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CRA EXPLORATION PTY.LIMITED.

HEEMSKIRK FALLS EL 30/79

U.M.	A.O.	G.G.	E.O.	...
D. DIR.	19 APR 1984			Reg. Secy
	DEPT. OF MINES			E & IL
	REF. No. 4006/84			

EXPLORATION REPORT FOR YEAR ENDING

15 APRIL, 1984

Author: 
T.W. Dickson

Date: 15 April, 1984.

Copies: CRAE Canberra
CRAE Hobart
CRAE Burnie
Mines Department, Tasmania

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1. SUMMARY

During 1983 five separate areas of the EL have been prospected to varying degrees. Two areas of suspected Renison Bell Formation rocks were investigated in the eastern section of the EL and although results are inconclusive, work is continuing in both areas.

Some 18 EM anomalies are present in an old Mines Department Reserve that has now been included in the EL. None of the anomalies have been tested previously and we are currently sampling stream sediments and running lines of bedrock geochemical samples across each anomaly to provide an initial evaluation. One additional untested EM anomaly occurs in the Upper Oonah Volcanics and dolomite in the north east of the EL.

Pan concentrate sampling has downgraded the tin potential of the Licence and work has been suspended in areas of HEC, Pieman Dam Reserves, along the Pieman River and in the north-west corner of the Licence area.

2. INTRODUCTION

EL 30/79 was granted on the 15th November 1979 and was taken to cover possibilities for Tin and Base metals. The tin potential has since been downgraded, but a number of EM anomalies are currently being evaluated in the south-east section of the EL. This work is in progress at the moment and will be reported to the Mines Department on completion.

3. CONCLUSIONS

1. The tin potential of the area has been severely downgraded. Any tin anomalies occurring along the Pieman River are due to either contamination from Renison Bell, or from alluvial cassiterite contained in small areas of Tertiary Gravels.

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2. A large section of the EL (36.4 km² or 22.5% of the total area) is covered by HEC Pieman Dam Reserves. These areas are not subject to the Mining Act and all work has ceased in these areas.

3. Areas of supposed Renison Bell and or Crimson Creek Formation rocks in the east of the E.L. warrant further work and this is currently underway.

4. A large number of untested E.M. anomalies occur in an old Mines Department Reserve in the south-east of the E.L. These are currently being evaluated by stream sediment and bedrock geochemistry.

4. RECOMMENDATIONS

1. Continue geochemical evaluation of all E.M. targets in the south-east of Licence area.

2. Continue mapping and sampling of possible Crimson Creek-Renison Bell sediments in the eastern section of the EL.

5. CURRENT EXPLORATION

5.1 North West (Stringers Creek) Aeromagnetic Anomaly

This anomaly is marked by a distinct thumb-print magnetic high in the north-west corner of the EL.

Rocks in the area of the anomaly were mapped as Lower Oonah quartzites, although it is possible from the magnetic pattern that basic volcanics associated with the 'Whyte Schist' could just pass into the corner of the EL.

Rock types in the immediate area of the anomaly are quartzites and mid to pale brown shales.

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There is no obvious magnetic material at the surface although a small outcrop of haematitic material was reported from a small stream on the west bank of the Pieman River.

Several stream sediments were taken in the general area to assist in evaluation of the anomaly and a list of sample numbers and assay results is given below. Locations are marked on plan TASH 1738.

No.	Cu	Pb	Zn	As	Sn
770289	10	10	65	50	3
770288	15	15	40	30	10
770287	620	300	2200	650	2500
785280	20	20	65	10	0.5
785281	15	10	20	5	2
785282	20	2.5	20	5	2

Sample 770287 is highly anomalous but it could be due to contamination along the Pieman River.

A detailed programme of line cutting, bedrock geochemical and ground magnetometer surveys were then planned for the area, but all work was suspended when it was learnt that the Mines Department has no legal standing in areas of HEC Reserves. The anomaly is completely covered by the HEC Lower Pieman Damsite Reserve and in fact 36.4 km² or 22% of the EL has been effected by the HEC reserves (see Plan TASH 1688).

5.2 Pan Concentrate Sampling Pieman River

During November a contractor collected 12 pan concentrate samples from all major streams draining into the Pieman River. Samples were taken 150-300 metres up stream and all sites were marked with permatags and yellow or orange flagging tape.

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All samples consisted of 10 level dishes or approximately 60 litres of unsorted gravels and fine sediment. These were panned to approximately 1 cup full in the field. Samples were assayed for tin and tungsten by XRF at Comlabs with some check assays by AMDEL. Full sample description and assay results are given in Appendix I and on plans TASH 1739, 1740, 1741.

Only two streams, Heemskirk River (sample 869546) and Watsons Creek (869457) give any really anomalous values but both these drain areas of Tertiary gravels, within the core of Dolerite "sill", which are known to contain alluvial tin.

Sample 869454 contained 4900 ppm tin. It came from the Stanley River and it too drains an area of known tin mineralisation outside the EL.

Tungsten results were all very low.

This sampling programme has considerably downgraded the tin-tungsten potential of the EL and all further work has been concentrated on lead-zinc mineralisation and on a number of outcrops of Crimson Creek or possible outcrops of Renison Bell Formation rocks located in the extreme eastern section of the EL.

5.3 Pieman Crossing Area

This area is located in the extreme north-east of the EL. The area is triangular in shape with the western section marked by Lower Oonah beds grading upwards into the typical mixed siltstone dolomite and basic volcanic material of the Upper Oonah. Further east, Tony Brown of the Tasmanian Mines Department, has mapped conglomerates, sandstones and mudstones of the lower sections of the Success Creek Group.

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According to this mapping (Plan TASH 1742) rocks of the Renison Bell Formation occur immediately outside the EL.

A new Forestry Commission logging track has been constructed along the southern bank of the Pieman River and near the end of this track a sequence of rocks strongly suggestive of Crimson Creek and Renison Bell Formation occur. It is possible that a small faulted block of these prospective rocks could occur in this area and for that reason the track was surveyed, traversed with a ground magnetometer and several rock chips and petrological samples were taken.

Rock types intersected along the track from east to west are siltstones and quartzites typical of the Lower Success Creek group, but after about 2km there is a sequence of red tuffaceous mudstones, ferruginous cherts and pelletal cherts - a sequence very similar to the Renison Bell Formation rock types.

A gossanous ironstone was found near the end of the track close to the EL boundary, although geochemical analysis of several samples returned no significant base metal or tin values. A total of 11 rock chip samples were dispatched for analysis of Cu, Pb, Zn, Ag, As, Fe, Cr, Ni and Co by AAS and W, Sn and Ba by XRF - Results are appended in appendix II, while petrological description for 7 samples (Sample Nos. 1141019, 1141021, 1141022, and 1141330 to 1141333) are given in appendix III.

Fander describes samples 1141330 - 1141333 as cherts which

" show considerable contrasts and distinctive features; one (321) appears to be a type of sinter in which at least some of the quartz is replacive and some is probably accretionary. Another (330) also shows some evidence of carbonate silicification, i.e. replacement and not sedimentary.

007

331 and 333 are sedimentary, but very different; 331 is a distinctive pelletal rock formed as a type of soft-pebble deposit, probably as coagulated masses, squeezed during compaction to their present shapes."

The three remaining samples are described as agate/chalcedony type quartz formations (019, 022) while the third (021) is a fine grained sedimentary ironstone. Fander, believed they showed no resemblance to the Renison Bell sediments although the occurrence of these types of sediments in the Lower Success Creek group rocks is rather unusual.

Although the initial geochemical results are disappointing, further mapping and sampling will be necessary to evaluate this area.

North of the Pieman River a number of dolomitic outcrops have been located within the Upper Oonah sediments and lavas. The outcrops are directly coincident with an airborne EM anomaly detected by CSR in 1975. This anomaly was never followed up although one stream draining the anomaly gave values in the order of 40 ppm copper.

All streams draining the anomaly are to be stream sediment sampled and at least one line of bedrock auger samples are to be taken across the centre of the anomaly, as a first step in evaluating the anomaly - this work is currently underway along with similar sampling to the south.

5.4 Dunkleys Tramway

A series of cut lines and stream sediment samples were planned for the south-eastern edge of the Licence to examine the uppermost sections of the Oonah quartzite sequence.

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To date, only the three southern traverses have been cut and eight stream sediment samples have been collected as a first phase of the work. This data is shown on plan TASH 1745, and the geochemical assay results are listed in appendix II.

Two samples 972170 and 972173 are anomalous - one sample from each of the outcrop areas. CSR constructed a major grid over the northern outcrop area, but in their final report they did suggest the grid should be extended further west to take in a zone of weak magnetic response west of the Tramway.

Future work in the area is to carry out bedrock geochemical sampling along traverse "C" and "D" to further evaluate the southern outcrop zone. - This work is currently in hand.

5.5 Old Mines Department Reserve

This area was only included in the Heemskirk Falls EL in September 1983. The area was covered by CSR's airborne EM survey but as they held no title to the area, they never followed up any of the anomalies. In all, there are 18 EM anomalies of various degrees of intensity in an area of 15km² (see Plan TASH 1746. The area is entirely underlain by Oonah siltstones and quartzites with a small inlier of Crimson Creek Formation in the south-east corner.

The area is featureless on the Mines Department West Coast and old RTZ aeromagnetic surveys.

This area is being actively explored at the present time. Each anomaly is to have all streams draining it sampled geochemically and one to two reconnaissance lines of bedrock sampling are to be run across each anomaly. This work is currently underway and will be reported when sampling is completed and fully evaluated.

009

6. KEYWORDS

Geochem-drainage, stream sediments, petrological description

7. LOCATION

Queenstown SK55-5.

