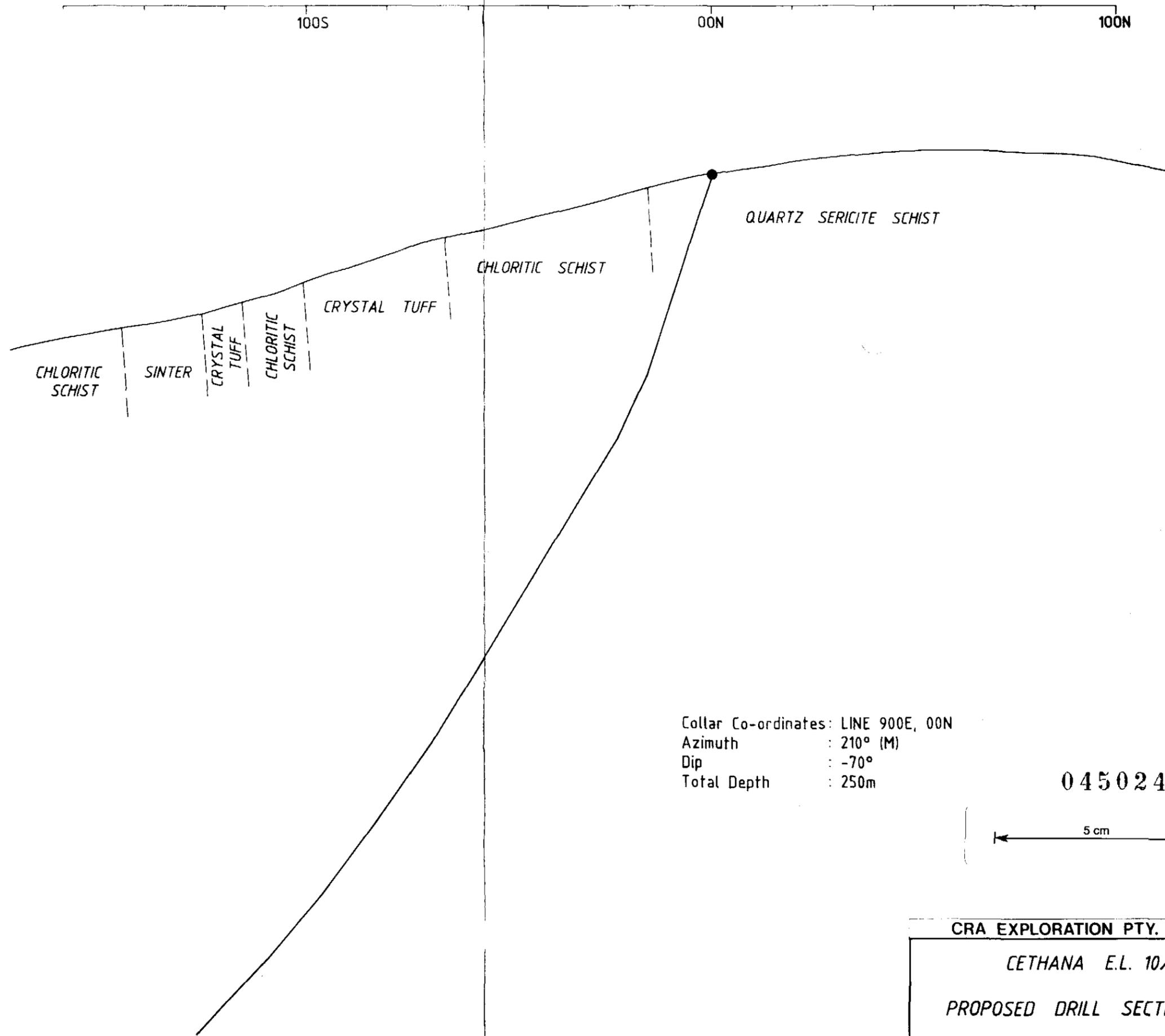
CRA EXPLORATION PTY. LIMITED

CETHANA E.L. 10/76  
RD 84 CC 9 SECTION

REF.	SK 55-3		
SCALE	1:1000	DRAWN	D.M.L.
AUTHOR	I.M.C.	REPORT No.	13743
DATE	5-10-84	PLAN No.	TASh 2163

86-2534

021



Collar Co-ordinates: LINE 900E, 00N  
 Azimuth : 210° (M)  
 Dip : -70°  
 Total Depth : 250m

