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EL 47/83 LYNCHFORD WEST TASMANIA

REPORT ON EXPLORATION MARCH 1985 - JANUARY 1986

OPEN FILE

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Date: 15 January 1986

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Accepted by:



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REPORT NO: 13722

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1.

1. SUMMARY

Exploration within El 47/83, since it was granted in March 1985, has comprised of compilation and evaluation of previous exploration, a re-interpretation of a DIGHEM survey, the initiation and virtual completion of a regional drainage survey for gold using new techniques and reconnaissance ground EM surveys.

A number of geophysical and geochemical anomalies north of the King River have been followed-up with negative results. Further anomalies remain for follow-up in future programmes. A model for a different style of mineralisation at the King River gold mine was proposed, tested and rejected.

South of the King River, reconnaissance mapping has identified an area of prospective Mt. Read volcanics which will require more detailed mapping and interpretation in order to select exploration targets.

2. INTRODUCTION

EL 47/83, Lynchford, covers an area of approximately 32 square kilometres to the south of Queenstown (Plans TASH 1457 and 2865). The EL was granted to CRA Exploration in March 1985. This report describes work for the period March 1985 - January 1986 and is to accompany the application for a renewal of the Licence.

3. CONCLUSIONS

A number of DIGHEM and drainage anomalies have been identified as requiring further follow-up in the portion of the EL north of

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the King River. Once this has been completed, this northern area can be considered as adequately tested for near surface base metal and gold mineralisation.

South of the King River new work is revealing a greater proportion of Central Volcanics than previously suspected. These have good potential for base metal and gold mineralisation and, considering the paucity of exploration in this area, are regarded as highly prospective. Further mapping is required to identify specific exploration targets.

4. RECOMMENDATIONS

1. The EL should be renewed for a further year in order to continue exploration.
2. Follow-up of drainage anomalies at Specimen Creek and evaluation of gold potential in that area using rock and sediment sampling and mapping, including locating the source of hydrothermally altered volcanics already found as float in this creek.
3. Additional sampling of the stockwork found at DIGHEM anomaly 8/738 and of the ironstone at DIGHEM 39/303.5.
4. Mapping south of the King River, particularly the Mt. Read Volcanics. New access being created by the H.E.C. must be mapped and sampled. This area has received little previous attention and the recent recognition of significant areas of Central Volcanics has upgraded it's prospectivity.

5. PREVIOUS EXPLORATION

The area has a very long history of prospecting and exploration; the King River Gold Mine was discovered before any of the shows in the Mt. Lyell field. Because of the proximity to that mining field, the area has seen an immense amount of prospecting, particularly for gold. It is highly likely that all obvious surface indications of possible mineralisation have already been found and prospected. The area is littered with small pits, costeans and adits which have investigated quartz veins and blows, gossanous weathering zones, faults and interesting lithologies.

The most recent exploration has been carried by Pickands Mather, Cyprus Mines and Renison Gold Fields (Mt. Lyell). Little modern exploration has been conducted south of the King River because of access problems.

5.1 Pickands Mather International (1965-1967)

To follow-up drainage anomalies a large grid established over the Lynch Creek area (Plan TASH 2866) Soil geochemistry located Pb and Cu anomalies but follow-up ground magnetics and "In-Line electromagnetic" surveys provided no encouragement for further investigation. High base metal backgrounds in the underlying basic volcanics explained the soil geochemistry. (Smith 1967).

5.2 Cyprus Mining Corporation (1971-1972)

Prompted by the recognition of favourable lithologies in the Lynch Creek-King River Gold Mine area, C.M.C. established a grid (Plan TASH 2866) and carried out detailed mapping, soil geochemistry, ground magnetics and IP. All responses were

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explained by the known geology and no drill targets were generated (C.M.C. 1972, Morris 1972).

5.3 Renison Goldfields Consolidated Ltd. (1980-1982)

Prior to the relinquishment of the area now covered by EL47/83, a drainage survey north of the King River was completed (TASH 2693, 2694) and parts of the area were covered by DIGHEM. No follow-up of these surveys was attempted. Two lines of IP over the King River Gold Mines failed to locate any anomalies (Komysan & Bishop 1982).

6. GEOLOGY

The geology between Queenstown and the King River has been mapped and described by Corbett (1979). South of the King River, existing mapping has been based on aerial photography; new tracks being made by the H.E.C. are providing information which will up-grade the quality of mapping in this area. Plan TASH 2867 is a compilation of CRAE, Mines Dept. and H.E.C. mapping and for the area south of the King must be regarded as provisional until further work is completed.

6.1 General Geology

6.1.1 Cambrian (Mt. Read Volcanics)

North of the King River the Mt. Read Volcanics present belong to the Western Volcano sedimentary sequence of Corbett (1979). They comprise greywackes, shales, vitric tuffs, quartz-phyric tuffs, agglomerates and basic lavas. Major quartz feldspar porphyry bodies within the sequence may be intrusive.

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Structurally the succession is anticlinal about a NNE-SSW axis. The most significant volcanic components in this Western Sequence are the basic lavas and tuffs within the core of the anticline and those on its western limb in the Lynch Creek area. In that area the basics are overlain by tuffs and agglomerates, the uppermost Cambrian units within the EL, which are in turn unconformably overlain by the Ordovician Pioneer Beds.

The Western Sequence strikes south of the King River where it is flanked to the east by units of the Central Volcanics (Corbett 1979). These are dominantly feldspar porphyries, feldspar phytic tuffs and some shales and sandstones. The contact between Western Sequence and Central Volcanics may be represented by a schistose zone recently exposed in the new Mt. Jukes-Lynchford road.

6.1.2 Ordovician

A 10-20m sequence of sandstones conglomerate and calcareous siltstones, correlates of the uppermost Owen Conglomerate or Pioneer Beds, unconformably overlies the volcanics in the west of the EL. It is succeeded conformably by the Gordan Limestone then Silurian sandstones and shales. The absence of Owen Conglomerate in this western part appears to be a primary depositional feature reflecting control of sedimentation by major faults east of the EL.

In the south of the EL moderate thicknesses of Owen Conglomerate are present overlying the Mt. Read Volcanics. The nature of the change between minimal deposition of Ordovician clastics (Pioneer Beds) in

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the north to the deposition of a significant thickness of Owen Conglomerate to the south is not known but a major fault controlling primary deposition is suspected.

6.2 Mineral Occurrences

Plan TASH 2866 shows the location of known mineral occurrences within the EL.

7. GEOPHYSICS

7.1 Airborne EM

In 1982 Mt. Lyell Mining & Railway Co. (RGCL) commissioned a DIGHEM II survey which covered the northern portion of this EL. Original interpretation of the data failed to locate any significant anomalies.

CRAE reappraised the data and recognised a number of subtle anomalies which are considered of interest (Appendix I and Plan TASH 2860). A number of these anomalies have been investigated and are described elsewhere in this report.

7.2 Aeromagnetism

Enhanced aeromagnetic contour plans from the DIGHEM survey were examined and major magnetic features were extracted (Plan TASH 2860) and compared with mapped geology. Good correlation between the magnetism and the mapping is evident except for a NNE swing in strike towards the King River.

The Mines Dept. West Coast aeromagnetic survey, plotted at

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suitable scales was integrated with regional geology (Plan TASH 2868).

No magnetic anomalies worthy of follow-up were recognised.

7.3 Ground EM

Whilst conducting follow-up of DIGHEM anomalies, a number of traverses were made covering new access tracks using an SE-88 GENIE system. The results of the traverses, and of those over specific DIGHEM targets are given in Appendix II.

No interesting anomalies were located.

8. DRAINAGE GEOCHEMISTRY

8.1 Previous Surveys

Both P.M.I. and R.G.C. have conducted quite intensive stream sediment sampling programmes over the EL north of the King River. Plans TASH 2693 and 2694 summarise the results of these programmes. Gold determinations were infrequent.

In general the results reflect bedrock geochemistry. The basic volcanics in the Lynch Creek area have higher base metal backgrounds, particularly Zn, plus known vein gold occurrences, this is evident in the drainage geochemistry. No discrete anomalies have been recognised as worthy of follow-up.

8.2 1985 CRAE Survey

Because of the lack of gold determinations and of sampling

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south of the King River, a regional sediment sampling programme was carried out. This was designed to test for fine (invisible) Au, both as a primary target and as a pathfinder for base metal mineralisation.

Samples were collected from all accessible major drainages and analysed using cyanide leach techniques sensitive down to 50 ppt Au. Such techniques have been tested elsewhere on the West Coast in orientation surveys which show that sample density as low as 1 per 5 sq.km. is effective in locating ultrafine gold associated with known base metal deposits. Standard -80 mesh samples were also collected for base metal and gold determinations.

The results (Appendix III, Plan TASH 2869) located only one definite anomaly (2100 ppt Au, Specimen Creek) and a number of possible anomalous values (>900 ppt Au). All drain or are close to known gold workings but are still regarded as significant because the CN technique is known to be inefficient at reporting coarse gold such as found in typical quartz vein gold occurrences. The implication is that these results are indicative of fine gold, possibly associated with base metal sulphides or perhaps low grade, large tonnage, hydrothermal gold mineralisation. Follow-up of these anomalies is planned.

9. PROSPECT EVALUATION

9.1 King River Gold Mine

Whilst known to be a quartz vein hosted gold occurrence, all reports on the workings comment upon the depth and intensity of weathering of the host andesites. It was considered possible that this might be indicative of a strong,

9.

pervasive argillic alteration associated with a hydrothermal stockwork with gold mineralisation too fine or low grade to have been recognised by the old miners.

Field examination noted a quite well developed fracture system or stockwork within the andesites but no evidence of any argillic or other alteration. Sampling failed to locate any interesting gold values (Appendix III).

No further work is proposed.

9.2 DIGHEM Anomaly 10/713

GENIE-EM, reconnaissance mapping and some soil sampling was completed over three lines cut over this anomaly. The GENIE-EM results did not indicate any significant conductors (Appendix II). It is thought that the DIGHEM response was due to an area of weathered andesites occupying swampy ground in the west of the grid (Plan TASH 2870).

Soil, rock and drainage sampling did not locate any anomalies. No further work is proposed.

9.3 DIGHEM Anomaly 39/303.5

A grid was cut over this anomaly (TASH 2866) on which an ironstone was located, close to the interpreted site of the anomaly. The geology mapped showed a N-S striking succession of grey to black shales, reworked tuffs, greywackes and minor quartzites. Quartz veining is common and numerous pits and trenches have been put down on the larger veins. The ironstone consists of a friable mass of welded goethite/limonite plates, with no evidence of box works. It appears to be limited in extent and may well be a

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surficial ferricrete.

GENIE-EM failed to locate any anomalies associated with the ironstone or elsewhere on the grid (Appendix II). It is possible that the DIGHEM response was caused by black shales.

Assays of the ironstone revealed slightly anomalous As (240 ppm) but no base or precious metal anomalies. Samples from numerous small creeks in the area returned no anomalous values.

Further follow-up should consist of additional rock sampling about the ironstone.

9.4 DIGHEM Anomaly 8/738

Previously written-off as due to the Queenstown dump, this anomaly has been re-interpreted as possibly being on the east bank of the Queen River. A new power line (post DIGHEM survey) prevented meaningful results being obtained by a GENIE-EM traverse of the area (Appendix II).

Strongly silicified and fractured quartzite with malachite or possibly fuchsite was found at the site. Sampling has not located any anomalous geochemistry but further sampling is proposed.

9.5 DIGHEM Anomalies 22/530 and 21/544.5

The Lynchford H.E.C. camp has recently constructed over the sites of these two anomalies. Excavations for the camp are reported to have uncovered sphalerite-galena veinlets within Gordon Limestone at 22/530. Such small Pb-Zn shows are

quite common in this formation.

21/544.5 appears to lie over a highly weathered basic or ultrabasic body faulted (?) against the limestone. Sampling revealed no anomalies.

Further work is impractical.

9.6 DIGHEM Anomaly 28/449

Highly carbonaceous and pyritic black shales located at the site of this anomaly adequately explain the response. Sampling of these shales plus associated breccias and a ferruginous fault zone for base metals and gold located no anomalies. No further work is proposed.

9.7 Specimen Creek

The 2100 ppt Au CN leach drainage anomaly has not yet been followed up. Whilst the known quartz vein hosted gold mineralisation maybe responsible for the anomaly, the potential for fine gold will be checked. Float of highly silicified and haematized volcanics found in the creek indicate the presence of hydrothermally altered areas within the catchment.

Follow-up will consist of further drainage sampling, mapping and rock chip sampling.

10. REFERENCES

- | | | |
|--------------------------------|------|--|
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11. LOCATION

Queenstown 1 : 250 000 Sheet SK55-5

13.

12. KEYWORDS

Cambrian, acid volcanics, andesite, basic volcanics, pyroclastics, shales. Ordovician, conglomerate, sandstone. Silurian. Geophysics, aeromagnetics, EM, GENIE-EM, DIGHEM. Geochemistry, soil, rock, drainage.

13. LIST OF PLANS

<u>Plan No</u>	<u>Title</u>	<u>Scale</u>
TASH 1457	Application for Exploration Licence Lynchford.	1:100 000
TASH 2865	Lynchford EL 47/83 Location Plan	1:1 000 000
TASH 2866	Lynchford 47/83 Grid Location Plan plus Mineral Occurrences.	1:10 000
TASH 2867	Lynchford EL 47/83 Geological Interpretation	1:10 000
TASH 2860	Lynchford EL 47/83 Geophysical Compilation Showing DIGHEM Anomalies, GENIE-EM Traverses and Aeromagnetic Features	1:10 000
TASH 2868	Lynchford EL 47/83 Regional Aero- magnetics and Geology	1:100 000
TASH 2693	Lynchford EL 47/83 Stream Sediment Sample Locations (Previous Explorers)	1:10 000

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- TASH 2694 Lynchford EL 47/83 Stream Sediment 1:10 000
Sample Results (Previous Explorers)
- TASH 2869 Lynchford EL 47/83 CRAE Geochemical 1:10 000
Sampling and Gold Drainage Geo-
chemistry
- TASH 2870 Lynchford EL 47/83 DIGHEM Anomaly 1:5 000
10/713 Follow-Up Grid, Geology and
Sample Locations

14. LIST OF APPENDICES

- Appendix I Lynchford DIGHEM Survey.
- Appendix II Reconnaissance Lines Over The Lynchford EL Using
The SE-88 GENIE System.
- Appendix III Sample Ledgers.
- Appendix IV Petrological Reports.

APPENDIX I

LYNCHFORD DIGHEM SURVEY



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IN REPLY PLEASE QUOTE

MEMO TO: I. M. CLEMENTSON
COPY TO: T. W. DICKSON

MEMO FROM: T. VON STROKIRCH

SUBJECT: LYNCHFORD DIGHEM SURVEY

On inspection of the DIGHEM data from the survey performed for Mount Lyell Mining and Railway company in 1982 a number of further anomalies can be extracted from the data. These are generally very small resistivity anomalies which have presumably been discounted as being due to minor surface variations but which may in fact have some bedrock source. All the anomalies are listed below including those previously considered and are graded according to relative interest. The anomalies are labelled according to flight line and fiducial.

Grade One

8/738 Strong anomaly associated with a magnetic response but it appears to be due to a real conductor. Unfortunately I suspect that this is the Queenstown car dump.
15/642.7 A strong anomaly in the resistivity channel near the flank of a magnetic feature.
16/629.7 Good resistivity anomaly.
22/523.7 Conductor on the flank of a magnetic high. This anomaly was picked out by DIGHEM as a possible conductor.

Grade Two

9/726.8 Large resistivity anomaly near a big flight velocity change. This may have affected the response.
10/713 Narrow subtle resistivity anomaly
11/701.2 Very narrow resistivity anomaly
16/624.5 Small anomaly
21/544.3 Big resistivity anomaly but of poor form.
39/304.5 Broad subtle resistivity anomaly
2/867.9 Resistivity anomaly on edge of low. Possibly a contact.
2/869.2 Resistivity anomaly on edge of low. Possibly a

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PAGE 2

contact.

11/700.4 Broad resistivity low reaching from 700.2 to 700.5
across the end of a magnetic anomaly

24/498.7 Small anomaly

28/449 Small anomaly

Conclusion

The anomalies apart from the grade one anomalies are
extremely small, in fact some of the grade three responses
are very close to background, so these smaller anomalies are
not recommended for follow up without better excuse.

Torbjorn von Strokirch

APPENDIX II

RECONNAISSANCE LINES OVER THE LYNCHFORD EL USING THE

SE-88 GENIE SYSTEM



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COPY TO: T.W. DICKSON

MEMO FROM: T. VON STROKIRCH

SUBJECT:

RECONNAISSANCE LINES OVER THE LYNCHFORD EL USING THE SE-88 GENIE SYSTEM

The Genie system was used in order to traverse some recently cut HEC lines and roads in the area. A portion of a Goldfields grid was also traversed as well as two CRA grids over DIGHEM anomalies. The results were not exciting though a number of shallow conductors were detected.

On all lines readings were taken at 25 metre intervals using a 100 metre separation between the receiver and transmitter except for the track under the power line where a 50 metre separation was required. The responses at two frequency pairs 3037/112.5 Hz and 337/112.5 Hz. were measured at all stations. The results for the various areas follow.

LYNCHFORD HEC ROAD SOUTH OF KING RIVER

This road is at present under construction which led to very noisy readings in those portions which were being worked at the time of the survey. This is exemplified by the very noisy area

between 3600E and 4400E where a lot of work was being done widening the road. Between 1860E and 3500E the surface conductivity is higher but there is no change in the lower frequency response so this effect is due to different weathering or cover rather than to a more conductive rock type. The apparent conductor at 1860E is due to a shed. On the whole this line did not prove up anything of interest. The expected continuation of the Henty fault did not even show up.

