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CRA EXPLORATION PTY LTD

3 APR 1986
DEPT. OF MINES
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LOONGANA EL 36/79

REPORT ON EXPLORATION FOR 12 MONTHS TO 1 APRIL 1986

OPEN FILE

Author: S J Caithness

Date: 1 April 1986

Submitted to: T W Dickson

Accepted by:

Copies: CRAE Hobart
CRAE Canberra
Department of Mines,
Tasmania
Billiton Australia

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REPORT NO: 13863

CONTENTS

1. SUMMARY

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

Two diamond drillholes were drilled on the Two Hummocks prospect in order to test a UTEM anomaly along the strike of the Barite occurence. No mineralisation was intersected.

A programme of follow up of geochemical anomalies with mapping, further geochemistry and regional ground geophysics is proposed.

2. INTRODUCTION

This report describes work carried out on EL 36/79 (Loongana) for the year ending 1st April 1986.

EL 36/79 is the subject of a joint venture between Billiton Australia and CRA Exploration Pty Limited. CRAE began exploring the EL in conjunction with neighbouring licences EL 7/74 (Moina) and EL 8/77 (Riana) in March 1985.

The Licence is situated approximately 35 km south of Burnie and is dominantly used for logging and forest management (see plans TASh 2954 and 2956).

3. CONCLUSIONS

The regional stream sediment sampling programme has outlined a number of areas for follow-up, the most important being the zone to the west of the Challenger II prospect.

Percussion drilling at the Two Hummocks prospect failed to intersect significant mineralisation associated with a UTEM anomaly. The anomaly is interpreted to be caused by the contact between tuffs and rhyolite.

The Cattley North area is interpreted to be along the same anticlinal structure as the Hellyer and Que River orebodies. This area is virtually untouched by previous explorers.

4. RECOMMENDATIONS

(1) Reconnaissance geological mapping and rock chip sampling to the west of the Challenger II grid to determine the source of the drainage anomalies.

(2) Reconnaissance geological mapping, gridding and a UTEM geophysical survey in the Cattley North area.

(3) Downhole EM geophysics on the Challenger III drillholes.

(4) Statistical manipulation of stream sediment data to determine subtle anomalies for follow-up.

5. GEOLOGY

The Loongana Exploration License lies at the central-western end of the WSW trending Fossey Mountain Trough. The area consists of a series of anticlines and synclines generally trending EW, with major fault trends running NNW to NW. Anticlinal cores are generally occupied by Cambrian acid to intermediate volcanics, sediments and cherts of the Mt Read group.

The Cambrian is unconformably overlain by the Ordovician Roland Conglomerate and Moina Sandstone. This in turn is overlain by the Gordon Limestone which outcrops in an EW trending synclinal structure at Taylors Flats.

Tertiary basalt masks the underlying geology over much of the license area.

Previous explorers' work concentrated within the Cambrian volcanics with some attempts to trace the volcanics under basalt cover proving unsuccessful.

6. GEOCHEMISTRY

A regional stream sediment sampling programme has been carried out in order to locate areas for further follow-up. The main emphasis of the programme was to search for fine gold either as a primary target or as a pathfinder for volcanogenic massive sulphides. Large (5 kg) -4 mesh samples were collected at each site and assayed for gold using the cyanide leach technique. A standard -80 mesh sample was also collected and assayed for base metals and indicator elements. All results are contained in Appendix 1 and sample sites are shown on plan TASh 2950.

The sampling detected many anomalies, virtually all in base metals. It highlighted a number of prospects already investigated by previous explorers, including the Two Hummocks area (Geopeko & Shell's Challenger III prospect), Native Track Tier (Geopeko & Shell's Challenger II prospect) and Tulip Tree Creek (Shell's Tulip Creek prospect). The sampling of streams draining Native Track Tier greatly extended the strike length of the Challenger II prospect.

7. TWO HUMMOCKS PROSPECT

7.1 Geology

The Two Hummocks prospect lies within a window of Cambrian sediments and volcanics surrounded by Ordovician conglomerate and Tertiary basalt. The area has been explored in the past by Geopeko, Pennzoil and Shell.

Geological mapping carried out by Geopeko indicated a sequence of acid volcanics, and volcanic derived sediments with interbeds of carbonaceous shale. Weak disseminated galena occurs at the base of a shale horizon exposed in a quarry and a minor barite occurrence was exposed during costeaning.

7.2 Geophysics

Numerous geophysical techniques have been tried over the area including RRMIP and UTEM by Pennzoil and Shell respectively. Earlier reinterpretation of the RRMIP data showed there to be a small conductor near the barite occurences. Inspection of the UTEM data shows this trend to run across five of the six lines surveyed. This was the anomaly drilled. The UTEM interpretation is discussed in greater detail in Appendix 3 and contours of Channel 6 data can be seen on Plan TASh 2828.

7.3 Drilling

Two percussion holes, PD85TH1 and TH2 were drilled by CRAE to test the reinterpreted UTEM geophysical anomalies. The holes passed through a sequence of

altered tuffs with minor black shales before being stopped in weakly altered rhyolite. No significant mineralisation was intersected and assays were of a low order. The source of the UTEM response is interpreted to be associated with the contact between the tuffs and rhyolite.

Assay results and drill logs are contained in Appendix 2 and drillhole sections are shown on plans TASh 2853 and 2854.

7.4 Discussion

No significant mineralisation was intersected during drilling at the Two Hummocks prospect. Low order surface geochemistry and the lack of any significant geophysical anomalies further downgrade the prospect.

8. CHALLENGER II PROSPECT

8.1 Geology

The Challenger II prospect lies on Native Track Tier and was previously explored by Geopeko and Shell.

The gridded area contains a sequence of sediments, tuffaceous sediments and cherts which contain narrow crosscutting acid dykes (lavas?) plus a large NW trending tracyhtic intrusive. The tracyhte contains trace disseminated galena.

8.2 Geophysics

A narrow Pb/Zn geochemical anomaly extends from the south of the trachyte. Two lines of Scintrex SE88 GENIE EM were conducted across this anomaly in order to locate any massive sulphides that might be causing the anomaly. No major conductor was detected. The results are discussed more fully in Appendix 4. The GENIE profiles can be seen on Plans TASh 2851 and 2852.

8.3 Geochemistry

Regional stream sediment sampling has increased the strike length of the Challenger II prospect to approximately 7 km. Consistently elevated Pb assays draining either side of the Native Track Tier indicate a source running along the ridge line.

8.4 Discussion

Further work needs to be carried out in order to assess the cause of the drainage anomalies. Initial field checking would involve geological investigation and rock chip sampling in order to locate areas where metal may be concentrated in significant quantities.

9. FUTURE PROGRAMME

The future programme will be dominated by geological and geophysical investigations in the Challenger II and Cattley North areas.

Investigation needs to be carried out to determine the cause of stream sediment anomalies draining the Native Track Tier to the west of Challenger II. Initial work would involve reconnaissance geological mapping and rock chip sampling. If further encouragement was given, gridding and detailed ground geophysics would be conducted.

The Cattley North area contains a sequence of largely undifferentiated Cambrian rocks which are virtually unexplored. The area possibly lies along the same north-south trending anticlinal structure as the Que River and Hellyer orebodies.

Initial work on the prospective area would involve reconnaissance geological mapping to determine the extent of the Cambrian rocks. Gridding should then be carried out to facilitate a UTEM geophysical survey.

10. REFERENCES

Lawton J.J. et al 1983 EL 36/79 LOONGANA Progress report on Exploration for the Period 1/5/80 to 3/6/83. Unpublished Shell Report No. 08.1266

Wright R.G. Smyth W.D. 1984 EL 36/79 LOONGANA Progress report on Exploration for the Period 1/7/83 to 30/6/84. Unpublished Shell Report No. 08.2263

11. LOCATION

Burnie 1:250 000 Sheet SK5503

12. KEYWORDS

Geochem-drainage, Drill-percuss, Cambrian, Volcanics, Geophys-EM

13. LIST OF PLANS

Plan No	Title	Scale
TASh 2954	LOONGANA EL 36/79 Location Plan	1:1 000 000
TASh 2956	LOONGANA EL 36/79 EL and Prospect Location Plan	1:100 000
TASh 2957	LOONGANA EL 36/79 Challenger 2 Geological Map and Position of GENIE Traverses	1:5 000
TASh 2851	LOONGANA EL 36/79 Challenger 2 Pb Anomaly GENIE Profiles Line A	1:2 500
TASh 2852	LOONGANA EL 36/79 Challenger 2 Pb Anomaly GENIE Profiles Line B	1:2 500
TASh 2950	LOONGANA EL 36/79 CRAE Regional Stream Sediment Sample Locations 1985-86	1:25 000

TASh 2824	LOONGANA EL 36/79 Challenger 3 (Two Hummocks) Outline of Geology and Geophysical Anomalies	1:10 000
TASh 2853	LOONGANA EL 36/79 Two Hummocks Prospect PD85 TH1 Section	1:1 000
TASh 2854	LOONGANA EL 36/79 Two Hummocks Prospect PD85 TH2 Section	1:1 000
TASh 2828	LOONGANA EL 36/79 Two Hummocks Prospect Channel Six UTEM Contours	1:5 000

14. LIST OF APPENDICES

Appendix I	Regional Stream Sediment Geochemistry
Appendix II	Challenger III (Two Hummocks) Drilling Results
Appendix III	Challenger III (Two Hummocks) Geophysics
Appendix IV	Challenger II Geophysics

011

APPENDIX I

LOONGANA EL 36/79

REGIONAL STREAM SEDIMENT GEOCHEMISTRY

PROJECT SHEFFIELD - MOUNIA — GEOCHEMICAL SAMPLING LEDGER — DATES : MARCH 1985 — 012

TENEMENT — LAB. AMDEL/ALS

AREA / PROSPECT REGIONAL STREAM SED SURVEY — GEOLOGIST SJC — SAMPLE TYPE STREAM SEDIMENT — PAGE NO.

SAMPLE NUMBER	GRID REF.	ANALYSES Cu	Pb	Zn	Ag	As	Mn	(%) Fe	Ba	(ppm) Au	(ppt) Au		DPO NUMBER	GEOLOGICAL OBSERVATIONS	CORRESP. -80 MESH STREAM SAMPLE
1153943	402300E	26	43	200	<1	7	760	7.88	290	<0.005		logged SJC		Mod fl, low gradient, 5m; mod incised; colluvial bank, 40% gravel, 40% sand, 20% silt, <1% clay; logged eucalypt forest. Float dominated by dark grey/black, non magnetic basalt; minor qz float; minor sediment float	
	5411300N														
1153944											100			CN track sample	1153943

METHOD DET.LIMIT

040013

PROJECT Sheffield Mining

TENEMENT

AREA / PROSPECT Regional S/SED

GEOCHEMICAL SAMPLING LEDGER

GEOLOGIST I.M. Clementson

SAMPLE TYPE S/Sediments

DATES : March 1985

LAB. Amdel

PAGE NO.

SAMPLE NUMBER	GRID REF.	Cu	Pb	Zn	Ag	As	Mn	(%) Fe	Ba	(ppm) Au	(ppb) Au	Stain	Colour	OPO NUMBER	GEOLOGICAL OBSERVATIONS 013	CORRESP. -80 MESH STREAM SAMPLE
990501	394400E 5414600N	22	5	220	<1	<2	1260	7.16	200	<0.005		Mn*	M		-80# 1½m Gentle slope Med flow Between [illegible] Clay rich [illegible] basalt/[illegible] Float	
990502	394400E 5414600N										50				CN Leach -4# s/s.	990501
990503	399800E 5416700N	14	8	78	<1	6	320	2.64	260	0.020		Mn	[illegible]		-80# s/s 4m Med flow Gentle valley [illegible] banks Basalt Float plus o/c black micaceous shale + [illegible] pyrite (988978) Dip 30°W St. 190°M.	
990504	399800E 5416700N										150				CN Leach 4#	990503
990505	399700E 5416950N	28	10	125	<1	5	195	7.20	210	0.010		Mn/Fe	[illegible]		-80# s/s 1m Low flow Gentle valley [illegible] incised [illegible] clay rich gravel bar sample. Float 90% basalt 10% weathered [illegible] shales	
990506	399700E 5416950N										150				CN Leach -4# s/s	990505
990507	400255E 5416400N	25	11	80	<1	3	800	4.40	95	0.010		Mn/org	Road		-80# s/s 10m wide Med flow Gentle valley B' bar. Little clay. Ab basalt o/c and Float	
990508	400250E 5416400N										200				CN Leach -4#	
METHOD DET.LIMIT																

040014

PROJECT Sheffield Mining

TENEMENT

AREA / PROSPECT Regional S/Seds

GEOCHEMICAL SAMPLING LEDGER

GEOLOGIST I M Clemen[illegible]

SAMPLE TYPE Stream Sediment

DATES : March 1995

LAB. Amdel

PAGE NO.