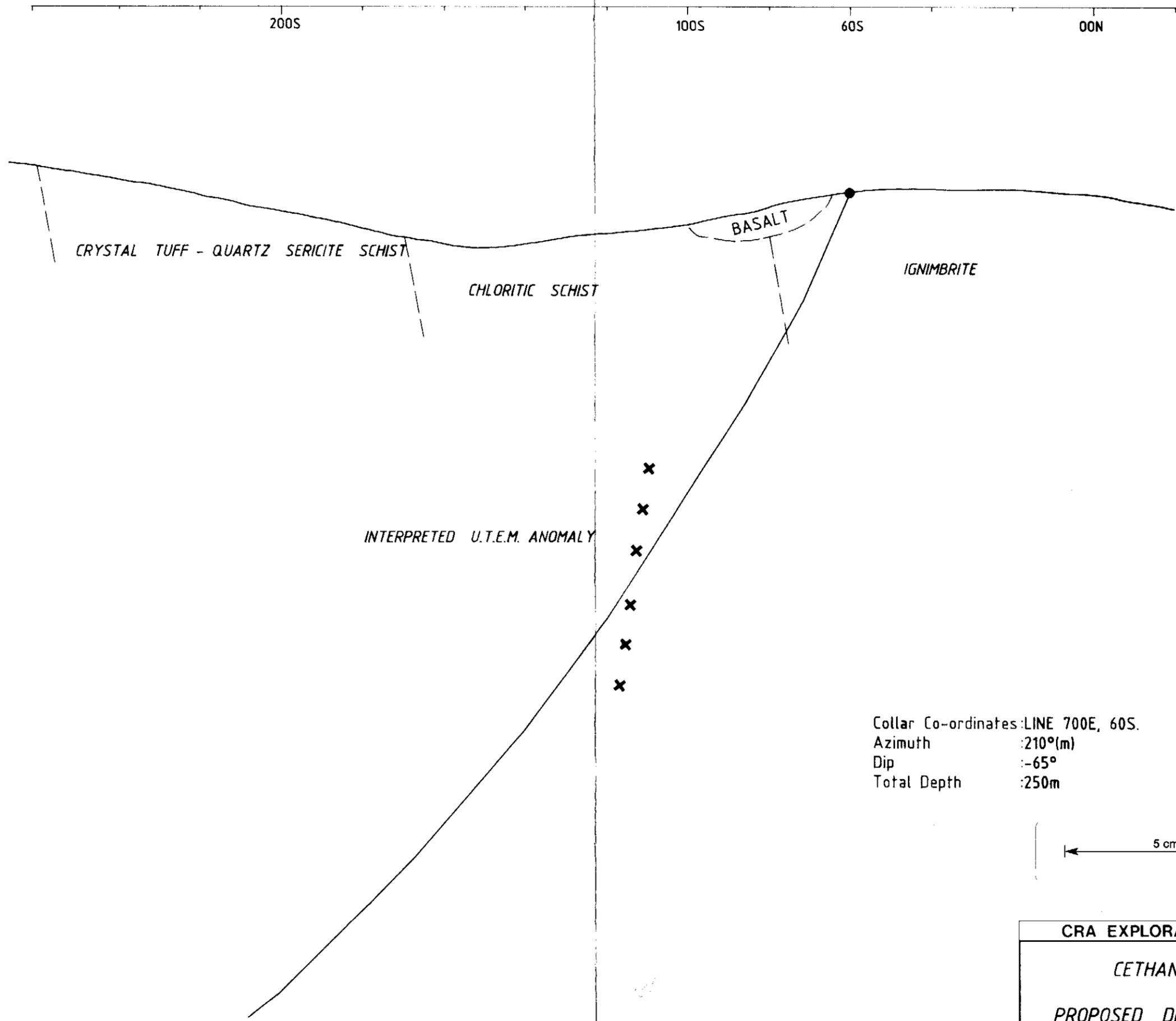
045024

5 cm

CRA EXPLORATION PTY. LIMITED	
CETHANA E.L. 10/76	
PROPOSED DRILL SECTION 'A'	
REF. SK55 - 3	( 8115 )
SCALE 1 : 1000	DRAWN R.T.
AUTHOR S.J.C.	REPORT No. 13743
DATE 3 - 2 - 1986	PLAN No. TASH 2912

86-2534

022



045025

CRA EXPLORATION PTY. LIMITED	
CETHANA E.L. 10/76	
PROPOSED DRILL SECTION ' B '	
REF. SK55 - 3	( 8115 )
SCALE 1 : 1000	DRAWN R.T.
AUTHOR S.J.C.	REPORT No. 13743
DATE 3 - 2 - 1986	PLAN No. TASH 2913