GRID OVER DIGHEM ANOMALY 39/303.5

Three lines 150 metres apart were surveyed over the grid which lies over a strong DIGHEM anomaly and also a gossan like iron stone. No distinct anomaly was found over the gossan though an area of higher surface conductivity occurs between 5975E and 6150E on line 6850N. The lower frequency is also displaying some anomalous response indicating some variation in the rock conductivity but it is not possible to define any separate conductors. This area may be the source of the DIGHEM anomaly that is being followed up. The other lines both have areas of slightly higher surface conductivity but no conductors of interest.

GOLDFIELDS GRID

Two lines were surveyed over a grid put in by Goldfields on the edge of the Lynchford EL. No bedrock conductors were detected.

GRID OVER DIGHEM ANOMALY 10/713

Shallow anomalies occurring only on the higher frequency can be seen on all three lines though line 5100N did not go far enough to completely cover both peaks. In no case is there a response on the lower frequency indicating that the anomaly is caused by a very shallow source. The anomaly is centered on 3320E on line 5100N, 3240E on line 5000N and 3275E on line 4900N. On line 4900N

there is an anomaly at 3025E which is due to a deeper source. This greater depth is inferred because of the well defined peaks on both frequencies. The two peaks are too close together to lend themselves to quantitative interpretation but the amplitudes are not such that there is likely to be a sizeable ore body there. There is an indication of a slight anomaly on line 5000N at 2875E which may be a continuation of this feature though the dip appears to be in the opposite direction. At the western end of lines 4900N and 5000N there is a sharp increase in the resistivity indicating either that there is a contact with a more resistive rock type or that the rocks are generally fresher.

DIGHEM ANOMALY 8/738

This line ran directly under a power line so it did not prove possible to measure 3037/112.5 Hz and because of the high level of noise it was only possible to read the lower frequency with a transmitter/receiver separation closed in to 50 metres. Due to the small receiver separation the trough between the peaks on an anomaly due to a narrow dyke like body will be only be visible on one point which makes it difficult to distinguish them from noise. Two conductive features occur on the line, one centred on 425N and the other on 300N. Both probably dip to the north and the one at 300N is the stronger but little more can be said without more information. Both are centred on power line poles which gives food for thought. A third pole does not give a distinct anomaly.

DIGHEM ANOMALY 22/530

The proposed survey line was through the middle of the HEC offices and camp. A check of noise levels was made and these were found to be extremely high so the survey was not attempted.

CONCLUSIONS

It is difficult to justify doing any further work on DIGHEM anomaly 8/738 when the anomalies coincide with power poles though the airborne anomaly presumably was caused by something. Both anomalies are reasonably strong and probably of shallow source if not due to the poles so a bit of soil geochemistry might indicate whether there is any future in them. The other conductor recorded during the program, on the DIGHEM anomaly 10/713 is not sufficiently well defined to be a single body and does not seem to be of the amplitude as that might be expected from an ore body. In conclusion, the GENIE program does not seem to have turned up any anomalies of interest.

T. VON STROKIRCH

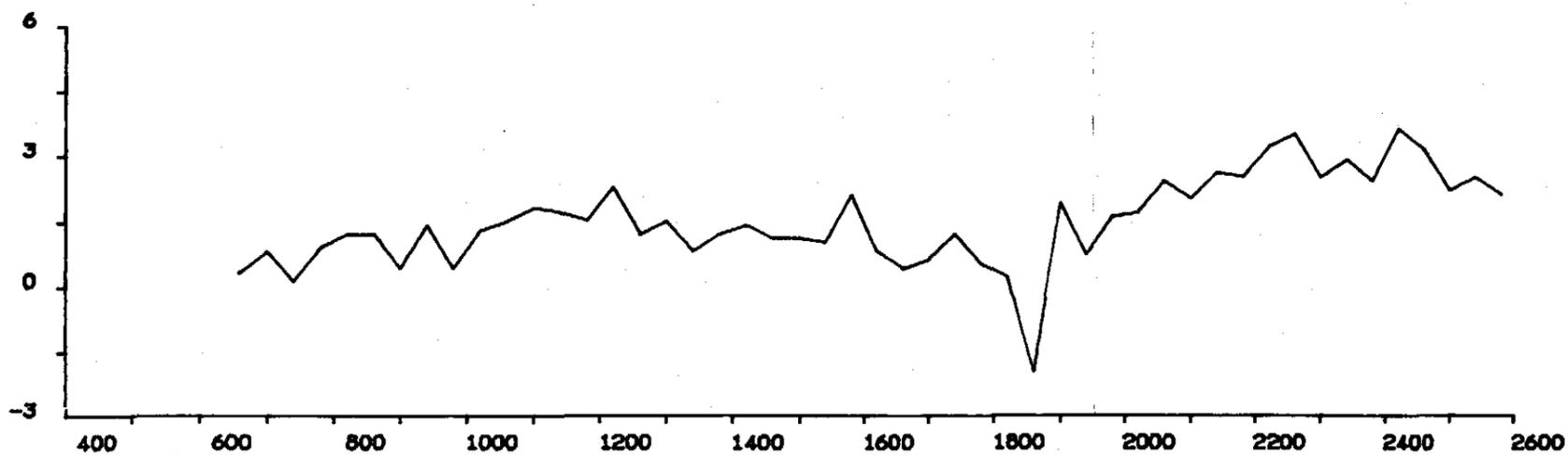
LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Tash 2860 (Missing - Not on Microfiche)	Lynchford EL 47/83 Geophysical compilation showing DIGHEM anomalies , GENIE-EM Traverses and Aeromagnetic Features	1:10 000
Tash 2844	Lynchford EL 47/83 GENIE Traverses, Lynchford H.E.C. Road West	1:10 000
Tash 2845	Lynchford EL 47/83 GENIE Traverses, Lynchford H.E.C. Road East	1:10 000

Tash 2797	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 8/738	1:2500
Tash 2798	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 39/303.5 Line 6700E.	1:2500
Tash 2799	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 39/303.5 Line 6850E.	1:2500
Tash 2800	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 39/303.5 Line 7000E.	1:2500
Tash 2846	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 10/713 Line 4900N.	1:2500
Tash 2847	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 10/713 Line 5000E.	1:2500
Tash 2848	Lynchford EL 47/83 GENIE Traverses, DIGHEM Anomaly 10/713 Line 5100E.	1:2500

3037/112 HZ

LYNCHFORD HEC ROAD



3037/112 HZ

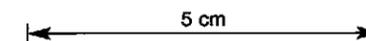


337/112 HZ

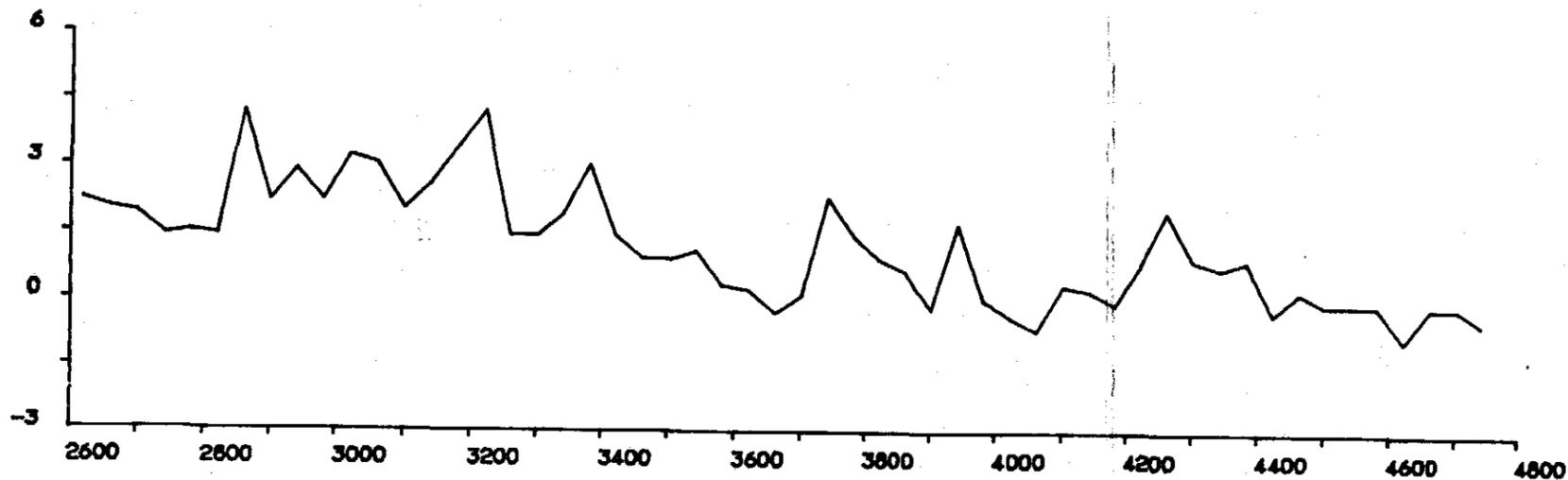
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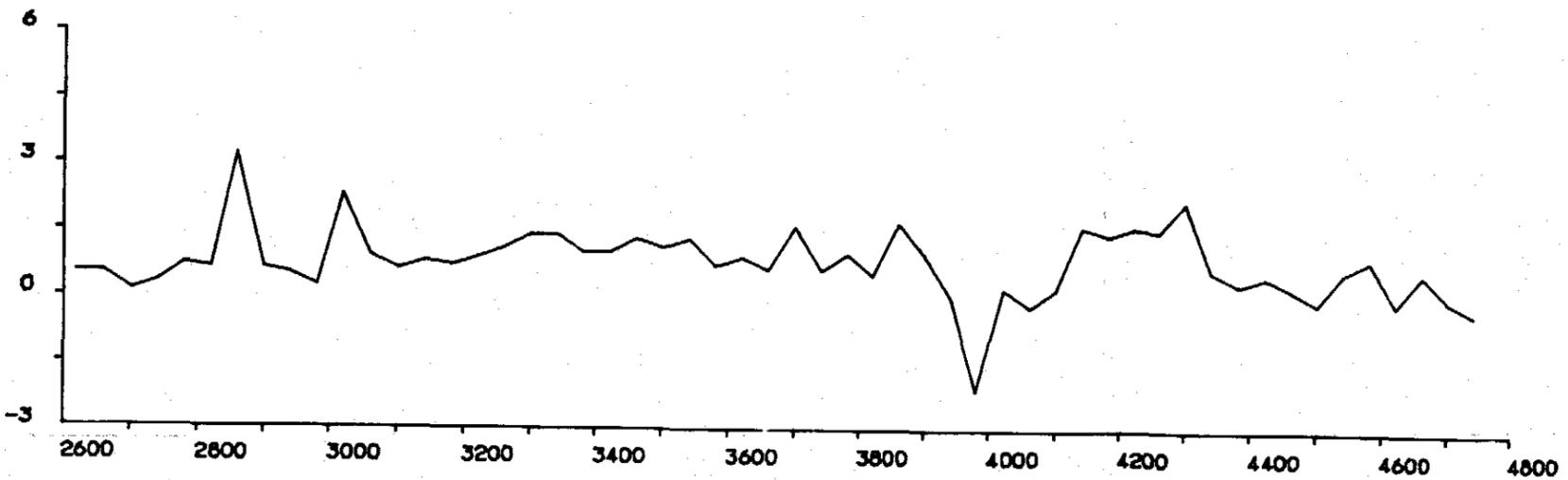
CRA EXPLORATION PTY. LIMITED	
LYNCHFORD E.L. 47/83	
GENIE PROFILES	
LYNCHFORD H.E.C. ROAD WEST	
REF.	SK55 - 5 (8073)
SCALE	1 : 10000
AUTHOR	T.v.S.
DATE	JAN 1986
DRAWN	T.v.S.
REPORT No.	
PLAN No.	TASh 2844



LYNCHFORD HEC ROAD



3037/112 HZ



337/112 HZ

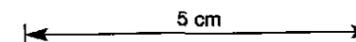
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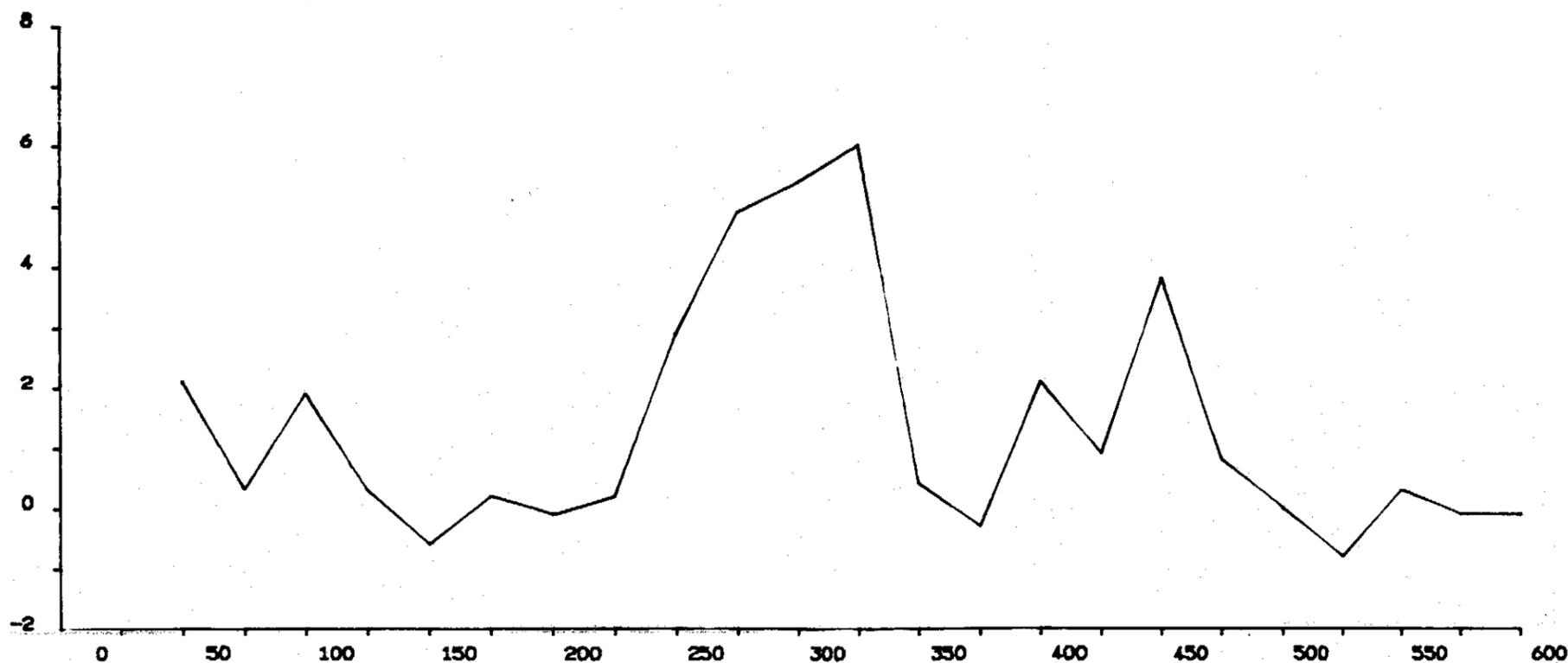
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100m Separation
Tx in East

CRA EXPLORATION PTY. LIMITED

LYNCHFORD E.L. 47/83
GENIE PROFILES
LYNCHFORD H.E.C. ROAD EAST

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AUTHOR	T.v.S.	REPORT No.
DATE	JAN 1986	PLAN No. TASH 2845





337/112 HZ

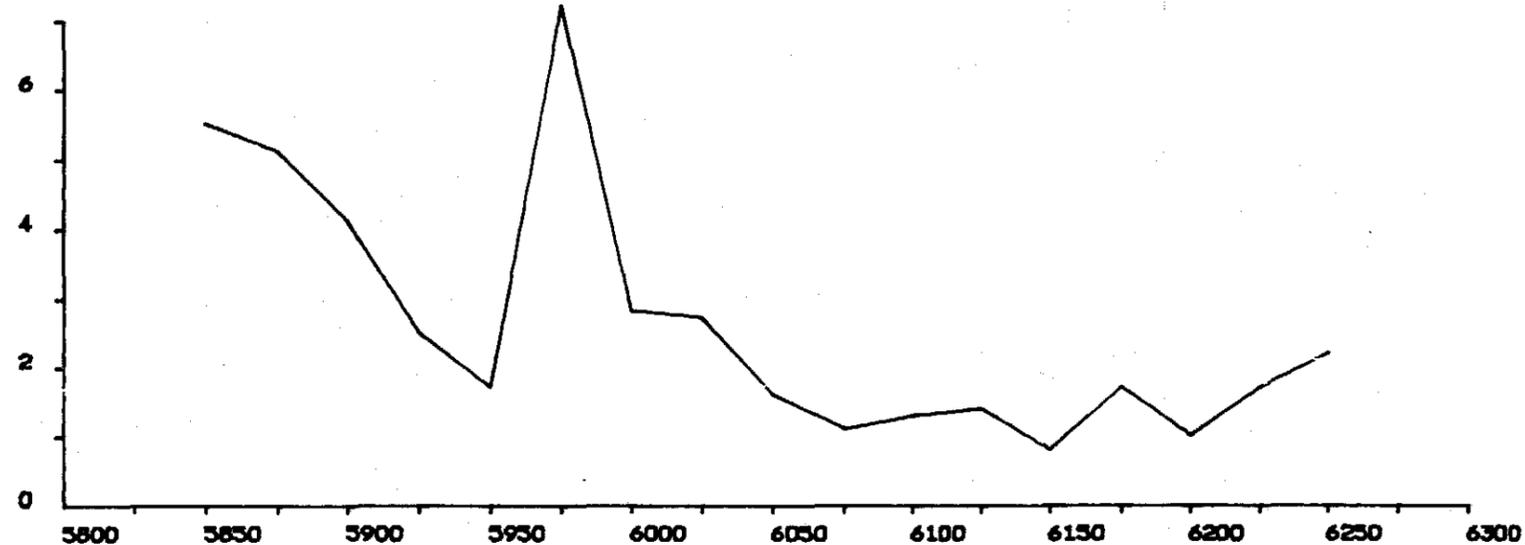
High Frequency not possible because of power line noise