SAMPLE NUMBER	GRID REF.	Cu	Pb	Zn	Ag	As	Fe	Mn	Ba	Au(ppb)	[illegible]	[illegible]	DPO NUMBER	GEOLOGICAL OBSERVATIONS	CORRESP. -80 MESH STREAM SAMPLE
990509	404750E 5417500N										Mn/Fe	-		-80# s/s [illegible] Med Flow [illegible] gradient [illegible] Gravel bar - clay/silt [illegible]. [illegible] - grey [illegible] grey [illegible] [illegible] Float as above plus Tertiary basalt buff qzites + shales with [illegible].	
990510	404750E 5417500N													CN Leach -4# s/s	990509
990511	404875E 5417600N										Mn/Fe	-		-80# s/s Smalla Med Flow Moderately incised only mod. gradient. Gravel-boulder bar, low silt-clay. Float - Tertiary basalt, grey micaceous shales, buff quartzites	
990512	404875E 5417600N													CN Leach -4# s/s	990510
METHOD DET.LIMIT															

014

040015

PROJECT Sheffield - Moina
TENEMENT
AREA / PROSPECT [illegible]

GEOCHEMICAL SAMPLING LEDGER

GEOLOGIST I M Clelland[illegible] SAMPLE TYPE Stream Sediment

DATES : March 1985
LAB. Amdel
PAGE NO. 015

SAMPLE NUMBER	GRID REF.	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppb)	Stream	[illegible]	DPO NUMBER	GEOLOGICAL OBSERVATIONS	CORRESP. -80 MESH STREAM SAMPLE
990645	405200E 5412300N	62	19	82	<1	5	380	2.50	170	<0.005		Fe+	Log		-80# 6m wide Mod flow. Gentle valley, mod incision. Rill/cut banks. Gravel bars. Sand rich sediment. Float: hematitic conglomerate, chloritic v. coarse lithic breccia, quartzites, grey-green shales, mafic/chloritic siltstones	
990646	405200E 5412300N										200				CN Leach -4# S/S	990645
990647	406450E 5410750N	3	6	6	<1	<2	18	1.00	45	<0.005		Fe	Log		-80# 3m wide, low-mod flow. Steep gradient, mod incised. Average pebble size - V. sand rich sediment. Float angular - coarse hematitic quartzose grits and conglom.	
990648	406450E 5410750N										350				CN Leach - 4#	990647
990649	405850E 5410600N	14	7	20	<1	3	74	1.61	45	<0.005		Fe	Log		-80# 5m wide. Gentle slope, moderate incision. Boulder bars c/c and cut banks. c/c quartzose mafic rich grits. Float: variety of quartzitic grits, lithic greywackes (tuffs - often chloritic)	
990650	405850E 5410600N										250				CN Leach -4# S/S.	990649

METHOD
DET. LIMIT

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SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geolcgical Observations
1197585	397700	5411570	-80#	9	4	22	<1	<2	120	1.29	30	<0.005		Weakly incised; moderate gradient; flowing; 2.5m wide; grass, titree + eucalypt forest; 80% gravel, 15% sand, 4% silt, 1% clay + organics
586			-5#										250	Dominant basalt float; lesser quartzite
1197587	400400	5412250	-80#	12	35	105	<1	2	360	2.82	280	0.010		Moderate gradient; flowing; 3m wide; titree + eucalypt forest;
588			-5#										450	70% gravel, 25% sand, 14% silt, 1% clay + organics
														Dominant basalt; lesser quartzite; minor yellow chert
1197589	400650	5412250	-80#	26	56	100	<1	3	1860	5.04	310	0.010		Moderately incised; moderate gradient; 1.5m wide; flowing;
590			-5#										350	titree + eucalypt forest; 70% gravel, 25% sand, 14% silt, 1% clay + organics;
														Common basalt float; lesser cherty quartzite; minor quartzite
1197591	392750	5415600	-80#	29	2	250	<1	4	445	8.72	140	<0.005		Moderately incised; moderate gradient; 5.0m wide; flowing;
592			-5#										200	titree + myrtle forest; 50% gravel, 40% sand, 9% silt, 1% clay + organics
														Dominant basalt float; minor yellow cherty siltstone
1197593	390050	5413530	-80#	45	6	195	<1	3	630	8.58	110	<0.005		Weakly incised; flowing; 2.0m wide; alluvial banks; grazing
594			-5#										300	land; 70% gravel, 25% sand, 4% silt, 1% clay + organics
														Dominant basalt float; minor cherty siltstone + Sandstone
1197595	390400	5413600	-80#	78	23	330	<1	<2	780	9.54	110	0.020		Weakly incised; flowing; 1.5m wide; grazing land, titree +
596			-5#										150	myrtle forest; high gradient; 80% gravel, 17% sand, 2% silt, 1% clay + organics
														Dominant basalt float; minor yellow-green chert
DETECTION LIMIT														
ANALYTICAL METHOD														

ANALYSES

Project : SHEFFIELD - MOINA

Tenement : LOONGANA EL 36/79

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY

1 : 250 000 Sheet :

AMG Zone :

DPO's :

5 cm

Sheet No. :

Laboratory : ALS AMDEL

Collected By : P. TEMBY

Date :

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CRA EXPLORATION PTY. LTD.

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SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppb)	Au (ppt)	Geological Observations
1142767	411300	5423900	-80#	2	26	15	<1	<2	30	0.44	170	<0.005		Moderately incised; strong flow; low organics; colluvial ba ba; logged
768			-4#										<50	eucalypt forest; 60% gravel, 35% sand, 5% silt
														Fine-med grained, well sorted sst float dominant; angular vein
														quartz; rounded qz pebbles; minor black shale + conglomerate
1142769	411100	5426200	-80#	5	22	27	<1	2	210	1.74	110	<0.005		Moderately incised; strong flow; low organics; colluvial/alluvial
770			-4#										250	ba ba; agricultural + eucalypt forest; 50% gravel, 40% sand, 10% silt
														Common grey-black basalt; lesser fine-med grained tuffaceous volcanics;
														minor acid volcanics + conglomerate.
1142771	409800	5423800	-80#	8	43	39	<1	4	155	1.64	180	<0.005		Moderately incised; mod-strong flow; low organics; colluvial ba ba;
772			-4#										<50	pine + logged eucalypt forest; 50% gravel, 40% sand, 10% silt.
														Common m.g., well sorted sst; lesser tuffaceous volcanic sedi + ?
														(andesitic); minor grey shale + conglomerate.
1142773	411400	5424100	-80#	4	10	23	<1	<2	62	0.77	110	<0.005		Moderately incised; strong flow; low organics; colluvial ba ba; logged
774			-4#										<50	pine + eucalypt forest; 60% gravel, 35% sand, 5% silt.
														Common m.g. tuffaceous sst; lesser shale; minor vein quartz.
1142775	410300	5419300	-80#	6	42	110	<1	<2	560	1.87	440	<0.005		Well incised; strong flow; low organics; colluvial ba ba; logged
776			-4#										<50	eucalypt forest; 60% gravel, 30% sand, 10% silt.
														Dominant tuffaceous sediments; lesser chloritically altered
														porphyritic volcanic; minor f.g. sediments; common qz; ? in creek is
														med-coarse acid volcs - sericite + chlorite alter".
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet :

AMG Zone :

Sheet No. :

Tenement : LOONGANA EL 36/79

DPO's :

Laboratory : ALS ADELAIDE

Area / Prospect : STREAM SEDIMENT SURVEY

5 cm

Collected By : S. CATHNESS

Date : 7-5-85, 8-5-85

CRA EXPLORATION PTY. LTD.

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SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppb)	Geological Observations
1142777	406800	5421700	-80#	3	8	10	<1	4	42	0.76	60	<0.005		Moderately incised; strong flow; low organics; colluvial banks; logged
778			-4#										<50	eucalypt forest; 50% gravel, 40% sand, 10% silt
														Dominant mg-fg. sedi-t; black mudstone/shale; clean white
														sst with minor qz veining; vein qz gravel
1142779	407850	5418200	-80#	3	31	24	<1	10	195	0.95	250	<0.005		Well incised; strong flow; low organics; colluvial banks; eucalypt
780			-4#										<50	forest; 60% gravel, 35% sand, 5% silt
														Dominant mg. tuffaceous volcanic containing some large lithic
														clasts; minor conglomerate; vein qz + qz pebbles
1142781	407700	5418000	-80#	14	29	68	<1	3	405	3.08	260	<0.005		Well incised; moderate flow; low organics; colluvial banks;
782			-4#										<50	eucalypt forest; 60% gravel, 30% sand, 10% silt
														Dominant mg. tuffaceous volcanic (qz rich); minor vein qz,
														porphyritic (qz) volcanic + conglomerate
1142783	407900	5417450	-80#	19	8	100	<1	<2	440	4.25	230	<0.005		Weakly incised; low organics; strong flow; alluvial banks;
784			-4#										<50	eucalypt forest; 30% gravel, 60% sand, 10% silt
														Quartz gravel with minor tuffaceous sedi-t
1142785	413900	5423000	-80#	4	26	24	<1	3	285	1.10	370	0.005		Weakly incised; mod flow; low organics; alluvial banks; logged
786			-4#										<50	eucalypt forest; 50% gravel, 40% sand, 10% silt
														% of basic-intermediate, fg. tuffaceous volcanic; minor volcanic
														float; common qz float
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA

Tenement : LOONGANA EL 36/79

Area / Prospect : STREAM SEDIMENT SURVEY

1 : 250 000 Sheet :

AMG Zone :

DPO's :

5 cm

Sheet No. :

Laboratory : ALS ADELAIDE

Collected By : S. CAITHNESS

Date : 8-5-85

CRA EXPLORATION PTY. LTD.

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019

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type S. SEDS	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au(ppm) / Au(ppt)	STAIN / CONTAM	Geological Observations
990575	410400	5419200	-80#	9	32	110	<1	3	720	2.26	320	<0.005	Fe / Log	1½m wide. Strong flow, steep valley sides, fairly incised. Qtz of fine grained intermediate volcaniclastics. Gravel bar site.
576			-4#									<50		
990577	409950	5418600	-80#	3	52	88	<1	<2	395	0.63	390	<0.005	Fe /	1½m wide, strong flow, deeply incised. Gravelbar. Float and abundant Qtz of fresh, unaltered, intermediate lavas plus occasional qz-porphyries.
578			-4#									<50		
990579	409100	5417300	-80#	7	38	125	<1	5	420	2.83	390	<0.005	/ Lith	2½m wide, strong flow. Gentle valley. Very good rich sed. mat. Float: felsic (fresh) lavas, minor grey shales and minor massive, chloritic lava.
580			-4#									<50		
990581	409750	5416550	-80#	11	25	94	<1	<2	315	3.13	260	<0.005	/ Lithics	5m, strong flow. Moderate valley. Gravel bar. No stain. Float: quartzites, qz, shales and siltstones (buff, ochre, red) and felsic lavas.
582			-4#									<50		
990583	411200	5415850	-80#	8	14	43	<1	<2	210	2.30	110	<0.005	Fe / Log	½m wide, moderate flow. Gravelbar. Moderately steep valley. Float: grey siltstones and hematitic grits
584			-4#									<50		
990585	411500	5415600	-80#	9	6	49	<1	<2	320	2.54	75	<0.005	Mn / Log	1m wide, moderate flow. Boulder-gravelbar. Moderately steep valley. Float: basalt, purple intermediate (coarse grained) volcaniclastic, qz-ite
586			-4#									<50		
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet : BURNIE AMG Zone : 55

Sheet No. :

Tenement : LOONGANA EL 36/79

DPO's :

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY

5 cm

Collected By : Date : 9 · MAY · 85

CRA EXPLORATION PTY. LTD.

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020

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
1141993	405800	5423800	-80#	5	10	18	<1	11	210	1.28	100	<0.005		Moderately incised; slow flows; colluvial banks; low organics; logged
994			-4#										50	eucalypt forest; 70% gravel, 25% sand, 5% silt.
														Dominant med grained granite float; common rounded quartz;
														minor quartz-feldspar porphyry float; * uneven location *
1141995	409000	5423300	-80#	7	2	10	<1	<2	96	0.79	35	<0.005		Moderately incised; mod flows; low organics; colluvial banks; logged
996			-4#										100	eucalypt + pine forest; 30% gravel, 60% sand, 10% silt.
														Dom. granite float; lesser basalt float; minor sst float with
														quartz veining
1141997	409000	5423100	-80#	10	39	41	<1	9	155	1.41	220	<0.005		Moderately incised; mod flows; low organics; alluvial banks; logged
998			-4#										100	eucalypt + pine forest; 60% gravel, 35% sand, 5% silt.
														Common green, banded, med grained quartzite with trace
														pyrite; minor conglomerate; minor shale; quartz pebbles.
1141999	409150	5422900	-80#	6	33	62	<1	7	225	1.98	340	<0.005		Moderately incised; mod flows; low organics; logged eucalypt
2000			-4#										100	forest; colluvial banks; 60% gravel, 35% sand, 5% silt.
														Common purple, med grained crystal tuff; minor shale; minor
														pyritic sst; minor conglomerate.
1231505	421750	5416400	-80#	16	6	56	<1	4	485	3.47	100	0.015		Moderate flows; locally incised (swamp); 1m wide; agricultural
506			-4#										<50	land; 45% gravel, 45% sand, 10% silt.
														Dominant basalt float; lesser conglomerate + quartz.
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOUNT

1 : 250 000 Sheet :

AMG Zone :

Sheet No. :

Tenement : LOONGANA EL 36/79

DPO's :

5 cm

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY

Collected By : A. CRICK, I. ROGERS

Date : MAY 1985

CRA EXPLORATION PTY. LTD.

