

CRA EXPLORATION PTY. LIMITED

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EXPLORATION AT THE LAKE BARRINGTON PROSPECTSHEFFIELD EL 7/73 NORTHERN TASMANIAFOR THE PERIOD ENDING DECEMBER, 1983

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Date : 19th December, 1983.

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Accepted By :



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 Department of Mines Tasmania

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CONTENTS

	<u>Page</u>
1. SUMMARY	1
2. INTRODUCTION	1
3. CONCLUSIONS	2
4. RECOMMENDATIONS	3
5. GEOLOGY	3
6. DRILLING	4
7. RESULTS	5
8. REFERENCES	7
9. KEYWORDS	8
10. LIST OF PLANS	8
11. LIST OF APPENDICIES	8

1. SUMMARY

The Lake Barrington copper prospect lies approximately twelve kilometres west-south-west of the township of Sheffield within EL 7/73.

Previous exploration (mapping, sampling, geophysics and drilling) refer Purvis 1981 and Weber 1983 showed a sequence of Cambrian acid volcanics together with related sediments contained significant copper mineralisation (5.15m at 2.45% Cu, 23gm Ag and 0.18gm Au in drillhole LB3).

Drillhole DD83 LB4 was sited 100 metres grid east of this intersection on the eastern end of the Mise-a-la-masse anomaly. A similar sequence of rock was intersected but less fracturing and quartz - carbonate veining was found. The hole also intersected a shale sequence at 257 metres which was not located in LB3. The best results were :-

48.0 - 49.0 1 metre 1.86% Cu, 5gm Ag.

225.8 - 226.3 0.5 metres 4.78% Cu, 36gm Ag, 3.16gm Au and 515ppm Co.

The uppermost mineralisation was in a very weathered altered lava sequence. The lower zone being within fresh lava in a stringer zone but without the usual quartz - carbonate and strong chlorite alteration. The shales at the end of the hole also contained minor mineralisation in fractures.

2. INTRODUCTION

This report details the results of the fourth hole drilled on the Lake Barrington copper prospect (refer Location Plan TV 375) on the steep slopes on the western side of Lake Barrington.

The Sheffield licence area was originally applied for by Asarco (Australia) Pty. Limited on March 15th, 1973. It occupied an area of 743 square kilometres and covered most of the Cambrian Volcanics (Mt Read equivalents) within the Fossey Mountain Trough in Northern Tasmania. The area was reduced to 429 square kilometres in March 1974. CRAE entered into a Joint Venture on the 12th July, 1976 and the title was transferred to CRAE on the 29th December, 1977. In August 1979 the licence was reduced to the current 199 square kilometres and Asarco transferred its interest in the Joint Venture to Carpentaria Exploration Co. Pty. Limited on the 11th June, 1980. On 8th June, 1983 Carpentaria Exploration withdrew from the Joint Venture.

The prospect was originally located by Asarco in 1973 as a 1300ppm Cu drainage anomaly in a creek draining a 0.5 square kilometre area of Cambrian acid volcanics.

Followup geological work resulted in three diamond drill-holes completed. These indicated mineralisation and alteration within a stringer zone was increasing to the east. A fourth drillhole was sited approximately 100 metres east of the major intersection in LB3. The mineralisation is in much narrower zones but of slightly higher grade and of interest is the gold values obtained especially in the lower intersection. Further exploration work in the form of downhole geophysics and drilling is recommended.

3. CONCLUSIONS

1. The stringer zone (quartz - carbonate ferroan dolomite - siderite veining) is less intense in LB4 than LB3 indicating the zone of most intense fracturing is in the region of LB3.

- 3 -

2. The chlorite alteration is less in LB4 than LB3 indicating the zone of most alteration is in the vicinity of LB3.
3. Gold values show an increase towards LB4.