8. LIST OF PLANS

- 1. EL 30/79 Heemskirk Falls Locality Plan TASH 1688 ✓
- 2. EL 30/79 Heemskirk Falls Areas of Work 1983 TASH 1737 ✓
- 3. EL 30/79 Heemskirk Falls Stringers Creek Aeromagnetic Anomaly TASH 1738 ✓
- 4. EL 30/79 Heemskirk Falls Pan Con Sample Location TASH 1739 ✓
- 5. EL 30/79 Heemskirk Falls Pan Con Tin Assay TASH 1740 ✓
- 6. EL 30/79 Heemskirk Falls Pan Con Tungsten Assay TASH 1741 ✓
- 7. EL 30/79 Heemskirk Falls Regional Geology North-East Corner of E.L. TASH 1742 ✓
- 8. EL 30/79 Heemskirk Falls Tape & Compass Survey New Forestry Road South of Pieman River TASH 1743 ✓
- 9. EL 30/79 Heemskirk Falls Ground Magnetometer Survey of Forestry Road South of Pieman River TASH 1744 ✓
- 10. EL 30/79 Heemskirk Falls Dunkley's Tramway Geochemical sampling on line cutting. TASH 1745 ✓
- 11. EL 30/79 Heemskirk Falls Location of Airborne Electromagnetic anomalies Old Mines Dept. Reserve. TASH 1746 ✓

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- Appendix I Pieman River Pan Concentrate Sample Descriptions and Assay Results
- Appendix II Assay Results
 - (a) Forestry Track South of Pieman River
 - (b) Dunkley's Tramway
- Appendix III Petrological Descriptions

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APPENDIX I

PIEMAN RIVER PAN CONCENTRATE

SAMPLE DESCRIPTIONS AND ASSAY RESULTS

011

Sample No: 869451
 Stream: Lone Hill Creek
 Sediment: Quartzite, siltstone & quartz vein fragments with minor cobbles of acid volcanics (c) and conglomerate (Oo)
 Outcrop: pC siltstone and quartzites.
 Remarks: Minor grey metallic and abundant fine medium grained black heavies.

Sample No: 869452
 Stream: Western Rivulet
 Sediment: Quartzite siltstone and quartz vein derived.
 Outcrop: pC siltstone and quartzites (100° 30° mag)
 Remarks: Heavies not apparent.

Sample No: 869453
 Stream: Trail Creek
 Sediment: As for 869451
 Outcrop: pC siltstone and quartzites.
 Remarks: Black fine-medium grained heavies.

Sample No. 869454
 Stream: Stanley River
 Sediment: As for 869451 and abundant quartz grains of granitic origin.
 Outcrop: Quartzite 050.80°.
 Remarks: As for 869453 and fine yellow-green heavies.

Sample No. 869455
 Stream: Big Ben Creek
 Sediment: Quartzite, siltstone and quartz vein fragments.
 Outcrop: Permian tillite overlying preCambrian siltstones 155° .70°.
 Remarks: As for 869453.

Sample No. 869456
 Stream: Heemskirk River
 Sediment: As for 869455 with granitic quartz grains.
 Outcrop: Jurassic dolerite.
 Remarks: As for 869453.

Sample No. 869457
 Stream: Watsons Creek
 Sediment: Dominantly quartz detritus from veining and granite plus black siltstone and dolerite.
 Outcrop: As for 869456.
 Remarks: Abundant black heavies as for 869453. Only two dish fulls concentrated, sample collected from holes in stream bed.

Sample No: 869458
 Stream: Northridge Creek
 Sediment: Quartz, quartzite derived sediment.
 Outcrop: As for 869456
 Remarks: Heavies not apparent.

Sample No: 869459
 Stream: No name, 1.5km downstream of Northridge Creek,
 southern bank.
 Sediment: Quartz pebbles.
 Outcrop: As for 869456
 Remarks: 5 dish fulls, creek difficult to locate
 amongst dolerite scree and outcrop.

Sample No: 869460
 Stream: Woodland Creek
 Sediment: Quartz from veining and granitic source.
 Outcrop: As for 869456.

Sample No: 869461
 Stream: Healy Creek
 Sediment: Variety of cobbles from tillite
 Outcrop: Permian tillite.

Sample No: 869462
 Stream: No name, 1.2km due W.N.W. of Healy Creek
 Sediment: Quartzite, siltstone, quartz vein fragments.
 Outcrop: pC quartzite & siltstone

013

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PANNED CONCENTRATE ASSAY RESULTSCOMLABS P/L. JOB COM 810044RESULTS IN PPM

<u>Sample</u>	<u>Sn</u>		<u>W</u>	
	<u>Comlabs</u>	<u>Amdel</u>	<u>Comlabs</u>	<u>Amdel</u>
869451	36	24	10	75
452	4	10	<10	<10
453	60	50	<10	75
454	4900	4750	60	55
455	530	520	20	80
456	9800	9500	20	80
457	1.55%	1.54%	55	70
458	34	50	<10	<10
459	2350	2800	10	70
460	1050	1050	10	<10
461	800	800	15	25
462	200	140	10	10

APPENDIX II

- (a) Assay values rock chip samples
Forestry Track south of Pieman
River.
Samples 1141329 - 1141333
1141109 - 1141024
- (b) Assay values stream sediment
samples Dunkley's Tramway area.
Samples 972168 - 972175
Rock Sample 1141328

Sample Descriptions

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Sample No. 1141328 - Cemented Tertiary gravels
Dunkley's Tramway.

1141329 Sheared, silicified black shale.

1141330 Gossan/Ironstone.

1141331 Silicified red brecciated chert.

1141332 Greenish silicified Oonah
quartzite.

1141333 Red banded chert and mudstone.

1141019 Chert

1141020 Red brecciated chert

1141021 Gossan

1141022 Chert ironstained.

1141023 Ironstone/Gossan.

1141024 Greenish silicified volcanic.

ANALABS

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ANALYTICAL DATA

SAMPLE PREFIX REPORT NUMBER REPORT DATE CLIENT ORDER No. PAGE

15.2 00 2260 15.12.83 30247 1 OF 4

TUBE No.	SAMPLE No.		Cu	Pb	Zn	Fe	Ca	Mg	Mo	As	Other
1	002168		5	10	30	0.5	X	10	1150	X	
2	002169		X	5	10	X	X	10	1300	X	
3	002170		10	260	95	0.5	X	15	7500	X	
4	002171		10	60	50	X	X	5	3500	X	
5	002172		5	15	15	X	5	5	1550	X	
6	002173		95	880	950	9.5	5	10	2.15%	X	
7	002174		5	25	30	X	X	10	2050	X	
8	002175		X	X	15	X	X	10	950	X	
9	1141019		X	X	5	X	-	-	1700	X	
10	1141020		20	10	15	X	-	-	5.00%	X	
11	1141021		105	10	70	X	-	-	14.0%	X	←
12	1141022		X	X	10	X	-	-	1550	X	
13	1141023		30	20	40	X	-	-	14.0%	X	
14	1141024		50	5	20	X	10	20	4.75%	X	
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

Results in ppm unless otherwise specified
 T = element present; but concentration too low to measure
 X = element concentration is below detection limit
 - = element not determined

AUTHORISED OFFICER: *[Signature]*

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

15.2 08 2260

15.12.83

30247

3 OF 4

TUBE No.	SAMPLE No.	Cr								
1	972168	-								
2	972169	-								
3	972170	-								
4	972171	-								
5	972172	-								
6	972173	-								
7	972174	-								
8	972175	-								
9	1141019	-								
10	1141020	-								
11	1141021	-								
12	1141022	-								
13	1141023	-								
14	1141024	80								
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

Results in ppm unless otherwise specified
 T = element present; but concentration too low to measure
 X = element concentration is below detection limit
 - = element not determined

AUTHORISED OFFICER



Batch No.: L060 Client: CRA EXPLORATION PTY. LIMITED Area Contact: MR. G. WEBER
Address: G.P.O. BOX 384D Address: P.O. BOX 139
Date Received 11/11/83 MELBOURNE BURNIE TAS.
Date Completed 16/11/83 VIC 3001

Order No.: DPO 30244 Sample Type: ROCK No. of Samples: 40

SAMPLE NO.	Cu	Pb	Zn	Ag	Co	Fe	As	EL
	m	m	m	m	m	%	m	L
	G001	G001	G001	G001	G001	G001	G001	ME
1141301	5	25	35	<1	<5	0.33	<20	
1141302	135	30	65	2	15	24.9	<20	
1141303	155	30	90	2	35	5.86	<20	
1141304	195	25	210	3	75	35.4	<20	
1141308	65	25	35	2	15	1.39	20	
1141309	25	25	25	5	5	2.54	<20	
1141310	10	80	65	1	5	1.86	<20	
1141311	145	50	15	13	15	9.97	<20	
1141312	90	55	25	<1	15	4.67	<20	
1141313	390	55	30	2	75	27.4	<20	
1141314	270	85	30	1	35	8.46	<20	
1141315	15	80	100	1	10	0.89	<20	
1141316	35	280	170	3	220	8.76	<20	
1141317	25	240	170	2	15	5.81	60	
1141318	10	80	30	<1	5	0.69	<20	
1141319	25	80	110	1	15	4.32	<20	
1141325	220	0.52	% 0.56	% 20	30	3.00	260	
1141327	140	0.12	% 0.10	% 6	5	0.54	<20	
1141328	15	380	540	3	20	33.9	<20	
1141329	15	115	125	<1	<5	0.47	<20	
1141330	40	75	115	1	40	12.5	<20	
1141331	5	45	65	<1	<5	5.95	<20	
1141332	10	25	30	<1	<5	0.43	<20	
1141333	10	15	20	<1	5	2.53	<20	
1141334	5	20	25	1	<5	0.34	<20	
1141335	115	25	30	1	5	1.05	280	
1141336	25	20	35	2	5	0.71	<20	
1141337	95	10	45	1	5	0.37	60	
1141338	45	25	25	1	5	0.68	20	
1141339	2	15	20	1	5	0.30	<20	

0203

APPENDIX III

PETROLOGICAL DESCRIPTIONS

FORESTRY TRACK SOUTH OF PIEMAN RIVER

021

Central Mineralogical Services



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

Mr. P. Temby
Geologist
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BURNIE / TAS. 7320

16th January, 1984

REPORT CMS 83/12/15

YOUR REFERENCE:	D.P.O. No. 30248
DATE RECEIVED:	13th December, 1983
SAMPLE NOS.:	3 Samples
SUBMITTED BY:	G.B. Weber
WORK REQUESTED:	Petrology

Copy to:
The Chief Geologist
C.R.A. Exploration Pty. Ltd.
P.O. Box 656
FYSHWICK / A.C.T. 2609

H.W. Fander
H.W. Fander, M. Sc.

