CRA EXPLORATION PTY LIMITED

E.L. 5/85 LAKE MARGARET

MT SEDGWICK EAST PROSPECT

REPORT ON ACTIVITIES

FOR THE PERIOD NOVEMBER 1987 TO AUGUST 1988

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1. SUMMARY

CRA Exploration holds sole title over an area of approximately nine square kilometres centred on the Mount Sedgwick East aeromagnetic anomaly. This area was excluded from the joint venture agreement entered into between CRAE and Aberfoyle Exploration covering EL 5/85 Lake Margaret. The prospect area is composed of a thick sequence of Cambro-Ordovician Owen Conglomerate overlying the Cambrian Mt Read Volcanics.

A detailed assessment of the published magnetic and gravity data covering the west coast led to the identification of the aeromagnetic anomaly centred just east of Mt Sedgwick was identified as an exploration target. A grid was established and ground magnetics carried out in order to more accurately define the aeromagnetic anomaly. Several lines of dipole-dipole IP were also completed in an effort to delineate zones of chargeability within the conglomerate. Drillhole DD88MS1 was collared on the margin of the magnetic anomaly and drilled to a depth of 600 metres. The aeromagnetic anomaly was interpreted to be due to a zone of disseminated magnetite intersected between 454 to 600 metres. While the Cambrian volcanics were not intersected, rhyolitic dykes were observed intruding the Owen Conglomerate and a fossil hydrothermal alteration system was identified. No gold or base metal mineralisation was encountered.

2. INTRODUCTION

The most economically important sequence of rocks in Tasmania are the Cambrian Mount Read Volcanics which form an arcuate belt on the Western margin of the PreCambrian Tyennan nucleus. The Mount Read Volcanics are unconformably overlain by the siliceous sediments of the Cambrio-Ordovician Owen Conglomerate (Denison Group).

The exposed Mount Read Volcanics have been subject to detailed geological mapping, geochemical and geophysical exploration, while the Mount Read Volcanics concealed beneath the Cambro-Ordovician cover have been the subject to very little investigation.

Of particular interest were the Cambrian rhyolitic domes which, where exposed at Red Hills and Mt. Jukes Proprietry, host Cu-Au mineralization and posses a distinct magnetic response. These systems contain in the order of 1-2 g/t gold but no significant reserves have been defined. During 1987 Torbjorn Von Strokirch undertook a revision of the available magnetic and gravity data covering western Tasmania in order to target prospective areas for ground investigations. This study suggested that the very large magnetic anomaly located east of Mt Sedgwick may be related to a Cambrian dome and that it had a similar character to the one overlying the Roxby Downs U-Cu-Au deposit.

The dominant control on relief in the area is lithological. The Gordon Limestone has a thick vegitation cover and an average elevation of 620 metres while the Owen Conglomerate forms extensive flat, lightly vegetated areas at an average elevation of 960 metres.

Stringent environmental safeguards were applied to the exploration programme as it was carried out wholly within the South West Conservation area. A close liaison was maintained between the Department of Mines representatives, the drilling contractor and CRAE personnel.

3. CONCLUSIONS

The I.P. survey defined discrete chargeable bodies within the Owen Conglomerate. The source of the large magnetic anomaly underlying the East Mt Sedgwick grid is interpreted to be the zone of disseminated magnetite encountered in DD88MS1 between 450 and 600 metres. A fossil hydrothermal alteration system was recognized. Carbonate alteration is seen to overprint an earlier acid hydrothermal alteration. Rhyolitic dykes are seen to have intruded the Owen Conglomerate prior to the carbonate alteration which in turn predates the last major deformational event of the Tabberabberan Orogeny. No gold mineralisation was intersected although base metal levels were seen to increase with depth and elevated levels of copper were recorded over a weakly pyritic interval between 32 and 43.5 metres.

4. RECOMMENDATIONS

1. That a downhole EM survey be carried out on DD88MS1.

2. Fission track dating should be attempted on the zircon crystals present in the rhyolitic dykes.

3. The strongest chargeable anomalies located on the Lake Julia grid should be drill tested.

5. GEOPHYSICS

Following the identification of the Mt Sedgwick East aeromagnetic anomaly a grid was cut over the prospect and ground magnetics completed, see plan TASh 3694. Readings were taken with a Scientrex MP-3 proton precession magnetometer at 12.5 metre intervals. Magnetic profiles of the four lines are given on plans TASh 3655 to 3658. Modelling of the magnetic data indicated that the main magnetic source is a 1100 metre wide block at some 600 metres depth, asuming homogeneity, see Appendix 3.

An Induced Polarisation (IP) survey was completed over lines 49750N and 50750N. The survey used a dipole-dipole array and utilised Scientrex IPR11 and IPR10 receivers. Initially line 49750N was surveyed with 200m dipoles. This resulted in extremely noisy data. However, chargeable anomalies were outlined at both ends of the traverse. The anomaly at the western end is poorly defined and is too far from the magnetic anomaly to comfortably fit the model. Hence the anomaly at the eastern end of the line was traversed with 100 metre dipoles. This had the effect of resolving two separate bodies both of which remained incomplete to the east due to the impossibility of continuing the lines through rather thick banksia scrub. A chargeable source at depth under 386400E disappeared on the more detailed survey. This anomaly is only defined on the n = 6 readings indicating a depth of some 300 to 400 metres to source. The narrow steeply dipping anomalies on the line, while all incomplete, are believed to be due to source at 38535E, 387150E and perhaps 387300E. An average of 0.1% disseminated pyrite was observed between 32 and 45.3m in DD88MS1. This disseminated pyrite is possibly related to the I.P. source interpreted to be below 387150E.

The magnetic susceptibility of the drillcore which intersected the upper 100 metres of the carbonate magnetite alteration was measured using a Geoinstruments JH-8 susceptibility meter, see appendix 1. The core has a magnetic susceptiblity of between 150 and 2000 x 10^{-5} SI units, this corresponds to a magnetite content of between 0.08 and 0.9%. Higher readings were recorded towards the base of the hole. Magnetite was observed to occur both within the clasts and matrix of the conglomeratic sequence.

6. GEOLOGY

6.1 Lithology

An excellent 1:25 000 scale geological plan covering the prospect has been published by the Department of Mines and is reproduced in part on plan TASh 3713. As can be seen from the above plan the prospect grid covers a folded sequence of Owen Conglomerate which, in the north east of the grid, is overlain by a body of Gordon Limestone. The limestone is deeply incised by the Dante Rivulett and developed karstic topography which severely impeded ground surveys. The lithologies encountered by DD88MS1 are shown on plan TASh 3714. Where recorded, younging indicators always showed the sequence to be "right way up" and bedding is essentially flat lying. The drillhole was collared vertically in the siliceous sandstones and pebble conglomerates of the uppermost unit of the Owen Conglomerate, represented on the Department's map by COou. Several marly units were encountered between 109.6 and 119.0m. These may correlate with the Mines Department's impure limestone and calcareous sandstone, COonl. A massive cobble rich interval was intersected between 278 and 413 metres and is thought to belong to the COol unit. Clasts of acid igneous and acid volcanic material are first recognised at 440m and become more common towards the base of the hole. The presence of the acid clasts suggest that the rocks may belong to COoc and/or COj units. Rhyolitic dykes are seen to intrude into the conglomerates between 439 and 535m. These dykes vary from 10 to 110cm in thickness and their contacts with the Owen range from sharp to corrosive. Their geometries are variable with some being tabular parallel sided bodies and others possessing an irregular shape.

Only the basal units of the Owen Conglomerate, COoc and COj are known to contain a significant proportion of acid igneous clasts. Given the increasing abundance of these clasts seen in DD88MS1 below 440 metres it is reasonable to assume that the drillhole was terminated in the basal units of the Owen Conglomerate.

It is unusual to encounter such thick sequences of acid clast bearing conglomerate as the Jukes Breccia is usually deposited as a channel or valley fill deposit.

A possible explanation for the thickness of the conglomerates intersected in the drillhole is that they may have been deposited in a large basin.

The drillhole is therefore thought to have drilled through a near complete section of the Owen Conglomerate. A tentative subdivision of the Owen Conglomerate intersected by DD88MS1 is given on Plan TASh 3714.
There is a dearth of recent published material describing the lithology and petrography of the Owen Conglomerate in detail and consequently the proposed subdivision is based on the unit descriptions given on the 1:25 000 scale Geology of the Tyndall Range area sheet.

The recognition of rhyolitic dykes intruding the Owen Conglomerate is important as these intrusives provide a mechanism for the development of a mineralising system within the Owen. Several thin sections were cut from samples and described, see 1653186 and 87, Appendix 2. They were both identified as being rhyolitic in composition. Sample 1653186 was identified as being a welded tuff by Amdel but the author has examined the thin section and hand specimen and it is clear that the structure Amdel identified as a compaction foliation is orientated at 20 degrees to the core axis and is undoubtedly a cleavage plane. While both intrusives are quartz and feldspar phyric, 1653187 contains considerable potassium feldspar whereas 1653186 contains only altered plagioclase feldspar.

6.2 Structural Geology

Extensive bedrock outcrops in the area covered by the Mount Sedgwick East grid. While detailed structural mapping was not carried out on the prospect, reconnaissance traverses were completed along some grid lines. On a prospect scale a siliceous sequence of Owen Conglomerate is folded to form a syncline which in the Dante's Rivulette area has a core of Gordon Limestone.

A prominent plug of Jurassic Dolerite has intruded across the boundary of the Mt Read Volcanics and the Owen Conglomerate and forms Mt Sedgwick, see TASh 3713.

The tectonic history of the area is best recorded in the sandstones and conglomerates of the Owen Conglomerate.

The terminology described in Bell & Duncan (1978) will be used in this report. Two cleavages may be seen in outcrop. An early near vertical NNW trending cleavage, (S_1), is seen to be overprinted by an approx east-west trending fabric, (S_2), which is generally less penetrative. In outcrop scale these cleavages are clearly discernible in the conglomerates as considerable rotation of clasts has occurred along with resolution of quartz and phyllosilicates along the cleavage planes. Mesoscopic folds at both generations were observed, although D_1 folds were the most common and these were observed to plunge shallowly to the NNW and SSE. This plunge reversal is thought to be due to refolding of F_1 folds by D_2. The major structure in the area is a syncline which is plunging shallowly north. Both D_1 and D_2 are thought to be Mid Devonian in age and related to the Tabberabberan Orogeny. Cox (1981) considered D_1 to have occurred before the onset of metamorphic conditions suitable for the development of foliation generating fabric elements. This does not hold true for the Owen Conglomerate exposed in the study area as a well developed cleavage is observed which is orientated roughly parallel to the fabric referred to by Cox as S_1 in the underlying Cambrian sequence.

DD88MS1 was sited on a near horizontal sequence of conglomerates and the drillhole was collared vertically. Plan TASh 3715 shows the structural features recorded from drillcore. The drillhole was surveyed at approximately 100m intervals and the only appreciable deviation from vertical occurred when the core size was reduced to BQ.

The sequence intersected by the drillhole was found to be essentially flat lying with nearly all bedding structures being orientated at between 80 degrees and 90 degrees from the core axis, (C.A.), see TASh 3715.

The maximum bedding dip was found to be at 65 degrees to the C.A. It should be noted that because the sequence intersected from 400 - 600m was massive pebble conglomerate very little bedding data was recorded and it is possible that bedding could be at some considerable angle to the core axis towards the base of the hole. However, on the basis of the recorded data it appears as if the hole was drilled vertically into the hinge zone of a major D_1 syncline.

Generally only one cleavage was visible in the drillcore and this was strongly developed at 5 - 20 degrees to the core axis and is thought to be S_1 as this was the most strongly developed cleavage in outcrop.

The quartz grains in the matrix of the sandstones and conglomerates showed a strongly recrystallised texture. The larger clasts showed intensely deformed, polycrystalline textures with very strong undulose strained extinction and localised granulation. In all cases where thin section examination of vein calcite was carried out well developed deformation lamella and local recrystallisation were noted.

6.3 Alteration

To assist in defining the physio-chemical evolution of the Mt Sedgwick area 21 drillcore samples were submitted for petrographic descriptions and where appropriate XRD analysis. The XRD work was required to differentiate between the various fine grained phyllosilicates noted in hand specimens. The analytical results and petrographic descriptions are reported in Appendix 2.

The dominantly siliceous lithologies of DD88MS1 have been subject to several episodes of alteration. The author believes that early high temperature advanced argillic alteration was overprinted by a carbonate alteration, see plan TASh 3715.

With only one drillhole it is not possible to accurately define the geometry of the alteration zones in three dimensions but for the purposes of this report we shall assume them to be flat lying, tabular zones.

The first 300 metres of DD88MS1 encountered a largely unaltered highly siliceous sequence of siltstones, sandstones, conglomerates with occasional marly beds. Between 300 and 450 metres an increasing percentage of pyrophyllite and lesser muscovite is noted. From 450 and 600 metres a strong carbonate alteration is observed. No pyrophyllite was identified over this interval. However, the calcite was found to be associated with disseminated magnetite which was interpreted to be the source of the Mt Sedgwick aeromagnetic anomaly.

Many hydrothermal alteration systems are known to be capped by a zone of intense silicification. It is extremely difficult to determine whether or not the first 300 metres of DD88MS1 have been subject to pervasive silicification as the original wall rock was composed nearly entirely of quartz and have undergone considerable recrystallisation during the Devonian Tabberabberran Orogeny.

The presence of a quartz-pyrophyllite assemblage between 300 and 450 metres diagnostic of a high temperature advanced argillic alteration. In addition to pyrophyllite and quartz lesser amounts of kaolinite and muscovite are present, see plan TASh 3715. Pyrophyllite, in the absence of diaspore and a metastable silica phase, can only form at pressures greater than 300 bar and temperatures between the kaolinite and andalusite stability field extremes i.e. 270 to 360^{o}C, Knight (1977). The absence of alunite from this assemblage suggests that the fluids responsible for the acid alteration had a low sulphate activity and that the alteration system was of the low sulphur type. The abundance of pyrophyllite is seen to increase from 300 to 450 metres.

From 450 metres to the end of the hole, (600m), a quartz - calcite - (sercite/clay) - (magnetite) alteration mineralogy is dominant. This assemblage is readily identifiable in hand specimens by the abundance of calcite which occurs predominantly as a matrix replacement and the high magnetic susceptibility, generally greater than 200 x 10^{-5} SI units. The abundance of calcite between 450 and 600 metres suggests boiling. Where an ascending solution, reasonably close to calcite saturation, boils as a result of decompression (cooling adiabatically), carbonate is likely to precipitate, Fournier (1985). The presence of both calcite and magnetite suggests high pH fluids were responsible for the alteration, see plan TASh 3715. Note that this is in strong contrast to the low pH conditions which applied during the high temperature advanced argillic alterations.

6.4 Age Relationships

It has not been possible to directly date the age of the alteration due to the lack of suitable minerals, i.e. no alunite for K-Ar dating.

It may, however, be possible using the zircon crystals present in the rhyolitic intrusives to obtain an approximate age date for their crystallization using fission track techniques. While this technique has limitations it should be possible to determine the time of emplacement to within 50 Mys.

While direct dating has not been undertaken several overprinting relationships were observed which allow a relative timing of events to be established. Narrow, less than 110 cm wide (apparent thickness), rhyolitic dykes are seen to intrude the Cambro-Ordovician Owen Conglomerate. These dykes are often cut by calcite + quartz veins which are coeval with the main phase of carbonate alteration. The carbonate alteration is also seen to overprint a high temprature acid argillic alteration which is thought to be related to the emplcement of acid igneous bodies at depth. Petrographic examination of the calcite veins reveals that they are strongly deformed, displaying deformation lamella, local recrystallisation. This deformation suggests that the veining predates D_2 of the Tabberabberan Orogeny. This restricts the age of emplacement of the rhyolitic intrusives to sometime between the Early Ordovician to Mid Devonian.

The problem of metamorphic equivalence must always be considered when attempting to identify relict hydrothermal systems in terrains which have been subject to regional metamorphism. The Mount Read Volcanics and Owen Conglomerate have been subject to Lower Greenschist facies metamorphism during the Devonian. Cox (1981) noted that the presence of a quartz + pyrophyllite bearing assemblage in aluminous hydrothermally altered volcanics limits temperatures to 275 - 350°C, assuming water pressures in the vicinity of 2kbar, Cox (1981).

It is doubtful that these conditions were reached in the Owen Conglomerate in the prospect area subsequent to the carbonate alteration as minor kaolinite but no pyrophyllite was observed between 440 and 600 metres. This constrains the maximum temprature reached to less than 270°C.

A schematic diagram showing a cross section through system is given on plan TASh 3722.

6.5 Mineralisation/Geochemistry

The base of oxidation was found to be gradational at 454m, however, a band of unoxidized material was intersected between 92 and 121 metres. Directly below the main base of oxidation 0.1 to 1% disseminated magnetite occurs. The pyrite encountered by DD88MS1 occurs as sparse (0.1%) disseminations as seen between 32 and 43.5m or with calcite + quartz ± chlorite ± pyrite veins towards the base of the hole, see 597m. A rhyolitic dyke at 505.93m contained minor bornite + pyrite.

Downhole plots of Ag-Cu-Pb-Zn-Ba and As-Mn-Fe are given on plans TASh 3716 and 3717 respectively. The copper plot shows elevated levels, 45 to 175ppm, between 30 and 48 metres which is coincident with the zone of disseminated pyrite noted in the drill logs. These higher copper levels suggest that there may be trace chalcopyrite over this interval. This weak copper-IP association is encouraging and should be further investigated. The strong shallow IP responses located on the Lake Julia grid would be most suited to futher follow up because of its similar character to the East Mt Sedgwick IP anomalies and easier access. Considering the high cost of airlifting a conventional drillrig to the site the fact that the IP anomalies on the Lake Julia Grid are shallow consideration should be given to using a small man portable diamond rig to test several of the IP features.

The lead and zinc plots were unremarkable only showing an elevation in abundance below 440m which corresponds to the presence of the carbonate alteration and an increased component of acid igneous clasts in the conglomerate. This elevation in abundances below 440m is also seen in the arsenic, iron, manganese and barium plots. Barium values below 440m average on the order of 1000 ppm and this is considered to be anomalous. The Ba is thought to occur as fine grained barite ($BaSO_4$) although none was identifed in thin section. The source for the barium is interprated to lie within the Cambrian Volcanics. It is possible that base metal mineralization, which is often barite rich is associated with the postulated intrusive which initiated the hydrothermal alteration observed in DD88MS1. A downhole EM survey would hopefully illuminate any massive sulphide in close (100m) proximity of the drillhole.

Basic element statistics are given on plans TASh 3718, 3719 and 3721. Most elements have a bimodal distribution with the lower population thought to be distributed through the top 440m of the hole with the second population being concentrated in the bottom 160 metres. Correlation plots between Pb-Cu, Zn-Cu, Zn-Pb, Zn-Ba are given on plan TASh 3720. The greatest correlation was seen between Zn-Pb and Zn-Ba again two populations were observed.

REFERENCES

BELL T.H. & DUNCAN A.C. (1978) "A Rationalised and Unified Shorthand Terminology for Lineations and Fold Axis in Tectonites" Tectonophysics, Vol.47, pp 91-95.

COX S.F. (1981) "The Stratigraphic and Structural Setting of the Mt Lyell Volcanic-Hosted Sulfide Deposits" Econ. Geol. Vol.76 pp 231-245.

FOURNIER R.O. (1985) "Carbonate Transport and Deposition in the Epithermal Environment" in Geology and Geochemistry of Epithermal Systems. Reviews in Economic Geology, Vol.2 pp 63-72.

KNIGHT J.E. (1977) "A Thermochemical Study of Alunite, Enargite, Luzonite and Tennantite Deposits" Econ. Geol. Vol.72 pp 1321-1336

LOCATION

QUEENSTOWN	SK55OS	1:250 000
BURNIE	SK55O3	1:250 000

KEYWORDS

Cambrian, Ordovician, rhyolites, sediments, drill diamond, geochemistry geophysics magnetic, geophysics IP, petrography, alteration.

APPENDIX 1
DRILLCORE LOG - DD88MS1

51 - 80103

019

387050 mE } GRID
499750 mN }

726020

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

SHEET No. 01

TENEMENT NAME LAKE MARGARET No. 5/85

PLAN – MAP REFERENCE

386950 mE } AMG
CO-ORDINATES 6499750 mN AZIMUTH N.A DRILLERS Diamond Drillers COMMENCED 10-3-1988 DEPTH 600m HOLE No DD88MS1

RL COLLAR ~ 850 (AMG) INCLINATION -90° DRILL TYPE Longyear 38 COMPLETED 10-4-1988 CASING LEFT DPO No(s) 46280

DEPTH From (m)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by AGS (PRIS)) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
-0	0-2	0	HQ		Pre-Core		1655029	0.0	3.0		<0.01	1	4	15	20	10		2.31%	<5
2	4.0	3.8	HQ		Pebble Conglomerate – Oxidized pinky coloured clast supported with a sandstone matrix. Clasts 3-10mm diam sub-angular to subrounded. Clasts are quartzose and vary from red chert to sandstone in content. 3.0 → 3.5m is a more sand rich interval.														
.0	5.4		HQ		Interbedded Pebble Conglomerate/Siltstone: Conglomerate as above except the average clast diam ~ 9mm / stringers 5-10 cm wide of medium grained siltstone. These stringers are at 90° to the Core Axis (C.A). Trace pyrite & base of interbeds. Flame structures indicate the sequence is younging upwards		1655030	3.0	6.0		<0.01	<1	2	10	15	10		2.56%	5
4	9.4		HQ		Pebble Conglomerate: Clast supported and 5-20 mm diam and sub-angular shaped clasts. Between 6.4 to 8.0 m are 4 cm wide beds of siltstone showing good bedding at 90° to C.A & younging up. Between 8.3 and 8.5m are en echelon tension gash.		1655031	6.0	9.0		<0.01	<1	2	10	15	10		1.53%	<5
.4	10.0		HQ		Interbedded Pebble Conglomerate/Sandstone: Conglomerate as above with dark maroon coloured fine grained sandst one 50 mm wide with graded bedding showing the sequence to be younging upwards.		1655032	9.0	12.0		<0.01	1	8	10	35	25		2.81%	<5
.0	13.1		HQ		9.2 ABOVE: See sandy beds between 13.9 – 13.1m, 12.3 – 12.6 m & 12.8m are a strong cleavage developed at 30° to C.A Cleavage defined by alteration of clasts, some silica veining alteration.		1655033	12.0	15.0		<0.01	1	3	10	15	15		3.01%	40
..	18.4		HQ		Pebble Conglomerate: Clasts 2-20 mm diam, sub-angular → sub rounded Average clast diam 8-10mm diam with lesser qtz sandy matrix. One siltstone conformable bed between 17.1 and 17.3 m		1655034	15.0	18.0		<0.01	<1	2	10	15	15		2.85%	220

020 387050 mE } GRID
+9750 mN }

726021

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

SHEET No. 02
TENEMENT NAME LAKE MARGARET No. 5/85
PLAN – MAP REFERENCE

CO-ORDINATES 387950 mE } A.M.G. 9750 mN AZIMUTH N.A DRILLERS DIAMOND DRILLERS COMMENCED 13-3-1993
DEPTH 600m HOLE No. DD88MS1
RL COLLAR ≈ 850 (±5m) INCLINATION -90° DRILL TYPE LONGYEAR 38 COMPLETED 15-4-1993
CASING LEFT PVC DPO No(s) #6280

DEPTH From (m)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
4	19.15		HQ		SANDSTONE: Quartzose, medium grained, well sorted, mod. well rounded and oxidized. Tonian gouge seen between 18.5 and 18.7m. See occasional quartz veins at 45° to C.A which contain trace unidentified clay mineral.		1655035	18.0	21.0		<0.01	<1	2	10	15	10		2.34	25
15	21.45		HQ		PEBBLE-GRIT CONGLOMERATE: Siliceous, clast supported as above.		1655036	21.0	24.0		<0.01	<1	1	5	20	10		0.67	95
45	21.60		HQ		SANDSTONE: Quartzite, medium grained, tan-grey clour.		1655037	24.0	27.0		<0.01	<1	2	10	15	10		0.60	95
0	26.70		HQ		PEBBLE CONGLOMERATE: Clasts 2-17mm, fine, sub-angular and clast supported. Very silicic. At 26.23m see 8mm wide milky quartz veins at 60° to the C.A. Trace chl/pyrite around some clast boundaries.		1655038	27.0	30.0		<0.01	<1	2	5	15	15		1.94	75
70	27.30		HQ		SANDSTONE/PEBBLE CONGLOMERATE: Pink clour, increasing conglom towards 27.3m. As above.		1655039	30.0	33.0		<0.01	<1	16	45	15	15		2.14	160
7.30 m			CHANGE		CORE SIZE TO NQ		1655040	33.0	36.0		<0.01	<1	3	65	15	15		0.89	95
30	37.8		NQ		PEBBLE CONGLOMERATE: Matrix supported with minor 0.1% chl on grain boundaries, silicic conglomerate.		1655041	36.0	39.0		<0.01	<1	2	175	20	5		1.20	75
80	38.35		NQ		SANDSTONE: Fine grained, silicic and a light-pink-green clour. 28.0→28.2 see lots of chl on structures at 75-90° to the C.A. At 38.15m see a 93-CHL6 vein with pyrite selvages, 4mm wide.		1655042	39.0	42.0		<0.01	<1	2	35	20	10		1.03	135
35	39.4		NQ		PEBBLE CONGLOMERATE: Light pink-grey clour, clast supported. 0.2% fine and bimodal chlorite and minor (0.05%) fine pyrite. Clasts and matrix quartz rich.		1655043	42.0	45.0		<0.01	<1	2	140	15	5		1.40	115

021 387950 mE } GRID 49750 mN

726022

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

SHEET No. 03

TENEMENT NAME Cape Margaret No. 5/85

PLAN – MAP REFERENCE

CO-ORDINATES 386950 mE } AMG 8349750 mN AZIMUTH N.A. DRILLERS Diamond Drillers COMMENCED 10-3-1988 DEPTH 600 m HOLE No. DD88 MS 1

RL COLLAR [illegible] INCLINATION -90° DRILL TYPE [illegible] COMPLETED [illegible] 1988 CASING LEFT P.V.C. DPO No(s) 46150

Depth From (M)	Depth To (M)	Core Rec. (M)	Core Size	Graphic Log	Core Description	Special Features (Weath, Alteration, Fracturing, Veining, Mineralization)	Sample No.	From (M)	To (M)	Rec (M)	Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
·90	31·65		NQ		SANDSTONE: Fine grained, maroon colour, variable qtz and mica content. 20 cm grit layer between 29.9 and 30.1 m. Sheared chlorite veins at 70° to the C.A.														
65	32·80		NQ		PEBBLE CONGLOMERATE: Siliceous, clast supported with a cleavage at 20° to the C.A. Minor dissn pyrite (0.05%) concentrated around grain boundaries.														
80	35·00		NQ		SANDSTONE: Coarse grained, quartzose. From 32.8–34.2 m see 5 mm wide milky quartz veins at 70° to the C.A. See tension gashes between 33.5 and 33.9 m which show chl + pyrite infillings. Chl veins at 80° to C.A. at 38.2 m. Pyrite 0.1% with two generations seen 1) yellow dissem and 2) A more brassy type which is concentrated around clasts. This uncorroded pyrite is thought to be a latter introduced type and probably the cause of the I.P anomaly.														
5·00	37·20		NQ		PEBBLE CONGLOMERATE: Sub-angular to sub-rounded clasts. Brassy pyrite 0.08% is generally fine grained and concentrated around grain boundaries.														
20	39·60		NQ		SANDSTONE / PEBBLE CONGLOMERATE: Disseminated pyrite 0.1–0.2% some coarse grained clasts to 9 mm diameter. Between 37.2 and 37.27 m we see milky quartz veins at 90° to the C.A. with some chl content.														
·60	44·00		NQ		PEBBLE CONGLOMERATE: Variable clast size, two populations one are 10 mm diam and other 4 mm diam. Pyrite 0.1% see QTZ-PY veins at 80° to C.A between 42 and 44 m. Clast >> vein pyrite. Between 43 and 43.7 m see milky quartz tension														

ASSAY VALUES (Analysed by A.L.S. [illegible])

022

337050 mE } GRID
4499750 mN }

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

726023

SHEET No. 04

TENEMENT NAME LAKE MARGARET No. 5/85

PLAN – MAP REFERENCE

CO-ORDINATES 336450 mE } AMG
4499750 mN } AZIMUTH N-A DRILLERS DIAMOND DRILLERS COMMENCED 10-5-1988

DEPTH 600 m HOLE No. DD88M51

RL COLLAR ≈ 350 (+/- 5m) INCLINATION -60° DRILL TYPE LONGYEAR 38 COMPLETED 10-5-1988

CASING LEFT PVC DPO No(s) 46350

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS(Qld)) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
00	45.30		NQ		SANDSTONE/GRIT: (90:10) Quartzose sandstone with variable pg clast content. Sandstone is coarse grained and contains 0.1% clot pyrite.		1655044	45.0	48.0		<0.01	<1	2	65	15	10		1.69	60
.30	46.30		NQ		PEBBLE CONGLOMERATE: Average clast diam 8mm diam, and 0.05% disseminated pyrite. Pinolution textures seen in matrix.														
.30	47.50		NQ		SANDSTONE: Quartzose which is very coarse grained with 0.05% clot pyrite. Odd 8mm diam clasts seen.														
50	50.60		NQ		PEBBLE CONGLOMERATE: Clasts sub-rounded, 2-25mm diam chiefly average 6mm diam Clast supported with abundant milky quartz veins at 50° and 80° to the C.A which show minor chl, pyrite enclosed. Rare diss pyrite. Vein chlorite at 80° at C.A. at 49.9m.		1655045	48.0	51.0		<0.01	<1	3	20	15	10		2.00	600
0.60	51.55		NQ		SANDSTONE: Siliceous, py pyrite with a 5cm wide band of micaceous material at 10° to C.A seen at 51.2m i.e S_0 : 80° to C.A		1655046	51.0	54.0		<0.01	<1	3	10	15	10		2.42	230
1.55	54.90		NQ		PEBBLE CONGLOMERATE: Pinky grey clast supported, clasts 4-25mm diam, rock has a quartzose sand matrix. Chlorite seen to fill fractures in clasts, Tension gash at 52.7m I_o at 25° to C.A														
.90	55.65		NQ		SANDSTONE Occasional 2m wide bands of conglomerate and micaceous siltstone. Bedding is at 88° to the C.A		1655047	54.0	57.0		<0.01	<1	4	5	20	10		2.40	65
65	58.00		NQ		INTERBEDDED CONGLOMERATE/SILTSTONE: Siliceous siltstone and conglom. units with 10cm wide interbeds Micaceous sandstone. Excellent bedding at 90° to C.A.		1655048	57.0	60.0		<0.01	<0.1	2	5	3	1			

0. 023

387550 m E } GRID
49750 m N }

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

726024

SHEET No. 05

TENEMENT NAME Lake Margaret No. 5/85

PLAN – MAP REFERENCE

386950 m E } A.M.G.