040022

021

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppb)	Geological Observations
1231507	422200	5418000	-80#	14	7	28	<1	<2	220	2·83	20	<0.005		Slow flow; weakly incised; 1m wide; colluvial banks; agricultural
508			-4#										<50	land; boulder trap; 25% gravel, 60% sand, 15% silt.
														Basalt float; lesser quartz
1231509	427400	5415600	-80#	39	12	125	<1	<2	1420	8·24	310	0·165		Well incised; mod. flow; 1m wide; colluvial banks; agricultural
510			-4#										<50	land; 60% gravel, 35% sand, 5% silt; boulder trap.
														Dominant basalt float; quartz pebbles; sandstone pebbles.
1231511	427400	5415700	-80#	47	6	125	<1	5	850	8·26	220	<0.005		Moderate flow; moderately incised; 2·0m wide; colluvial banks;
512			-4#										<50	agricultural land; 60% gravel, 40% sand; boulder trap.
														Dominant basalt float; lithic sandstone.
1231513	427750	5415800	-80#	37	5	120	<1	<2	1560	8·26	320	<0.005		Moderate flow; moderately incised; 1·5m wide; colluvial banks;
514			-4#										<50	agricultural land; 50% gravel, 25% sand, 25% silt; boulder trap with bar
														Basalt float with Fe staining
1231515	428250	5417150	-80#	36	16	130	<1	<2	1020	7·58	290	<0.005		Moderate flow; well incised; 2·5m wide; agricultural + eucalypt
516			-4#										<50	forest; 60% gravel, 30% sand, 10% silt; boulder trap
														Basalt float - Fe staining; quartz; conglomerate
1231549	417000	5416400	-80#	<2	25	52	<1	3	400	3·79	360	<0.005		Moderate flow; well incised; alluvial banks; 2·5m wide; farmland;
550			-4#										<50	65% gravel, 35% sand; gravel bar.
														Black shales; sandstone; siltstone; quartzite.
DETECTION LIMIT														
ANALYTICAL METHOD														

ANALYSES

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet :

AMG Zone :

Sheet No. :

Tenement : LOONGANA EL 36/79

DPO's :

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY

5 cm

Collected By : A. COCK, I. ROGERS

Date : MAY 1985

CRA EXPLORATION PTY. LTD. 040023 022

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
1231551	424850	5416850	-80#	12	23	84	<1	4	610	4.28	100	0.005		Moderate flow; well incised; alluvial banks; 0.5m wide; rainforest;
552			-4#										50	45% gravel, 45% sand, 5% silt, 5% organics; plunge pool
														Dominant basalt float; quartz; conglomerate; siltstone; Mn stain.
1231553	425100	5416200	-80#	39	4	100	<1	6	1020	7.84	270	<0.005		Slow flow; colluvial banks; well incised; 1m wide; 45% gravel,
554			-4#										<50	45% sand, 5% silt, 5% organics; log trap site
														Dominant basalt float; quartz
1231559	420500	5410250	-80#	3	12	8	<1	4	26	0.76	35	0.005		Moderate flow; weakly incised; 0.75m wide; alluvial banks; logged
560			-4#										<50	rainforest; 70% gravel, 25% sand, 5% silt; rock bar
														Basalt float; quartz; conglomerate; pink staining on quartz
1231561	423200	5409900	-80#	4	20	60	<1	4	70	1.17	350	<0.005		Slow flow; weakly incised; alluvial banks; 0.5m wide; logged
562			-4#										50	eucalypt forest; 65% gravel, 35% sand; rock trap
														Basalt; quartz; siltstones or mudstone
1197583	399500	5411550	-80#	30	5	135	<1	<2	530	6.04	120	<0.005		Moderate gradient; weakly incised; flowing; 1.5m wide; teatree +
584			-4#										250	eucalypt forest; weak Fe staining; 60% gravel, 30% sand, 19% silt, 1% clay.
														Dominant basalt float; lesser quartz sand; minor vein quartz + quartz
														feldspar porphyry; fuchsite (?) or prehnite (?)
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD – MOINA

1 : 250 000 Sheet :

AMG Zone :

Sheet No. :

Tenement : LOONGANA EL 36/79

DPO's :

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY.

5 cm

Collected By : A. CRICK, I. ROGERS

Date : MAY 1985.

PROJECT: SHEFFIELD - MOINA
TENEMENT:
AREA / PROSPECT: REGIONAL STREAM SED SURVEY
GEOLOGIST: SJC

GEOCHEMICAL SAMPLING LEDGER

040024

SAMPLE TYPE: STREAM SEDIMENT

DATES: MARCH 1985
LAB.: AMDEL / ALS
PAGE NO.: 023

SAMPLE NUMBER	GRID REF.	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppb)	Staining	Contamination	DPO NUMBER	GEOLOGICAL OBSERVATIONS	CORRESP. -80 MESH STREAM SAMPLE
1153937	402100E 5412500N	25	39	190	<1	5	1140	9.16	240	<0.005			logging		Mod. fl; low gradient; 4m; mod incised; colluvial banks; 40% gravel, 30% sand, 20% silt, 10% clay + organics; contamin from logging. Sand size dark green-grey sediment; unaltered + uniform.	
1153938											300				CN leach sample.	1153937
1153939	404600E 5414300N	12	10	60	<1	2	355	2.62	70	<0.005			logging		Strong fl; mod-steep gradient; 4m; well incised; colluvial banks; 50% gravel, 40% sand, 10% silt, logged eucalypt forest; high energy stream i.e. trap site sample. Coarse-m.g. conglomerate (Roland); rounded red chert fragments common.	
1153940											100				CN leach sample	1153939
1153941	403800E 5414200N	10	3	41	<1	3	270	2.18	65	<0.005			logged		Mod. fl; mod gradient; 4m; mod incised; colluvial banks; 30% gravel, 35% sand, 35% silt, <1% clay; logged eucalypt forest. Highly weathered vesicular basalt; possible breccia in places.	
1153942											50				CN leach sample	1153941
METHOD																
DET. LIMIT																

040025

024

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
1153146	399450	5415200	-4#	1									50	Weakly incised; moderate flow; eucalypt rain forest; alluvial banks; 20% gravel, 50% sand, 30% silt; low organics. Dominant basalt float; minor vein quartz + quartzite cobbles.
147			-80#	10	4	36	<1	6	180	2·00	50	0·10		
1153148	399550	5415100	-4#										<50	Weakly incised; moderate flow; eucalypt rain forest; alluvial banks; 40% gravel, 40% sand, 20% silt; moderate organics. Dominant quartzite and sandstone float; minor vein quartz.
149			-80#	10	20	38	<1	4	165	2·60	65	0·10		
990789	402800	5416450	-80#	12	14	74	<1	4	310	2·50	200	0·10		Well incised; strong flow; 7m wide; eucalypt forest; colluvial banks; 50% gravel, 30% sand, 20% silt; low organics. Dominant dark grey to pale brown sst - micaceous; minor quartz; carbonaceous siltstone % - pyrite + chalcopyrite (?) traces.
790			-4#										<50	
990791	406000	5418450	-80#	28	65	46	<1	20	240	3·25	50	0·005		Well incised; moderate flow; 4m wide; colluvial banks; eucalypt forest; 70% gravel, 25% sand; 5% silt; low organics. Dominant basalt float; lesser conglomerate float.
792			-4#										100	
990793	412150	5414550	-80#	12	45	82	<1	10	1500	3·50	420	<0·005	...	Weakly incised; moderate flow; 4m wide; alluvial banks; eucalypt forest; 60% gravel, 35% sand; 5% silt; low organics.
794			-4#										50	
DETECTION LIMIT														
ANALYTICAL METHOD														

Project: SHEFFIELD - MOINA | 1 250 000 Sheet: BURNIE | AMG Zone: | Sheet No.: 1

Tenement: LOONGANA EL 36/79 | DPO's: | Laboratory: AMDEL

Area / Prospect: REGIONAL STREAM SEDIMENT SURVEY | 5 cm | Collected By: S. CAITHNESS | Date: 12-12-85

CRA EXPLORATION PTY. LTD.

040026

025

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
														Dominant conglomerate float; lesser lithic tuff; minor feldspar porphyry and red-brown sandstone.
990795	411800	5412500	-80#	14	15	24	<1	<2	85	1·00	45	<0·005		Weakly incised; moderate flow; 3m wide; alluvial b. bed; eucalypt forest; 50% gravel, 45% sand, 5% silt; moderate organics.
796			-4#										50.	Dominant conglomerate float; lesser highly weathered pale grey siltstone; minor fresh green-grey siltstone.
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet : BURNIE AMG Zone :

Sheet No. : 2

Tenement : LOONGANA EL 36/79

DPO's

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY

5 cm

Collected By : S. CRITHNESS Date : 12-12-85

CRA EXPLORATION PTY. LTD.

040027

026

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
1154460	418650	5407550	-4#										50	Moderately incised; rapid flow; rainforest; colluvial banks; 8m wide; 60% gravel, 35% sand, 5% silt; low organics. Dominant sst float; quartzite; vein quartz; siltstone, conglomerate; % of greywacke.
461			-80#	4	20	8	<1	10	45	1:03	65	0.005		
1154462	418950	5407700	-4#										<50	Moderately incised; medium flow; rainforest; alluvial banks; 3m wide; 40% gravel, 45% sand, 15% silt; moderate organics. Dominant sst float; lower quartzite; vein quartz; siltstone + conglomerate; % of massive siltstone.
463			-80#	8	22	14	<1	8	55	1:15	<10	0.005		
1154476	419400	5411700	-4#										50	Moderately incised; medium flow; eucalypts; 4m wide; colluvial banks; Fe staining; 35% gravel, 45% sand, 20% silt; low organics. Dominant conglomerate float; sst; siltstone; vein quartz.
477			-80#	8	15	26	<1	6	550	2:16	110	<0.005		
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet : BURNIE

AMG Zone :

Sheet No. : 2/3

Tenement : LOONGANA EL 36/79

DPO's :

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENTS

5 cm

Collected By : B. FITZPATRICK Date : JANUARY 1986.

A. EDWARDS

CRA EXPLORATION PTY. LTD.

040028

021

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
1153360	409250	5418250	-4#										<50	Moderately incised; mod. flow; eucalypt rainforest; alluvial
361			-80#	10	45	90	<1	2	200	0.95	300	<0.005		banks; 5m wide; 10% gravel, 50% sand, 40% silt; low organics. Dominant sst, quartzite + greywacke float; lesser siltstone, vein quartz + conglomerate; Mn stain; greywacke %
1153364	405350	5412950	-4#										<50	Weakly incised; mod-slow flow; rainforest; alluvial
365			-80#	12	25	100	<1	6	280	1.05	370	<0.005		banks, 2m wide; Mn staining; 5% gravel, 50% sand, 45% silt; mod-high organics. Dominant sst; quartzite; vein quartz; volcanic sediment Massive compact volc - m.g + small feldspar phenocrysts.
1154456	412300	5413000	-4#										50	Moderately incised; mod-fast flow; eucalypt; colluvial
457			-80#	24	18	80	<1	14	2350	4.30	650	0.005		banks; 4m wide; Mn staining; 60% gravel, 30% sand, 10% silt; low organics. Dominant conglomerate; micaceous sst; quartzite; vein quartz; pyrite veins in conglomerate.
1154458	412050	5413050	-4#										<50	Moderately incised; fast flow; eucalypt forest; 4m wide;
459			-80#	8	65	100	<1	10	1380	3.05	460	<0.005		60% gravel, 30% sand, 10% silt; low organics; Mn staining. Dominant conglomerate; sst; vein qz; quartzite.
DETECTION LIMIT														
ANALYTICAL METHOD														

ANALYSES

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet : BURNIE AMG Zone :

Sheet No. : 1/3

Tenement : LOONGANIA EL 36/79

DPO's :

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENTS.

5 cm

Collected By : B. FITZPATRICK Date : JANUARY 1986

A. EDWARDS

CRA EXPLORATION PTY. LTD.

040029

028

SAMPLE NUMBER	LOCATION Easting	LOCATION Northing	Sample Type	Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	Geological Observations
1154478	409150	5412050	-4#										<50	Weakly incised; moderate flow; colluvial boulder; 2m wide;
479			-80#	7	18	26	<1	10	135	2.52	55	<0.005		eucalypt forest; Fe staining; 25% gravel, 55% sand, 20% silt; low organics.
														Dominant conglomerate; sst; vein quartz; quartzite
1154480	409000	5412000	-4#										<50	Weakly incised; moderate flow; 2m wide; colluvial
481			-80#	7	22	17	<1	<2	115	1.32	25	<0.005		boulder; Fe staining; 25% gravel, 60% sand, 15% silt; low organics.
														Dominant conglomerate; sst; quartzite + vein quartz
1154482	409100	5412700	-4#										<50	Mod-well incised; moderate flow; scrubland; 3m wide;
483			-80#	5	24	18	<1	6	15	1.07	35	<0.005		colluvial boulder; Fe staining; 25% gravel, 60% sand, 15% silt; low organics.
														Dominant conglomerate float; % of quartzite; vein quartz.
DETECTION LIMIT														
ANALYTICAL METHOD														

ANALYSES

Project : SHEFFIELD - MOINA

1 : 250 000 Sheet : BURNIE AMG Zone :

Sheet No. : 3/3

Tenement : LOONGANA EL 36/79

DPO's :

Laboratory : AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENTS.