Copy & Invoice to:
Administration Officer
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
ROSNY PARK / TAS. 7018

022

REPORT CMS 83/12/15

Three rock samples were received for petrological study; thin-sections were prepared and are described below. Two of the rocks are agate/chalcedony-type quartz formations, and one is a bedded ironstone; they show no resemblance to Renison Bell sediments as known to the author.

1141019 (T.S. 48452)

This rock consists entirely of quartz and may be regarded as a type of agate or similar formation; there is no suggestion of a sedimentary origin such as chert.

The rock consists of intricately interlocking patches of grey-green translucent silica, and whitish material which is generally more coarsely crystalline and contains traces of ultrafine pigmented clay. The translucent areas have a vaguely organic structure, but this may be misleading, as many agate structures (e.g. crazy lace agate) show this characteristic. The rock may be related to volcanic activity, especially basalts.

1141021 (T.S. 48453)

This is a fine-grained sedimentary ironstone, largely opaque and thus lacking recognisable details. It shows no particular resemblance to the Crimson Creek (Red Rock) formation or to the Renison Bell formation known to the author.

The rock is mainly composed of ultrafine, uniform hematite with clays; the purplish-brown colour is not typical of hematite. There are small lenses of more compact, purer hematite, as well as ovoid bodies of earthy goethite with micaceous textures; these various bodies all have subparallel orientation and are bedded. There are also subparallel cracks which are thought to be due to shrinkage.

1141022 (T.S. 48454)

This rock resembles 1141019 and consists entirely of quartz, with typical concretionary, crustiform textures; there are no sedimentary features.

The quartz varies in its crystallinity and is generally fine-grained, with some relict banding accentuated by subtle pigmentation and changes in texture and grain size. The various features suggest that the formation may be a siliceous sinter or similar igneous-related rock.

H.W. Fander, M. Sc.

023

440024.

Central Mineralogical Services



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

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

22nd November, 1983

REPORT CMS 83/11/12

YOUR REFERENCE:	D.P.O. No. 30245
DATE RECEIVED:	9th November, 1983
SAMPLE NOS.:	7 Samples
SUBMITTED BY:	G.B. Weber
WORK REQUESTED:	Petrology

Copy to:
The Chief Geologist
C.R.A. Exploration Pty. Ltd.
P.O. Box 656
FYSHWICK / A.C.T. 2609

H.W. Fander
H.W. Fander, M. Sc.

Copy & Invoice to:
Administration Officer
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
ROSNY PARK / TAS. 7018

024

REPORT CMS 83/11/12

Seven rock samples were received for petrological study; thin-sections were prepared and examined together with the offcuts. Brief descriptions are attached.

Summary

The rocks comprise sediments and metasediments and include several cherts, a meta-arkose, a silicified ironstone, and a dravite-muscovite metaquartzite.

The four cherts show considerable contrasts and distinctive features; one (321) appears to be a type of sinter in which at least some of the quartz is replacive and some is probably accretionary. Another (330) also shows some evidence of carbonate silicification, i.e. replacement and not sedimentary. 331 and 333 are sedimentary, but very different; 331 is a distinctive pelletal rock formed as a type of soft-pebble deposit, probably as coagulated masses, squeezed during compaction to their present shapes.

The meta-arkose (319) is only mildly metamorphosed, retaining many sedimentary features, but with pervasive recrystallization of clastic grains.

The ironstone consists mainly of fine hematite studded with well-formed (now oxidised) magnetite crystals; there is good evidence that the quartz is secondary, replacing carbonate.

The dravite-muscovite metaquartzite is a metasediment, believed to have been metasomatised as well as mildly regionally metamorphosed, as the amount of tourmaline present is far greater than would normally occur in a sediment.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals
------------	-------------------------	--------	----------------

1141-302 (T.S. 47935) MAGNETITE D. D. D.	Magnetite-Hematite Quartzite. Scattered, oxidized magnetite crystals surrounded by fine hematite, with small patches of fine quartz studded with minute carbonate grains.	Vague preferred fabric. Quartz believed to be replaceive. Magnetite crystals 0.5 - 1 mm.	Crosscutting quartz veins. Development of goethite in places.
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Original rock may have been a sideritic iron ore, with subsequent extensive silicification. Perhaps marginally metamorphosed.

1141-319 (MINUCLES)	Meta-Arkose. Granular quartz with vestiges of clastic outlines, cloudy argillised feldspar, and chloritic grains and shreds possibly representing glauconite.	Very evenly sized and uniformly granular; faint relict banding; bedding. Grainsize = 0.1 mm.	A few detrital muscovite flakes. Detrital heavy minerals. Crosscutting chlorite veins.
------------------------	---	--	--

Low-grade, ?contact-metamorphic rock verging on siltstone. Rock has relatively high feldspar content. Weakly folded.
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1141-331 HEMISKURK	"Chert". Consists of various forms of chemically deposited SiO ₂ , as patches of fibrous-radiating chalcedony, micro-crystalline mosaic quartz, coarser clear stressed quartz.	Some evidence of replacement of earlier minerals. No bedding. Crustiform banding.	Ultrafine carbonate patches, with spherical/concentric textures.
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Evidence for replacement of concretionary carbonate, and much of the SiO ₂ is agate-like; perhaps a type of siliceous sinter.
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1141-330 HEMISKURK	Ferruginous Chert. Micro- to cryptocrystalline quartz with blotchy, diffuse limonite patches and small goethite segregations with clear quartz borders.	Some suggestion of relict coarse carbonate cleavage. No bedding.	Traces of fine carbonate in places. MnO ₂ (?pyrolusite) veins.
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May have been a coarsely-crystalline carbonate rock, now completely replaced by cherty quartz, but evidence not clear.
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1141-331 HEMISKURK	Hematitic Pelletal Chert. Irregular and ovoid elongate pellets of chert with varying amounts of ultrafine hematite; interstitial clear quartz cement; grades into pelletal chert.	Shapes of pellets clearly show that they were still plastic; deformed and squeezed.	Scattered carbonate rhombs, partly ferruginised. Cross-cutting quartz veinlets.
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Pale pellets are devoid of hematite. Rock is a "soft-pebble" deposit of deformed hematitic globules or pellets.

1141-333 HEMISKURK	Chert. Uniform micro- to cryptocrystalline quartz with variable hematite pigmentation and minute grains of ?oxidised pyrite, and carbonate rhombs.	Streaky, bedded structures; occasional pelletal textures. Fractured.	Silicified carbonate veins with relict cleavage. Quartz, goethite veins.
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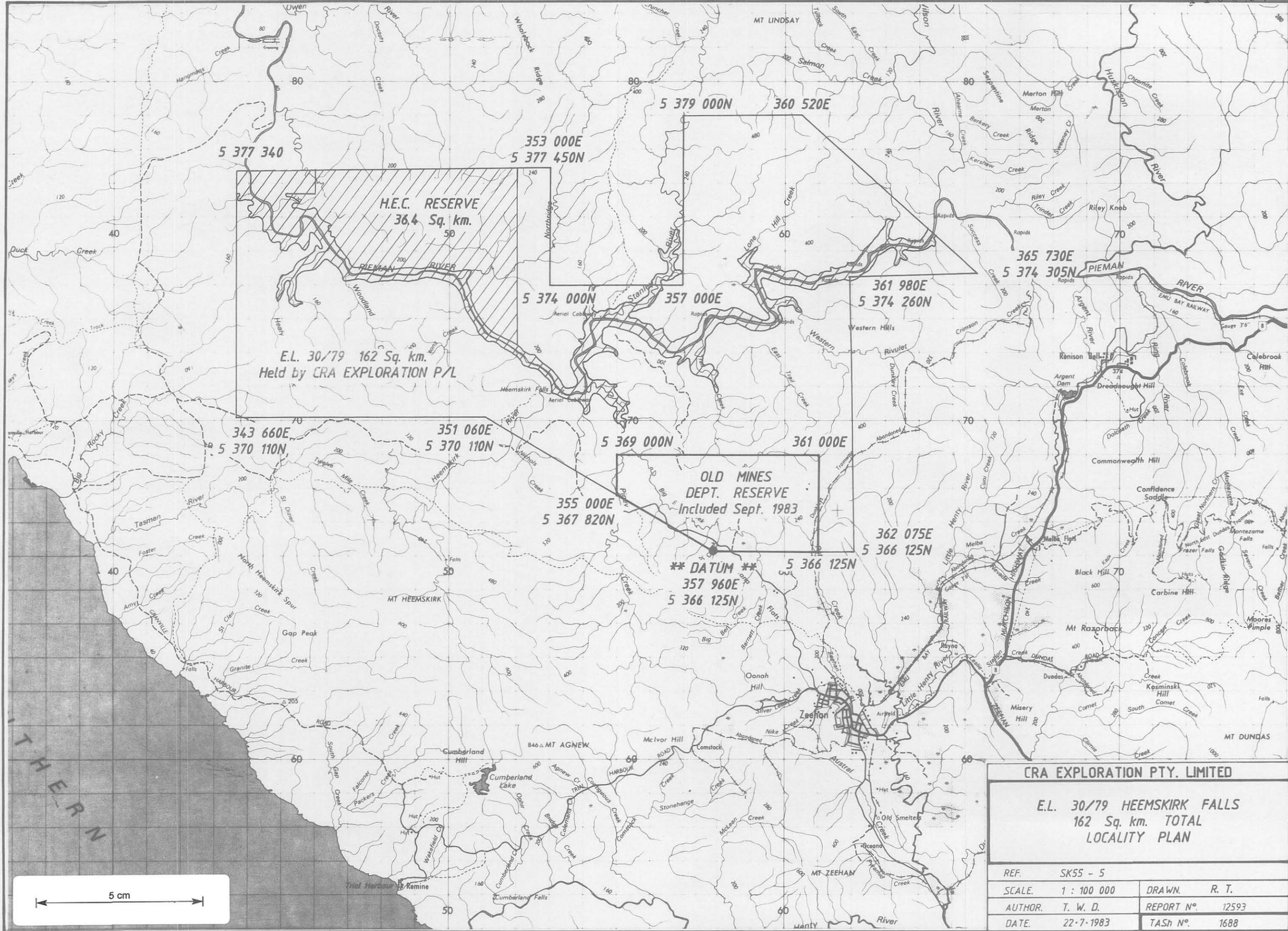
Appears to be a normal sedimentary chert, pyritic, but with hematitic pigment. Veins are mostly post-lithification.