4. RECOMMENDATIONS

1. Drillholes LB2 and LB4 (LB3 lost) are probed using a downhole E.M. technique to determine directions of increasing mineralisation.
2. A further drillhole be sited to test beneath the mineralised zone in LB3.
3. A U.T.E.M. survey be planned to cover the uppermost portions of the tuff-shale sequence containing minor stringer mineralisation south of the drillholes and to test the sequence to the west under the Tertiary basalt cover.

5. GEOLOGY

The sequence of rocks at the Lake Barrington prospect consists of a suite of Cambrian acid-intermediate volcanics, breccio - conglomerates and tuffaceous grits and shales. Purvis (1981) reported the hydrothermal alteration (quartz-sericite-siderite) of the volcanic rocks within the drillholes was only slight to moderate. However in DD82 LB3 the mineralisation was generally accompanied by strong to very strong chlorite alteration which in some cases masked the original rock type. An inter-relation between

chlorite alteration and sulphide mineralisation was very evident on drillhole LB3. This hole also intersected considerably more carbonate (calcite-siderite) veining than earlier drillholes. Drillhole LB4 intersected less quartz - carbonate veining and chlorite alteration. There was no clear relationship between an increase of chlorite alteration and copper mineralisation in LB4.

6. DRILLING

DD83 LB4 was commenced on the 24th November, 1983 and completed at 281 metres on the 2nd December, 1983. The hole was drilled grid south (210⁰m) at -48⁰ to test the eastern continuation of the stringer mineralisation intersected in LB3 approximately 100 metres to the west.

A detailed log can be found in Appendix One and a drillhole section at the back of the report. The correlation between LB3 and LB4 was fair to good. The altered rhyolite logged between 41.0 metres and 111.8 metres may be a more silicified or less weathered tuffaceous grit as logged in the upper sections of LB3.

Geological mapping (Purvis 1981) indicates the Breccio - Conglomerate sequences are not present at surface on line 4850E so the intersection of 62 metres of this unit implies a moderate plunge of this unit to the east.

The intersecting of tuff shale / shale sequence at the end of the hole is very interesting. The shale unit forms a constant stratigraphic horizon of quiescent sedimentation within a mineralised volcanic province. The intersecting of this unit in LB4 gives three intersections over 250 metres giving a strike of approximately 315⁰ to this unit and a dip of between 70 and 80⁰ to the south-west from intersection angles within the drillholes.

- 5 -

LB3 was re-entered to clean out the hole and to extend the hole to the tuff shale / shale unit however the PVC casing slipped and the hole was lost.

LB2 was cleaned out in preparation for downhole geophysical work.

7. RESULTS

The tuff shale / shale unit intersected in LB4 with upfacings downhole shows this unit is present for at least 250m of strike length. This unit is greater than 50 metres (true thickness) in LB2 and the footwall (younger) rocks have not been located in any drillholes. Mapping by Purvis (1981) shows the contact to be with a Dacitic unit.

The gold value of 3.16gm Au at 225.8 metres albeit in a narrow chalcopyrite stringer zone is an encouraging result. It may indicate that gold mineralisation is richer in a peripheral zone to the thicker and wider stringer mineralisation.

From the four drillholes now completed on this prospect and the geophysics completed the following points can be made.

1. The footwall sequence of variable acid volcanics contains zones of chlorite alteration, fracturing with infill quartz - carbonate (ferroan dolomite - siderite) veining with or without significant chalcopyrite mineralisation. It is of interest to note that no Baryte in veins or beds have been intersected.

- 6 -

2. The younger tuff shale / shale sequence indicates a quiescent period within an acid volcanic province. The strike length is greater than 250 metres and the thickness is undetermined. Mineralisation within this unit so far intersected in drillholes is of a stringer zone variety with only minor bedded pyrite mineralisation.
3. The Mise-a-la-masse survey indicated a zone of mineralisation east from LB1 and in LB3 drilled to intersect this zone, an interval of 5.15m of 2.45% Cu and 23gm Ag and minor Au was intersected. Some four other zones of stringer mineralisation were also intersected.
4. The Pulse E.M. survey did not locate any drillable anomaly and as discussed in Weber 1983 this may have been due to a number of factors - malfunctioning machine, bad loop position or the target was too deep for the system.
5. The earlier dipole - dipole I.P. survey indicated a chargeability high and resistivity low on line 4600E centered at 4875N. This anomaly should have been intersected in drillhole LB2. No encouraging intersections were made.