5 cm

Collected By : B. FITZPATRICK Date : JANUARY 1986.

A. EDWARDS

APPENDIX II

LOONGANA EL 36/79

CHALLENGER III (TWO HUMMOCKS) DRILLING RESULTS

030

040031

The Australian
Mineral Development
Laboratories

Flemington Street, Frewville,
South Australia 5063
Phone Adelaide (08) 79 1662
Telex AA82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

16 January 1986

GS 3/1/6/0

C.R.A. Exploration Pty. Limited,
P.O. Box 138,
ROSNY PARK, TAS. 7018

ATT: I.M. CLEMENTSON

REPORT G6559/86

YOUR REFERENCE:	DPO No. 35010
IDENTIFICATION:	990772 and 990801
MATERIAL:	Two rock samples
LOCALITY:	Mt. Read Volcanics, Tasmania
DATE RECEIVED:	18 December 1985
WORK REQUIRED:	Petrography (2MA1.2)

Investigation and Report by: Frank Radke

Chief - Geological Services Section: Dr Keith J Henley

Alan Webb

for Dr William G Spencer
Manager
Mineral & Materials Sciences Division

c.c. C.R.A. Exploration Pty Ltd
P.O. Box 138
ROSNY PARK, TAS. 7018
ATT: ADMINISTRATION OFFICER

C.R.A. Exploration Pty Ltd
P.O. Box 656
FYSHWICK, ACT. 2609
ATT: CHIEF GEOLOGIST -
INFORMATION SERVICES

bp

Head Office:
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Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Telex: Amdel AA94893
Sydney, N.S.W.
Telephone (02) 439 7735
Telex: Amdel AA20053
Townsville
Queensland 4814
Telephone (077) 75 1377

SAMPLE: 990801: TS45912

Rock Name:

Barite & Sericite Veined Breccia

Hand Specimen:

This is a fragmental appearing rock containing angular pale grey clasts up to about 1 cm in size separated by vein-like structures with a pale tan to dull white colour.

Thin Section:

This sample consists mainly of very finely granular, cherty textured quartz intergrown with very finely divided phyllosilicates comprised mainly of fibrous sericite and a weakly birefringent clay or chlorite. This cherty matrix with a significiant phyllosilicate component has a highly fractured and brecciated character being veined with sericite and barite. The fine grained cherty textured areas would represent the greenish coloured clasts noted in hand specimen while the sericite and barite veins would represent the interstitial vein-like structures.

The barite veins in particular range up to 0.5 mm wide and have a granular to columnar texture. Minor quartz is also locally intergrown with the barite as small grains and granular aggregates. A small proportion of the more coarsely granular barite and quartz has a granulated and deformed appearing texture with the development of sutured grain margins and strained extinction characteristics. The barite in particular tends to be concentrated within irregular angular patches up to a few millimetres wide where it exhibits a deformed character. The muscovite forms fibrous textured vein-like structures which in some cases partially enclose larger barite patches.

This is considered to be a very fine grained cherty rock which has been subjected to brecciation and the development of secondary phyllosilicates (mainly a weakly birefringent clay/chlorite and fibrous sericite) along with moderate amounts of barite. The sericite and barite tend to be concentrated as interstitial vein-like structures between cherty textured clasts which contain a significant proportion of intergrown clay and sericite.

032

C.R.A. EXPLORATION PTY. LIMITED

040033

DRILL CORE LOG

SHEET No. 1/[redacted]

TENEMENT NAME Loongana EL No. 36/79

10000E

PLAN – MAP REFERENCE Burnie 1:250,000 Sh

CO-ORDINATES 10245 N AZIMUTH 217°(m) DRILLERS G. SPAULDING COMMENCED 17-12-85 DEPTH 154 m HOLE No. PD85TH9

RL COLLAR ____ INCLINATION -80° DRILL TYPE ____ COMPLETED 18-12-85 CASING LEFT 154 m DPO No(s) 32007

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS) Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Au (ppb)
					0–6m												
0	6				Precambrian pale green vitric tuff with pervasive chlorite alteration.												
6	9				6–11m	1231601				5	70	75	1	5	0.16	15	3
9	12				Pale green, silt-size vitric tuff with pervasive chlorite alteration. Water table ~11m	602				10	110	30	1	16	0.41	10	3
12	15				11–28m	603				25	180	60	2	24	0.58	5	3
15	18				Interbedded siltstone and shale	604				10	115	40	3	22	0.65	10	3
18	21				sequence; pale green; shale weathers to an	605				10	90	55	2	10	0.30	10	<3
21	24				orange-brown colour; weak pervasive	606				5	65	40	1	8	0.26	10	<3
24	27				chlorite alteration; minor Mn staining and	607				20	400	210	<1	12	0.57	15	<3
					silicification; rare silicified grey shale												
27	30				28–33m	608				15	800	330	1	16	0.45	10	<3
30	33				Dominantly black shale sequence with	609				80	530	270	2	20	0.57	10	<3
					interbeds of pale green siltstone; shale is												
					well laminated and locally siliceous.												
33	36				33–57m	610				30	290	115	1	18	1.32	15	<3
36	39				Interbedded sequence of siltstone and	611				10	190	80	1	10	0.54	15	<3
39	42				shale; pale green with pervasive weak	612				5	155	60	1	9	0.42	20	<3
42	45				chlorite alteration; minor black shale	613				10	180	75	1	20	0.62	30	25
45	48				interbeds.	614				15	185	75	1	26	1.19	20	3
48	51				Possible fault zone from 44m to 60m; highly	615				15	280	70	2	32	1.04	35	<3
51	54				weathered maroon siltstone with high clay	616				15	140	50	1	20	0.71	30	<3
54	57				content – argillic alteration; poor recovery	617				30	280	220	1	14	3.80	40	<3

040034

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

SHEET No. 2/2

TENEMENT NAME LOONGANA EL No. 36/(1)

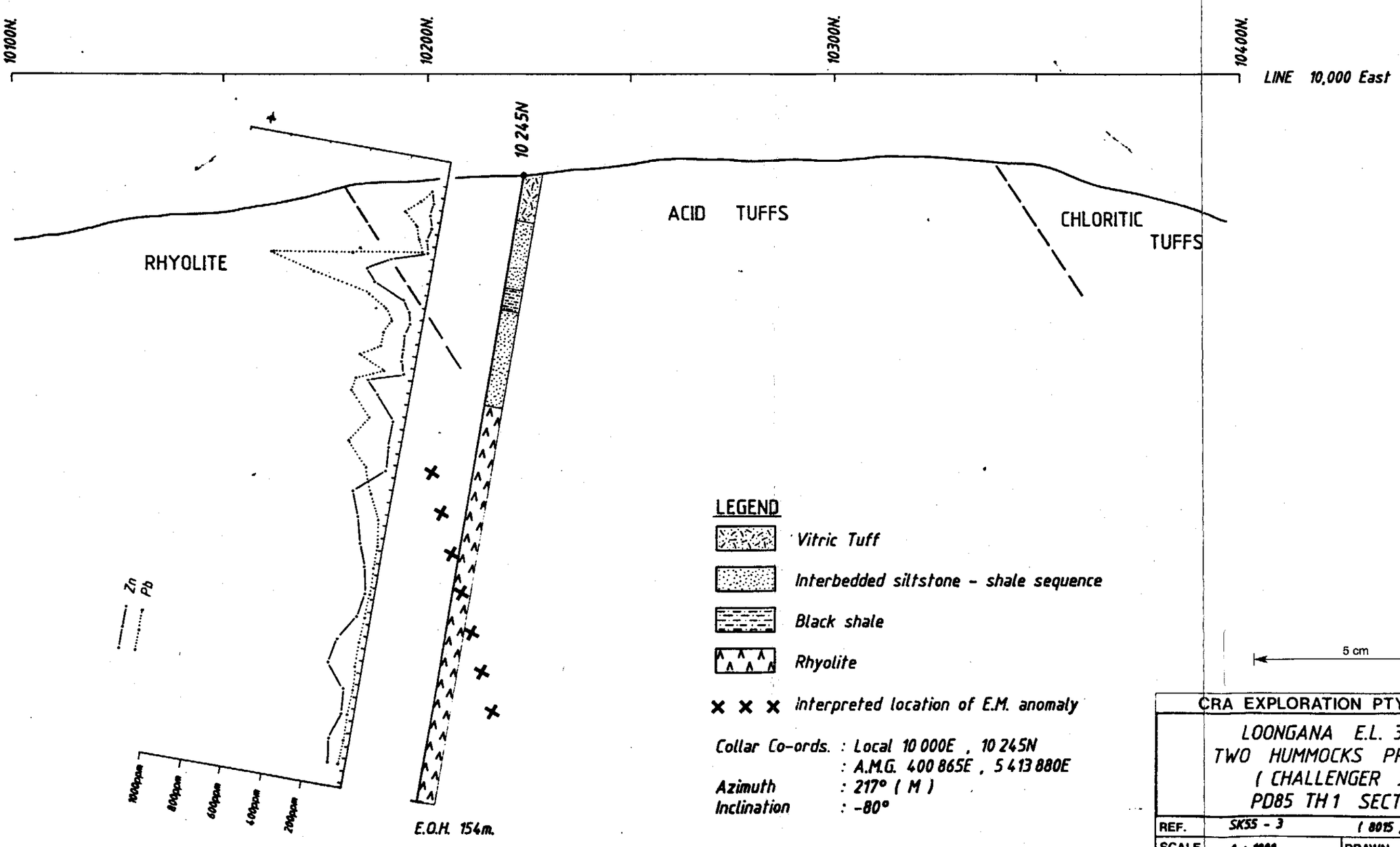
PLAN – MAP REFERENCE BURNIE 1:250,000

CO-ORDINATES 10000E 10245N AZIMUTH 217° (m) DRILLERS G. SPAULDING COMMENCED 17-12-85 DEPTH 154 m HOLE No. PD85TH10

RL COLLAR ____ INCLINATION -80° DRILL TYPE ____ COMPLETED 18-12-85 CASING LEFT 154 m DPO No(s) 32007

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS) Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Au (ppb)
57	60				57 – 154 m	1231618				35	290	185	3	12	3.17	30	5
60	63				Pink sand-sized rhyolite; weakly	619											
63	66				altered (chlorite) to unaltered with	620				15	180	55	<1	5	0.71	25	<3
66	69				localized increases in alteration.	621											
69	72				132m, 138m & 144m – Trace disseminated pyrite.	622				10	260	65	<1	5	0.95	35	<3
72	75				114 – 126m – interbeds of brown siltstone.	623											
75	78					624				5	145	50	<1	4	0.63	30	<3
78	81				154 m	625											
81	84				End of hole.	626				5	105	195	<1	8	2.10	1300	<3
84	87					627											
87	90					628				2	45	145	<1	4	1.91	1100	<3
90	93					629											
93	96					630				2	30	115	<1	4	1.67	990	<3
96	99					631											
99	102					632				<2	30	70	<1	5	1.42	770	<3
102	105					633											
105	108					634				2	25	45	<1	5	0.68	340	<3
108	111					635											
111	114					636				2	30	70	<1	6	1.09	670	<3
114	117					637											
117	120					638				<2	35	145	<1	5	3.56	250	<3
120	123					639											
123	126					640				<2	35	175	1	7	3.65	100	3
126	129					641											
129	132					642				<2	25	75	<1	5	2.07	1250	<3
132	135					643											
135	138					644				2	35	65	<1	6	1.70	510	<3
138	141					645											
141	144					646				2	30	100	<1	7	2.55	1850	<3
144	147					647										^	
147	150					648				<2	35	85	<1	7	2.74	1550	<3

040035



LEGEND

- Vitric Tuff
- Interbedded siltstone - shale sequence
- Black shale
- Rhyolite
- × × × interpreted location of E.M. anomaly

Collar Co-ords. : Local 10 000E , 10 245N
: A.M.G. 400 865E , 5 413 880E
Azimuth : 217° (M)
Inclination : -80°

5 cm

CRA EXPLORATION PTY. LIMITED		
LOONGANA E.L. 36/79 TWO HUMMOCKS PROSPECT (CHALLENGER III) PD85 TH1 SECTION		
REF.	SK55 - 3	(8015 , 8115)
SCALE	1 : 1000	DRAWN R.T.
AUTHOR	S.J.C.	REPORT No.
DATE	7 - 1 - 1986	PLAN No. TASh 2853