1141-339 (T.S. 47942)	Dravite-Muscovite Metaquartzite. Thin bands of subparallel stubby dravite tourmaline crystals, intergrown muscovite, alternating with bands of mosaic quartz.	Compositional banding reflects banding in original rock. Medium-grained, schistose in places.	Occasional patches of cloudy leucoxene. Detrital zircon. Patchy Fe-staining.
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Dravite is Mg-rich tourmaline. Its occurrence here indicates probable metasomatism, as well as the greenschist-facies metamorphism.

STDI 2162			
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026



H.E.C. RESERVE
36.4 Sq. km.

E.L. 30/79 162 Sq. km.
Held by CRA EXPLORATION P/L

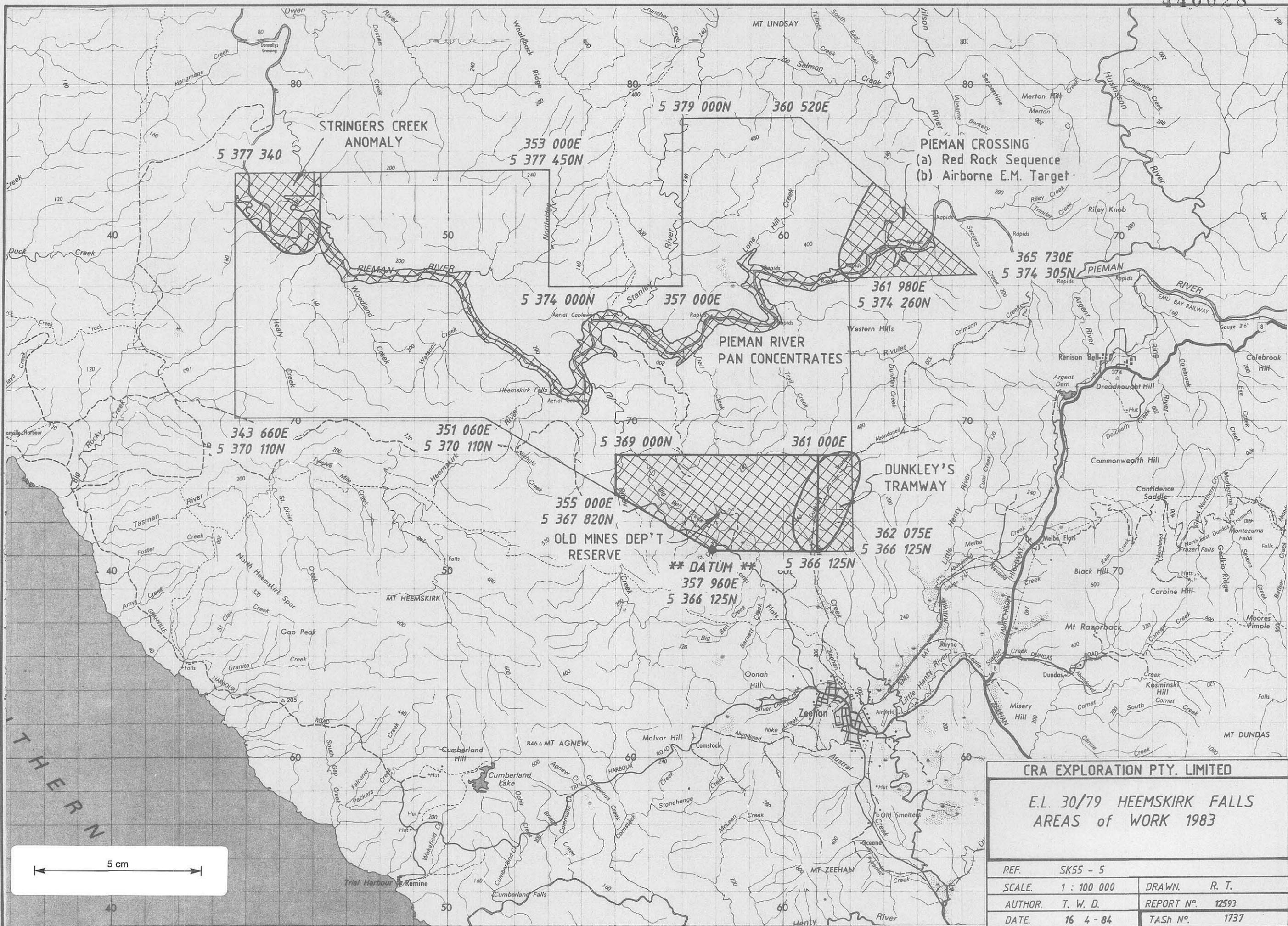
OLD MINES DEPT. RESERVE
Included Sept. 1983

**** DATUM ****
357 960E
5 366 125N

CRA EXPLORATION PTY. LIMITED	
E.L. 30/79 HEEMSKIRK FALLS 162 Sq. km. TOTAL LOCALITY PLAN	
REF. SK55 - 5	
SCALE. 1 : 100 000	DRAWN. R. T.
AUTHOR. T. W. D.	REPORT N°. 12593
DATE. 22-7-1983	TASH N°. 1688

027

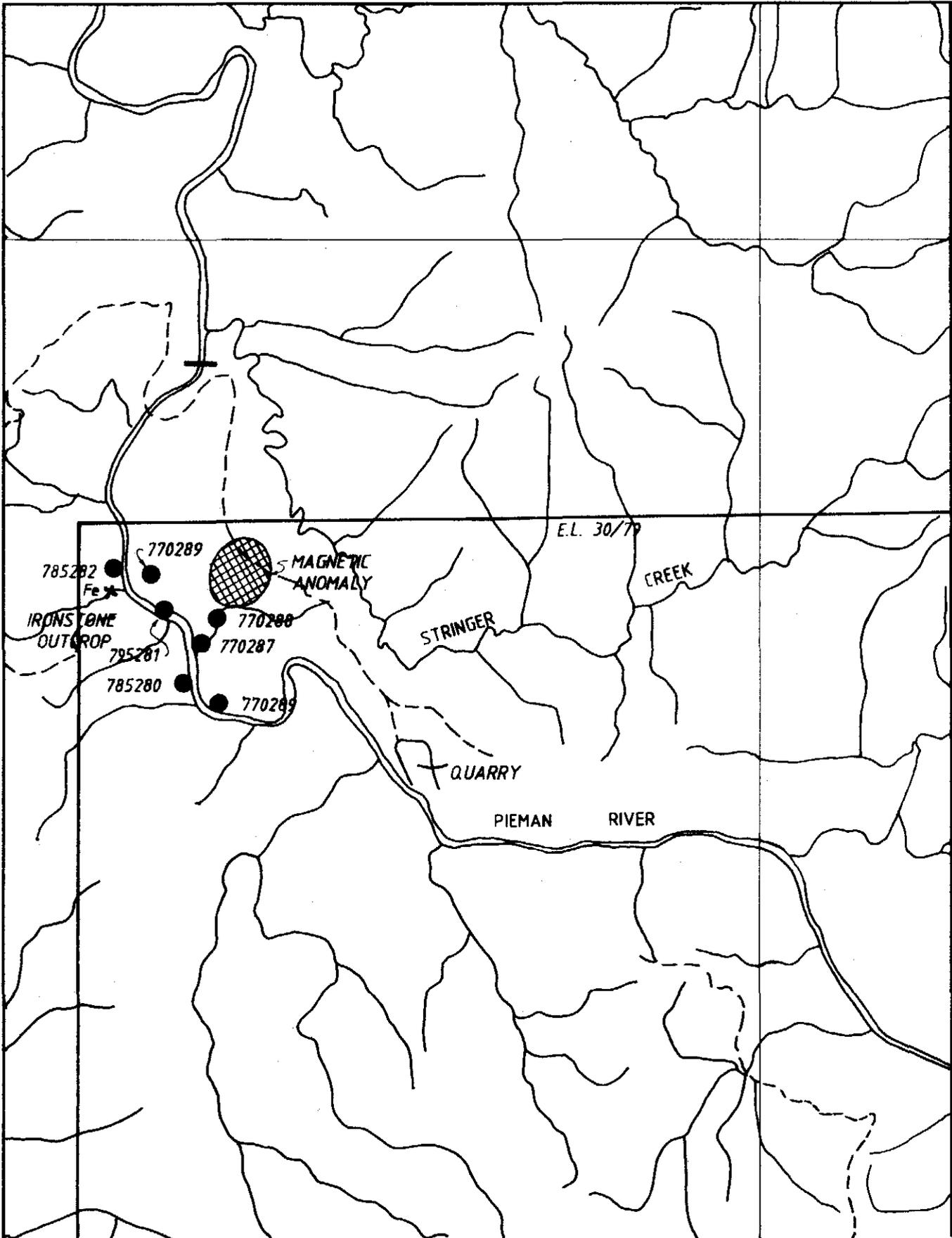
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CRA EXPLORATION PTY. LIMITED			
E.L. 30/79 HEEMSKIRK FALLS			
AREAS of WORK 1983			
REF.	SK55 - 5		
SCALE.	1 : 100 000	DRAWN.	R. T.
AUTHOR.	T. W. D.	REPORT N°.	12593
DATE.	16 4 - 84	TASH N°.	1737