From these observations it is concluded that the Barrington prospect still has potential for Rosebery type volcanogenic sulphides. There are three directions greater mineralisation may be discovered.

1. The tuff shale / shale sequence has not been probed on its upper surface. What mineralisation that does exist in this unit is still fracture fill (minor syngenetic bedded pyrite). The commencement of volcanism / completion of sedimentation maybe a interval of emplacement of massive sulphides. Due to topography part of this portion of the grid is covered with Roland Conglomerate scree. However the lower slopes show a Dacitic unit occurs in this position. Further geophysics (E.M.) and drilling are recommended to test this theory.
2. DOWNDIP under LB1 - LB3 - LB4 area where the greatest mineralisation was found. The stringer zone could well increase in grade and width down dip and the edges of this zone may well be gold rich. The mise-a-la-masse survey indicated a steep plunge to the west-north-west with a substantial depth extent. This zone could be intersected by a deep hole under LB1. The recommended downhole E.M. surveys could define this zone for siting the proposed hole.
3. The volcanic / sediment contact is known to strike westwards under Tertiary basalt cover - thickness unknown. Some consideration should be given to testing the thickness of the basalt. If under 20 metres an E.M. survey may indicate anomalous zones. If thicker several percussion holes could test the contact for mineralisation.

8. REFERENCES

- BARKER, R.G. 1974 EL 7/73 Stream Sediment Sampling
Paradise Tasmania
Asarco (Aust.) Pty. Ltd. internal
report

- 8 -

- BARKER, R.G. 1975 EL 7/73 Paradise Tasmania. Report
for the year ending March, 1975.
Asarco (Aust.) Pty. Ltd. internal
report
- PURVIS, J.G. 1981 Exploration at the Lake Barrington
Copper Prospect. Sheffield EL 7/73
Northern Tasmania.
CRAE Report No. 10520

9. KEYWORDS

Copper - acid volcanics - alteration - stringer mineralisation
- sulphides - drill-diamond - geophysics - P.E.M. - S.P. -
Mise-a-la-masse.

10. LIST OF PLANS

<u>Plan No.</u>		<u>Scale</u>
TV 375	Locality Plan - Lake Barrington Prospect	1 : 500 000
TV 376	Geological Plan	1 : 1000
TASH 1569	Drillhole Section LB4	1 : 1000

11. LIST OF APPENDICIES

APPENDIX ONE : Drillhole Log LB4

APPENDIX ONE

DRILLHOLE LOG LB4

464012

435000 E 5411400 N

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

SHEET No. ONE

TENEMENT NAME SHEFFIELD No. 773

PLAN - MAP REFERENCE BARRINGTON PROSPECT

CO-ORDINATES 4850E 4300N AZIMUTH 210m DRILLERS OVERLAND COMMENCED 24.11.83 DEPTH 281.0 metres HOLE No. DD83L64

RL COLLAR INCLINATION -4.8° DRILL TYPE WARMAN-SCOUT COMPLETED 02.12.83 CASING LEFT 6" PVC P.S. NQ750m DPO No(s)