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

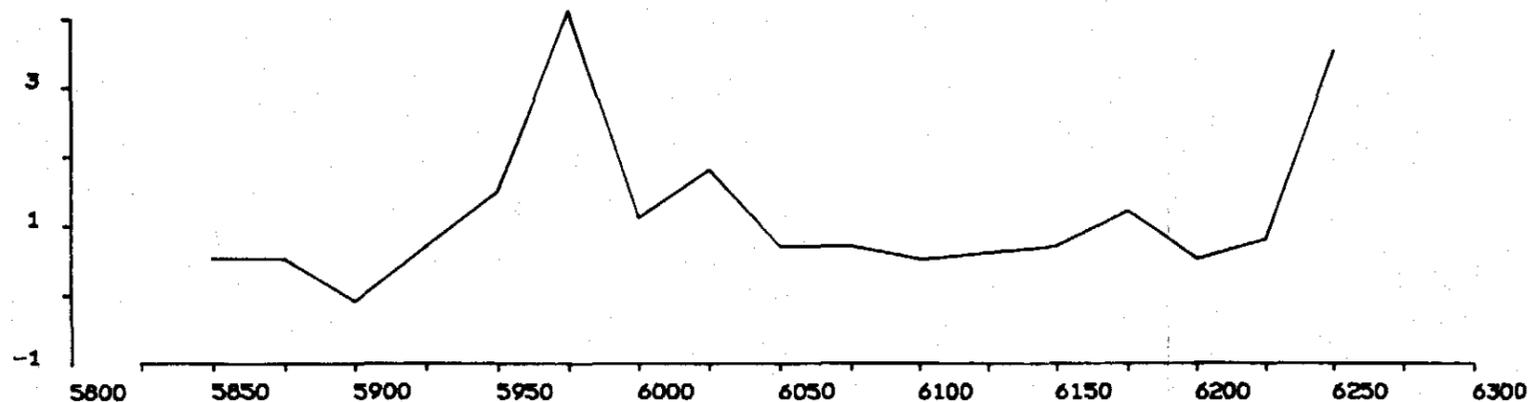
CRA EXPLORATION PTY. LIMITED			
LYNCHFORD E.L. 47/83			
GENIE PROFILE			
DIGHEM ANOMALY 8/738			
REF.	SK55 - 5	(8013)	
SCALE	1:2500	DRAWN	T.v.S.
AUTHOR	T.v.S.	REPORT No.	
DATE	Jan. 1986	PLAN No.	TASh 2797

5 cm

DIGHEM ANOMALY LINE 6700N



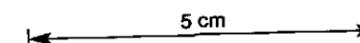
3037/112 HZ



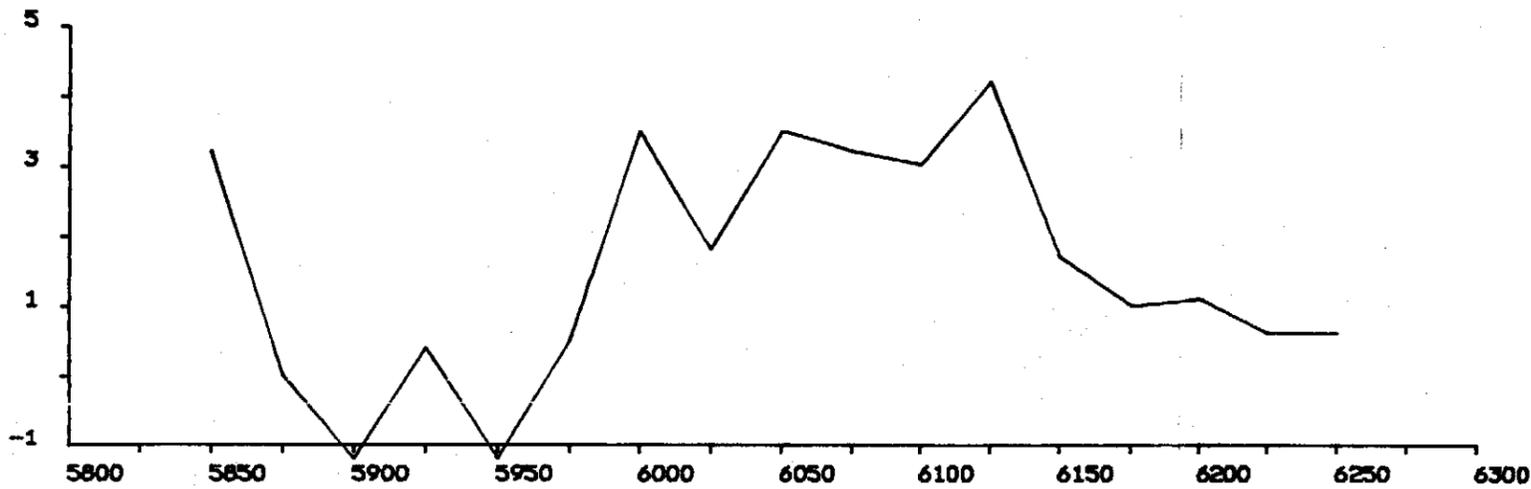
337/112 HZ

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

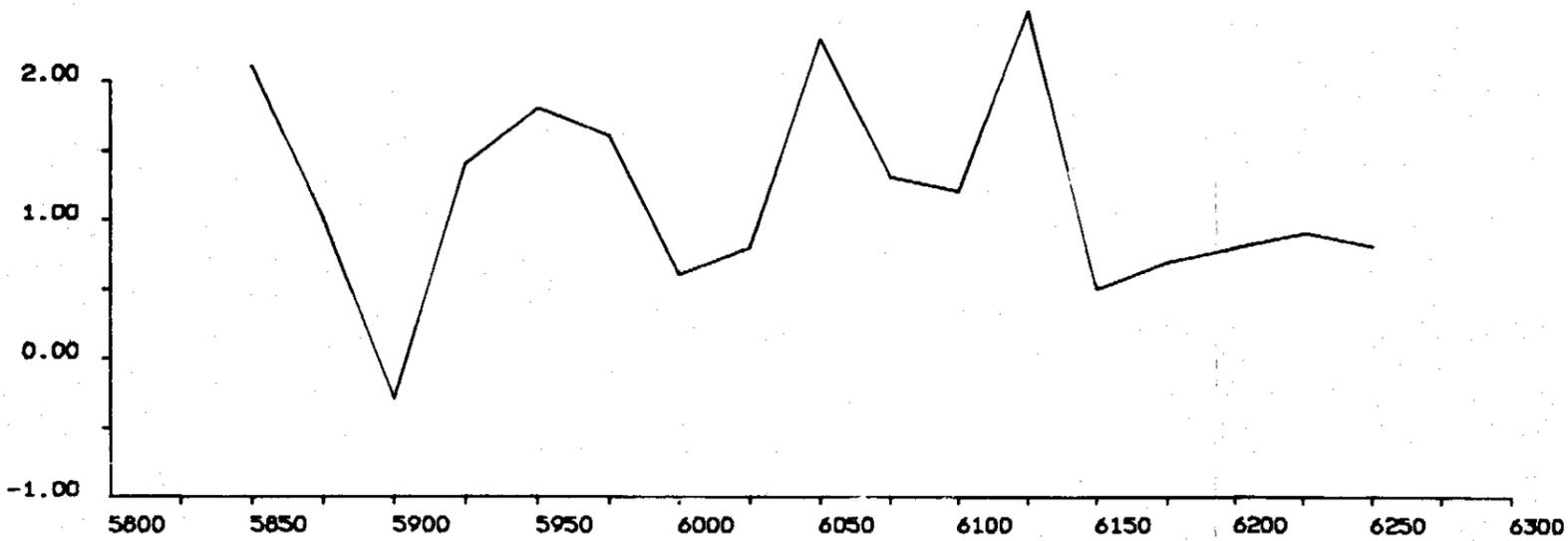
CRA EXPLORATION PTY. LIMITED	
LYNCHFORD E.L. 47/83	
GENIE PROFILES	
DIGHEM ANOMALY 39/303.5	
LINE 6700 N.	
REF.	SK55 - 5 (8013)
SCALE	1 : 2500
AUTHOR	T.v.S.
DATE	JAN. 1986
DRAWN	T.v.S.
REPORT No.	
PLAN No.	TASH 2798



DIGHEM ANOMALY LINE 6850N



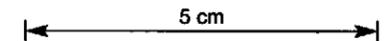
3037/112 HZ



337/112 HZ

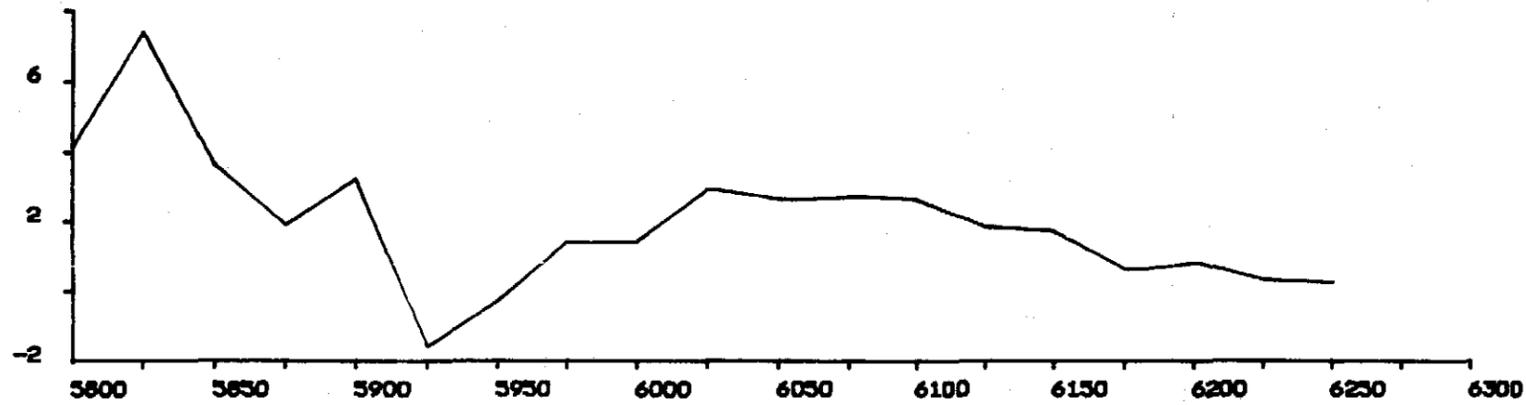
* N.B. *
100m Separation
Tx in West

CRA EXPLORATION PTY. LIMITED			
LYNCHFORD E.L. 47/83			
GENIE PROFILES			
DIGHEM ANOMALY 39/303.5			
LINE 6850 N.			
REF.	SK55 - 5	(8013)	
SCALE	1 : 2500	DRAWN	T.v.S.
AUTHOR	T.v.S.	REPORT No.	
DATE	JAN. 1986	PLAN No.	TASh 2799

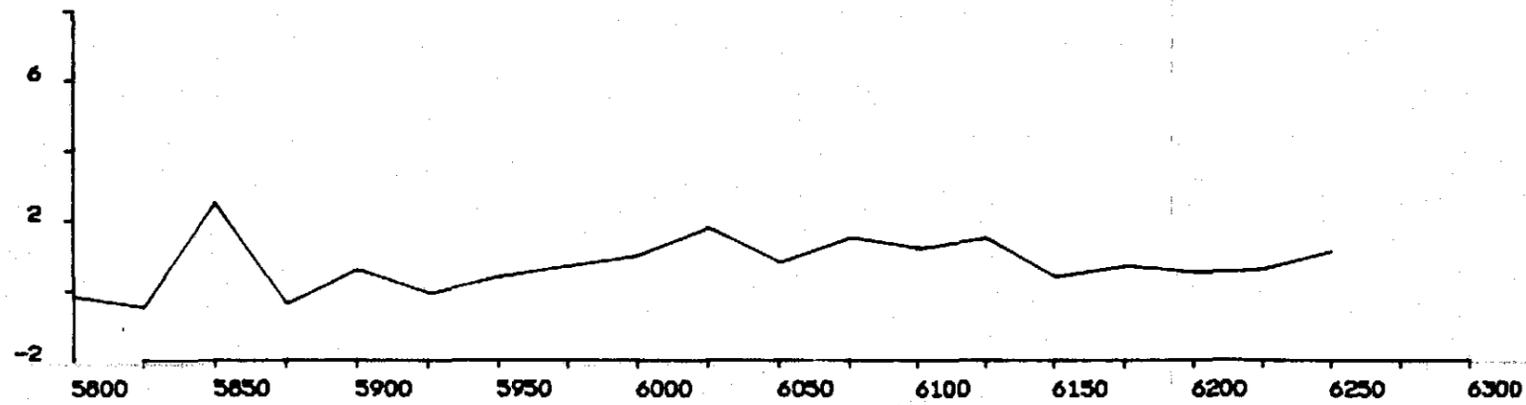


31

DIGHEM ANOMALY LINE 7000E



3037/112 HZ

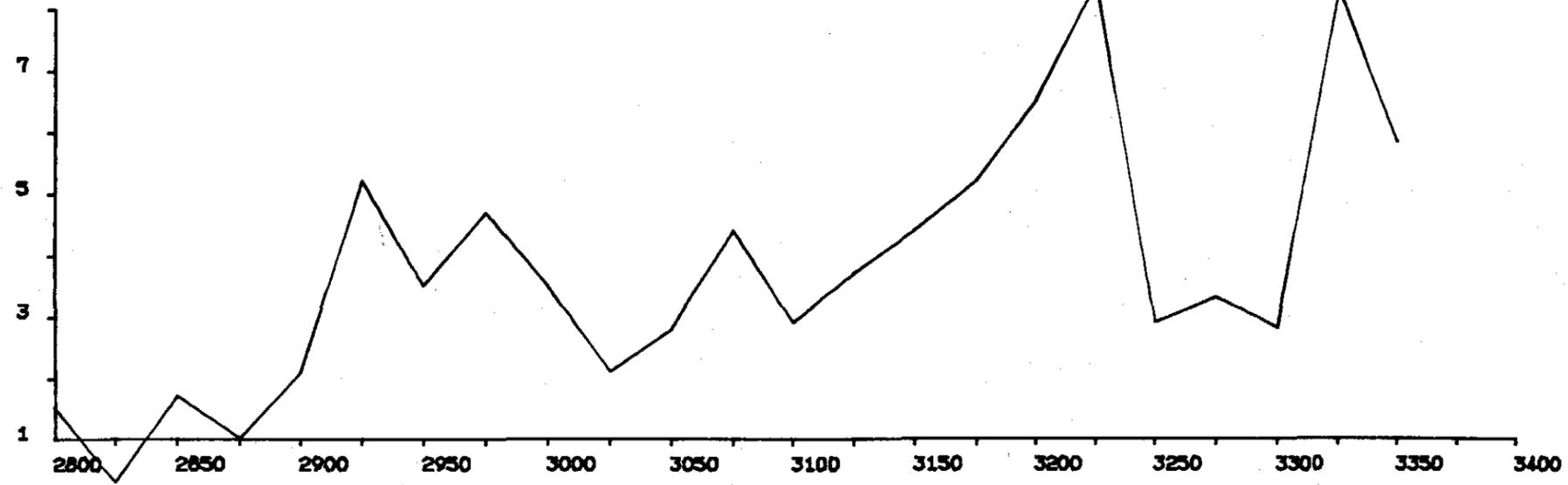


337/112 HZ

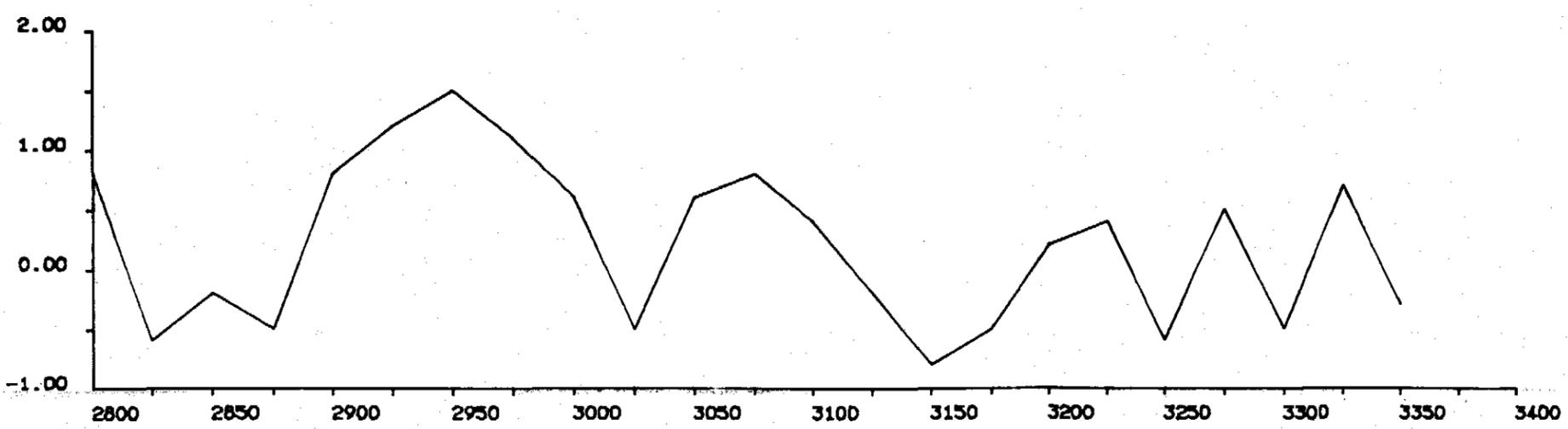
* N.B. *
100m Separation
Tx in West

CRA EXPLORATION PTY. LIMITED	
LYNCHFORD E.L. 47/83	
GENIE PROFILES	
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LINE 7000 E.	
REF.	SK55 - 5 (8013)
SCALE	1 : 2500
AUTHOR	T.v.S.
DATE	JAN 1986
DRAWN	T.v.S.
REPORT No.	
PLAN No.	TASh 2800