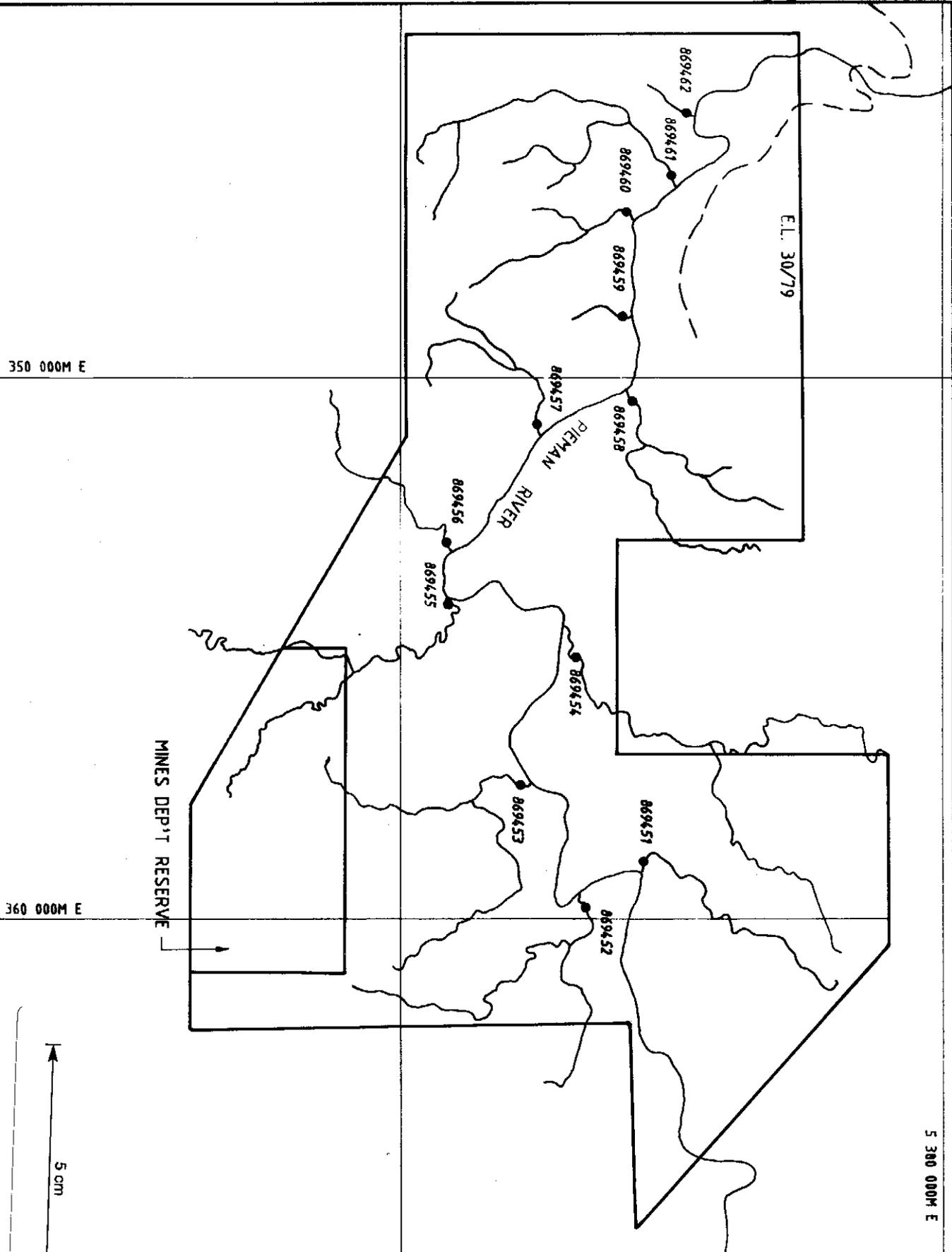
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028



CRA EXPLORATION PTY. LIMITED	
E.L. 30/79 HEEMSKIRK FALLS STRINGER CREEK AEROMAGETIC ANOMALY	
REF.	SK55 - 5
SCALE	1 : 50 000
AUTHOR	G.B.W.
DATE	12 - 4 - '84
DRAWN	G.W.
REPORT No.	12593
PLAN No.	TASH 1738