DEPTH		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 ANLABS)								
From (M)	To (M)										Cu	Pb	Zn	Ag	Fe%	Co	As	Au	
0.0	8.5	-			TRICONED - WEATHERED TUFACEOUS GRIT.														
8.5	22.8	1231	NQ		TUFACEOUS GRIT Coarse grained tufaceous acid volcanic qtz eyes to 2mm. From 21.6-22.8 very broken - quite clastic	mod. highly weathered to 13m. Mn+ Fe staining Several granular zones B + 13.5m = A zone more clastic alteration less weathering Fe on joints and fractures 13.5 - 22.8m	1141217* 1141218*	8.5 16.6	16.6 22.8	6.55 5.76	720 590	15 10	135 175	x x	4.20 4.15	50 40	x x		
22.8	41.0	172	NQ		RHYODACITIC LAVA. Generally pale red-bn mod jointed medium grained min. qtz eyes, ferrous, min. Fe staining on joints occ. dk gy sections more clastic zones. 29.7-32m feeder cone (full spec still attend) - light bn 32-34.5 core dk gy bn 34.9-39.7 - feeder cone - light bn 39.7 - 41.0 Vdk gy gy clastic lava	Fe stained joints, mod fractured becoming more massive by 25 metres Fe alt. along joints more intense but less fracturing from 25-29.7m less Fe staining only at mod jointed ditto ditto qtz veined veins upto 2cm	1141219* 1141220* 1141221*	22.8 29.9 34.9	29.9 34.9 41.0	71 5.0 5.1	230 115 200	5 5 5	100 75 80	x x x	290 220 310	20 25 30	x x x		
						* GRIND SAMPLES.													

464015

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

SHEET No. FOUR

TENEMENT NAME SHEFFIELD No. 7/3

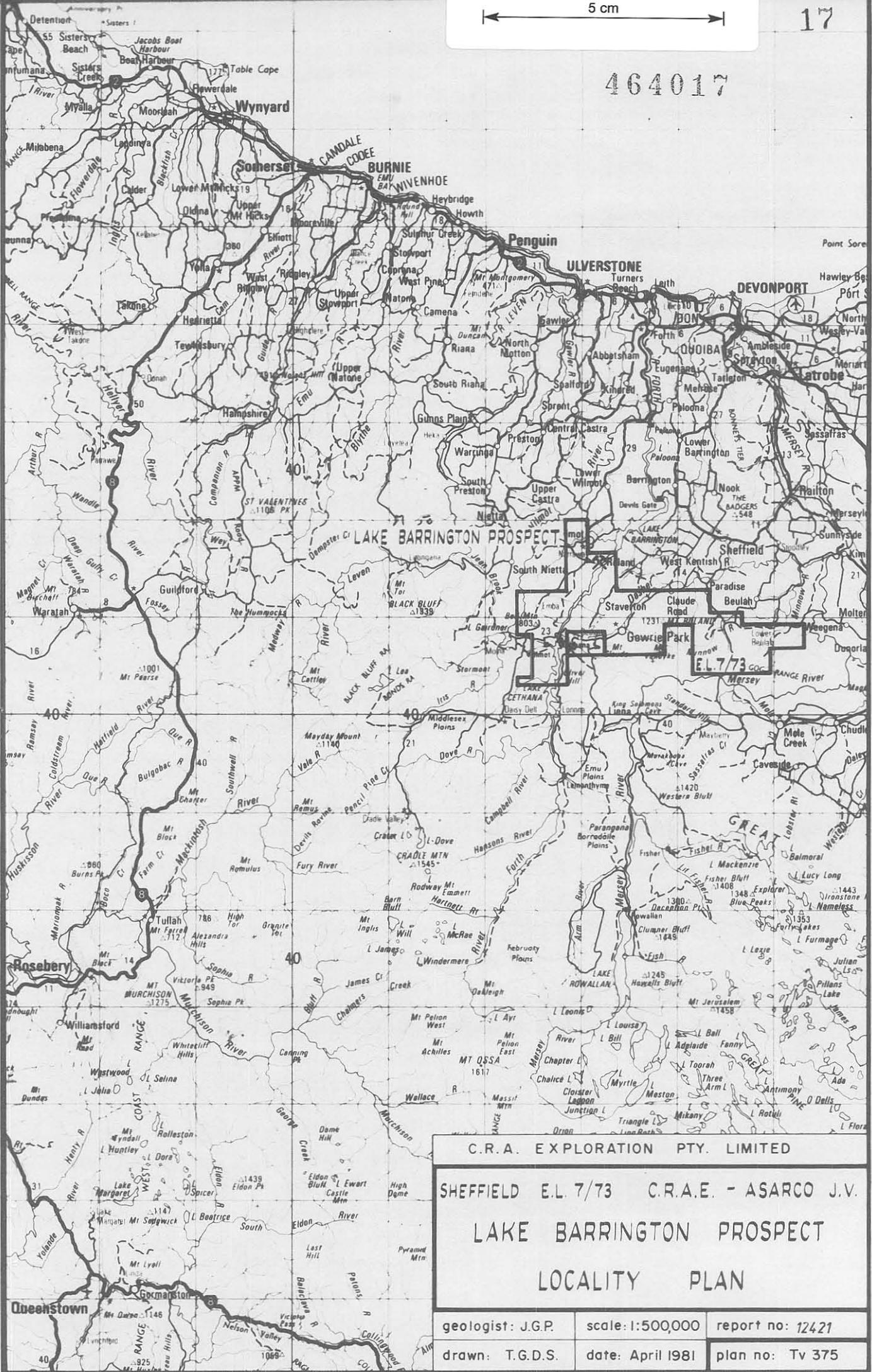
PLAN - MAP REFERENCE BARRINGTON PROSPECT