5 cm



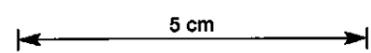
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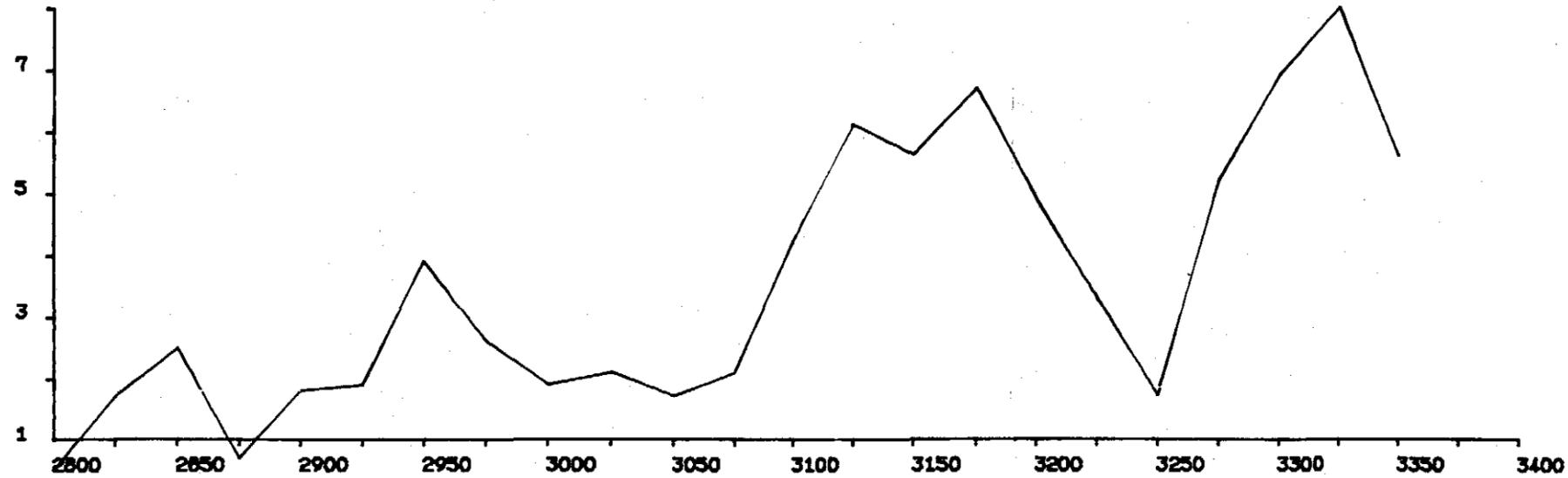


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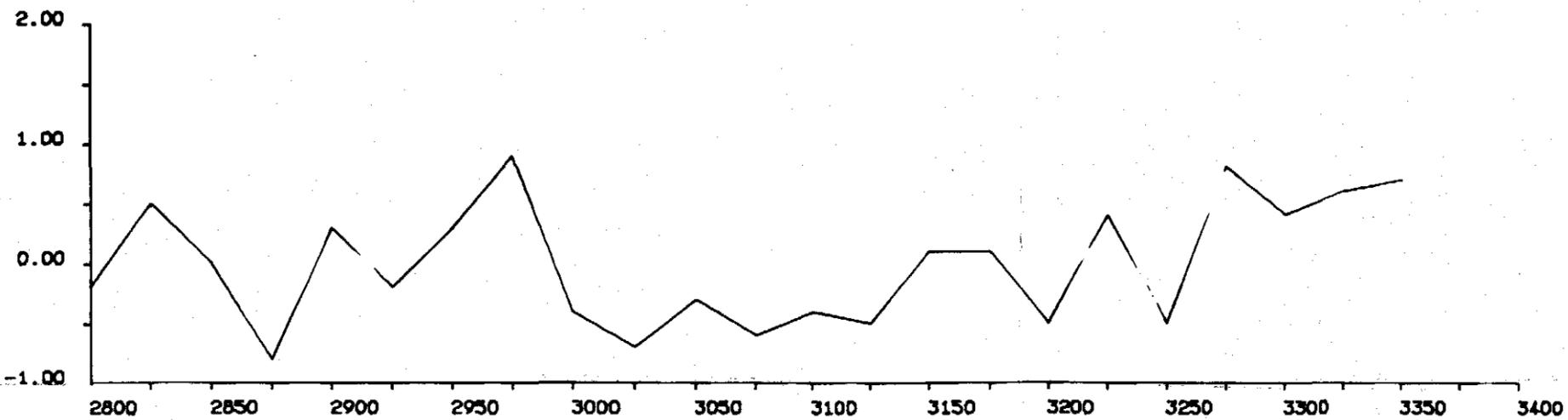
* N.B. *
100m Separation
Tx in East

CRA EXPLORATION PTY. LIMITED	
LYNCHFORD E.L. 47/83	
GENIE PROFILES	
DIGHEM ANOMALY 10/713	
LINE 4900 N.	
REF.	SK55 - 5
SCALE	1 : 2500
AUTHOR	T.v.S.
DATE	JAN 1986
DRAWN	T.v.S.
REPORT No.	
PLAN No.	TASh 2846





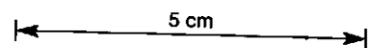
3037/112 HZ

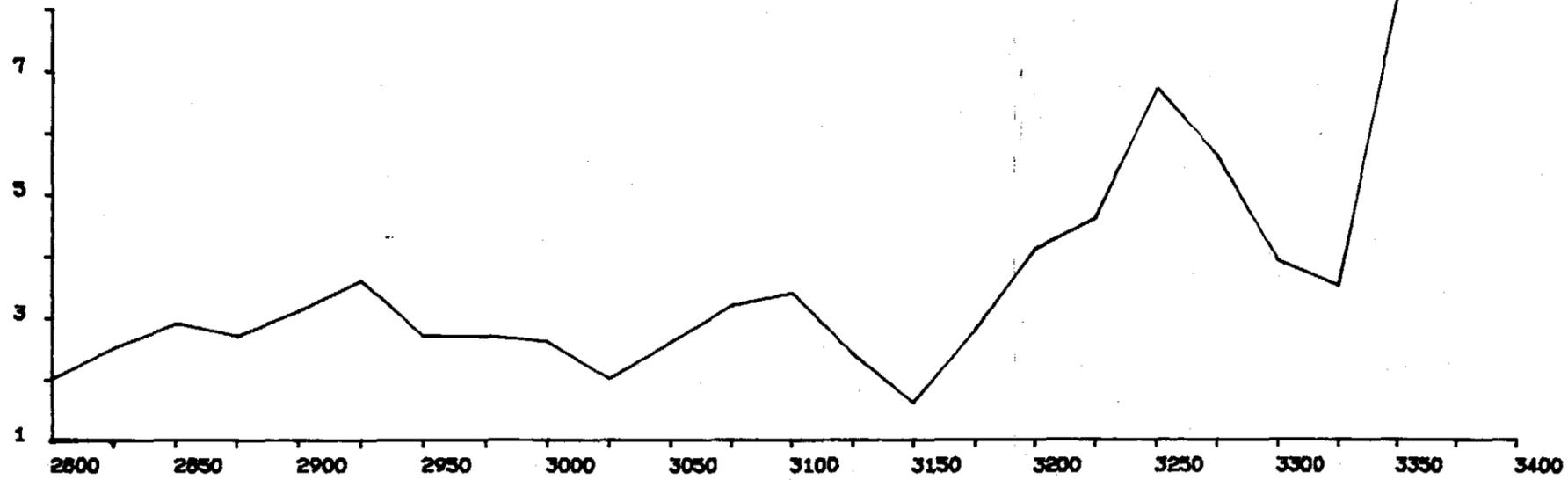


337/112 HZ

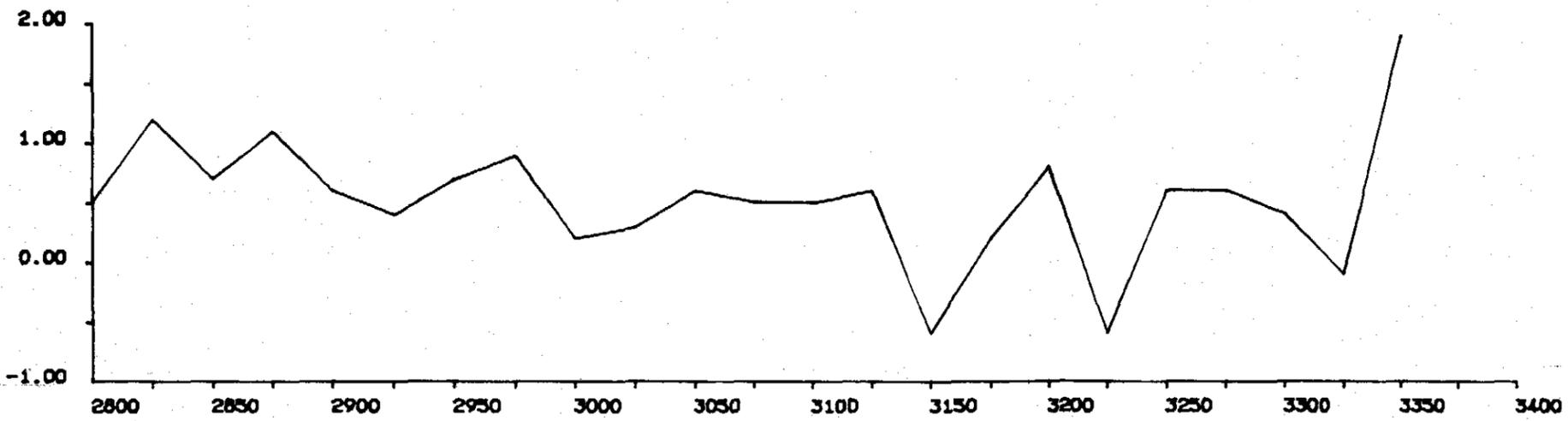
* N.B. *
100m Separation
Tx in East

CRA EXPLORATION PTY. LIMITED			
LYNCHFORD E.L. 47/83			
GENIE PROFILES			
DIGHEM ANOMALY 10/713			
LINE 5000 N.			
REF.	SK55 5	(0013)	
SCALE	1 2500	DRAWN	T.v.S.
AUTHOR	T.v.S.	REPORT No.	
DATE	JAN 1986	PLAN No.	TASh 2847





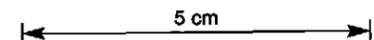
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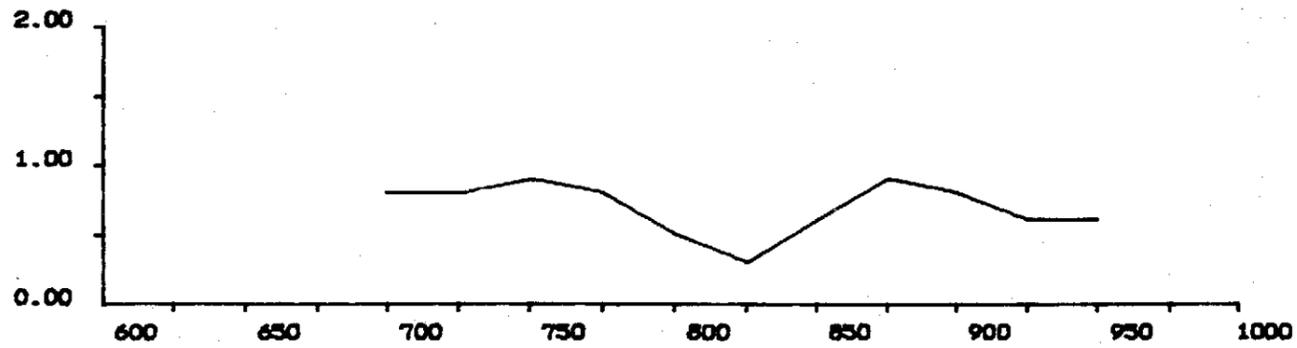


337/112 HZ

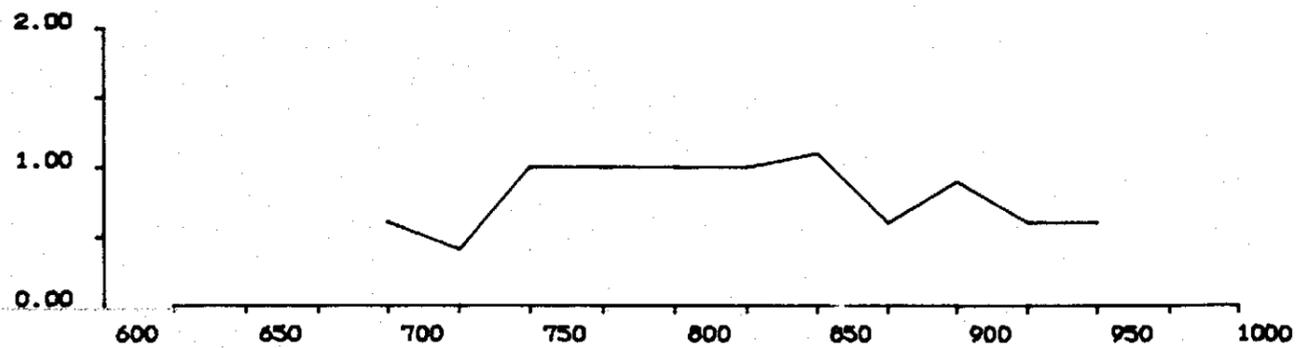
* N.B. *
100m Separation
Tx in East

CRA EXPLORATION PTY. LIMITED	
LYNCHFORD E.L. 47/83	
GENIE PROFILES	
DIGHEM ANOMALY 10/713	
LINE 5100 N.	
REF. SK55 - 5	(8013)
SCALE 1 : 2500	DRAWN T.v.S.
AUTHOR T.v.S.	REPORT No.
DATE JAN 1986	PLAN No. TASH 2848





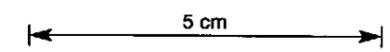
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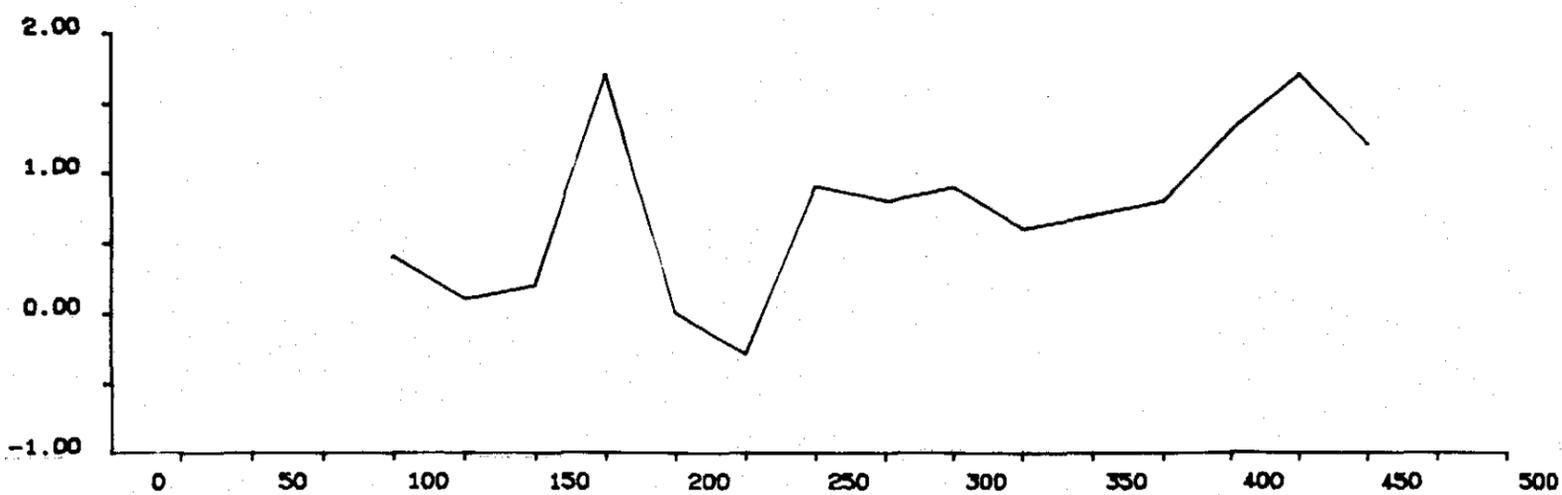
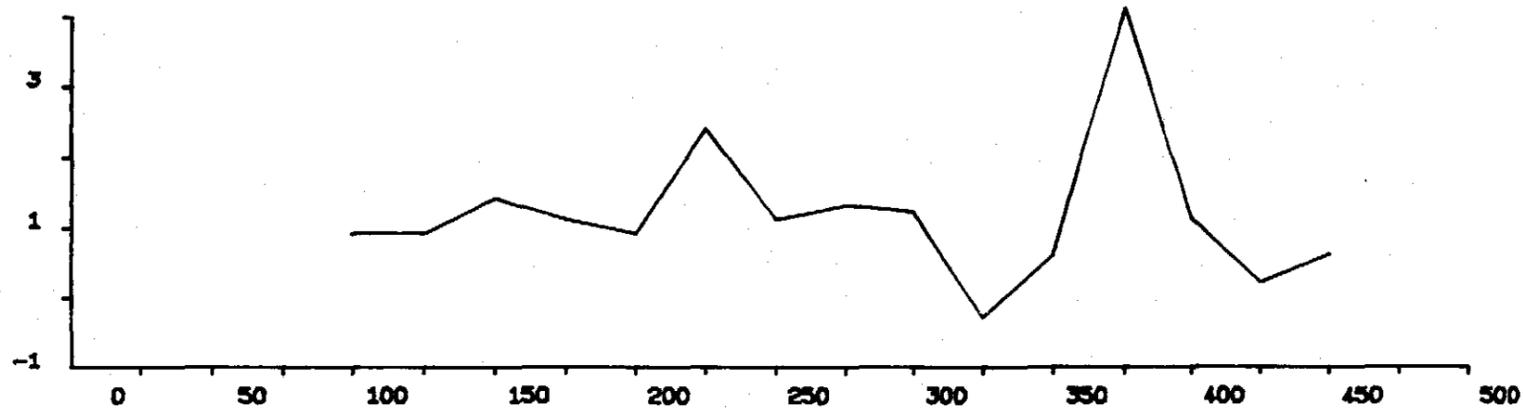