029



CRA EXPLORATION PTY. LIMITED
E.L. 30/79 HEEMSKIRK FALLS
PAN CON SAMPLE LOCATIONS

REF.	SK55 - 5	DRAWN	G.W.
SCALE	1 : 100 000	REPORT No.	12593
AUTHOR	T. W. D.	PLAN No	TASh 1739
DATE	12 - 4 - 84		



5 cm

350 000M E

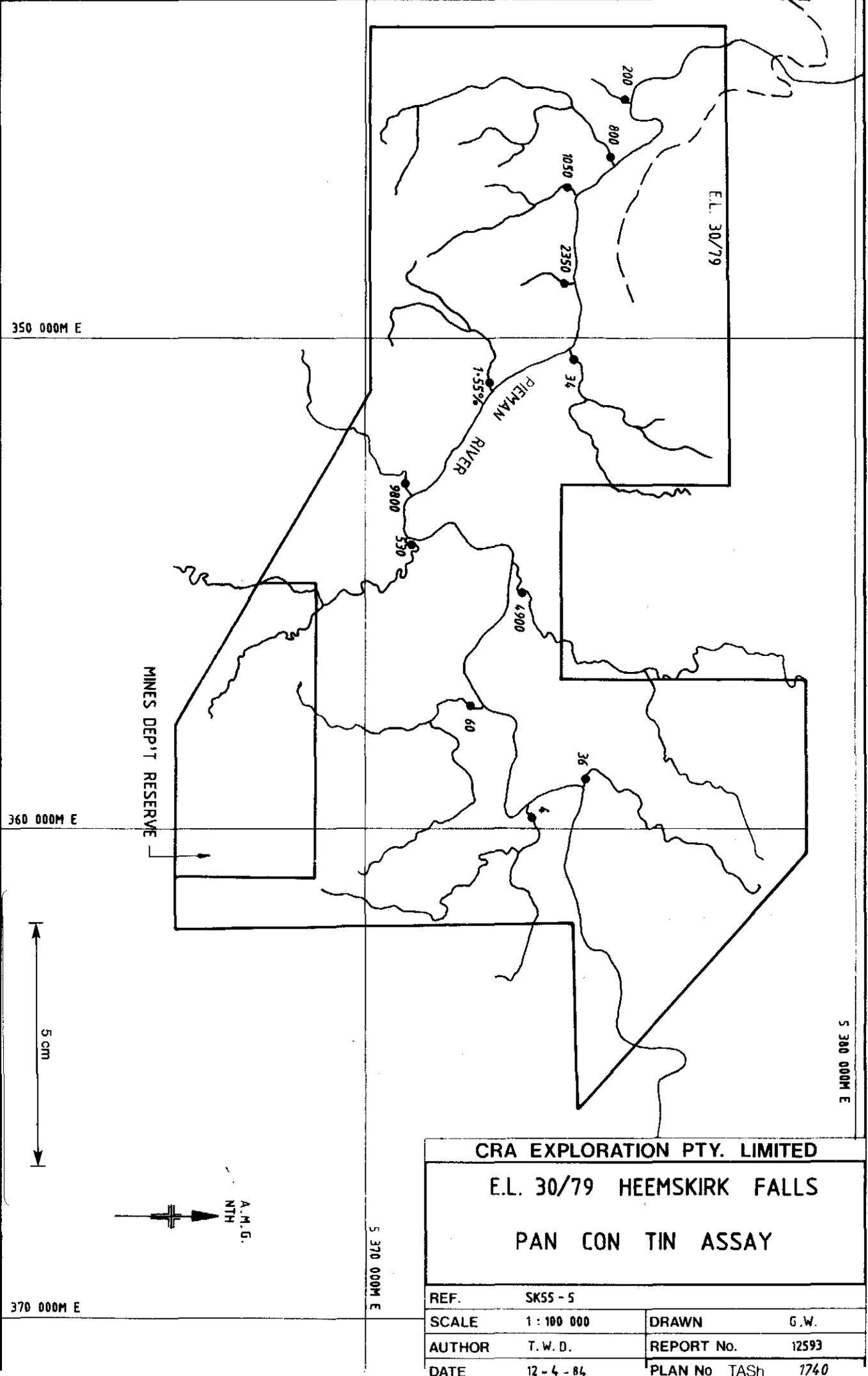
360 000M E

370 000M E

5 370 000M E

5 380 000M E

030



CRA EXPLORATION PTY. LIMITED
 E.L. 30/79 HEEMSKIRK FALLS
 PAN CONTIN ASSAY

REF.	SK55 - 5	DRAWN	G.W.
SCALE	1 : 100 000	REPORT No.	12593
AUTHOR	T. W. D.	PLAN No	TASH 1740
DATE	12 - 4 - 84		

350 000M E

360 000M E

370 000M E

MINES DEP'T RESERVE

E.L. 30/79

PIEMAN RIVER

5 CM

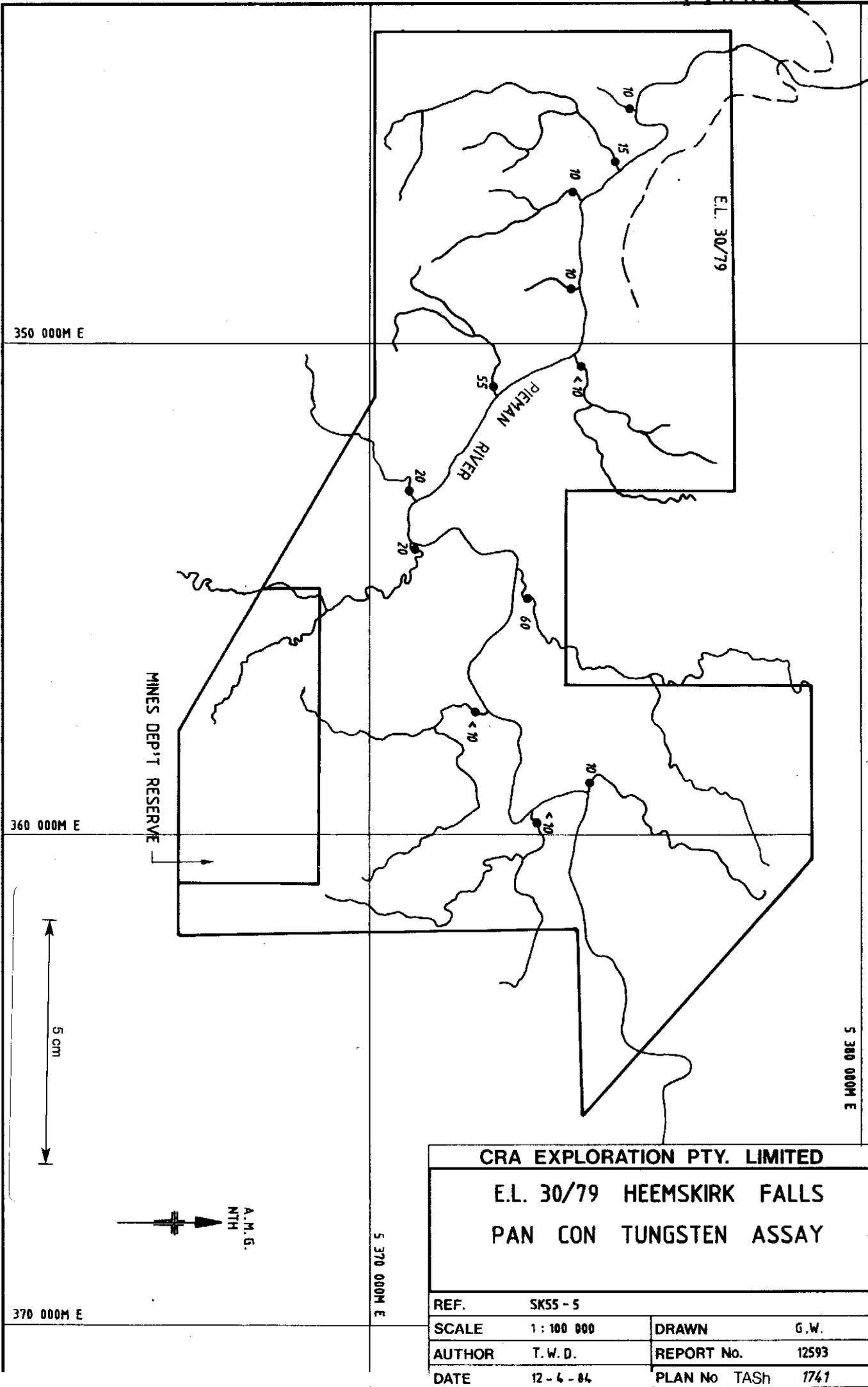
A.M.G.
NTH

5 370 000M E

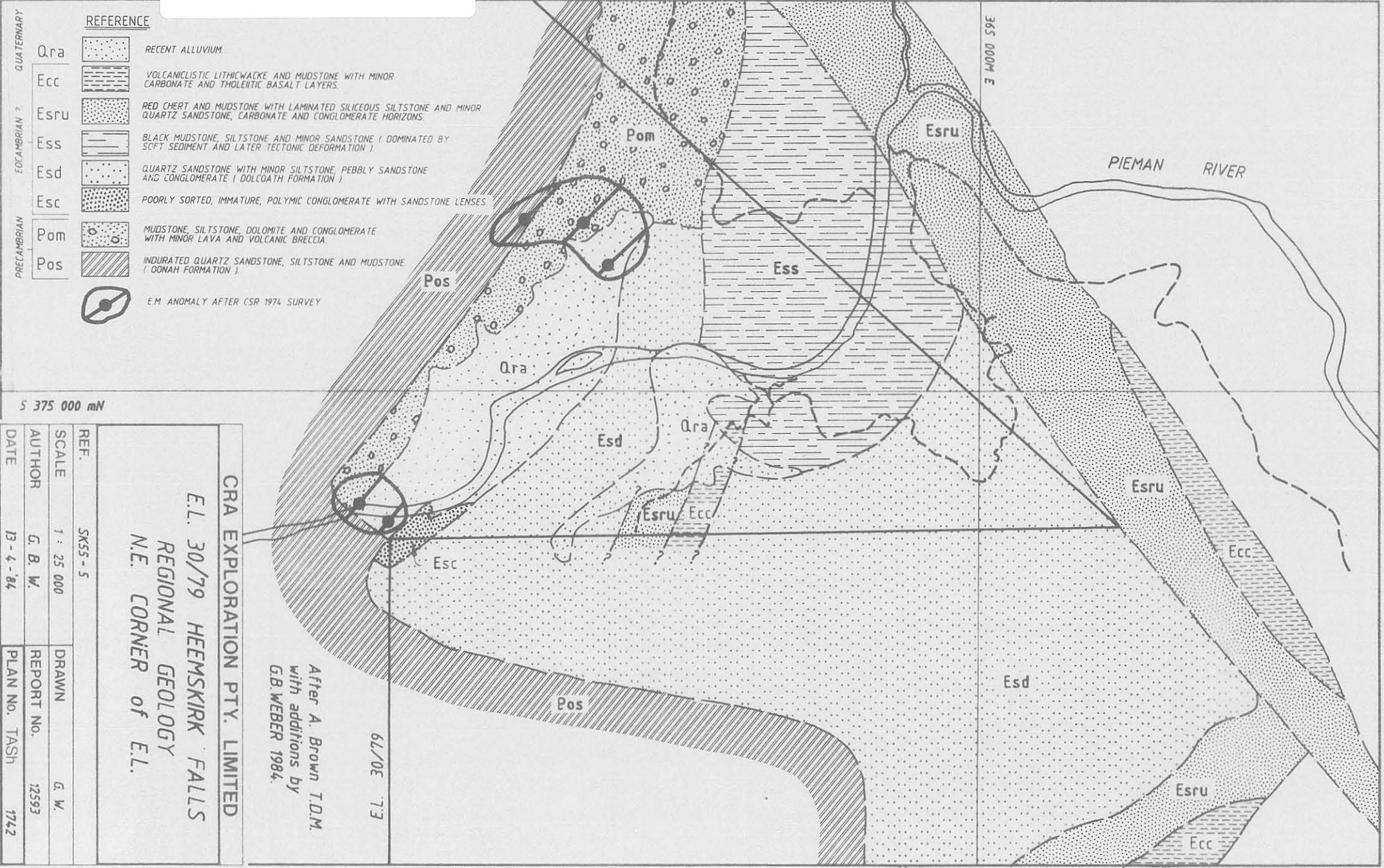
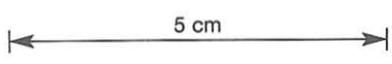
5 300 000M E

031

440032



CRA EXPLORATION PTY. LIMITED			
E.L. 30/79 HEEMSKIRK FALLS			
PAN CON TUNGSTEN ASSAY			
REF.	SK55 - 5	DRAWN	G.W.
SCALE	1 : 100 000	REPORT No.	12593
AUTHOR	T.W.D.	PLAN No	TASH 1741
DATE	12 - 6 - 84		