CO-ORDINATES 4850E 4900N AZIMUTH 210° DRILLERS OVERLAND COMMENCED 24-11-83 DEPTH 281.0 metres HOLE No. DD83 LB4

RL COLLAR INCLINATION -48° DRILL TYPE WARMAN SCOUT COMPLETED 02-12-83 CASING LEFT 50m of AQ CASING DPO No(s)

DEPTH		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 ANALAB)									
From (M)	To (M)										Cu	Pb	Zn	Ag	Fe%	Co	As	Au		
					Occ green translucent mineral as previously described through core.	At 172 g _g -carb vein almost // to core axis over 1m. σ														
					At 183m black/dk grey/clay hard in g _g -carb vein - 10-15% Cp inclusions L.B. vein material NUM.	Also large g _g carb vein at 183.2m N.V.M. Sl. chlorite alt on joints 186m A most unusual fractured green g _g with core cleat approx 15cm diameter occurs at 188.5m General tenor of cleat alignment about 70° to long core axis. Fairly altered + veined for last 1.5m.														
206.8	257.6	477	BQ		RHYODACITIC LAVA Med red-br lava min clasts dk gr black chlorite on joints Core fairly massive 134-136m more silty - cherty layers - some slightly altered - rock recognizable as volcanic but phenocrysts broken down	Med fractured + jointed min g _g -carbonate veins. Core developed more chlorite alteration bands similar to L.B3. Zone of g _g -carb veining 219.6-225 N.V.M. 225-227 Cp > 7% but not in highly chloritic zone but min chlorite alt. Generally dk gr-g _g chloritic zone less slightly more silty but only slight 147.5 8cm wide g _g -carb vein. Min epidote alt.	1141214 1141215 1141216 1141201 1141202	224.9 225.8 226.3 254.0 256.6	225.8 226.3 227.6 256.6 257.6	0.9 0.5 1.3 2.0 1.0	1400 4780 720 95 95	170 310 25 115 85	100 115 150 180 165	0.5 36 0.5 10 0.5	840 930 885 685 745	50 515 35 40 40	X 500 X X X	- 3.16 - - -		

464017



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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: 12421
drawn: T.G.D.S.	date: April 1981	plan no: Tv 375