034

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 02

040036

TENEMENT NAME LOONGANNA EL No. 3619

PLAN – MAP REFERENCE BURNIE 1:250,000

CO-ORDINATES 10225N 10200E AZIMUTH 217°(—) DRILLERS G. SPALDING COMMENCED 19-12-85 DEPTH 123m HOLE No. PD85TH2

RL COLLAR ..... INCLINATION -81° DRILL TYPE ..... COMPLETED 21-12-85 CASING LEFT ~105m DPO No(s) 32007

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 ALS) Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Au (ppb)
					0-6m Precollar... Pale green vitric crystal tuff; fine-medium grained quartz and flattened chlorite clasts; pervasive moderate chlorite alteration; minor quartz veinlets. Water table 6m													
6	9				6-33m Pale green vitric crystal tuff as per precollar; minor local increase in quartz veining with associated manganese staining; localized zones of trace very fine grained disseminated pyrite; siliceous zones		1154401				30	280	470	1	28	0.66	105	20
9	12						402				25	340	550	1	12	0.48	65	<3
12	15						403				20	195	270	1	14	0.33	45	3
15	18						404				10	135	145	1	10	0.40	40	<3
18	21						405				20	130	280	1	14	0.31	50	10
21	24						406				10	90	60	1	8	0.33	20	5
24	27				The interval 27-30m contained minor siliceous black shale with trace very fine grained pyrite & pale grey quartz veining.		407				15	175	160	1	10	0.51	30	5
27	30						408				10	520	80	1	10	0.85	200	3
30	33						409				10	160	210	1	10	2.16	1300	3
33	36				Chlorite alteration increases towards		410											
36	39				the base of the interval		411				30	95	165	1	12	1.13	135	5
39	42						412											
42	45				33-123m Pink sand sized rhyolite; contains		413				20	110	210	1	8	1.38	160	10
45	48						414											
48	51				fine-medium grained quartz and feldspar		415				10	55	140	1	5	2.15	850	<3
51	54				phenocrysts; quartz phenocrysts often have		416											
54	57				whispy tails; rhyolite is weakly chloritic altered		417				45	160	165	1	7	1.20	410	<3
57	60				to weak altered. Trace disseminated pyrite;		418											
60	63				minor-rare white barite chips from 99m-123m		419				35	70	210	1	6	3.34	2300	<3
63	66						420											
66	69				123m		421				20	160	165	1	6	1.10	420	<3
69	72				End of hole		422											
72	75						423				20	85	125	1	5	1.13	440	3
75	78						424											

040037

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

SHEET No. 2/2

TENEMENT NAME LOONGANA EL No. 36/1

PLAN – MAP REFERENCE BURNIE 1:250,000

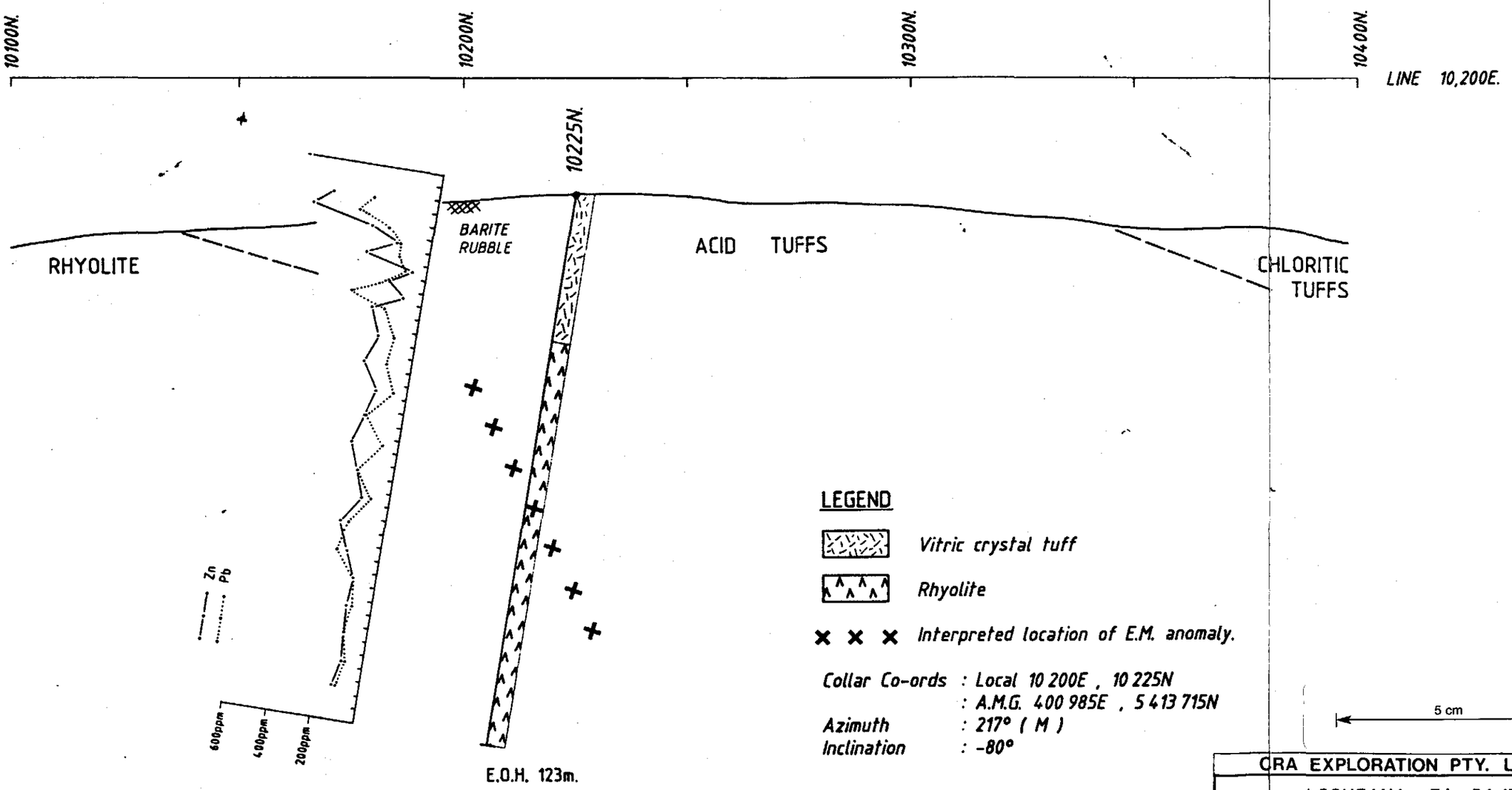
CO-ORDINATES 10200E 10225N AZIMUTH 217°(—) DRILLERS G. SPALDING COMMENCED 19-12-85 DEPTH 123m HOLE No. PDBSTH2

RL COLLAR ..... INCLINATION -81° DRILL TYPE ..... COMPLETED 21-12-85 CASING LEFT ~105m DPO No(s). 32007

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 ALS) Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	As (ppm)	Fe (%)	Mn (ppm)	Au (ppb)
78	81						1154425				25	170	200	1	6	1·20	450	<3
81	84						426											
84	87						427				25	195	150	1	5	1·11	370	<3
87	90						428											
90	93						429				40	105	100	1	5	1·26	400	<3
93	96						430											
96	99						431				40	90	115	1	3	1·30	410	<3
99	102						432											
102	105						433				25	110	110	1	4	1·48	560	3
105	108						434											
108	111						435				25	85	95	1	4	1·50	530	<3
111	114						436											
114	117						437				25	110	125	1	6	1·49	450	3
117	120						438											

037

040038



LEGEND

Vitric crystal tuff

Rhyolite

× × × Interpreted location of E.M. anomaly.

Collar Co-ords : Local 10 200E , 10 225N
: A.M.G. 400 985E , 5 413 715N
Azimuth : 217° (M)
Inclination : -80°

5 cm

CRA EXPLORATION PTY. LIMITED		
LOONGANA E.L. 36/79 TWO HUMMOCKS PROSPECT (CHALLENGER III) PD85 TH 2 SECTION		
REF.	SKSS - 3	(8015 , 8115)
SCALE	1 : 1000	DRAWN R.T.
AUTHOR	S.J.C.	REPORT No.

APPENDIX III

LOONGANA EL 36/79

CHALLENGER III (TWO HUMMOCKS) GEOPHYSICS

039

040040

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

LEVEL 4, BELLERIVE QUAY,
CAMBRIDGE ROAD, BELLERIVE, 7018, TASMANIA, AUSTRALIA

P.O. BOX 138
BELLERIVE 7018
TELEGRAMS: CRAEX
TELEX: AA57144
TELEPHONE: 44 3533
AREA CODE: (002)

IN REPLY PLEASE QUOTE

MEMO TO: I.M. CLEMENTSON
COPIES TO: S.J. CAITHNESS
T.W. DICKSON

MEMO FROM: T. VON STROKIRCH

UTEM AT CHALLENGER 3

A UTEM survey was completed at Challenger 3 in 1983 as a test survey for Shell Minerals to assess the technique. Five lines separated by 200 metres were traversed across the prospect with readings of the vertical component of the magnetic field taken at 25 metre station intervals. Shell found that the UTEM detected the two known black shale horizons (conductors A and B on the accompanying profile) but stated that no quantitative interpretation was possible due to the effect of the highly conductive basalt surrounding the prospect.

Reappraisal of the survey has shown there to be a small anomaly present along the inferred line of the barite occurences. The effect of the highly conductive basalts dominates the vertical scale on the profiles so it was necessary to obtain the data in numerical form in order to remove the basalt effect.

The anomaly proved to be extremely subtle though present on four out of the five lines. Its best expression is on line 10000E at 10225N where a quantitative interpretation was attempted.

The source is interpreted as being at a depth of 75 metres (minimum 65). Its dip is likely to be at 70 to 80 degrees to the north though a conflicting interpretation from the peak ratios indicated a possible dip to the south at 45 degrees. If the latter is the case then one would expect that the loop would only have given 10 to 15 percent coupling with the conductor which could definitely add to the error in our estimations.

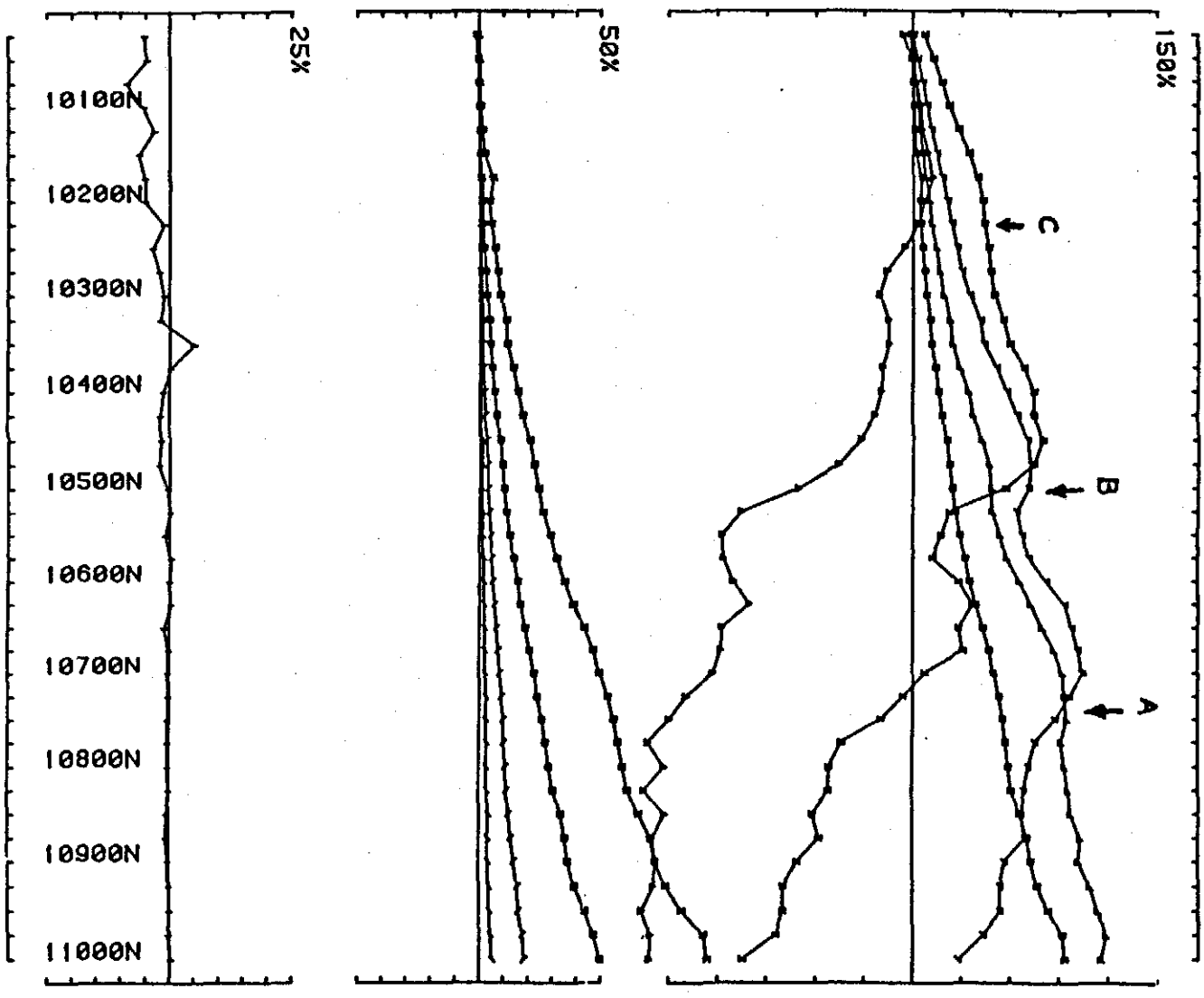
The conductor is interpreted as having a time constant of .15 which is very poor. The major positive factors of the anomaly are its direct association with a barite occurence and the fact that it appears to lie in the middle of a geological unit rather than at a contact which might imply a fault.