REFERENCE

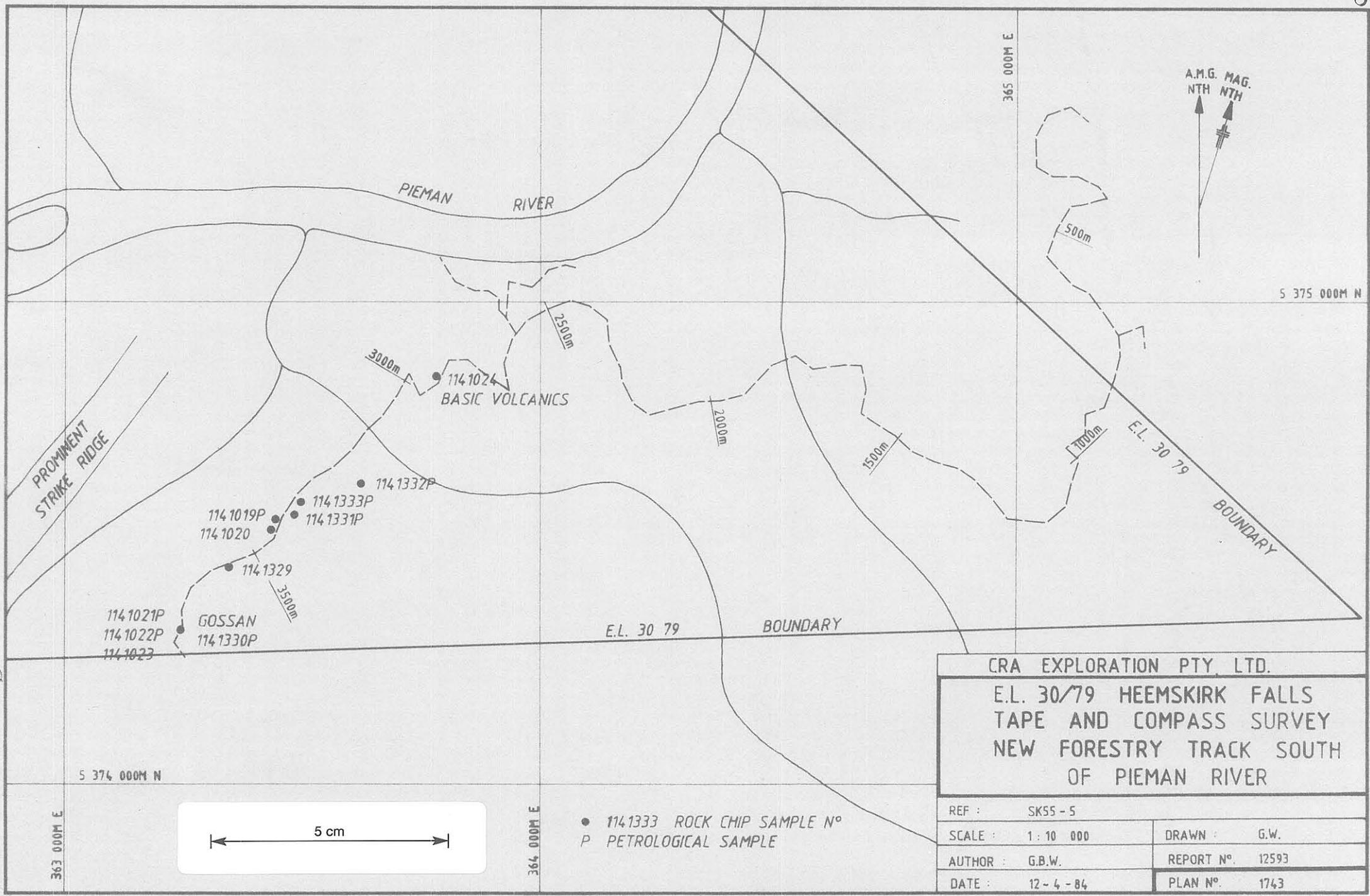
- QUATERNARY
 - Qra RECENT ALLUVIUM.
 - Ecc VOLCANICLITIC LITHICWACKE AND MUDSTONE WITH MINOR CARBONATE AND THOLEIITIC BASALT LAYERS.
 - EOCAMBRIAN ?
 - Esru RED CHERT AND MUDSTONE WITH LAMINATED SILICEOUS SILTSTONE AND MINOR QUARTZ SANDSTONE, CARBONATE AND CONGLOMERATE HORIZONS.
 - Ess BLACK MUDSTONE, SILTSTONE AND MINOR SANDSTONE (DOMINATED BY SOFT SEDIMENT AND LATER TECTONIC DEFORMATION).
 - Esd QUARTZ SANDSTONE WITH MINOR SILTSTONE, PEBBLY SANDSTONE AND CONGLOMERATE (DOLCOATH FORMATION).
 - Esc POORLY SORTED, IMMATURE, POLYMIC CONGLOMERATE WITH SANDSTONE LENSES
 - PRECAMBRIAN
 - Pom MUDSTONE, SILTSTONE, DOLOMITE AND CONGLOMERATE WITH MINOR LAVA AND VOLCANIC BRECCIA.
 - Pos INDURATED QUARTZ SANDSTONE, SILTSTONE AND MUDSTONE (OONAH FORMATION).
- EM ANOMALY AFTER CSR 1974 SURVEY

REF. SK55 - 5		DRAWN G. W.	
SCALE 1 : 25 000	AUTHOR G. B. W.	REPORT No. 22593	
DATE 13 - 4 - '84	PLAN No. TASH 1742		
CRA EXPLORATION PTY. LIMITED E.L. 30/79 HEEMSKIRK FALLS REGIONAL GEOLOGY N.E. CORNER of E.L.			

After A. Brown T.D.M.
with additions by
G.B. WEBER 1984.

66/0E T3

033

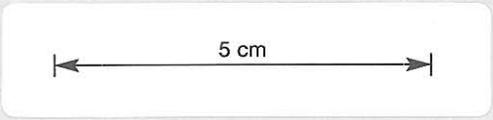


1118-48

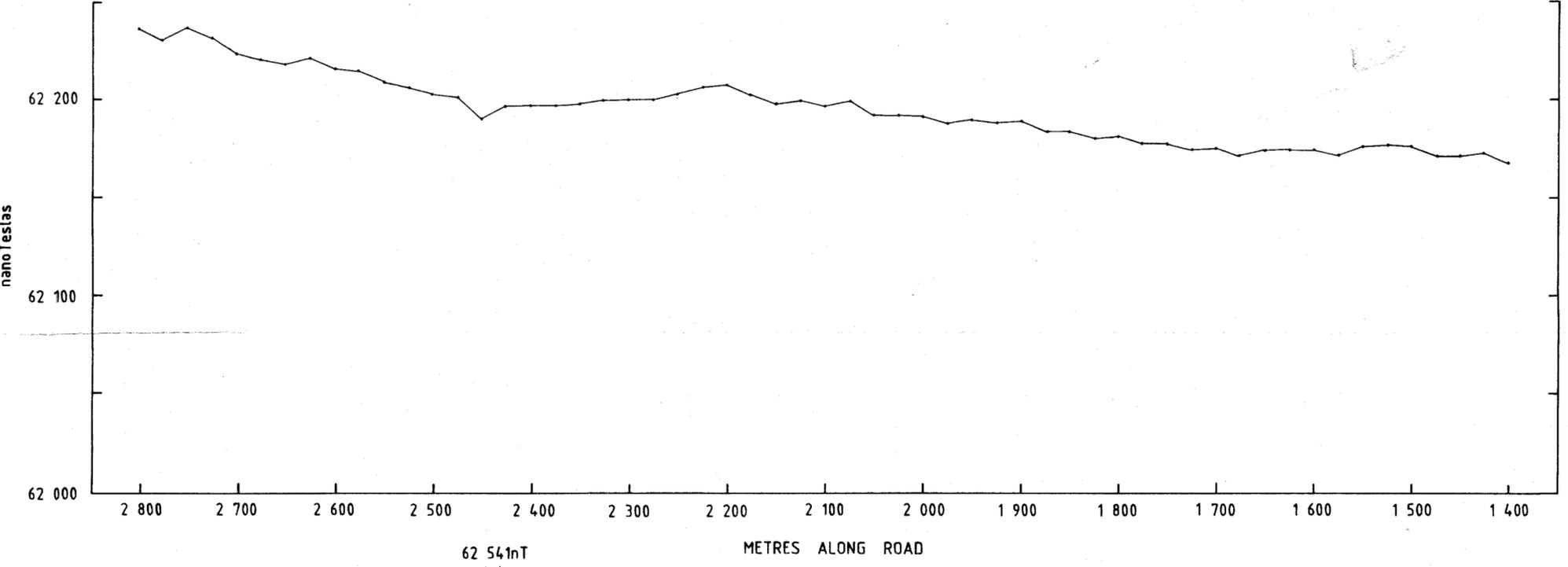
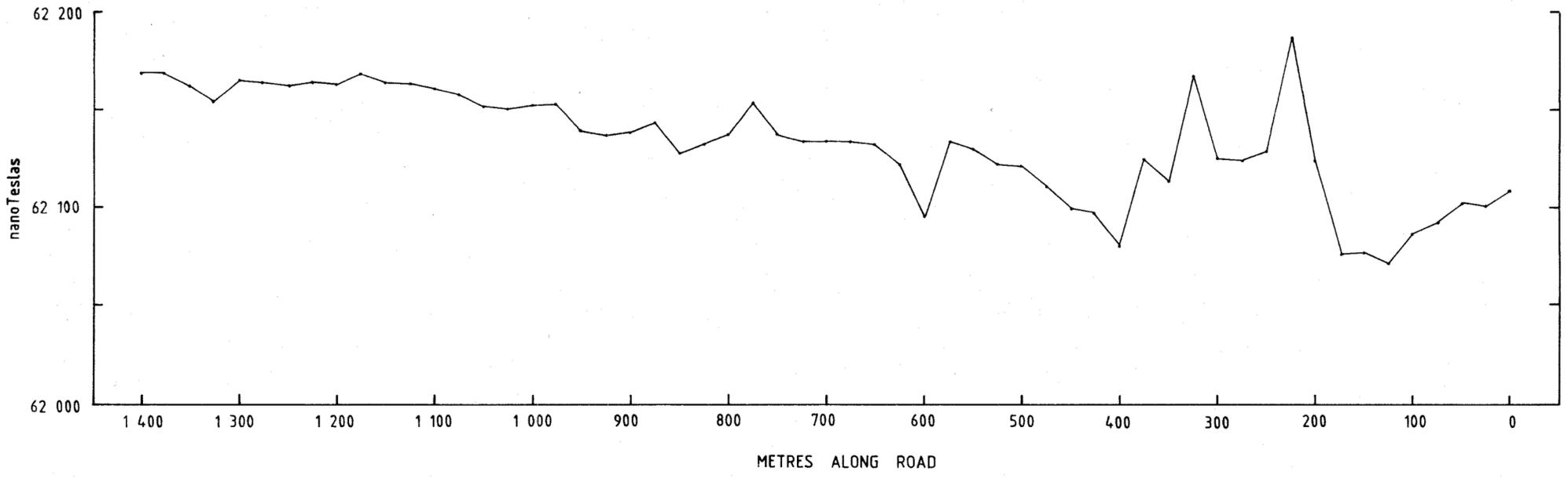
440034