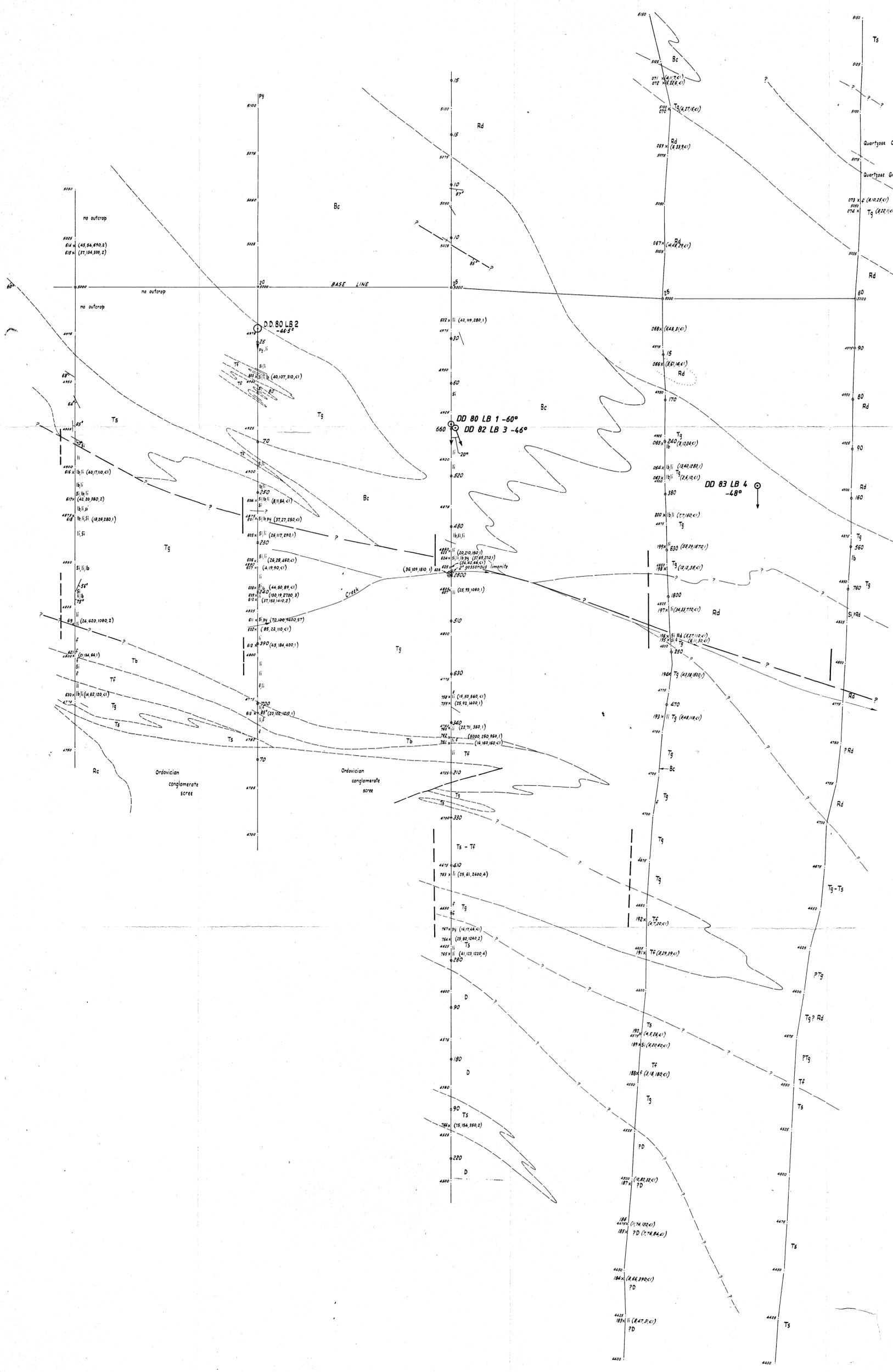
4500E.

4600E.

4700E.

4800E.

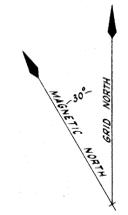
4900E.