Conductor B is open to the east but peters out to the west where it either goes under Roland conglomerate or is displaced by it. The eastern end (line 10400E) gives the best response both in width and conductivity. It is dipping at approximately 50 degrees to the east which agrees with the outcrop in the quarry and from the presence of the second peak to the east it would appear that it increases in conductivity with depth. The swamp does not appear to be thick enough to have produced any conductive response of its own.

T. von Strokirch

041

040042

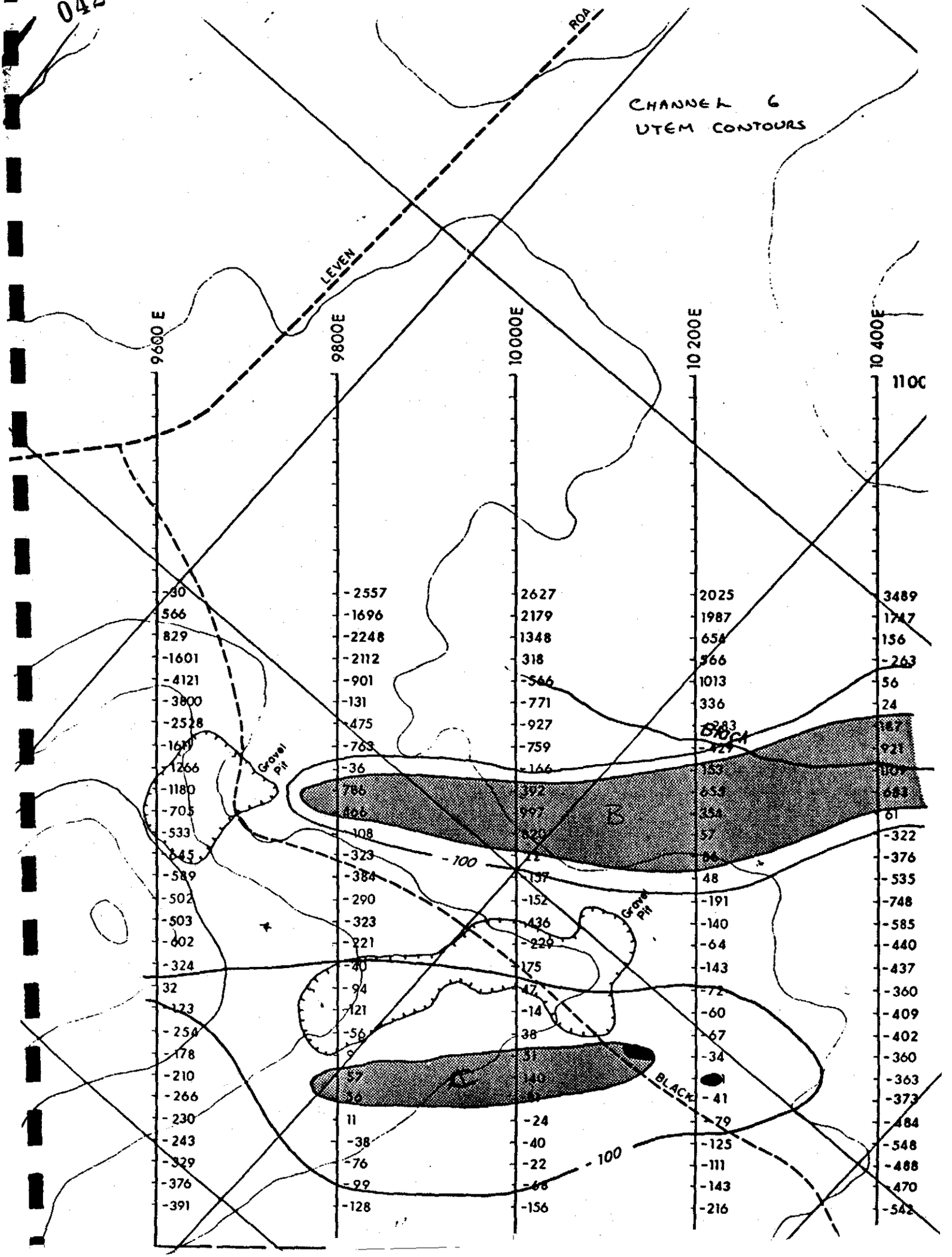


UTEM SURVEY conducted by PMM BJS Job 1502

Project Area Challenger III Survey for Shell Metals freq(hz) 26.230

Loopno 0002 Line 10000E component Hz secondary Ch 1

040043


ROA
LEVEN
CHANNEL 6
UTEM CONTOURS
9600 E
9800E
10000E
10 200E
10 400E
110C
Gravel Pit
Gravel Pit
BLOCK
B
C
BLACK
-100
-100

APPENDIX IV

LOONGANA EL 36/79

CHALLENGER II GEOPHYSICS

044

040045

CRA EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)

2ND FLOOR, BELLERIVE QUAY,
31 CAMBRIDGE ROAD, BELLERIVE, 7018, TASMANIA, AUSTRALIA

P.O. BOX 138
ROSNY PARK 7018
TELEGRAMS: CRAEX
TELEX: AA57144
TELEPHONE: 44 3533
AREA CODE: (002)

IN REPLY PLEASE QUOTE

3/1/86

MEMO TO: S.J. CAITHNESS
COPY TO: T.W. DICKSON
I.M. CLEMENTSON
MEMO FROM: T. VON STROKIRCH

SUBJECT:

RECONNAISSANCE SCINTREX SE-88 GENIE SURVEY AT CHALLENGER 2

It was proposed that an EM survey be performed across a narrow 1200 ppm lead anomaly in soils south of the lead bearing trachyte which produces most of the anomalies in the vicinity, to determine whether there might be a concentration of sulphides present.

Two lines were surveyed on roads which crossed the anomaly. On both lines readings were taken at 25 metre intervals using a 100 metre separation between the receiver and transmitter. The responses at two frequency pairs 3037/112.5 Hz and 337/112.5 Hz. were measured at all stations.

Line A located a small anomaly which was not visible on line B indicating that line A was likely to be across strike. The anomaly appears to be centred on 125S and dipping to the north which would tie in well with the soil anomaly being to the south. The trough of the anomaly is poorly defined and narrow indicating that there is some interference with another minor conductor probably further to the north. This makes accurate quantitative

interpretation impossible.

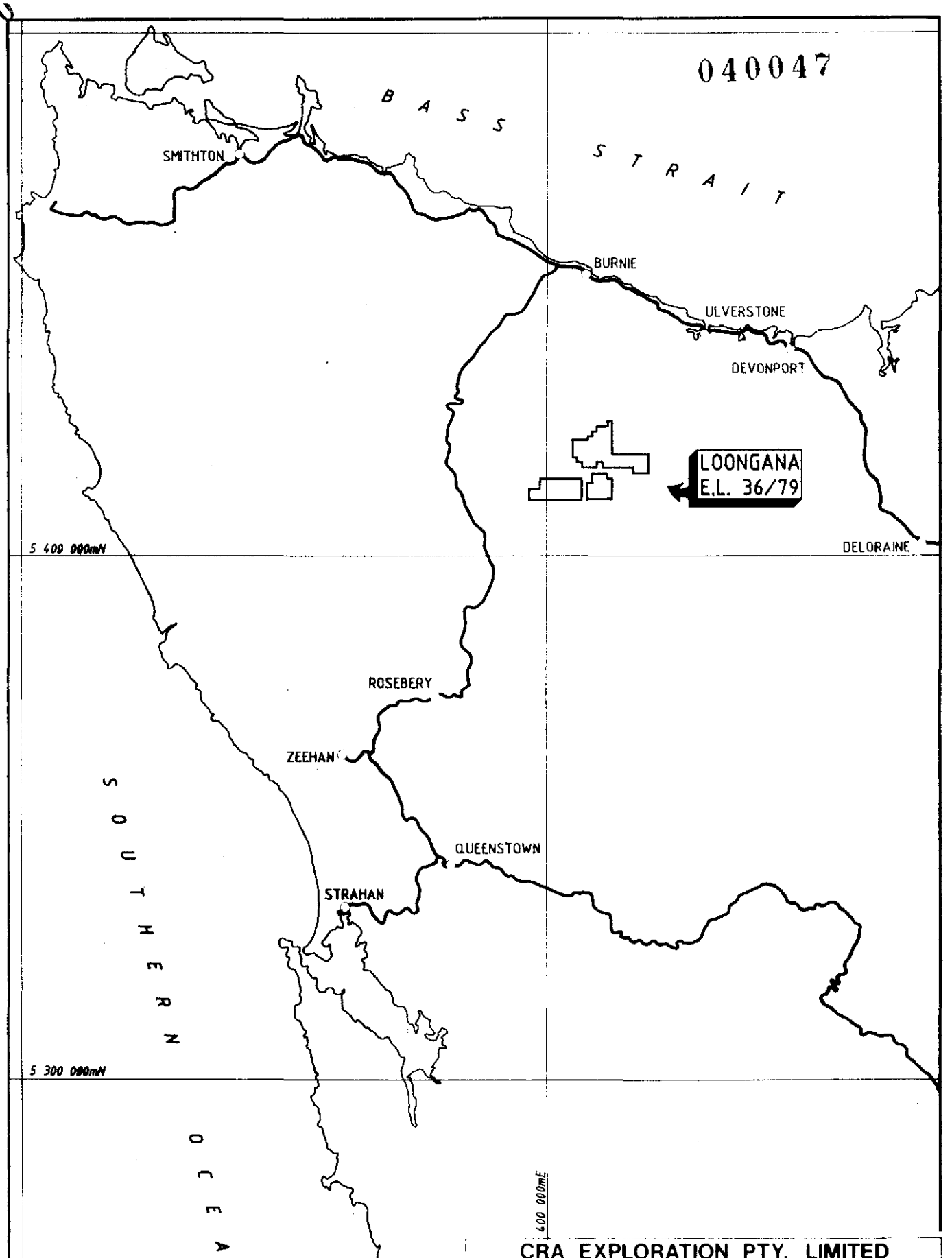
A third line was commenced across an anomalous portion of the trachyte but heavy rained caused the receiver to break down and the traverse was called off. No useful results were gained.

This test survey has not located a strong conductor due to massive sulphides but in view of the fact that it has located a small feature associated with the lead anomaly it might be worth putting a costean across the strike to check whether there is a trachyte present that might be causing some response. At present it does not seem that the soil anomaly is likely to be due to a significant sulphide concentration and any further work on this anomaly must be of low priority.