337/112 HZ

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

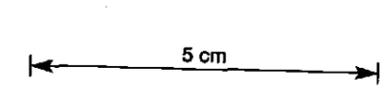
CRA EXPLORATION PTY. LIMITED			
LYNCHFORD E.L. 47/83			
GENIE PROFILES			
GOLDFIELDS GRID			
LINE 300 E.			
REF.	SK55 - 5	(8013)	
SCALE	1 : 2500	DRAWN	T.v.S.
AUTHOR	T.v.S.	REPORT No.	
DATE	JAN 1986	PLAN No.	TASh 2849





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

CRA EXPLORATION PTY. LIMITED	
LYNCHFORD E.L. 47/83	
GENIE PROFILES	
GOLDFIELDS GRID	
LINE 1000 N.	
REF.	SK55 - 5 (8013)
SCALE	1 : 2500
AUTHOR	T.v.S.
DATE	JAN 1986
DRAWN	T.v.S.
REPORT No.	
PLAN No.	TASH 2850



APPENDIX III

SAMPLE LEDGERS

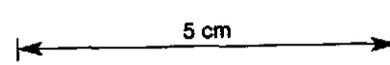
CRA EXPLORATION PTY. LTD.

050040

039

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES								Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe%	Mn	Au		
				ppb									
988987	5825	7000N	ST. SED	10	15	10	<1	6	0.22	10	<3		1m wide, moderate flow. Incised. Fe stain. Float 95% v. qz 4% light buff qz:ke (micaceous) 1% dark grey-black shale.
988988 ^A	5985	7000	Rockcl	75	35	15	1	44	1.49	25			0/c of dark grey, well laminated shale. No visible sulphides Strike 000°m D: > 55° E
988989	6095	6850	Float ^A S	10 10	25 30	95 110	4 4	240	43.0 48.0	800 1000	3 <3		Float of a highly ferruginous surficial deposit: an ironstone very friable, dominantly goethite after? specular hematite. Possibly a reprecipitated gascon, now probably a Tertiary Perrinitic texture. Corresponds closely to 7 m: clw location of the DIGHEN anomaly
988990	6025	6850	-80# ST. SED	15	20	30	<1	20	243	150	<3		Clw ironstone occurrence. 1m med flow Fe stain. 0/c of grey slightly pyritic shales. Clw, at this point, transgressing strike
988991	6100	6700	-80# ST. SED	15	15	25	<1	9	2.10	170	<3		1/2m slow. Float of ochre-brown, some grey silt and shales.
988992	5425	6700	-80# ST. SED	15	25	35	<1	10	1.29	105	<3		1m, med flow. Float med-fine gr. tubbs, foliated, green-grey low quartz
988993	5800	6750	-80# ST. SED	10	30	20	<1	8	1.02	60	<3		1 1/2m Med flow. Float med/c grey and ochre shales.
DETECTION LIMIT				2	5	2	1	1	0.01	5	3		
ANALYTICAL METHOD				ICP									→ FINE/A.A.S.

Project: QUEENSTOWN-ZEEHAN	1 250 000 Sheet: QUEENSTOWN	AMG Zone: 55	Sheet No.: 1
Tenement: LYNCHFORD EL 47/83	DPO's: 35001		Laboratory: A.L.D.
Area / Prospect: DIGHEN ANOMALY 39/303.5			Collected By: I.M. CLEMENTSON Date: 12 June 85

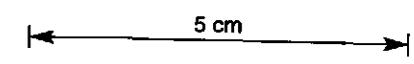


CRA EXPLORATION PTY. LTD.

050041

040

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES											Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au	PE / Pb ppb			
				ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb		ppb		
988997	379750	5330850	d/c	85 ⁵⁰	200 ⁷⁰⁰	20 ³⁰⁰	<1	22	0.55 ^{1.10}	45	<3		Malachite/chalcocite dusting within f-m grained sandstone, slightly chloritic		
988998	"	"	d/c	110 ¹²⁰	290 ³¹⁰	60 ¹⁴⁵	<1	60	2.23 ^{2.00}	165	<3		Pyrite and arsenopyrite in sandstone as above		
988999	379825	5330650	d/c	50	165	200	<1	40	1.90	45	<3		Dark greyish black sandy loam - carbonaceous highly weathered.		
989000	379900	5330450	d/c	45	30	25	<1	4	2.66	40	<3		Purplish, hematitic (?) fine grained siltstone tuff. Silt to sand grade. Zone of chlorite veins. Siltstone dips at 60° to 060°m.		
989951	379880	5330150	d/c	40	20	5	<1	4	0.75	15	<3		As above, but with bedding visible dipping at 45° to 080°m.		
989958	380450	5330800	d/c	35	20	40	<1	10	2.46	65	<3		Coarse tuffaceous breccio-conglomerate unit within fairly uniform felsic-lithic tuff. Fe staining but not after pyrite.		
989963	378500	5334050	d/c	145 ¹⁴⁰	55 ⁵⁵	55 ⁵⁵	1	120	7.39 ^{7.12}	60	<3 ⁵⁰		Gaseous zones within dark grey-black shales.		
989964	"	"	d/c	130 ¹²⁰	45 ⁴⁵	15 ²⁰	1	310	9.99 ^{9.99}	80	<3 ⁵⁰		Gaseous quartz vein within fine sandy tuff.		
989965	"	"	d/c	195 ²⁰⁰	90 ⁹⁰	55 ⁵⁵	2	190	13.7 ^{13.7}	80	<3 ⁵⁰		Selected pyrite nodules & vein coatings within very carbonaceous shales.		
988966	378300	5334075	d/c	150	30	100	1	32	7.62	4200	<3		Coarse breccia - felsic porphyrite clasts in a similar matrix.		
988967	377650	5334900	d/c	35	10	35	1	8	3.00	570	<3	<50% / 10	Coarse, foliated ultrabasic weathered.		
988968	378300	5334075	d/c	170	110	105	1	50	7.02	1.48%	<3		Manganese-iron stained fault zone within silty lithic tuff.		
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50 / 10			
ANALYTICAL METHOD				ICP							A.A.S / CRA	Fire Assay			
Project : QUEENSTOWN ZEEHAN				1 : 250 000 Sheet : QUEENSTOWN				AMG Zone : SRSS-S				Sheet No. :			
Tenement : LINCHFORD EL 47/83				DPO's : 35004 & 35008 (check Repeats)				Laboratory : A.L.S.							
Area / Prospect : REGIONAL RECONNAISSANCE ROAD DRAINAGE SURVEY								Collected By : I.M. CLEMENTSON				Date : 29/10/85			

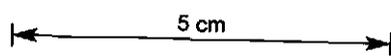


CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au ppm	Pt/Pd		
													ppb	
989971	378760	5331900	plc-R/C	75	40	60	1	22	1.65	1200	<3		Dark grey, very dirty (whole in places). Close to contact with coarse qz porphyry. Abundant dissemin. pyrite.	
989972	-	-	REPEATS	⁶⁵ 55	¹¹⁰ 90	¹³⁵ 115	1	110	^{7.00} 6.90	240	^{1.05} 15		As above but with gossanous stockwork.	
989973	378200	5333050	plc-R/C	135	65	45	1	44	2.86	170	<3		Black shale with minor pyrite. Dip 75° E to 75° N.	
989974	378200	5333070	plc-R/C	AMDEL Report: "Graywacke"									PETROLOGY: ?? qz porphyry but well banded & with shale fringe. Rounded qz eyes & rhomboid feldspars.	
989989	379230	5336730	R R/C	15	15	5	<1	16	3.65	65	<3		Highly silicified & haematized volcanic fragmental.	
989990	-	-		⁸⁰ 80	²⁰ 20	²⁰ 20	⁴ <1	36	^{9.20} 8.51	55	^{0.02} <3		As above	
989991	-	-		⁴⁰ 40	¹⁰ 10	¹⁰ 10	1	9	^{23.6} 15.4	40	^{0.03} <3		As above but intensely haematized & magnetitic. 600-9000 x 10 ⁻⁵ Si	
DETECTION LIMIT														
ANALYTICAL METHOD														
Project: QUEENSTOWN-ZEEHAN				1: 250 000 Sheet: QUEENSTOWN AMG Zone: 55						Sheet No.:				
Tenement: LYNCHFORD EL47/83				DPO's: 35004 & 35008 (check reports)						Laboratory: ALS / AMDEL				
Area / Prospect: REGIONAL SAMPLING										Collected By: I. M. CLEMENTSON Date: 1 Nov '85				

5 cm

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES								Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au PPB	Au P.P.T.	
989952	380100	5329800	-4# CN _g									50	1m wide, moderate flow. Boulder bar very gravel-sand rich. Minor Fe stain. Float 90% Owen conglomerate & quartz; 10% fine shaly tuffs.
989953			-80# s/s	2	20	10	4	7	0.48	70	3		
989954			-4# CN s/s									50	2m wide, moderate flow. Boulder bar. Very gravel rich. Silt clay deficient. Minor Fe stain. Float 90% Roland/Owen Cong & 92 10% purple/green argillitic tuff-shales & schists. Poss. content from road works.
989955	379950	5330075	-80# s/s	2	20	15	4	4	0.16	25	43		
989956	379900	5330550	-4# CN s/s									50	1m wide, moderate flow, otherwise as above.
989957			-80# s/s	2	15	70	4	18	0.32	50	43		
989959	380800	5331350	-80# s/s	2	10	5	4	8	0.06	5	43		1/2m wide, very low flow. Very sand rich, low clay. No stain. Float is all Owen Conglomerate.
989960			-4# CN s/s									100	
989961	380550	5331075	-80# s/s	2	15	5	4	5	0.05	45	43		1m wide, low flow. Minor Fe stain. Roland/Owen Conglomerate and minor shale-tuff float. Boulder bar, sand rich site.
989962			-4# CN s/s									100	
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50	
ANALYTICAL METHOD				ICP							CRA AAS	CN LEACH	
Project : QUEENSTOWN - ZEEHAN				1 : 250 000 Sheet : QUEENSTOWN				AMG Zone : SK55-S				Sheet No. :	
Tenement : LINCHFORD EL 47/83				DPO's : 30393								Laboratory : ANDEL / A.L.S.	
Area / Prospect : REGIONAL RECONNAISSANCE ROCK DRILLAGE SURVEY												Collected By : I. F. CLEMENTSON Date : 29.10.85	

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	LOCATION			Sample Type	ANALYSES										Geological Observations
	Easting	Northing	Cu		Pb	Zn	Ag	Hs	Fe %	Mn	Au P.P.B.	Pb P.P.T.			
989969 70	379970	5332050	-80# -4#	20	45	70	<1	14	2.06	260	<3		1 1/2m, mod flow. Low Fe stain. Gravel rich boulder bar. Float: 30% black shale, 60% sericitic lithic tuff, 10% qz. q/c highly sericitic lithic tuff.		
989975 76	380650	5334500	-80# -4#	2	15	5	<1	5	0.26	15	<3	100	1 1/2m, mod flow. Low Fe stain. Gravel bar. Float: 80% qz & qz:ite or finer siltstones, 10% qz fls porphyry, 10% lithic tuff. q/c qz, lithic tuff.		
989977 78	380100	5336620	-80# -4#	50 45	30 75	30 45	<1	46	2.17	240	5	950	1m, mod flow. Moderate Fe stain. Boulder bar. Float: 40% pale qz:ite, 40% grey shales & fine lithic tuffs, 10% dark green chl. tuffs, 10% serc. tuff.		
989979 80	380120	5336560	-80# -4#	95	85	140	1	26	5.80	730	<3	250	1 1/2m, mod flow. Mod Fe stain, boulder bar. Float: qz lithic tuffs, minor qz:ite & shales.		
989981 982	380320	5336540	-80# -4#	55	60	110	<1	16	1.68	610	5	750	1 1/2m, mod flow. Minor Fe stain. Gravel bar. Float: qz-serc. schistose tuffs & grey cleaved shales, vein qz. q/c v. qz & schistose lithic tuffs.		
989983 84	380650	5336560	-80# -4#	25	40	20	<1	20	0.97	155	3	150	2m, mod flow. Low Fe/Mn stain. Gravel rich. Float: v. qz, black shale, lithic tuffs. q/c black shales & int bdd shale tuffs.		
989985 86	379350	5336475	-80# -4#	105	60	140	<1	20	4.28	840	3	850	1 1/2m, mod flow. Heavy Fe/Mn stain. V. silt rich. Float: v. qz, chl tuffs (lithic with shale frags); andesite.		
DETECTION LIMIT.				ICP							AAS CRA	CN LEACH			
ANALYTICAL METHOD				2	5	2	1	1	0.01	5	3	50		← 5 cm →	

Project : QUEENSTOWN-ZEEHAN

1:250 000 Sheet : QUEENSTOWN AMG. Zone : 55

Sheet No. :

Tenement : LYNCHFORD EL 47/83

DPO's : 35004 & 30398

Laboratory : ALS / AMDEL

Area / Prospect : REGIONAL DRAINAGE SAMPLING

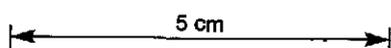
Collected By : I. CURRIE Date : 7/11/85

CRA EXPLORATION PTY. LTD.

050045

044

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au PPD	Flu P.P.T.		
989987 88	379350	533060	-80# -4#	90 ²⁰	70 ⁸⁰	90 ⁸⁰	<1 ²¹	22	4.10 ^{8.10}	420 ⁶⁰	10 ¹⁰	250	3m. Mod. Flow Mod. Fe stain. Float: andesite, qz porphyry grey shale and shale tuff. Visible Au in pan.	
989992 993	378070	5332750	-4# -80#	15	35	85	<1	12	143	320	<3	250	1m. Plugpool. Heavy Fe/Mn stain? Contain in Queen River. Float 70% dark shales (S.I) 30% grey green foliated litic tuffs o/c - black shale (Silurian)	
989994 989995	377650	5333340	-4# -80#	5	25	20	<1	6	0.25	45	<3	850	1/2m mod flow M. var Fe/Mn. Boulder bar. Possibly glacial or v. coarse alluvial banks. Float: everything including shales, qzites various tuffs, qz porphyry, vein quartz.	
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50		
ANALYTICAL METHOD				ICP								AAS CRA CN LEACH		

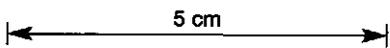


Project : QUEENSTOWN - ZEEHAN	1 : 250 000 Sheet : QUEENSTOWN AMG Zone : 55	Sheet No. :
Tenement : LYNCHFORD EL 47/83	DPO's : 35004 & 30398	Laboratory : ALS / AMDEL
Area / Prospect : REGIONAL DRAINAGE		Collected By : McCLEMENTSON Date : 7.11.85

CRA EXPLORATION PTY. LTD.