LEGEND

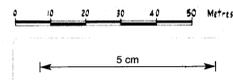
- ORDOVICIAN**
- Rc** QUARTZ CONGLOMERATE
Homomorphic
 - D** DACITIC VOLCANICS
Massive dark green almost unaltered volcanics comprising feldspar hornblende, chlorite glass and some quartz. Includes fuses, fragmentals and fine tufts.
 - Rd** RHYO-DACITIC LAVA
Massive unaltered.
 - Bc** Volcanic BRECCIA-CONGLOMERATE
Unaltered, accessions weakly altered. Angular and well-rounded clasts of volcanics up to 10cm, usually < 3cm, in gritty matrix of similar material. Coarse stratification in places, generally poorly sorted and massive.
 - Tg** TUFFACEOUS GRIT
Sandy to gritty tuff with quartz glass and occasional 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-wearing. (As on line 4500E). Generally weakly - moderately altered.
 - Tf** FINE GRAINED TUFF
Fine grained crystalline 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-wearing. (As on line 4500E). rock appears agglomeratic.
- CAMBRIAN**
- Symbols**
- 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 necessarily related to mineralisation.
 - lb** - Leached, bleached, mineralised rock.
 - si** - Silicification - generally weak.
 - py** - Pyrite.
 - 802x** Rock sample. All samples prefixed 816 (Pb, Zn, Cu, Ag) results in ppm.
 - C.R.A.E.** grid peg.
 - 8240** Asarco grid peg with soil sample Cu value in ppm.
 - o** Assumed position Asarco grid peg.
 - I.P. ANOMALY - Definite
 - - -** I.P. ANOMALY - Probable

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



464018

SCALE 1:1000



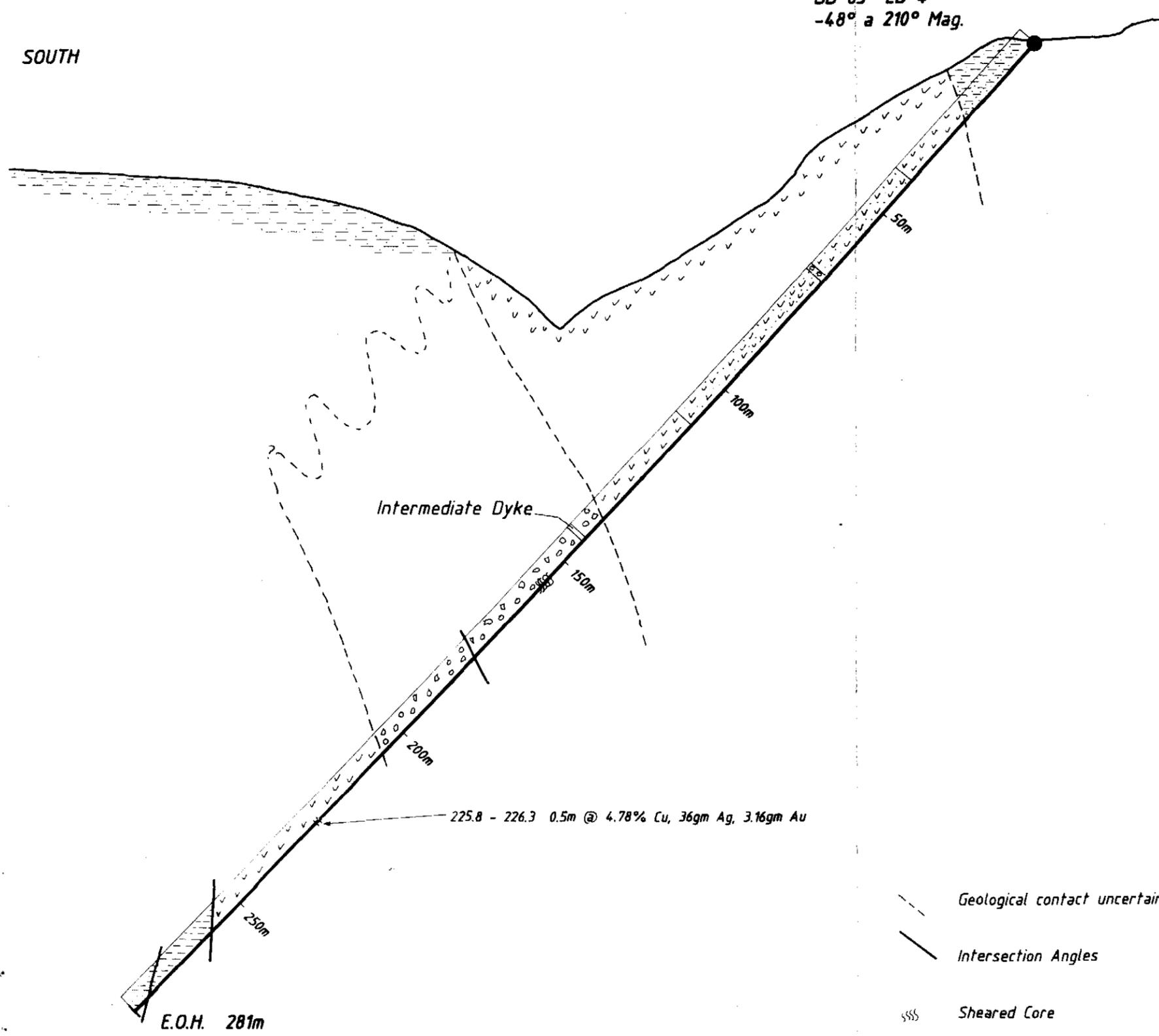
C.R.A. EXPLORATION PTY. LIMITED		
SHEFFIELD	E.L. 7/73	C.R.A.E. - ASARCO J.V.
LAKE BARRINGTON PROSPECT		
GEOLOGICAL PLAN 84-2090		
geologist: JGP & J.C.	scale: 1:1000	report no: 12427
drawn: T.G.D.S.	date: Jan 1981	plan no: Tv 376