T. von Strokirch

050

040047



CRA EXPLORATION PTY. LIMITED

LOONGANA E.L. 36/79

LOCATION PLAN

REF.	SK55 - 3	(8015 - 8115)	
SCALE	1 : 1000 000	DRAWN	R.T.
AUTHOR	T.vS.	REPORT No.	13863
DATE	27 - 3 - 1986	PLAN No. TASh	2954

86-2539

040048

CHALLENGER 2

CHALLENGER 3

CATTLEY NORTH

407 000mE
5 415 000mN

412 700mE
5 415 000mN

420 000mE
5 416 000mN

5 cm

CRA EXPLORATION PTY. LIMITED

LOONGANA E.L. 36/79
E.L. AND PROSPECT
LOCATION PLAN

REF.	SK55 - 3		(8015 - 8115)
SCALE	1 : 100 000	DRAWN	R.T.
AUTHOR	T.v.S.	REPORT No.	13863
DATE	27 - 3 - 1986	PLAN No. TASh	2956

86-2539

SYMBOLS:

IGNEOUS:
- A — acid igneous unclassified
- Ar — rhyolite
- I — intermediate unclassified
- Ia — andesite

SEDIMENTARY:
- S — unclassified sediments
- Ssh — shale
- Sltst — siltstone
- Ssst — sandstone
- Scongl — conglomerate

STRUCTURAL and TEXTURAL:
- t — tuff unclassified
- lt — lithic tuff
- xt — crystal tuff
- vt — vitric tuff
- ag — agglomerate >32mm
- p — porphyritic
- vns — veins
- clvd — cleaved
- ox — oxidised
- af — ash flow
- bd — bedded
- lam — laminated
- chert — chert
- frags — fragments
- interb — interbedded
- flt — float
- crs — coarse
- ves — vesicles
- brec — brecciated

STRUCTURAL:
- outcrop limit
- rubble boundary
- approximate contact
- interpreted contact
- bedding
- cleavage
- primary foliation
- vein
- approximate boundary or trend line between pyroclastics and volcaniclastics (rich in clastic material, quartz)

GRAIN SIZE:
- fg — fine grained (<1mm)
- cg — coarse grained (5mm-5cm)

COLOURS:
- pk — pink
- grn — green
- pur — purple
- wte — white
- dk — dark
- ple — pale

SILICATE MINERALOGY:
- q — quartz
- f — feldspar
- c — chlorite
- s — sericite
- ferromag — ferromagnesians
- mafics — mafics

SULPHIDE MINERALOGY:
- mag — magnetite
- py — pyrite

GEOLOGICAL LETTERING:
- *horizontal* — obtained from Rogers (1976)

MISCELLANEOUS:
- TS 0686 — thin section and rock number (Rogers 1976)

GEOLOGICAL INTERPRETATION:

Pencil		
19-03	Є	Conglomerate, sandstone (Scongl, Ssst)
19-35	Є	Silica chert, high level exhalative (fg pArf silica rock)
19-21	Є	Glassy (fine grained) acid lava with nodules (fg A nodules)
19-42	Є	Plagioclase crystal vitric tuff lava (Ixt f)
19-11	Є	Lithic quartz crystal tuff (lxt q)
19-01	Є	Laminated shale, siltstone, tuffaceous sediments (lam Ssh, Sltst, Sv)
19-08	Є	Lithic tuff, lithic crystal tuff, minor crystal tuff (ag lt, lt, lxt, xt)
19-15	Є	Vesicular porphyritic rhyodacite (pArf q ves)

ROCK GEOCHEMISTRY: (ppm)

KR	Cu	Pb	Zn	Ag	Mn	Fe%
0998	10	240	490	<2	340	2·9
0999	10	50	140	<2	540	5·9

ANALYTICAL TECHNIQUE:
Cu, Pb, Zn, Ag, Mn, Fe by AAS following hot conc. HCl leach and HCl / HNO_3 leach in latter stages for 1 hr. at 0·25g sample.

GN MN 11·7°

DATE: October 1977
GEOLOGIST: G.L.B.
DRAWN: L.G.
CHECKED: M.C.R

GEOPEKO LIMITED
KING ISLAND GROUP

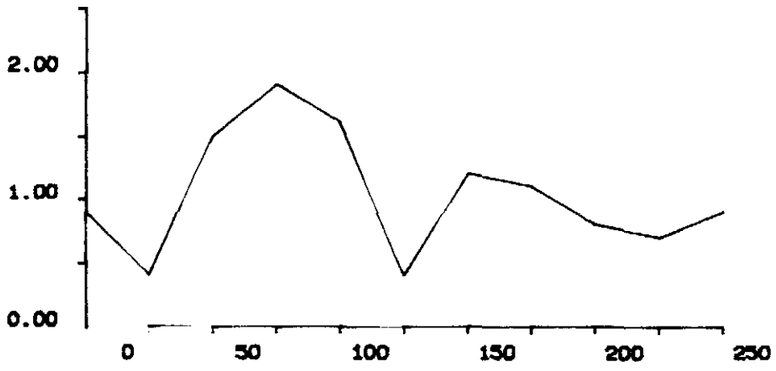
SCALE: 1 : 5000

No KT2/76-CH2-3

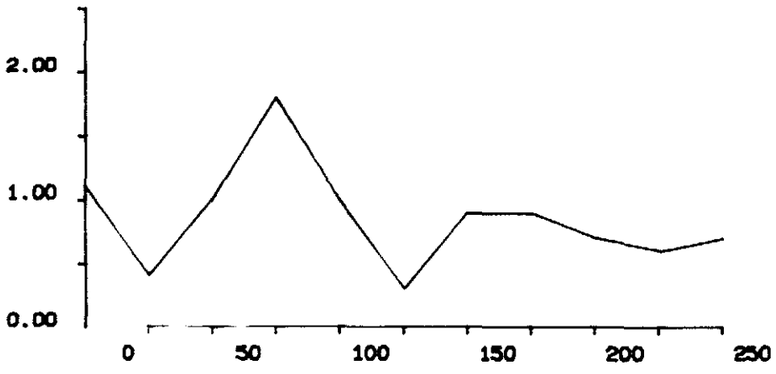
E.L. 2/76 LOONGANA, TASMANIA
CHALLENGER 2
GEOLOGICAL MAP

PLAN No. TASh 2957

86-2539



3037/112 HX



227/112 HX

960

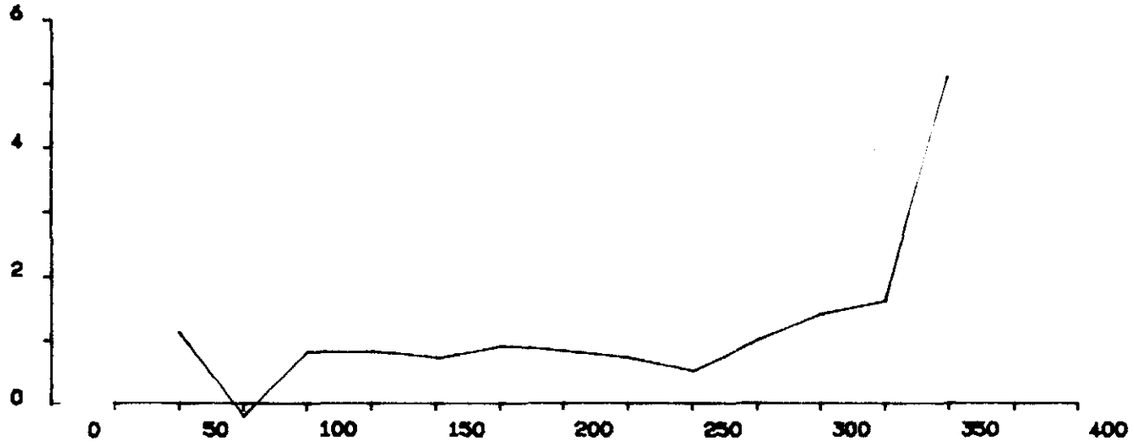
* N.B. *
100m Separation
Tx in North

040050

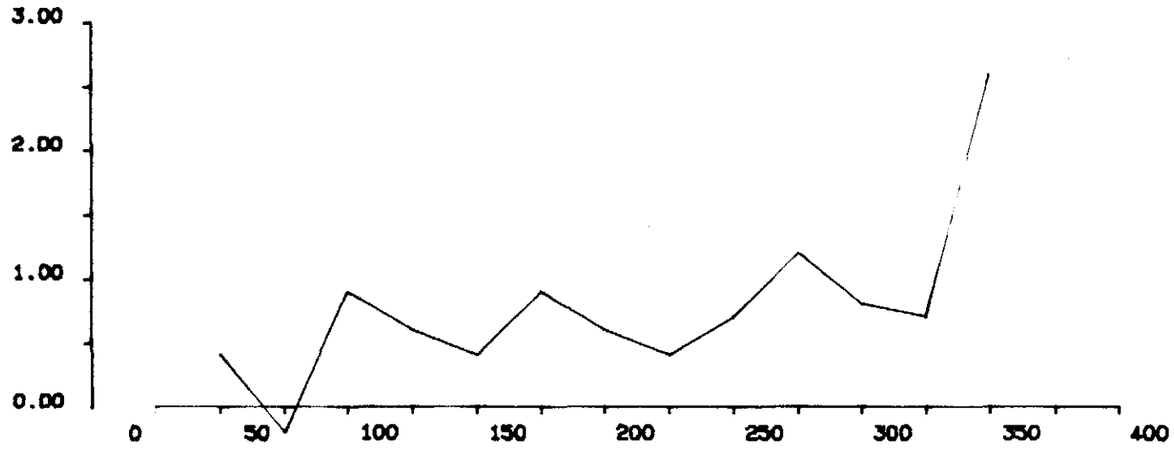
5 cm

CRA EXPLORATION PTY. LIMITED			
LOONGANA E.L. 36/79 GENIE PROFILES LINE A CHALLENGER II Pb ANOMALY			
REF.	SK55 - 3	(8015 - 8115)	
SCALE	1 : 2500	DRAWN	T.vS.
AUTHOR	T.vS.	REPORT No.	13863
DATE	JAN 1986	PLAN No. TASh	2851

86-2539



3037/112Hz



337/112 Hz

040051

5 cm

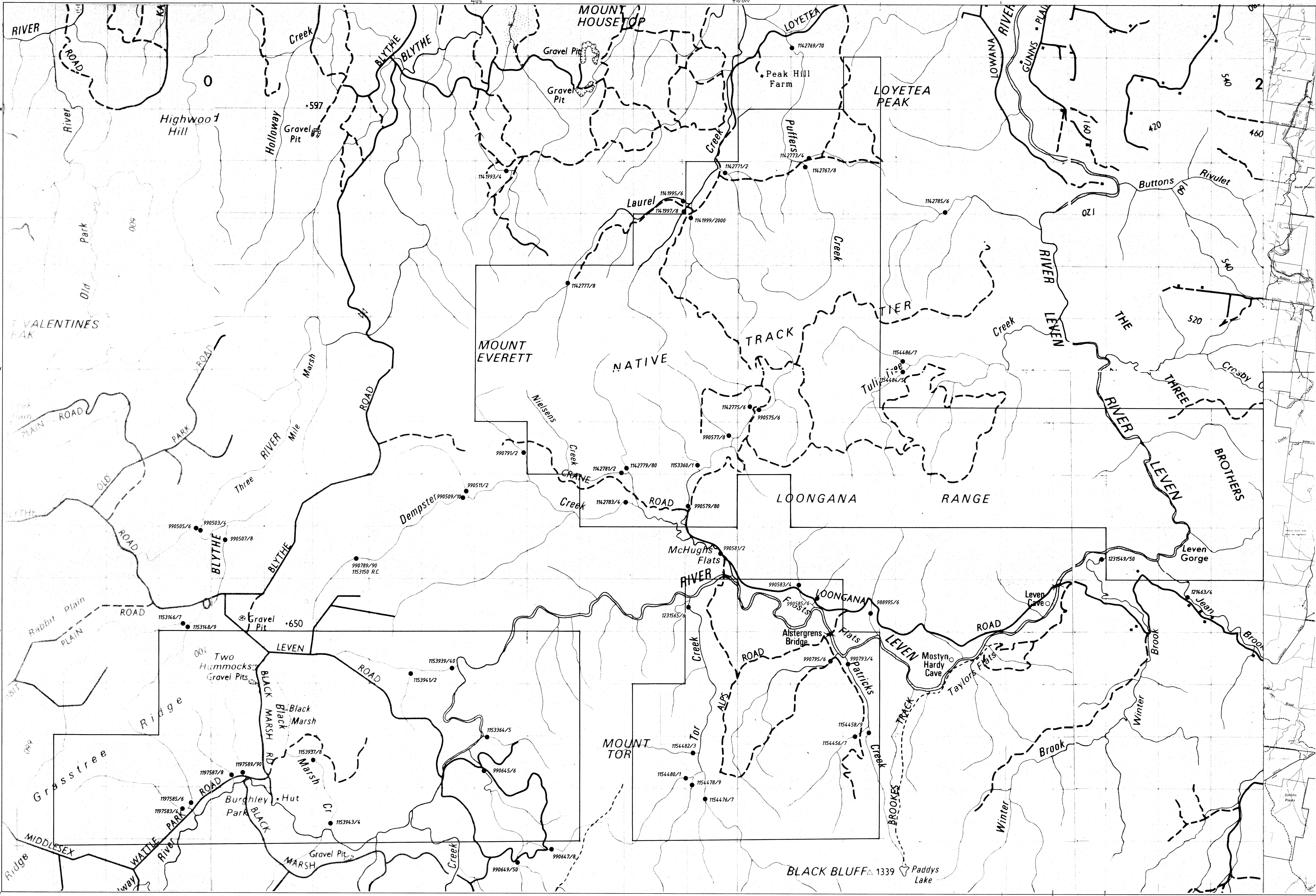
* N.B. *
100m Separation
Tx in West

CRA EXPLORATION PTY. LIMITED		
LOONGANA E.L. 36/79 GENIE PROFILES LINE B CHALLENGER II Pb ANOMALY		
REF.	SK55 - 3	(8015 - 8115)
SCALE	1 : 2500	DRAWN T.vS.
AUTHOR	T.vS.	REPORT No. 13863
DATE	JAN 1986	PLAN No. TASh 2852

170

& 2539

LOONGANA E.L. 36/79


MOUNT HOUSETOP
LOYETEA
Peak Hill Farm
LOYETEA PEAK
Highwood Hill
Holloway
Gravel Pit
BLYTHE
Creek
Pufferst
Laurel
Buttons
Rivulet
RIVER
LEVEN
THE
THREE
BROTHERS
TIER
TRACK
NATIVE
MOUNT EVERETT
Nielsens
Creek
CRANE
ROAD
Dempster
Three Mile Marsh
LOONGANA RANGE
McHughs Flats
Leven Gorge
Leven Cave
Mostyn Hardy Cave
Alstergrens Bridge
Taylors Flats
Fossts Flats
Patricks Creek
Winter Brook
Jean Brook
Brook
ALPS ROAD
MOUNT TOR
Tor Creek
BROOKES TRACK
BLACK BLUFF 1339
Paddys Lake
Tulip Tree
Crosby
Old Park
VALENTINES
Rabbit Plain
PLAIN ROAD
Two Hummocks Gravel Pits
BLACK MARSH RD
Black Marsh
Marsh Cr
Burghley Park
Hut
Ridge
Grasstree Ridge
MIDDLESEX
WATTLE PARK
Gravel Pit
GUNNS PLAINS
LOWANA
1142769/70
1142773/4
1142771/2
1142767/8
1141993/4
1141995/6
1141997/8
1141999/2000
1142785/6
1142777/8
1154486/7
1154484/5
1142775/6
990575/6
990577/8
990791/2
1142781/2
1142779/80
1153360/1
990511/2
990509/10
1142783/4
990579/80
990505/6
990503/4
990507/8
990789/90
1153150 R.C.
990581/2
990583/4
990585/6
988995/6
1231549/50
121463/4
1231565/6
1153146/7
1153148/9
990795/6
990793/4
1153939/40
1153941/2
1153364/5
990645/6
1153937/8
1154458/9
1154456/7
1154482/3
1154480/1
1154478/9
1154476/7
1197587/8
1197589/90
1197585/6
1197583/4
1153943/4
990647/8
990649/50
400 000mE
405 000mE
410 000mE
415 000mE
420 000mE
5 425 000mN
5 420 000mN
5 415 000mN
5 410 000mN

040052

5 cm

5761

* N.B. * EVEN No. .... -4 mesh CYANIDE LEACH SAMPLE.
ODD No. .... -80 mesh SAMPLE.