CO-ORDINATES 5249750 m N } AZIMUTH N.A. DRILLERS Diamond Drillers COMMENCED [illegible] DEPTH 600m HOLE No. DD88MS1

RL COLLAR ≃ 850 (✓ s m) INCLINATION -90° DRILL TYPE Longyear 38 COMPLETED [illegible] CASING LEFT PVC DPO No(s) 46283

DEPTH From (m)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
0	59.40		NQ		PEBBLE CONGLOMERATE: Quartzose clasts 3-25mm diam. Clast supported. Rare disseminated pyrite between 58.0 and 59.0m and JO at 35° to C.A.														
40	60.60		NQ		SILTSTONE > PEBBLE CONGLOMERATE: Fine to very coarse grained siltstone with clast supported conglomerate. At 60.5m So=90° to C A; JO=20° to C A.														
60	66.60		NQ		PEBBLE CONGLOMERATE: Siliceous clast supported conglom ical sandstone interbeds between 62.10 → 62.40 and 63.70-66.40m. Base of oxidation at 62.70m. Below 62.7m is pale grey colour with only occasional irregular oxidized (pink) material. No sulphides visible, unidentified black mineral disseminated throughout ≥ 0.3%.		1655049	60.0	63.0		<0.01	0.3	2.9	20	3	2			
70	= BOX						1655050	63.60	66.0		<0.01	0.3	16	60	5	1			
60	66.75		NQ		SANDSTONE: Olive-grey medium grained and no sulphides were visible. Occasional siliceous pebble or half oxidized silt bands.		1655051	66.0	69.0		<0.01	0.3	20	55	13	4			
75	69.00		NQ		PEBBLE CONGLOMERATE: Light grey colour, no magnetite. Clasts 3-15 mm diam with a quartzose sandy matrix. Occasional dots of v.f.g pyrite seen in the matrix between 68.7 and 68.9m total 0.1%. Milky quartz veins seen between 68.2m and 68.5m.														
00	71.00		NQ		SANDSTONE: Medium grained with occasional pebble entrained. No sulphides and fractures seen // to the C.A. Milky quartz veins seen between 70.65 and 70.75m		1655052	69.0	72.0		<0.01	0.2	7.4	48	12	2			
00	74.00		NQ		PEBBLE CONGLOMERATE: Light grey colour to 73m and pink below 73m. Top Of Oxidation at 73m. Often see fine grained pyrite associated with rare silt bands at 90° to C A. see 72.3m, 72.5m and 73m.		1655053	72.0	75.0		<0.01	0.2	4.0	19	2	<1			
00	= TOX																		

ASSAY VALUES (Analysed by ALS ([illegible]))

024

726025

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

SHEET No. 06

TENEMENT NAME Lake Margaret No. S/85

PLAN – MAP REFERENCE

CO-ORDINATES 386950 mE / 7449750 mN } AMG. AZIMUTH DRILLERS Diamond Drillers COMMENCED 10-5-89

DEPTH 600m HOLE No. RR85MS2

RL COLLAR INCLINATION DRILL TYPE Longyear 38 COMPLETED 12-5-89

CASING LEFT 8 NC DPO No(s) 46233

DEPTH From (m)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS (Brisb.)) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
30	77.30		NQ		PEBBLE CONGLOMERATE: Oxidised with dark matrix from changing from 2mm - 10mm Clast supported with a sandy matrix		16555[illegible]	75.0	78.0		<0.01	0.1	0.5	5	2	<1			
30	82.30		NQ		SANDSTONE: Medium to very coarse grained, quartzose with minor 4cm wide IB's of micaceous siltstone i.e. 81→81.3m; 80.3-80.5; Sa at 90° to the C.A. Tension gashes between 77.3-78.1 and 79.7-79.85. Veins at 81.9-82.0m see abundant botryoidal hematite. Base of oxidation at 78.9m and Top of Oxidation at 81.00m.		16555055	78.0	81.0		<0.01	<0.1	2.6	2	3	<1			
8 m = Box																			
0 m = Top																			
30	86.40		NQ		PEBBLE CONGLOMERATE: Oxidised clast supported conglom with a sandy matrix At 84.8m see So at 80° to the C.A. Dissolution features seen between 84-84.2m and 86.1m		16555056	81.0	84.0		<0.01	0.2	0.5	7	4	1			
							16555057	84.0	87.0		<0.01	<0.1	0.5	16	2	<1			
40	91.70		NQ		SANDSTONE/SILTSTONE: Maroon quartzose med and micaceous / quartzose siltstone. One conglom layer between 88.1 and 88.3m. Between 86.4-89m see interbeds (So) at 70° to the C.A. Some chlorite developed in the fine grained beds. At 91m see Q2-CHL vein at 60° C.A		16555058	87.0	90.0		<0.01	<0.1	0.4	2	2	1			
70	92.80		NQ		PEBBLE CONGLOMERATE: Pyrite (medium grained) is disseminated and constitutes 0.1% then associated with chlorite, Quartzose composition and dissolution textures seen between 92.7-92.8m Base of oxidation seen at 92.1m		16555059	90.0	93.0		<0.01	<0.1	2.1	50	2	1			
1m	=BOX																		
80	94.80		NQ		SANDSTONE/SILTSTONE (90/1°) Unoxidized medium grey-green colour So = 70° to C.A at 93.4m. See clots of pyrite along grain boundaries, especially between 93.3 - 93.5m = 0.1% pyrite		16555060	93.0	96.0		<0.01	0.2	7.4	28	5	2			
80	100.55		NQ		PEBBLE CONGLOMERATE/SILTSTONE: (90/1°) Medium grey-green colour. At 97.4m see Sa at 80° to C.A. Ja at 40° to C.A. Clasts 5-25mm lime		16555061	96.0	99.0		<0.01	<0.1	6.9	18	2	1			

025

387050 mE } GRID
49750 mN

336950 mE } A.M.G.

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

726026

SHEET No. 07

TENEMENT NAME LAKE MARGARET No. 5/35

PLAN – MAP REFERENCE

CO-ORDINATES 5344750 mN AZIMUTH N.A. DRILLERS DIAMOND DRILLERS COMMENCED 10.5.88

RL COLLAR ≈ 850 (m.s.l.) INCLINATION -90° DRILL TYPE LONGYEAR 38 COMPLETED 10.14.88

DEPTH 600 m HOLE No. DD88MS1

CASING LEFT PVC DPO No(s) 46183

ASSAY VALUES (Analysed by AAS (Batch))

From (M)	To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
99.55	102.80		NQ		SANDSTONE: Medium to very coarse grained. Med. grey colour. Qz rich		1655062	99.0	102.0		<0.01	0.2	3.9	65	1	1			
102.80	104.00		NQ		PEBBLE CONGLOMERATE: Siliceous clasts 2-12 mm diam average 7 mm diam. 5 cm wide band of silt at 103.5 m. 0.1% clot pyrite. Distinctive black HE?? rich clasts sub-rounded & whisp shaped present, especially between 103.6 - 103.9 m.		1655063	102.0	105.0		<0.01	0.3	7.9	36	3	1			
104.00	104.50		NQ		SANDSTONE: Medium grained; 0.05% clot pyrite, see the odd black clast in the matrix. Common 3 mm wide siltstone bands and So at 80° to the C.A.														
104.50	107.00		NQ		PEBBLE CONGLOMERATE: Clasts 4-12 mm diam and averages 6 mm. Clast supported. Between 105.4-105.7 see a siltstone bed at 80° to the core axis with minor chlorite developed		1655064	105.0	108.0		<0.01	<0.1	1.3	4	3	1			
107.00	109.60		NQ		SANDSTONE/SILTSTONE (60:40) No sulphides, leucoxene spots 2 mm in diam evenly disseminated throughout. 108.2-108.5 m conglom band														
OX at 106.40 m					Top Of Oxidation 106.40 m; Base of Oxidation 107.80 m														
OX at 107.80 m																			
109.60	115.00		NQ		SANDY MARL: Interbedded fine and coarse grained material. Olive grey colour, So at 90° to C.A. Rare disseminated pyrite seen in minor discontinuous sandstone bds. At 113.4 m see a 3 mm wide chl-py vein at 45° to C.A which shows signs of shearing. Between 113.3-113.6 m see clasts with rimming of black material.		1655065	108.0	111.0		<0.01	<0.1	4.7	34	3	8			
							1655066	111.0	114.0		<0.01	0.2	8.7	75	6	18			
115.00	117.00				SANDSTONE: Oxidized maroon colour. Medium to coarse grained. No sulphides. Band of olive grey siltstone between 115.75 and 116.1 m which contains carbonate. Thought to have a marley character.		1655067	114.0	117.0		<0.01	0.2	2.9	30	11	11			
115 = Box																			
116.9 = Tox																			

026

387050 mE } GRID
49750 mN }

726027

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

SHEET No. 2.3

TENEMENT NAME LAKE MARGARET No. 5/85

PLAN – MAP REFERENCE

CO-ORDINATES 387050 mE } A.M.G. 49750 mN } AZIMUTH N/A DRILLERS [illegible] COMMENCED 10.5.88

DEPTH 600m HOLE No. DD88MS1

RL COLLAR 350 (±5m) INCLINATION -90° DRILL TYPE LONGYEAR 38 COMPLETED [illegible]

CASING LEFT PVC DPO No(s) 46193

DEPTH From (m)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS (Brisbane)) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
.00	119.00		NQ		MARLEY/ SILTSTONE: Unoxidized, olive grey colour with very coarse siltstone lenses at 85° to the CA. No visible sulphides. Shearing // to bedding, this may be the cause of the irregular coarse grained beds. Some carbonate in the beds. SURVEY AT 118.0 m SHOWS HOLE AT -89°, 108° (mag)		1655068	117.0	120.0		<0.01	0.2	5.9	65	9	5			
.00	121.40		NQ		SANDSTONE Quartzose with minor conglomerate beds. Light medium grey colour. Pyrite common between 119.9 → 120.0 with lenses pyrite seen to 121.4. Between 120.1 and 120.6 see x5 10cm wide beds of clay/siltstone and pebble conglomerate at 90° to CA (ripple bedding).		1655065	120.0	123.0		<0.01	0.1	2.7	38	5	<1			
1.40	= TOK				Top of Oxidation														
.40	126.30		NQ		PEBBLE CONGLOMERATE: Oxidized, red → maroon colour and siliceous in character. Clasts 2 → 15mm diam and average 6mm, red chert fragments common. Occasional thin x< 1cm wide beds of sandy material seen approximately at 90° to the CA.		1655070	123.0	126.0		<0.01	<0.1	0.3	6	1	<1			
.30	130.50		NQ		PEBBLE CONGLOMERATE/SANDSTONE (70:30) Sandstone is siliceous and medium to coarse grained and occurs as interbeds 0.x maroon coloured siltstone interbeds, some with x seen at 126.55m and contains considerable pyrite. Conglomerate clast sizes as above and towards 130m see an increasing proportion of hematite rich chert clasts		1655071	126.0	129.0		<0.01	<0.1	<0.2	3	1	<1			
.30	132.40		NQ		PEBBLE CONGLOMERATE Moderately sorted, clasts 1-20mm diam and average 4mm and sub-angular to sub-rounded. 5% of clasts are strongly hematized chert/chalc. [illegible]		1655072	129.0	132.0		<0.01	<0.1	0.4	<1	1	<1			

027 381550 mE } GRID 49750 mN }

566950 mE } AMG

726028

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

SHEET No. 09

TENEMENT NAME Lake Margaret No. 5/85

PLAN – MAP REFERENCE

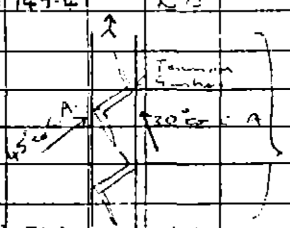
CO-ORDINATES 53 45 750 mN } AZIMUTH N.A. DRILLERS [illegible] COMMENCED [illegible]

RL COLLAR ≈ 450 (?-5m) INCLINATION -90° DRILL TYPE [illegible] COMPLETED [illegible]

DEPTH [illegible] HOLE No. [illegible]

CASING LEFT [illegible] DPO No(s) 46353

ASSAY VALUES (Analysed by ALS (Perth))

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION / SPECIAL FEATURES (Weath, Alteration, Fracturing, Veining, Mineralization)	Sample No.	From (M)	To (M)	Rec (M)	Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
..40	134.80		NQ		SANDSTONE/PEBBLE CONGLOMERATE (60:40) Sandstone varies from very fine grained to very coarse grained type and a maroon colour. Trace disseminated pyrite. In conglom maroon strongly haematized clasts constitute 2%. At 133.9 see a pyrite + chl?/amp? vein.	1655073	132.0	135.0		<0.01	<0.1	0.6	2	2	<1			
..80	142.??		NQ		PEBBLE CONGLOMERATE/SANDSTONE (60:40) Siliceous sub-rounded clasts set in a sandy quartzose matrix, maroon coloured. Weakly bedded sandstone is locally dominant S₀=80° to C.A. Average grainsize = 1mm. No sulphides. Twinning at 10-20° to C.A. b/w 139-140m	1655074	135.0	138.0		<0.01	<0.1	<0.2	14	1	<1			
						1655075	138.0	141.0		<0.01	<0.1	0.4	3	1	<1			
..20	149.4		NQ		PEBBLE CONGLOMERATE/SANDSTONE (90:10) Siliceous sub-rounded to sub-angular clasts set in a fine grained siliceous matrix. Clasts 2-50mm ave 6mm diam. Red HE rich lenses are more siliceous and comprise 5% of clasts. Tension gashes seen between 147.0-147.3, 147.5-147.7m which contain chl (+ctro), pyrite	1655076	141.0	144.0		<0.01	<0.1	2.5	3	2	<1			
						1655077	144.0	147.0		<0.01	<0.1	1.1	5	1	<1			
						1655078	147.0	150.0		<0.01	<0.1	1.8	17	1	<1			
..40	151.30		NQ		SANDSTONE/PEBBLE CONGLOMERATE (80:20) Sandstone, coarse grained and maroon in colour, S₀ at 30° to C.A. Between 149.4-150m see a strong cleavage at 20° to C.A. Irregular bands of conglom are seen with clasts 2-12mm and average 4mm diam.	1655079	150.0	153.0		<0.01	<0.1	1.2	17	1	<1			
..30	162.4		NQ		PEBBLE CONGLOMERATE: Oxidized, clast supported, clasts 3-12mm ave 4mm diam. Occasional c.g. sandstone interbeds, see 153.0-153.2 and 156.5-156.8m. Between 157.4 and 157.7m see 3.5mm wide quartz vein (barren) between 50° to 80° to C.A. At 151.3m see one qz vein, 10mm wide, at 80° to C.A.	1655080	153.0	156.0		<0.01	<0.1	1.2	6	1	<1			
						1655081	156.0	159.0		<0.01	<0.1	0.4	7	3	<1			
						1655082	159.0	162.0		<0.01	<0.1	<0.2	4	1	<1			
..40	169.10				PEBBLE CONGLOMERATE/SANDSTONE (70:30) Siliceous clasts 2-15 [illegible] set in a fine [illegible] matrix. [illegible]	1655083	162.0	165.0		<0.01	<0.1	<0.2	1	2	2			

028

387050 – E } GDA
49750 – N

726029

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

SHEET No. 1.0

TENEMENT NAME LAKE MARGARET No. S/85

PLAN – MAP REFERENCE

386950 – E } AMG
CO-ORDINATES 49750 – N AZIMUTH N.A DRILLERS DIAMOND DRILLERS COMMENCED 10.3.88 DEPTH 600 m HOLE No. DDH88MG1

RL COLLAR ≈ 350 (M.S.L.) INCLINATION -90° DRILL TYPE LONGYEAR 38 COMPLETED 10.4.88 CASING LEFT NIL DPO No(s) 16283

DEPTH From (m)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS (BRISB.)) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
164	169.10	CORE	NQ		Interbeds of v f g to c g sandstone. At 164.20 see So at 75° to C.A. defined by a 5cm wide band of micaceous siltstone.		1655084	165.0	168.0		<0.01	<0.1	<0.2	2	<1	<1			
169.10	171.30		NQ		SANDSTONE/PEBBLE CONGLOMERATE: (80:20) Light pink colour Light red HE rich clasts constitute 1% of clasts. Core is extremely siliceous and red → c.g. and Jo at 25° to C.A. Core is very broken between 168.7 and 170.9m		1655085	168.0	171.0		<0.01	<0.1	<0.2	3	<1	<1			
171.30	176.00		NQ		SANDSTONE: Very siliceous, coarse grained (c.g.) with minor chl/mica in matrix. Common joints at 25-30° to C.A. Medium grained section between 170 - 176m. At 174.5m see Qz+PY +EPIDOTE" vein at 30° to C.A Extremely rare vein pyrite. SURVEY AT 172m shows -89°, BEARING 128°		1655086	171.0	174.0		<0.01	<0.1	<0.2	18	<1	<1			
							1655087	174.0	177.0		<0.01	<0.1	<0.2	5	<1	<1			
176.00	181.50		NQ		SANDSTONE/PEBBLE CONGLOMERATE: Siliceous medium - coarse grained sandstone Light pink with darker pink conglomerate. Minor disseminated chlorite and an unident. tabular black mineral (Cond Min). At 176.6 see PY+SERICITE" vein at 20° to C.A. Also rare milky Qz veins at 20° to C.A		1655088	177.0	180.0		<0.01	<0.1	<0.2	3	<1	<1			
181.50	185.40		NQ		PEBBLE CONGLOMERATE/SANDSTONE: (70:30) Conglomerate has generally fine grained clasts 1-30 mm dia are 4mm Dark maroon HE rich clasts constitute 10% of the clasts Quartzose sandstone is pink-grey in colour and is orientated at 80° to C.A		1655089	180.0	183.0		<0.01	<0.1	<0.2	3	<1	<1			
							1655090	183.0	186.0		<0.01	<0.1	<0.2	6	<1	<1			
185.40	191.50		NQ		SANDSTONE: Pink-grey colour, very siliceous and medium grained. Ubiquitous black spots - HE rich? are disseminated throughout and constitute 5% of the rock. Periodic common garnets seen at 186.9, 187.9 and 189 and 190.1 + 191.1 : rate 1m period. At 185.8m see Qz + CHL/Sericite? vein. Occurs some hand		1655091	186.0	189.0		<0.01	<0.1	<0.2	1	4	<1			
							1655092	189.0	192.0		<0.01	0.2	0.9	1	<1	<1			

629 [illegible] } GRID

726030

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

SHEET No. 11

TENEMENT NAME [illegible] No. 5/85

PLAN – MAP REFERENCE

CO-ORDINATES [illegible] } A.M.G. AZIMUTH N.A. DRILLERS [illegible] COMMENCED [illegible] DEPTH [illegible] HOLE No. [illegible]

RL COLLAR [illegible] INCLINATION -90° DRILL TYPE [illegible] COMPLETED [illegible] CASING LEFT [illegible] DPO No(s) [illegible]

DEPTH From (m)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION / SPECIAL FEATURES (Weath, Alteration, Fracturing, Veining, Mineralization)	Sample No.	From (M)	To (M)	Rec (M)	Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
[illegible]	195.90		NQ		SANDSTONE/PEBBLE CONGLOMERATE: (80 20) Pink coloured fg → cg with occasional conglomerate bands with clasts 2 → 20 mm 4 mm here. So still at 80° to C A and black clasts still common (5% of clasts present)	1655093	192.0	195.0		<0.01	0.1	1.5	1	<1	1			
[illegible]	199.30		NQ		SANDSTONE: Oxidized light pink colour Black angular HE? fragments present throughout (1% of rock) Generally medium grained and no sulphides present. Joints (Jn) at 15° to C A cause very broken core between 197.2 – 197.9 m Milky QZ veins are seen at 45° to C A between 1987 and 199.1 m	1655094	195.0	198.0		<0.01	<0.1	1.2	<1	2	<1			
[illegible]	200.6		NQ		PEBBLE CONGLOMERATE Quartzose clasts 2 – 6 mm ... and clast supported Black angular fragments (non-magnetic) still present No sulphides observed	1655095	198.0	201.0		<0.01	<0.1	1.4	<1	<1	1			
[illegible]	205.90		NQ		SANDSTONE Siliceous, medium to fine grained with 2% being black angular (HE rich) fragments. Chlorite is present on joints at 10° to C A. At 202.7 m see a brecciated vein of milky qtz filled with chlorite and dogs tooth QZ At 205.9 m see vein QZ – CHL/SE?? Occasional clasts of red chert	1655096	201.0	204.0		<0.01	<1	9	<5	10	5	460	2.12	70
						1653097	204.0	207.0		<0.01	<1	4	<5	<5	<5	40	0.84	80
[illegible]	256.00		NQ		SANDSTONE: Oxidized pale pink to buff maroon colour Fine to	1655098	207.0	210.0		<0.01	<1	3	<5	5	<5	100	0.82	30
					coarse grained with minor grit interbeds. Siliceous in	1655099	210.0	213.0		<0.01	<1	8	<5	<5	<5	80	0.65	60
					character. Between 213.3 – 218 m see a siltstone bed at 90° to C A	1655100	213.0	216.0		<0.01	<1	2	<5	<5	<5	80	0.50	20
					and between 219 – 222 m abundant HE chips in the sandstone	1653406	216.0	219.0		<0.01	<1	6	<5	<5	<5	230	1.19	70
					Quartz – (Chlorite) tension gashes prominent between 212.9 –	1653407	219.0	222.0		<0.01	<1	2	<5	<5	<5	120	0.62	40
					213 m, 213.4 – 213.5 m, 215.9 – 216 m; 236.1 – 236.2 and 239 – 239.2 m	1653408	222.0	225.0		<0.01	<1	1	<5	<5	<5	50	0.99	40
					Chl/Sericite/HE veins seen at 247.7 – 249.7 and 257 – 257.1 m	1653409	225.0	228.0		<0.01	<1	2	<5	<5	<5	130	0.88	100
					At 210.7 m see QZ – PY – CHL vein at 30° to C A	1653410	228.0	231.0		<0.01	<1	3	<5	<5	<5	170	1.05	30
					At 217.3 m see QZ – PY vein at 5° to C A	1653411	231.0	234.0		<0.01	<1	8	<5	<5	5	340	2.02	70

ASSAY VALUES (Analysed by [illegible])

030 387050 mE } GRID
44750 mN

726031

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

SHEET No. 13

TENEMENT NAME [illegible] No. [illegible]

PLAN – MAP REFERENCE

CO-ORDINATES 336950 mE } A.M.G. [illegible] mN AZIMUTH N.A. DRILLERS [illegible] COMMENCED [illegible] DEPTH 600m HOLE No. [illegible]

RL COLLAR [illegible] (+/- 5m) INCLINATION -90° DRILL TYPE [illegible] COMPLETED [illegible] CASING LEFT [illegible] DPO No(s) [illegible]

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
[illegible]	[illegible]		NQ		SILTSTONE/SANDSTONE (60:40) M[illegible]	[illegible] some grain-	1653412	234.0	237.0		<0.01	<1	6	<5	<5	<5	170	1.03	50
					ed siltstone and fine grained	sandstone. Both are siliceous	1653413	237.0	240.0		<0.01	<1	2	5	<5	<5	90	1.66	20
					and well defined bedding (S_0)	is at 80° to C.A. Between 373-	1653414	240.0	243.0		<0.01	<1	<1	<5	<5	<5	30	1.07	20
					278.3m see occasional very coarse	pebbles - [illegible] 3cm.	1653415	243.0	246.0		<0.01	<1	<1	<5	<5	<5	30	1.08	50
					Between 277.3 - 277.6m see QZ-	SPEC. HAEM - ?? BLACK [illegible]	1653416	246.0	249.0		<0.01	<1	2	<5	<5	<5	160	1.19	20
					MINERAL VEINS. QZ-CHL/SE? veins	at 35° to C.A. very common	1653417	249.0	252.0		<0.01	<1	2	5	<5	<5	150	1.65	30
					Shear zone between 273.5 - 275.5m where	clasts have been	1653418	252.0	255.0		<0.01	<1	<1	<5	<5	<5	50	1.28	40
					rotated into parallelism with 10°	to C.A. and lots of sericite	1653419	255.0	258.0		<0.01	1	5	<5	<5	<5	290	1.86	110
					/clay developed in the matrix.		1653420	258.0	261.0		<0.01	<1	10	45	<5	<5	680	1.96	30
							1653421	261.0	264.0		<0.01	<1	6	10	<5	<5	260	1.20	60
[illegible]	413.00		NQ		COBBLE (PEBBLE) CONGLOMERATE (clast	supported, clasts 5-90mm	1653422	264.0	267.0		<0.01	<1	4	<5	<5	<5	190	1.12	60
					[illegible] and average [illegible] diam.	Brecciated with only one	1653423	267.0	270.0		<0.01	<1	5	<5	<5	<5	270	1.26	50
					quartz vein at 3[illegible] which	is 2cm wide. Haematite and	1653424	270.0	273.0		<0.01	<1	5	<5	<5	<5	230	1.43	40
					specular haematite developed	between [illegible]	1653425	273.0	276.0		<0.01	<1	6	<5	<5	<5	230	1.57	50
					as interstitial fillings. From	3[illegible] → [illegible] increasing	1653426	276.0	279.0		<0.01	<1	11	<5	<5	<5	370	1.73	80
					sericite content in matrix	[illegible] more commonly on [illegible]	1653427	279.0	282.0		<0.01	<1	14	<5	<5	<5	540	1.70	50
					at 45° to C.A. Clasts are	dominantly siliceous sandstone	1653428	282.0	285.0		<0.01	<1	17	<5	<5	<5	460	1.51	50
					[illegible] with occasional diorite?	clasts, one with volcanic clasts	1653429	285.0	288.0		<0.01	<1	13	<5	<5	<5	400	1.41	30
					SURVEY OF HOLE AT 327m	shows -89° bearing 030°	1653430	288.0	291.0		<0.01	<1	17	<5	<5	<5	380	1.73	40
					SURVEY OF HOLE AT 410m	shows -88° bearing 210°	1653431	291.0	294.0		<0.01	<1	11	<5	<5	5	390	1.39	40
					At 372.80m a QZ-Specular hae	matite vein at 70° to the C.A. (3mm	1653432	294.0	297.0		<0.01	<1	12	<5	<5	<5	440	1.39	40
					wide) is seen to [illegible] a	4mm wide vein of pyrophyllite?	1653433	297.0	300.0		<0.01	<1	9	<5	<5	<5	290	1.39	50
					clay at 30° to C.A. This mineral is	also seen in the matrix.	1653434	300.0	303.0		<0.01	<1	1	<5	<5	<5	30	1.14	40
					At 390m vein SE (pyrophyllite?)	at 45° to C.A. Massive	1653435	303.0	306.0		<0.01	<1	5	<5	<5	<5	190	0.86	40
					[illegible] SE? pyrophyllite? seen betw	een 386.4-386.5m also present	1653436	306.0	309.0		<0.01	<1	4	<5	<5	<5	170	0.85	50
					in matrix and is sheared into	vein like structures at 45° to C	1655643	309.0	312.0		<0.01	<1	5	<5	<5	<5	200	0.88	20
					412.80m has PYRITE+PYROPHYL	LITE (± CHL?) veins at 20° to C.A	1655644	312.0	315.0		<0.01	<1	6	<5	<5	<5	170	0.36	50
					Acid igneous clasts noted in	this region. Between 412.3	1655645	315.0	318.0		<0.01	<1	7	<5	<5	<5	230	1.02	50
					and 412.35m once pure quartzite?	has been recrystallized [illegible]	1655646	318.0	321.0		<0.01	<1	9	<5	<5	<5	260	1.03	30
							1655647	321.0	324.0		<0.01	<1	6	<5	<5	<5	250	0.89	40

(031 337050 - E } AMG
44750 - N }

726032

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

SHEET No. 13

TENEMENT NAME ... No. ...

PLAN – MAP REFERENCE

2569 50 - E } AMG.

CO-ORDINATES 334 9750 mN AZIMUTH N/A DRILLERS ... COMMENCED ... DEPTH ... HOLE No. 033MS1

RL COLLAR ... INCLINATION -90° DRILL TYPE ... COMPLETED ... CASING LEFT ... DPO No(s) ...

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ...) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
3.00	413.00		NQ / BQ		Note. Reduction from NQ to BQ at 406m		1655648	324.0	327.0		<0.01	<1	8	<5	<5	<5	270	1.43	60
					Interval is oxidized and is clast supported. Clasts range		1655649	327.0	330.0		<0.01	<1	5	<5	<5	<5	30	1.33	50
					from 8-90 mm diameter, average 30mm and a very coarse		1655650	330.0	333.0		<0.01	<1	9	<5	<5	<5	330	1.29	30
					sand - granule matrix fills the interstices.		1655651	333.0	336.0		<0.01	<1	10	<5	<5	10	290	1.27	60
							1655652	336.0	339.0		<0.01	<1	14	<5	<5	<5	390	1.56	50
00	429.00				PEBBLE CONGLOMERATE: Clast diameter ranges from 5-60mm and		1655653	339.0	342.0		<0.01	<1	10	<5	<5	<5	200	1.36	40
					average 20mm. Rare sandstone intrusives are observed. The		1655654	342.0	345.0		<0.01	<1	4	<5	<5	<5	<10	1.72	60
					conglomerate has a granule matrix and is clast supported.		1655655	345.0	348.0		<0.01	<1	8	<5	<5	<5	300	1.44	20
					Bedding is seen to be at 45° to the C.A. at 418.5m where		1655656	348.0	351.0		<0.01	<1	12	<5	<5	<5	350	1.48	60
					it is defined by a 5cm thick bed of oxidized sandstone.		1655657	351.0	354.0		<0.01	<1	15	<5	<5	<5	460	1.61	80
					Towards 429m there is increase in the matrix component.		1655658	354.0	357.0		<0.01	<1	14	<5	<5	<5	570	2.08	100
					413-429m contains white clay in the matrix KA'Ac		1655659	357.0	360.0		<0.01	<1	11	5	<5	<5	360	1.45	80
					423.5m - stained tension gash observed and it contains		1655660	360.0	363.0		<0.01	<1	11	<5	<5	<5	340	1.77	40
					QZ-HAEM (specular). A strong cleavage is developed at 45° to		1655661	363.0	366.0		<0.01	<1	6	<5	<5	<5	230	1.38	250
					C.A. as are some pyrophyllite? veinlets		1655662	366.0	369.0		<0.01	<1	12	<5	<5	<5	440	1.78	60
							1655663	369.0	372.0		<0.01	<1	10	<5	<5	<5	390	1.50	40
1.00	439.00		BQ		GRANULE: Average clast diameter 2-3mm with occasional		1655664	372.0	375.0		<0.01	<1	2	<5	<5	<5	100	0.86	30
					pebble clast. The rock is clast supported and the matrix		1655665	375.0	378.0		<0.01	<1	18	10	<5	25	550	1.58	70
					has chlorite + clay (pyroph?) locally developed		1655666	378.0	381.0		<0.01	<1	15	<5	10	<5	480	1.86	70
							1655667	381.0	384.0		<0.01	1	15	<5	<5	<5	520	1.77	60
9.00	440.00		BQ		GRANULE - PEBBLE CONGLOMERATE (90:10). NOTE: 439.50 to		1655668	384.0	387.0		<0.01	<1	18	<5	<5	10	410	1.58	70
					439.70 a Rhyolite dyke seems to intrude the conglomerate.		1655669	387.0	390.0		<0.01	<1	13	<5	<5	5	370	1.55	50
					See pet sample 6573187. The sediment is oxidized.		1655670	390.0	393.0		<0.01	<1	13	<5	<5	<5	380	1.58	60
							1655671	393.0	396.0		<0.01	<1	18	5	<5	10	130	1.92	70
0.00	447.20		BQ		PEBBLE CONGLOMERATE: Occasional cobble clasts are noted with		1655672	396.0	399.0		<0.01	<1	18	<5	<5	<5	540	1.94	70
					clast diam ranging from 5-60mm and average 15mm diam.		NOT DESPATCHED	399.0	402.0											
					The rock is clast supported and has mica-qtz matrix.		1653437	402.0	405.0			<1	38	10	30	15	190	1.58	50
					Some coal (gamma) clasts, all rounded noted.		1653438	405.0	408.0			<1	38	<5	20	10	480	2.05	60
					NOTE: RHYOLITE DYKE between 443.4 → 443.6m which is		1653439	408.0	411.0			<1	30	<5	20	10	350	1.59	60
							1653440	411.0	414.0			<1	24	<5	20	10	150	1.33	30

726033

032 38 1050 mE } GRID
+9 750 mN }

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

SHEET No. 14

TENEMENT NAME LAKE MARGARET No. 3/85

PLAN – MAP REFERENCE

CO-ORDINATES 366 950 mE } A.M.G. 7349720 mN AZIMUTH N.A. DRILLERS DIAMOND DRILLING COMMENCED 15/5/1985

DEPTH 600 m HOLE No. DD85MS1

RL COLLAR ≈ 330 (A.S.L.) INCLINATION -70° DRILL TYPE LONGYEAR 38 COMPLETED 17/5/1985

CASING LEFT PVC DPO No(s) 46.290/1

DEPTH From (m)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS Lab.) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
1.20	448.90		BQ		RHYOLITIC INTRUSIVE: Qz and feldspar phenocrysts present		1653441	414.0	417.0		<0.01	<1	20	5	5	15	300	1.10	35
					enhedral and embedded supporting. This Rhyolite is seen to be		1653442	417.0	420.0		<0.01	<1	30	<5	20	10	310	1.63	40
					cut by Qz and Qz+CALCITE veins which are at 15° & 70° to the		1653443	420.0	423.0		<0.01	<1	24	<5	15	10	290	1.51	40
							1653444	423.0	426.0		<0.01	<1	26	<5	15	15	420	1.86	30
448.90	471.00		BQ		PEBBLE CONGLOMERATE: Clast diameter ranges from 5-120 mm and		1653445	426.0	429.0		<0.01	<1	17	<5	35	5	640	1.79	40
					averages 10 mm. Moderate carbonate alteration dominantly on		1653446	429.0	432.0		<0.01	<1	46	15	25	20	790	3.23	140
					matrix replacement and as narrow irregular sided veins at		1653447	432.0	435.0		<0.01	<1	46	5	40	40	830	3.18	200
					10° to the C.A. Strong calcite development between 458 → 478m		1653448	435.0	438.0		<0.01	<1	44	5	60	35	940	2.34	760
					Base Of Oxidation is gradational at around 455m		1653449	438.0	441.0		<0.01	<1	38	5	50	65	920	2.57	530
							1653450	441.0	444.0		<0.01	<1	38	5	50	65	1000	2.64	700
471.00	542.00		BQ		PEBBLE CONGLOMERATE: Occasional cobble sized clasts and		1653451	444.0	447.0		<0.01	<1	42	5	45	65	830	2.58	650
					granule interbeds developed, see below. All sequences are		1653452	447.0	450.00		<0.01	<1	50	15	60	80	820	3.04	730
					clast supported with only minor granule matrix, very little		1653453	450.0	453.0		<0.01	<1	44	10	45	65	980	2.57	870
					sand sized material. Calcite generally weak - moderately developed		1653454	453.0	456.0		<0.01	<1	46	10	40	85	450	2.53	1300
					with strongly developed calcite between 514 - 516.5m; 540.5 -		1653455	456.0	459.0		<0.01	<1	44	10	35	85	980	2.49	1300
					541.6 and 545.4 - 547m. Milky vein quartz is seen to be b		1653456	459.0	462.0		<0.01	<1	38	15	50	95	330	2.55	970
					to the C.A between 511.5 - 511.6 m. Calcite - chlorite veins		1653457	462.0	465.0		<0.01	<1	50	15	50	115	980	2.85	1200
					5 cm wide is seen between 537.35 - 537.90; 536 - 536.5 and		1653458	465.0	468.0		<0.01	1	12	10	40	110	940	2.92	1100
					536.80 - 537.0 m and a more pervasive CALCITE-CHL developed between		1653459	468.0	471.0		<0.01	1	38	10	40	90	320	3.36	710
					535.9 - 539.0 m. At 542.4m a 1cm wide Qz-CALCITE vein is		1653460	471.0	474.0		<0.01	1	46	15	55	105	890	2.61	920
					seen at 70° to C.A. A V.C SAND - GRANULE interbed is seen between		1653461	474.0	477.0		<0.01	<1	55	10	60	130	1200	3.05	990
					542 - 542.8 m and ∴ of lower porosity than less carbonate host		1653462	477.0	480.0		<0.01	<1	44	10	55	105	340	2.58	1150
					RHYOLITE INTRUSIVES: Do not contain Mt, occasionally seem to		1653463	480.0	483.0		<0.01	<1	46	10	60	120	930	2.80	1050
					grade into sediments, see especially 517.1 - 518.2m		1653464	483.0	486.0		<0.01	<1	50	10	50	100	1050	2.66	760
					DARK MAROON RHYOLITIC INTRUSIVE: Feldspar phyric seen between 523.35 -		1653465	486.0	489.0		<0.01	<1	48	35	65	130	1050	3.18	830
					523.75; 529.9 - 530.2 these are sericited and not // sided.		1653466	489.0	492.0		<0.01	<1	50	5	50	125	920	3.09	710
					RHYOLITE INTRUSIVES: Light pink, Quartz - Feldspar phyric, no-		1653467	492.0	495.0		<0.01	<1	44	10	55	105	1050	2.58	680
					magnetite seen 525.1 - 5.3 and 535.4 - 5.6 with minor VQz @ 20°.		1653468	495.0	498.0		<0.01	<1	48	10	65	105	1050	2.73	620
					At 525.2 → 5.9 and 548.7 → 548.8 Dykes seen between		1653469	498.0	501.0		<0.01	<1	55	20	50	100	360	3.29	1455
											<0.01	<1	55	10	45	95	850	2.66	1300

033 387050 mE } G.D.A.
7950 mN }

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

726034

SHEET No. 15

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES 356950 mE } A.M.G. AZIMUTH N.A. DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. .....