4800 4825 4850 4875 4900 4925 4950 4975 5000N (Base Line)

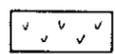
DD 83 LB 4
-48° a 210° Mag.

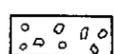
SOUTH

NORTH



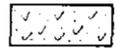
LEGEND

- 

RHYOLYTIC LAVA
Hard often silicified, massive. Moderately altered-carbonate sericite. Angular porphyritic qtz. 1-3 mm, feldspar phenocrysts 1-2mm in felsic and vitric groundmass. Ill defined flow banding. Vague agglomeratic character in places. In places fractured, infilled with stringer mineralisation. Strong to V.strong chloritic alteration associated with mineralisation.
- 

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 100mm, usually <30mm in gritty matrix of similar material with many qtz. fragments.
- 

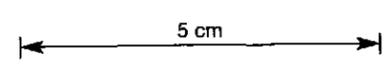
TUFF - SHALE
Grey, weakly or unaltered, v. fine grained, vitric tuff shale and tuffaceous siltstone. Well bedded often brittle
- 

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.
- 

ALTERED RHYOLITE LAVA?
Generally very weathered original rock uncertain maybe Tuffaceous Grit-generally Fe stained occasional thin gossanous zones. esp 41 - 68 m Qtz. carb. veined. Chloritic alteration.

-  Geological contact uncertain.
-  Intersection Angles
-  Sheared Core

464019



CRA EXPLORATION PTY. LIMITED			
SHEFFIELD E.L. 7/73 LAKE BARRINGTON PROSPECT DD 83 LB 4 SECTION 83-2090			
REF.	SK55 - 3		
SCALE	1 : 1000	DRAWN	R. T.
AUTHOR	G. B. W.	REPORT No.	12421
DATE	22 - 12 - 1983	PLAN No.	TASh 1569