050046

045

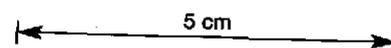
SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au PPB	Au PPT.		
1153822 823	378050	5333580	-4# -80#									50	Mod. flow; well incised; steep gradient; cleared eucalypt forest; colluvial ls. ls.; 60% gravel, 30% sand, 10% silt. % of carbonaceous fine grained tuffaceous sediment; minor laminated shale float; minor unaltered tuffaceous sediment	
1153824 825 295	378000	5333810	-4# -80#	70 80	65 70	120 120	1 4	32	3.47 3.62	690 750	5	150 0.92	Mod. flow; mod incised; steep gradient; colluvial ls. ls.; cleared eucalypt forest; 60% gravel, 35% sand, 5% silt; low organic. % of dark green intermediate(?) tuff; minor dark grey tuffaceous siltstone/shale	
1153366 367	378130	5333570	-4# -80#	55	65	105	1	24	3.47	810	15	250	Strong flow; mod incised; alluvial banks; branch scree; 70% gravel, 25% sand, 5% silt. Green tuffaceous sst + siltstone; minor grey-black shale; minor vein quartz.	
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50		
ANALYTICAL METHOD				ICP							AAS CRA	CN LEACH		

Project: QUEENSTOWN-ZEEHAN	1 250 000 Sheet: QUEENSTOWN	AMG Zone: 55-S	Sheet No.: 3
Tenement: LYNCHFORD EL 43/83	DPO's: 30398 & 35004 & 35008 (Habit)	Laboratory: ALS BRISBANE	
Area / Prospect: REGIONAL STREAM SEDIMENTS		Collected By: J. CATHNESS	Date: 31-10-85

CRA EXPLORATION PTY. LTD.

050047

046

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au P.P.B.	Au P.P.T.		
1153368 369	378220	5335570	-4# -80#									100	Strong flow; mod. incised; alluvial banks; bracken scrub; high organics; 40% gravel, 50% sand, 10% silt. Dominant massive, unaltered acid tuff float; minor fine siltstone/shale	
1153370 371	378400	5336050	-4# -80#	85	75	190	1	22	5.18	1700	5	2150	Mod-strong flow; well incised; alluvial banks; bracken scrub & ruscus sp.; low organics; 40% gravel, 40% sand, 20% silt. Pyritic acid tuff; vein quartz	
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50		
ANALYTICAL METHOD				ICP							AAS CRA	CN LEACH		
Project: QUEENSTOWN-ZEEHAN			1: 250 000 Sheet: QUEENSTOWN AMG Zone: 55. 5			Sheet No.: 4								
Tenement: LYNCHFORD EL 43/83			DPO's: 30398 & 35004			Laboratory: ALS BRISBANE / AMDEL.								
Area / Prospect: REGIONAL STREAM SEDIMENTS			Collected By: S. CAITHNESS			Date: 31-10-85								

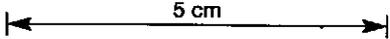
CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au PPB	Au P.P.T.			
1153812	379050	5331430	-4#									300	Mod-stn flow; weakly incised; eucalypt forest; low organics; 50% gravel, 40% sand, 10% silt. Dominant qz porphyry float; minor vein qz + rhyolite (!)		
813			-80#	10	15	20	<1	3	0.09	<5	25				
813	Revised								0.01		0.67				
1153814	379250	5331180	-4#									50	Mod flow; mod incised; eucalypt forest; mod organics; colluvial banks; 60% gravel, 30% sand, 10% silt. Dominant qz porphyry float; minor vein qz.		
815			-80#	5	15	10	<1	2	0.07	<5	5				
1153816	378950	5331140	-4#									<50	Mod flow; mod incised; eucalypt forest; 60% gravel, 30% sand, 10% silt. Dominant clean qz silt (Moina?); minor vein qz.		
817			-80#	2	15	10	<1	3	0.22	10	<3				
1153818	378340	5332390	-4#									550	Mod. flow; well incised; eucalypt forest; 60% gravel, 35% sand, 5% silt. Fine-med grained tuffaceous sediment % + qz mining.		
819			-80#	25	45	80	1	16	1.87	540	<3				
1153820	378240	5333200	-4#									100	Mod-strong flow; well incised; eucalypt forest; colluvial banks; 60% gravel, 30% sand, 10% silt, low organics. Fine tuffaceous silt + siltstone % - chl alter; vein quartz.		
821			-80#	15	25	20	<1	10	1.19	55	10				
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50			
ANALYTICAL METHOD				ICP											
													← 5 cm →		
Project: QUEENSTOWN - ZEEHAN				1 250 000 Sheet: QUEENSTOWN				AMG Zone: SS-S				Sheet No.: 2			
Tenement: LYNCHFOOD EL 43/83				DPO's: 30398 & 35004 (35008/9/10)				Laboratory: ALS BRISBANE							
Area / Prospect: REGIONAL STREAM SEDIMENTS								Collected By: S. CATHNESS				Date: 30-10-85			

CRA EXPLORATION PTY. LTD.

050049

048

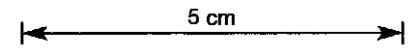
SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES								Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe	Mn	Au	
								%		ppb		
1153372	378570	5336080	Rock Chip	25	10	10	<1	2	1.28	60	<3	Highly altered red tuff(?). Haematized and silicified; pitting after sulphide; Rock occurs as float at the base of a hill; Weakly magnetic 80×10^{-5} SI units.
373				50	10	10	<1	30	2.33	50	<3	
1153374	378330	5336950	r.c.	25	15	15	<1	6	0.56	30	<3	DRHEM anomaly; stockwork quartz veining through sandstone + grit (Maine st). Minor silicified black shale; common malachite staining on road cutting
375				15	<5	10	<1	1	0.79	80	<3	
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	
ANALYTICAL METHOD				ICP							AAS CRA	

Project : QUEENSTOWN-ZEEHAN	1 250 000 Sheet : QUEENSTOWN	AMG Zone : SK55-5	Sheet No. : 1
Tenement : LYNCHFORD EL 43/83	DPO's : 35004		Laboratory : ALS BRISBANE
Area / Prospect : ROCK CHIP SAMPLES			Collected By : S. CATHNESS Date : 30-10-85

CRA EXPLORATION PTY. LTD.

050050

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES									Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au P.P.B.	Au P.P.T.	
1142799 800	379750	5330850	-80# -4#	5	15	20	<1	4	0.08	10	5	450	Strong-moderate flow; well incised; eucalypt forest; possible contamination from HEC work; 60% gravel, 35% sand, 5% silt. Rhyolite % at sample site; red-brown rhyolite float; conglomerate; sandstone.
1153806 807	379380	5330650	-4# -80#	5	15	10	<1	2	0.22	50	<3	<50	Moderate-strong flow; moderately incised; eucalypt forest; mod. org. i.c.; colluvial to bed; 40% gravel, 40% sand, 20% silt. Dominant fine-med grained sandstone/siltstone float.
1153808 809	379430	5330650	-4# -80#	5	45	25	<1	7	0.46	360	<3	50	Strong flow; moderately incised; eucalypt + myrtle forest; low organics; 50% gravel, 30% sand, 20% silt. Fine grained tuffaceous siltstone; grey-black shale %.
1153810 811	379010	5334470	-4# -80#	5	30	15	<1	6	0.54	25	10	700	Mod. flow; mod. incised; low organics; eucalypt forest; possible contamination from old workings (250m north along track); 60% gravel, 30% sand, 10% silt. Dominant siltstone/sst float; minor qp porphyry + vein qp.
DETECTION LIMIT				2	5	2	1	1	0.01	5	3	50	
ANALYTICAL METHOD				ICP									



Project: QUEENSTOWN - ZEEHAN	1 250 000 Sheet: QUEENSTOWN	AMG Zone: SK 35-5	Sheet No.: 1
Tenement: LYNCHFORD EL 43/83	DPO's: 30398 & 35004	Laboratory: ALS BRISBANE	
Area / Prospect: REGIONAL STREAM SEDIMENTS		Collected By: S. CAITHNESS	Date: 30-10-85

PROJECT QUEENSTOWN - ZEEHAN

GEOCHEMICAL SAMPLING LEDGER

DATES : MARCH 1985

TENEMENT LYNCHFORD EL 47/83

050051 050

LAB. ANDEL

AREA / PROSPECT NEWALL CREEK RECONNAISSANCE

GEOLOGIST I.M. CLEMENTSON

SAMPLE TYPE ROCK

PAGE NO. 1

SAMPLE NUMBER	GRID REF.	ANALYSES														DPO NUMBER	GEOLOGICAL OBSERVATIONS	CORRESP -80 MESH STREAM SAMPLE						
		Cu	Pb	Zn	Fe %	Alu																		
988954	378620E 5331500N	14	<5	6	1.03	0.005											30348	Flint (origin probably the N buttress of the new King R. bridge): highly chloritic (? fuchsite) quartzite with minor black Mn oxide						
988955	378850E 5331500N	14	<5	4	2.06	0.005												o/c: channel sample (5m) of weathered silty quartzites near old workings	Rock desc.					
988956	378850E 5331500N	7	8	32	0.58	0.010												Flint: very chloritic (? fuchsite) vein quartz from old workings						
988957	378850E 5331500N	34	58	52	4.55	0.04												o/c: channel sample (2m) of very ferruginous weathered quartzite						
988958	379250E 533100N	17	<5	7	2.28	0.005	PETROLOGY: Argillised porphyric rhyolite; could be a lava or a tuff-lava perhaps grading into an ignimbrite																o/c: large quartz "blow" - blackwork to semi-massive vein quartz with a host of ?? high yellow/pale green soft aphanitic (?) sillstone or ? volcanic dome.	
988959	379200E 5331075N	1E	<5	7	1.64	0.005	PETROLOGY: Porphyritic rhyolite; no flow features. Fabric indicates a minor intrusion. Selective concentration of biotite and some plagioclase.																o/c: as above but with lower proportion vein quartz and mostly 2-5mm quartz clasts or phenocrysts.	
METHOD DETERMINED																								

PROJECT QUEENSTOWN-ZEEHAN
 TENEMENT LYNCHFORD FL47/83
 AREA / PROSPECT RECONNAISSANCE - general

GEOCHEMICAL SAMPLING LEDGER

GEOLOGIST J.M. Clementson SAMPLE TYPE _____

050053 052

DATES: MARCH 84
 LAB. AMDEL
 PAGE NO. 1

SAMPLE NUMBER	GRID REF.	ANALYSES										DPO NUMBER	GEOLOGICAL OBSERVATIONS	CORRESP. -80 MESH STREAM SAMPLE	
		Cu	Pb	Zn	Fe %	Ag									
988951	377300E 5335950N	15	<5	42	5.38	0.005							30348	dk - dark green sample massive to micaceous with some fibrous material Abundant - 1/2" chip over 5m dia length.	
988952	377780E 5335950N	1750	8	30	6.72	0.095								Flint - chloritic and permineral, acidic o.v. with 10% chrom. py + ksp	
988953	3777820E 5335700N	24	<5	2	1.37	0.005								dk - massive pale green chrysolite.	
PETROLOGY: Argillized devitrified dyalite, probably originally a glassy lava															

METHOD
 DEVLWAT

APPENDIX IV

PETROLOGICAL REPORTS

SAMPLE: 989974: TSC46402

Rock Name:

Graywacke

Hand Specimen:

This is a medium grained, well indurated rock with a grey colour. The rock contains darker grey coloured fragments up to about 1 cm in size. Staining with sodium cobaltinitrite after a hydrofluoric acid etch shows that the rock contains no potash feldspar.

Thin Section:

This is a detrital rock containing angular plagioclase and quartz grains as well as lithic clasts ranging up to about 1 mm in size. The detrital quartz and plagioclase grains typically exhibit angular shapes and many of the detrital plagioclase grains still retain well preserved elongate, lath shapes. The lithic clasts tend to have somewhat more rounded appearing shapes and in some cases are difficult to distinguish from the matrix which contains chlorite and fibrous phyllosilicates.

The thin section was cut to include one of the dark grey patches noted in hand specimen. This region consists of a much finer grained sedimentary rock containing angular quartz and feldspar grains up to 0.1 mm wide distributed through an argillaceous matrix. Within this area a well preserved foliation is defined by a concentration of opaque material along narrow discontinuous lamellae. This foliation direction is parallel to a much vaguer foliation direction evident in the coarser grained portion of the rock. A very vague mineralogical banding oriented at a high angle to this foliation is also evident in the argillaceous patch.

The detrital plagioclase is moderately fresh showing some alteration to finely divided sericite/clay. This alteration is highly variable even within the same detrital grain.

Opaques occur as disseminated grains and aggregates up to 0.2 mm wide. Very finely divided opaque material tends to be concentrated along narrow discontinuous lamellae which define a foliation direction.

This is an immature detrital sediment comprised mainly of detrital plagioclase and quartz grains. Much of the detrital plagioclase retains remnant lath shapes which could make them appear as phenocrysts in hand specimen accounting for the presence of a porphyritic appearing texture in parts of the hand specimen. The darker grey patches in hand specimen consist of a finer grained detrital sediment and are thought to represent finer grained, argillaceous regions in the original sediment. Both the argillaceous patches and the coarser grained proportion of the rock exhibit a bedding foliation defined by discontinuous opaque lamellae.

PETROGRAPHY OF TWO ROCKS

SAMPLE: 990772: TS45911

Rock Name:

Chloritic Schist (Meta-Rhyolite)

Hand Specimen:

This is a greyish-green coloured rock with a moderately well developed schistose foliation and a few milky grey, granular quartz bodies.

Thin Section:

In thin section this rock can be seen to consist mainly of finely divided phyllosilicate flakes which are intergrown with very finely granular felsic minerals producing a fine grained matrix through which large quartz crystals are disseminated. A very well developed lepidoblastic foliation is defined by the phyllosilicate flakes. The phyllosilicates consist of finely divided muscovite/sericite and a weakly pleochroic, bright green chlorite with low birefringence. A vague banding oriented parallel to the lepidoblastic foliation is produced by variations in chlorite, sericite and finely granular felsic minerals within different bands and lenses in the matrix.

Large quartz crystals up to 3 mm in size are disseminated through the rock. These quartz crystals exhibit anhedral to subhedral, embayed shapes typical of quartz phenocrysts in acid volcanic rocks. The rock also contains some prismatic shaped patches up to about 1 mm in size comprised of granular quartz intergrown with secondary phyllosilicates believed to represent altered feldspar phenocrysts. The large disseminated quartz grains in particular produce a remnant porphyritic texture.

Traces of zircon were noted as small disseminated crystals up to 0.1 mm long. Opaque to translucent iron oxides form disseminated grains and aggregates up to 0.2 mm wide. Some translucent, reddish-brown limonitic iron oxides partially line voids up to 0.5 mm wide which have shapes suggesting that they could represent altered and leached pyrite crystals.

This is considered to be an acid volcanic rock such as a rhyolite which has been subjected to greenschist facies grade metamorphism producing a very well foliated matrix of metamorphic origin. Development of abundant chlorite is most likely associated with the metamorphism. Very well preserved remnant quartz phenocrysts are still evident but the matrix has been completely recrystallised leaving little textural evidence to indicate whether the original rock was of flow or pyroclastic origin.

REPORT CMS 85/3/19

Five rock samples were received for petrographic study and for mineragraphy (sample 931799). Thin-sections (and one polished section) were prepared and examined, and are described in the attached table.

Summary

All the rocks are volcanic, and include rhyolites, an andesite, and a lapilli tuff.

Two of the rhyolites (988953, 988958) are extensively argillised, and there is uncertainty as to whether they are lavas or minor intrusives; on the whole, the surviving evidence suggests extrusive rocks. Field evidence may clarify the problem.

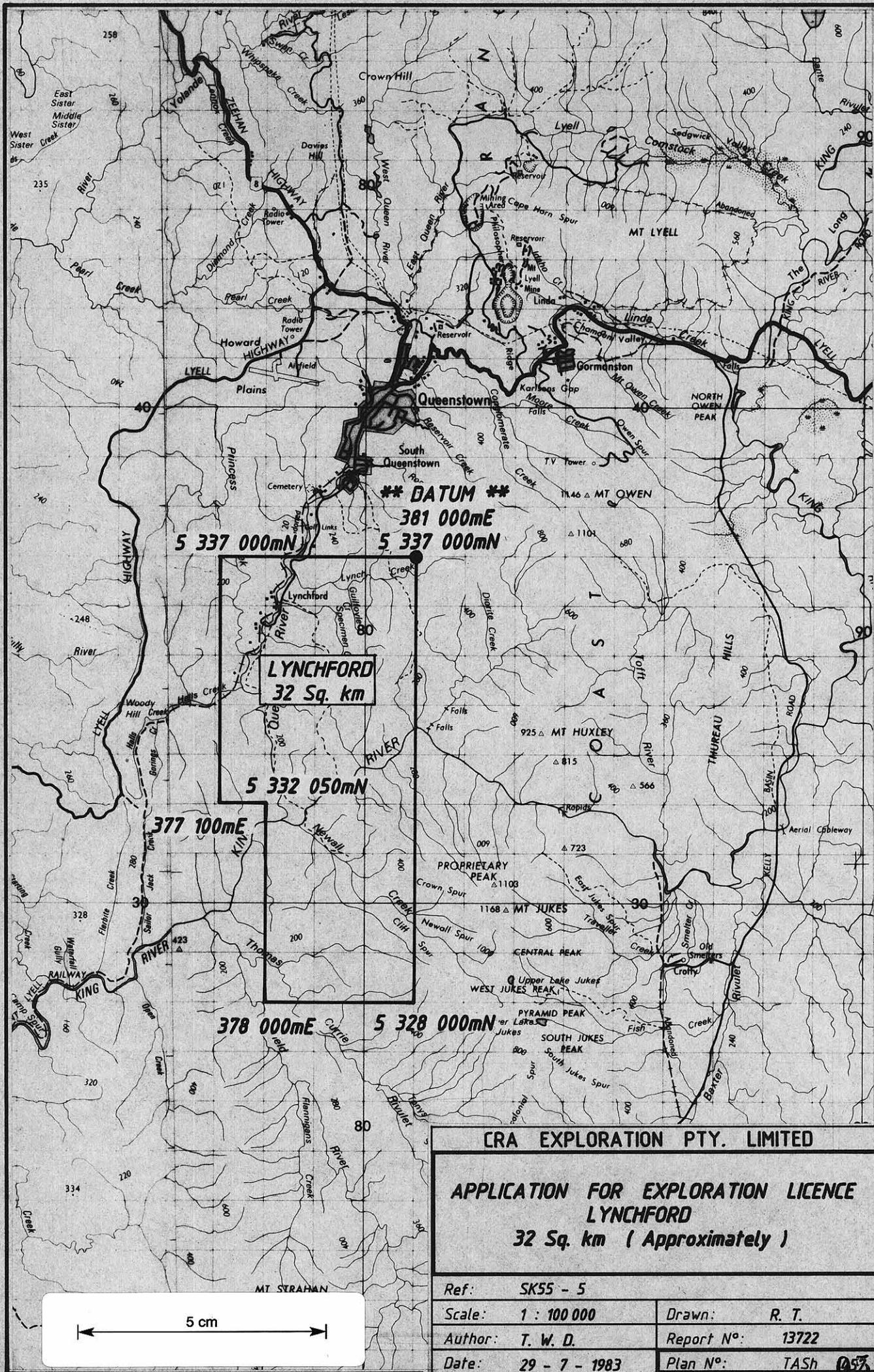
988959 is much fresher and appears to be a minor intrusive; it gives a good positive K-feldspar stain reaction. 988960 is an orthodox porphyritic andesite, originally glassy.