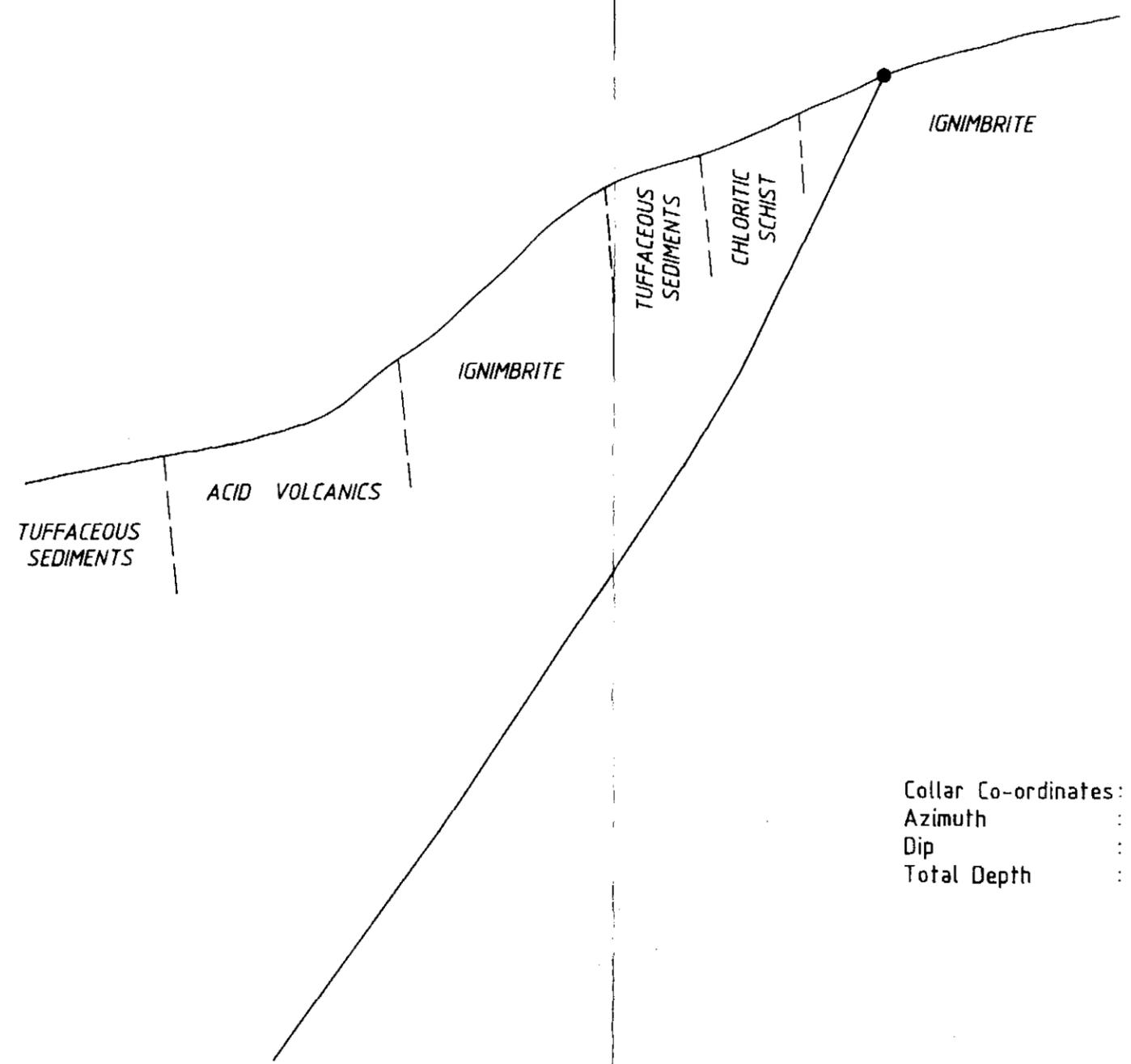
86-2534

023

400S 300S 240S 200S

>500ppm Pb  
in soils

>500ppm Pb in soils



Collar Co-ordinates: LINE 1200E, 240S  
 Azimuth : 210° (M)  
 Dip : -65°  
 Total Depth : 200m

045026

5 cm

CRA EXPLORATION PTY. LIMITED

CETHANA E.L. 10/76

PROPOSED DRILL SECTION 'C'

REF.	SK55 - 3	( 0115 )
SCALE	1 : 1000	DRAWN R.T.
AUTHOR	S.J.C	REPORT No. 13743
DATE	3 - 2 - 1986	PLAN No. TASH 2914

86-2534