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS) Au	Ag	As	Cu	Pb	Zn	Ba	Fe	Mn
2.00	568.00				PEBBLE CONGLOMERATE: A marked increase in the matrix (sand in fine granule size). The matrix grainsize ranges from 2-8mm dia and averages 6mm while the clasts range from 10-90 mm and average 30 mm dia. The rock is matrix supported and where coarser sections are encountered we see an increased degree of carbonate alteration i.e. 562.5 → 566.5 m. Five mm wide vein calcite is seen at: 562.5m – this is at 30° to C.A. 568.7m " " 90° to C.A. 568.75m " " 90° to C.A. QZ-CALCITE-CHL veins are seen between 568.9-569.1m and 570.1-570.2m.		1653471	564.0	565.0		<0.01	<1	55	15	50	90	1650	2.91	1150
							1653472	567.0	570.0		<0.01	<1	42	10	50	75	970	2.16	790
							1653473	570.0	573.0		<0.01	<1	16	15	55	105	990	2.67	930
							1653474	573.0	576.0		<0.01	<1	46	10	45	105	860	3.26	1050
							1653475	576.0	579.0		<0.01	<1	46	15	50	95	950	2.85	1150
							1653476	579.0	582.0		<0.01	<1	60	15	50	115	1000	3.28	1100
							1653477	582.0	585.0		<0.01	<1	50	10	75	85	830	2.83	930
							[illegible]	[illegible]	[illegible]		<0.01	<1	55	15	65	100	820	[illegible]	730
							[illegible]	588.0	591.0		<0.01	<1	50	10	60	80	870	[illegible]	830
							1653490	591.0	594.0		<0.01	<1	55	25	60	105	1200	[illegible]	[illegible]
							1653491	594.0	597.0		<0.01	2	46	60	35	95	360	2.73	860
							1653492	597.0	600.0		<0.01	1	55	25	50	75	1250	3.39	1460
							1653485	600.0	603.0		<0.01	<1	60	10	50	120	1350	3.00	1270
5.0	600.0		BQ		PEBBLE CONGLOMERATE: Pebble sized clasts with a very coarse sand matrix. Clasts range 10-60 mm and average 25 mm dia. the sand averages 1.75 mm. Moderate carbonate alteration evident to 600 m averages 5% of the matrix volume, some vein control. Vein calcite-QZ at 40° to C.A at 599.54, 9.72 & 1.76. RHYOLITE INTRUSIVES seen at 582.2-583.2 m, 593.7-593.9 m over this last interval the dyke is cross-cut by calcite veins at 45° and 0° to the C.A. Lesser quartz and pyrite are also associated with this veining. At 597 m a CARB-QZ-CHL-PY vein 15 mm wide is seen at 20° to the C.A. CALCITE-QZ-CHL ± PY veins 9 mm wide was seen at 80-90° to the C.A at a frequency of 1/m from 593-600 m. 600 m = E.O.H. SURVEY CARRIED OUT AT 600 m ⇒ DECLIN° -85°, BEARING° 280°		1653493	603.0	606.0		<0.01	<1	50	20	35	100	1650	3.53	1150
							1653494	606.0	609.0		<0.01	<1	44	15	50	105	1000	2.81	1050
							1653495	609.0	612.0		<0.01	<1	65	20	45	105	1000	3.38	1150
							1653496	612.0	615.0		<0.01	<1	65	25	50	100	1250	4.29	1150
							1653497	615.0	618.0		<0.01	<1	50	20	55	105	1050	3.08	1460
							1653498	618.0	621.0		<0.01	<1	46	10	45	90	1650	3.46	760
							1653499	621.0	624.0		<0.01	<1	46	20	60	105	1450	3.19	950
							[illegible]	[illegible]	[illegible]		<0.01	<1	48	35	45	145	370	3.53	1150
							1653492	567.0	570.0		<0.01	<1	55	20	40	115	1000	3.45	1050
							1653493	570.0	573.0		<0.01	<1	44	10	40	110	900	3.05	860
							1653494	573.0	576.0		<0.01	<1	50	20	70	120	950	3.54	1050
							[illegible]	[illegible]	[illegible]		<0.01	<1	60	20	40	95	1050	3.33	1100
							1653496	579.0	582.0		<0.01	<1	55	15	55	95	1150	3.87	1150
							1653497	582.0	585.0		<0.01	<1	40	10	40	75	1050	2.70	940
							1653498	585.0	588.0		<0.01	<1	50	10	40	90	930	3.23	1050
							1653499	588.0	591.0		<0.01	<1	42	20	60	95	1150	2.76	910
							1655160	[illegible]	[illegible]		[illegible]	<1	46	15	45	80	1150	2.75	730
							[illegible]	[illegible]	[illegible]		<0.01	<1	46	15	60	440	1400	3.47	930

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726035

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

SHEET No. 16
TENEMENT NAME LAKE MARGARET No. 5/85
PLAN – MAP REFERENCE

870050 mE } GRID
49750 mN }
386950 mE AMG

CO-ORDINATES 534 750 mN AZIMUTH N/A DRILLERS Diamond Drillers COMMENCED 10-3-1988 DEPTH 600m HOLE No. DD88MS2
RL COLLAR 850.55m INCLINATION -90° DRILL TYPE Longyear 38 COMPLETED 10-4-1988 CASING LEFT NONE DPO No(s)

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)

GRAINSIZE CLASSIFICATION: Udden–Wentworth scale used

64–256 mm Cobble conglom
4 – 64 mm Pebble conglom
2 – 4 mm Granule
1/16 – 2 mm Sand
1/256 – 1/16 mm Silt

DOWNHOLE SURVEYS:

Depth	Declination	Bearing (mag)
58 m	-89.5°	328°
118 m	-89°	108°
173 m	-89°	128°
327 m	-89°	030°
410 m	-88°	310°
500 m	-86.3°	≈ 070° very faint
600 m	-85°	≈ 290° very faint

635

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C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 17

TENEMENT NAME LAKE MARGARET No. 5/85

PLAN – MAP REFERENCE

387050 E / 49750 N } GRID

386950 mE } AMG

CO-ORDINATES 5349750 mN | AZIMUTH N.A | DRILLERS Diamond Drillers | COMMENCED 10-3-1988 | DEPTH 600m | HOLE No. DD88MS1

RL COLLAR 850 (±5m) | INCLINATION -90° | DRILL TYPE Longyear 38 | COMPLETED 10-4-1988 | CASING LEFT NONE | DPO No(s) 46281/28

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by AMDEL)
.60	99.70		NQ		1652980 Pebble Conglomerate/Sandstone: Identified as being a Quartz breccia. Intensely deformed. The dark clasts noted in hand specimen are comprised mainly of clay or chlorite and are a deformed argillaceous lens. QZ-65%, CY/CHL 25%, SE-6%						
-.90	114.00		NQ		1652981 SANDY MARL, alternating bands of argillaceous material and bands of detrital quartz grains cemented by interstitial dolomite. Muscovite flakes are concentrated in the quartz rich bands and is thought to be detrital. SE/CY 40% DOL 30% QZ 20%, MUSC 5%, CHL 2%, OPAQ 2%						
3.00	188.10		NQ		1652982 QUARTZITE, the black patches (voids) are composed of quartz and black Fe oxides. QZ-90%, SE/CY 4%, CHL 1%, OP 5%						
2.00	252.10		NQ		1652983 TENSION GASH QZ-70% PYRO 20% CHL 7%, OP 3%. Vein quartz with abundant deformed prismatic haematite.						
2.40	302.50		NQ		1652984 CONGLOMERATE; Siliceous with high T epithermal mineral assemblage. QZ 65%, PYRO 10% KAOL 10% MUSC 10% PY 5%						
.00	360.10		NQ		1652985 CONGLOMERATE, Some probable acid volcanic clasts dominantly quartz. Typical epithermal assemblage, QZ 50%, PYR 30%, KA 10%, OP 10% Pyrite present						
9.00	389.10		NQ		1653181 PEBBLE-COBBLE CONGLOMERATE: Identified as being a breccia. Quartz rich clasts separated by a QZ-PYROPHYLLITE matrix. QZ-70%, PYRO 20%, KAOL 4%, CAL 1%, OPAQ 5%						
5.40	416.00		NQ		1653182 GRANULE CONGLOMERATE: Identified as being a altered lithic conglomerate. Considerable component of acid						

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C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 18

TENEMENT NAME LAKE MARGARET No. 5/85

PLAN – MAP REFERENCE

3870500E } GRD
49750N

386950 E } AMG
5411750N

CO-ORDINATES 5411750N | AZIMUTH N.A | DRILLERS Diamond Drillers | COMMENCED 10-3-1988 | DEPTH 600m | HOLE No. DD88MS1

RL COLLAR 850 ± 5m | INCLINATION -90° | DRILL TYPE Longyear 38 | COMPLETED 10-4-1988 | CASING LEFT NONE | DPO No(s) 46281/282

DEPTH From (M)	To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ...)
50	439.60		BQ		1653187 RHYOLITIC PYAF: Maroon porphyry. Altered feldspar qtz phenos set in a v.f.g. felsic matrix. Calcite intergrown with the sericite patches.						
10	442.30		BQ		1653186 RHYOLITE: Qz & Fld phenos set in a red-brown matrix. Identified as a tuff but the feature AMDEL identified as being a compaction foliation is actually the S1 cleavage plane. Calcite is disseminated through the whole rock						
-90	461.00		BQ		1653183 CALCITE CEMENTED CONGLOMERATE, Mainly QZ and calcite with minor musc & chlorite. Trace K spar.						
70	538.80		BQ		1653184 GRANULE CONGLOMERATE - CALCITE VEINED. Most clasts are acid volcanic and have a porphyritic texture. See QZ-CALCITE veins with marginal chlorite.						
10	578.20		BQ		1653185: PEBBLE CONGLOMERATE WITH CALCITE & SPEC HAEM IN THE MATRIX. Clasts are dominantly acid volcanic in character. Disseminated calcite which cements the rock along with minor sericite and chlorite.						
					SEE APPENDIX 2 FOR COMPLETE DESCRIPTIONS						

DD88MS1

INTERVAL /m	MAGNETIC SUSCEPTIBILITY /x10^{-5} SI Units
442 - 443	150
454.3 - 454.5	200
455.7 - 455.9	150
456.2 - 456.6	200
458.8 - 459	200
459.1 - 469	200
470.9 - 471.2	150
471.2 - 471.6	2000
471.6 - 476	200
476 - 477	400
477 - 477.7	200
477.7 - 479	400
479 - 485	300
485 - 488	200
488 - 491	200
491 - 493	200
493 - 494	1500
494 - 497	200
497 - 500	200
500 - 503	200
503 - 506	200
506 - 509	200
509 - 512	200
512 - 515	200
515 - 518	250
518 - 521	200
521 - 524	200
524 - 527	200
527 - 528	200
528 - 530	200
530 - 536	200
536 - 538.3	200

APPENDIX 2
PETROGRAPHIC DESCRIPTIONS

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Amdel
technology and enterprise

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27 April 1988

CRA Exploration Pty. Limited,
Private Bag No. 9,
GORDON, N.S.W. 2072

ATT: MR. FRED FUNNELL

REPORT G 7506/88

YOUR REFERENCE:	DPO No. 46281 dated 30/3/88
IDENTIFICATION:	16529880-85
MATERIAL:	6 spent core samples
DATE RECEIVED:	31 March 1988
WORK REQUIRED:	Petrography (6 Code MA1.3), Mineragraphy (1 Code MA2.2) and X-Ray Diffraction Analysis (1 Code MB5)

Investigation and Report by: Frank Radke

Manager - Geological Services: Dr Keith J Henley

Keith Henley

for Dr William G Spencer
General Manager
Applied Sciences Group

c.c. CRA Exploration Pty. Limited,
P.O. Box 8093,
NORTHLAND CENTRE, VIC. 3072
ATT: MR. TOM DICKSON

CRA Exploration Pty. Limited,
P.O. Box 656,
FYSHWICK, A.C.T. 2609
ATT: CHIEF GEOLOGIST INFORMATION SERVICES

bp

PETROLOGY OF SIX SAMPLES

1. SUMMARY

Six samples submitted by CRA Exploration Pty. Limited for petrographic examination were given the following rock names.

SAMPLE & THIN SECTION NO.		ROCK NAME
1629880:	TSC50365	Quartz Breccia
1629881:	TSC50366	Sandy Marl
1629882:	TSC50367	Quartzite
1629883:	TSC50368	Vein Quartz with Shale Clasts
1629884:	TSC50369	Breccia
1629885:	TSC50370	Breccia

Samples 1629880 to 1629882 are thought to be detrital sedimentary rocks. Sample 1629880 has a coarse, brecciated texture but still retains a detrital character. Sample 1629881 is a very fine-grained rock containing argillaceous bands in contact with bands of lamellae comprised of sand-sized quartz and interstitial dolomite. Sample 1629882 is an equigranular quartz-rich sandstone cemented by abundant interstitial quartz.

Samples 1629883 to 1629885 have a much more hydrothermal to epithermal and altered character. Sample 1629883 consists mainly of vein type quartz with irregular argillaceous clasts comprised largely of a birefringent phyllosilicate and weakly birefringent clay. Samples 1629884 and 1629885 have epithermal quartz-rich mineral assemblages including pyrophyllite along with minor amounts of muscovite and kaolinite. Both samples 1629884 and 1629885 have deformed and brecciated textures. It is considered likely that at least some of the sericite in sample 1629883 is also pyrophyllite. Sample 1629883 was mineragraphically examined and the major opaque phase is hematite.

2. PETROLOGICAL DESCRIPTIONS

All of the thin sections described in this report have been stained with an alizarin red-S solution to distinguish calcite from other carbonates by staining it pink. None of the carbonates in these samples is affected by the stain and the carbonate is generally thought to be dolomite.

SAMPLE: 1629880: TSC50365

Rock Name:
Quartz Breccia

Hand Specimen:
A fragmental appearing rock containing pale grey to dark grey and black clasts up to about 1 cm in size distributed through a medium grey, siliceous matrix with a fine grain size.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	65
Clay/chlorite	25
Sericite	6
(?)Epidote	Tr-1
Tourmaline	Tr
Zircon	Tr
Carbonate	Tr
Opaques and semi-opaques	3

This sample consists mainly of large clasts up to several millimetres in size distributed through a finer grained matrix comprised of strongly recrystallised quartz intergrown with minor amounts of other phyllosilicates. Overall the rock has a detrital appearing texture with the finer grained quartz mosaic exhibiting vague remnant detrital appearing shapes despite strong recrystallisation with the development of sutured grain margins and localised granulation. At least some of the smaller grains which are generally between 0.1 and 0.5 mm in size have vague subrounded, detrital appearing shapes which have been modified by marginal recrystallisation.

The larger clasts are also generally quartz-rich and consist of fine-grained cherty textured rocks to coarse grained mosaics with a maximum grain size of about 3 mm. The coarser grained clasts have intensely deformed, polycrystalline textures with very strong undulose, strained extinction and localised granulation.

A very weakly birefringent phyllosilicate termed clay/chlorite in the above list of minerals forms irregular patches up to several millimetres in size containing angular disseminated quartz grains up to 0.3 mm in size. The angular and irregular character of these patches suggests that they could represent clay lenses or possible deformed clay-rich clasts in the original detrital sediment. These clay-rich areas would represent the darker patches noted in hand specimen. Although most of the clay is concentrated in these patches minor clay also forms interstitial intergrowths between quartz grains and in some cases tend to surround or partially surround quartz grains. Localised weakly developed microstylolitic textured veins lined with fine clay are also common. Fibrous sericite phyllosilicates are intergrown with the weakly birefringent clay both in the clay-rich patches and as narrow interstitial fillings and vein-like structures intergrown with quartz.

Traces of tourmaline and zircon form small disseminated grains up to 0.2 mm long some of which occur within clay-rich patches. A very weakly birefringent mineral with high relief locally forms interstitial fillings up to 0.2 mm wide. This mineral has tentatively been identified as epidote. Traces of carbonate were noted as angular crystals up to 0.2 mm in size within clay-rich patches.

Opaques are disseminated through the rock as subhedral to euhedral crystals up to 0.2 mm wide. These opaques are thought to represent disseminated pyrite crystals. A small number of anhedral to subhedral translucent reddish-brown grains possibly representing iron oxides are also disseminated through the rock. Turbid, finely granular aggregates of leucoxene up to 0.1 mm in size are also locally present.

This is thought to be a coarse grained detrital sedimentary rock containing quartz-rich clasts as well as detrital sand-sized quartz which has been subjected to very strong deformational effects producing an intensely recrystallised and deformed texture. The very dark clasts noted in hand specimen are phyllosilicate-rich areas comprised mainly of weakly birefringent clay or chlorite and would represent either deformed argillaceous lenses in the original sedimentary rock or argillaceous clasts.

SAMPLE: 1629881: TSC50366

Rock Name:
Sandy Marl

Hand Specimen:
This is a banded rock containing very fine-grained greenish-grey coloured bands separated by paler grey quartz-rich bands with a very fine grain size. Testing with dilute hydrochloric acid produces a very weak reaction in the paler grey bands indicating the presence of dolomite.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Sericite/clay	40
Carbonate (dolomite)	30
Quartz	20
Muscovite	5
Chlorite	3
Tourmaline	Tr-1
Zircon	Tr
Opaques	2

This is a strongly banded rock comprised of fibrous phyllosilicate-rich bands separated by bands comprised mainly of detrital quartz grains intergrown with interstitial carbonate. The clay-rich bands would represent the greenish-grey bands noted in hand specimen and consist of a fibrous birefringent phyllosilicate termed sericite intergrown with much smaller amounts of weakly birefringent clay. The fibrous sericite exhibits a strongly foliated character oriented parallel to the mineralogical banding. Intergrown with these clay-rich bands are turbid carbonate aggregates up to 0.15 mm in size.

The coarser grained bands consist of quartz grains between 0.1 and 0.2 mm in size intergrown with interstitial carbonate. The quartz grains have somewhat modified detrital appearing shapes with angular to subangular characters. The carbonate is unaffected by the alizarin red-S stain indicating that it is dolomite and tends to form turbid, finely granular aggregates up to 0.3 mm wide. Small amounts of birefringent sericite also occur as interstitial fillings between the quartz grains. Some discontinuous lenses and lamellae of sericite occur in the coarser grained quartz bands. Narrow lenses of coarser grained quartz also occur in the clay-rich bands.

Well-developed muscovite flakes up to 0.4 mm long are disseminated through the rock and tend to be oriented parallel to the general foliation and banding. These muscovite flakes tend to be concentrated in the quartz-rich bands and lenses and are thought to be of detrital origin.

A green phyllosilicate with low birefringence termed chlorite in the above list of minerals forms flaky patches up to 0.2 mm in size which are generally intergrown with the quartz-rich bands. It is considered possible that this mineral could represent glauconite or a smectite-like mineral rather than chlorite.

Minor tourmaline was noted as well-developed prismatic crystals up to 0.1 mm long which tend to be intergrown with the quartz-rich bands. The fine nature of the prismatic tourmaline crystals suggest they are of diagenetic origin. Minor zircon forms detrital appearing grains up to 0.1 mm wide. Opaques tend to be concentrated in the granular quartz-rich bands as disseminated grains and aggregates up to 0.1 mm wide. Within localised areas opaques are concentrated as interstitial fillings between the quartz. Very finely divided opaque to translucent grains generally below 0.05 mm in size are disseminated through the argillaceous bands.

This is a strongly banded fine-grained detrital sediment comprised of alternating argillaceous bands and bands or lenses comprised of sand-sized detrital quartz grains cemented by interstitial dolomite.

SAMPLE: 1629882: TSC50367

Rock Name:
Quartzite

Hand Specimen:
This is a very fine-grained, massive rock with a well indurated character. The rock has a reddish-brown colour containing irregular black patches or ovoid structures generally about 2 mm in size.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	90
Sericite/clay	4
Chlorite	1
Tourmaline	Tr-1
Zircon	Tr
Opaques	5

This sample contains detrital quartz grains generally between 0.15 and 0.3 mm in size cemented by overgrowth quartz which produces a very strongly indurated rock. The original quartz grains are well defined by narrow concentrations of very finely divided opaque material around their outer margins and generally exhibit angular to subangular shapes with a very small proportion exhibiting subrounded shapes. The quartz forms a recrystallised appearing mosaic with the overgrowth quartz forming recrystallised appearing intergrowths. The detrital quartz also generally has a strained character showing undulose, strained extinction thought to be largely of postdepositional origin. A very small proportion of detrital quartz grains show slightly more intensely deformed characters with polycrystalline textures and incipient granulation.

Very finely divided sericitic phyllosilicates occur interstitially between the detrital quartz grains as small flakes below 0.1 mm long. The phyllosilicates tend to be concentrated in irregular patches or very narrow vein-like structures or coatings around detrital quartz grains. Intergrown with the birefringent sericite are smaller amounts of weakly birefringent clay. A pale green chloritic phyllosilicate also locally forms flaky aggregates up to 0.1 mm in size located interstitially between the detrital quartz grains. This phyllosilicate generally exhibits low, anomalous birefringence.

The dark patches noted in hand specimen consist of areas which contain concentrations of opaque material interstitial to the detrital quartz grains. These areas range up to a few millimetres in size but are generally approximately 1 mm in size. Within these areas virtually all of the interstitial regions between the detrital quartz grains are filled with opaque material. These opaques appear to be a black iron oxide. Opaques are also disseminated through the rock as grains up to 0.2 mm in size which appear to be of detrital origin.

Accessory tourmaline and traces of zircon form small detrital grains up to 0.3 and 0.1 mm in size respectively. The tourmaline generally forms rounded grains while the zircon typically forms rounded to prismatic grains.

This is a quartz-rich detrital sediment strongly cemented by overgrowth quartz. The black patches evident in hand specimen are produced by concentrations of interstitial opaque iron oxides which are concentrated in areas up to a few millimetres wide where they largely take the place of overgrowth quartz.

SAMPLE: 1629883: TSC50368: PS47376

Rock Name:
Vein Quartz with Shale Clasts

Hand Specimen:
This sample consists mainly of milky grey quartz which contains localised irregular bodies in a dark grey rock with a weakly foliated texture. These darker grey bodies are generally below 1 cm in width and have vague lenticular to irregular, elongate shapes.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	70
Sericite/clay	20
Chlorite	7
Tourmaline	Tr
Zircon	Tr
Opaques	3

This sample consists mainly of a coarsely granular quartz mosaic comprised of quartz grains ranging up to several millimetres in size. The quartz forms a somewhat deformed mosaic exhibiting undulose, strained extinction, localised sutured grain margins and localised granulation. In some areas the quartz has a slightly more recrystallised appearing character with vague irregular grain boundaries typical of vein type quartz. The quartz also tends to have a turbid character produced by very finely divided inclusions which is also typical of vein type quartz.

The thin section was cut to include some of the dark grey lenses noted in hand specimen. These regions consist mainly of weakly birefringent clay intergrown with a birefringent sericitic phyllosilicate. In general these areas have a foliated character but the foliation has a highly irregular and contorted character. Chlorite is intergrown with the argillaceous patches as somewhat irregular flakes up to 0.4 mm wide. The chlorite flakes have a pleochroic bright green colour and very low, anomalous birefringence. These chlorite flakes tend to be concentrated along the contacts of the argillaceous patches with quartz and locally form aggregates up to several millimetres in size.

Although most of the phyllosilicates are concentrated in large patches some irregular bands and vein-like structures with highly contorted characters form intimate intergrowths with the quartz. These intergrowths generally consist largely of sericitic phyllosilicates and chlorite with smaller amounts of weakly birefringent clay. In many cases these irregular bodies are tenuously connected to larger argillaceous patches. It is strongly suspected that a significant proportion of the birefringent phyllosilicate termed sericite is in fact pyrophyllite and this is particularly true in these irregular sericitic intergrowths with vein type quartz. X-ray diffraction analysis would be required to positively determine the character of the birefringent phyllosilicate.

Traces of tourmaline and zircon form small disseminated crystals below 0.5 mm long which occur in the argillaceous patches. Opaques are also concentrated in the argillaceous patches as relatively large crystals up to 2 mm long and as very finely divided intergrowths. Some opaques also locally form intergrowths with the quartz.

Polished Section:

An optical estimate of the relative proportions of opaque constituents gives the following :

	%
Hematite	95
Leucoxene	5

The major opaque mineral in this rock is hematite which tends to form elongate, prismatic crystals as well as large irregular shaped crystals up to a few millimetres in size. Much of the hematite exhibits an irregular lamellar internal texture which is believed to be due largely of deformational origin. Many of the large, flaky hematite crystals have bent and contorted characters and this lamellar structure is particularly developed in the deformed hematite crystals. Hematite also forms very fine intergrowths with the clay-rich areas.

Minor leucoxene is also disseminated through the clay-rich areas as small aggregates up to 0.1 mm in size.

Conclusions:

This is thought to represent a sample of vein quartz containing some irregular clasts of shale or similar argillaceous material. The clasts consist mainly of fine intergrowths of a birefringent phyllosilicate termed sericite and weakly birefringent clay as well as localised concentrations of chlorite marginal to vein quartz. It is thought that at least some of the birefringent phyllosilicate consists of pyrophyllite and the pyrophyllite along with the chlorite represents an alteration product associated with the vein quartz. The major opaque mineral in this rock is hematite which is concentrated in the shale clasts. The shales clasts have intensely deformed characters having highly contorted foliated textures and this deformation is also reflected in the hematite.

SAMPLE: 1629884: TSC50369

Rock Name:
Breccia

Hand Specimen:
This core interval consists mainly of a grey to reddish-brown coloured rock with a fine grain size which locally has a fragmental, brecciated character. The thin section was cut from a highly brecciated portion of the sample.

A bulk X-ray diffraction trace shows that the sample consists mainly of quartz with trace to accessory amounts (probably about 10%) of pyrophyllite, kaolinite and muscovite along with much smaller amounts of pyrite.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	65
Sericite	15
Clay	15
Tourmaline	Tr
Opaques	5

This sample consists mainly of angular quartz grains and quartz-rich clasts ranging up to several millimetres in size distributed through a matrix comprised largely of very finely granular quartz intergrown with birefringent sericite and weakly birefringent clay. The clasts show some textural variation but generally have recrystallised detrital appearing textures. At least one very fine-grained chert or possible siltstone/shale clast is present. Another clast contains irregular disseminated quartz grains somewhat reminiscent of quartz phenocrysts in acid volcanic rocks and could represent an acid volcanic rock clast. Finely divided sericite is intergrown with some of the clasts particularly some of the finer grained cherty textured clasts.

The matrix between the clasts and quartz grains consists of fine-grained quartz intergrown with a birefringent phyllosilicate termed sericite and a weakly birefringent clay. X-ray diffraction analysis shows that the birefringent sericite consists of both pyrophyllite and muscovite while the weakly birefringent clay is kaolinite. The foliation is defined by the phyllosilicates but this foliation has an intensely deformed and contorted character. A small proportion of the matrix quartz forms small spherulitic structures with fine radiating aggregates or irregular, sectoral extinction characteristics.

Opaques are disseminated through the rock as disseminated grains and aggregates up to 0.3 mm wide. The opaques are generally intergrown with the matrix and a small proportion have translucent, reddish-brown colours indicating they represent iron oxides. X-ray diffraction analysis shows that pyrite is also disseminated through the rock.

This is a brecciated, siliceous rock with an epithermal mineral assemblage comprised mainly of quartz but which includes pyrophyllite and pyrite along with kaolinite and muscovite.

SAMPLE: 1629885: TSC50370

Rock Name:
Breccia

Hand Specimen:
A fragmental rock containing clasts up to about 2 cm long with a dull white to pale grey and darker grey colour distributed through a finer grained, reddish-brown matrix. The rock contains a few vein-like structures lined with a soft, dull white phyllosilicate.