931799 is a fairly coarse lapilli tuff, perhaps ranging into an agglomerate or lava-breccia in places. The various lithic components are generally argillised and thus not always classifiable with certainty. Mineralisation is related to alteration, particularly to the introduction of sideritic carbonate. The main sulphide is pyrite, occurring as scattered small crystals and clusters; many crystals contain fine (mostly $< 10 \mu$) inclusions of galena, sphalerite and chalcopyrite; traces of chalcopyrite also occur separately, as grains up to 50μ . Very occasional patches of fibrous pyrite (?altered marcasite) are present, with chalcopyrite-filled microfractures.

H.W. Fander, M. Sc.

ple	Rock Type - Composition	Fabric	Minor Minerals	Comments
9-3	<u>Argillised, Devitrified Rhyolite.</u> Small corroded quartz and argillised feldspar phenocrysts scattered through a uniform mass of fine quartz and sericite.	Felsitic devitrification textures common. Preferred orientation, but not distinct flow-features.	Fine leucoxene patches throughout.	Uniform, featureless rock; quartz is inverted beta-quartz. Probably originally a glassy lava, depending on field occurrence.
3-2	<u>Argillised Porphyritic Rhyolite.</u> Embayed fragmented quartz phenocrysts in a fine groundmass of quartz and sericite, cut by sets of quartz-K-feldspar veins.	Devitrification textures. Some shearing, postdating veins. Phenocrysts fragmented.	Limonite pseudomorphs after carbonate rhombs. Leucoxene streaks throughout.	Could be a lava or a tuff-lava, i.e. lava with pyroclastic components, perhaps grading into an ignimbrite.
-	<u>Porphyritic Rhyolite.</u> Large phenocrysts of quartz, argillised plagioclase, sometimes mantled by K-feldspar; sericitised biotite phenocrysts. Fine K-feldspar/ quartz groundmass.	Randomly orientated phenocrysts, no flow-features. Minor fracturing.	Accessory zircon and apatite. Secondary leucoxene in altered biotite.	Fabric indicates a minor intrusive. Selective sericitisation of biotite and some plagioclase (sodic oligoclase). Verging on toscanite (rhyodacite).
-1	<u>Porphyritic Andesite.</u> Many single and clustered phenocrysts of cloudy andesine; fresh and partly altered augite; groundmass of semi-opaque altered feldspars, chlorite streaks.	Glomeroporphyritic texture. Streaky, flow-banded groundmass, originally largely glassy.	Streaks of brown chloritised glass. Fine leucoxene. Quartz patches - ?amygdales.	Rock was originally glassy, almost certainly extrusive. Small amounts of fine ?pumpellyite of deuteritic origin throughout.
-	<u>Altered Lapilli Tuff.</u> Large and small fragments of argillised glass, vitric tuff, argillised porphyritic dacite and other volcanics; abundant sideritic carbonate throughout.	Fragments have flow-fabrics, scoriaceous textures. Plastically deformed, stretched.	Fine sulphides (see separate description).	Relict features and alteration assemblages suggest dacitic to trachytic composition. Sulphides associated with alteration, especially carbonate.
	T.S. 52869 - T.S. 52873			

050059



CRA EXPLORATION PTY. LIMITED

APPLICATION FOR EXPLORATION LICENCE
LYNCHFORD
32 Sq. km (Approximately)

Ref:	SK55 - 5	Drawn:	R. T.
Scale:	1 : 100 000	Report No:	13722
Author:	T. W. D.	Plan No:	TASH 0573
Date:	29 - 7 - 1983		

86 - 2529 1457

050060

B A S S

S T R A I T

SMITHTON

BURNIE

ULVERSTONE

DEVONPORT

DELORAINÉ

5 400 000mN

ROSEBERY

ZEEHAN

QUEENSTOWN

STRAHAN

LYNCHFORD
E.L. 47/83

S O U T H E R N

5 300 000mN

O C E A N

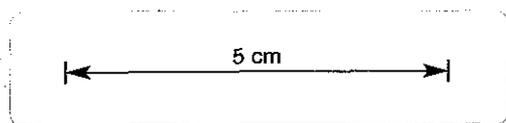
400 000mE

CRA EXPLORATION PTY. LIMITED

LYNCHFORD E.L. 47/83

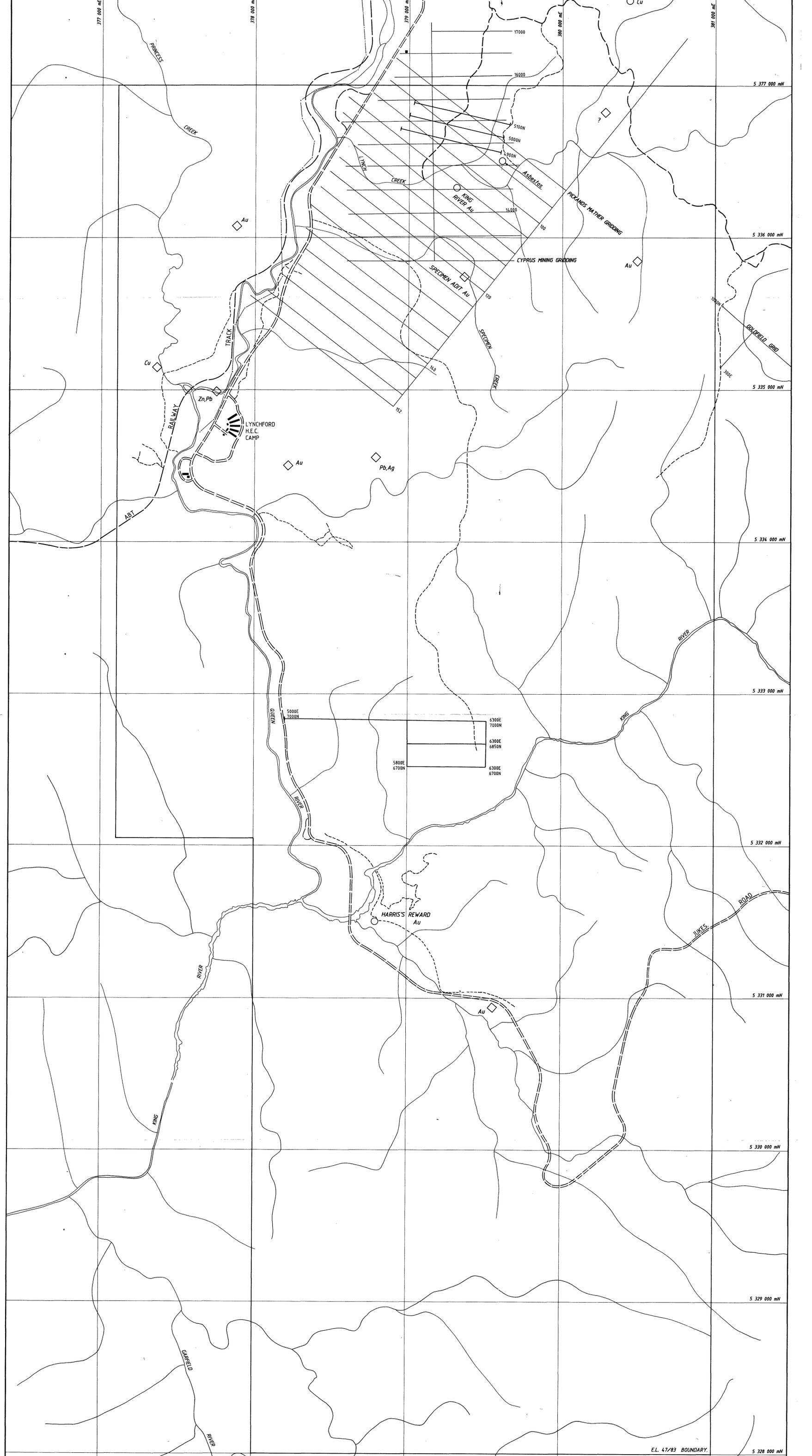
LOCATION PLAN

REF.	SK55 - 5	(8013)
SCALE	1 : 1 000 000	DRAWN R.T.
AUTHOR	I.M.C.	REPORT No. 13722
DATE	13 - 1 - 1986	PLAN No. TASH 2865



300 000mE

86-2529



MINERAL OCCURRENCES

○ Au Vein Deposit and Commodity

◇ Pb Deposit (Unknown Style) and Commodity.

Pre 1985 Gridding

1985 CRAE Gridding

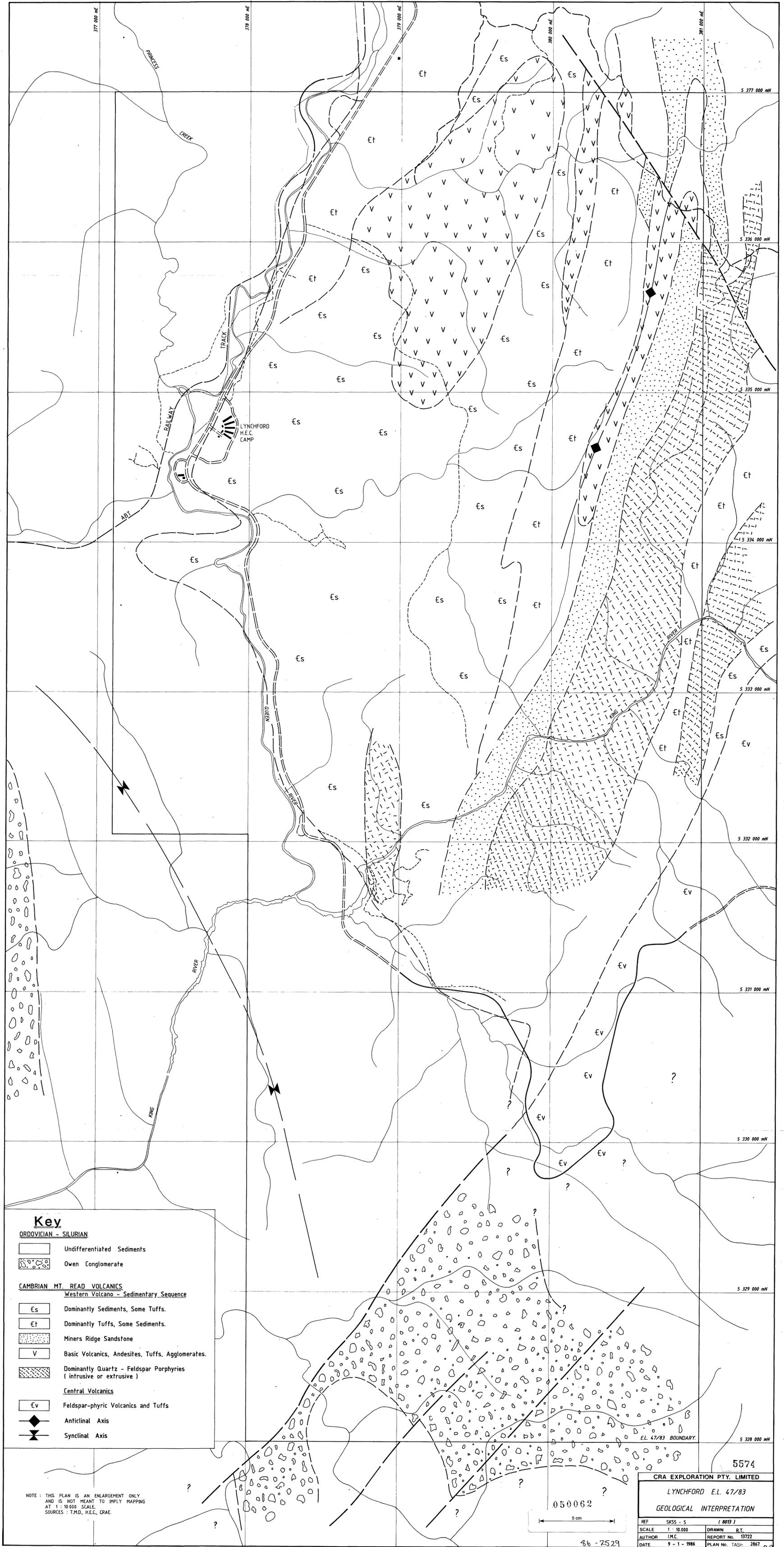
5 cm

050061 5573

CRA EXPLORATION PTY. LIMITED

LYNCHFORD E.L. 47/83
GRID LOCATION PLAN PLUS
MINERAL OCCURRENCES

REF. SK55 - 5 (8013)	DRAWN R.T.
SCALE 1 : 10,000	REPORT No. 13722
AUTHOR I.H.C.	PLAN No. TASH 2866
DATE 15 - 1 - 1986	



Key

ORDOVICIAN - SILURIAN

- Undifferentiated Sediments
- Owen Conglomerate

CAMBRIAN MT. READ VOLCANICS

Western Volcano - Sedimentary Sequence

- Es Dominantly Sediments, Some Tuffs.
- Et Dominantly Tuffs, Some Sediments.
- Miners Ridge Sandstone
- V Basic Volcanics, Andesites, Tuffs, Agglomerates.
- Dominantly Quartz - Feldspar Porphyries (intrusive or extrusive)

Central Volcanics

- Ev Feldspar-phyric Volcanics and Tuffs
- Anticlinal Axis
- Synclinal Axis

NOTE: THIS PLAN IS AN ENLARGEMENT ONLY AND IS NOT MEANT TO IMPLY MAPPING AT 1:10 000 SCALE. SOURCES - T.M.D., H.E.C., CRAE.

050062

5 cm

86-7529

5574

E.L. 47/83 BOUNDARY.

5 328 000 MN

5 330 000 MN

5 332 000 MN

5 333 000 MN

5 334 000 MN

5 335 000 MN

5 336 000 MN

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DIGEM ANOMALY
39/303.5

REFERENCE

- 10/731 Digem Anomaly and Line / Fiducial No.
- ↔ Genie - E.M. Traverses.

Aeromagnetic Features Interpreted from Digem Enhanced Magnetic Contour Plan.

- Strong Magnetic Response
- Moderate Magnetic Response
- Weak Magnetic Response or inferred continuation of magnetic unit.