86-2539

CRA EXPLORATION PTY. LIMITED			
LOONGANA E.L. 36/79 CRAE REGIONAL STREAM SEDIMENT SAMPLE LOCATIONS 1985 - '86			
REF.	SK55 - 3	(8015 - 8115)	
SCALE	1 : 25 000	DRAWN	R.T.
AUTHOR	S.J.C.	REPORT No.	13863
DATE	7 - 3 - 1986	PLAN No.	TASh 2950

5761

LEVEN ROAD

BLACK MARSH ROAD

PD85TH1

PD85TH2

5414000mN

5413000mN

400000mE

401000mE

402000mE

Tertiary basalt

Ordovician roland conglomerate

Cambrian rhyolite

Cambrian chloritic tuffs

Cambrian black shales

Cambrian acid tuffs

Baryte occurrence

Utem conductor

RRMIP conductor

040053

5 cm

CRA EXPLORATION PTY. LIMITED

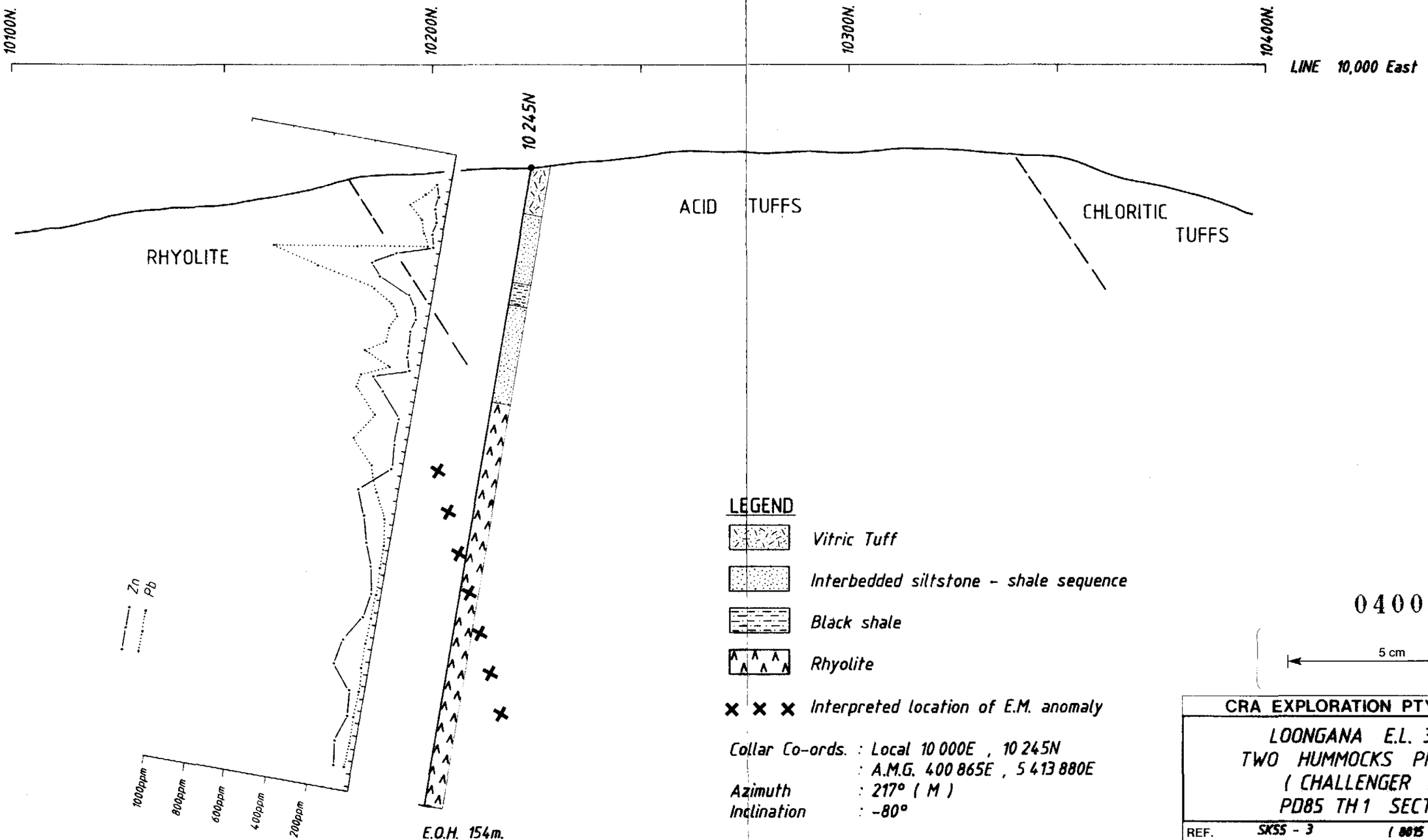
LOONGANA EL 36/79

CHALLENGER III - TWO HUMMOCKS OUTLINE OF GEOLOGY & GEOPHYSICAL ANOMALIES

REF.	
SCALE 1:10 000 (approx)	DRAWN A.R.
AUTHOR I.M.C.	REPORT No. 13863
DATE 24.10.85	PLAN No. TASh 2824

052

86-2539



LEGEND

- Vitric Tuff
- Interbedded siltstone - shale sequence
- Black shale
- Rhyolite
- × × × Interpreted location of E.M. anomaly

Collar Co-ords. : Local 10 000E , 10 245N
: A.M.G. 400 865E , 5 413 880E
Azimuth : 217° (M)
Inclination : -80°

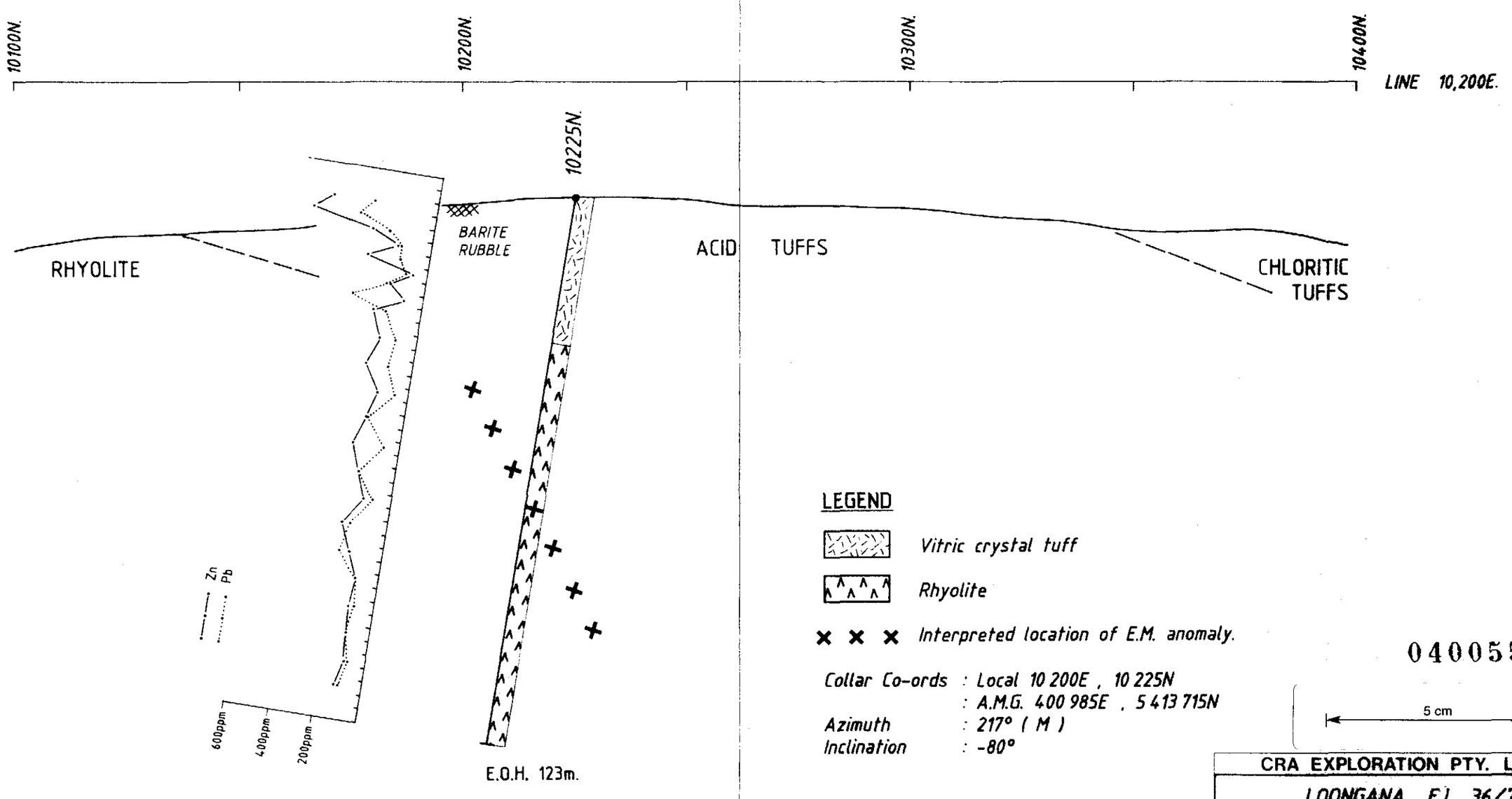
040054

5 cm

CRA EXPLORATION PTY. LIMITED	
LOONGANA E.L. 36/79 TWO HUMMOCKS PROSPECT (CHALLENGER III) PD85 TH1 SECTION	
REF. SK55 - 3	(8015 , 8115)
SCALE 1 : 1000	DRAWN R.T.
AUTHOR S.J.C.	REPORT No. 13863
DATE 7 - 1 - 1986	PLAN No. TASh 2853

RL 2529

048



LEGEND

Vitric crystal tuff

Rhyolite

× × × Interpreted location of E.M. anomaly.

Collar Co-ords : Local 10 200E , 10 225N
: A.M.G. 400 985E , 5 413 715N
Azimuth : 217° (M)
Inclination : -80°

040055

5 cm

CRA EXPLORATION PTY. LIMITED

LOONGANA E.L. 36/79
TWO HUMMOCKS PROSPECT
(CHALLENGER III)
PD85 TH 2 SECTION

REF.	SX55 - 3	(8015 , 8115)	
SCALE	1 : 1000	DRAWN	R.T.
AUTHOR	S.J.C.	REPORT No.	13863
DATE	7 - 1 - 1986	PLAN No. TASh	2854

86-2539

670

5 415 000 N

400 000E

401 000 E

402 000 E

5 414 000N

5 413 000 N

700

800

600

LEVEN ROAD

9600 E

9800E

10.000E

10 200E

10 400E

11.000N

10000N

Two Hummocks

Gravel Pit

Gravel Pit

Black

Black

Marsh

MARSH

ROAD

Marsh

Creek

CHANNEL SIX
UTEM DATA CONTINUOUSLY NORMALISED
REGIONAL SUBTRACTED AND FRASER FILTER APPLIED

> 50 Contour

Barite

5 cm

040056

CRAE REPORT
No. 13863

TASH 2828

DATE: Dec 1976
GEOLOGIST:
DRAWN: L.G.
CHECKED: M.C.R

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:5000

No. KT2/76-CH3-1

E.L. 2/76

LOONGANA, TASMANIA

CHALLENGER NO. 3

CHANNEL SIX UTEM CONTOURS 5763

86-2539