A bulk X-ray diffraction trace shows that this sample consists mainly of quartz along with much smaller amounts of pyrophyllite and still slightly smaller amounts of kaolinite, muscovite and pyrite.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	50
Sericite	30
Clay	10
Zircon	Tr
Opaques	10

This sample consists mainly of fine-grained quartz intergrown with finely divided sericite flakes. Overall the rock has a fragmental texture containing clasts comprised of finely intergrown quartz and sericite showing textural variations intergrown with minor amounts of interstitial sericite and weakly birefringent clay. Some of the clasts have strongly deformed textures being comprised of granulated quartz intergrown with sericite which exhibits a strong foliated texture. Some of these deformed clasts exhibit remnant detrital appearing textures. At least one clast containing large quartz phenocrysts up to 3 mm in size in a much finer grained siliceous matrix with finely divided sericite is also present in the rock. Other clasts appear to consist of low temperature quartz forming fine intergrowths with finely divided sericite. Some clasts are very rich in sericite being comprised mainly of very finely divided birefringent flakes.

X-ray diffraction analysis shows that the birefringent phyllosilicate termed sericite consists largely of pyrophyllite along with minor muscovite. The weakly birefringent clay was identified as kaolinite by X-ray diffraction.

Opaques are disseminated through the rock as irregular patches and discontinuous vein and fracture fillings. Some opaques also form subhedral disseminated grains up to 0.1 mm wide. X-ray diffraction shows that pyrite is present in the rock and probably represents the disseminated subhedral grains. Many of the irregular opaque patches have vague translucent characters and would represent iron oxides. Traces of zircon form small disseminated crystals up to 0.15 mm long.

This is a strongly fragmented rock with a brecciated texture containing clasts including both detrital appearing rock clasts and probable acid volcanic rock clasts. Overall the sample is very similar to sample 1629884 having a similar epithermal mineral assemblage comprised mainly of quartz but including pyrophyllite and smaller amounts of kaolinite, muscovite and pyrite.

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24 May 1988

CRA Exploration Pty. Limited,
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ATT: MR. FRED FUNNELL

REPORT G 7536/88

YOUR REFERENCE:	DPO No. 46282
IDENTIFICATION:	1653181-87
MATERIAL:	Half drill core
DATE RECEIVED:	15 April 1988
WORK REQUIRED:	Petrography (7 Code MA1.3) and X-Ray Diffraction (5 Code MB5)

Investigation and Report by: Frank Radke
X-Ray Diffraction by: Dr Roger Brown

Manager - Geological Services: Dr Keith J Henley

Keith Henley

for Dr William G Spencer
General Manager
Applied Sciences Group

c.c. CRA Exploration Pty. Limited,
P.O. Box 8093,
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ATT: ADMIN. OFFICER

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ATT: CHIEF GEOLOGIST INFORMATION SERVICES

bp

PETROLOGY OF 7 SAMPLES

1. SUMMARY

Seven samples submitted by CRA Exploration Pty. Limited for petrographic examination were given the following rock names.

SAMPLE & THIN SECTION NO.		ROCK NAME
1653181:	TS46630	Breccia
1653182:	TS46631	Altered Lithic Conglomerate
1653183:	TS46632	Calcite Cemented Lithic Conglomerate
1653184:	TS46633 A&B	Lithic Conglomerate
1653185:	TS46634	Lithic Conglomerate
1653186:	TS46635	Rhyolitic Welded Tuff
1653187:	TS46648	Rhyolite

Most of these samples consist of very coarse grained detrital rocks termed conglomerate or breccia. These samples contain abundant lithic clasts and smaller amounts of detrital quartz. Sample 1653181 contains fine-grained quartz-rich metasedimentary rock clasts while the other samples contain acid igneous rock clasts. Sample 1653183 also contains a small number of fine-grained metamorphic rock clasts similar to those in sample 1653181.

Samples 1653186 and 1653187 are rhyolitic rocks. Sample 1653186 has a well preserved tuffaceous texture while sample 1653187 has a very finely granular matrix and is most likely of shallow intrusive origin.

Samples 1653181 and 1653182 show alteration to pyrophyllite a typical epithermal alteration mineral. In the other samples the birefringent phyllosilicate consists of muscovite. Several samples were selected for positive identification of the phyllosilicates by X-ray diffraction.

2. X-RAY DIFFRACTION

The bulk mineralogy of selected samples as determined by X-ray diffraction analysis is given in Table 1. Pyrophyllite was only detected in samples 1653181 and 1653182 and these samples also contain minor muscovite.

3. PETROGRAPHIC DESCRIPTIONS

All of the hand specimens described in this report have been stained with sodium cobaltinitrite after a hydrofluoric acid etch to detect the possible presence and location of potash feldspar. This is only mentioned in the hand specimen descriptions where potash feldspar has been detected.

The thin sections have been stained with an alizarin red-S solution to distinguish calcite from other carbonates by staining it pink. In the thin section descriptions calcite is used only for stained carbonate.

Most of these samples contain a birefringent phyllosilicate which have generally been termed sericite particularly in samples 1653181 and 1653182 where both pyrophyllite and muscovite are present. It is optically very difficult and in some cases impossible to distinguish between pyrophyllite and muscovite.

SAMPLE: 1653181: TS46630

Rock Name:
Breccia

Hand Specimen:
This is a fragmental rock containing angular clasts up to approximately 3 mm in size which have a pale purple to dull white colour. The clasts are separated by a paler coloured matrix which at least locally has a weakly foliated character. One clast which was not included in the thin section has a pale green colour and a very soft character and is comprised mainly of a phyllosilicate such as pyrophyllite or muscovite.

The X-ray diffraction trace of this sample shows that it consists mainly of quartz with much smaller amounts of pyrophyllite and muscovite and traces of kaolinite and hematite.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	70
Sericite	20
Clay (kaolinite)	4
Calcite	1
Tourmaline	Tr
Zircon	Tr
Opaques	5

This sample consists mainly of granular quartz-rich clasts separated by an interstitial matrix comprised mainly of sericitic phyllosilicates and quartz. The quartz-rich clasts show a range of textures and grain sizes although most have weakly foliated and strongly recrystallised appearing textures. Most of the clasts contain strongly deformed quartz grains with sutured grain margins and undulose, strained extinction. The sericite flakes in the clasts generally exhibit a strong lepidoblastic foliation. Most of the clasts have a grain size ranging between 0.1 and 0.5 mm.

The interstitial vein-like structures between the clasts contain abundant fibrous sericite which tends to exhibit a strong preferred orientation parallel to the vein-like bodies. This sericite is intergrown with granular quartz and smaller amounts of weakly birefringent clay believed to be kaolinite. Smaller angular clasts ranging up to approximately 1 mm in size are also locally present in the interstitial matrix between the larger clasts.

X-ray diffraction shows that the sericite in this rock consists of both pyrophyllite and muscovite. It is considered likely that the pyrophyllite would represent the interstitial fibrous sericite and the muscovite would represent the phyllosilicates intergrown with the clasts. Although no chlorite was detected by X-ray diffraction analysis minor chlorite was noted as small flakes and flaky aggregates up to 0.5 mm in size intergrown with some quartz-rich clasts. This chlorite has a very pale green weakly pleochroic colour and very low birefringence.

Traces of tourmaline are disseminated through the rock as small, prismatic crystals up to 0.1 mm long which are generally intergrown with the quartz-rich clasts. Opaques are disseminated through the rock as irregular grains and patches up to 0.2 mm in size. A small proportion of the opaques have vague subhedral shapes but most have anhedral, irregular shapes. Some very finely divided opaque material is concentrated as intergrowths with the interstitial matrix but other opaque material is disseminated through the clasts. X-ray diffraction analysis shows that the opaques consist mainly if not exclusively of hematite. Traces of zircon were also noted locally as small disseminated grains up to 0.2 mm long.

This is a coarse grained breccia most likely of sedimentary origin cemented by a pyrophyllite-rich matrix.

SAMPLE: 1653182: TS46631

Rock Name:
Altered Lithic Conglomerate

Hand Specimen:
A massive, reddish-brown rock with a well indurated granular texture containing clasts ranging up to approximately 1 cm in size. The clasts range in colour from a milky grey to a very dark black to greenish-grey although most of the clasts have a reddish-brown colour.

X-ray diffraction analysis of this sample shows that it consists mainly of quartz with slightly smaller amounts of pyrophyllite and still smaller amounts of hematite, muscovite and kaolinite.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Granular quartz	35
Sericite	35
Quartz phenocrysts	15
Clay (kaolinite)	10
Zircon	Tr
Opaques	5

This sample consists mainly of a finely granular quartz and sericite-rich matrix through which larger quartz grains typical of quartz phenocrysts in acid volcanic rocks are disseminated. The matrix shows variations in texture within different areas due to the fragmental nature of this sample. Although not very well-developed the sample appears to consist mainly of acid volcanic lithic clasts which have a strongly compacted character. These clasts show a variety of remnant textures with some exhibiting vague remnant tuffaceous textures.

The disseminated quartz phenocrysts would represent quartz phenocrysts in the acid volcanic rock clasts and range up to approximately 3 mm in size. These phenocrysts typically exhibit highly embayed, anhedral shapes although a small proportion exhibit angular, broken shapes. Prismatic sericite patches up to 2 mm long are also present in some of the clasts and would almost certainly represent completely altered feldspar phenocrysts. Within localised areas opaques are concentrated in elongate, prismatic patches where they are intergrown with finely divided sericite. The shape and character of these patches suggest that they represent completely altered mica (probably biotite) phenocrysts in the original acid volcanic rocks.

In all cases the matrix of the different clasts is comprised of granular quartz intergrown with varying proportions of finely divided sericite. In some clasts the quartz has a grain size ranging up to 0.3 mm but in most cases the quartz has a very finely granular, cherty texture. X-ray diffraction analysis shows that the sericite consists mainly of pyrophyllite although minor finely divided muscovite is also present. Small amounts of a weakly birefringent clay identified as kaolinite by X-ray diffraction is intergrown with the sericite.

Traces of zircon form very small disseminated crystals up to 0.2 mm long. Opaques are disseminated through the rock as finely disseminated grains and aggregates and as larger disseminated grains up to 1 mm in size. Most of the opaques have anhedral, irregular shapes but a small proportion of opaques have vague subhedral shapes.

This is thought to be a fine-grained lithic conglomerate comprised of acid volcanic rock clasts including at least some welded tuffs which has been subjected to alteration producing abundant pyrophyllite and fine-grained quartz.

SAMPLE: 1653183: TS46632

Rock Name:
Calcite Cemented Lithic Conglomerate

Hand Specimen:
This is a fragmental rock containing greenish-grey to reddish-brown lithic clasts generally between 0.5 and 3 cm in size cemented by an interstitial white matrix. Microchemical tests show that some of the clasts contain localised fine intergrowths of potash feldspar.

An X-ray diffraction trace of this sample shows that it consists mainly of quartz with slightly smaller amounts of calcite and still smaller amounts of muscovite and chlorite. Traces of potash feldspar were also tentatively identified by X-ray diffraction.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	50
Muscovite/sericite	25
Calcite	20
Sericite	7
Potash feldspar	1
Zircon	Tr
Opaques	2

This sample consists mainly of lithic clasts ranging up to several millimetres in size cemented by an interstitial, calcite-rich matrix. The clasts consist mainly of acid volcanic rock clasts although a smaller proportion of fine-grained quartz-rich clasts which are probably of metasedimentary origin are also present. The acid volcanic rock clasts show a range of textures but generally have a very fine-grained matrix comprised of finely granular quartz and very finely divided phyllosilicates comprised mainly of sericite. Many of these clasts contain disseminated quartz phenocrysts up to 3 mm in length which generally exhibit anhedral embayed to angular, broken appearing shapes. Many of the clasts also contain prismatic sericite patches believed to represent completely altered feldspar phenocrysts. The matrix of these clasts show great textural variation with some having vague remnant textures believed to be of tuffaceous origin.

A much smaller proportion of the clasts consist of strongly recrystallised quartz mosaics with a typical grain size of about 0.1 mm. These clasts also contain moderate amounts of very finely divided muscovite/sericite with intimate, interstitial intergrowths with the quartz.

Calcite is concentrated as coarsely granular interstitial fillings with a maximum grain size of 1 mm. The calcite generally has a deformed character exhibiting well-developed deformational lamellae which locally exhibit highly contorted characters. Within localised areas finely granulated calcite mosaics are also present. Some muscovite/sericite is intergrown with the interstitial calcite as very fine fibrous flakes and aggregates.

Chlorite is disseminated through the rock as small flakes and flaky aggregates up to 1 mm in size. Some chlorite aggregates intergrown with acid volcanic rock clasts also contain intergrowths of opaque material and exhibit shapes suggesting that they represent completely chloritised mica (probably biotite) phenocrysts. Finely divided opaques are generally intergrown with this chlorite. Other chlorite forms small flakes and flaky aggregates intergrown with the interstitial matrix or irregular patches within lithic clasts some of which contain fine calcite intergrowths.

Minor potash feldspar was detected in the hand specimen as very localised intergrowths with some clasts. This potash feldspar could not be positively identified in thin section probably due to the very fine grain size of the felsic matrix in the volcanic lithic clasts.

Traces of zircon are disseminated through the rock as small grains ranging up to 0.2 mm wide. Opaques are also disseminated through the rock as small grains and aggregates up to 0.4 mm wide which occur both as localised intergrowths with the acid volcanic rock clasts and irregular intergrowths with the interstitial calcite-rich matrix.

This is a conglomerate comprised of lithic clasts cemented by an interstitial calcite-rich matrix. The lithic clasts consist mainly of acid volcanic rock clasts including at least some welded tuffs but smaller amounts of fine-grained quartz-rich metasedimentary rock clasts are also present. The clasts generally show some alteration to secondary phyllosilicates (mainly muscovite/sericite and chlorite) but is difficult to determine whether this alteration occurred in the original rocks rather than in the conglomerate.

SAMPLE: 1653184: TS46633 A & B

Rock Name:
Lithic Conglomerate

Hand Specimen:
This core interval has a somewhat variable character locally exhibiting a well indurated fragmental texture containing clasts ranging between 2 mm and several centimetres in size. Another area has a much more even texture and could represent a very large clast. The sample is also transected by some veins ranging up to 8 mm wide some of which have a pale grey to dull white colour and consist mainly of quartz and calcite and another which has abundant green chlorite.

Two thin sections were cut from this sample and the following description is of sample TS46633B. The other thin section is not radically different although it does contain a slightly different chlorite-rich vein.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Quartz	40
Sericite/clay	25
Feldspar	10
Chlorite	10
Calcite	10
Degraded biotite	4
Zircon	Tr
Opaques	1

This is a fragmental rock containing very well indurated lithic clasts with great textural variation. Most of the clasts are acid volcanic rock clasts exhibiting porphyritic textures defined by quartz phenocrysts and sericitic pseudomorphs after feldspar phenocrysts. Most of the clasts have finely granular matrix textures believed to be comprised mainly of quartz. Some of the clasts exhibit remnant tuffaceous textures in the matrix indicating they represent welded tuffs. In all of the clasts the matrix generally consists of very finely granular quartz intergrown with fibrous sericite/clay.

Some of the clasts contain what appear to be plagioclase laths up to 0.3 mm long which are most likely remnant plagioclase phenocrysts. These laths have been largely altered to finely divided sericite/clay. The exact proportions of quartz and plagioclase present in these clasts is difficult to determine due to the fine grain size of most of the rock. Some clasts appear to represent coarser grained quartz and feldspar-rich rocks with a typical grain size between 0.3 and 1 mm. These clasts contain highly altered plagioclase laths intergrown with interstitial anhedral quartz. The plagioclase in these clasts has been altered to finely divided sericite/clay. One margin of the thin section consists mainly of a very large clast with this texture.

Highly degraded biotite flakes up to 0.5 mm long are disseminated through the coarser grained clasts. These biotite flakes have been largely altered to green chlorite but still retain minor brown coloured highly degraded biotite remnants.

The rock is transected by a granular quartz vein approximately 5 mm wide. The quartz in this vein has a grain size ranging up to 0.8 mm and is intergrown with moderate amounts of calcite. Both the quartz and calcite have strongly deformed textures showing localised granulation. The quartz also exhibits sutured grain margins and undulose, strained extinction. The calcite typically has very well-developed deformation lamellae which are locally highly contorted. Minor chlorite is present locally near the margins of the vein as bright green flaky aggregates up to 0.4 mm wide which are generally associated with calcite.

This rock is also transected by another vein approximately 5 mm wide oriented parallel to the quartz and calcite vein. This vein consists of granular calcite intergrown with chlorite which is concentrated in irregular patches up to 2 mm wide. This vein would represent the dark green vein noted in hand specimen. The chlorite forms bright green, pleochroic flakes with very low, anomalous birefringence. The flakes rarely exceed 0.1 mm in size and are concentrated in irregular flaky aggregates intergrown with the calcite. The calcite has a highly variable grain size and very irregular texture due to the irregular chlorite intergrowths. This calcite also exhibits well-developed deformational lamellae.

Traces of zircon are disseminated through the rock as small crystals up to 0.1 mm wide. Although most of the calcite is concentrated in the veins noted earlier minor calcite is disseminated through some of the clasts as small grains and aggregates up to 0.3 mm wide. Opaques form anhedral disseminated grains ranging up to 0.3 mm wide. Finely divided opaques tend to be concentrated in some intensely chloritised biotite flakes.

This is thought to be a coarse grained detrital sedimentary rock comprised mainly of acid volcanic clasts showing moderate alteration to finely divided sericite/clay and partially chloritised biotite flakes. The rock is transected by veins containing either a calcite and quartz assemblage or a calcite and chlorite assemblage.

SAMPLE: 1653185: TS46634

Rock Name:
Lithic Conglomerate

Hand Specimen:
Much of this core interval consists of very fine-grained rock with irregular dark reddish-brown patches somewhat similar to fiamme in welded tuffs. This is thought to represent a very large clast and is in contact with a finer grained fragmental area containing pale greenish-grey clasts with some interstitial white calcite. This area also contains some very dark reddish-brown clasts. Microchemical tests show that some of the clasts in the finer grained fragmental portion of the rock contain small amounts of finely intergrown potash feldspar.

The X-ray diffraction trace of this sample shows calcite as the major mineral with smaller amounts of muscovite, quartz, plagioclase and traces of chlorite and hematite. These mineral proportions are different than those in the thin section and probably reflects mineralogical variations in the rock.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Felsic matrix	25
Sericite/clay	20
Lithic clasts	20
Calcite	10
Quartz	10
Plagioclase phenocrysts	10
Chlorite	1
Apatite	Tr
Zircon	Tr
Opaques	4

Most of this thin section was cut to include the tuffaceous appearing region believed to represent a large clast in hand specimen. This portion of the rock contains plagioclase phenocrysts up to 3 mm in size disseminated through a very fine-grained matrix which has a vague remnant tuffaceous texture produced mainly by irregular patches rich in sericite/clay. The plagioclase shows moderate alteration to finely divided sericite/clay. A very small number of quartz phenocrysts up to 1 mm in size are also disseminated through this part of the rock and generally have anhedral to slightly broken appearing shapes.

Calcite is also disseminated through this portion of the rock as small grains and aggregates up to 0.5 mm wide. The reddish-brown patches noted in hand specimen consist of irregular concentrations of very finely divided opaque material which are probably iron oxides.

The finer grained fragmental appearing portion of the sample is also included in thin section and consists mainly of acid igneous rock clasts up to several millimetres in size. A small number of angular quartz grains generally below 0.5 mm in size are also present in this portion of the rock. The lithic clasts show a variety of textures including some clasts with well preserved tuffaceous textures, and others with fine-grained granular felsic groundmass. One opaque clast several millimetres in size containing minor intergrown quartz and sericite/clay is also present.

Fibrous sericite is also present in this portion of the rock and is locally concentrated as very narrow vein-like structures located between the lithic clasts. Calcite forms coarsely granular interstitial fillings with a grain size ranging up to 0.5 mm. This calcite typically has a strongly deformed character with localised granulation, irregular grain margins and very strongly deformational lamellae.

Most of the lithic clasts in this portion of the rock are thought to consist mainly of fine-grained silica but testing of the hand specimen shows that at least some potash feldspar is also present. It is considered likely that plagioclase could also be intergrown with some of these lithic clasts.

Minor chlorite is locally present as flaky aggregates up to 0.5 mm wide which have a pale green colour. A brownish phyllosilicate also forms very fine flaky aggregates up to 0.5 mm in size and has been included with the chlorite although it could represent another clay mineral. Traces of apatite and zircon form small disseminated crystals up to 0.2 mm wide. Opaques are disseminated through the sample as anhedral grains and aggregates up to 0.5 mm wide.

This is thought to be a coarse grained conglomeritic rock containing one very large tuffaceous clast as well as some smaller clasts. The rock is cemented mainly by calcite but also it contains interstitial sericitic phyllosilicates and minor chlorite.

SAMPLE: 1653186: TS46635

Rock Name:
Rhyolitic Welded Tuff

Hand Specimen:
This is a massive rock containing small quartz and feldspar phenocrysts disseminated through an aphanitic reddish-brown matrix.

An X-ray diffraction trace of this sample shows that it consists mainly of plagioclase with slightly smaller amounts of quartz and somewhat less muscovite.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Felsic matrix	45
Altered feldspar phenocrysts	30
Quartz phenocrysts	15
Altered mica phenocrysts	4
Calcite	2
Altered hornblende phenocrysts	1
Chlorite	Tr-1
Zircon	Tr
Opaques	2

This is a porphyritic rock containing altered feldspar phenocrysts, quartz phenocrysts and a small number of mafic phenocrysts disseminated through a very fine-grained felsic matrix with a remnant vitrophyric texture. The matrix has a very finely granular, cherty texture and is comprised mainly of felsic minerals believed to be largely quartz and plagioclase since testing of the hand specimen failed to detect any potash feldspar. The matrix exhibits a remnant tuffaceous texture including vague shard structures and moderately well-developed compaction foliation which is best developed marginal to some phenocrysts. The shards are generally defined by slightly paler coloured aggregates disseminated through a matrix which has a pale brown colour most likely due to very finely divided iron oxide inclusions which would also account for the colour of the hand specimen.

The feldspar phenocrysts range up to 1.5 mm in length and exhibit euhedral to subhedral prismatic shapes. Most of the feldspar phenocrysts have been almost completely replaced by birefringent sericite and weakly birefringent clay although some phenocrysts contain plagioclase remnants. The quartz phenocrysts range up to 4 mm in size and typically exhibit anhedral, embayed shapes.

The rock contains some altered mica phenocrysts up to 2 mm long now comprised of fibrous sericite and weakly birefringent clay. These phenocrysts also typically contain finely divided opaque material and a few contain granular calcite intergrowths. A smaller number of altered hornblende phenocrysts are also disseminated through the rock. These phenocrysts have subhedral, prismatic shapes typical of hornblende and range up to approximately 1 mm in size. They have been completely replaced by weakly birefringent clay and sericite with lamellar intergrowths of opaque material which define remnant hornblende cleavage. Minor chlorite was noted locally as small intergrowths with altered mica phenocrysts.

Calcite is disseminated through the rock as small grains and granular aggregates up to 0.2 mm wide. Most of the calcite is disseminated through the tuffaceous textured matrix but some is also intergrown with altered phenocrysts. Traces of zircon form small disseminated crystals up to 0.15 mm long. Opaques are disseminated through the rock as anhedral grains up to 0.5 mm wide.

This is a porphyritic rock containing altered feldspar and mafic phenocrysts as well as fresh quartz phenocrysts disseminated through a very finely granular felsic matrix which retains a remnant tuffaceous texture including vague shard structures and compaction foliation.

SAMPLE: 1653187: TS46648

Rock Name:
Rhyolite

Hand Specimen:
This core interval has a highly variable lithology ranging from a fine-grained porphyritic rock to a strongly fragmental textured area. The porphyritic rock contains quartz phenocrysts and very dark coloured patches up to approximately 4 mm wide disseminated through an aphanitic, purple matrix. This rock is in sharp contact with a coarse fragmental rock containing clasts up to about 1 cm in size including reddish-brown clasts and milky grey quartz clasts. This fragmental rock is in sharp contact with a much differently textured fragmental rock containing angular green clasts in a finer grained matrix with a mottled pale greenish-grey to pink colour.

The thin section was cut from the porphyritic portion of the rock. Testing of this portion of the rock shows that the matrix contains abundant finely intergrown potash feldspar.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Felsic matrix	50
Sericite/clay	35
Quartz phenocrysts	10
Calcite	Tr-1
Zircon	Tr
Opaques	5

This is a porphyritic rock containing altered feldspar phenocrysts and quartz phenocrysts disseminated through a very finely granular, felsic matrix. Testing of the hand specimen shows that the matrix contains significant proportions of potash feldspar although some quartz and some probable altered plagioclase is also present. The matrix generally consists of very finely granular felsic minerals with a grain size below 0.1 mm but small feldspar laths including some altered plagioclase laths are intergrown with the matrix.

Anhedral to subhedral quartz phenocrysts ranging up to 1 mm in size are disseminated through the rock. A small proportion of the quartz phenocrysts exhibit highly embayed shapes. Virtually all of the quartz phenocrysts have very narrow coronas with a very fine poikilitic textures which are in optical continuity with the quartz phenocryst.

Prismatic shaped sericite patches up to 1.5 mm long are also disseminated through the rock and are thought to represent altered feldspar phenocrysts. Some irregular angular sericite patches and vein-like structures are also present and could represent sericite vein and fracture fillings. A very small proportion of sericite patches contain lamellar intergrowths of opaque material and are thought to represent completely altered mafic phenocrysts. Calcite tends to be intergrown with some of the sericite patches as small grains ranging up to 0.2 mm wide.

Traces of zircon form small disseminated crystals up to 0.2 mm long. Opaques form fine disseminated grains and aggregates up to 0.1 mm in size which are distributed through the matrix as well as larger irregular patches ranging up to 1 mm in size. Minor opaques also occur locally as narrow vein and fracture fillings.

This is a porphyritic igneous rock of rhyolitic composition whose granular felsic matrix suggests that it is most likely of shallow intrusive origin although an extrusive origin could not be completely ruled out.

TABLE 1: BULK MINERALOGY BY X-RAY DIFFRACTION

1653181		1653182		1653183		1653185		1653186	
Q	D	Q	D	Q	D	Cal	D	F	D
Pr	A	Pr	SD	Cal	SD	M	SD	Q	SD
M	A	H	A	M	A	Q	A	M	A
K	Tr	M	A	C	A	F	A		
H	Tr	K	Tr-A	F'?	Tr	C	Tr		
						H?	Tr		

Mineral Key

C	Chlorite
Cal	Calcite
F	Feldspar (albite)
F'	K feldspar
H	Hematite
K	Kaolinite
M	Muscovite
Pr	Pyrophyllite
Q	Quartz

SEMIQUANTITATIVE ABBREVIATIONS:

D = Dominant. Used for the component apparently most abundant, regardless of its probable percentage level.

SD = Sub-dominant. The next most abundant component(s) providing its percentage level is judged above about 20.

A = Accessory. Components judged to be present between the levels of roughly 5 and 20%.

Tr = Trace. Components judged to be below about 5%.

APPENDIX 3
GEOPHYSICAL MEMORANDA

C.R.A. EXPLORATION PTY. LIMITED
(INCORPORATED IN NSW)
137 TASMAN HIGHWAY, CAMBRIDGE, TASMANIA 7170

21 December 1937

Memorandum to: T W DICKSON

Copy to: F R FUNNELL

From: T VON STROKIRCH

GEOPHYSICS OVER LAKE MARGARET AEROMAGNETIC ANOMALIES

Introduction

A chain of aeromagnetic anomalies extends down the west coast from north of Granite Tor to south of Macquarie Harbour. In places where the Cambrian outcrops, such as Red Hills, Mt Jukes and Beatrice, the anomaly can be found to be due to magnetite veins accompanied by sulphides within rhyolitic 'domes'. These sulphides have been known to contain some 2 ppm gold though as yet no significant quantity has been found.

Three aeromagnetic anomalies on the Lake Margaret licence (EL 5/85) were selected for further work on the basis of aeromagnetic depth interpretations and anomalous gravity responses. The Julia Creek and Rolleston Road anomalies also appear to lie on a major north west trending magnetic lineament and the East Mt Sedgwick anomaly is significant through being the most pronounced aeromagnetic feature in the chain.

Surveys and Results

Reconnaissance grids were completed over the three anomalies and ground magnetic surveys conducted with readings taken at 12.5 metre intervals along the lines.

Interpretation of the Rolleston Road anomaly indicated a source of low magnetite content some three hundred metres down. While the anomaly was located its depth and relatively weak mineralisation tends to decrease its interest to us at this stage and no further work has been proposed.

The East Mt Sedgwick and Julia Creek grids showed evidence of much shallow magnetic reponses.

On the base line of the Julia Creek survey (line 82000E) a number of anomalies can be seen. Quantative modelling is difficult as the sources are close together however examination of the gradients and half widths of the anomalies indicate that they are generally within 100m of the surface and those with steeper gradients come to within forty metres. Clearly in this case the mineralised Cambrian rocks are covered by only a small thickness of conglomerate and this is further borne out by recently released Department of Mines mapping which shows small outcrops of Cambrian in the area.

In view of the likely presence of mineralisation within 100 metres of the surface an IP survey was conducted along the northern two lines of the grid and the northern two thirds of the base line. The survey used the dipole-dipole assays with 100 metre spacings on all lines. Scientrex IPR11 and IPR10 receivers were used.

Chargeability anomalies were detected on all lines so 50 metre dipoles were used to detail the best anomalies. Three steeply dipping anomalies were detected on line 5362500N and one on 5363000 which was located coincident with the peak of the magnetic anomaly. In all cases the anomalies seem to be due to narrow concentrations of chargeable material rather than to a broad sulphidic zone capping a cryptodome which was the highest rated target. At the northern part of Line 82000E a chargeable zone was located under the conglomerate. In this a shallow chargeable zone centred on 63150N was detected with the 100m dipoles. Detailing with 50 metre dipoles gave a different result with a weakly chargeable buried body present at 63275N. While this may be evidence of mineralisation in the base of the conglomerate it is unlikely to represent a major concentration of sulphide. Indeed Goldfields and Mt Lyell exploration teams found that micaceous haematite within the highly resistive Owen Conglomerate could produce a chargeable anomaly and this may be what is occurring in this case.

In the case of the narrow chargeable bodies on the other lines, the same cause may be present or the bodies may be due to weakly sulphidic zones. However at this stage there are no indications from the relatively low chargeabilities and the lack of coincident resistivity anomaly of a major sulphide concentration.

In the case of the East Mt Sedgwick grid, a broad anomaly was located. Modelling of this data has indicated that the main magnetic source is a 1100 metre wide block at some 600 metre depth assuming homogeneity.

Using the model of magnetite veining within rhyolite it is likely that the body would be homogeneous, becoming less magnetitic to the edges. In view of this it is likely that the source may be somewhat shallower though a major (order of magnetude) change in the depth interpretation is not likely. However while the main source is at depth there are some high frequency responses present at the centre of the anomaly, in particular on line 49750N. These high frequency anomalies are indicative of magnetic material intruding the conglomerate and coming close to surface. As line 49750N crosses the edge of a dome within the conglomerate it is possible that the magnetic material occurs within axial fractures occurring at the centre of the dome. Assuming the model holds, it is possible that pyritic materials may also occupy similar fractures. Hence an IP survey was planned over lines 49750N and 50750N.

The choice of line 50750N was determined by the presence of lakes which were two wide for crossing with IP surveys without having access to boats.

Initially line 49750N was surveyed with 200m dipoles. This resulted in extremely noisy data. However chargeable anomalies were outlined at both ends of the traverse. The anomaly at the western end is poorly defined and is too far from the magnetic anomaly to comfortably fit the model. Hence the anomaly at the eastern end of the line was traversed with 100 metre dipoles. This had the effect of resolving two separate bodies both of which remained incomplete to the east due to the impossibility of continuing the lines through rather thick banksia scrub. A chargeable source at depth under 386400E disappeared on the more detailed survey. This anomaly is only defined on the n = 6 readings indicating a depth of some 300-400 metres to source.

The narrow steeply dipping anomalies on the line, while all incomplete, are believed to be due to source at 385350E, 387150E and perhaps at 387300E. More accurate IP surveys would be required to define these sources properly and such surveys are recommended if these sources are to be tested by drilling. In the case of the two eastern anomalies the sources come as close to surface as can be defined with 100 metre dipole (i.e. within 50m). These sources are quite chargeable and may dip either vertically or to the west as one might expect from veins above an intrusive mineralised rhyolite but due to the incomplete nature of the data little more can be said.