CRA EXPLORATION PTY. LTD.	
E.L. 30/79 HEEMSKIRK FALLS TAPE AND COMPASS SURVEY NEW FORESTRY TRACK SOUTH OF PIEMAN RIVER	
REF :	SK55 - 5
SCALE :	1 : 10 000
AUTHOR :	G.B.W.
DATE :	12 - 4 - 84
DRAWN :	G.W.
REPORT N° :	12593
PLAN N° :	1743

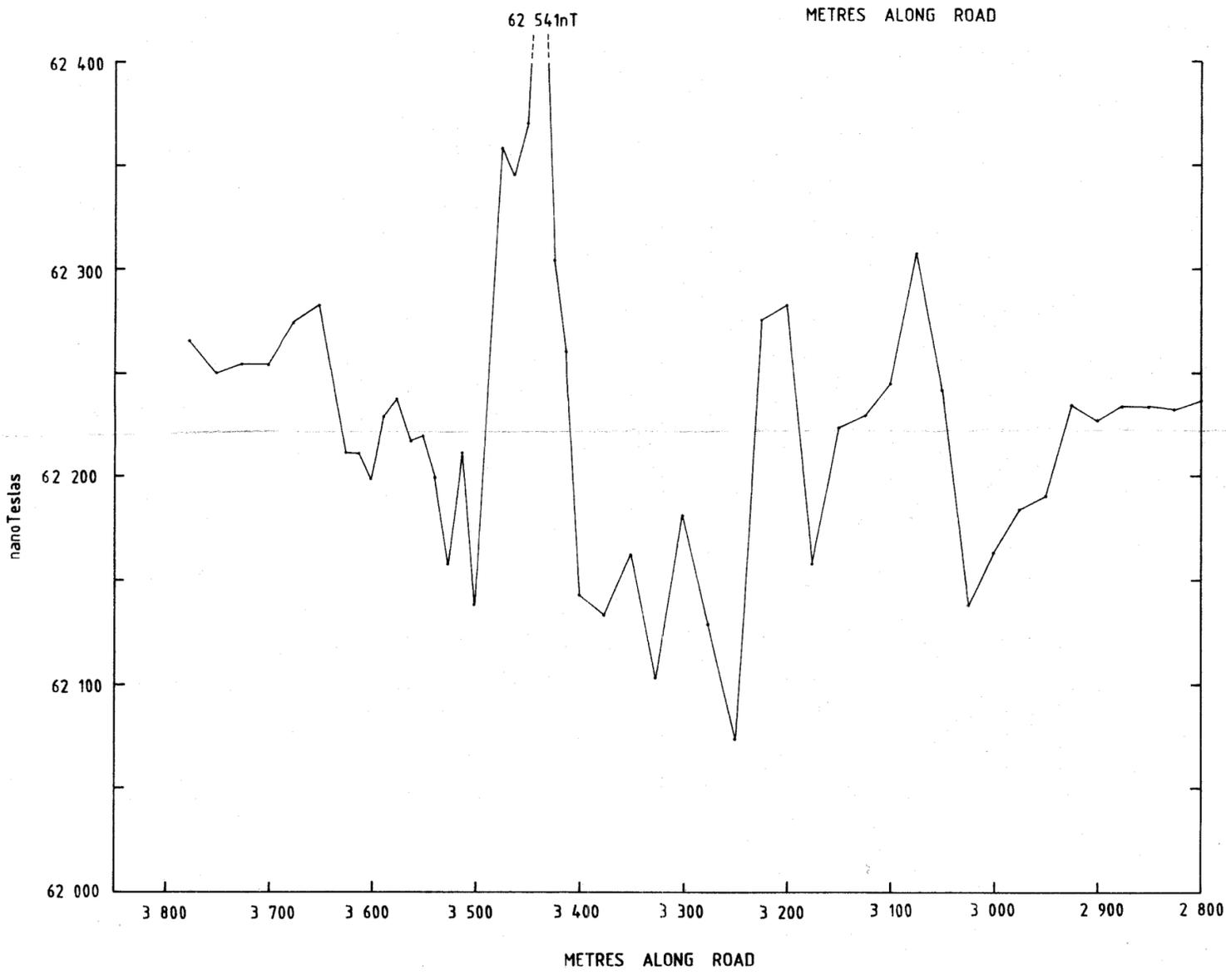
● 114.1333 ROCK CHIP SAMPLE N°
P PETROLOGICAL SAMPLE



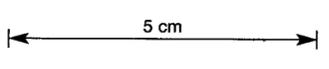
034A



034B



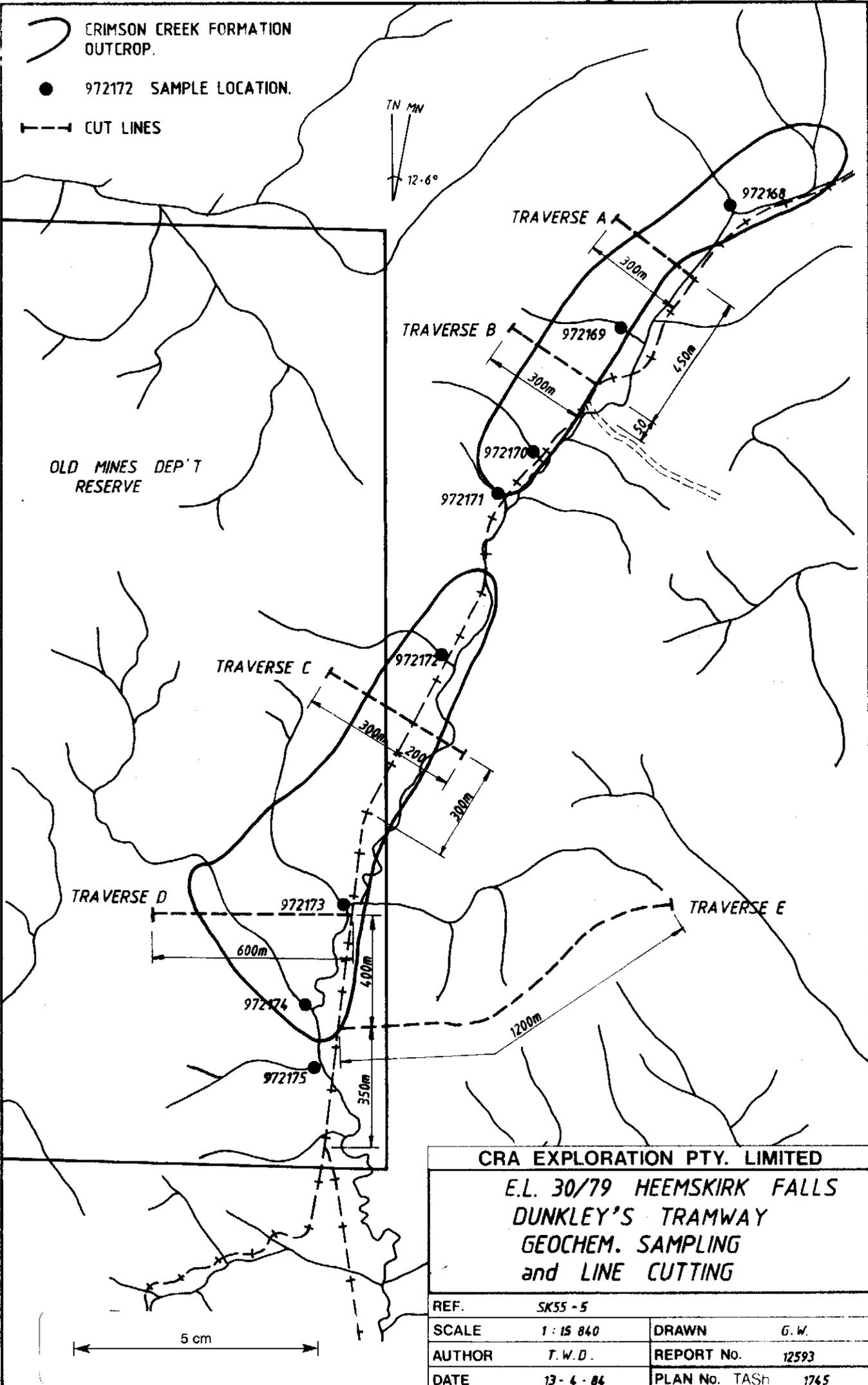
NOTE :
 LEVELLED EVERY 30 MINUTES
 BASE STATION READINGS VERY
 CONSTANT.



CRA EXPLORATION PTY. LTD.	
HEEMSKIRK FALLS E.L. 30/79	
GROUND MAGNETOMETER SURVEY	
of NEW FORESTRY ROAD	
SOUTH of PIEMAN RIVER	
REF : SK55-5	
SCALE : 1 : 5000	DRAWN : G.W. R.T.
AUTHOR : G.B.W.	REPORT N ^o . 12593
DATE : 12-6-84	PLAN N ^o . TASH 1744

440032

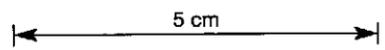
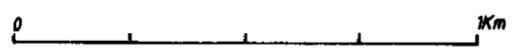
035



CRA EXPLORATION PTY. LIMITED
 E.L. 30/79 HEEMSKIRK FALLS
 DUNKLEY'S TRAMWAY
 GEOCHEM. SAMPLING
 and LINE CUTTING

REF.	SK55 - 5		
SCALE	1 : 15 840	DRAWN	G. W.
AUTHOR	T. W. D.	REPORT No.	12593
DATE	13 - 6 - 84	PLAN No.	TASh 1745

436



E.L. 30/79

CRA EXPLORATION PTY. LIMITED
 E.L. 30/79 HEEMSKIRK FALLS
 LOCATION of AIRBORNE
 ELECTROMANETIC ANOMALIES
 OLD MINES DEP'T RESERVE

REF.	SK55 - 5	DRAWN	G. W.
SCALE	1 : 15 840	REPORT No.	12593
AUTHOR	T. W. D.	PLAN No.	TASh 1746
DATE	13 - 4 - 84		