5 cm

050063

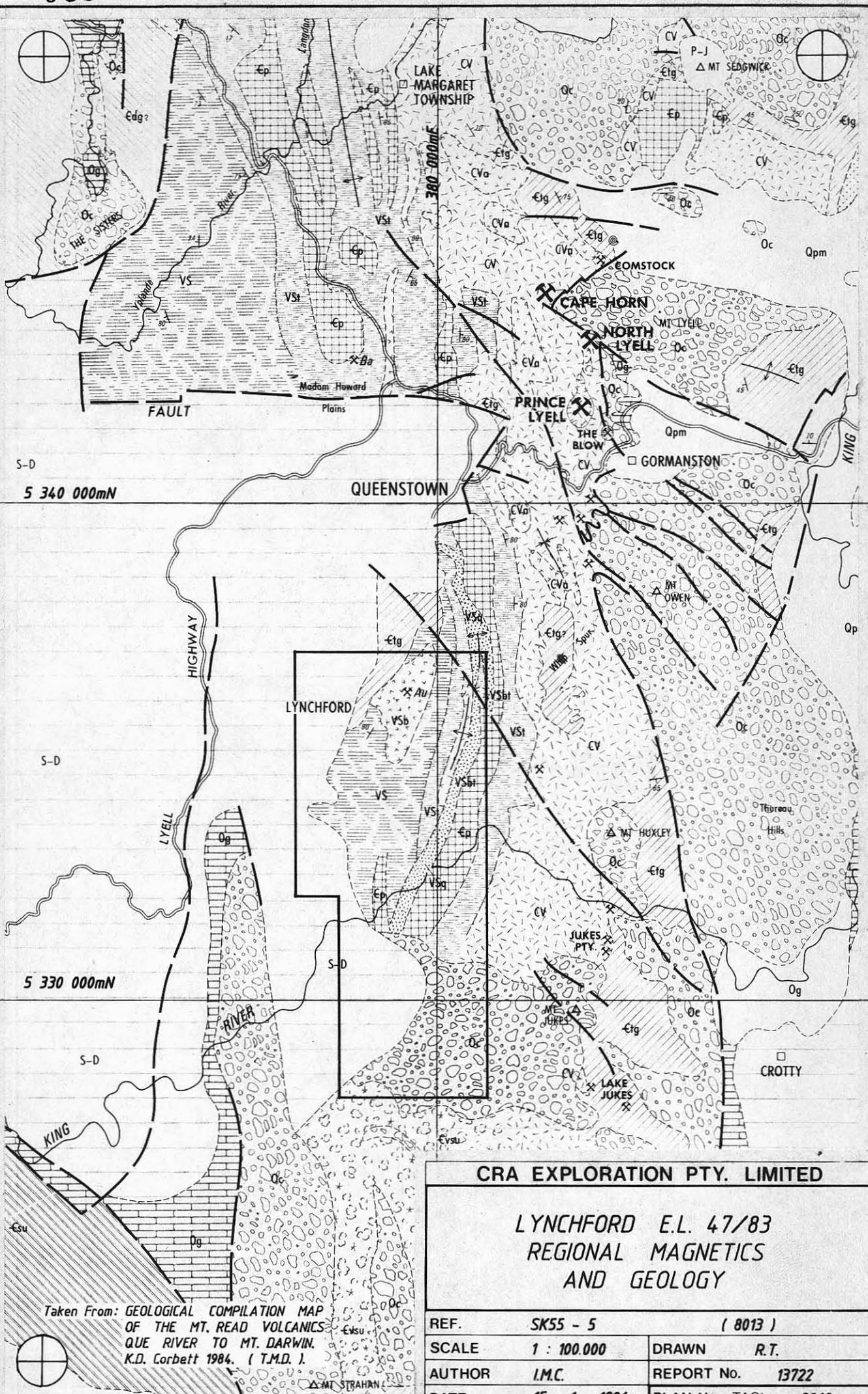
5575

CRA EXPLORATION PTY. LIMITED

LYNCHFORD E.L. 47/83
GEOPHYSICAL COMPILATION SHOWING
DIGEM ANOMALIES, GENIE E.M. TRAVERSES
AND AEROMAGNETIC FEATURES

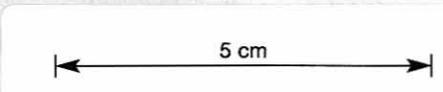
REF	SK55 - 5	(8013)
SCALE	1 : 10,000	DRAWN R.T.
AUTHOR	T.V.S.	REPORT No. 13722
DATE	9 - 1 - 1986	PLAN No. TASH 2860

86-2529



REFERENCE

- SILURIAN - EARLY DEVONIAN**
- S-D Eldon Group undifferentiated
 - Conformity, ?disconformity
- ORDOVICIAN**
- Og Gordon Limestone Subgroup
 - Unconformity, disconformity, conformity
- LATE CAMBRIAN - EARLY ORDOVICIAN**
- Oe Owen Conglomerate and correlates
 - Unconformity, disconformity
- CAMBRIAN - ?EOCAMBRIAN**
- Etg Tyndall Group and correlates - (late Middle to Late Cambrian) - mainly quartz-feldspar-phyric volcanics and volcanoclastic conglomerates
 - Esr Sticht Range Beds - quartzwacke, siltstone, siliclastic conglomerate
 - Unconformity, ?disconformity
 - CV Central Volcanic Sequence - rhyolitic to dacitic volcanics, mainly feldspar-phyric
 - CVa Andesitic volcanics and intrusives
 - Og Shale-siltstone horizons
 - VS Volcano-Sedimentary Sequence - greywacke, siltstone, felsic tuff
 - VSf Mainly felsic tuff
 - VSb Basaltic volcanics (tholeiitic variety VSbt)
 - VSq Quartzwacke-siltstone
- UNASSIGNED CAMBRIAN UNITS**
- Evu Felsic volcanics
 - Esu Sedimentary units, including Farrell Slate
 - CVSU Volcano-sedimentary sequence
- CAMBRIAN INTRUSIVE ROCKS**
- Egr Granite
 - Ep Felsic porphyry



CRA EXPLORATION PTY. LIMITED

LYNCHFORD E.L. 47/83
REGIONAL MAGNETICS
AND GEOLOGY

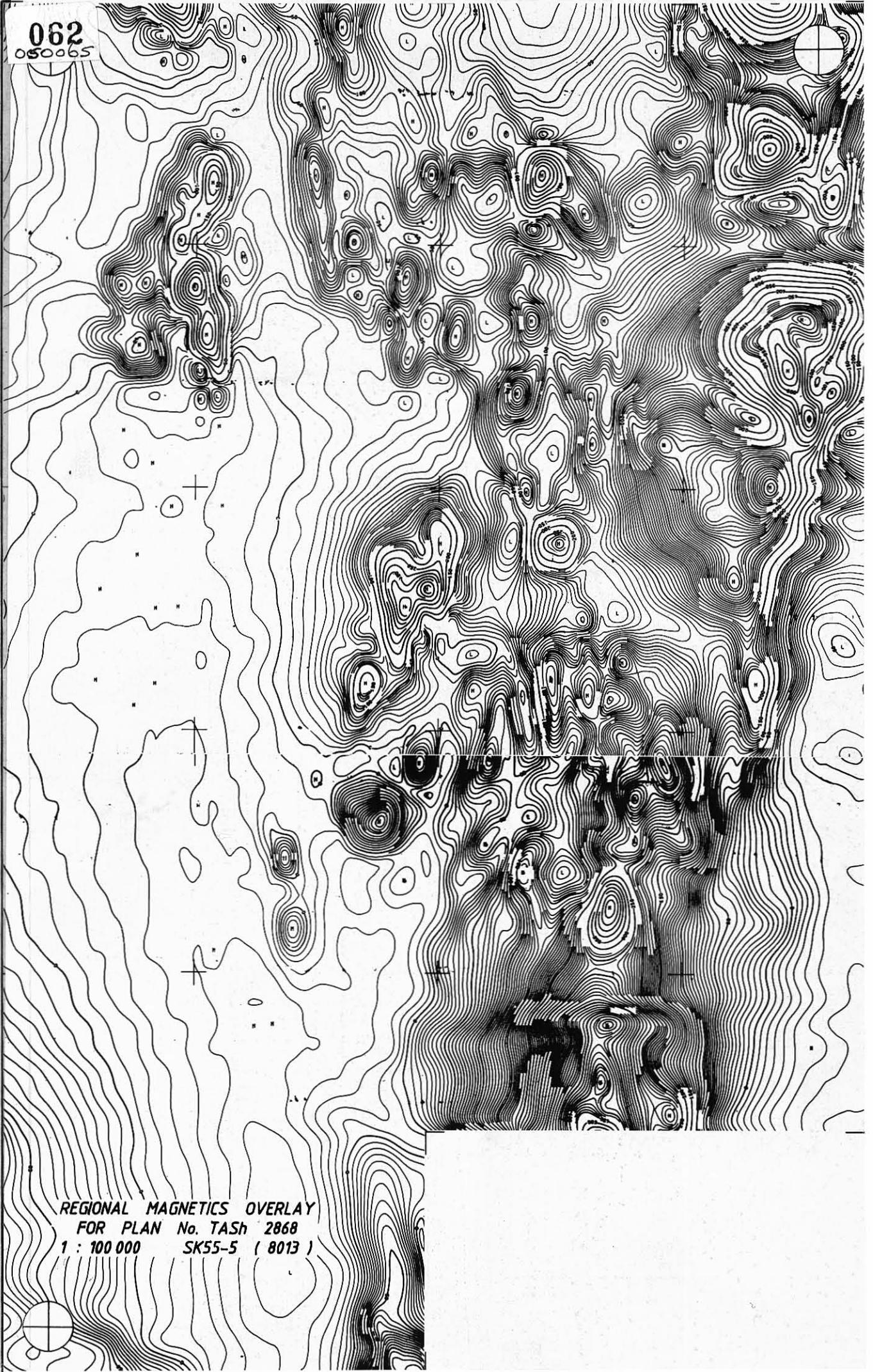
REF.	SK55 - 5	(8013)
SCALE	1 : 100.000	DRAWN R.T.
AUTHOR	I.M.C.	REPORT No. 13722
DATE	15 - 1 - 1986	PLAN No. TASH 2868

Taken From: GEOLOGICAL COMPILATION MAP OF THE MT. READ VOLCANICS QUE RIVER TO MT. DARWIN. K.D. Corbett 1984. (T.M.D.)

062
050065

5 cm

REGIONAL MAGNETICS OVERLAY
FOR PLAN No. TASH 2868
1 : 100 000 SK55-5 (8013)

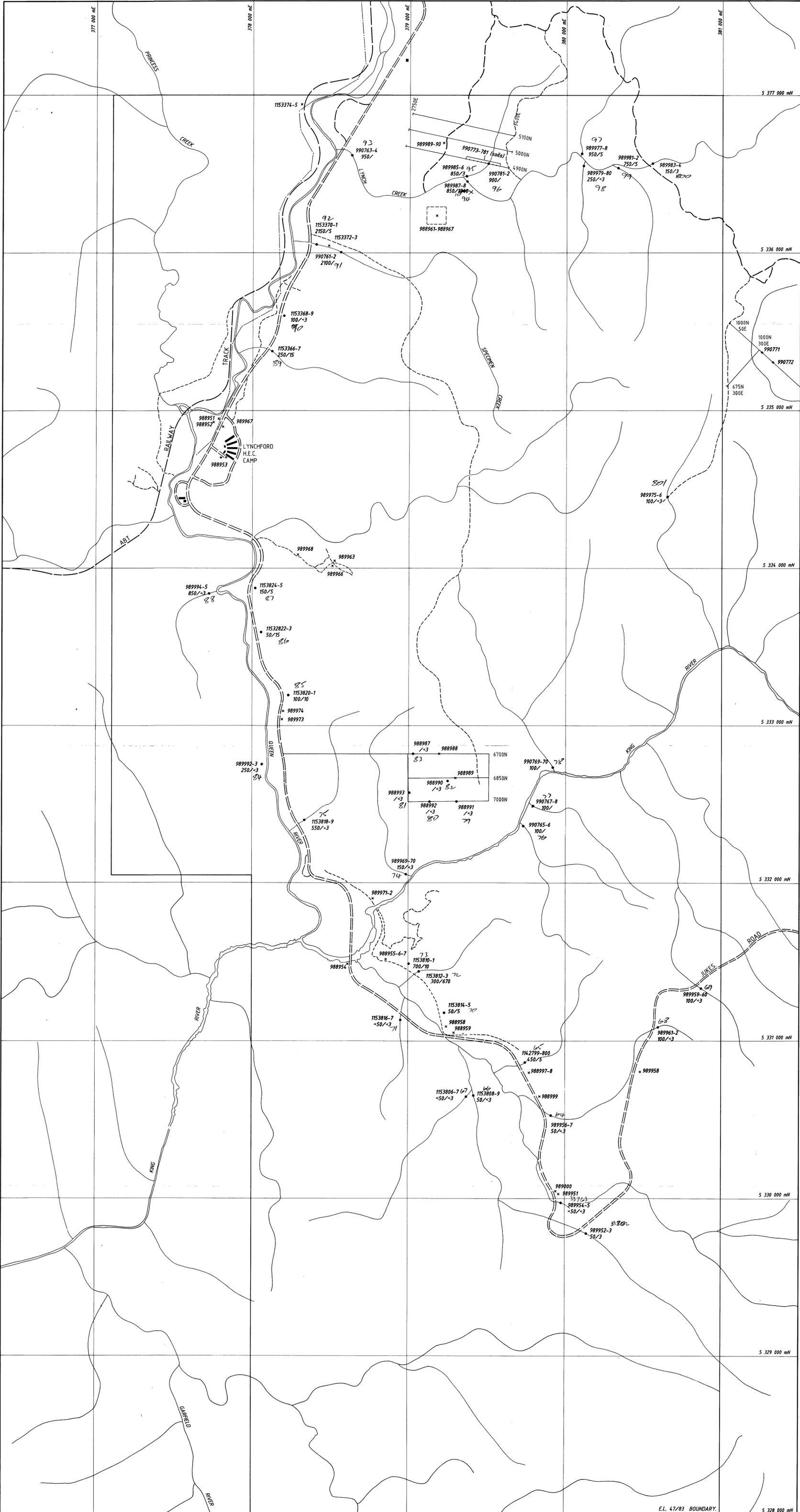




5 cm

050067
 KEY
 Cu, Pb, Zn, Au
 all values in ppm
 (-80 mesh fraction)

CRA EXPLORATION PTY. LIMITED	
LYNCHFORD EL 47/83 STREAM SEDIMENT SAMPLE RESULTS (Previous Explorers)	
REF SK55 - 5	(8013)
SCALE 1 : 10 000	DRAWN R.T.
AUTHOR L.M.C.	REPORT NO 13722
DATE JULY 1985	PLAN NO TASH 2694



△ ▽ Fine-med gr tuffs / g'wackes
Trace pyrite.

△ ▽ Coarse breccia / lithic tuffs
Intermediate. Sandy in parts.

SSS Fine gr sericitic schists &
Shales / tuffs.

XXX Silicified & hematized "volcanics"

Andesite

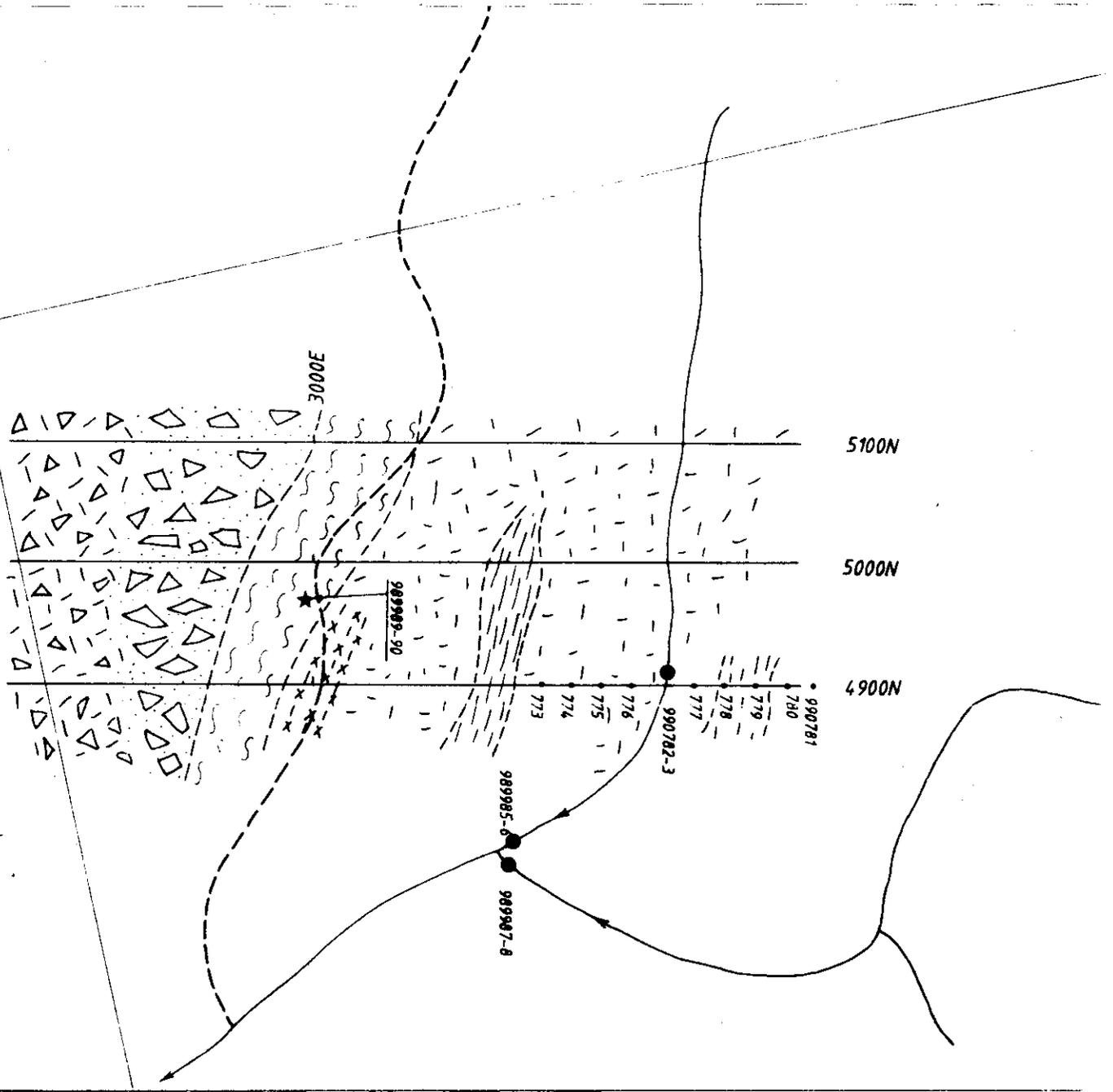
Fine gr tuff / silt-shale

5 cm

86-2529

379 000 mE

5 337 000 mN



★ ROCK SAMPLE
● DRAINAGE SAMPLE
--- SOIL SAMPLE

050069

060

CRA EXPLORATION PTY. LIMITED

LYNCHFORD E.L. 47/83
DIGHEM ANOMALY 10/773
FOLLOW UP GRID, GEOLOGY
& SAMPLE LOCATIONS

REF.	SK55 - 5	(8013)
SCALE	1 : 5000	
AUTHOR	LMC	DRAWN R.T.
DATE	15 - 1 - 1986	REPORT NO. 13722
		PLAN No. TASH 2870