On line 50750N 100m dipoles were used. Two narrow west dipping chargeable bodies were resolved at 87100E and 86850E and a chargeable zone at the eastern end of the line where the limestone occurs. One of the bodies coincides with the limestone contact and the other is 250m further west.

In this case the chargeable anomalies are on the eastern limb of the magnetic anomaly as different from line 49750N where the chargeable anomalies fit on the eastern part of the top of the anomaly.

Conclusion and Recommendations

1. Rolleston Road. No further work without considerable encouragement elsewhere in the system.

2. Julia Creek. As the anomalies appear to be shallow and as the conglomerate topography in the area is locally dissected through the Cambrian a programme of stream sediment sampling of all drainages for gold is suggested. If no encouragement is derived from this or from further work in this style of mineralisation, no further work is recommended.

   If encouragement is obtained then the IP and magnetic data should be modelled in detail.

3. East Mt Sedgwick. The most interesting part of the anomaly appears to be on line 49750N where there is the strongest indication of magnetic material and chargeable material close to the surface. At this stage the IP anomalies are poorly defined and ideally an additional survey should be carried out to give complete coverage over them. In view of time and economic restraints, this may not be the preferred course. As the magnetic anomaly is modelled at 600m and as the IP anomalies are believed to be dipping to the west, a vertical hole collared at 387050E and drilled to a depth of 500m may intersect both the IP source and the major magnetic source at depth, as well as the postulated sulphide zone above the magnetic anomaly which may be represented by the increased n = 6 chargeability between 386200E and 386400E.

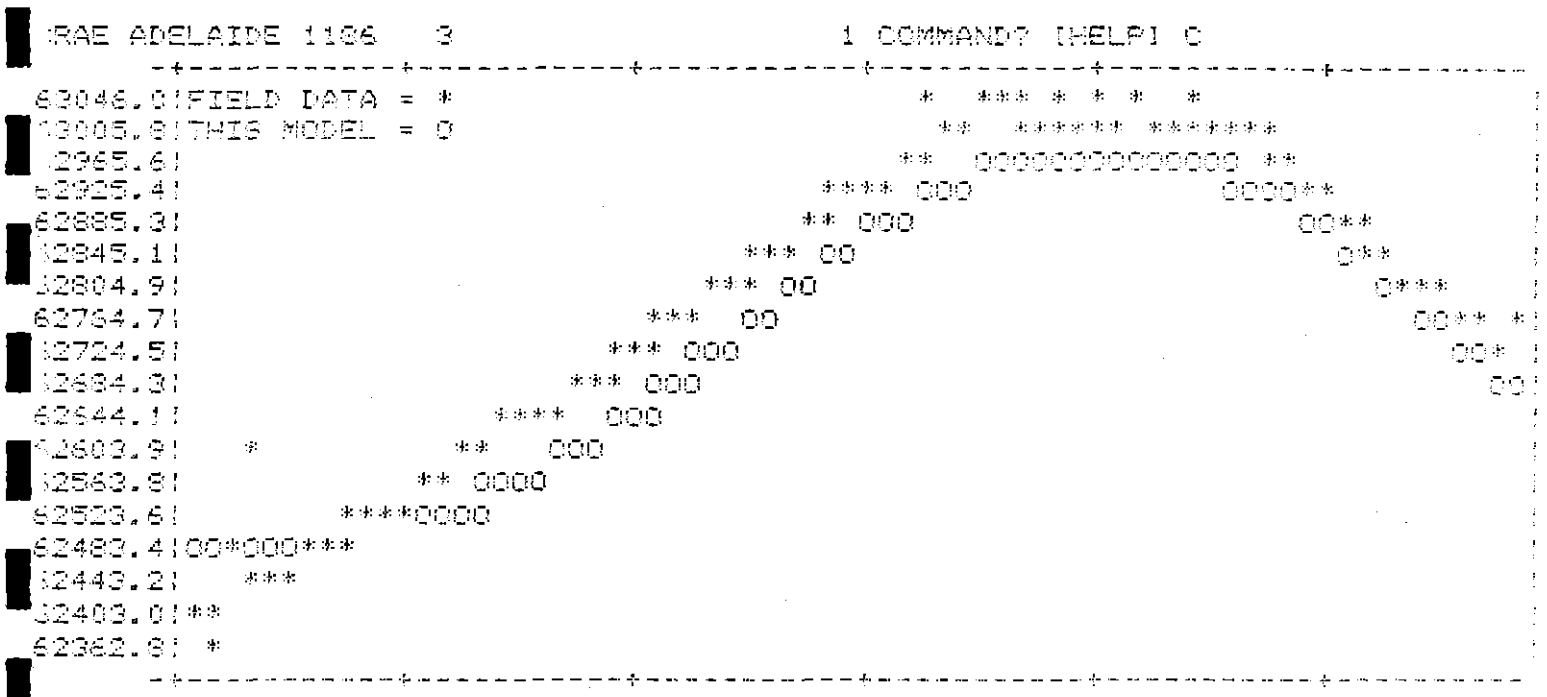
F. R. Funnell
for
T VON STROKIRCH

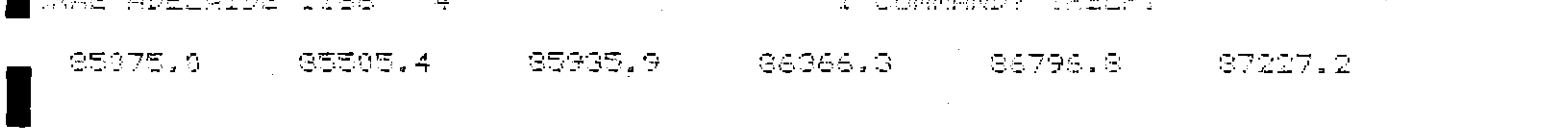
076

```
  ADD/       SUM/DIST M/DIST    M/BRG   M/R.L.     C/EAST   C/North  C/R.L.
  1    :   0   168.9  2072.3    206.9      3.5        0.0       0.0      0.0

RAE ADELAIDE 1186   9                     1 COMMAND? [HELP] C
     -+-----------+-----------+-----------+-----------+-----------+----------
62046.0!FIELD DATA = *                       *   *** * * *   *
63005.8!THIS MODEL = O                        **OO******O*******
 2965.6!                                   O**               OOO**
62925.4!                                  ****                  OO**
62885.3!                                **                        OO**
 2845.1!                             ***O                          O**
 2804.9!                           ***OO                            OO***
62764.7!                        *** OO                                O  ** *
 2724.5!                      *** OO                                   OOO *
 2684.3!                    ***  OO                                      OO
62644.1!                ****   OO                                         O
62603.9!   *           **    OO                                            O
 2563.8!             **    OO
62523.6!         ****   OOOO
62483.4!OO*OOO***OOOOOO
 2443.2!   ***
 2403.0!**
62362.8! *
     -+-----------+-----------+-----------+-----------+-----------+----------
  85075.0     85505.4     85935.9     86366.3     86796.8     87227.2

RAE ADELAIDE 1186  10                     1 COMMAND? [HELP]

#=START NEW MODEL                        *=GET OLD MODEL
 =REMOVE TREND FROM FIELD DATA          @=SAVE MODIFIED FIELD DATA
 UMBERS (1 THROUGH 9 AND 0)=MODEL FIELD DATA WITH THAT NUMBER

 NORMAL OPERATION IS TO CHANGE A PARAMETER THEN TYPE C


 RAE ADELAIDE 1186  10                    1 COMMAND? [HELP] L
 EPTH TO TOP =    600.00
DEPTH TO BOTTOM=   800.00
TRUE WIDTH=  1200.00
 TRIKE LENGTH=  2000.00
DISTANCE TO END (IN -Y DIRN)=  1000.00
POSITION ALONG DATA LINE = 86800.00
 IP FROM +N=   110.00
ANGLE FROM STRIKE TO LINE=  85.00
TOTAL FIELD=   62500.
 TRIKE WRT MN= 350.00
 NCLINATION= -70.00
SUSCEPTIBILITY(CGS)= .150E-01
% MAGNETITE=   4.56
```

077

726078





RAE ADELAIDE 1186 4 1 COMMAND? [HELP] L

EPTH TO TOP = 600.00
EPTH TO BOTTOM= 1500.00
TRUE WIDTH= 1200.00
STRIKE LENGTH= 2000.00
ISTANCE TO END (IN -Y DIRN)= 1000.00
OSITION ALONG DATA LINE = 86700.00
IP FROM +X= 70.00
NGLE FROM STRIKE TO LINE= 85.00
OTAL FIELD= 62500.
STRIKE WRT MN= 350.00
NCLINATION= -70.00
USCEPTIBILITY(CGS)= .500E-02
% MAGNETITE= 2.04

RAE ADELAIDE 1186 4 1 COMMAND? [HELP] K
USCEPTIBILITY(CGS)= .500E-02
USCEPTIBILITY(SIS)= .004

APPENDIX 4
ASSAY DATA SHEETS

079

Australian Laboratory Services PTY. LTD.

CONSULTING ANALYTICAL CHEMISTS

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LABORATORY REPORT

Charters Towers Laboratory
18 Drew Street, Charters Towers, Q. 4820
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Bendigo Laboratory
127A Victoria Street, Eaglehawk, Vic. 3556.
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Brisbane Head Office and Lab
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Phone: (07) 352 5577. Telex:
Fax: (07) 352 5108.

Perth Office and Laboratory
16 Bassendean Road, Bayswa
Phone: (09) 272 2300. Fax: (0

Townsville Laboratory
21 Bombala Street, Garbutt, Q.
Phone: (077) 79 9155. Fax: (077

Client: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO. 9
GORDON
NSW 2072

Batch Number: E042

Contact: MR. F. FUNNELL

No. of Samples: 19
Date Received: 06/05/
Date Completed: 18/05/

Order No. DPO 46280 o-S7-

Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC582	Pb ppm IC582	Zn ppm IC582	Ag ppm IC582	As ppm IC5
1655029		15	20	10	1	
1655030		10	15	10	<1	
1655031		10	15	10	<1	
1655032		10	35	25	1	
1655033		10	15	15	1	
1655034		10	15	15	<1	
1655035		10	15	10	<1	
1655036		5	20	10	<1	
1655037		10	15	10	<1	
1655038		5	15	15	<1	
1655039		45	15	15	<1	1
1655040		65	15	15	<1	
1655041		175	20	5	<1	
1655042		35	20	10	<1	
1655043		140	15	5	<1	
1655044		65	15	10	<1	
1655045		20	15	10	<1	
1655046		10	15	10	<1	
1655047		5	20	10	<1	
Detection Limit:		5	5	5	1	1

Comments:

Signatory:

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32 Shand Street, Stafford, Q. 4053
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Bendigo Laboratory
127A Victoria Street, Eaglehawk, Vic. 3556
Phone: (054) 46 1390. Fax (054) 46 1389.

Client: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO. 9
GORDON
NSW 2072

Batch Number: E042

Contact: MR. F. FUNNELL

No. of Samples: 19

Date Received: 06/05/8

Order No. DPO 46280 *Sample Type:* CORE

Date Completed: 18/05/8

SAMPLE NUMBER	Element Unit Method	Fe % IC582	Mo ppm IC582	Mn ppm IC582	Au ppm FM209	Au(F ppm CHE
1655029		2.91	5	<5	<0.01	
1655030		2.56	5	5	<0.01	
1655031		1.53	5	<5	<0.01	
1655032		2.81	5	<5	<0.01	
1655033		3.01	<5	40	<0.01	
1655034		2.85	5	220	<0.01	
1655035		2.34	5	25	<0.01	
1655036		0.67	<5	95	<0.01	
1655037		0.60	<5	95	<0.01	
1655038		1.94	5	75	<0.01	
1655039		2.74	5	160	<0.01	
1655040		0.89	5	95	<0.01	
1655041		1.20	5	75	<0.01	
1655042		1.03	5	135	<0.01	
1655043		1.40	5	115	<0.01	<0.0
1655044		1.69	5	60	<0.01	
1655045		2.00	5	600	<0.01	
1655046		2.42	5	230	<0.01	
1655047		2.40	5	65	<0.01	<0.0
Detection Limit:		0.01	5	5	0.01	

Comments:

Signatory: G. Dunn

FC

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Phone: (054) 46 1390. Fax (054) 46 1389.

nt: CRA EXPLORATION PTY. LTD.

ress: PRIVATE BAG NO.9
GORDON
NSW 2072

Page 1 of 1

Batch Number: E042-1

Contact: MR. F. FUNNELL

er No. DPU 46280

Sample Type: CORE

No. of Samples: 19
Date Received: 24/05/88
Date Completed: 27/05/88

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586
1655029		<5
1655030		<5
1655031		<5
1655032		<5
1655033		<5
1655034		<5
1655035		<5
1655036		<5
1655037		<5
1655038		<5
1655039		<5
1655040		<5
1655041		<5
1655042		<5
1655043		<5
1655044		<5
1655045		<5
1655046		<5
1655047		<5
tection Limit:		5

mments:

LESS NOTIFIED PULPS WILL BE DUMPED ON 30/11/88 AND SPLITS (IF ANY) ON 24/08/88

Registered Laboratory No. 825

Signatory: J. Quinn

FORM ALS O

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Australian Laboratory Services PTY. LTD.

CONSULTING ANALYTICAL CHEMISTS

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LABORATORY REPORT

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Townsville Laboratory
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Phone: (077) 79 9155. Fax: (077) 799 729

Client: CRA EXPLORATION PTY. LTD.

ress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E043

tact: MR. F. FUNNELL

No. of Samples: 48
Date Received: 06/05/88
Date Completed: 30/05/88

Order No. DPO 46283 57-201m Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC588	Pb ppm IC588	Zn ppm IC588	Ag ppm IC588	As ppm IC588
1655048		5	3	1	<0.1	2.0
1655049		20	3	2	0.3	2.8
1655050		60	5	1	0.3	16
1655051		55	13	4	0.3	20
1655052		48	12	2	0.2	7.4
1655053		19	2	<1	0.2	4.0
1655054		5	2	<1	0.1	0.5
1655055		2	3	<1	<0.1	2.6
1655056		7	4	1	0.2	0.5
1655057		16	2	<1	<0.1	0.5
1655058		2	2	1	<0.1	0.4
1655059		50	2	1	<0.1	2.1
1655060		28	5	2	0.2	7.4
1655061		18	2	1	<0.1	6.9
1655062		65	1	1	0.2	3.9
1655063		36	3	1	0.3	7.9
1655064		4	3	1	<0.1	1.3
1655065		34	3	8	<0.1	4.7
1655066		75	6	18	0.2	8.7
1655067		30	11	11	0.2	2.9
1655068		65	9	5	0.2	5.9
1655069		38	5	<1	0.1	2.7
1655070		6	1	<1	<0.1	0.3
1655071		3	1	<1	<0.1	<0.2
1655072		<1	1	<1	<0.1	0.4
1655073		2	2	<1	<0.1	0.6
1655074		14	1	<1	<0.1	<0.2
1655075		3	1	<1	<0.1	0.4
1655076		3	2	<1	<0.1	2.5
1655077		5	1	<1	<0.1	1.1
Detection Limit:		1	1	1	0.1	0.2

Comments:

Signatory:

FORM

033

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726084

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Bendigo Laboratory
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Phone: (054) 46 1390. Fax (054) 46 1389.

nt: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E043

ontact: MR. F. FUNNELL

No. of Samples: 48
Date Received: 06/05/88
Date Completed: 30/05/88

er No. DPD 46283 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Sb ppm IC588	Hg ppm IC588	Mo ppm IC588	Bi ppm IC588
1655048		0.7	<0.5	4.9	0.2
1655049		0.9	<0.5	6.1	<0.2
1655050		1.0	<0.5	4.8	<0.2
1655051		1.2	<0.5	5.5	<0.2
1655052		0.6	<0.5	4.7	<0.2
1655053		0.3	<0.5	6.1	<0.2
1655054		0.3	<0.5	5.9	<0.2
1655055		0.3	<0.5	5.2	<0.2
1655056		0.9	<0.5	5.5	<0.2
1655057		0.4	<0.5	6.1	<0.2
1655058		0.8	<0.5	4.9	<0.2
1655059		0.3	<0.5	2.3	<0.2
1655060		0.6	<0.5	2.4	<0.2
1655061		0.3	<0.5	2.8	<0.2
1655062		0.3	<0.5	4.2	<0.2
1655063		0.5	<0.5	2.8	<0.2
1655064		0.2	<0.5	3.8	<0.2
1655065		0.5	<0.5	2.0	<0.2
1655066		1.0	<0.5	0.9	0.4
1655067		0.8	<0.5	1.5	<0.2
1655068		0.9	<0.5	1.8	<0.2
1655069		0.3	<0.5	7.4	<0.2
1655070		0.4	<0.5	4.2	<0.2
1655071		0.2	<0.5	4.1	<0.2
1655072		0.3	<0.5	4.2	<0.2
1655073		0.4	<0.5	3.3	<0.2
1655074		0.2	<0.5	3.6	<0.2
1655075		<0.2	<0.5	3.6	<0.2
1655076		0.6	<0.5	2.9	<0.2
1655077		0.4	<0.5	3.4	<0.2
Detection Limit:		0.2	0.5	0.2	0.2

mments:

Signatory:

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Fax: (07) 352 5109.

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Bendigo Laboratory
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Perth Office and Laboratory
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Townsville Laboratory
21 Bombala Street, Garbutt, Q. 4814
Phone: (077) 79 9155. Fax: (077) 799 729

LABORATORY REPORT

nt: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E043

Contact: MR. F. FUNNELL

ler No. OPO 46283 Sample Type: CORE

No. of Samples: 48
Date Received: 06/05/88
Date Completed: 30/05/88

SAMPLE NUMBER	Element Unit Method	Cu ppm IC588	Pb ppm IC588	Zn ppm IC588	Ag ppm IC589	As ppm IC588
1655078		17	1	<1	<0.1	1.8
1655079		17	1	<1	<0.1	1.2
1655080		6	1	<1	<0.1	1.2
1655081		7	3	<1	<0.1	0.4
1655082		4	1	<1	<0.1	<0.2
1655083		1	2	2	<0.1	<0.2
1655084		2	<1	<1	<0.1	<0.2
1655085		3	<1	<1	<0.1	<0.2
1655086		18	<1	<1	<0.1	<0.2
1655087		5	<1	<1	<0.1	<0.2
1655088		3	<1	<1	<0.1	<0.2
1655089		3	<1	<1	<0.1	<0.2
1655090		6	<1	<1	<0.1	<0.2
1655091		1	4	<1	<0.1	<0.2
1655092		1	<1	<1	0.2	0.3
1655093		1	<1	1	0.1	1.5
1655094		<1	2	<1	<0.1	1.2
1655095		<1	<1	1	<0.1	1.4
tection Limit:		1	1	1	0.1	0.2

mments:

Signatory:

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Phone: (054) 46 1390. Fax (054) 46 1389.

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Phone: (09) 272 2300. Fax: (09) 272 5787

Townsville Laboratory
21 Bombala Street, Garbutt, Q. 4814
Phone: (077) 79 9155. Fax: (077) 799 729.

Client: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E043

Contact: MR. F. FUNNELL

No. of Samples: 48
Date Received: 06/05/88
Date Completed: 30/05/88

Order No. DPD 46283 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Sb ppm IC588	Hg ppm IC588	Mo ppm IC588	Bi ppm IC588	
1655078		<0.2	<0.5	3.0	<0.2	
1655079		0.5	<0.5	3.9	<0.2	
1655080		0.5	<0.5	4.6	<0.2	
1655081		0.3	<0.5	6.8	<0.2	
1655082		<0.2	<0.5	6.0	<0.2	
1655083		0.3	<0.5	6.2	<0.2	
1655084		<0.2	<0.5	5.6	<0.2	
1655085		<0.2	<0.5	6.3	<0.2	
1655086		<0.2	<0.5	6.0	<0.2	
1655087		<0.2	<0.5	5.7	<0.2	
1655088		<0.2	<0.5	5.5	<0.2	
1655089		<0.2	<0.5	6.2	<0.2	
1655090		<0.2	<0.5	7.0	<0.2	
1655091		<0.2	<0.5	5.9	<0.2	
1655092		<0.2	2.0	6.6	<0.2	
1655093		<0.2	2.5	5.7	<0.2	
1655094		<0.2	2.5	6.0	<0.2	
1655095		<0.2	2.5	5.7	<0.2	
Detection Limit:		0.2	0.5	0.2	0.2	

Comments:

Signatory:

026
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Townsville Laboratory
21 Bombala Street, Garbutt, Q. 4814
Phone: (077) 79 9155. Fax: (077) 799 729.

nt: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E043-1

Contact: MR. F. FUNNELL

No. of Samples: 48
Date Received: 06/05/88
Date Completed: 30/05/88

er No. DPO 46283 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Au ppm PM209	Au(R) ppm CHECKS			
1655048		<0.01	<0.01			
1655049		<0.01				
1655050		<0.01				
1655051		<0.01				
1655052		<0.01				
1655053		<0.01				
1655054		<0.01				
1655055		<0.01				
1655056		<0.01				
1655057		<0.01				
1655058		<0.01	<0.01			
1655059		<0.01				
1655060		<0.01				
1655061		<0.01				
1655062		<0.01				
1655063		<0.01				
1655064		<0.01				
1655065		<0.01				
1655066		<0.01				
1655067		<0.01				
1655068		<0.01				
1655069		<0.01				
1655070		<0.01				
1655071		<0.01				
1655072		<0.01				
1655073		<0.01				
1655074		<0.01				
1655075		<0.01				
1655076		<0.01				
1655077		<0.01				
ection Limit:		0.01				

nments:

Signatory:

027

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Phone: (054) 46 1390. Fax (054) 46 1389.

nt: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E043-1

Contact: MR. F. FUNNELL

No. of Samples: 48
Date Received: 06/05/88
Date Completed: 30/05/88

er No. DPO 46283 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Au ppm PM209	Au(R) ppm CHECKS			
1655078		<0.01				
1655079		<0.01				
1655080		<0.01	<0.01			
1655081		<0.01				
1655082		<0.01				
1655083		<0.01				
1655084		<0.01				
1655085		<0.01				
1655086		<0.01				
1655087		<0.01				
1655088		<0.01				
1655089		<0.01				
1655090		<0.01	<0.01			
1655091		<0.01				
1655092		<0.01	<0.01			
1655093		<0.01				
1655094		<0.01				
1655095		<0.01				
Detection Limit:		0.01				

nments:

Signatory:

038

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Townsville Laboratory
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Phone: (077) 79 9155. Fax: (077) 799 729.

Charters Towers Laboratory
18 Drew Street, Charters Towers, Q. 482
Phone: (077) 87 4155. Fax: (077) 87 4220

Bendigo Laboratory
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Phone: (054) 46 1390. Fax: (054) 46 138

Orange Laboratory
10 Leewood Drive, Orange, N.S.W. 2800
Phone: (063) 631 722. Fax: (063) 631 185

ient: CRA EXPLORATION PTY. LTD.

Page 1 of 6

ddress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 03/06/88
Date Completed: 25/06/88

der No. DPO 46285 201-399 Sample Type: DRILL CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	As ppm IC586
1655096		<5	10	5	<1	9
1655097		<5	<5	<5	<1	4
1655098		<5	5	<5	<1	3
1655099		<5	<5	<5	<1	8
1655100		<5	<5	<5	<1	2
1653406		<5	<5	<5	<1	6
1653407		<5	<5	<5	<1	2
1653408		<5	<5	<5	<1	1
1653409		<5	<5	<5	<1	2
1653410		<5	<5	<5	<1	3
1653411		<5	<5	5	<1	8
1653412		<5	<5	<5	<1	6
1653413		5	<5	<5	<1	2
1653414		<5	<5	<5	<1	<1
1653415		<5	<5	<5	<1	<1
1653416		<5	<5	<5	<1	2
1653417		5	<5	<5	<1	2
1653418		<5	<5	<5	<1	<1
1653419		<5	<5	<5	1	5
1653420		45	<5	<5	<1	10
1653421		10	<5	<5	<1	6
1653422		<5	<5	<5	<1	4
1653423		<5	<5	<5	<1	5
1653424		<5	<5	<5	<1	5
1653425		<5	<5	<5	<1	6
1653426		<5	<5	<5	<1	11
1653427		<5	<5	<5	<1	14
1653428		<5	<5	<5	<1	17
1653429		<5	<5	<5	<1	13
1653430		<5	<5	<5	<1	17
tection Limit:		5	5	5	1	1

mments:

Signatory:

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Orange Laboratory
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Phone: (063) 631 722. Fax: (063) 631 189.

LABORATORY REPORT

nt: CRA EXPLORATION PTY. LTD.
Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 03/06/88
Date Completed: 25/06/88

er No. DPO 46285 Sample Type: DRILL CORE

SAMPLE NUMBER	Element / Unit / Method	Fe % IC586	Ba ppm IC586	Bi ppm IC586	Mn ppm IC586	Mo ppm IC586
1655096		2.12	460	<5	70	<5
1655097		0.84	40	<5	80	<5
1655098		0.82	100	<5	30	<5
1655099		0.65	80	<5	60	<5
1655100		0.50	80	<5	20	<5
1653406		1.19	230	<5	70	<5
1653407		0.62	120	<5	40	<5
1653408		0.99	50	<5	40	<5
1653409		0.88	130	<5	100	<5
1653410		1.05	170	<5	30	<5
1653411		2.02	340	<5	70	<5
1653412		1.03	170	<5	50	<5
1653413		1.06	90	<5	20	<5
1653414		1.07	30	<5	20	<5
1653415		1.08	30	<5	50	<5
1653416		1.19	160	<5	20	<5
1653417		1.65	150	<5	30	<5
1653418		1.28	50	<5	40	<5
1653419		1.86	290	<5	110	<5
1653420		1.96	680	<5	80	<5
1653421		1.20	260	<5	60	<5
1653422		1.12	190	<5	60	<5
1653423		1.26	270	<5	50	<5
1653424		1.43	230	<5	40	<5
1653425		1.57	280	<5	50	<5
1653426		1.73	370	<5	80	<5
1653427		1.70	540	<5	50	<5
1653428		1.51	460	<5	50	<5
1653429		1.41	400	<5	30	<5
1653430		1.73	380	<5	40	<5
ection Limit:		0.01	10	5	10	5

nments:

Signatory: G. Quinn

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ent: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 03/06/88
Date Completed: 25/06/88

fer No. DPO 46285 Sample Type: DRILL CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	As ppm IC586
1653431		<5	<5	5	<1	11
1653432		<5	<5	<5	<1	12
1653433		<5	<5	<5	<1	9
1653434		<5	<5	<5	<1	1
1653435		<5	<5	<5	<1	5
BREAK IN SEQUENCE 1653436		<5	<5	<5	<1	4
1655643		<5	<5	<5	<1	5
1655644		<5	<5	<5	<1	6
1655645		<5	<5	<5	<1	7
1655646		<5	<5	<5	<1	9
1655647		<5	<5	<5	<1	6
1655648		<5	<5	<5	<1	8
1655649		<5	<5	<5	<1	5
1655650		<5	<5	<5	<1	9
1655651		<5	<5	10	<1	10
1655652		<5	<5	<5	<1	14
1655653		<5	<5	<5	<1	10
1655654		<5	<5	<5	<1	4
1655655		<5	<5	<5	<1	8
1655656		<5	<5	<5	<1	12
1655657		<5	<5	<5	<1	15
1655658		<5	<5	<5	<1	14
1655659		5	<5	<5	<1	11
1655660		<5	<5	<5	<1	11
1655661		<5	<5	<5	<1	6
1655662		<5	<5	<5	<1	12
1655663		<5	<5	<5	<1	10
1655664		<5	<5	<5	<1	2
1655665		10	<5	25	<1	18
1655666		<5	10	<5	<1	15
tection Limit:		5	5	5	1	1

mments:

Signatory: G. Lamm

691

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CONSULTING ANALYTICAL CHEMISTS

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LABORATORY REPORT

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Phone: (063) 631 722. Fax: (063) 631 189

int: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 03/06/88
Date Completed: 25/06/88

er No. DPO 46285 Sample Type: DRILL CORE

SAMPLE NUMBER	Element / Unit / Method	Fe % IC586	Ba ppm IC586	Bi ppm IC586	Mn ppm IC586	Mo ppm IC586
1653431		1.39	390	<5	40	<5
1653432		1.39	440	<5	40	<5
1653433		1.39	290	<5	50	<5
1653434		1.14	30	<5	40	<5
1653435		0.86	190	<5	40	<5
1653436		0.85	170	<5	50	<5
1655643		0.88	200	<5	20	<5
1655644		0.96	170	<5	50	<5
1655645		1.02	230	<5	50	<5
1655646		1.03	260	<5	30	<5
1655647		0.89	250	<5	40	<5
1655648		1.13	270	<5	60	<5
1655649		1.33	30	<5	50	<5
1655650		1.29	330	<5	30	<5
1655651		1.27	290	<5	60	<5
1655652		1.86	390	<5	50	<5
1655653		1.36	200	<5	40	<5
1655654		1.72	<10	<5	60	<5
1655655		1.44	300	<5	20	<5
1655656		1.48	350	<5	60	<5
1655657		1.61	460	<5	80	<5
1655658		2.08	370	<5	100	<5
1655659		1.45	360	<5	80	<5
1655660		1.77	340	<5	40	<5
1655661		1.38	290	<5	250	<5
1655662		1.70	440	<5	60	<5
1655663		1.50	390	<5	40	<5
1655664		0.86	100	<5	30	<5
1655665		1.58	550	<5	70	<5
1655666		1.86	480	<5	70	<5
ction Limit		0.01	10	5	10	5

iments:

Signatory: G. Quinn

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LABORATORY REPORT

ent: CRA EXPLORATION PTY. LTD.

Page 5 of 6

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 03/06/88
Date Completed: 25/06/88

der No. DPO 46285 Sample Type: DRILL CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	As ppm IC586
1655667		<5	<5	<5	1	15
1655668		<5	<5	10	<1	18
1655669		<5	<5	5	<1	13
1655670		<5	<5	<5	<1	13
1655671		5	<5	10	<1	18
1655672		<5	<5	<5	<1	18
tection Limit:		5	5	5	1	1

mments:

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nt: CRA EXPLORATION PTY. LTD.

ddress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033

Contact: MR. F. FUNNELL

No. of Samples: 66

er No. DPO 46285 Sample Type: DRILL CORE

Date Received: 03/06/88

Date Completed: 25/06/88

SAMPLE NUMBER	Element / Unit / Method	Fe % IC586	Ba ppm IC586	Bi ppm IC586	Mn ppm IC586	Mo ppm IC586
1655667		1.77	520	<5	60	<5
1655668		1.58	410	<5	70	<5
1655669		1.55	370	<5	50	<5
1655670		1.58	380	<5	60	<5
1655671		1.92	130	<5	70	<5
1655672		1.94	540	<5	70	<5
ection Limit:		0.01	10	5	10	5

nments:

Signatory: G. Dunn

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ent: CRA EXPLORATION PTY. LTD.

dress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033-1

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 03/06/88
Date Completed: 25/06/88

ler No. DPO 46285 Sample Type: DRILL CORE

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586	F ppm G006	Au ppm PM209	Au(R) ppm CHECKS	
1655096		<5	440	<0.01		
1655097		<5	240	<0.01		
1655098		<5	240	<0.01		
1655099		<5	240	<0.01		
1655100		<5	280	<0.01		
1653406		<5	380	<0.01		
1653407		<5	160	<0.01		
1653408		<5	180	<0.01		
1653409		<5	160	<0.01		
1653410		<5	100	<0.01		
1653411		<5	300	<0.01	<0.01	
1653412		<5	160	<0.01		
1653413		<5	<20	<0.01		
1653414		<5	160	<0.01	<0.01	
1653415		<5	160	<0.01		
1653416		<5	180	<0.01		
1653417		<5	180	<0.01		
1653418		<5	240	<0.01		
1653419		<5	300	<0.01		
1653420		<5	420	<0.01		
1653421		<5	220	<0.01		
1653422		<5	180	<0.01		
1653423		<5	180	<0.01		
1653424		<5	160	<0.01		
1653425		<5	180	<0.01		
1653426		<5	120	<0.01		
1653427		<5	100	<0.01		
1653428		<5	40	<0.01		
1653429		<5	40	<0.01		
1653430		<5	<20	<0.01		
ıction Limit:		1	20	0.01		

ıments:

Signatory: G. Quinn

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int: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033-1

Contact: MR. F. FUNNELL

No. of Samples: 66

Date Received: 03/06/88

er No. DPO 46285 Sample Type: DRILL CORE

Date Completed: 25/06/88

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586	F ppm G006	Au ppm PM209	Au(R) ppm CHECKS	
1653431		<5	40	<0.01		
1653432		<5	40	<0.01		
1653433		<5	60	<0.01		
1653434		<5	60	<0.01		
1653435		<5	60	<0.01		
1653436		<5	20	<0.01		
1655643		<5	40	<0.01		
1655644		<5	20	<0.01		
1655645		<5	40	<0.01		
1655646		<5	40	<0.01		
1655647		<5	40	<0.01	<0.01	
1655648		<5	60	<0.01	<0.01	
1655649		<5	160	<0.01		
1655650		<5	60	<0.01		
1655651		<5	<20	<0.01		
1655652		<5	40	<0.01		
1655653		<5	<20	<0.01		
1655654		<5	<20	<0.01		
1655655		<5	20	<0.01		
1655656		<5	40	<0.01		
1655657		<5	<20	<0.01		
1655658		<5	<20	<0.01		
1655659		<5	20	<0.01		
1655660		<5	<20	<0.01		
1655661		<5	40	<0.01		
1655662		<5	<20	<0.01		
1655663		<5	20	<0.01		
1655664		<5	180	<0.01		
1655665		<5	20	<0.01	<0.01	
1655666		<5	20	<0.01	<0.01	
ection Limit:		1	20	0.01		

nments:

Signatory:

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LABORATORY REPORT

Client: CRA EXPLORATION PTY. LTD.

Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: F033-

Contact: MR. F. FUNNELL

No. of Samples: 66

Date Received: 03/06/8

Order No. DPO 46285

Sample Type: DRILL CORE

Date Completed: 25/06/8

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586	F ppm G006	Au ppm PM209	Au(R) ppm CHECKS	
1655667		80	80	<0.01		
1655668		<5	40	<0.01		
1655669		<5	40	<0.01		
1655670		<5	40	<0.01		
1655671		<5	60	<0.01		
1655672		<5	160	<0.01		
Detection Limit:		1	20	0.01		

Comments:

Signatory: G. Quinn

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int: CRA EXPLORATION PTY. LTD.

dress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A

Contact: MR. F. FUNNELL – MS1

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

ler No. DPO 46284 402-600m Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	As ppm IC586
1653437		10	30	15	<1	38
1653438		<5	20	10	<1	38
1653439		<5	20	10	<1	30
1653440		<5	20	10	<1	24
1653441		5	5	15	<1	20
1653442		<5	20	10	<1	30
1653443		<5	15	10	<1	24
1653444		<5	15	15	<1	26
1653445		<5	35	5	<1	17
1653446		15	25	20	<1	46
1653447		5	40	40	<1	46
1653448		5	60	95	<1	44
1653449		5	50	65	<1	38
1653450		5	50	65	<1	38
1653451		5	45	65	<1	42
1653452		15	60	80	<1	50
1653453		10	45	65	<1	44
1653454		10	40	85	<1	46
1653455		10	35	85	<1	44
1653456		15	50	95	<1	38
1653457		15	50	115	<1	50
1653458		10	40	110	1	12
1653459		10	40	90	1	38
1653460		15	55	105	1	46
1653461		10	60	130	<1	55
1653462		10	55	105	<1	44
1653463		10	60	120	<1	46
1653464		10	50	100	<1	50
1653465		35	65	130	<1	48
1653466		5	50	125	<1	50
tection Limit:		5	5	5	1	1

mments:

ILESS NOTIFIED PULPS WILL BE DUMPED ON 02/02/89 AND SPLITS (IF ANY) ON 02/11/88

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nt: CRA EXPLORATION PTY. LTD.

ress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

er No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Fe % IC586	Ba ppm IC586	Bi ppm IC586	Mn ppm IC586	Mo ppm IC586
1653437		1.58	190	<5	50	<5
1653438		2.05	480	5	60	<5
1653439		1.39	350	<5	60	<5
1653440		1.39	150	<5	30	<5
1653441		1.10	300	<5	25	<5
1653442		1.63	310	<5	40	<5
1653443		1.51	290	<5	40	<5
1653444		1.86	420	<5	30	<5
1653445		1.79	640	<5	40	<5
1653446		3.23	790	<5	140	<5
1653447		3.18	830	<5	200	<5
1653448		2.94	940	<5	760	<5
1653449		2.57	920	<5	590	<5
1653450		2.64	1000	<5	700	<5
1653451		2.58	830	<5	550	<5
1653452		3.04	820	<5	730	5
1653453		2.57	980	<5	970	<5
1653454		2.53	450	<5	1300	<5
1653455		2.49	980	<5	1300	<5
1653456		2.55	930	<5	970	<5
1653457		2.85	980	<5	1200	<5
1653458		2.92	940	<5	1100	<5
1653459		2.36	920	<5	710	<5
1653460		2.61	890	<5	920	<5
1653461		3.05	1200	<5	990	<5
1653462		2.58	340	<5	1150	<5
1653463		2.80	930	<5	1050	<5
1653464		2.66	1050	<5	760	<5
1653465		3.18	1050	<5	830	<5
1653466		3.09	920	<5	710	<5
tection Limit:		0.01	10	5	10	5

mments:

Signatory: G. Lum

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LABORATORY REPORT

nt: CRA EXPLORATION PTY. LTD.
ress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A

Contact: MR. F. FUNNELL

er No. DPO 46284 Sample Type: CORE

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

SAMPLE NUMBER	Element Unit Method	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	As ppm IC586
1653467		10	55	105	<1	44
1653468		10	65	105	<1	48
1653469		20	50	100	<1	55
1653470		10	45	95	<1	55
1653471		15	50	90	<1	55
1653472		10	50	75	<1	42
1653473		15	55	105	<1	16
1653474		10	45	105	<1	46
1653475		15	50	95	<1	46
1653476		15	50	115	<1	60
1653477		10	75	85	<1	50
1653478		15	65	100	<1	55
1653479		10	60	90	<1	50
1653480		25	60	105	<1	55
1653481		60	35	95	2	46
1653482		25	50	75	1	55
1653483		10	50	120	<1	60
1653484		20	35	100	<1	50
1653485		15	50	105	<1	44
1653486		20	45	105	<1	65
1653487		25	50	100	<1	65
1653488		20	55	105	<1	50
1653489		10	45	90	<1	46
1653490		20	60	105	<1	46
1653491		35	45	145	<1	48
1653492		20	40	115	<1	55
1653493		10	40	110	<1	44
1653494		20	70	120	<1	50
1653495		20	40	95	<1	60
1653496		15	55	95	<1	55
ection Limit		5	5	5	1	1

nments:

Registered Laboratory No. 825

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Signatory: G. Dunn

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Address: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

Order No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element / Unit / Method	Fe % IC586	Ba ppm IC586	Bi ppm IC586	Mn ppm IC586	Mo ppm IC586
1653467		2.58	1050	<5	680	<5
1653468		2.73	1050	<5	690	<5
1653469		3.29	360	5	1450	<5
1653470		2.60	850	<5	1300	<5
1653471		2.91	1050	<5	1150	<5
1653472		2.16	970	<5	790	<5
1653473		2.67	990	<5	930	5
1653474		3.26	860	<5	1050	<5
1653475		2.85	950	<5	1150	<5
1653476		3.28	1000	<5	1100	5
1653477		2.83	830	<5	590	<5
1653478		2.71	820	<5	730	<5
1653479		2.60	870	<5	630	5
1653480		3.33	1200	<5	900	<5
1653481		2.78	960	<5	800	<5
1653482		3.39	1250	<5	1400	<5
1653483		3.06	1350	<5	1200	<5
1653484		3.53	1050	<5	1150	<5
1653485		2.81	1000	<5	1050	<5
1653486		3.38	1000	<5	1150	<5
1653487		4.29	1250	<5	1150	<5
1653488		3.08	1050	<5	640	<5
1653489		3.46	1650	<5	700	<5
1653490		3.19	1450	<5	950	<5
1653491		3.53	370	<5	1150	<5
1653492		3.45	1000	<5	1050	<5
1653493		3.05	900	<5	860	<5
1653494		3.54	950	<5	1050	<5
1653495		3.33	1050	<5	1100	<5
1653496		3.87	1150	<5	1150	<5
Detection Limit:		0.01	10	5	10	5

Comments:

Signatory:

101

726102

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CONSULTING ANALYTICAL CHEMISTS

INCORPORATED IN QUEENSLAND

LABORATORY REPORT

Brisbane Head Office and Laboratory
32 Shand Street, Stafford, Q. 4053.
P.O. Box 66, Everton Park, Q. 4053.
Phone: (07) 352 5577.
Fax: (07) 352 5109.

Perth Office and Laboratory
Lot 197 Victoria Road, Malaga, W.A. 6062.
Phone: (09) 249 2988. Fax: (09) 249 2942.

Townsville Laboratory
21 Bombala Street, Garbutt, Q. 4814.
Phone: (077) 79 9155. Fax: (077) 799 729.

Charters Towers Laboratory
18 Draw Street, Charters Towers, Q. 4820.
Phone: (077) 87 4155. Fax (077) 87 4220.

Bendigo Laboratory
127A Victoria Street, Eaglehawk, Vic. 3556.
Phone: (054) 46 1390. Fax. (054) 46 1389.

Orange Laboratory
10 Leewood Drive, Orange, N.S.W. 2800.
Phone: (063) 631 722. Fax: (063) 631 189.

nt: CRA EXPLORATION PTY. LTD.

ress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

er No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	As ppm IC586
1653497		10	40	75	<1	40
1653498		10	40	90	<1	50
1653499		20	60	95	<1	42
1655360		15	45	80	<1	46
1655361		15	60	440	<1	46
1655362		25	55	70	<1	42
tection Limit:		5	5	5	1	1

mments:

Signatory: G. Dunn

102

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Charters Towers Laboratory 18 Drew Street, Charters Towers, Q. 4820. Phone: (077) 87 4155. Fax: (077) 87 4220.
Bendigo Laboratory 127A Victoria Street, Eaglehawk, Vic. 3556. Phone: (054) 46 1390. Fax: (054) 46 1389.
Orange Laboratory 10 Leewood Drive, Orange, N.S.W. 2800. Phone: (063) 631 722. Fax: (063) 631 189.

ent: CRA EXPLORATION PTY. LTD.
dress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

ter No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Fe % IC586	Ba ppm IC586	Bi ppm IC586	Mn ppm IC586	Mo ppm IC586
1653497		2.70	1050	<5	940	<5
1653498		3.23	930	<5	1050	<5
1653499		2.76	1150	<5	910	<5
1655360		2.75	1150	<5	790	<5
1655361		3.47	1400	<5	930	<5
1655362		3.01	950	<5	830	<5
tection Limit:		0.01	10	5	10	5

mments:

Registered ...boratory ...825

Signatory: G. Dunn

103

726104

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CONSULTING ANALYTICAL CHEMISTS

LABORATORY REPORT

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Fax: (07) 352 5109.

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Phone: (054) 46 1390. Fax: (054) 46 1389.

Orange Laboratory
10 Leewood Drive, Orange, N.S.W. 2800.
Phone: (063) 631 722. Fax: (063) 631 189.

Page 1 of 3

int: CRA EXPLORATION PTY. LTD.

dress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A1

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

ler No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586	F ppm G006	Au ppm PM209	Au(R) ppm CHECKS	
1653437		<5	80	<0.01		
1653438		<5	80	<0.01		
1653439		<5	80	<0.01		
1653440		<5	60	<0.01	<0.01	
1653441		<5	160	<0.01		
1653442		<5	140	<0.01		
1653443		<5	100	<0.01		
1653444		<5	80	<0.01		
1653445		<5	100	<0.01		
1653446		<5	460	<0.01		
1653447		<5	220	<0.01		
1653448		<5	400	<0.01		
1653449		<5	400	<0.01		
1653450		<5	220	<0.01		
1653451		<5	320	<0.01		
1653452		<5	420	<0.01		
1653453		<5	380	<0.01		
1653454		<5	280	<0.01		
1653455		<5	200	<0.01		
1653456		<5	140	<0.01		
1653457		<5	160	<0.01		
1653458		<5	240	<0.01	<0.01	
1653459		<5	160	<0.01	<0.01	
1653460		<5	160	<0.01	<0.01	
1653461		<5	140	<0.01		
1653462		<5	220	<0.01		
1653463		<5	200	<0.01		
1653464		<5	200	<0.01		
1653465		<5	360	<0.01		
1653466		<5	240	<0.01		
tection Limit:		5	20	0.01		

mments:

ILESS NOTIFIED PULPS WILL BE DUMPED ON 02/02/89 AND SPLITS (IF ANY) ON 02/11/88

Signatory: G. Quinn

FORM ALS 01

104 726105

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Orange Laboratory
10 Leewood Drive, Orange, N.S.W. 2800
Phone: (063) 631 722 Fax: (063) 631 189

ent: CRA EXPLORATION PTY. LTD.
dress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A1

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

ler No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586	F ppm G006	Au ppm PM209	Au(R) ppm CHECKS	
1653467		<5	180	<0.01		
1653468		<5	280	<0.01		
1653469		<5	100	<0.01		
1653470		<5	160	<0.01		
1653471		<5	200	<0.01		
1653472		<5	280	<0.01		
1653473		<5	280	<0.01		
1653474		<5	460	<0.01		
1653475		<5	200	<0.01		
1653476		<5	120	<0.01	<0.01	
1653477		<5	460	<0.01	<0.01	
1653478		<5	200	<0.01		
1653479		<5	240	<0.01		
1653480		<5	140	<0.01		
1653481		<5	200	<0.01		
1653482		<5	180	<0.01		
1653483		<5	160	<0.01		
1653484		<5	160	<0.01		
1653485		<5	160	<0.01		
1653486		<5	140	<0.01		
1653487		<5	180	<0.01		
1653488		<5	280	<0.01		
1653489		<5	200	<0.01		
1653490		<5	180	<0.01		
1653491		<5	160	<0.01		
1653492		<5	160	<0.01		
1653493		<5	180	<0.01		
1653494		<5	280	<0.01	<0.01	
1653495		<5	200	<0.01	<0.01	
1653496		<5	200	<0.01		
tection Limit:		5	20	0.01		

mments:

Signatory: G. Dunn

105

726106

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Orange Laboratory
10 Leewood Drive, Orange, N.S.W. 2800.
Phone: (063) 631 722. Fax: (063) 631 189.

nt: CRA EXPLORATION PTY. LTD.

ress: PRIVATE BAG NO.9
GORDON
NSW 2072

Batch Number: E057A1

Contact: MR. F. FUNNELL

No. of Samples: 66
Date Received: 02/08/88
Date Completed: 05/08/88

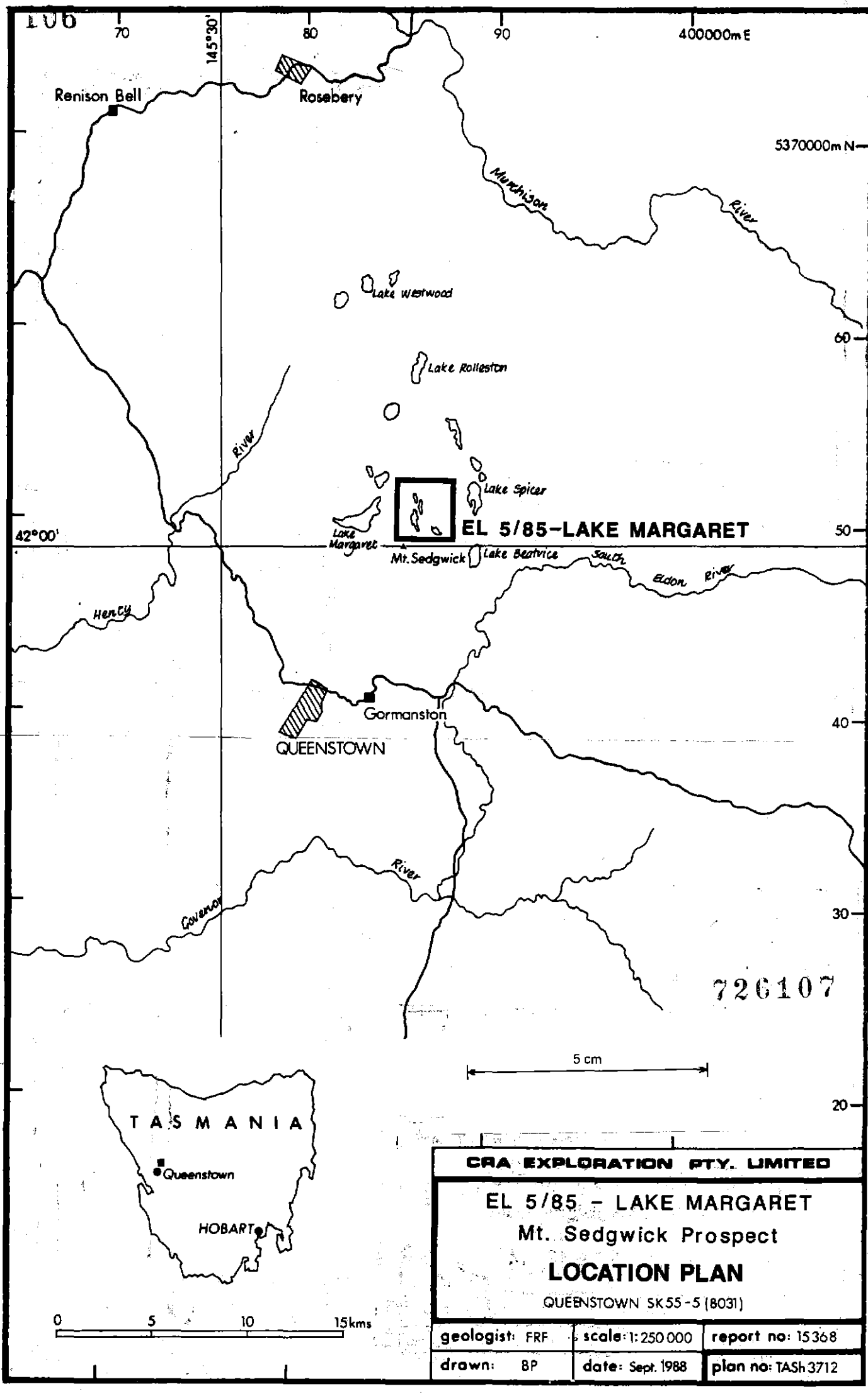
er No. DPO 46284 Sample Type: CORE

SAMPLE NUMBER	Element Unit Method	Sb ppm IC586	F ppm G006	Au ppm PM209	Au(R) ppm CHECKS	
1653497		<5	160	<0.01		
1653498		<5	280	<0.01		
1653499		<5	280	<0.01		
1655360		<5	260	<0.01		
1655361		<5	240	<0.01		
1655362		<5	220	<0.01		
ection Limit:		5	20	0.01		

mments:

Signatory:

Registered Laboratory ... 825


106
70
80
90
400000m E
145°30'
Renison Bell
Rosebery
5370000m N
Murchison River
Lake Westwood
Lake Rolleston
Lake Spicer
EL 5/85-LAKE MARGARET
Lake Margaret
Mt. Sedgwick
Lake Beatrice
South Eldon River
42°00'
Henty River
Gormanston
QUEENSTOWN
Gordon River
60
50
40
30
20
726107
5 cm
TASMANIA
Queenstown
HOBART
0
5
10
15kms
CRA EXPLORATION PTY. LIMITED
EL 5/85 - LAKE MARGARET
Mt. Sedgwick Prospect
LOCATION PLAN
QUEENSTOWN SK55-5 (8031)
geologist: FRF
scale: 1:250 000
report no: 15368
drawn: BP
date: Sept. 1988
plan no: TASh 3712

88 2870

383000m E 84 85 86 87 88 389000m E

5352000m N

51

50

49

5348000m N

Lake Mary

Lake Apollos

84750E

85750E

87750E

88750E

51250N

Lake Paul

50750N

Lake Peter

Lake Polycarp

50250N

Lake Margaret

49750N

DD88 MS1

Lake Barnabas

Lake Adam

MOUNT SEDGWICK

86750E

Lake Beatrice

726108

5 cm

TASMANIA

Queenstown

HOBART

0 1 2km

GN MN

CRA EXPLORATION PTY. LIMITED

EL 5/85 – LAKE MARGARET

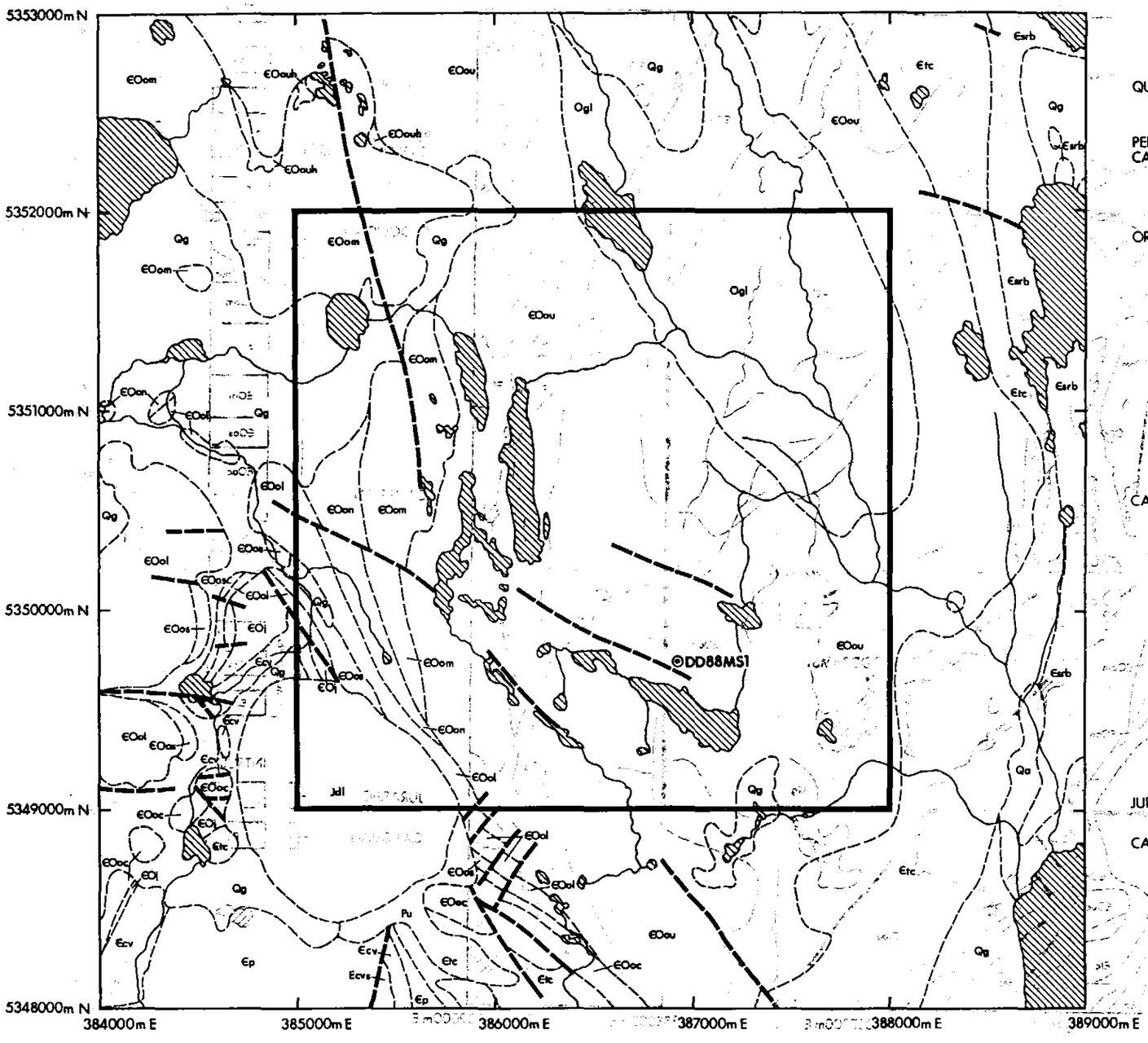
Mt. Sedgwick Prospect

GRID & DRILLHOLE LOCATION PLAN

QUEENSTOWN SK55-5 (8031)

geologist: FRF	scale: 1:25 000	report no: 15368
drawn: BP	date: SEPT. 1988	plan no: TASh 3694

107



Geology taken from "Map 5. Geology of the Tyndall Range Area" by Corbett, K.D. and Jackson, J.C. (1987)

KEY

QUATERNARY

- Qa — *Alluvium and swamp deposits.*
- Qg — *Pleistocene glacial deposits, mainly till.*

PERMIAN–? CARBONIFEROUS

- Pu — *Bouldery mudstone sandstone, siltstone.*

ORDOVICIAN

- Ogl — *Gordon Limestone sequence undifferentiated.*

OWEN CONGLOMERATE = DENISON GROUP

- €Oou / €Oouh — *Upper sequence of generally pink sandstone and granule-pebble conglomerate with minor siltstone. Clasts of pink chert common. Some units of local basal facies of bedded hematite and hematitic sandstone (€Oouh) indicated.*
- €Oom — *Dominantly thick-bedded to massive cobble-pebble to cobble-boulder conglomerate with minor sandstone lenses, pink to pale pink-grey in colour.*
- €Oon — *Interbedded sequence of micaceous sandstone, siltstone and siliciclastic pebble conglomerate, generally grey but pink in some areas. Trace fossils widespread and marine fossils in some localities. Slump structures common.*
- €Ool — *Dominantly thick-bedded to massive pink cobble-pebble to cobble-boulder conglomerate with minor sandstone lenses.*
- €Oos — *Dominantly pink sandstone, pebbly sandstone and pebble conglomerate.*
- €Ooc — *Dominantly thick-bedded to massive cobble-pebble to cobble-boulder conglomerate with minor sandstone lenses. Colour pink to grey. Contains volcanic clasts in some areas.*

CAMBRIAN

- €Oi — *Volcaniclastic conglomerate and sandstone - correlate of Jukes Conglomerate.*

TYNDALL GROUP AND STICHT RANGE BEDS

MOUNT READ VOLCANICS

- €tct / €tc — *Mixed quartz-feldspar-phyric volcaniclastic (epiclastic) rocks and tuff. Some units of volcaniclastic conglomerate (€tc) indicated.*
- €rb — *Siliciclastic grey conglomerate and sandstone with interbedded micaceous siltstone.*

CENTRAL VOLCANIC COMPLEX

- €cv — *Dominantly feldspar-phyric felsic pyroclastic rocks, lavas and minor intrusives.*
- €cvs — *Shale-siltstone-sandstone units, often with vitric ash and epiclastic tuff.*

INTRUSIVE ROCKS

JURASSIC

- Jdl — *Dolerite*

CAMBRIAN

- €p — *Quartz-feldspar porphyry.*

5 cm

Lake

726109

88-2870

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EL 5/85 – LAKE MARGARET
Mt. Sedgwick Prospect

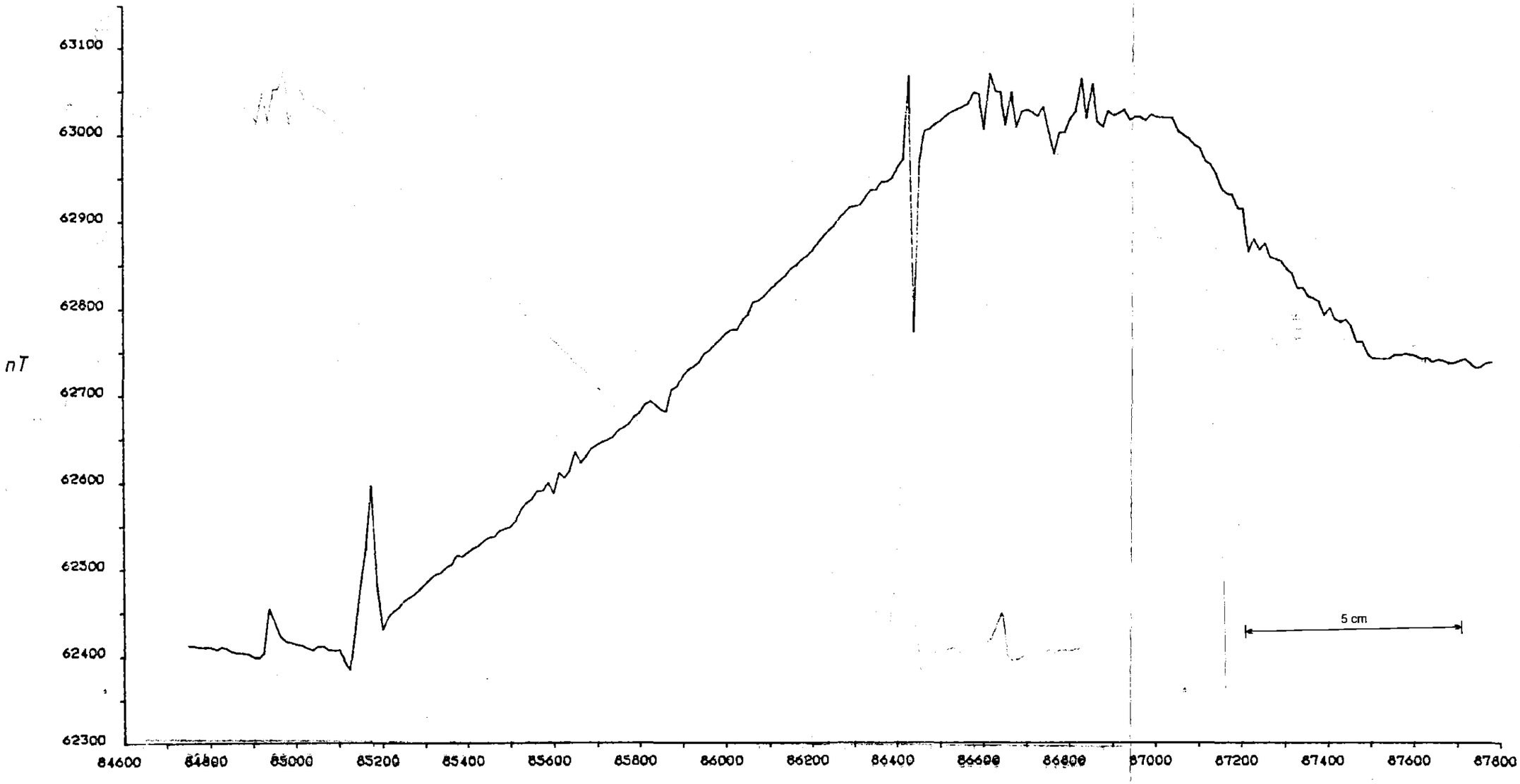
PROSPECT GEOLOGY

QUEENSTOWN SK55-5 (8013)

geologist : FRF	scale : 1:25000	report no: 15368
drawn : BP	date : SEPT. 1988	plan no: TASh 3713

108

88-2870



726110

Reference : BURNIE SK 55 - 3

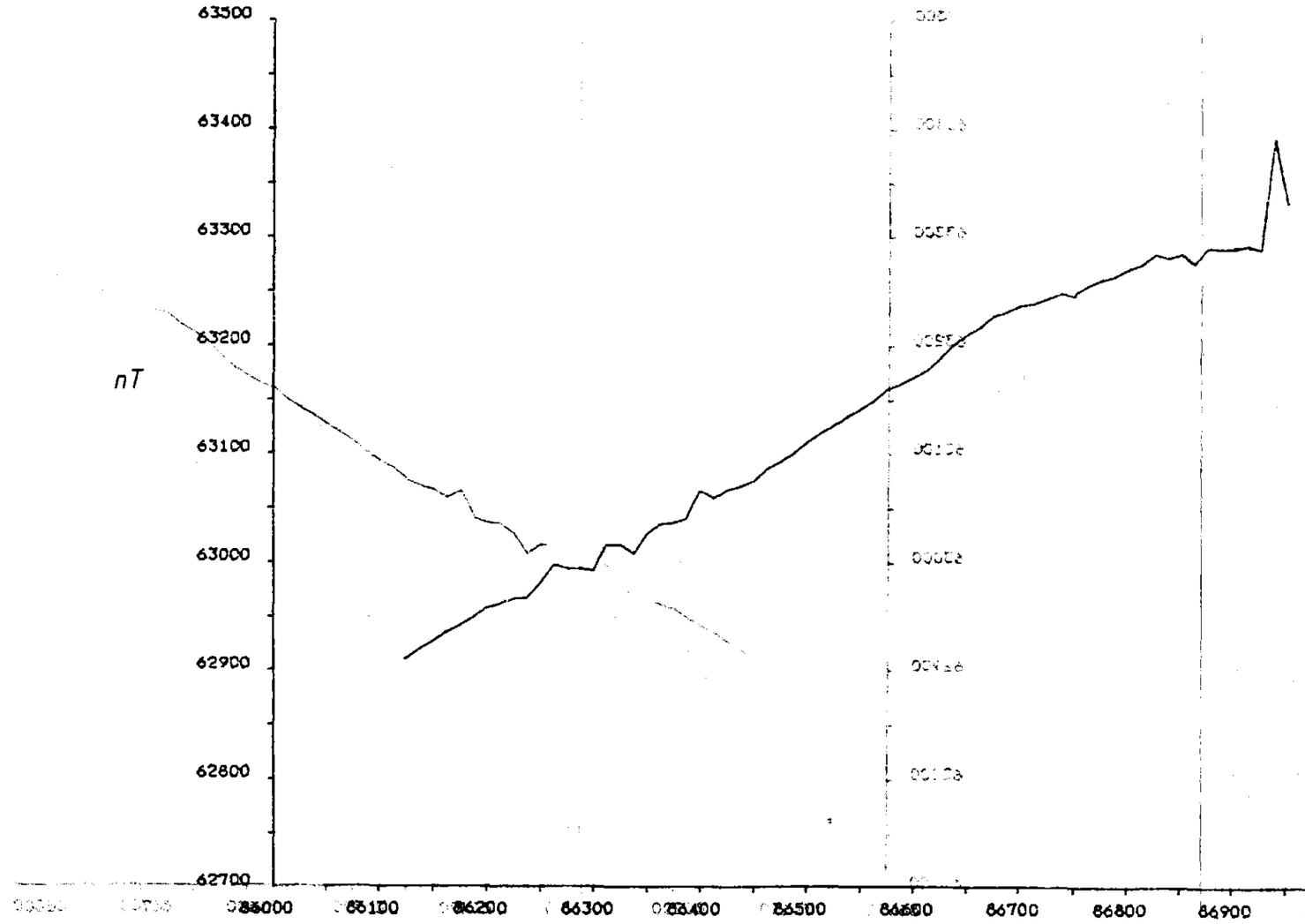
CRA EXPLORATION PTY. LIMITED

EL 5/85 – LAKE MARGARET
Mt. Sedgwick Prospect

GROUND MAGNETICS LINE: 49750N

geologist: TVS	scale: 1:10 000	report no: 15368
drawn: BP	date: SEPT. 1988	plan no: TASh 3655

111



726111

88-2870

CRA EXPLORATION PTY. LIMITED

EL 5/85 - LAKE MARGARET

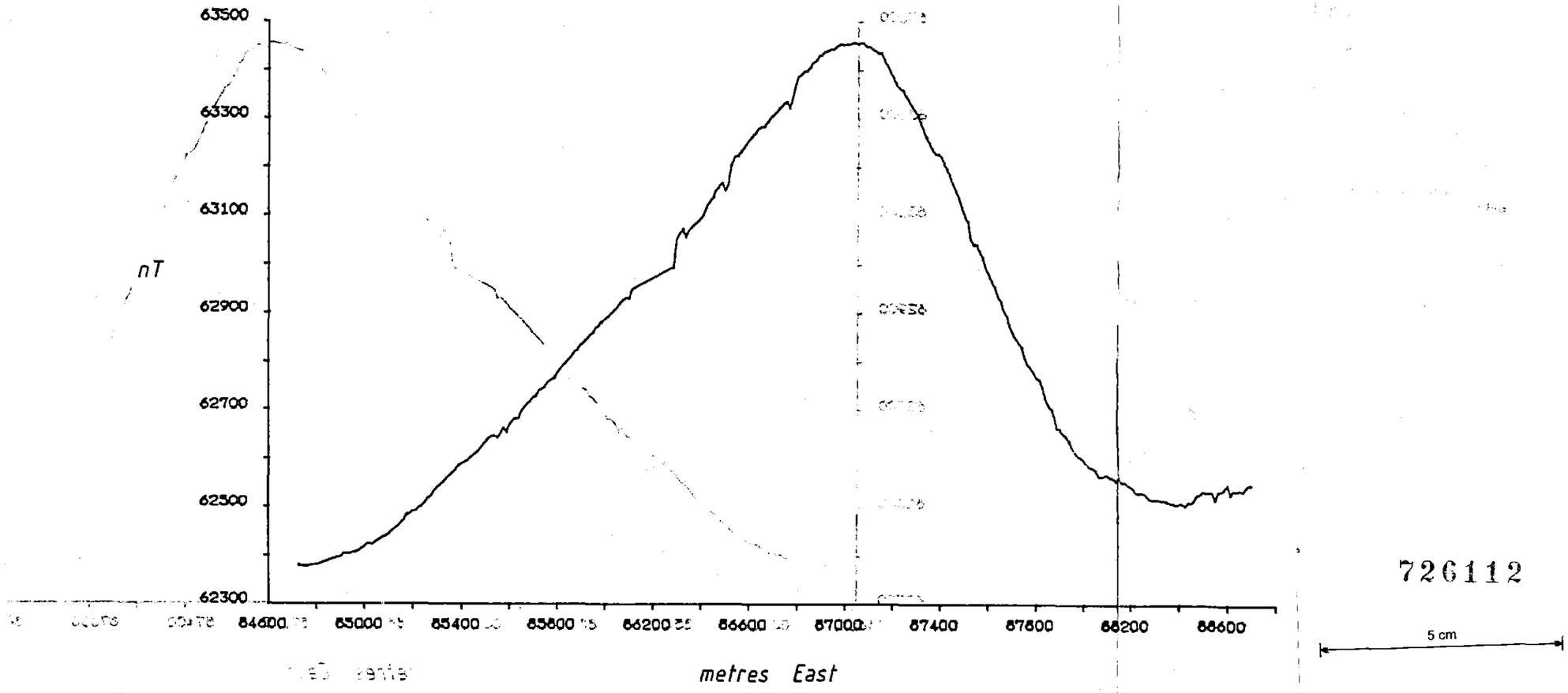
Mt. Sedgwick Prospect

GROUND MAGNETICS LINE: 50250N

geologist: TVS	scale: 1:10 000	report no: 15368
drawn: BP	date: SEPT. 1988	plan no: TASh 3656

Reference : BURNIE SK 55-3

110



726112

5 cm

88-2870

CRA EXPLORATION PTY. LIMITED

EL 5/85 - LAKE MARGARET

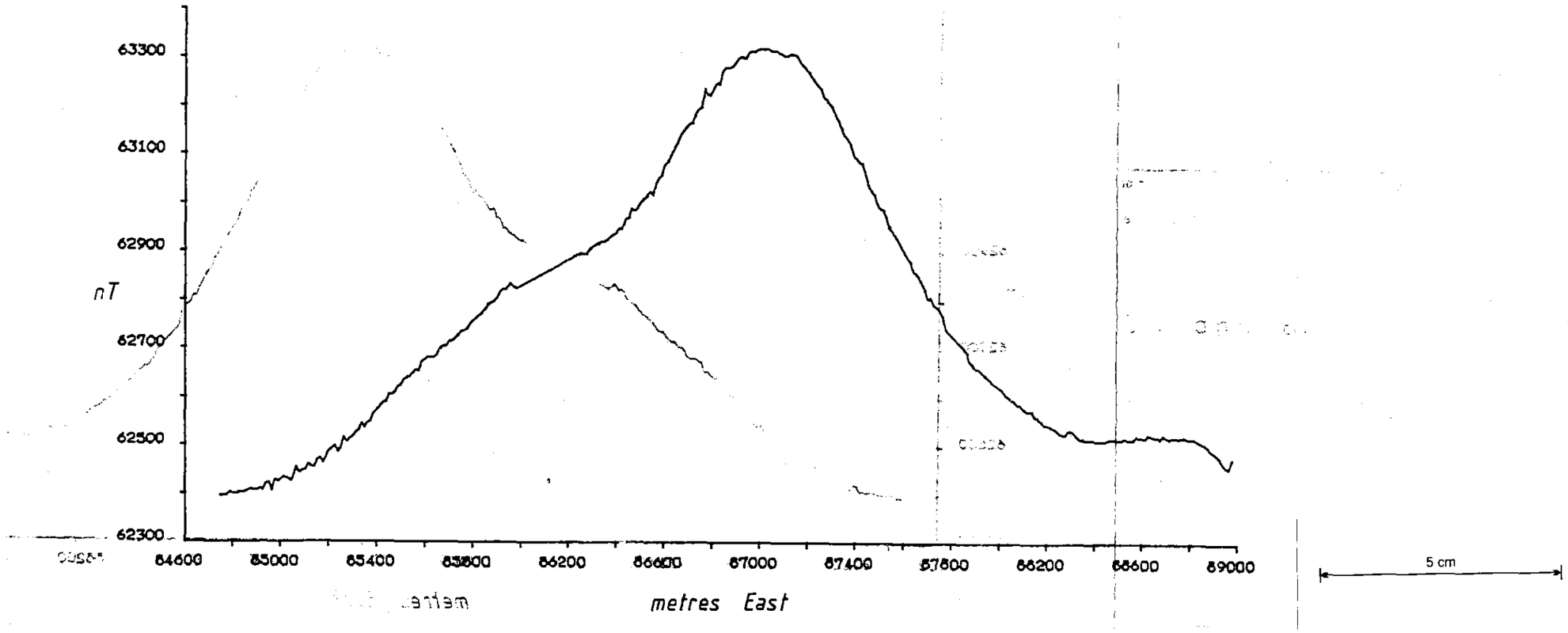
Mt. Sedgwick Prospect

GROUND MAGNETICS LINE: 50750N

geologist: TVS	scale: 1:10 000	report no: 15368
drawn: BP	date: SEPT. 1988	plan no: TASh 3657

Reference : BURNIE SK 55 - 3

169



726113

88-2870

CRA EXPLORATION PTY. LIMITED

EL 5/85 – LAKE MARGARET

Mt. Sedgwick Prospect

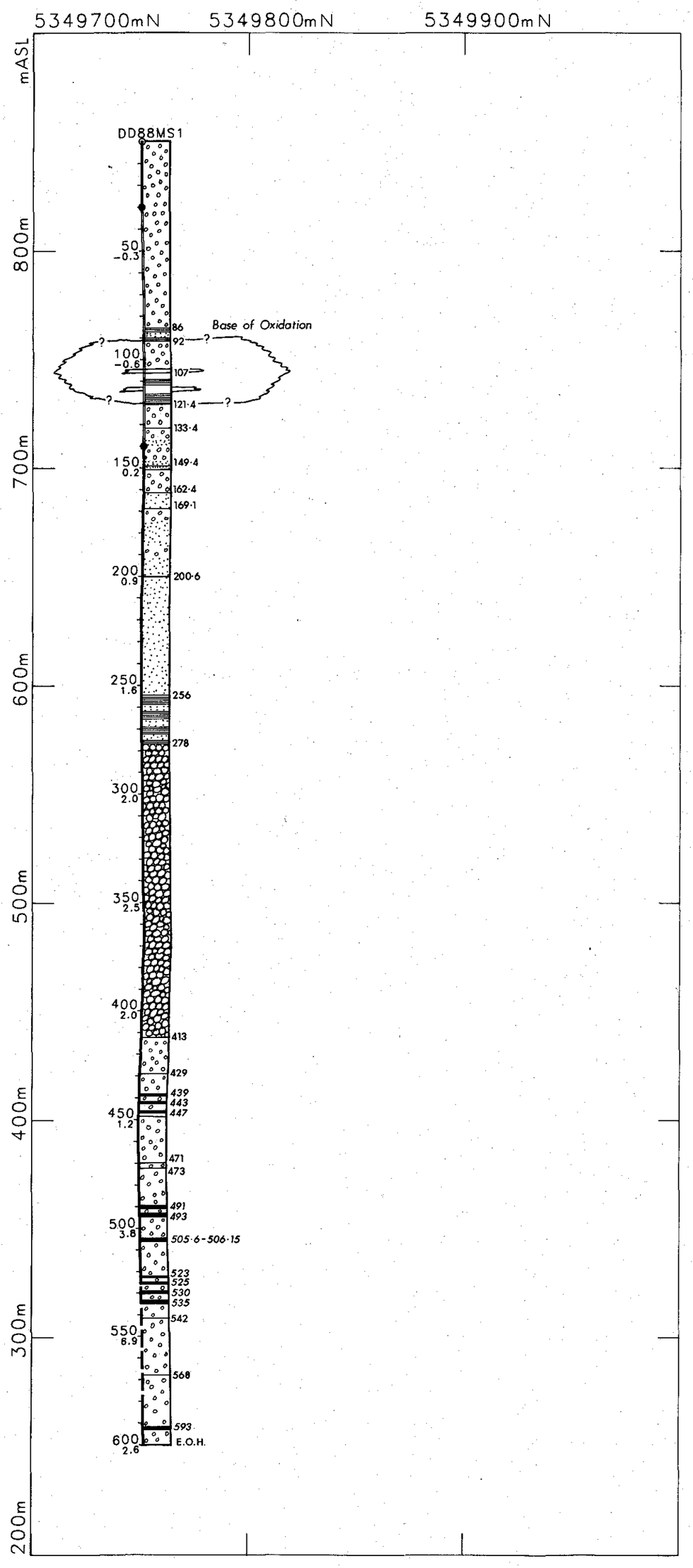
GROUND MAGNETICS LINE: 51250N

geologist: TVS	scale: 1:10 000	report no: 15368
drawn: BP	date: SEPT. 1988	plan no: TASh 3658

Reference : BURNIE SK 55 - 3

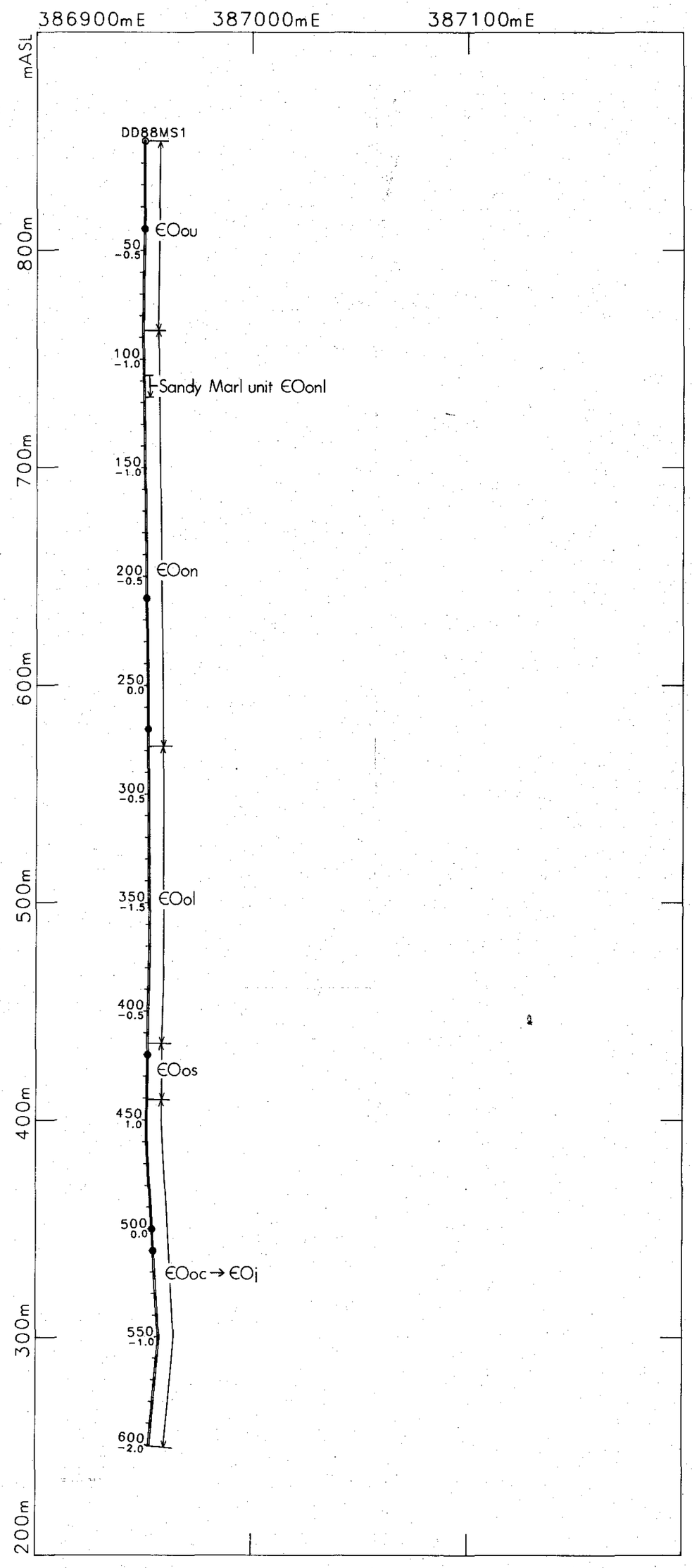
112

LITHOLOGY



SECTION ALONG 386950m E

TENTATIVE STRATIGRAPHIC SUBDIVISIONS



SECTION ALONG 5349750m N

LEGEND

CAMBRIAN – ORDOVICIAN SEDIMENTS

- *Cobble conglomerate - clast supported*
- *Pebble conglomerate - clast supported with a quartz sand matrix, some sand rich intervals.*
- *Siliceous sandstone occassional siltstone interbeds.*
- *Siltstone*

Combinations of the above rock types are present with the relative abundance of each component mirrored in the symbol
ie

- *Interbedded Siltstone > shale*
- *Pebble conglomerate > sandstone*

INTRUSIVES

- *Rhyolitic dyke, quartz-feldspar phyric. 10 to 110cm wide*

LEGEND

ORDOVICIAN
- €Oou — *Upper sequence of generally pink sandstone and granule-pebble conglomerate with minor siltstone. Clasts of pink chert common.*
- €Oon — *Interbedded sequence of micaceous sandstone, siltstone and siliciclastic pebble conglomerate, generally grey but pink in some areas. Impure limestone and calcareous sandstone. (€Oonl)*
- €Ool — *Dominantly thick-bedded to massive pink cobble-pebble to cobble-boulder conglomerate. Some units of grey conglomerate and sandstone.*
- €Oos — *Dominantly pink sandstone, pebbly sandstone and pebble conglomerate units of pebble-cobble conglomerate.*

CAMBRIAN
- €Ooc — *Dominantly thick-bedded to massive cobble-pebble to cobble-boulder conglomerate with minor sandstone lenses. Contains volcanic clasts in some areas.*
- €Oj — *Volcaniclastic conglomerate and sandstone - correlate of Jukes Conglomerate.*

5 cm

Depth ticks at 10 metre intervals, depth annotation interval 50m

Offsets from section are negative in front of section plane, and positive behind plane.

Drill hole trace displayed as a solid line when within 5m of section plane, broken line between 5 and 15m.

Circles on drill hole trace mark points of intersection with section plane.

Reference: QUEENSTOWN SK55-5 (8013)

0 100 200
metres

88-2870

726114

CRA EXPLORATION PTY. LIMITED

EL 5/85 – LAKE MARGARET
Mt. Sedgwick Prospect

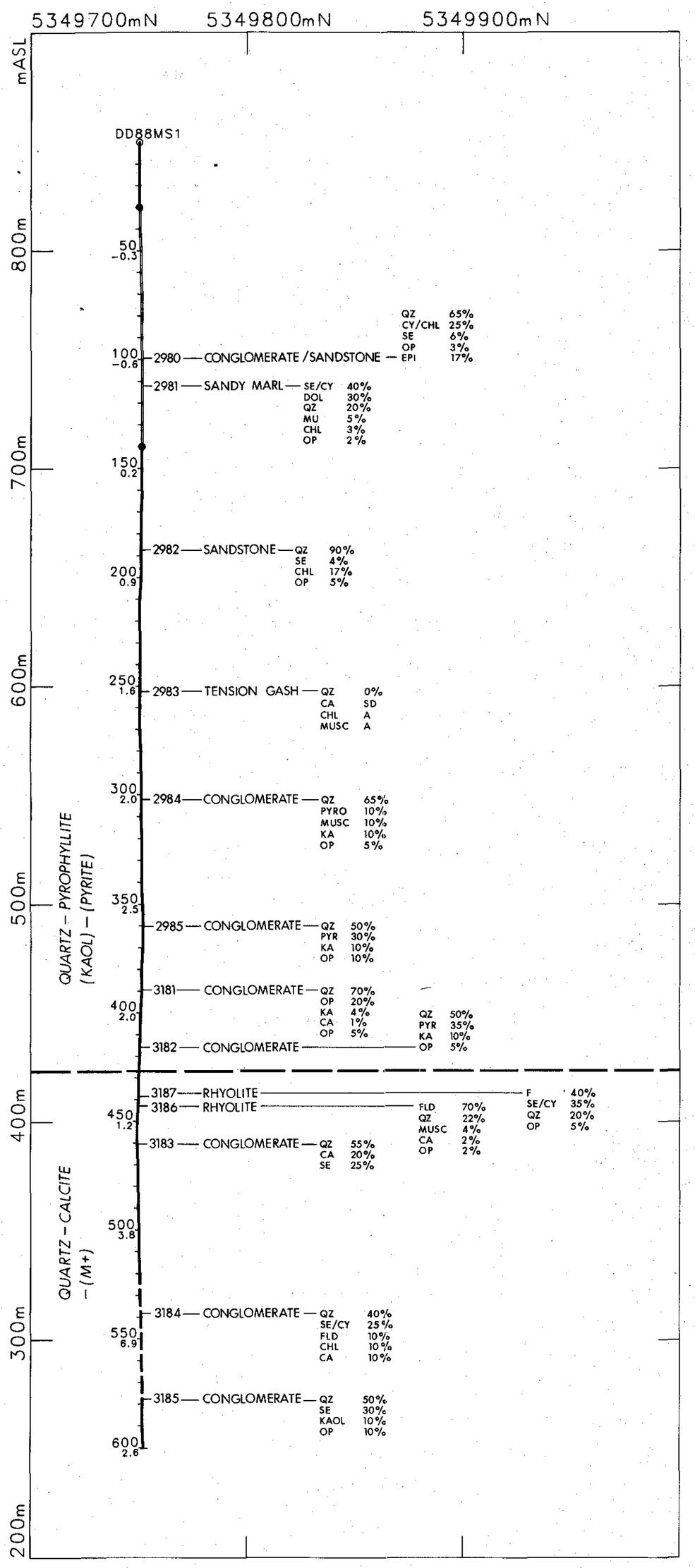
DD88MS1

7668

LITHOLOGY AND TENTATIVE STRATIGRAPHIC SUBDIVISIONS

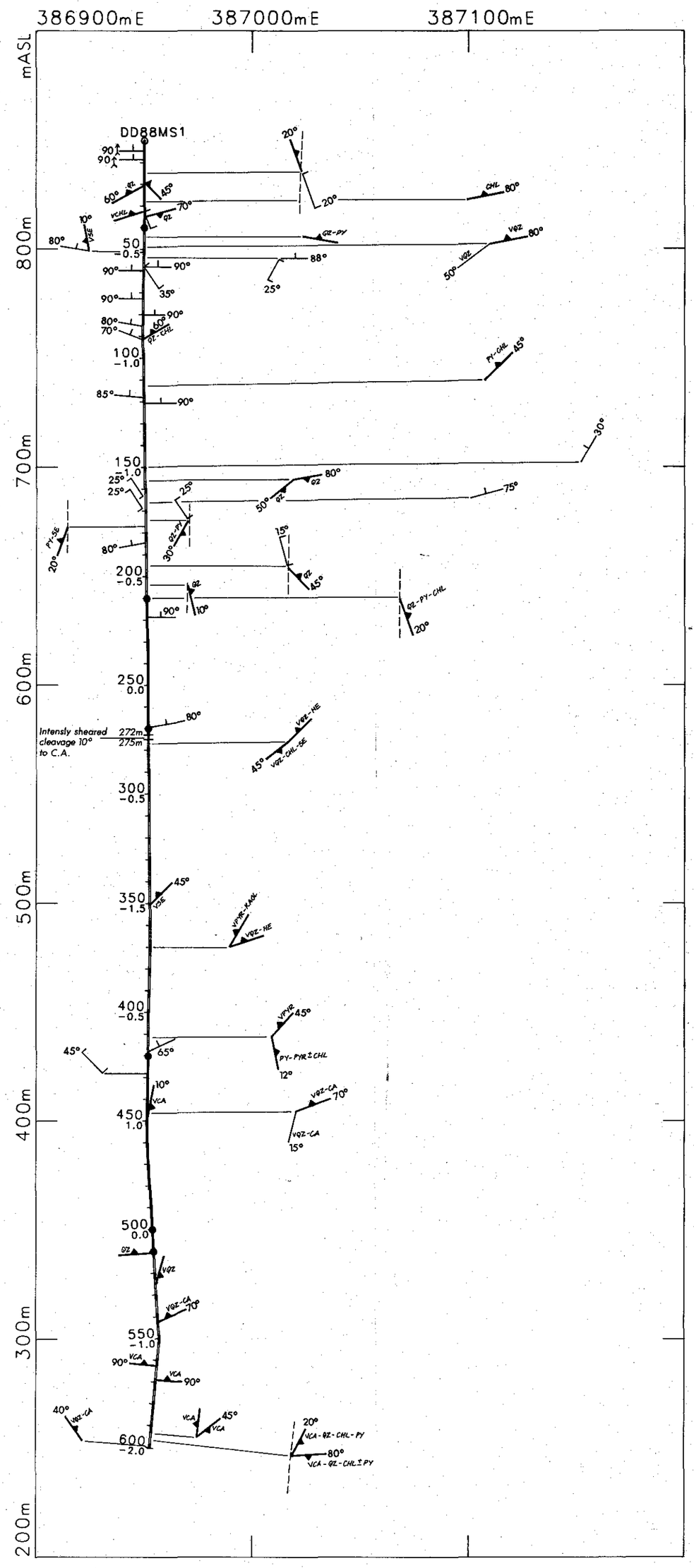
geologist: F.R.Funnell	scale: 1:2000	report no: 15386
drawn: B P	date: September 1988	plan no: TASh 3714

PETROGRAPHIC SAMPLE NUMBER LOCATIONS & ALTERATION FACIES



SECTION ALONG 386950m E

STRUCTURAL FEATURES



SECTION ALONG 5349750m N

D Dominant, most common mineral
SD Sub Dominant ≃ 20%
A Accessory 5 - 20%
Tr Trace x < 5%

80° Bedding; angle to C.A
Cleavage
Vein quartz - pyrite
Joint
Younging direction up towards top of arrow
Core axis orientation

QZ	QUARTZ
PYR	PYROPHYLLITE
KA	KAOLINITE
SE/CY	SERICITE/CLAY
DOL	DOLOMITE
CA	CALCITE
CHL	CHLORITE
MUSC	MUSCOVITE
FLD	FELDSPAR
OP	OPAQUES

All sample numbers prefixed by 165, ie 1652980

726115

5 cm

88-2870

Depth ticks at 10 metre intervals, depth annotation interval 50m

Offsets from section are negative in front of section plane, and positive behind plane.

Drill hole trace displayed as a solid line when within 5m of section plane, broken line between 5 and 15m.

Circles on drill hole trace mark points of intersection with section plane.

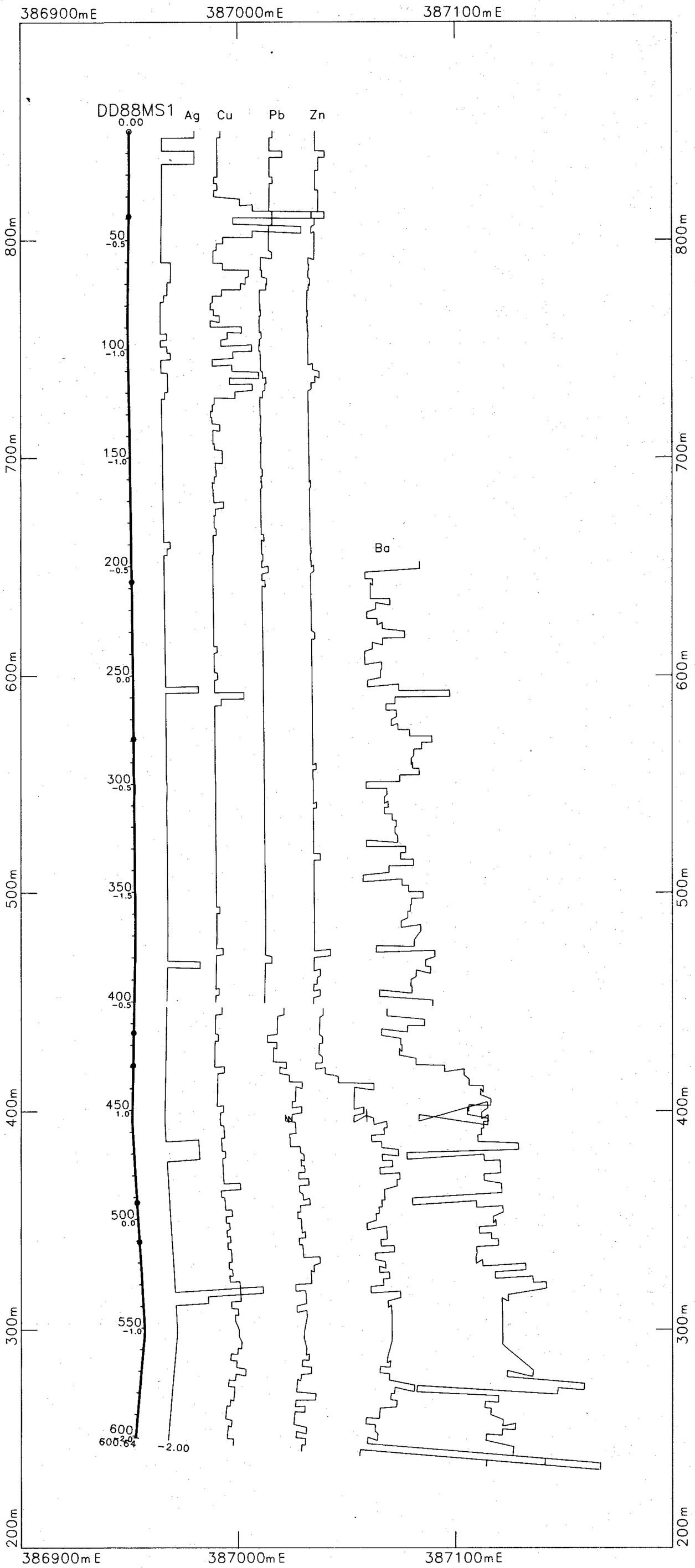
Reference : QUEENSTOWN SK55-5 (8013)

0 100 200
metres

CRA EXPLORATION PTY. LIMITED

EL 5/85 – LAKE MARGARET
Mt. Sedgwick Prospect
DD88MS1 7669
STRUCTURAL FEATURES and PETROGRAPHIC SAMPLE NUMBER LOCATIONS & ALTERATION FACIES

geologist F.R.Funnell	scale 1:2 000	report no : 15368
drawn B P	date : September 1988	plan no : TASh 3715



ASSAY PROFILE INFORMATION

Ag	Offset: 10mm,	Scale: 1ppm/cm
Cu	Offset: 25mm,	Scale: 50ppm/cm
Pb	Offset: 40mm,	Scale: 50ppm/cm
Zn	Offset: 55mm,	Scale: 50ppm/cm
Ba	Offset: 70mm,	Scale:250ppm/cm

Offset: base of assay profile (0 ppm) to drill hole trace.

SECTION ALONG 5349750N

SCALE 1:1500

Depth ticks at 10 metre intervals, depth annotation interval 50 metres. Values beneath drill hole depths are drill hole offsets from the section plane. Offsets are positive in front of section plane, negative behind. Circles on the drill hole trace denote points of intersection between the drill hole and section plane.

726116

5 cm

88-2870

CRA EXPLORATION PTY. LIMITED

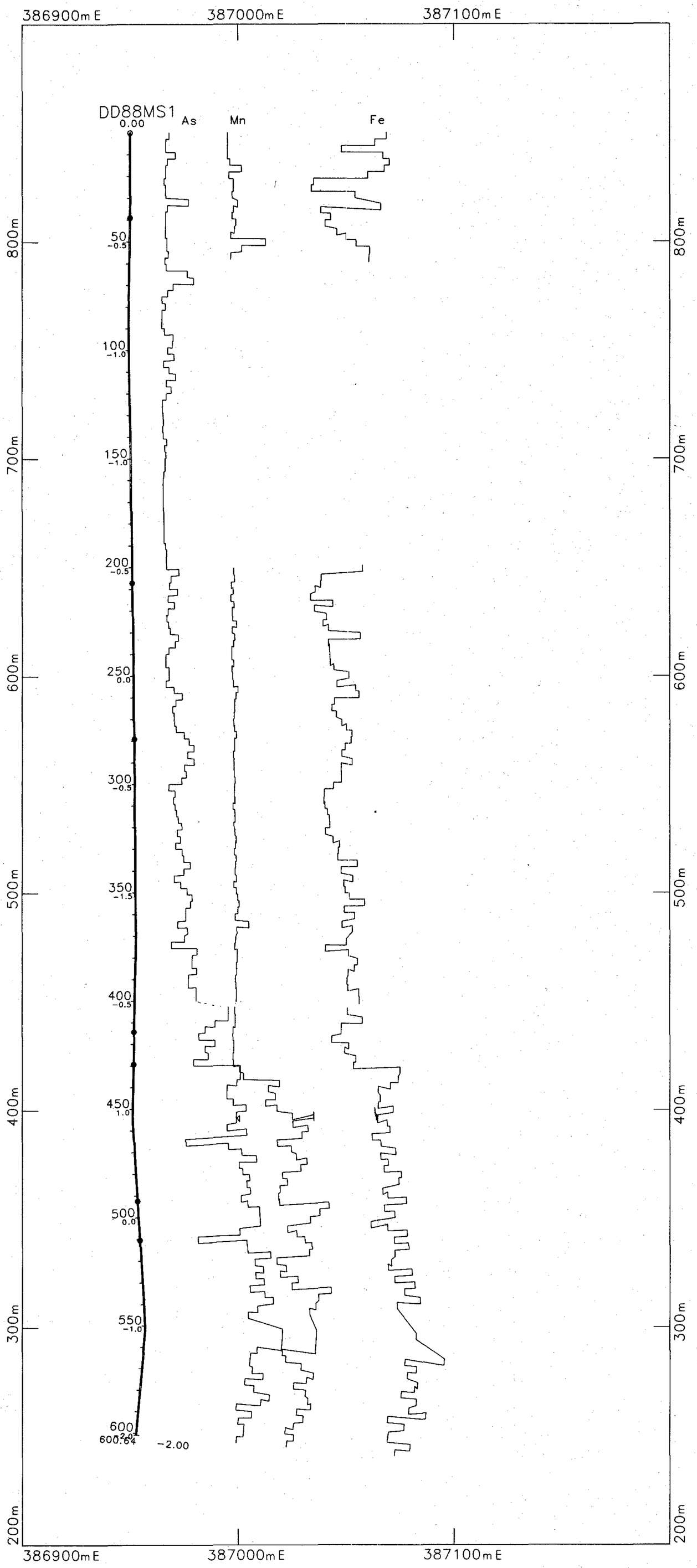
EL 5/85 - LAKE MARGARET

Mt. Sedgwick Prospect

DD88MS1 7670

DOWNHOLE HISTOGRAMS, Ag-Cu-Pb-Ba

geologist : FRF	scale : 1:1500	report no : 15368
drawn :	date : SEPT. 1988	plan no : TASh 3716



ASSAY PROFILE INFORMATION

As Offset: 10mm, Scale: 20ppm/cm
Mn Offset: 30mm, Scale: 500ppm/cm
Fe Offset: 50mm, Scale: 100 000ppm/cm

Offset: base of assay profile (0 ppm) to drill hole trace

SECTION ALONG 5349750N

SCALE 1:1500

Depth ticks at 10 metre intervals, depth annotation interval 50 metres. Values beneath drill hole depths are drill hole offsets from the section plane. Offsets are positive in front of section plane, negative behind. Circles on the drill hole trace denote points of intersection between the drill hole and section plane.

726117

5 cm

88-2870

CRA EXPLORATION PTY. LIMITED

EL 5/85 - LAKE MARGARET

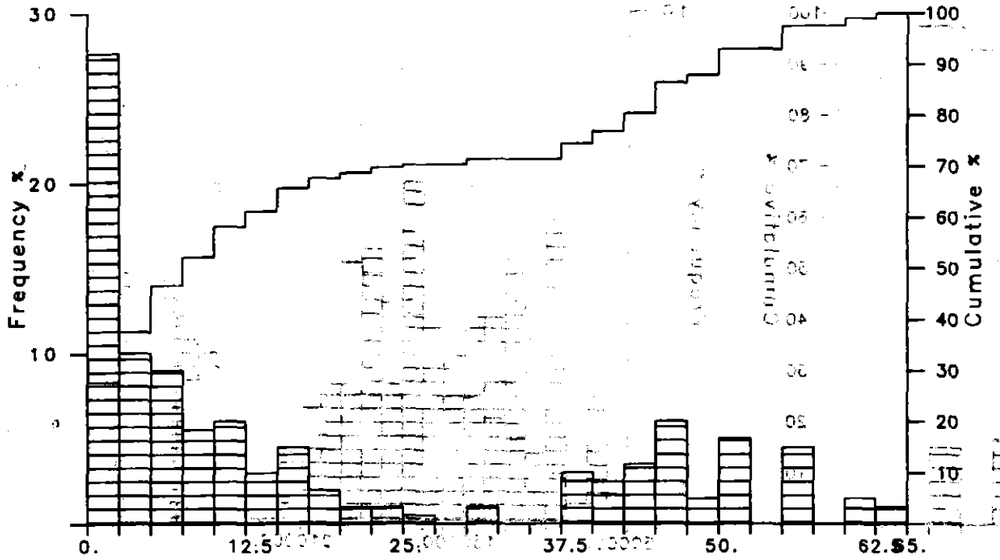
Mt. Sedgwick Prospect

DD88MS1 7671

DOWNHOLE HISTOGRAM, As-Mn-Fe

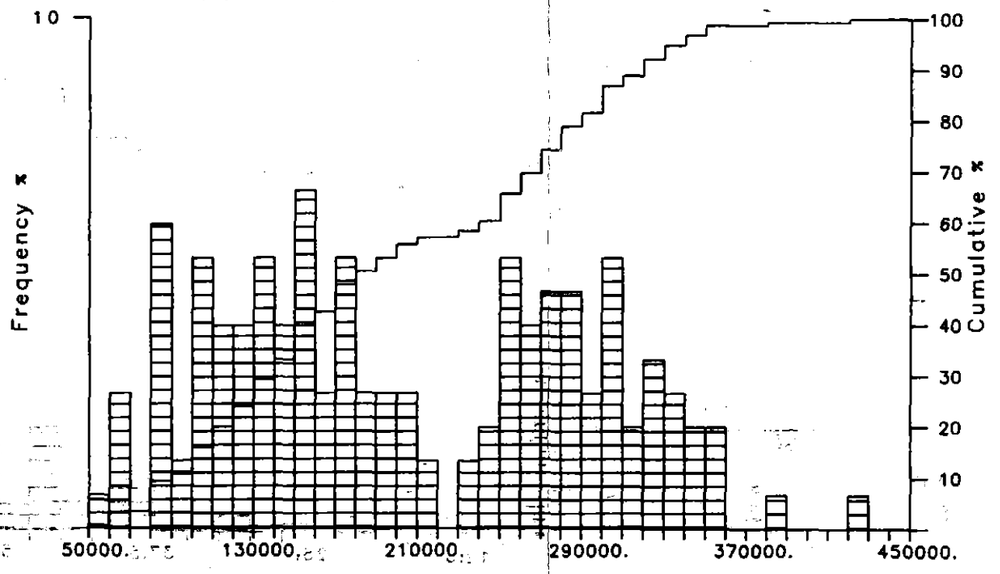
geologist: FRF	scale: 1:1500	report no: 15368
	date: SEPT. 1988	plan no: TASh 3717

Statistics for :As



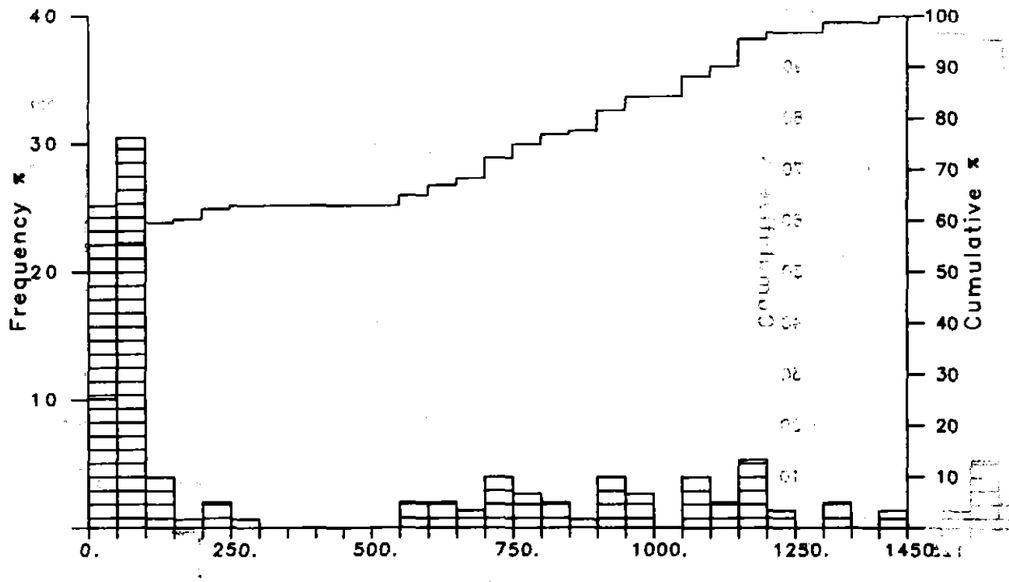
Average : 18.5 Minimum : 0.0 Maximum: 65.0
Stand. Dev.: 20.0 Coef/Var: 108.1 Samples: 199

Statistics for :Fe



Average : 205644.8 Minimum : 50000.0 Maximum: 429000.0
Stand. Dev.: 87103.4 Coef/Var: 42.4 Samples: 151

Statistics for :Mn



Average : 389.8 Minimum : 0.0 Maximum: 1450.0
Stand. Dev.: 450.3 Coef/Var: 115.5 Samples: 151

726118

5 cm

88-2870

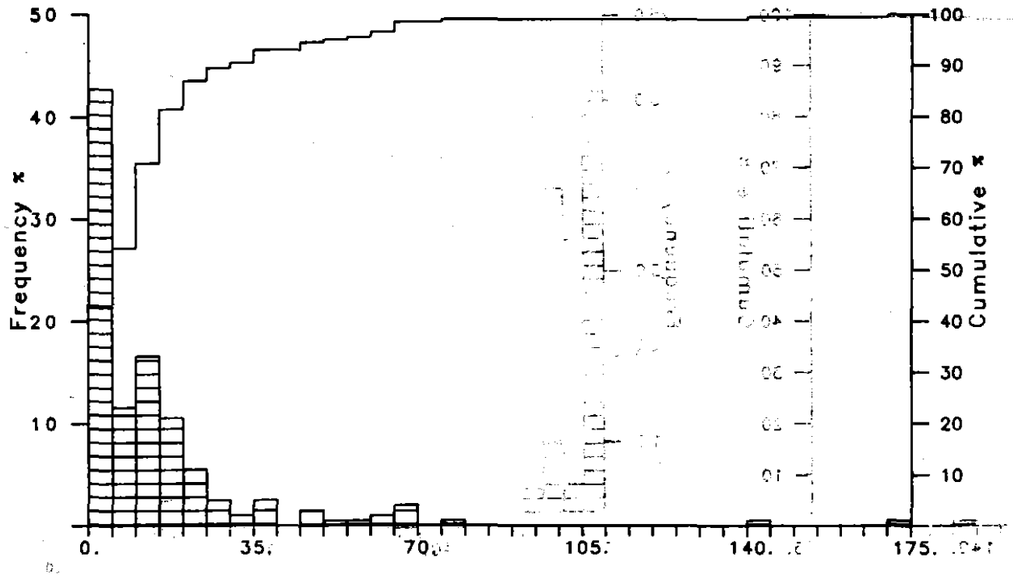
CRA EXPLORATION PTY. LIMITED

EL 5/85 - LAKE MARGARET
Mt. Sedgwick Prospect

DD88MS1
As-Fe-Mn STATISTICS

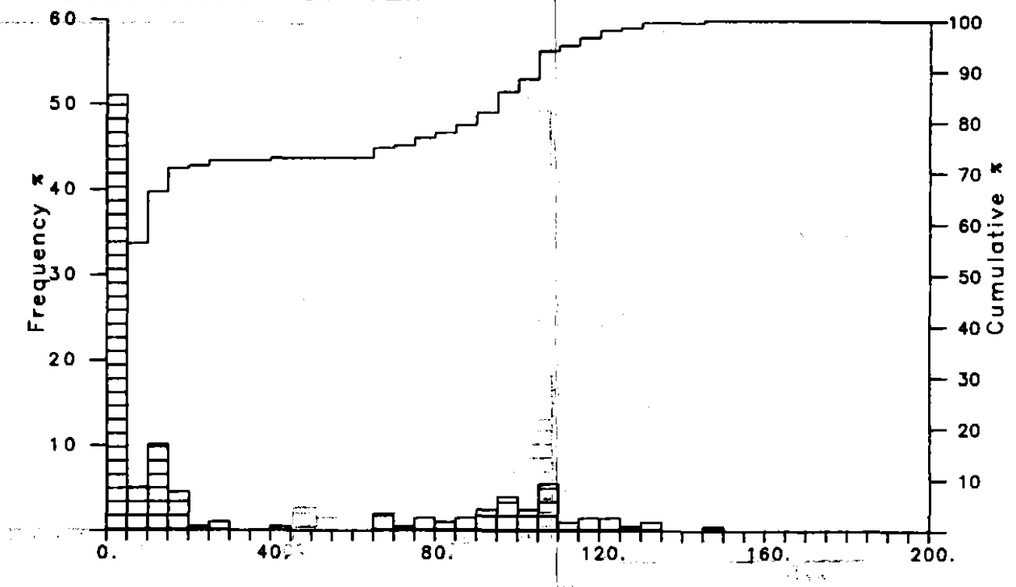
geologist FRF	scale	report no 15368
drawn	date SEPT. 1988	plan no TASh 3718

Statistics for :Cu



Average : 12.2 Minimum : 0.0 Maximum: 175.0
Stand. Dev.: 21.0 Coef/Var: 172.0 Samples: 199

Statistics for :Zn



Average : 31.5 Minimum : 0.0 Maximum: 440.0
Stand. Dev.: 52.2 Coef/Var: 165.8 Samples: 198

Statistics for :Pb

Average : 17.7 Minimum : 0.0 Maximum: 75.0
Stand. Dev.: 22.2 Coef/Var: 125.2 Samples: 199

Statistics for :Ba

Average : 579.5 Minimum : 0.0 Maximum: 1650.0
Stand. Dev.: 395.2 Coef/Var: 68.2 Samples: 132

CRA EXPLORATION PTY. LIMITED

EL 5/85 - LAKE MARGARET
Mt. Sedgwick Prospect

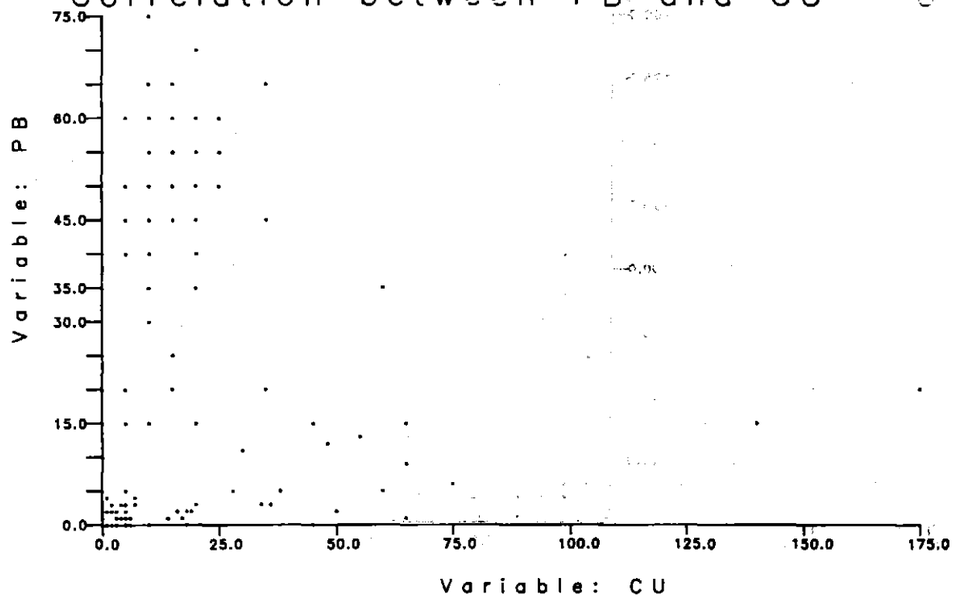
DD88MS1
Cu-Pb-Zn-Ba STATISTICS

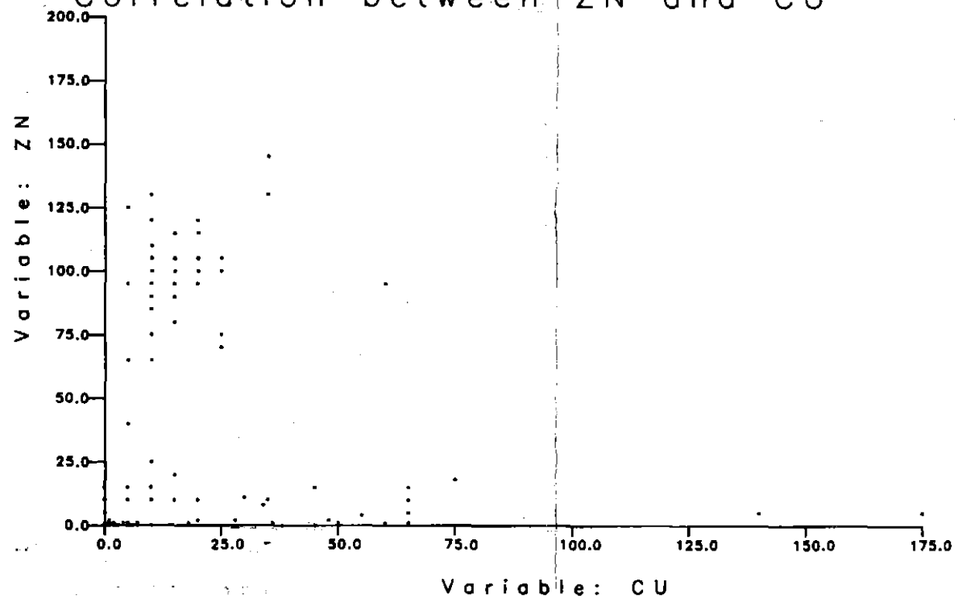
geologist: FRF	scale	report no: 15368
drawn:	date: Sept. 1988	plan no: TASh 3719

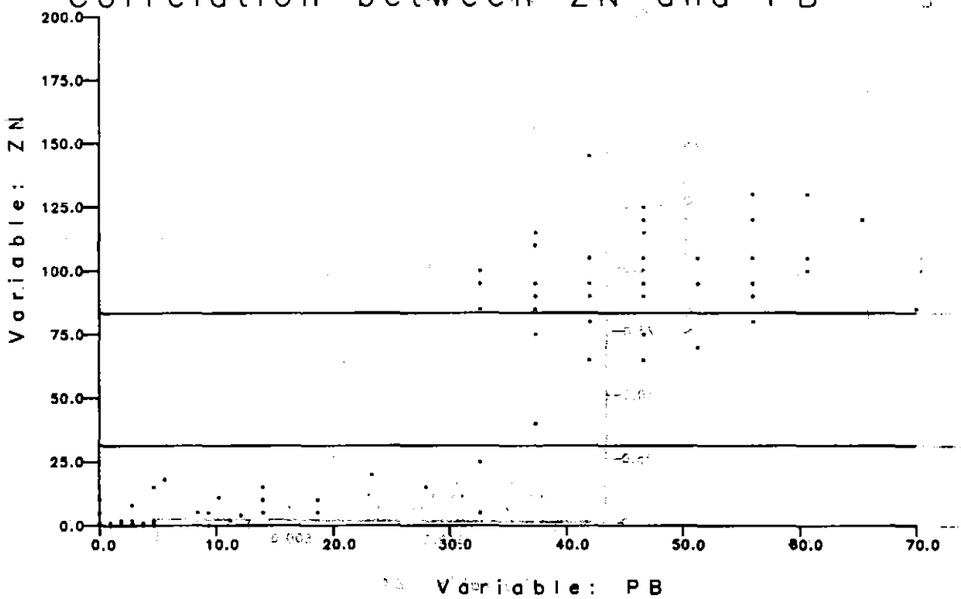
88-2870 J

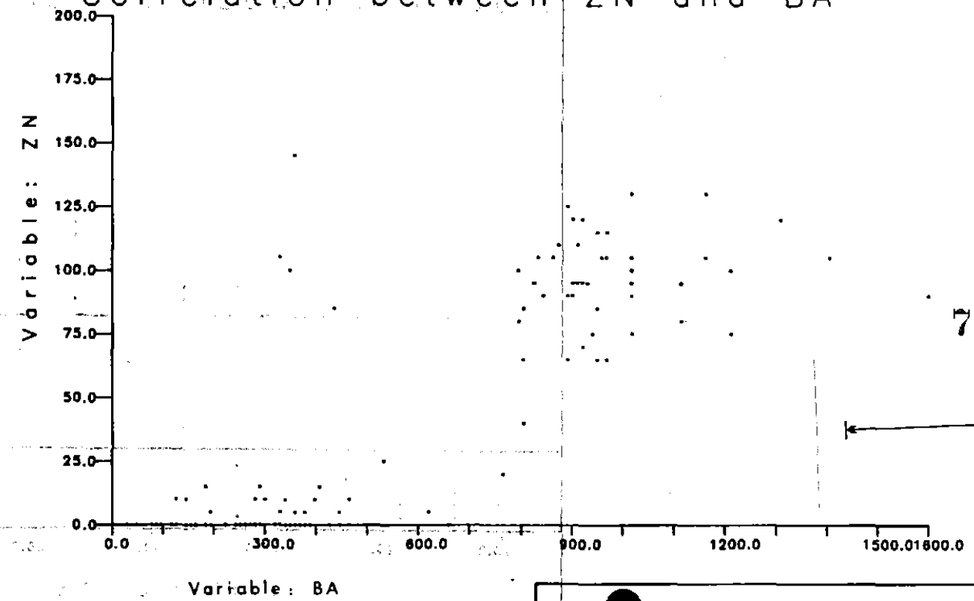
726119

115









726120

5 cm

CRA EXPLORATION PTY. LIMITED

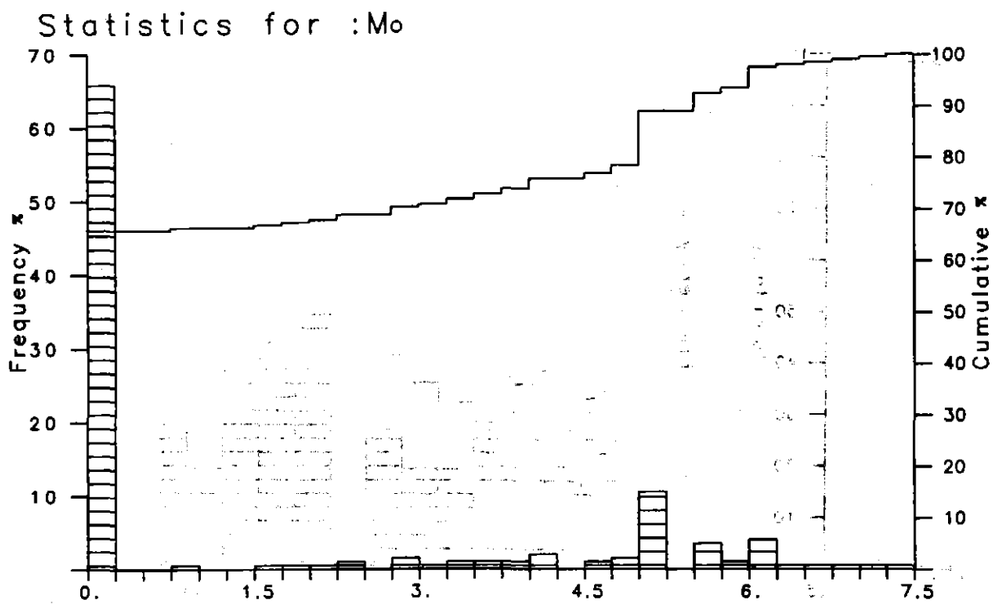
EL 5/85 – LAKE MARGARET
Mt. Sedgwick Prospect

DD88MS1
Pb–Cu, Zn–Cu, Zn–Pb, Zn–Ba
CORRELATIONS

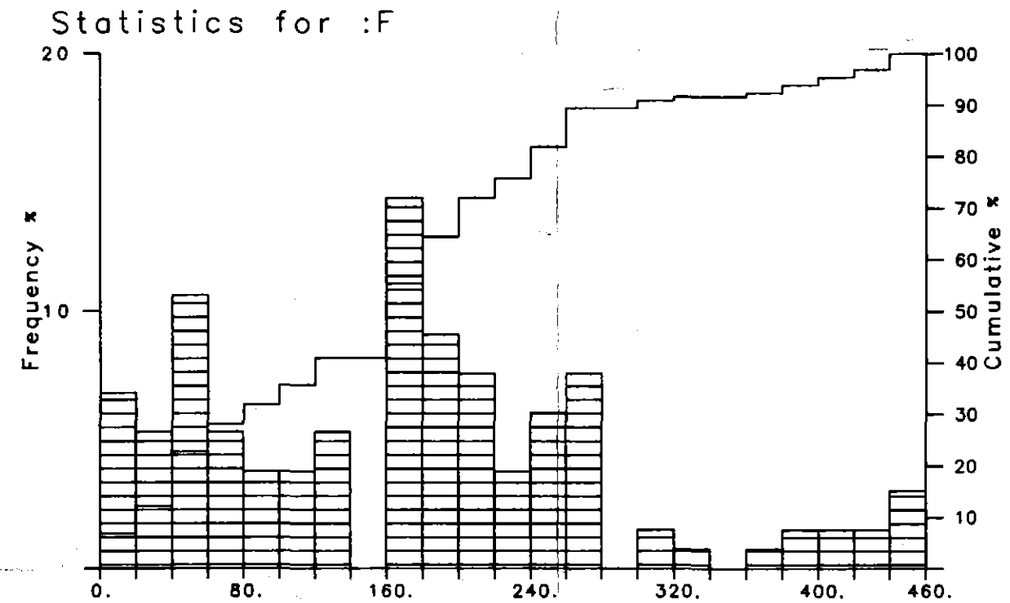
geologist : FRF	scale :	report no : 15368
drawn :	date : SEPT. 1988	plan no : TASh 3720

88-2870

114



Average :	1.63	Minimum :	0.00	Maximum:	7.40
Stand. Dev.:	2.39	Coef/Var:	146.98	Samples:	199



Average :	162.6	Minimum :	0.0	Maximum:	460.0
Stand. Dev.:	114.3	Coef/Var:	70.3	Samples:	132

726121

88-2870

CRA EXPLORATION PTY. LIMITED

EL 5/85 - LAKE MARGARET

Mt. Sedgwick Prospect

DD88MS1

Mo-F STATISTICS

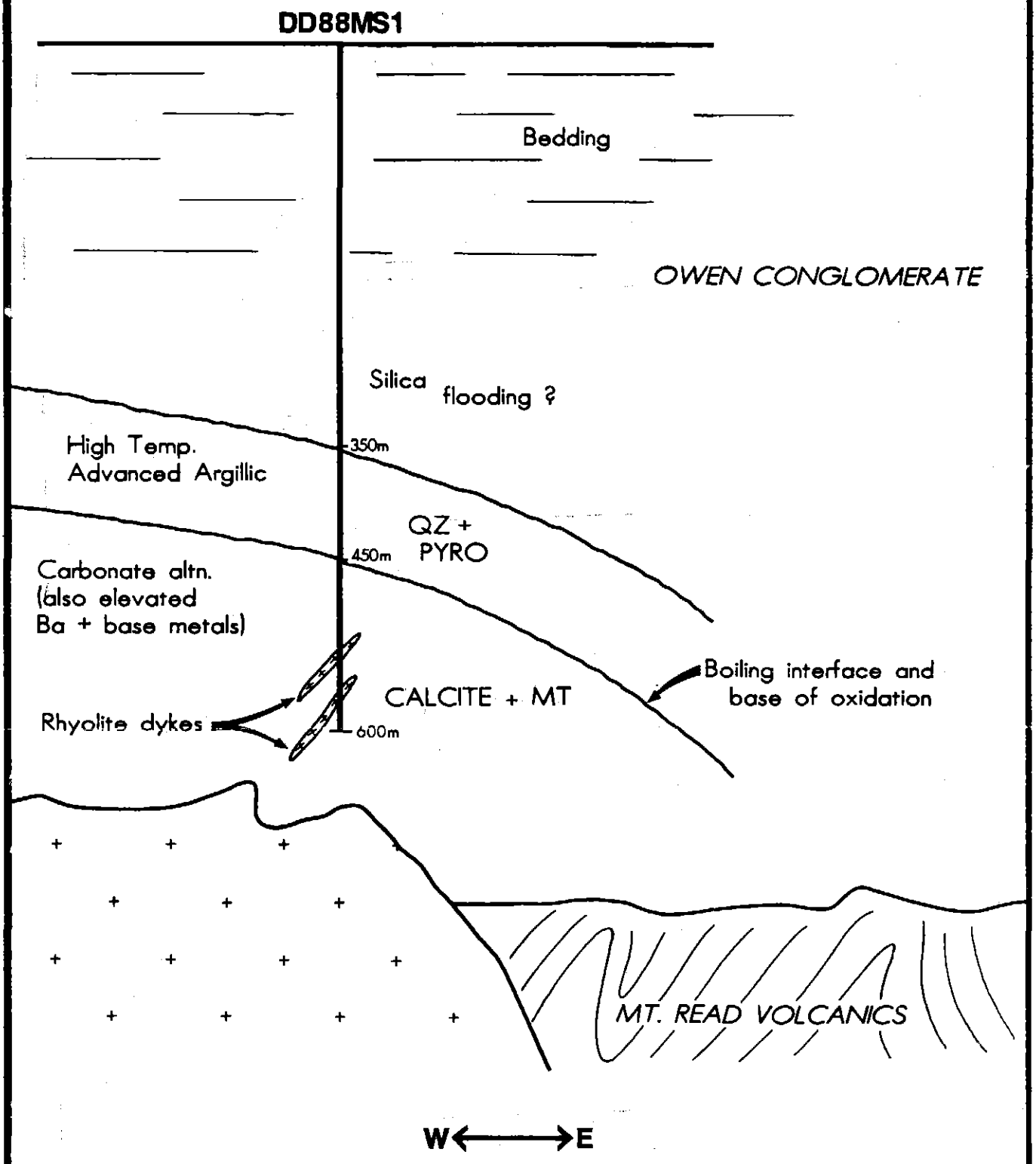
geologist : FRF	scale :	report no : 15368
drawn :	date : SEPT. 1988	plan no : TASh 3721

116

117

88-2870

726122



QZ - QUARTZ
MT - MAGNETITE
PYRO - PYROPHYLLITE

Note: Not to scale

CRA EXPLORATION PTY. LIMITED		
EL 5/85 – LAKE MARGARET Mt. Sedgwick Prospect		
SCHEMATIC CROSS-SECTION		
Ref: BURNIE SK 55-3		QUEENSTOWN SK 55-5
geologist: FRF	scale: —	report no: 15368
drawn: BP	date: SEPT. 1988	plan no: TASh 3722